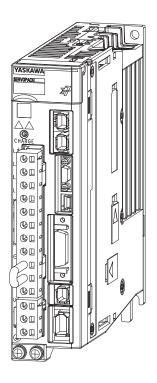
YASKAWA

 Σ -7-Series AC Servo Drive Σ -7S SERVOPACK with FT/EX Specification for Application with Special Motor, Harmonic Drive Systems **Actuator Product Manual**

Model: SGD7S-□□□A20□□□□F81□, -□□□A10□□□□F81□





Basic Information on **SERVOPACKs**

Selection

Maintenance

Parameter Lists

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About this Manual

This manual describes the Σ -7-Series AC Servo Drive Σ -7S SERVOPACKs with Actuator Drive from Harmonic Drive Systems Inc. for combinations with special motors.

Read and understand this manual to ensure correct usage of these Σ -7-Series AC Servo Drives. Keep this manual in a safe place so that it can be referred to whenever necessary.

Refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc. for the specifications, performances, and functionality of the motors and encoders.

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 product manual given in the following table.

ltem			This Manual	Σ-7S SERVOPACK with MECHA- TROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)	Σ-7S SERVOPACKS with MECHA- TROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
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Continued on next page.					

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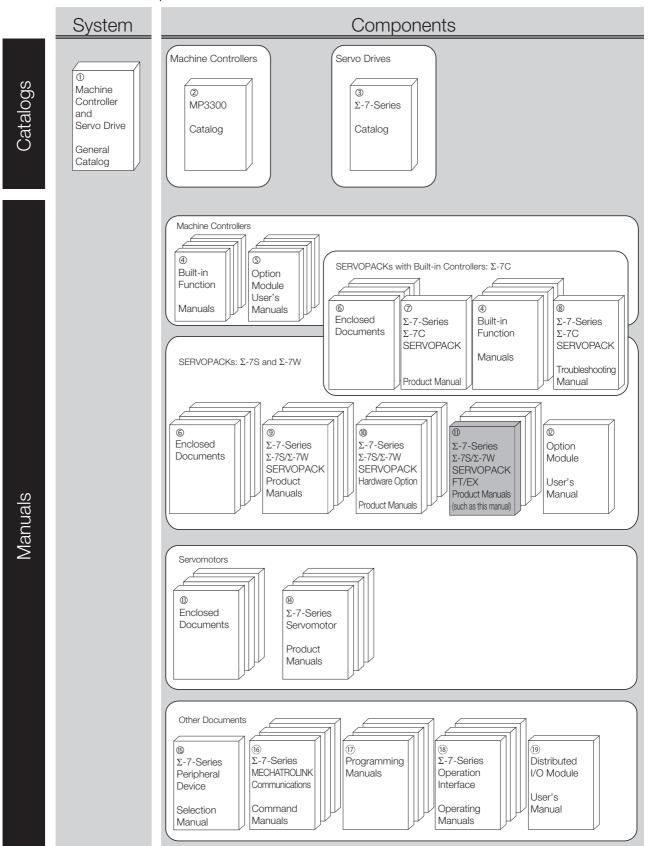
ltem			This Manual	Σ-7S SERVOPACK with MECHA- TROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)	Σ-7S SERVOPACKS with MECHA- TROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
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			Σ-7S SERVOPACK with MECHA- TROLINK-II	Σ-7S SERVOPACKs with MECHA- TROLINK-III
	lika ma	This	Communications	Communications
	Item	Manual	References Product	References Product
			Manual	Manual
			(Manual No.:	(Manual No.:
			SIEP S800001 27)	SIEP S800001 28)
	Inspections and Part Replacement	_	12.1	12.1
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	Displaying the Alarm History	_	12.2.4	_
	Clearing the Alarm History	_	12.2.5	_
	Resetting Alarms Detected in Option Modules	_	12.2.6	-
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Item		This Manual	Σ-7S SERVOPACK with MECHA- TROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)	Σ-7S SERVOPACKS with MECHA- TROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)	
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		List of Servo Parameters	4.2.2	_	_
		Interpreting the MECHATROLINK-III Common Parameter List	4.2.3	-	_
		List of MECHATROLINK-III Common Parameters	4.2.4	_	_
		Parameter Recording Table	4.2.5	_	_
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Related Documents

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



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

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

Olassification	Decime out Nieur	Decime and Ma	Continued from previous page.	
Classification	Document Name	Document No.	Description	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 28		
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual	SIEP S800001 27		
Σ-7-SeriesΣ-7-Series	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with Analog Voltage/Pulse Train References Product Manual	SIEP S800001 26	Provide detailed information on selecting Σ-7-Series Σ-7S and Σ-7W SERVOPACKs; installing, connecting, setting, testing in trial	
Σ-7S/Σ-7W SERVOPACK Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual	SIEP S800001 64	operation, tuning, monitoring, and maintaining Servo Drives; and other information.	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual	SIEP S800001 70		
	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual	SIEP S800001 29		
	Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifica- tions Dynamic Brake Product Manual	SIEP S800001 73	Provide detailed information on	
SERVOPACK with Hardware Option Specifications Product Manuals	Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifica- tions HWBB Function Product Manual	SIEP S800001 72	Hardware Options for Σ-7-Series SERVOPACKs.	
[®] Σ-7-Series Σ-7S/Σ-7W SERVOPACK FT/EX Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Index- ing Application Product Manual	SIEP S800001 84	Provide detailed information on the FT/EX Option for Σ-7-Series	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Track- ing Application Product Manual	SIEP S800001 89	SERVOPACKs.	

Classification	Document Name	Document No.	Continued from previous page. Description
Olassilloation	Σ-7-Series AC Servo Drive	Document No.	Description
	Σ-7S SERVOPACK with FT/EX Specification for Application with Special Motor, SGM7D Motor Product Manual	SIEP S800001 91	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Application with Special Motor, Harmonic Drive Systems Actuator Product Manual	This manual (SIEP S800001 92)	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Press and Injection Molding Application Product Manual	SIEP S800001 94	
^① Σ-7-Series Σ-7S/Σ-7W SERVOPACK FT/EX Product Manuals	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Transfer and Alignment Application Product Manual	SIEP S800001 95	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Application with Special Motor, Harmonic Drive Systems Actuator Product Manual	SIEP S800001 98	Provide detailed information on the FT/EX Option for Σ -7-Series SERVOPACKs.
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application Product Manual	SIEP S800002 09	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Cutting Application Feed Shaft Motor Product Manual	SIEP S800002 10	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Three-Point Latching for Conveyance Application Product Manual	SIEP S800002 17	
	Σ-7-Series AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Semi-/Fully-Closed Loop Control Online Switching for Conveyance Application Product Manual	SIEP S800002 27	
	Σ-7-Series AC Servo Drive Σ-7W SERVOPACK with FT/EX Specification for Gantry Applications Product Manual	SIEP S800002 29	Continued on next page

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

Classification	Document Name	Document No.	Description
[®] Programming Manuals	Machine Controller MP3000 Series Ladder Programming Manual	SIEP C880725 13	Provides detailed information on the ladder programming specifications and instructions for MP3000-Series Machine Controllers and Σ -7-Series Σ -7C SERVOPACKs.
	Machine Controller MP3000 Series Motion Programming Manual	SIEP C880725 14	Provides detailed information on the motion programming and sequence programming specifications and instructions for MP3000-Series Machine Controllers and Σ -7-Series Σ -7C SERVOPACKs.
® Σ-7-Series Operation Interface Operating Manuals	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 AC Servo Drive Digital Operator Operating Manual	SIEP S800001 33	Describes the operating procedures for a Digital Operator for a Σ-7-Series Servo System.
	AC Servo Drive Engineering Tool SigmaWin+ Operation Manual	SIET S800001 34	Provides detailed operating procedures for the SigmaWin+ Engineering Tool for a Σ -7-Series Servo System.
® Distributed I/O Module User's Manual	MECHATROLINK-III Compatible I/O Module User's Manual	SIEP C880781 04	Describes the functions, specifications, operating methods, and MECHATROLINK-III communications for the Remote I/O Modules for MP2000/MP3000-Series Machine Controllers.

Using This Manual

◆ Technical Terms Used in This Manual

The following terms are used in this manual.

Term	Meaning
Actuator	An Actuator made by Harmonic Drive Systems Inc., that couples a Speed Reducer for precision control with a Flat AC Servo Motor.
Servomotor	A Flat AC Servo Motor used in an Actuator from Harmonic Drive Systems Inc.
SERVOPACK	A Σ -7-Series Σ -7S Servo Amplifier with MECHATROLINK-III Communications References.
Servo Drive	The combination of a Servomotor and SERVOPACK.
Servo System	A servo control system that includes the combination of a Servo Drive with a host controller and peripheral devices.
servo ON	Supplying power to the motor.
servo OFF	Not supplying power to the motor.
base block (BB)	Shutting OFF the power supply to the motor by shutting OFF the base current to the power transistor in the SERVOPACK.
servo lock	A state in which the motor is stopped and is in a position loop with a position reference of 0.
Main Circuit Cable	One of the cables that connect to the main circuit terminals, including the Main Circuit Power Supply Cable, Control Power Supply Cable, and Servomotor Main Circuit Cable.
SigmaWin+	The Engineering Tool for setting up and tuning Servo Drives or a computer in which the Engineering Tool is installed.

Notation Used in this Manual

■ Notation for Reverse Signals

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

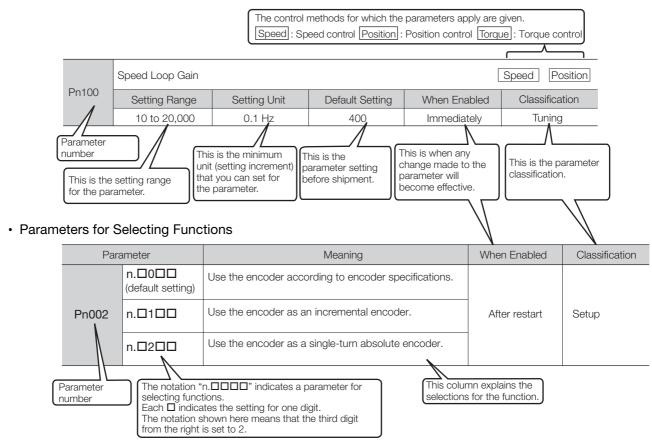
Notation Example

BK is written as /BK.

Notation for Parameters

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

· Parameters for Numeric Settings



Notation Example

Notation Examples for Pn002

Dig		Digit Notation	Numeric Value Notation	
n.0 0 0 0	Notation	Meaning	Notation	Meaning
$\top \top \top \top \longrightarrow$	Pn002 = n.□□□X	Indicates the first digit from the right in Pn002.	Pn002 = n.□□□1	Indicates that the first digit from the right in Pn002 is set to 1.
 	Pn002 = n.□□X□	Indicates the second digit from the right in Pn002.	Pn002 = n.□□1□	Indicates that the second digit from the right in Pn002 is set to 1.
—	Pn002 = n.□X□□	Indicates the third digit from the right in Pn002.	Pn002 = n.□1□□	Indicates that the third digit from the right in Pn002 is set to 1.
	Pn002 = n.X□□□	Indicates the fourth digit from the right in Pn002.	Pn002 = n.1□□□	Indicates that the fourth digit from the right in Pn002 is set to 1.

♦ Trademarks

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

♦ Visual Aids

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



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



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

Example Indicates operating or setting examples.

Information Indicates supplemental information to deepen understanding or useful information.

Safety Precautions

◆ Safety Information

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

DANGER

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

WARNING

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

A CAUTION

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

NOTICE

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

Safety Precautions That Must Always Be Observed

General Precautions

DANGER

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

There is a risk of electric shock, operational failure of the product, or burning.

MARNING

- 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.
- ullet Connect the ground terminals on the SERVOPACK and Servomotor to ground poles according to local electrical codes (100 Ω or less for a SERVOPACK with a 200-VAC power supply). There is a risk of electric shock or fire.
- Do not attempt to disassemble, repair, or modify the product.
 There is a risk of fire or failure.
 The warranty is void for the product if you disassemble, repair, or modify it.

CAUTION

- The SERVOPACK heat sinks, regenerative resistors, External Dynamic Brake Resistors, Servomotor, Actuator, 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, Servomotor, or Actuator 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 the SERVOPACKs, Servomotors, and Actuators in one of the specified combinations
- Do not touch a SERVOPACK, Servomotor, or Actuator with wet hands. There is a risk of product failure.

■ Storage Precautions

CAUTION

 Do not place an excessive load on the product during storage. (Follow all instructions on the packages.)

There is a risk of injury or damage.

NOTICE

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

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

Transportation Precautions

M CAUTION

- Transport the product in a way that is suitable to the mass of the product.
- Do not use the eyebolts on a SERVOPACK or Servomotor to move the machine. There is a risk of damage or injury.
- When you handle a SERVOPACK, Servomotor, or Actuator, 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, Servomotor, or Actuator is a precision device. Do not drop it or subject it to strong shock.

There is a risk of failure or damage.

- Do not subject connectors to shock.
 There is a risk of faulty connections or damage.
- If disinfectants or insecticides must be used to treat packing materials such as wooden frames, plywood, or pallets, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used.

Example: Heat treatment, where materials are kiln-dried to a core temperature of 56°C for 30 minutes or more.

If the electronic products, which include stand-alone products and products installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogen, which includes chlorine, fluorine, bromine, or iodine can contribute to the erosion of the capacitors.

Do not overtighten the eyebolts on a SERVOPACK or Servomotor.
 If you use a tool to overtighten the eyebolts, the tapped holes may be damaged.

Installation Precautions

M CAUTION

- Install a SERVOPACK, Servomotor, or Actuator in a way that will support the mass given in technical documents.
- Install SERVOPACKs, Servomotors, Actuators, 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 a SERVOPACK, Servomotor, or Actuator. 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, Servomotor, or Actuator 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 block the inlets and outlets on a SERVOPACK and do not allow any foreign matter to enter the inlets and outlets.

There is a risk of failure.

■ Wiring Precautions

A DANGER

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

⚠ WARNING

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

There is a risk of failure or fire.

 If you use a SERVOPACK that supports a Dynamic Brake Option, connect an External Dynamic Brake Resistor that is suitable for the machine and equipment specifications to the specified terminals.

There is a risk of unexpected operation, machine damage, burning, or injury when an emergency stop is performed.

⚠ CAUTION

 Wait for six minutes after turning OFF the power supply 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.

• Observe the precautions and instructions for wiring and trial operation precisely as described in this document.

Failures caused by incorrect wiring or incorrect voltage application in the brake circuit may cause the SERVOPACK to fail, damage the equipment, or cause an accident resulting in death or injury.

- Check the wiring to be sure it has been performed correctly.
 Connectors and pin layouts are sometimes different for different models. Always confirm the pin layouts in technical documents for your model before operation.
 There is a risk of failure or malfunction.
- Connect wires to power supply terminals and motor connection terminals securely with the specified methods and tightening torque.
 Insufficient tightening may cause wires and terminal blocks to generate heat due to faulty contact, possibly resulting in fire.
- Use shielded twisted-pair cables or screened unshielded multi-twisted-pair cables for I/O Signal Cables and Encoder Cables.
- The maximum wiring length is 3 m for I/O Signal Cables, and 50 m for Encoder Cables or Servomotor Main Circuit Cables.
- Observe the following precautions when wiring the SERVOPACK's main circuit terminals.
 - Turn ON the power supply to the SERVOPACK only after all wiring, including the main circuit terminals, has been completed.
 - If a connector is used for the main circuit terminals, remove the main circuit connector from the SER-VOPACK before you wire it.
 - Insert only one wire per insertion hole in the main circuit terminals.
 - When you insert a wire, make sure that the conductor wire (e.g., whiskers) does not come into contact with adjacent wires.
- Install molded-case circuit breakers and other safety measures to provide protection against short circuits in external wiring.

There is a risk of fire or failure.

NOTICE

- Whenever possible, use the Cables specified by Yaskawa.
 If you use any other cables, confirm the rated current and application environment of your model and use the wiring materials specified by Yaskawa or equivalent materials.
- Securely tighten cable connector screws and lock mechanisms.
 Insufficient tightening may result in cable connectors falling off during operation.
- Do not bundle power lines (e.g., the Main Circuit Cable) and low-current lines (e.g., the I/O Signal Cables or Encoder Cables) together or run them through the same duct. If you do not place power lines and low-current lines in separate ducts, separate them by at least 30 cm. If the cables are too close to each other, malfunctions may occur due to noise affecting the low-current lines.
- Install a battery at either the host controller or on the Encoder Cable.

 If you install batteries both at the host controller and on the Encoder Cable at the same time, you will create a loop circuit between the batteries, resulting in a risk of damage or burning.
- When connecting a battery, connect the polarity correctly. There is a risk of battery rupture or encoder failure.

Operation Precautions

MARNING

- Before starting operation with a machine connected, change the settings of the switches and parameters to match the machine.
 - Unexpected machine operation, failure, or personal injury may occur if operation is started before appropriate settings are made.
- Do not radically change the settings of the parameters.
 There is a risk of unstable operation, machine damage, or injury.
- Install limit switches or stoppers at the ends of the moving parts of the machine to prevent unexpected accidents.

There is a risk of machine damage or injury.

 For trial operation, securely mount the Servomotor or Actuator and disconnect it from the machine.

There is a risk of injury.

- Forcing the motor to stop for overtravel is disabled when the Jog, Origin Search, or Easy FFT utility function is executed. Take necessary precautions.
 There is a risk of machine damage or injury.
- When an alarm occurs, the Servomotor will coast to a stop or stop with the dynamic brake
 according to the SERVOPACK Option specifications and settings. The coasting distance will
 change with the moment of inertia of the load and the resistance of the External Dynamic Brake
 Resistor. Check the coasting distance during trial operation and implement suitable safety measures on the machine.
- Do not enter the machine's range of motion during operation.
 There is a risk of injury.
- Do not touch the moving parts of the Servomotor, Actuator, or machine during operation. There is a risk of injury.

CAUTION

- Design the system to ensure safety even when problems, such as broken signal lines, occur.
 For example, the P-OT and N-OT signals are set in the default settings to operate on the safe side if a signal line breaks. Do not change the polarity of this type of signal.
- When overtravel occurs, the power supply to the Servomotor is turned OFF and the brake is released. If you use the Actuator to drive a vertical load, set the Actuator to enter a zeroclamped 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.

- 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 Actuator will be damaged quickly.
- Do not frequently turn the power supply ON and OFF. After you have started actual operation, allow at least one hour between turning the power supply ON and OFF (as a guideline).
 Do not use the product in applications that require the power supply to be turned ON and OFF frequently.

The elements in the SERVOPACK will deteriorate quickly.

- An alarm or warning may occur if communications are performed with the host controller while the SigmaWin+ or Digital Operator is operating.
 If an alarm or warning occurs, it may interrupt the current process and stop the system.
- After you complete trial operation of the machine and facilities, use the SigmaWin+ to back up
 the settings of the SERVOPACK parameters. You can use them to reset the parameters after
 SERVOPACK replacement.

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

Maintenance and Inspection Precautions

DANGER

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

WARNING

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

⚠ CAUTION

 Wait for six minutes after turning OFF the power supply 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

DANGER

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

There is a risk of fire, electric shock, or injury.

⚠ WARNING

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

↑ CAUTION

- When an alarm occurs, remove the cause of the alarm and ensure safety. Then reset the alarm or turn the power supply OFF and ON again to restart operation.
 There is a risk of injury or machine damage.
- If a Servo ON command (SV_ON) has been executed for 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)



North American Safety Standards (UL File No.)

UL 61800-5-1 (E147823), CSA C22.2 No.274

European Directives







EU Directive	Harmonized Standards
Machinery Directive 2006/42/EC	EN ISO13849-1: 2015
EMC Directive 2014/30/EU	EN 55011 group 1, class A EN 61000-6-2 EN 61000-6-4 EN 61800-3 (Category C2, Second environment)
Low Voltage Directive 2014/35/EU	EN 50178 EN 61800-5-1
RoHS Directive 2011/65/EU	EN 50581

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

◆ Safety Standards



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

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

■ Safety Parameters

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

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Basic Information on SERVOPACKs

This chapter provides information required to select SERVOPACKs, such as SERVOPACK models and combinations with Servomotors or Actuators.

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1.1

Product Introduction

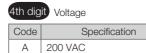
The Σ -7S SERVOPACKs described in this manual are designed to drive Servomotors or Actuators from Harmonic Drive Systems Inc.

1.2 Model Designations



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

Voltage	Code	Specification
	3R8	0.5 kW
Three-	5R5*1	0.75 kW
Phase,	120 ^{*2}	1.5 kW
200 VAC	180	2.0 kW
	330	5.0 kW



	5th+6th digits Interface				
Code Specification					
	10	MECHATROLINK-II communications reference			
	20	MECHATROLINK-III communications reference			



011- 011- 4011- 11-11-	Hardware Options
8th+9th+10th digits	Specification

Code	Specification	Applicable Models
000	Without options	All Models
800	Single-phase, 200-VAC power supply input	SGF7S-120A
020*3	External dynamic brake resistor	All Models
034*3	Single-phase, 200-VAC power supply input External dynamic brake resistor	SGD7S-120A

1	Trin+12th+13th digits F1/EX Specification		
	Code	Specification	
	F81	Driving Actuators from	

14th digit BTO Specification*4		
Code	Specification	
None	None	
В	BTO specification	

- *1. You can use these models with either a single-phase or three-phase input.
- *2. A model with a single-phase, 200-VAC power supply input is available as a hardware option (model: SGD7S-120A□0A008 or SGD7S-120A□0A034).
- *3. Refer to the following manual for details.
 - Σ -7-Series AC Servo Drive Σ -7S/ Σ -7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- *4. The BTO specification indicates if the SEVOPACK 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.
 - AC Servo Drives Σ-7 Series (Manual No.: KAEP S800001 23)

1.3

Combinations of SERVOPACKs with Servomotors or Actuators

The supported combinations of SERVOPACKs with Servomotors or Actuators are given in the following table.

Servomotor Model	Actuator Model	SERVOPACK Model: SGD7S-□□□□□0A□□□F81
	SHA25Y□□□CG	3R8A, 5R5A
MAB09□200-□S17bA-□□	SHA25Y□□□SG	
	SHA25Y□□□HP	
	SHA32YDDDCG	120A
MAB12□200-□S17bA-□□	SHA32Y□□□SG	
	SHA32Y□□□HP	
MAB15□200-□S17bA-□□	SHA40Y□□□CG	- 180A
WAD 136200-63170A-66	SHA40Y□□□SG	
MAA21□200-□S17bA-□□	SHA58Y□□□SG	- 330A
WAAZ 16200-65170A-66	SHA65Y□□□SG	

1.4 Functions

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

- Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)
- Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

Functions given inside bold lines are restricted for the SERVOPACKs described in this manual. Refer to the following section for details on restrictions to these functions.

1.5.1 Function Application Restrictions on page 1-7

· Functions Related to the Machine

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

· Functions Related to the Host Controller

Function	
Electronic Gear Settings	
I/O Signal Allocations	
ALM (Servo Alarm) Signal	
/WARN (Warning) Signal	
/TGON (Rotation Detection) Signal	
/S-RDY (Servo Ready) Signal	
	O = + !

Continued from previous page.

Function
/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
Gravity Compensation
Backlash Compensation
Model Following Control
Compatible Adjustment Functions
Mechanical Analysis
Easy FFT

• Functions for Trial Operation during Setup

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

• Functions for Inspection and Maintenance

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

1.5 Restrictions

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

1.5.1 Function Application Restrictions

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

Function	Restriction
Motor Direction Setting	This function can be used. However, the forward direction depends on the Servomotor or Actuator that is used. Refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc. for information on the rotation directions of the Servomotors or Actuators.
Automatic Detection of Connected Motor	This function cannot be used. Set the following parameter: Pn000 = n.0□□□.
Linear Encoder Pitch Setting	This function cannot be used.
Writing Linear Servomotor Parameters	This function cannot be used.
Selecting the Phase Sequence for a Linear Servomotor	This function cannot be used.
Polarity Sensor Setting	This function cannot be used.
Polarity Detection	This function cannot be used.
Holding Brake	This function can be used. Refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc. for the times required to brake.
Setting the Origin of the Absolute Encoder	This function can be used. However, the Set Origin (Fn020) function for an absolute linear encoder cannot be used.
Setting the Multiturn Limit	The multiturn limit of the Actuator is fixed and cannot be changed. You cannot use the Multiturn Limit Setting after Multiturn Limit Disagreement Alarm (Fn013). To set the multiturn limit and reset a Multiturn Limit Disagreement (A.CC0) alarm, set Pn205 to a value that agrees with the specifications of the Actuator you are using. For details, refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc. Example: If you use an Actuator with an output axis one-turn absolute encoder, set Pn205 to the following value: Gear ratio -1.
Overheat Protection	This function cannot be used.
Speed Ripple Compensation	This function cannot be used.

1.5.2 Restrictions on Specifications

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

Item			Specification			
Feedback	With Rotary Servomotor		You cannot use a Yaskawa Rotary Servomotor.			
1 eeuback	With Linear Servomotor		You cannot use a linear servomotor.			
Mounting Ty	ре		There are no rack-mounted models or duct-ventilated models.			
Linear Ser Overheat I Signal Inpu		rotection	This input cannot be used.			
I/O Signals	Sequence Input Sig- nals	Input Signals That Can Be Allocated	You cannot use the /P-DET (Polarity Detection) signal.			
Option Modules			You cannot use a Safety Module.			

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+.

This chapter provides information required to select a SER-VOPACK and peripheral devices.

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2.1.1 Ratings

2.1

Selecting a SERVOPACK

This section provides the rating, specifications, and external dimensions of the SERVOPACKs.

2.1.1 Ratings

Three-Phase, 200 VAC

Model SGD7S-			3R8A	5R5A	120A	180A	330A
Maximum Applicable Motor Capacity [kW]		0.5	0.75	1.5	2.0	5.0	
Continuous Ou	utput Current [Arms]		3.8	5.5	11.6	18.5	32.9
Instantaneous	Maximum Output C	urrent [Arms]	11	16.9	28	42	84
Main Circuit	Power Supply		200 VA	AC to 240 V	AC, -15% to	5 +10%, 50	/60 Hz
Mairi Circuit	Input Current [Arm	ns]*	3.0	4.1	7.3	10	25
Control	Power Supply			AC to 240 V	AC, -15% to	5 +10%, 50	/60 Hz
Control	Input Current [Arm	ns]*	0.2	0.2	0.2	0.25	0.3
Power Supply	Capacity [kVA]*		1.3	1.6	3.2	4.0	7.5
	Main Circuit Powe	r Loss [W]	28.5	38.9	72.6	104.2	226.6
	Control Circuit Por	14	14	15	16	19	
Power Loss*	Built-in Regenerat Power Loss [W]	8	8	12	12	36	
	Total Power Loss	[W]	50.5	60.9	97.6	136.2	281.6
	Built-In Regener- ative Resistor	Resistance $[\Omega]$	40	40	20	12	8
Regenerative		Capacity [W]	40	40	60	60	180
Resistor	Minimum Allowabl Resistance $[\Omega]$	Minimum Allowable External Resistance [Ω]		40	20	12	8
Overvoltage Category				III			

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

Single-Phase, 200 VAC

Model SGD7S-			5R5A	120A		
Maximum Applicable Motor Capacity [kW]		0.75	1.5			
Continuous Ou	utput Current [Arms]		5.5	11.6		
Instantaneous	Maximum Output C	urrent [Arms]	16.9	28		
Main Circuit	Power Supply		200 VAC to 240 VAC, -15% to +10%, 50 Hz/60 Hz			
Mail Circuit	Input Current [Arm	ıs]*	8.7	16		
Control	Power Supply		200 VAC to 240 VAC, -15	% to +10%, 50 Hz/60 Hz		
Control	Input Current [Arm	ıs]*	0.2	0.25		
Power Supply Capacity [kVA]*		1.9	4.0			
	Main Circuit Power Loss [W]		39.2	71.8		
	Control Circuit Por	wer Loss [W]	14	16		
Power Loss*	Built-in Regenerat Power Loss [W]	ve Resistor	8	12		
	Total Power Loss	[W]	61.2	103.8		
	Built-In Regener- ative Resistor	Resistance $[\Omega]$	40	12		
Regenerative Resistor		Capacity [W]	40	60		
	Minimum Allowabl Resistance $[\Omega]$	e External	40	12		
Overvoltage Category						

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

270 VDC

Мо	3R8A	5R5A	120A	180A	330A	
Maximum Applicable Motor Capacity [kW]		0.5	0.75	1.5	2.0	5.0
Continuous Output (3.8	5.5	11.6	18.5	32.9	
Instantaneous Maxin	num Output Current [Arms]	11.0	16.9	28.0	42.0	84.0
Main Circuit	Power Supply	2	70 VDC to 3	324 VDC, -1	5% to +109	%
Main Circuit	Input Current [Arms]*1	3.8	4.9	11	14	34
0 1 1	Power Supply	270 VDC to 324 VDC, -15% to +10%				
Control	Input Current [Arms]*1	0.2	0.2	0.2*2	0.25	0.3
Power Supply Capac	1.4	1.6	3.2	4.0	7.5	
	Main Circuit Power Loss [W]	23.0	30.7	55.8	82.7	146.2
Power Loss*1	Control Circuit Power Loss [W]	14	14	15	16	19
	Total Power Loss [W]	37.0	44.7	70.8	98.7	165.2
Overvoltage Category				III		

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

^{*2.} The value is 0.25 Arms for the SGD7S-120A \square 0A008, -120A \square 0A034

2.1.2 Overload Protection Characteristics

This section describes the overload protection characteristics.

SERVOPACK Overload Protection Characteristics

The overload protection characteristics of the SERVOPACKs are the same as those of Σ -7S SERVOPACKs with MECHATROLINK-III Communications References.

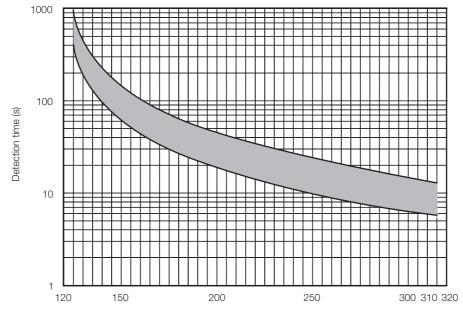
Refer to the following manual for your SERVOPACK for details.

- Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)
- Ω Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

Overload Protection Characteristics for Combinations of SERVOPACKs with Servomotors or Actuators

The overload protection characteristics for supported combinations of SERVOPACKs with Servomotors or Actuators are given in the following table.

- ◆ MAB Servomotors and SGD7S-3R8A, SGD7S-5R5A, SGD7S-120A, or SGD7S-180A SERVOPACKs
- MAB09□200, MAB12□200, and MAB15□200

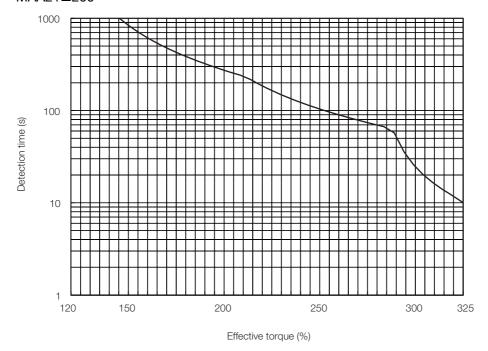


Effective torque (%)

Selection

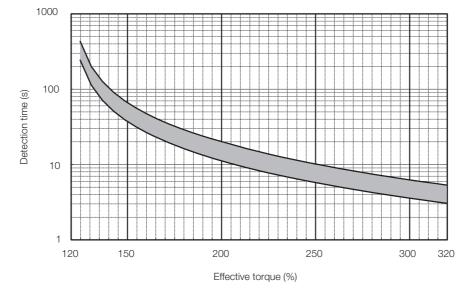
◆ MAA Servomotors and SGD7S-330A SERVOPACKs

• MAA21□200



◆ SHA25Y Actuators and SGD7S-3R8A or SGD7S-5R5A SERVOPACKs

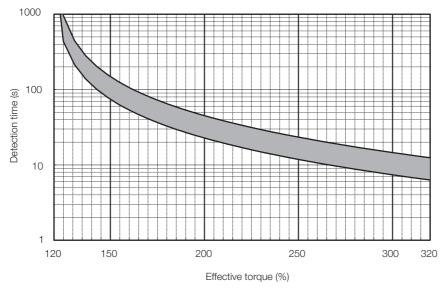
SHA25Y□□□CG, SHA25Y□□□SG, and SHA25Y□□□HP



2.1.2 Overload Protection Characteristics

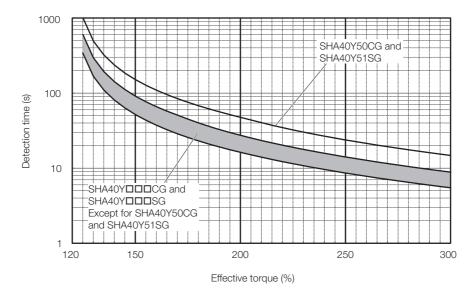
◆ SHA32Y Actuators and SGD7S-120A SERVOPACKs

• SHA32Y□□□CG, SHA32Y□□□SG, and SHA32Y□□□HP



◆ SHA40Y Actuators and SGD7S-180A SERVOPACKs

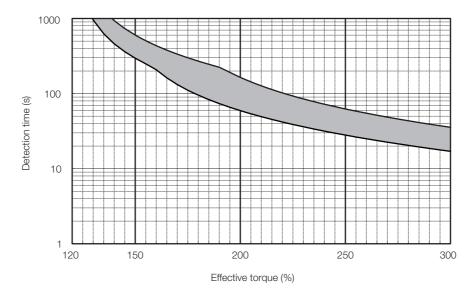
SHA40Y□□□CG and SHA40Y□□□SG



Selection

♦ SHA58Y or SHA65Y Actuators and SGD7S-330A SERVOPACKs

• SHA58Y□□□SG and SHA65Y□□□SG



2.1.3 Specifications

The product specifications are given below.

SERVOPACKs with MECHATROLINK-II Communications References

Item		Specification			
Control Met	hod	IGBT-based PWM control, sine wave current drive			
Feedback	With Servomotor or Actuator from Har- monic Drive Systems Inc.	Serial encoder: 17 bits (absolute encoder)			
	Surrounding Air Temperature*1	-5°C to 55°C (With derating, usage is possible between 55°C and 60°C.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)			
	Storage Temperature	-20°C to 85°C			
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)			
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²			
	Shock Resistance	19.6 m/s ²			
Environ- mental Conditions	Degree of Protection	Degree SERVOPACK Model: SGD7S- IP20 3R8A, 5R5A, 120A IP10 180A, 330A, 120A10A008, 120A10A034			
	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 			
	Altitude*1	 1,000 m max. (With derating, usage is possible between 1,000 m and 2,000 m.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27) 			
	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 Standards on page xxix			
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%)			
D (Coefficient of Speed	0% of rated speed max. (for a voltage fluctuation of ±10%)			
Perfor- mance	Fluctuation*2	$\pm 0.1\%$ of rated speed max. (for a temperature fluctuation of 25°C ± 25 °C)			
	Torque Control Precision (Repeatability)	±1%			
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)			

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.
	T dioo Garpat		Allowable voltage range: 24 VDC ±20% Number of input points: 7 (Input method: Sink inputs or source inputs)
	Sequence Input Signals	Input Signals That Can Be Allo- cated	Input Signals P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals DEC (Origin Return Deceleration Switch) signal EXT1 to /EXT3 (External Latch Input 1 to 3) signals FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed.
I/O Signals	Fixed Output		Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 (A photocoupler output (isolated) is used.) Output signal: ALM (Servo Alarm) signal
			Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.)
	Sequence Output Signals	Output Signals That Can Be Allo- cated	Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /WLT (Speed Limit Detection) signal • /WARN (Warning) signal • /WARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.
	50 4004	Inter- faces	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+)
	RS-422A Communi- cations	1:N Commu- nications	Up to N = 15 stations possible for RS-422A port
Communi- cations	(CN3)	Axis Address Setting	41h to 5Fh (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).
	USB Com-	Interface	Personal computer (with SigmaWin+)
	munica- tions (CN7)	Communications Standard	Conforms to USB2.0 standard (12 Mbps).
Displays/Indicators			CHARGE, PWR, and COM indicators, and one-digit seven-segment

2.1.3 Specifications

Continued from previous page.

	Item	Specification		
	Communications Protocol	MECHATROLINK-II		
MECHA- TROLINK-II	Station Address Settings	41h to 5Fh (maximum number of slaves: 30) Selected with the combination of a rotary switch (S2) and DIP switch (S3).		
Communi- cations	Transmission Speed	10 Mbps, 4 Mbps A DIP switch (S3) is used to select the transmission speed.		
	Transmission Cycle	250 μs or 0.5 ms to 4.0 ms (multiples of 0.5 ms)		
	Number of Transmission Bytes	17 or 32 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.		
Reference	Performance	Position, speed, or torque control with MECHATROLINK-II communications		
Method	Reference Input	MECHATROLINK-I or MECHATROLINK-II commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)		
MECHATRO	LINK-II Communica-	Rotary switch (S2) positions: 16		
tions Setting	Switches	Number of DIP switch (S3) pins: 4		
Analog Moni	tor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)		
Dynamic Brake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.		
Regenerative	e Processing	Built-in Refer to the following section for details. 2.2.3 Regenerative Resistor on page 2-21		
Overtravel (OT) Prevention		Stopping with dynamic brake, deceleration to a stop, or coasting to a stop for the P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal		
Protective Functions		Overcurrent, overvoltage, low voltage, overload, regeneration error, etc.		
Utility Function	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*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3		
Applicable 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.

 $\label{eq:coefficient} \mbox{Coefficient of speed fluctuation} = \frac{\mbox{No-load motor speed - Total-load motor speed}}{\mbox{Rated motor speed}} \times 100\%$

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

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

SERVOPACKs with MECHATROLINK-III Communications References

Item		Specification			
Control Met	hod	IGBT-based PWM control, sine wave current drive			
Feedback	With Servomotor or Actuator from Har- monic Drive Systems Inc.	Serial encoder: 17 bits (absolute encoder)			
	Surrounding Air Temperature*1	-5°C to 55°C (With derating, usage is possible between 55°C and 60°C.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)			
	Storage Temperature	-20°C to 85°C			
	Surrounding Air Humidity	95% relative humidity max. (with no freezing or condensation)			
	Storage Humidity	95% relative humidity max. (with no freezing or condensation)			
	Vibration Resistance	4.9 m/s ²			
	Shock Resistance	19.6 m/s ²			
Environ- mental Conditions	Degree of Protection	Degree SERVOPACK Model: SGD7S- IP20 3R8A, 5R5A, 120A IP10 180A, 330A, 120A20A008, 120A20A034			
	Pollution Degree	 Must be no corrosive or flammable gases. Must be no exposure to water, oil, or chemicals. Must be no dust, salts, or iron dust. 			
	Altitude*1	1,000 m max. (With derating, usage is possible between 1,000 m and 2,000 m.) Refer to the following manual for derating specifications. Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)			
	Others	Do not use the SERVOPACK in the following locations: Locations subject to static electricity noise, strong electromagnetic/magnetic fields, or radioactivity			
Applicable S	Standards	Refer to the following section for details. Compliance with UL Standards, EU Directives, and Other Safety Standards on page xxix			
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 load fluctuation of ±10%)			
Perfor- mance	Fluctuation*2	±0.1% of rated speed max. (for a temperature fluctuation of 25°C ±25°C)			
	Torque Control Precision (Repeatability)	±1%			
	Soft Start Time Setting	0 s to 10 s (Can be set separately for acceleration and deceleration.)			
		Continued on next page			

2.1.3 Specifications

Continued from previous page.

Item			Specification	
	Encoder Div Pulse Outp		Phase A, phase B, phase C: Line-driver output Number of divided output pulses: Any setting is allowed.	
			Allowable voltage range: 24 VDC ±20% Number of input points: 7 (Input method: Sink inputs or source inputs)	
	Sequence Input Signals	Input Signals That Can Be Allo- cated	 Input Signals /DEC (Origin Return Deceleration Switch) signal /EXT1 to /EXT3 (External Latch Input 1 to 3) signals P-OT (Forward Drive Prohibit) and N-OT (Reverse Drive Prohibit) signals /P-CL (Forward External Torque Limit) and /N-CL (Reverse External 	
			 */P-CL (Forward External Torque Limit) and /N-CL (Reverse External Torque Limit) signals *FSTP (Forced Stop Input) signal A signal can be allocated and the positive and negative logic can be changed. Allowable voltage range: 5 VDC to 30 VDC Number of output points: 1 (A photocoupler output (isolated) is used.) Output signal: ALM (Servo Alarm) signal Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 	
I/O Signals		Fixed Output	Number of output points: 1 (A photocoupler output (isolated) is used.)	
	Sequence Output Signals	Output Signals That Can Be Allo- cated	Allowable voltage range: 5 VDC to 30 VDC Number of output points: 3 (A photocoupler output (isolated) is used.) Output Signals • /COIN (Positioning Completion) signal • /V-CMP (Speed Coincidence Detection) signal • /TGON (Rotation Detection) signal • /S-RDY (Servo Ready) signal • /CLT (Torque Limit Detection) signal • /VLT (Speed Limit Detection) signal • /VLT (Speed Limit Detection) signal • /WARN (Warning) signal • /MARN (Warning) signal • /NEAR (Near) signal A signal can be allocated and the positive and negative logic can be changed.	
	RS-422A Communi-	Inter- faces 1:N Commu-	Digital Operator (JUSP-OP05A-1-E) and personal computer (with SigmaWin+) Up to N = 15 stations possible for RS-422A port	
Communi- cations	cations (CN3)	Axis Address 03h to EFh (maximum number of slaves: 62)		
	USB	Interface	Personal computer (with SigmaWin+)	
	Communications (CN7)	Commu- nications Standard	Conforms to USB2.0 standard (12 Mbps).	
Displays/Indi	icators		CHARGE, PWR, CN, L1, and L2 indicators, and one-digit seven-segment display	

Continued from previous page.

	Item	Specification	
	Communications Protocol	MECHATROLINK-III	
MECHA-	Station Address Settings	03h to EFh (maximum number of slaves: 62) The rotary switches (S1 and S2) are used to set the station address.	
TROLINK-III Communi-	Baud Rate	100 Mbps	
cations	Transmission Cycle	125 μs, 250 μs, 500 μs, 750 μs, 1.0 ms to 4.0 ms (multiples of 0.5 ms)	
	Number of Transmission Bytes	32 or 48 bytes/station A DIP switch (S3) is used to select the number of transmission bytes.	
	Performance	Position, speed, or torque control with MECHATROLINK-III communications	
Reference Method	Reference Input	MECHATROLINK-III commands (sequence, motion, data setting, data access, monitoring, adjustment, etc.)	
	Profile	MECHATROLINK-III standard servo profile	
	LINK-III Communica-	Rotary switch (S1 and S2) positions: 16	
tions Setting	Switches	Number of DIP switch (S3) pins: 4	
Analog Moni	itor (CN5)	Number of points: 2 Output voltage range: ±10 VDC (effective linearity range: ±8 V) Resolution: 16 bits Accuracy: ±20 mV (Typ) Maximum output current: ±10 mA Settling time (±1%): 1.2 ms (Typ)	
Dynamic Brake (DB)		Activated when a servo alarm or overtravel (OT) occurs, or when the power supply to the main circuit or servo is OFF.	
Regenerative	e Processing	Built-in Refer to the following section for information on an External Regenerative Resistor. 2.2.3 Regenerative Resistor on page 2-21	
Overtravel (C	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 Fu	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*3	ISO13849-1 PLe (Category 3), IEC61508 SIL3	
Applicable C	ption Modules	Fully-Closed Modules	
		•	

2.1.4 External Dimensions

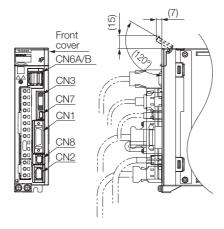
This section provides the external dimensions of the SERVOPACKs.

Front Cover Dimensions and Connector Specifications

◆ SERVOPACKs with MECHATROLINK-II Communications References

The front cover dimensions and panel connector section are the same for all models. Refer to the following figures and table.

· Front Cover Dimensions



· Connector Specifications

Connector No.	Model	Number of Pins	Manufacturer
CN1	10226-59A3MB	26	3M Japan Limited
CN2	3E106-0220KV	6	3M Japan Limited
CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
CN6A/B	1903815-1	8	Tyco Electronics Japan G.K.
CN7	2172034-1	5	Tyco Electronics Japan G.K.
CN8	1981080-1	8	Tyco Electronics Japan G.K.

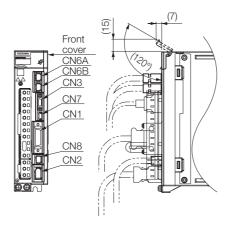
Note: The above connectors or their equivalents are used for the SERVOPACKs.

Selection

◆ SERVOPACKs with MECHATROLINK-III Communications References

The front cover dimensions and panel connector section are the same for all models. Refer to the following figures and table.

· Front Cover Dimensions



Connector Specifications

Connector No.	Model	Number of Pins	Manufacturer
CN1	10226-59A3MB	26	3M Japan Limited
CN2	3E106-0220KV	6	3M Japan Limited
CN3	HDR-EC14LFDTN- SLD-PLUS	14	Honda Tsushin Kogyo Co., Ltd.
CN6A, CN6B	1981386-1	8	Tyco Electronics Japan G.K.
CN7	2172034-1	5	Tyco Electronics Japan G.K.
CN8	1981080-1	8	Tyco Electronics Japan G.K.

Note: The above connectors or their equivalents are used for the SERVOPACKs.

2.1.4 External Dimensions

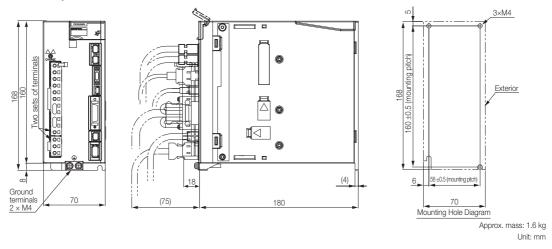
SERVOPACK External Dimensions

The external dimensions of the SERVOPACKs with MECHATROLINK-II Communications References are the same as the SERVOPACKs with MECHATROLINK-III Communications References. The external dimensions are given using a MECHATROLINK-III Communications Reference SERVOPACK as an example.

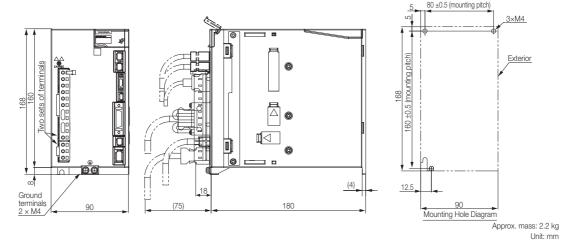
◆ Without a Dynamic Brake Hardware Option

The external dimensions of these SERVOPACKs are the same as the Σ -7S SERVOPACKs with MECHATROLINK-II Communications References (SGD7S- $\square\square\square$ A10 \square) and the Σ -7S SERVOPACKs with MECHATROLINK-III Communications References (SGD7S- $\square\square\square$ A20 \square).

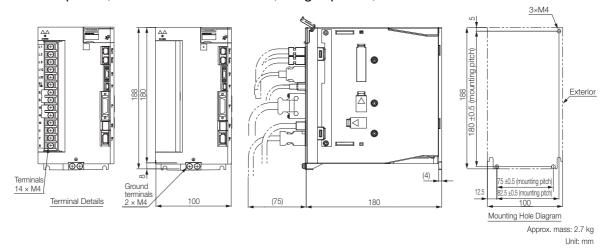
■ Three-phase, 200 VAC: SGD7S-3R8A and SGD7S-5R5A



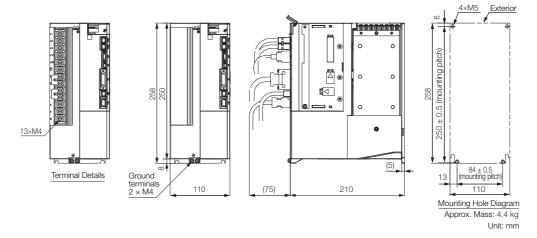
■ Three-phase, 200 VAC: SGD7S-120A



■ Three-phase, 200 VAC: SGD7S-180A; Single-phase, 200 VAC: SGD7S-120A□0A008



■ Three-phase, 200 VAC: SGD7S-330A

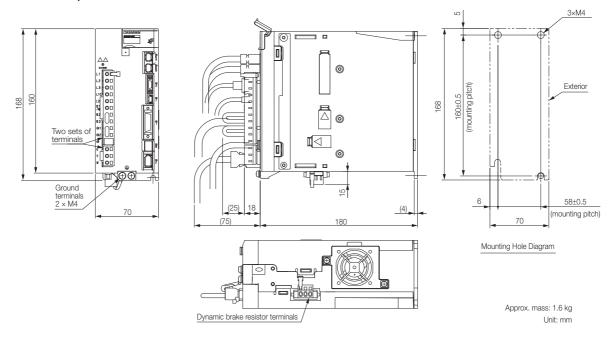


2.1.4 External Dimensions

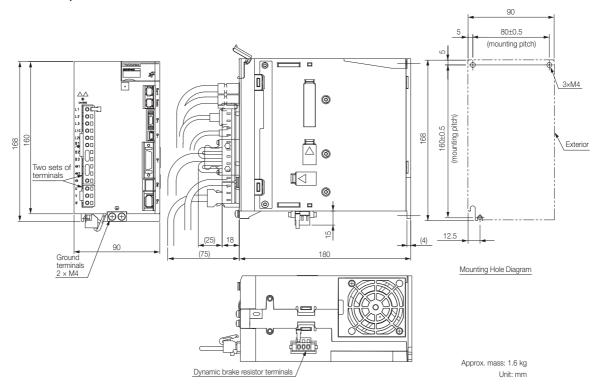
◆ With a Dynamic Brake Hardware Option

The external dimensions of these SERVOPACKs are the same as the Σ -7S SERVOPACKs with Dynamic Brake Hardware Option Specifications (SGD7S- $\square\square$ A10 \square 020 and SGD7S- $\square\square$ A20 \square 020).

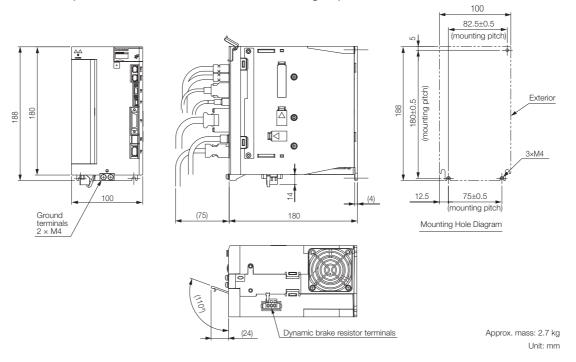
■ Three-phase, 200 VAC: SGD7S-3R8A and SGD7S-5R5A



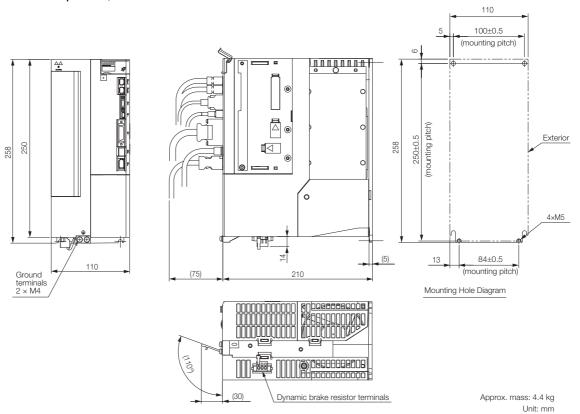
■ Three-phase, 200 VAC: SGD7S-120A



■ Three-phase, 200 VAC: SGD7S-180A; Single-phase, 200 VAC: SGD7S-120A□0A034



■ Three-phase, 200 VAC: SGD7S-330A



2.2.1 Servomotor Main Circuit Cable

2.2

Selecting Peripheral Devices

This section provides selection information for peripheral devices required to use the SERVO-PACKs.

Refer to the following manual for information on peripheral devices that is not described here. \square Σ -7-Series Peripheral Device Selection Manual (Manual No.: SIEP S800001 32)

2.2.1 Servomotor Main Circuit Cable

Use the Servomotor Main Circuit Cable manufactured by Harmonic Drive Systems Inc. For details, refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc.

2.2.2 Encoder Cable

Use the Encoder Cables listed in the following table.

Note: Do not use two or more cables together. Doing so may reduce noise resistance.

Servomo-	Connector		Order Number*2 Standard Flexible Cable Cable*3, *4		
tor and Actuator Models	Specifica- tions	Length (L)*1			Appearance
MAB09, MAB12, MAB15, SHA25Y, SHA32Y, or SHA40Y	_		JZSP- CSP19-□□-E	JZSP- CSP29-□□-E	SERVOPACK end Encoder end Battery Case (Battery included)
MAA21, SHA58V or	Straight	3 m, 5 m, 10 m, 15 m, or 20 m	JZSP- CVP06-□□-E	JZSP- CVP26-□□-E	SERVOPACK end Encoder end Battery Case (Battery included)
SHA58Y, or SHA65Y	Right-angle		JZSP- CVP07-□□-E	JZSP- CVP27-□□-E	SERVOPACK end Encoder end Battery Case (Battery included)

st1. The maximum cable length is 20 m. Do not use a cable that is longer than 20 m.

Note: These cables are available from Yaskawa Controls Co., Ltd.

^{*2.} Replace the boxes ($\square\square$) in the order number with the cable length (03, 05, 10, 15, or 20).

^{*3.} Use Flexible Cables for moving parts of machines, such as robots.

^{*4.} The recommended bending radius (R) is 90 mm or larger.

Selection

Regenerative Resistor

2.2.3

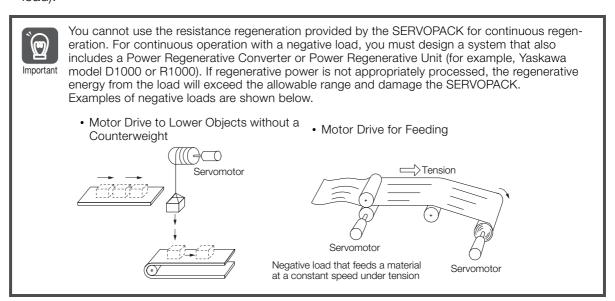
If the regenerative power exceeds the amount that can be absorbed by charging the smoothing capacitor, a regenerative resistor is used.

Regenerative Power and Regenerative Resistance

The rotational energy of a driven machine such as an actuator that is returned to the SERVO-PACK is called regenerative power. The regenerative power is absorbed by charging a smoothing capacitor. When the regenerative power exceeds the capacity of the capacitor, it is consumed by a regenerative resistor. (This is called resistance regeneration.)

The Servomotor is driven in a regeneration state in the following circumstances:

- While decelerating to a stop during acceleration/deceleration operation.
- While performing continuous downward operation on a vertical axis.
- During continuous operation in which the Servomotor is rotated by the load (i.e., a negative load).



Types of Regenerative Resistors

The following regenerative resistors can be used.

- Built-in regenerative resistor: A regenerative resistor that is built into the SERVOPACK.
- External Regenerative Resistor: A regenerative resistor that is connected externally to SER-VOPACK. These resistors are used when the smoothing capacitor and built-in regenerative resistor in the SERVOPACK cannot consume all of the regenerative power.

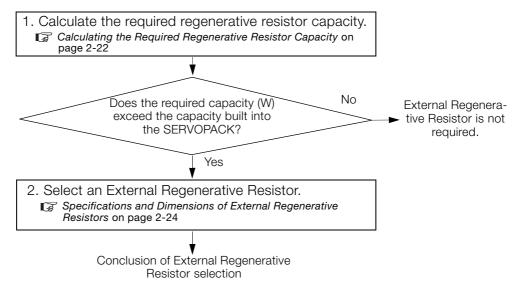
Specifications of Built-in Regenerative Resistors in SERVOPACKs

The following table gives the specifications of the built-in regenerative resistors in the SERVO-PACKs and the amount of regenerative power (average values) that they can process.

SERVOPACK Model	Built-In Regene	erative Resistor	Regenerative Power	Minimum
SGD7S-	Resistance $[\Omega]$	Capacity [W]	Processing Capacity of Built-in Regenerative Resistor [W]	Allowable Resistance $[\Omega]$
3R8A, 5R5A	40	40	8	40
120A	20	60	10	20
180A, 120A□0A008, 120A□0A034	12	60	16	12
330A	8	180	36	8

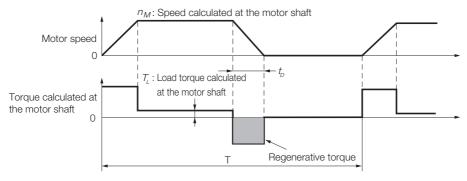
Selection Flowchart To Determine the Need for an External Regenerative Resistor

Use the following flowchart to determine whether an External Regenerative Resistor is necessary and select one when necessary.



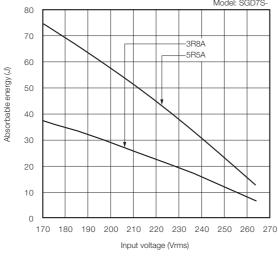
Calculating the Required Regenerative Resistor Capacity

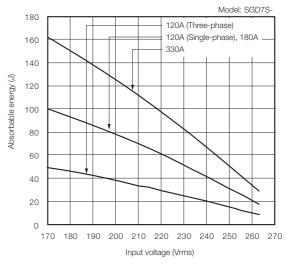
This section shows how to calculate the regenerative resistor capacity for the acceleration/deceleration operation shown in the following figure.



Step	Item	Symbol	Formula
1	Calculate the rotational energy of the Servo-motor.	E_S	$E_{\rm S} = J n_{\rm M}^2 / 182$
2	Calculate the energy consumed by load loss during the deceleration period	E _L	$E_L = (\pi/60) n_M T_L t_D$ Note: If the load loss is unknown, calculate the value with E_L set to 0.
3	Calculate the energy lost from Servomotor winding resistance.	E _M	$E_M = 0$
4	Calculate the energy that can be absorbed by the SERVOPACK.	E _C	Calculate the energy from the graphs in SER-VOPACK's Absorbable Energy*1
			$E_K = E_S - (E_L + E_M + E_C)$
5	Calculate the energy consumed by the regenerative resistor.	E _K	E _K = E _S - (E _L + E _M + E _C) + E _G ^{*2} Note: Use this formula if there will be continuous periods of regenerative operation, such as for a vertical axis.
	Calculate the required regenerative resistor	147	
6	capacity (W).	W_K	$W_K = E_K/(0.2^{*3} \times T)$

*1. The following figures show the relationship between the SERVOPACK's input power supply voltage and its absorbable energy.





- *2. E_G (joules): Energy for continuous period of regenerative operation $E_G=(2\pi/60)\,n_{MG}T_Gt_G$
 - T_G: Generated torque calculated at the motor shaft in continuous period of regenerative operation (N·m)
 - n_{MG}: Speed calculated at the motor shaft for same operation period as above (min⁻¹)
 - t_G: Same operation period as above (s)
- *3. This is the value when the regenerative resistor's utilized load ratio is 20%.

Note: The units for the various symbols are given in the following table.

Symbol	Meaning
E_S to E_K	Energy in joules (J)
W_K	Required regenerative resistor capacity (W)
J_M	Actuator moment of inertia calculated at the motor shaft (kg·m²)
J_L	Load moment of inertia at the motor shaft (kg·m²)

Symbol	Meaning
J	$=J_M+J_L~(\mathrm{kg}\cdot\mathrm{m}^2)$
n_M	Speed calculated at the motor shaft (min ⁻¹)
T_L	Load torque calculated at the motor shaft (N·m)
t_D	Deceleration stopping time (s)
Т	Repeat operation cycle (s)

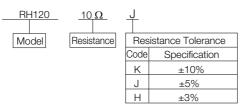
If the value of W_K does not exceed the capacity of the built-in regenerative resistor of the SER-VOPACK, an External Regenerative Resistor is not required. For details on the built-in regenerative resistors, refer to the SERVOPACK specifications. If the value of W_K exceeds the capacity of the built-in regenerative resistor, install an External Regenerative Resistor with a capacity equal to the value for W calculated above.

2.2.3 Regenerative Resistor

Specifications and Dimensions of External Regenerative Resistors

Selection Table

Model	Specification	Mass	Wire Size	Manufacturer	Inquiries
RH120	70 W, 1 Ω to 100 Ω	282 g	AWG16 (1.25 mm ²)		
RH150	90 W, 1 Ω to 100 Ω	412 g	AWG16 (1.25 mm ²)		
RH220	120 W, 1 Ω to 100 Ω	500 g	AWG16 (1.25 mm ²)	lwaki Musen Kenkyusho	Yaskawa Controls
RH220B	120 W, 1 Ω to 100 Ω	495 g	AWG14 (2.0 mm ²)	Co., Ltd.	Co., Ltd.
RH300C	200 W, 1 Ω to 10 kΩ	850 g	AWG14 (2.0 mm ²)		
RH500	300 W, 2 Ω to 50 Ω	1.4 kg	AWG14 (2.0 mm ²)		

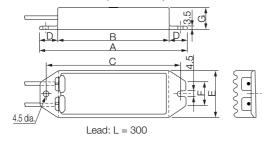


Specification

Item	Specification
Resistance Tolerance	K: ±10%, J: ±5%, H: ±3%
Temperature Resistance Characteristics	At less than 20 Ω : ± 400 PPM/°C, At 20 Ω or higher: ± 260 PPM/°C
Withstand Voltage	2,000 VAC/1 min, ΔR: \pm (0.1% + 0.05 Ω)
Insulation Resistance	500 VDC, 20 M Ω min.
Short-Duration Overload	10 times the rated power applied for 5 s: ΔR : $\pm (2\% + 0.05 \Omega)$
Service Life	1,000 hours at ratings, 90 min ON, 30 min OFF: Δ R: \pm (5% + 0.05 Ω)
Flame Resistance	There must be no ignition when 10 times the rated power is applied for 1 min.
Surrounding Air Temperature Range	-25°C to 150°C

◆ External Dimensions

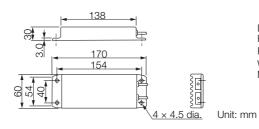
■ Model: RH120, RH150, or RH220



Model	Rated Power	Resistance Range	Wire Size			
RH120	70 W		A)A/O10			
RH150	90 W	1 Ω to 100 Ω	AWG16 (1.25 mm²)			
RH220	120 W		(1.25 11111-)			
External Dimensions (Unit: mm) Mass						

External Dimensions (Unit: mm)							Mass
Α							
							282 g
212	180	202	16	44	24	30	412 g
							500 g

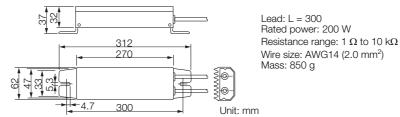
■ Model: RH220B



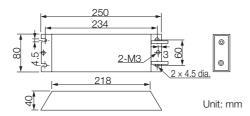
Lead: L = 500 Rated power: 120 W Resistance range: 1 Ω to 100 Ω Wire size: AWG14 (2.0 mm²) Mass: 495 g

2-24

■ Model: RH300C



■ Model: RH500



Lead: L = 450 Rated power: 300 W Resistance range: 2 Ω to 50 Ω Wire size: AWG14 (2.0 mm²) Mass: 1.4 kg

Precautions

- Refer to the following manual for your SERVOPACK to wire External Regenerative Resistors.
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- If an External Regenerative Resistor is used, you must set Pn600 (Regenerative Resistor Capacity) and Pn603 (Regenerative Resistor Resistance). Refer to the following manual for your SERVOPACK for details.
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)

2.2.4 Dynamic Brake Resistor

↑ WARNING

- Use an external dynamic brake resistor that matches the specifications for the relevant equipment or machine. Always evaluate the dynamic brake operation on the actual equipment or machine to confirm that there are no problems with the coasting distance or durability of the dynamic brake resistor. If necessary, select another dynamic brake resistor and install any necessary safety devices in the machine.
 - There is a risk of unexpected operation, machine damage, burning, or injury when an emergency stop is performed.
- The dynamic brake resistor cannot be used if the Actuator is turned by the machine after stopping due to a power interruption or error. Coast the Actuator to a stop instead.
 Failure to do so may cause the dynamic brake resistor or SERVOPACK to burn or may cause injury.

CAUTION

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.

2.2.4 Dynamic Brake Resistor

Selection Flow

Follow these steps to select an appropriate external dynamic brake resistor.

- 1. Determine the resistance of the dynamic brake resistor.

 Determining the Resistance of the Dynamic Brake Resistor on page 2-26
- 2. Calculate the energy consumption of the dynamic brake resistor.

 © Calculating the Energy Consumption of the Dynamic Brake Resistor on page 2-27
- 3. Present the required specifications to the resistor manufacturer.

 **Presenting the Required Specifications to the Resistor Manufacturer on page 2-27

This concludes the selection process.

Determining the Resistance of the Dynamic Brake Resistor

MARNING

 Do not set the resistance of the dynamic brake resistor to a value less than the minimum allowed resistance.

There is a risk of burning in the SERVOPACK or Actuator, damage to the machine, or injury.



Increasing the dynamic brake resistance will also increase the coasting distance proportionally.

Use the resistance of the connected dynamic brake resistor from the following table.

Model		Minimum Allowed Dynamic Brake Resistance (±5%)
	3R8A, 5R5A	6 Ω
SGD7S-	120A	3.5 Ω
30D73-	180A, 120A□0A034	3 Ω
	330A	1.5 Ω

Calculating the Energy Consumption of the Dynamic Brake Resistor

Calculate the energy that must be consumed by the resistance for one dynamic brake stop.

To simplify the energy consumption calculation, assume that all the kinetic energy until the Servomotor stops is consumed by the dynamic brake resistor and use the following formula. Out of all possible operation patterns, use the one which maximizes the kinetic energy of the Servomotor.

Dynamic brake resistor capacity: E_{DB} [J]

Actuator moment of inertia calculated at the motor shaft*: J_M [kg·m²]

Load moment of inertia at the motor shaft: J_I [kg·m²]

Speed calculated at the motor shaft just before stopping with the dynamic brake: N [min⁻¹]

* Refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc. for information on the moments of inertia of the Actuators.

$$E_{DB} = \frac{1}{2} \times (J_M + J_L) \times \left(\frac{2\pi}{60} \times N\right)^2$$

Presenting the Required Specifications to the Resistor Manufacturer

Provide the following information to the manufacturer of your resistors and select a dynamic brake resistor that is appropriate for the required specifications.

Required Information for Resistor Selection	Reference
Resistance $[\Omega]$	Determining the Resistance of the Dynamic Brake Resistor on page 2-26
Resistor energy consumption for one operation of the dynamic brake [J]	Calculating the Energy Consumption of the Dynamic Brake Resistor on page 2-27
Number of dynamic brake operations (estimated number of emergency stops required during the product life of your system)	-
Wire size: AWG14 (2.0 mm²) to AWG18 (0.9 mm²)	_

Precautions

- Refer to the following manual for information on wiring dynamic brake resistors.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- If a dynamic brake resistor is used, you must set Pn601 (Dynamic Brake Resistor Allowable Energy Consumption) and Pn604 (Dynamic Brake Resistance). Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)

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

3.1	SERVOP	ACKs with MECHATROLINK-II Communications References 3-2
	3.1.1 3.1.2 3.1.3 3.1.4 3.1.5 3.1.6 3.1.7	Alarm Displays
3.2	SERVOP	ACKs with MECHATROLINK-III Communications References3-49
	3.2.1 3.2.2 3.2.3 3.2.4 3.2.5 3.2.6 3.2.7	Alarm Displays

3.1.1 Alarm Displays

3.1

SERVOPACKs with MECHATROLINK-II Communications References

3.1.1 Alarm Displays

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display. However, if $\Box\Box$ - $\Box\Box$ appears on the panel display, the display will indicate a SERVOPACK system error. Replace the SERVOPACK.

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

Example: Alarm A.E60

3.1.2 List of Alarms

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

Servomotor Stopping Method for Alarms

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

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)

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		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.XDDD (External Encoder Usage) do not match.	Gr.1	No
A.04A	Parameter Setting Error 2	There is an error in the bank members or bank data settings.	Gr.1	No
A.050	Combination Error	The capacities of the SERVOPACK and Servomotor do not match.	Gr.1	Yes
A.051	Unsupported Device Alarm	An unsupported device was connected.	Gr.1	No
A.070	Motor Type Change Detected	The connected motor is a different type of motor from the previously connected motor.	Gr.1	No
A.0b0	Invalid Servo ON Com- mand Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	Gr.1	Yes
A.100	Overcurrent Detected	An overcurrent flowed through the power transistor or the heat sink overheated.	Gr.1	No
A.300	Regeneration Error	There is an error related to regeneration.	Gr.1	Yes
A.320	Regenerative Overload	A regenerative overload occurred.	Gr.2	Yes
A.330	Main Circuit Power Supply Wiring Error	 The AC power supply input setting or DC power supply input setting is not correct. The power supply wiring is not correct. 	Gr.1	Yes
A.400	Overvoltage	The main circuit DC voltage is too high.	Gr.1	Yes
A.410	Undervoltage	The main circuit DC voltage is too low.	Gr.2	Yes
A.510	Overspeed	The motor exceeded the maximum speed.	Gr.1	Yes
A.511	Encoder Output Pulse Overspeed	The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) was exceeded.	Gr.1	Yes
A.520	Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Gr.1	Yes
A.521	Autotuning Alarm	Vibration was detected during autotuning for the tuning-less function.	Gr.1	Yes
A.550	Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum motor speed.	Gr.1	Yes
A.710	Instantaneous Overload	The Servomotor was operating for several seconds to several tens of seconds under a torque that largely exceeded the rating.	Gr.2	Yes
A.720	Continuous Overload	The Servomotor was operating continuously under a torque that exceeded the rating.	Gr.1	Yes
A.730		When the dynamic brake was applied, the rota-		.,
A.731	Dynamic Brake Overload	tional or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Gr.1	Yes
A.740	Inrush Current Limiting Resistor Overload	The main circuit power supply was frequently turned ON and OFF.	Gr.1	Yes
A.7A1	Internal Temperature Error 1 (Control Board Tempera- ture Error)	The surrounding temperature of the control PCB is abnormal.	Gr.2	Yes
		Cont	inued on n	ovt pogo

3.1.2 List of Alarms

Continued from previous page.

Alarm Name Alarm Name Alarm Meaning Alarm Alarm Meaning Alarm Alarm Meaning Alarm Alarm Alarm Meaning Alarm Alarm Alarm Alarm An or arm occurred in the encoder all faled and Gr.1 No Alared External Encoder Module Alared External Incremental Encoder Module Encoder Sensor Error Alared External Incremental Encoder Module Encoder Sensor Error Alared External Incremental Encoder Module Encoder Sensor Error Alared External Incremental Encoder Sensor Error Alared External Incremental Encoder Sensor Error Alared External Incremental Alared Mechatrollink Communications Alared External Increder Over-			Continued	nom previo	ous page.
A.7A3 2 (Power Board Temperature Form International properature of the power PCB Gr.2 Yes abnormal. A.7A3 Internal Temperature Sensor Error An orror occurred in the temperature sensor circuit. A.7Ab SERVOPACK Built-in Fan Stopped The fan inside the SERVOPACK stopped. Gr.1 Yes A.810 Encoder Backup Alarm The power supplies to the encoder all falled and the position data was lost. There is an orror in the checksum results for encoder memory. A.820 Encoder Data Alarm There is an orror in the checksum results for encoder memory. A.840 Encoder Data Alarm There is an internal data error in the encoder. Gr.1 No A.850 Encoder Overspeed The battery vollage was lower than the specified level after the control power supply was turned ON. A.850 Encoder Overspeed The internal data error in the encoder. Gr.1 No A.860 Encoder Overheated The internal temperature of encoder is too high. Gr.1 No A.861 External Encoder Error An orror occurred in the external encoder. Gr.1 Yes A.862 External Incremental Encoder Module Error An error occurred in the external encoder. Gr.1 Yes A.863 External Encoder Error An error occurred in the external encoder. Gr.1 Yes A.864 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.865 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.866 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.867 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.868 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.869 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.860 External Encoder Overspeed An error occurred in the external encoder. Gr.1 Yes A.861 External Encoder Overspeed An error occurred in the external Gr.1 Yes A.862 External Encoder Overspee		Alarm Name	Alarm Meaning	motor Stop- ping	Reset Possi-
SERVOPACK Built-in Fan Stopped The fan inside the SERVOPACK stopped. Gr.1 Yes Stopped The power supplies to the encoder all failed and gr.1 No Encoder Backup Alarm The position data was lost. A.810 Encoder Backup Alarm There is an error in the checksum results for encoder memory. A.830 Encoder Battery Alarm There is an error in the checksum results for encoder memory. A.830 Encoder Battery Alarm There is an error in the checksum results for encoder memory. A.840 Encoder Data Alarm There is an internal data error in the encoder. A.850 Encoder Overspeed The battery voltage was lower than the specified level after the control power supply was turned On. A.860 Encoder Overspeed The encoder was operating at high speed when the power was turned On. A.860 Encoder Overheated The internal temperature of encoder is too high. A.861 External Encoder Error An error occurred in the external encoder. A.862 External Encoder Module Error An error occurred in the Serial Converter Unit. Gr.1 Yes External Incremental Encoder Sensor Error encoder. A.863 External Encoder Overspeed An error occurred in the external encoder. A.864 External Encoder Overspeed An error occurred in the position data of the encoder. A.865 External Encoder Overspeed An error occurred in the external encoder. A.866 External Encoder Overspeed An error occurred in the external encoder. A.867 External Encoder Overspeed An error occurred in the external encoder. A.868 External Encoder Overspeed An error occurred in the external encoder. A.869 External Encoder Overspeed An error occurred in the external encoder. A.860 External Encoder Overspeed An error occurred in the external encoder. A.861 External Encoder Overspeed An error occurred in MECHATROLINK communications. A.862 External Encoder Overspeed An error occurred in MECHATROLINK communications. A.863 Current Detection Error 3 An error occurred in MECHATROLINK communications. A.864 External Encoder Overspeed An error occurred in MECHATROLINK communications. A.865 External Encoder Oversp	A.7A2	2 (Power Board Tempera-		Gr.2	Yes
A.810 Encoder Backup Alarm A.820 Encoder Checksum Alarm A.820 Encoder Checksum Alarm A.830 Encoder Battery Alarm A.830 Encoder Battery Alarm A.830 Encoder Battery Alarm A.830 Encoder Battery Alarm A.840 Encoder Data Alarm A.850 Encoder Data Alarm A.850 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.850 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.860 Encoder Overspeed A.860 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.860 Encoder Overspeed A.861 External Encoder Module Error A.862 External Encoder Module Error A.863 External Incremental Encoder Sensor Error A.864 External Incremental Encoder Sensor Error A.865 External Incremental Encoder An error occurred in the external encoder. A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 Current Detection Error 3 An error occurred in the external encoder. A.864 External Encoder Overspeed A.865 External Encoder Overspeed A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 Current Detection Error 3 An error occurred in the external encoder. A.864 A.865 External Encoder Overspeed A.865 External Encoder Overspeed A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 Current Detection Error 3 An error occurred in the External A.864 External Encoder Overspeed A.865 External Encoder Overspeed A.866 Exter	A.7A3	·	· ·	Gr.2	No
A.820 Encoder Checksum Alarm There is an error in the checksum results for encoder memory. A.830 Encoder Battery Alarm A.840 Encoder Data Alarm There is an error in the checksum results for encoder memory. The battery voltage was lower than the specified level after the control power supply was turned ON. A.850 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.860 Encoder Overheated The internal temperature of encoder is too high. A.861 External Encoder Error A.862 External Encoder Module Error A.863 External Incremental Encoder Sensor Error A.864 External Incremental Encoder Sensor Error A.865 External Incremental Encoder Position Error A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.860 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 Current Detection Error 3 An error occurred in the external encoder. A.864 External Encoder Overspeed A.865 External Encoder Overspeed A.866 External Encoder Overspeed A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 Current Detection Error 3 An error occurred in the current detection circuit. A.864 External Encoder Overspeed A.865 External Encoder Overspeed A.866 External Encoder Overspeed A.866 External Encoder Overspeed A.867 External Encoder Overspeed A.868 External Encoder Overspeed A.868 External Encoder Overspeed A.869 External Encoder Overspeed A.860 External Encoder Overspeed A.861 External Encoder Overspeed A.862 External Encoder Overspeed A.863 External Encoder Overspeed A.864 External Encoder Overspeed A.865 External Encoder Overspeed A.865 External Encoder Overspeed A.866 Ex	A.7Ab		The fan inside the SERVOPACK stopped.	Gr.1	Yes
A.830 Encoder Battery Alarm A.840 Encoder Battery Alarm A.840 Encoder Data Alarm A.850 Encoder Data Alarm A.850 Encoder Overspeed The encoder was operating at high speed when the power supply was turned ON. A.860 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.860 Encoder Overheated A.860 External Encoder Error A.861 External Encoder Error A.862 External Encoder Module Error A.863 External Incremental Encoder Pror An error occurred in the external encoder. A.864 External Incremental Encoder Pror An error occurred in the external encoder. A.865 External Incremental Encoder Pror occurred in the external encoder. A.866 External Absolute Encoder Pror occurred in the position data of the external encoder. A.867 External Encoder Overspeed An error occurred in the position data of the external encoder. A.868 External Encoder Overspeed error occurred in the external encoder. A.869 External Encoder Overspeed error occurred in the external encoder. A.860 External Encoder Overspeed error occurred in the external encoder. A.860 External Encoder Overspeed error occurred in the external encoder. A.861 External Encoder Overspeed error occurred in the external encoder. A.862 External Encoder Overspeed error occurred in the external encoder. A.863 Current Detection Error 3 An error occurred in the current detection circuit. A.864 MECHATROLINK Communications ASIC Error 1 occurred in MECHATROLINK communications. A.866 MECHATROLINK Communications. A.867 Experimental program error 0 occurred in the SERVO-PACK. A.867 System Alarm 0 Internal program error 1 occurred in the SERVO-PACK. A.868 System Alarm 3 Internal program error 2 occurred in the SERVO-PACK. A.869 System Alarm 5 Internal program error 6 occurred in the SERVO-PACK. A.869 System Alarm 6 Internal program error 7 occurred in the SERVO-PACK. A.869 System Alarm 7 Internal program error 8 occurred in the SERVO-PACK. A.869 System Alarm 8 Internal program error 7 occurred in the SERVO-PACK. A.869 Syste	A.810	Encoder Backup Alarm		Gr.1	No
A.840 Encoder Data Alarm level after the control power supply was turned Gr.1 Yes A.840 Encoder Data Alarm There is an internal data error in the encoder. Gr.1 No A.850 Encoder Overspeed The encoder was operating at high speed when the power was turned ON. A.860 Encoder Overheated The internal temperature of encoder is too high. Gr.1 No A.860 External Encoder Error An error occurred in the external encoder. Gr.1 Yes A.841 External Encoder Module Error An error occurred in the Serial Converter Unit. Gr.1 Yes A.842 External Incremental Encoder Sensor Error An error occurred in the external encoder. Gr.1 Yes A.843 External Incremental Encoder Sensor Error An error occurred in the position data of the external encoder. Gr.1 Yes A.845 External Encoder Overspeed An overspeed error occurred in the external encoder. Gr.1 Yes A.846 External Encoder Overspeed An overspeed error occurred in the external encoder. Gr.1 Yes A.847 External Encoder Overspeed An overspeed error occurred in the external encoder. Gr.1 Yes A.848 External Encoder Overspeed An overspeed error occurred in the external encoder. Gr.1 Yes A.849 MECHATROLINK Communications ASIC Error 1 An error occurred in the current detection circuit. Gr.1 No A.860 MECHATROLINK Communications. ASIC error 1 occurred in MECHATROLINK communications Gr.2 No MECHATROLINK Communications. ASIC error 1 occurred in MECHATROLINK communications Gr.2 No MECHATROLINK Communications. Internal program error 0 occurred in the SERVO-PACK. A.870 System Alarm 0 Internal program error 1 occurred in the SERVO-PACK. A.871 No A.872 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.873 Internal program error 3 occurred in the SERVO-PACK. A.874 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.876 System Alarm 6 Internal program error 7 occurred in the SERVO-PACK. A.876 System Alarm 7 Internal pro	A.820	Encoder Checksum Alarm		Gr.1	No
A.850 Encoder Overspeed the power was turned ON. A.860 Encoder Overheated The power was turned ON. A.860 Encoder Overheated The internal temperature of encoder is too high. A.861 External Encoder Error An error occurred in the external encoder. A.862 External Encoder Module Error A.863 External Incremental Encoder Sensor Error A.864 External Incremental Encoder Position Error A.865 External Encoder Over-position Error A.866 External Encoder Over-speed Position Error A.866 External Encoder Over-pactor A.867 External Encoder Over-pactor A.868 External Encoder Over-pactor A.869 External Encoder Over-pactor A.860 External Encoder A.860 External Enc	A.830	Encoder Battery Alarm	level after the control power supply was turned	Gr.1	Yes
A.860 Encoder Overspeed A.860 Encoder Overspeed A.860 External Encoder Error A.861 External Encoder Error A.862 External Encoder Module Error A.863 External Incremental Encoder Module Error A.864 External Incremental Encoder Module Error A.865 External Incremental Encoder Module Error A.866 External Incremental Encoder Module Encoder Sensor Error A.867 External Encoder Module Encoder Position Error A.868 External Encoder Overspeed error occurred in the external encoder. A.869 External Encoder Overspeed An error occurred in the position data of the external encoder. An overspeed error occurred in the SERVO-pACK. An overspeed error occurred in the SERVO-pACK. An overspeed error occurred in the SERVO-pACK. An overs	A.840	Encoder Data Alarm	There is an internal data error in the encoder.	Gr.1	No
A.8A0 External Encoder Error An error occurred in the external encoder. A.8A1 External Encoder Module Error An error occurred in the Serial Converter Unit. A.8A2 External Incremental Encoder Sensor Error An error occurred in the external encoder. A.8A3 External Absolute Encoder Position Error An error occurred in the position data of the external encoder. A.8A5 External Encoder Over-speed error occurred in the external encoder. A.8A6 External Encoder Over-heated encoder. A.8A7 External Encoder Over-heated encoder. An overspeed error occurred in the external encoder. An error eccurred in the external encoder. Gr.1 No A.BF6 System Alarm 0 Internal program error 1 occurred in the SERVO-PACK. A.BF6 System Alarm 6 Internal program error 2 occurred in the SERVO-PACK. A.BF7 System Alarm 7 Internal program error 5 occurred in the SERVO-PACK. A.BF7 System Alarm 7 Internal program error 7 occurred in the SERVO	A.850	Encoder Overspeed		Gr.1	No
A.8A1 External Encoder Module Error A.8A2 External Incremental Encoder Sensor Error A.8A3 External Absolute Encoder Position Error A.8A4 External Encoder Over- Speed External Encoder Over- heated A.8A5 External Encoder Over- heated A.8A6 External Encoder Over- heated A.8A7 Overspeed error occurred in the external encoder. A.8A8 External Encoder Over- heated A.8A9 External Encoder Over- heated A.8A9 External Encoder Over- heated A.8A9 External Encoder A.8A9	A.860	Encoder Overheated	The internal temperature of encoder is too high.	Gr.1	No
A.8A1 Error A.8A2 External Incremental Encoder Sensor Error A.8A3 External Absolute Encoder Position Error A.8A3 External Absolute Encoder An error occurred in the external encoder. A.8A3 External Absolute Encoder Position Error An error occurred in the position data of the external encoder. A.8A5 External Encoder Overspeed error occurred in the external encoder. A.8A6 External Encoder Overheated encoder. Gr.1 No A.8B6 MECHATROLINK Communications. A.8Cl error 1 occurred in MECHATROLINK communications. Gr.1 No A.BF1 System Alarm 1 Internal program error 0 occurred in the SERVO-PACK. A.BF2 System Alarm 2 Internal program error 1 occurred in the SERVO-PACK. A.BF3 System Alarm 3 Internal program error 2 occurred in the SERVO-PACK. A.BF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.BF6 System Alarm 7 Internal program error 6 occurred in the SERVO-PACK. A.BF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.BF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Gr.1 No	A.8A0	External Encoder Error	An error occurred in the external encoder.	Gr.1	Yes
A.8A2 Encoder Sensor Error A.8A3 External Absolute Encoder Position Error A.8A5 External Encoder Overspeed error occurred in the external encoder. A.8A6 External Encoder Overspeed error occurred in the external encoder. A.8A6 External Encoder Overspeed error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. A.8A6 External Encoder Overheating error occurred in the external encoder. An overheating error occurred in MECHATROLINK communications. An error occurred in MECHATROLINK communic	A.8A1		An error occurred in the Serial Converter Unit.	Gr.1	Yes
A.8A5 Position Error external encoder. A.8A5 External Encoder Overspeed error occurred in the external encoder. A.8A6 External Encoder Overheated encoder. A.8A6 External Encoder Overheated encoder. A.BA6 External Encoder Overheated encode	A.8A2		An error occurred in the external encoder.	Gr.1	Yes
A.8A6 speed encoder. A.8A6 External Encoder Overheated An overheating error occurred in the external encoder. A.BA3 Current Detection Error 3 An error occurred in the current detection circuit. Gr.1 No ASIC error 1 occurred in MECHATROLINK communications ASIC Error 1 ASIC error 2 occurred in MECHATROLINK communications. A.b6A MECHATROLINK Communications ASIC Error 2 Internal program error 0 occurred in the SERVO-PACK. A.bF1 System Alarm 0 Internal program error 1 occurred in the SERVO-PACK. A.bF2 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.bF3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bF4 System Alarm 4 Internal program error 3 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 4 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 5 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK.	A.8A3			Gr.1	Yes
A.BA6 heated encoder. A.b33 Current Detection Error 3 An error occurred in the current detection circuit. Gr.1 No A.b6A MECHATROLINK Communications ASIC Error 1 Detections. ASIC error 1 Detections. ASIC Error 2 Detections. ASIC Error 3 Detections. ASIC Error 4 Detections. ASIC Error 5 Detections. ASIC Error 6 Detections. ASIC Error 7 Detections. ASIC Error 8 Detections. ASIC Error 9 Detections. ASIC Error 1 Detections. ASIC Error 2 Detections. ASIC Error 1 Detections. ASIC Error 2 Detections. ASIC Error 1 Detections. ASIC Error 1 Detections. ASIC Error 1 Detections. ASIC Error 1 Detections. ASIC Error 2 Detections. ASIC Error 1 Detections. ASIC Error 2 Detectio	A.8A5		·	Gr.1	Yes
A.b6A MECHATROLINK Communications ASIC Error 1 A.b6b MECHATROLINK Communications ASIC Error 1 A.b6b MECHATROLINK Communications ASIC Error 2 A.b7 MECHATROLINK Communications ASIC Error 2 ASIC error 2 occurred in MECHATROLINK communications. ASIC error 2 occurred in MECHATROLINK communications. Gr.2 No A.b70 System Alarm 0 A.b71 Internal program error 0 occurred in the SERVO-PACK. A.b72 System Alarm 1 A.b73 System Alarm 2 A.b74 System Alarm 3 A.b75 System Alarm 4 A.b75 System Alarm 5 A.b76 System Alarm 5 A.b77 System Alarm 6 A.b77 System Alarm 7 A.b78 System Alarm 8 A.B78 System Alarm 8 ASIC error 1 occurred in MECHATROLINK communications. Gr.1 No ASIC error 2 occurred in MECHATROLINK communications. Gr.1 No ASIC error 2 occurred in MECHATROLINK communications. Gr.2 No ASIC error 2 occurred in the SERVO-Gr.1 No ASIC error 1 occurred in the SERVO-PACK. Gr.1 No A.b79 System Alarm 2 Internal program error 3 occurred in the SERVO-PACK. Gr.1 No A.b79 System Alarm 6 Internal program error 5 occurred in the SERVO-PACK. Internal program error 6 occurred in the SERVO-PACK. Gr.1 No A.b79 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. Gr.1 No A.b79 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Gr.1 No	A.8A6			Gr.1	Yes
A.b6b nications ASIC Error 1 munications. A.b6b MECHATROLINK Communications ASIC Error 2 occurred in MECHATROLINK communications ASIC Error 2 munications. A.bF0 System Alarm 0 Internal program error 0 occurred in the SERVO-PACK. A.bF1 System Alarm 1 Internal program error 1 occurred in the SERVO-PACK. A.bF2 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.bF3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bF4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Gr.1 No	A.b33	Current Detection Error 3	An error occurred in the current detection circuit.	Gr.1	No
A.bf0 System Alarm 0 Internal program error 0 occurred in the SERVO-PACK. A.bf1 System Alarm 1 Internal program error 1 occurred in the SERVO-PACK. A.bf2 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.bf3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bf4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bf5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bf6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bf7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bf8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bf8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Gr.1 No	A.b6A			Gr.1	No
A.bF1 System Alarm 1 Internal program error 1 occurred in the SERVO-PACK. A.bF2 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.bF3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bF4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK.	A.b6b			Gr.2	No
A.bF2 System Alarm 2 Internal program error 2 occurred in the SERVO-PACK. A.bF3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bF4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Gr.1 No	A.bF0	System Alarm 0		Gr.1	No
A.bF3 System Alarm 3 Internal program error 3 occurred in the SERVO-PACK. A.bF4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK.	A.bF1	System Alarm 1		Gr.1	No
A.bF4 System Alarm 4 Internal program error 4 occurred in the SERVO-PACK. A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 No	A.bF2	System Alarm 2		Gr.1	No
A.bF5 System Alarm 5 Internal program error 5 occurred in the SERVO-PACK. A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK.	A.bF3	System Alarm 3	PACK.	Gr.1	No
A.bF6 System Alarm 6 Internal program error 6 occurred in the SERVO-PACK. A.bF7 System Alarm 7 Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Internal program error 8 occurred in the SERVO-PACK. Or.1 No	A.bF4	System Alarm 4	PACK.	Gr.1	No
A.bF7 System Alarm 7 PACK. Internal program error 7 occurred in the SERVO-PACK. A.bF8 System Alarm 8 Internal program error 8 occurred in the SERVO-PACK. Or. 1 No	A.bF5	System Alarm 5		Gr.1	No
A.bF8 System Alarm 8 PACK. Internal program error 8 occurred in the SERVO-PACK. Or. 1 No	A.bF6	System Alarm 6		Gr.1	No
PACK.	A.bF7	System Alarm 7	PACK.	Gr.1	No
Continued on next nage	A.bF8	System Alarm 8	PACK.		

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Continued from previous page.

		Continued	rom previo	ous page.
Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.C10	Servomotor Out of Control	The Servomotor ran out of control.	Gr.1	Yes
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 Module failed.	Gr.1	No
A.CF2	Timer Stopped Error in Feedback Option Module Communications	An error occurred in the timer for communications with the Feedback Option Module.	Gr.1	No
A.d00	Position Deviation Over- flow	The setting of Pn520 (Position Deviation Overflow Alarm Level) was exceeded by the position deviation while the servo was ON.	Gr.1	Yes
A.d01	Position Deviation Over- flow Alarm at Servo ON	The servo was turned ON after the position deviation exceeded the setting of Pn526 (Position Deviation Overflow Alarm Level at Servo ON) while the servo was OFF.	Gr.1	Yes
A.d02	Position Deviation Over- flow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON) limits the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Position Deviation Overflow Alarm Level) is exceeded before the limit is cleared.	Gr.2	Yes
A.d10	Motor-Load Position Deviation Overflow	There was too much position deviation between the motor and load during fully-closed loop con- trol.	Gr.2	Yes
A.E02	MECHATROLINK Internal Synchronization Error 1	A synchronization error occurred during MECHA-TROLINK communications with the SERVO-PACK.	Gr.1	Yes
A.E40	MECHATROLINK Trans- mission Cycle Setting Error	The setting of the MECHATROLINK communications transmission cycle is not correct.	Gr.2	Yes
A.E50*	MECHATROLINK Syn- chronization Error	A synchronization error occurred during MECHA-TROLINK communications.	Gr.2	Yes
A.E51	MECHATROLINK Syn- chronization Failed	Synchronization failed during MECHATROLINK communications.	Gr.2	Yes
A.E60*	Reception Error in MECHATROLINK Commu- nications	Communications errors occurred continuously during MECHATROLINK communications.	Gr.2	Yes

3.1.2 List of Alarms

Continued from previous page.

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.E61	Synchronization Interval Error in MECHATROLINK Transmission Cycle	An error occurred in the transmission cycle during MECHATROLINK communications.	Gr.2	Yes
A.E72	Feedback Option Module Detection Failure	Detection of the Feedback Option Module failed.	Gr.1	No
A.Eb1	Safety Function Signal Input Timing Error	An error occurred in the input timing of the safety function signal.	Gr.1	No
A.EC8	Gate Drive Error 1	An error occurred in the gate drive circuit.	Gr.1	No
A.EC9	Gate Drive Error 2	An error occurred in the gate drive circuit.	Gr.1	No
A.Ed1	Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.		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
FL-1*				
FL-2*				
FL-3*	System Alarm	An internal program error occurred in the	_	No
FL-4*	System Alami	SERVOPACK.		140
FL-5*				
FL-6*				
CPF00	Digital Operator Communications Error 1	Communications were not possible between the Digital Operator (model: JUSP-OP05A-1-E) and	_	No
CPF01	Digital Operator Communications Error 2	the SERVOPACK (e.g., a CPU error occurred).	_	INO

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

Troubleshooting Alarms

3.1.3

The following alarm table gives the alarm name, cause, confirmation method, correction, reference, and inquiry location in order of the alarm numbers.

Alarm Inquiry Locations

Alarms are classified in the following three groups. The inquiry location depends on the alarm group.

Contact the specified inquiry location if you cannot solve a problem with the corrections given in the table.

- A: Alarm Group: Motor and Encoder Alarms Inquiries: Harmonic Drive Systems Inc.
- B: Alarm Group: Motor, Encoder, and SERVOPACK Alarms
 Inquiries: Harmonic Drive Systems Inc. or your Yaskawa representative
- C: Alarm Group: SERVOPACK Alarms Inquiries: Your Yaskawa representative

Alarm Troubleshooting Table

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
	The power supply voltage suddenly dropped.	Measure the power supply voltage.	Set the power supply voltage within the spec- ified range, and initialize the parameter settings.	*1	
	The power supply was shut OFF while writing parameter settings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.		
A.020: Parameter	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were frequently changed from the host controller.	The SERVOPACK may be faulty. Replace the SERVOPACK. Reconsider the method for writing the parameters.	-	
Checksum Error (There is an error in the parameter data in the SERVO- PACK.)	A malfunction was caused by noise from the AC power supply, ground, static electricity, or other source.	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, noise may be the cause.	Implement countermeasures against noise.	*1	С
	Gas, water drops, or cutting oil entered the SERVO-PACK 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.	-	

Continued from previous page.

			Continued	trom previou	
Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.021: Parameter Format Error (There is an error in the parameter data format in the	The software version of the SERVO-PACK that caused the alarm is older than the software version of the parameters specified to write.	Read the product information to see if the software versions are the same. If they are different, it could be the cause of the alarm.	Write the parameters from another SERVO-PACK with the same model and the same software version, and then turn the power OFF and ON again.	*1	С
SERVOPACK.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.022:	The power supply voltage suddenly dropped.	Measure the power supply voltage.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
System Check- sum Error (There is an error in the	The power supply was shut OFF while setting a utility function.	Check the timing of shutting OFF the power supply.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
parameter data in the SERVO- PACK.)	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.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.	-	С
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.	-	С
A.030: Main Circuit Detector Error	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	С
	The SERVOPACK and Servomotor or Actuator do not match.	Check the combination of the SERVO-PACK and Servomotor or Actuator.	Use a suitable combination of SERVOPACK and Servomotor or Actuator.	page 1-4	
A.040: Parameter Set-	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
ting Error (A parameter setting is out- side of the set- ting range.)	A parameter setting is outside of the setting range.	Check the setting ranges of the parameters that have been changed.	Set the parameters to values within the setting ranges.	-	С
	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the following range: 0.001 < (Pn20E/Pn210) < 64,000.	Set the electronic gear ratio in the following range: 0.001 < (Pn20E/Pn210) < 64,000.	*1	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.041: Encoder Out- put Pulse Set- ting Error	The setting of Pn212 (Number of Encoder Output Pulses) is outside of the setting range or does not satisfy the setting conditions.	Check the setting of Pn212.	Set Pn212 to an appropriate value.	*1	С
	The speed of program jogging went below the setting range when the electronic gear ratio (Pn20E/Pn210) or the Servomotor was changed.	Check to see if the detection conditions*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1	
A.042: Parameter Combination Error	The speed of program jogging went below the setting range when Pn533 (Program Jogging Movement Speed) was changed.	Check to see if the detection conditions*2 are satisfied.	Increase the setting of Pn533.	*1	С
	The movement speed of advanced autotuning went below the setting range when the electronic gear ratio (Pn20E/ Pn210) or the Servomotor was changed.	Check to see if the detection conditions*3 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1	
A.044: Semi-Closed/ Fully-Closed Loop Control Parameter Setting Error	The setting of the Fully-closed Module does not match the setting of Pn002 = n.XDDD (External Encoder Usage).	Check the setting of Pn002 = n.X□□□.	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = n.X□□□.	*1	С
A.04A: Parameter Set- ting Error 2	For 4-byte parameter bank members, there are two consecutive members with nothing registered.	_	Change the number of bytes for bank members to an appropriate value.	-	С
ting Life! Z	The total amount of bank data exceeds 64 (Pn900 × Pn901 > 64).	-	Reduce the total amount of bank data to 64 or less.	-	
A.050: Combination Error (The capacities of the SERVO- PACK and Ser- vomotor do not match.)	The SERVOPACK and Servomotor or Actuator capacities do not match each other.	Confirm that the following condition is met: 1/4 ≤ (Servomotor capacity/SERVO-PACK capacity) ≤ 4	Use a suitable capacity of SERVOPACK and Servomotor or Actuator.	page 1-4	
	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	The encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.051: Unsupported Device Alarm	An unsupported Serial Converter Unit or encoder (e.g., an external encoder) is con- nected to the SER- VOPACK.	Check the product combination specifications.	Change to a correct combination of models.	-	С
A.070: Motor Type Change Detected (The connected motor is a differ- ent type of motor from the previously con- nected motor.)	A Rotary Servomotor was removed and a Linear Servomotor was connected.	_	Reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1	
	A Linear Servomotor was removed and a Rotary Servomotor was connected.	_	Set the parameters for a Rotary Servomotor and reset the motor type alarm. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1	С
A.0b0: Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	_	Turn the power supply to the SERVOPACK OFF and ON again. Or, execute a software reset.	*1	С

Continued from previous page.

Alarm Number:	Possible Cause	Confirmation	Correction	Reference	Inqui-
Alarm Name	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.		ries
A.100: Overcurrent Detected (An overcurrent	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, and W.	The cable may be short-circuited. Replace the cable.		
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Consult Harmonic Drive Systems Inc.	*1	
	There is a short-circuit or ground fault inside the SERVO-PACK.	Check for short- circuits across the Servomotor connec- tion 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.		B
flowed through the power tran- sistor or the heat sink over- heated.)	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1	Б
ca.ca.y	The dynamic brake (DB, emergency stop executed from the SERVOPACK) was frequently activated, or a DB overload alarm occurred.	Check the power consumed by the DB resistor to see how frequently the DB is being used. Or, check the alarm display to see if a DB overload alarm (A.730 or A.731) has occurred.	Change the SERVO-PACK model, operating methods, or the mechanisms so that the dynamic brake does not need to be used so frequently.		
	The regenerative processing capacity was exceeded.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Recheck the operating conditions and load.		
	The SERVOPACK regenerative resistance is too small.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Change the regenerative resistance to a value larger than the SERVOPACK minimum allowable resistance.	- page 2-21	

Continued from previous page.

Alarm Number:	Possible Cause	Confirmation	Correction	Reference	Inqui-	
Alarm Name	A heavy load was applied while the Servomotor was stopped or running at a low speed.	Check to see if the operating conditions exceed Servo Drive specifications.	Reduce the load applied to the Servo- motor. Or, increase the operating speed.	-	ries	
A.100: Overcurrent Detected (An overcurrent flowed through the power tran- sistor or the	A malfunction was caused by noise.	Improve the noise environment, e.g. by improving the wiring or installation conditions, and check to see if the alarm still occurs.	Implement countermea- sures against noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SERVOPACK's main circuit wire size.	-	В	
heat sink over- heated.)	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-		
	When using the built-in regenerative resistor, the jumper between the regenerative resistor terminals (B2 and B3) was removed.	Check to see if the jumper is connected between power supply terminals B2 and B3.*4	Correctly connect a jumper.	*1	*1	
A.300: Regeneration Error	The External Regenerative Resistor or Regenerative Resistor Unit is not wired correctly, or was removed or disconnected.	Check the wiring of the External Regener- ative Resistor or Regenerative Resis- tor Unit.*4	Correct the wiring of the External Regenerative Resistor.		С	
	A failure occurred in the SERVOPACK.	_	While the main circuit power supply is OFF, turn the control power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.			

Continued from previous page. Alarm Number: Inqui-Reference Possible Cause Confirmation Correction Alarm Name ries The power supply Set the power supply Measure the power voltage exceeded voltage within the specsupply voltage. the specified range. ified range. The external regenerative resistance Change the regeneravalue or regenera-Check the operating tive resistance value or tive resistor capacity capacity. conditions or the page 2-21 is too small, or there Reconsider the operatcapacity. has been a continuing conditions. ous regeneration state. There was a contin-Reconsider the system uous regeneration Check the load state because a applied to the Servoincluding the servo, negative load was motor or Actuator machine, and operatcontinuously during operation. ing conditions. applied. The setting of Pn600 (Regenera-Check to see if a A.320: tive Resistor Capac-Regenerative Resis-Regenerative Correct the setting of В itv) is smaller than tor is connected and Overload Pn600. the capacity of the check the setting of External Regenera-Pn600. tive Resistor. The setting of Pn603 (Regenera-Check to see if a tive Resistance) is Regenerative Resis-Correct the setting of smaller than the tor is connected and Pn603. capacity of the check the setting of External Regenera-Pn603. tive Resistor. Change the regenerative resistance to a cor-The external regen-Check the regenerarect value or use an erative resistance is page 2-21 tive resistance. External Regenerative too high. Resistor of an appropri-

A failure occurred in

the SERVOPACK.

ate capacity.

SERVOPACK.

The SERVOPACK may

be faulty. Replace the

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.330: Main Circuit	The regenerative resistor was disconnected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measuring instrument.	If you are using the regenerative resistor built into the SERVO-PACK, replace the SERVOPACK. If you are using an External Regenerative Resistor, replace the External Regenerative Resistor.	-	
Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	DC power was supplied when an AC power supply input was specified in the settings.	Check the power supply to see if it is a DC power supply.	Correct the power supply setting to match the actual power supply.	*1	С
turned OIV.	AC power was supplied when a DC power supply input was specified in the settings.	Check the power supply to see if it is an AC power supply.	Correct the power supply setting to match the actual power supply.		
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the AC/DC power supply voltage within the specified range.	_	
	The power supply is not stable or was influenced by a lightning surge.	Measure the power supply voltage.	Improve the power supply conditions, install a surge absorber, and then turn the power supply OFF and ON again. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.	-	
A.400: Overvoltage	The voltage for AC power supply was too high during acceleration or deceleration.	Check the power supply voltage and the speed and torque during operation.	Set the AC power supply voltage within the specified range.	-	
(Detected in the main circuit power supply section of the SERVOPACK.)	The external regenerative resistance is too high for the operating conditions.	Check the operating conditions and the regenerative resistance.	Select a regenerative resistance value that is appropriate for the operating conditions and load.	page 2-21	С
	The moment of inertia ratio or mass ratio exceeded the allowable value.	Check to see if the moment of inertia ratio or mass ratio is within the allowable range.	Increase the deceleration time, or reduce the load.	-	
	A failure occurred in the SERVOPACK.	_	While the main circuit power supply is OFF, turn the control power supply to the SERVO-PACK OFF and ON again. If the 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	Inqui- ries
	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	_	
A.410: Undervoltage (Detected in the main circuit	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*1	С
power supply section of the SERVOPACK.)	The SERVOPACK fuse is blown out.	_	Replace the SERVO-PACK and connect a reactor to the DC reactor terminals (⊝1 and ⊝2) on the SERVO-PACK.	-	
	A failure occurred in the SERVOPACK.	-	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 wiring of the Servomotor.	Make sure that the Servomotor is correctly wired.	-	
A.510: Overspeed (The motor	A reference value that exceeded the overspeed detection level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.		В
exceeded the maximum speed.)	The motor exceeded the maximum speed.	Check the waveform of the motor speed.	Reduce the speed reference input gain and adjust the servo gain. Or, reconsider the operating conditions.	_	Б
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
A.511: Encoder Out-	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of Pn212 (Number of Encoder Output Pulses).	*1	
put Pulse Over- speed	The encoder output pulse frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse setting and the motor speed.	Reduce the motor speed.	-	С
A.520: Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Check for abnormal Servomotor or Actua- tor noise, and check the speed and torque waveforms during operation.	Reduce the motor speed. Or, reduce the setting of Pn100 (Speed Loop Gain).	*1	
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*1	С
	The vibration detection level (Pn312) is not suitable.	Check that the vibration detection level (Pn312) is suitable.	Set a suitable vibration detection level (Pn312).	*1	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.521: Autotuning Alarm (Vibration was detected while executing the custom tun- ing, Easy FFT, or the tuning- less function.)	The Servomotor or Actuator vibrated considerably while performing the tun- ing-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	С
	The Servomotor or Actuator vibrated considerably while performing custom tuning or EasyFFT.	Check the waveform of the motor speed.	Check the operating procedure of corresponding function and implement corrections.	*1	
A.550: Maximum Speed Setting Error	The setting of Pn316 (Maximum Motor Speed) is greater than the maximum speed.	Check the setting of Pn316, and the upper limits of the maximum motor speed setting and the encoder output resolution setting.	Set Pn316 to a value that does not exceed the maximum motor speed.	*1	С
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	*1	
A.710: Instantaneous Overload	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Consider the following: Reconsider the load and operating conditions. Select a Servomotor or Actuator again.	-	В
A.720: Continuous Overload	An excessive load was applied during operation because the Servomotor or Actuator was not driven due to mechanical problems.	Check the operation reference and motor speed.	Correct the mechanical problem.	-	
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
	The Servomotor or Actuator was rotated by an external force.	Check the operation status.	Implement measures to ensure that the Servo-motor or Actuator will not be rotated by an external force.	-	
A.730 and A.731: Dynamic Brake Overload (An excessive power con- sumption by the dynamic brake was detected.)	When the Servomotor or Actuator was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: Reduce the Servomotor or Actuator command speed. Decrease the moment of inertia ratio or mass ratio. Reduce the frequency of stopping with the dynamic brake.	-	В
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply was frequently	The allowable frequency of the inrush current limiting resistor was exceeded when the main circuit power supply was turned ON and OFF.	_	Reduce the frequency of turning the main cir- cuit power supply ON and OFF.	-	С
turned ON and OFF.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SER-VOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVO-PACK installation conditions.	*1	
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	-	
A.7A1: Internal Temperature Error 1 (Control Board Temperature Error)	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVO-PACK installation conditions.	Install the SERVOPACK according to specifications.	*1	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number:	Describle Occurs	0		Defende	Inqui-
Alarm Name	Possible Cause	Confirmation	Correction	Reference	ries
A.7A2: Internal Temperature Error 2 (Power Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SER-VOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVO-PACK installation conditions.	*1	
	An overload alarm was reset by turning OFF the power supply too many times.	Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	_	
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVO-PACK installation conditions.	Install the SERVOPACK according to specifications.	*1	
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
A.7A3: Internal Temperature Sensor Error (An error occurred in the temperature sensor circuit.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.7Ab: SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
	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 040.	The Encoder Cable was disconnected and then connected again.	Check to see if the power supply was turned ON for the first time.	Check the encoder connection and set up the encoder.	*1	
A.810: Encoder Backup Alarm (Detected at the encoder, but only when an absolute encoder is	Power is not being supplied both from the control power supply (+5 V) from the SERVOPACK and from the battery power supply.	Check the encoder connector battery and the connector status.	Replace the battery or implement similar measures to supply power to the encoder, and set up the encoder.		A
used.)	A failure occurred in the absolute encoder.	-	If the alarm still occurs after setting up the encoder again, the encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	
	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.820: Encoder Check- sum Alarm (Detected at the	A failure occurred in the encoder.	_	Set up the encoder again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	*1	А
encoder.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.830: Encoder Bat-	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*1	
tery Alarm (The absolute encoder battery voltage was lower than the	The battery voltage is lower than the specified value (2.7 V).	Measure the battery voltage.	Replace the battery.	*1	A
specified level.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	The encoder mal- functioned.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actua- tor, or encoder may be	-	

A.840:

Alarm

encoder.)

Encoder Data

(Detected at the

The encoder malfunctioned due to

noise.

Continued on next page.

Α

faulty. Consult Har-

Correct the wiring

motor Main Circuit Cable or by grounding the encoder.

Inc.

monic Drive Systems

around the encoder by separating the Encoder

Cable from the Servo-

Continued from previous page.

Alarm Number:	December C	Confirmati		Pofores of	Inqui-
Alarm Name	Possible Cause	Confirmation	Correction	Reference	ries
A.850: Encoder Over- speed	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	A
(Detected at the encoder.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	The surrounding air temperature around the Servomotor or Actuator is too high.	Measure the sur- rounding air tempera- ture around the Servomotor or Actua- tor.	Reduce the surrounding air temperature of the Servomotor or Actuator to 40° or less.	-	
	The Servomotor load is greater than the rated load.	Use the accumulated load ratio to check the load.	Operate the Servo Drive so that the motor load remains within the specified range.	*1	
A.860: Encoder Over- heated (Detected at the encoder.)	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	A
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.8A0: External Encoder Error	A failure occurred in the external encoder.	_	Replace the external encoder.	_	С
A.8A1: External	A failure occurred in the external encoder.	-	Replace the external encoder.	_	C
Encoder Module Error	A failure occurred in the Serial Converter Unit.	_	Replace the Serial Converter Unit.	_	
A.8A2: External Incremental Encoder Sensor Error	A failure occurred in the external encoder.	_	Replace the external encoder.	_	С
A.8A3: External Absolute Encoder Position Error	A failure occurred in the external abso- lute encoder.	_	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrections.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.8A5: External Encoder Over- speed	An overspeed error was detected in the external encoder.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.	-	С
A.8A6: External Encoder Over- heated	An overheating error was detected in the external encoder.	_	Replace the external encoder.	_	С
A.b33: Current Detection Error 3	A failure occurred in the current detection circuit.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.b6A: MECHA- TROLINK Com- munications ASIC Error 1	There is a fault in the SERVOPACK MECHATROLINK communications section.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.b6b: MECHA- TROLINK Com- munications	A malfunction occurred in the MECHATROLINK communications section due to noise.	_	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring. • Attach a ferrite core to the MECHATROLINK Communications Cable.	-	С
ASIC Error 2	There is a fault in the SERVOPACK MECHATROLINK communications section.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.bF0: System Alarm 0	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF1: System Alarm 1	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF2: System Alarm 2	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.bF3: System Alarm 3	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF4: System Alarm 4	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF5: System Alarm 5	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF6: System Alarm 6	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF7: System Alarm 7	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF8: System Alarm 8	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servomotor wiring.	Make sure that the Servomotor is correctly wired.	_	
A.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	A failure occurred in the encoder.	_	If the motor wiring is correct and the alarm still occurs after turning the power supply OFF and ON again, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.C80: Encoder Clear Error or Multi- turn Limit Set- ting Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.C90: Encoder Communications Error	There is a faulty contact in the connector or the connector is not wired correctly for the encoder.	Check the condition of the encoder connector.	Reconnect the encoder connector and check the encoder wiring.	*1	
	There is a cable disconnection or short-circuit in the encoder. Or, the cable impedance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the specifications.	-	
	One of the following has occurred: corrosion caused by improper temperature, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in connector caused by vibration.	Check the operating environment.	Improve the operating environment, and replace the cable. If the alarm still occurs, replace the SERVO-PACK.	*1	В
	A malfunction was caused by noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.	*1	
	A failure occurred in the SERVOPACK.	_	Connect the Servomotor or Actuator to another SERVOPACK, and turn ON the control power supply. If no alarm occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
	Noise entered on the signal lines because the Encoder Cable is bent or the sheath is damaged.	Check the condition of the Encoder Cable and connectors.	Check the Encoder Cable to see if it is installed correctly.	*1	
A.C91: Encoder Communications Position Data Acceleration	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.	-	В
Rate Error	There is variation in the FG potential because of the influ- ence of machines on the Servomotor or Actuator 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.	-	
	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 vibration. Correctly install the Servomotor, Actuator, or encoder.	-	
A.C92: Encoder Com- munications Timer Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	_	В
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.CA0: Encoder Parameter Error	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	A
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
	The encoder is wired incorrectly or there is faulty contact.	Check the wiring of the encoder.	Make sure that the encoder is correctly wired.	*1	
	The specifications of the Encoder Cable are not correct and noise entered on it.	_	Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	-	
	The Encoder Cable is too long and noise entered on it.	-	The Encoder Cable wiring distance must be 20 m max.	_	
	There was variation in the FG potential because of the influence of machines on the Servomotor or Actuator 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.	-	
A.Cb0: Encoder Echo- back Error	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor, Actuator, or encoder.	-	A
	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.CC0: Multiturn Limit Disagreement	The multiturn limit of the encoder is dif- ferent from that of the SERVOPACK. Or, the multiturn limit of the SERVO- PACK has been changed.	Check the setting of Pn205 in the SERVO-PACK.	Set Pn205 to a value that matches the specifications of the Servomotor or Actuator you are using. For details, refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc.	*1	A
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.CF1: Reception Failed Error in Feedback Option Module Communica- tions	The cable between the Serial Converter Unit and SERVO- PACK is not wired correctly or there is a faulty contact.	Check the wiring of the external encoder.	Correctly wire the cable between the Serial Converter Unit and SERVOPACK.	*1	
	A specified cable is not being used between Serial Con- verter Unit and SER- VOPACK.	Check the wiring specifications of the external encoder.	Use a specified cable.	-	С
	The cable between the Serial Converter Unit and SERVO- PACK is too long.	Measure the length of the cable that con- nects the Serial Con- verter Unit.	The length of the cable between the Serial Converter Unit and SERVOPACK must be 20 m or less.	-	
	The sheath on cable between the Serial Converter Unit and SERVOPACK is broken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Converter Unit and SERVOPACK.	-	
A.CF2: Timer Stopped Error in Feed- back Option Module Com- munications	Noise entered the cable between the Serial Converter Unit and SERVO-PACK.	_	Correct the wiring around the Serial Converter Unit, e.g., separate I/O signal lines from the Main Circuit Cables or ground.	-	С
	A failure occurred in the Serial Converter Unit.	_	Replace the Serial Converter Unit.	-	
	A failure occurred in the SERVOPACK.	_	Replace the SERVO- PACK.	-	

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

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.d10: Motor-Load	The motor direction and external encoder installation orientation are backward.	Check the motor direction and the external encoder installation orientation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.XDDD (External Encoder Usage) to reverse the direction.	*1	С
Position Devia- tion 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.E02:	The MECHA- TROLINK transmis- sion cycle fluctuated.	_	Remove the cause of transmission cycle fluctuation at the host controller.	-	
MECHA- TROLINK Inter- nal Synchroniza- tion Error 1	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.E40: MECHA- TROLINK Trans- mission Cycle Setting Error	The setting of MECHATROLINK transmission cycle is outside of the specified range.	Check the setting of the MECHATROLINK transmission cycle.	Set the MECHA- TROLINK transmission cycle to an appropriate value.	-	С
A.E50*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.	-	
MECHA- TROLINK Syn- chronization Error	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.E51: MECHA- TROLINK Syn-	The WDT data at the host controller was not updated correctly at the start of synchronous communications, so synchronous communications could not be started.	Check to see if the WDT data is being updated in the host controller.	Correctly update the WDT data at the host controller.	-	С
chronization Failed	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.E60*5: Reception Error in MECHA- TROLINK Communications	MECHATROLINK wiring is not correct.	Check the MECHA- TROLINK wiring.	Correct the MECHA- TROLINK Communica- tions Cable wiring. Correctly connect the terminator.	-	
	A MECHATROLINK data reception error occurred due to noise.	_	Implement countermeasures against noise. (Check the MECHA-TROLINK Communications Cable and FG wiring, and implement measures such as attaching a ferrite core to the MECHA-TROLINK Communications Cable.)	-	С
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.E61: Synchroniza-	The MECHA- TROLINK transmis- sion cycle fluctuated.	Check the setting of the MECHATROLINK transmission cycle.	Remove the cause of transmission cycle fluctuation at the host controller.	-	
tion Interval Error in MECHA- TROLINK Trans- mission Cycle	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.E72: Feedback Option Module Detection Fail- ure	There is a faulty connection between the SERVOPACK and the Feedback Option Module.	Check the connection between the SERVOPACK and the Feedback Option Module.	Correctly connect the Feedback Option Module.	-	
	The Feedback Option Module was disconnected.	_	Reset the Option Module configuration error and turn the power supply to the SERVO-PACK OFF and ON again.	*1	С
	A failure occurred in the Feedback Option Module.	_	Replace the Feedback Option Module.	-	
	A failure occurred in the SERVOPACK.	_	Replace the SERVO- PACK.	_	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
A.Eb1: Safety Function Signal Input Timing Error	The delay between activation of the /HWBB1 and /HWBB2 input signals for the HWBB was ten second or longer.	Measure the time delay between the / HWBB1 and /HWBB2 signals.	The output signal circuits or devices for / HWBB1 and /HWBB2 or the SERVOPACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check to see if any of these items are faulty or have been disconnected.	-	С
	A failure occurred in the SERVOPACK.	-	Replace the SERVO-PACK.	_	
A.EC8: Gate Drive Error 1 (An error occurred in the gate drive cir- cuit.) A.EC9: Gate Drive Error 2 (An error occurred in the gate drive cir- cuit.)	- A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
		Check the Servomotor or Actuator status when the command is executed.	Execute the SV_ON or SENS_ON command only when the Servomotor or Actuator is not operating.	-	
A.Ed1: Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.	 For fully-closed loop control, check the status of the external encoder when the command is executed. For other types of control, check the status of the encoder when the command is executed. 	Execute the SENS_ON command only when an external encoder or an encoder is connected.	-	С
A.F10:	The three-phase power supply wiring is not correct.	Check the power supply wiring.	Make sure that the power supply is correctly wired.	*1	
Power Supply Line Open Phase (The voltage was low for	The three-phase power supply is unbalanced.	Measure the voltage for each phase of the three-phase power supply.	Balance the power supply by changing phases.	_	С
more than one second for phase R, S, or T when the main power supply was ON.)	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	_

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inqui- ries
FL-1*5: System Alarm FL-2*5: System Alarm FL-3*5: System Alarm FL-4*5: System Alarm FL-5*5: System Alarm FL-5*5:	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	C
CPF00: Digital Operator Communications Error 1	There is a faulty connection between the Digital Operator and the SERVO-PACK.	Check the connector contact.	Disconnect the connector and insert it again. Or, replace the cable.	_	С
	A malfunction was caused by noise.	_	Keep the Digital Operator or the cable away from sources of noise.	-	
CPF01: Digital Operator Communica- tions Error 2	A failure occurred in the Digital Operator.	_	Disconnect the Digital Operator and then connect it again. If the alarm still occurs, the Digital Operator may be faulty. Replace the Digital Operator.	-	
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С

*1. Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)

*2. Detection Conditions

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

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

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

*3. Detection Conditions

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

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

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

^{*4.} The SERVOPACK will fail if the External Regenerative Resistor or Regenerative Resistor Unit is connected while the jumper is connected between the B2 and B3 terminals.

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

3.1.4 Warning Displays

3.1.4 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.

3.1.5 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
A.900	Position Deviation Overflow	The position deviation exceeded the percentage set with the following formula: $(Pn520 \times Pn51E/100)$
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)
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.
A.911	Vibration	Abnormal vibration was detected during motor operation. The detection level is the same as A.520. Set whether to output an alarm or a warning by setting Pn310 (Vibration Detection Selection).
A.912	Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.
A.913	Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.
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.
A.921	Dynamic Brake Overload	This warning occurs before an A.731 alarm (Dynamic Brake Overload) occurs. If the warning is ignored and operation is continued, an alarm may occur.
A.923	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.
A.930	Absolute Encoder Battery Error	This warning occurs when the voltage of absolute encoder's battery is low.
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.
A.94b	Data Setting Warning 2 (Out of Range)	The command data is out of range.
A.94C	Data Setting Warning 3 (Calculation Error)	A calculation error was detected.
A.94d	Data Setting Warning 4 (Parameter Size)	The data sizes do not match.
A.94E	Data Setting Warning 5 (Latch Mode Error)	A latch mode error was detected.
A.95A	Command Warning 1 (Unsatisfied Com- mand Conditions)	A command was sent when the conditions for sending a command were not satisfied.

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Warning Number	Warning Name	Meaning
A.95b	Command Warning 2 (Unsupported Com- mand)	An unsupported command was sent.
A.95d	Command Warning 4 (Command Interference)	There was command interference, particularly latch command interference.
A.95E	Command Warning 5 (Subcommand Not Possible)	The subcommand and main command interfere with each other.
A.95F	Command Warning 6 (Undefined Command)	An undefined command was sent.
A.960	MECHATROLINK Communications Warning	A communications error occurred during MECHATROLINK communications.
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.
A.9A0	Overtravel	Overtravel was detected while the servo was ON.
A.9b0	Preventative Mainte- nance Warning	One of the consumable parts has reached the end of its service life.

Note: Use Pn008 = n.□X□□ (Warning Detection Selection) to control warning detection.

However, the following warnings are not affected by the setting of Pn008 = n.□X□□ and other parameter settings are required in addition to Pn008 = n.□X□□.

Warning	Parameters That Must Be Set to Select Warning Detection	Reference
A.911	Pn310 = n.□□□X (Vibration Detection Selection)	*
A.923	Not affected by the setting of Pn008 = n.□X□□.)	-
A.930	Pn008 = n.□□□X (Low Battery Voltage Alarm/Warning Selection)	*
A.94A to A.960	Pn800 = n.□□X□ (Warning Check Masks)	page 4-3
A.971	Pn008 = n.□□X□ (Function Selection for Undervoltage) (Not affected by the setting of Pn008 = n.□X□□.)	*
A.9A0	Pn00D = n.X□□□ (Overtravel Warning Detection Selection) (Not affected by the setting of Pn008 = n.□X□□.)	*
A.9b0	Pn00F = n.□□□X (Preventative Maintenance Warning Selection)	*

^{*} Refer to the following manual for details. \square Σ -7-Series Σ -7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)

3.1.6 Troubleshooting Warnings

The following warning table gives the warning name, cause, confirmation method, correction, reference, and inquiry location in order of the warning numbers.

Warning Inquiry Locations

Warnings are classified in the following three groups. The inquiry location depends on the warning group.

Contact the specified inquiry location if you cannot solve a problem with the corrections given in the table.

A: Warning Group: Motor and Encoder Warnings Inquiries: Harmonic Drive Systems Inc.

B: Warning Group: Motor, Encoder, and SERVOPACK Warnings Inquiries: Harmonic Drive Systems Inc. or your Yaskawa representative

C: Warning Group: SERVOPACK Warnings Inquiries: Your Yaskawa representative

Warning Troubleshooting Table

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Circuit Cables.	Make sure that there are no faulty connections in the wiring for the Servomotor and encoder.	-	
	A SERVOPACK gain is too low.	Check the SERVO- PACK gains.	Increase the servo gain, e.g., by using autotuning without a host reference.	*	
A.900: Position Deviation Overflow	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SER-VOPACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference acceleration by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.	-	С
	The excessive position deviation alarm level (Pn520 × Pn51E/100) is too low for the operating conditions.	Check excessive position deviation alarm level (Pn520 × Pn51E/100) to see if it is set to an appropriate value.	Optimize the settings of Pn520 and Pn51E.	*	
	A failure occurred in the SERVOPACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SER- VOPACK.	-	

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
A.901: Position Deviation Overflow Alarm at Servo ON	The position deviation when the servo was turned ON exceeded the percentage set with the following formula: (Pn526 × Pn528/100)	_	Optimize the setting of Pn528 (Position Devia- tion Overflow Warning Level at Servo ON).	-	С
A.910: Overload (warning before an A.710 or A.720 alarm occurs)	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	-	
	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Consider the following: Reconsider the load and operating conditions. Select a Servomotor or Actuator again.	-	
	An excessive load was applied during operation because the Servomotor was not driven because of mechanical problems.	Check the operation reference and motor speed.	Remove the mechanical problem.	-	В
	The overload warning level (Pn52B) is not suitable.	Check that the over- load warning level (Pn52B) is suitable.	Set a suitable overload warning level (Pn52B).	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.911: Vibration	Abnormal vibration was detected during Servomotor or Actuator operation.	Check for abnormal Servomotor or Actu- ator noise, and check the speed and torque waveforms during operation.	Reduce the motor speed. Or, reduce the servo gain with custom tuning.	*	
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*	С
	The vibration detection level (Pn312) is not suitable.	Check that the vibration detection level (Pn312) is suitable.	Set a suitable vibration detection level (Pn312).	*	

3.1.6 Troubleshooting Warnings

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVO-PACK installation conditions.	*	
	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.912: Internal Temperature Warning 1 (Control Board Temperature Error)	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	_	С
	The SERVO- PACK installa- tion orientation is not correct or there is insuffi- cient space around the SERVOPACK.	Check the SERVO- PACK installation conditions.	Install the SERVOPACK according to specifications.	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the surrounding temperature by improving the SERVO-PACK installation conditions.	*	
	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.913: Internal Tempera- ture Warning 2 (Power Board Temperature Error)	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С
	The SERVO- PACK installa- tion orientation is not correct or there is insuffi- cient space around the SERVOPACK.	Check the SERVO-PACK installation conditions.	Install the SERVOPACK according to specifications.	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	_
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
A.920: Regenerative Overload (warn- ing before an A.320 alarm occurs)	There is insufficient external regenerative resistance, regenerative resistor capacity, or SERVOPACK capacity, or there has been a continuous regeneration state.	Check the operating conditions or the capacity.	Change the regenerative resistance value, regenerative resistance capacity, or SERVOPACK capacity. Reconsider the operating conditions.	page 2- 21	В
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Servo- motor or Actuator during operation.	Reconsider the system including the servo, machine, and operating conditions.	-	

3.1.6 Troubleshooting Warnings

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
	The Servomotor or Actuator was rotated by an external force.	Check the operation status.	Implement measures to ensure that the Servo-motor or Actuator will not be rotated by an external force.	-	
A.921: Dynamic Brake Overload (warning before an A.731 alarm occurs)	When the Servomotor or Actuator was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: Reduce the Servomotor or Actuator command speed. Decrease the moment of inertia or mass. Reduce the frequency of stopping with the dynamic brake.	_	В
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.923: SERVOPACK Built-in Fan Stopped	The fan inside the SERVO-PACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVOPACK. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.930: Absolute Encoder Battery Error (The absolute encoder	The battery connection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*	
battery voltage was lower than the specified level.) (Detected	The battery voltage is lower than the specified value.	Measure the battery voltage.	Replace the battery.	*	В
only when an absolute encoder is connected.)	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.94A: Data Setting Warning 1 (Parameter Number Error)	An invalid parameter number was used.	Check the command that caused the warning.	Use the correct parameter number.	-	С
A.94b: Data Setting Warning 2 (Out of Range)	The set command data was clamped to the minimum or maximum value of the setting range.	Check the command that caused the warning.	Set the parameter within the setting range.	-	С
A.94C: Data Setting Warning 3 (Calculation Error)	The calculation result of the setting is not correct.	Check the command that caused the warning.	Set the parameter within the setting range.	-	С
A.94d: Data Setting Warning 4 (Parameter Size)	The parameter size set in the command is not correct.	Check the command that caused the warning.	Set the correct parameter size.	-	С

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
A.94E: Data Setting Warning 5 (Latch Mode Error)	A latch mode error was detected.	Check the command that caused the warning.	Change the setting of Pn850 or the LT_MOD data for the LTMOD_ON command sent by the host controller to an appropriate value.	-	С
A.95A: Command Warning 1 (Unsatisfied Command Conditions)	The command conditions are not satisfied.	Check the command that caused the warning.	Send the command after the command condi- tions are satisfied.	_	С
A.95b: Command Warning 2 (Unsupported Command)	An unsup- ported com- mand was received.	Check the command that caused the warning.	Do not send unsupported commands.	-	С
A.95d: Command Warning 4 (Command Interference)	The command sending conditions for latchrelated commands was not satisfied.	Check the command that caused the warning.	Send the command after the command condi- tions are satisfied.	-	С
A.95E: Command Warning 5 (Subcommand Not Possible)	The command sending conditions for subcommands was not satisfied.	Check the command that caused the warning.	Send the command after the conditions are satisfied.	-	С
A.95F: Command Warning 6 (Undefined Command)	An undefined command was sent.	Check the command that caused the warning.	Do not send undefined commands.	_	С
	The MECHA- TROLINK Com- munications Cable is not wired correctly.	Check the wiring conditions.	Correct the MECHA- TROLINK communica- tions cable wiring. Or, connect a terminator to the final station.	-	
A.960: MECHATROLINK Communications Warning	A MECHA- TROLINK data reception error occurred due to noise.	Confirm the installation conditions.	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring and implement countermeasures to prevent noise from entering. • Attach a ferrite core to the MECHATROLINK Communications Cable.	-	С
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

3.1.6 Troubleshooting Warnings

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Refer- ence	Inquiries
A.971: Undervoltage	For a 200-V SERVOPACK, the AC power supply voltage dropped below 140 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	_	
	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*	С
	The SERVO- PACK fuse is blown out.	_	Replace the SERVO- PACK and connect a reactor.	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.9A0: Overtravel (Overtravel status was detected.)	Overtravel was detected while the servo was ON.	Check the status of the overtravel sig- nals on the input sig- nal monitor.	Even if an overtravel signal is not shown by the input signal monitor, momentary overtravel may have been detected. Take the following precautions. • Do not specify movements that would cause overtravel from the host controller. • Check the wiring of the overtravel signals. • Implement countermeasures against noise.	*	С
A.9b0: Preventative Maintenance Warning	One of the consumable parts has reached the end of its service life.	_	Replace the part. Contact your Yaskawa representative for replacement.	*	С

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

Ω Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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

Problem	Possible Cause	Confirmation	Correction	Reference
	The control power supply is not turned ON.	Measure the voltage between control power supply terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the control power supply is turned ON.	-
	The main circuit power supply is not turned ON.	Measure the voltage across the main circuit power input terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the main circuit power supply is turned ON.	-
	The I/O signal connector (CN1) pins are not wired correctly or are disconnected.	Turn OFF the power supply to the servo system. Check the wiring condition of the I/O signal connector (CN1) pins.	Correct the wiring of the I/O signal connec- tor (CN1) pins.	*1
	The wiring for the Servomotor Main Circuit Cables or Encoder Cable is disconnected.	Check the wiring conditions.	Turn OFF the power supply to the servo system. Wire the cable correctly.	-
Servomotor or Actuator Does Not Start	There is an overload on the Servomotor or Actuator.	Operate the Servomotor or Actuator with no load and check the load status.	Turn OFF the power supply to the servo system. Reduce the load or replace the Servomotor or Actuator with a Servomotor or Actuator with a larger capacity.	-
	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).	*1
	The SV_ON command was not sent.	Check the commands sent from the host controller.	Send the SV_ON command from the host controller.	-
	The SENS_ON (Turn ON Sensor) command was not sent.	Check the commands sent from the host controller.	Send the commands to the SERVOPACK in the correct sequence.	-
	The P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal is still OFF.	Check the P-OT and N-OT signals.	Turn ON the P-OT and N-OT signals.	*1
	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.	*1

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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Problem	Possible Cause	Confirmation	Continued from pre	Reference
. 70010111	. Cooloio Gaago	Johnmadon	Turn ON the FSTP	. 1010101100
Servomotor or Actuator Does Not Start	The FSTP (Forced Stop Input) signal is still OFF.	Check the FSTP signal.	signal. • If you will not use the function to force the motor to stop, set Pn516 = n.□□□X (FSTP (Forced Stop Input) Signal Allocation) to disable the signal.	*1
	A failure occurred in the SERVOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
Servomotor or Actuator Moves	There is a mistake in the Servomotor wiring.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the Servomotor correctly.	-
Instanta- neously, and Then Stops	There is a mistake in the wiring of the encoder.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the cable correctly.	-
Servomotor or Actuator Operation Is Unstable	There is a faulty connection in the Servomotor wiring.	The connector connections for the power line (U, V, and W phases) and the encoder or Serial Converter Unit may be unstable. Turn OFF the power supply to the servo system. Check the wiring.	Tighten any loose terminals or connectors and correct the wiring.	-
Servomotor or Actuator Moves with- out a Refer- ence Input	A failure occurred in the SERVOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	The setting of Pn001 = n.□□□X (Motor Stopping Method for Servo OFF and Group 1 Alarms) is not suitable.	Check the setting of Pn001 = n.□□□X.	Set Pn001 = n.□□□X correctly.	-
Dynamic Brake Does Not Operate	The dynamic brake resistor is disconnected.	Check the moment of inertia, motor speed, and dynamic brake frequency of use. If the moment of inertia, motor speed, or dynamic brake frequency of use is excessive, the dynamic brake resistance may be disconnected.	Turn OFF the power supply to the servo system. Replace the SERVO-PACK. To prevent disconnection, reduce the load.	-
	There was a failure in the dynamic brake drive circuit.	_	There is a defective component in the dynamic brake circuit. Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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Problem	Possible Cause	Confirmation	Continued from pre	Reference
FlobleIII	Possible Gause	Commination	Reduce the load so	neierence
	The Servomotor or Actuator vibrated considerably while performing the tuning-less function with the default settings.	Check the waveform of the motor speed.	that the moment of inertia ratio or mass ratio is within the allowable value, or increase the load level or reduce the rigidity level in the tuning-less level settings. If the situation is not improved, disable the tuning-less function (i.e., set Pn170 to n.□□□□0) and execute autotuning either with or without a host reference.	*1
		Turn OFF the power supply to the servo system. Check the mounting state of the Servomotor or Actuator.	Tighten the mounting screws.	-
Abnormal	The machine mounting is not secure.	Turn OFF the power supply to the servo system. Check to see if there is misalignment in the coupling.	Align the coupling.	_
Noise from Servomotor or Actua- tor*2		Turn OFF the power supply to the servo system. Check to see if the coupling is balanced.	Balance the coupling.	_
	The bearings are defective.	Turn OFF the power supply to the servo system. Check for noise and vibration around the bearings.	Consult Harmonic Drive Systems Inc.	_
	There is a vibration source at the driven machine.	Turn OFF the power supply to the servo system. Check for any foreign matter, damage, or deformation in the machine's moving parts.	Consult with the machine manufacturer.	_
	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm ² (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	_

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because of incorrect Encoder Cable specifications.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it satisfies specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of	Use cables that satisfy the specifications.	-
	Noise interference occurred	at least 0.12 mm ² (stranded wire). Turn OFF the power sup-	The Encoder Cable	
	because the Encoder Cable is too long.	ply to the servo system. Check the length of the Encoder Cable.	length must be 20 m max.	-
	Noise interference occurred because the Encoder Cable is damaged.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it is pinched or the sheath is damaged.	Replace the Encoder Cable and correct the cable installation envi- ronment.	-
Abnormal Noise from Servomotor or Actua- tor*2	The Encoder Cable was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-
	There is a SERVOPACK pulse counting error due to noise.	Check to see if there is noise interference on the signal line from the encoder.	Turn OFF the power supply to the servo system. Implement countermeasures against noise for the encoder wiring.	-
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor or Actuator installation (mounting surface precision, securing state, and alignment).	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-
	A failure occurred in the encoder.	_	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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Problem	Possible Cause	Confirmation	Correction	Reference	
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*1	
Servomotor	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	-	
or Actuator Vibrates at Frequency of Approx.	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	-	
200 to 400 Hz.	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	-	
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	-	
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*1	
Large Motor Speed Overshoot	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	-	
	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	-	
on Starting and Stop- ping	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	-	
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	-	
	The torque reference is saturated.	Check the waveform of the torque reference.	Use the mode switch.	-	
Absolute Encoder Position Deviation Error (The	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	_	
position that was saved in the host con- troller when the power	There is a SERVOPACK pulse counting error due to noise.	Turn OFF the power supply to the servo system. Check to see if there is noise interference on the I/O signal line from the encoder.	Implement counter- measures against noise for the encoder wiring.	_	
was turned OFF is dif- ferent from the posi- tion when the power was next turned ON.)	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the mounting state of the Servomotor or Actuator.	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-	

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Continued from pre	Reference
Absolute Encoder Position Deviation Error (The position	A failure occurred in the encoder.	-	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-
	A failure occurred in the SERVOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
that was saved in the host con-		Check the error detection section of the host controller.	Correct the error detection section of the host controller.	-
troller when the power was turned OFF is dif-	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.	-
ferent from the posi- tion when the power was next turned ON.)	Position Data Reading Error	Check for noise interference in the cable between the SERVO-PACK and the host controller.	Implement counter- measures against noise and then perform parity checks again for the multiturn data or abso- lute encoder position data.	-
	The multiturn limit settings do not agree between the host controller and Pn205.	Check the multiturn limit settings on the host controller and in Pn205.	Set the same the multi- turn limit setting on the host controller and in Pn205.	*1
	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal was input.	Check the external power supply (+24 V) voltage for the input signals.	Correct the external power supply (+24 V) voltage for the input signals.	-
		Check the operating condition of the overtravel limit switches.	Make sure that the overtravel limit switches operate correctly.	-
		Check the wiring of the overtravel limit switches.	Correct the wiring of the overtravel limit switches.	*1
Overtravel Occurred		Check the settings of the overtravel input signal allocations (Pn50A/Pn50B).	Set the parameters to correct values.	*1
		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.	_
	The P-OT/N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal mal-	Check to see if the operation of the overtravel limit switches is unstable.	Stabilize the operating condition of the over-travel limit switches.	-
	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.	-

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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Problem	Possible Cause	Confirmation	Correction	Reference
Overtravel Occurred	There is a mistake in the allocation of the P-OT or N-OT (Forward Drive Prohibit)	Check to see if the P-OT signal is allocated in Pn50A = n.X□□□.	If another signal is allocated in Pn50A =n.X□□□, allocate the P-OT signal instead.	*1
	Reverse Drive Prohibit) signal in Pn50A = n.X□□□ or Pn50B = n.□□□X.	Check to see if the N-OT signal is allocated in Pn50B = n.□□□X.	If another signal is allocated in Pn50B =n.□□□X, allocate the N-OT signal instead.	
	The selection of the Servo- motor stopping method is	Check the servo OFF stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	*1
	not correct.	Check the torque control stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	
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.	_
Position Deviation (without Alarm)	The encoder was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor or Actuator installation (mounting surface precision, securing state, and alignment).	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-
	The coupling between the machine and Servomotor or machine and Actuator is not suitable.	Turn OFF the power supply to the servo system. Check to see if position offset occurs at the coupling between machine and Servomotor or machine and Actuator.	Correctly secure the coupling between the machine and Servomotor or machine and Actuator.	_
	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm² (stranded wire).	Use cables that satisfy the specifications.	-

3.1.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	-
Position Deviation (without Alarm)	An encoder fault occurred. (The pulse count does not change.)	_	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-
,	A failure occurred in the SERVOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
Servomotor or Actuator Overheated	The surrounding air temperature is too high.	Measure the surrounding air temperature around the Servomotor or Actuator.	Reduce the surrounding air temperature to 40°C or less.	-
	The Servomotor or Actuator surface is dirty.	Turn OFF the power supply to the servo system. Visually check the surface for dirt.	Clean dirt, dust, and oil from the surface.	-
	There is an overload on the Servomotor or Actuator.	Check the load status with a monitor.	If there is an overload, reduce the load or select SERVOPACK and Servomotor or Actuator models with larger capacities.	-

^{*1.} Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)

^{*2.} Contact Harmonic Drive System Inc. If you cannot solve a problem with the corrections given in the table.

3.2

SERVOPACKs with MECHATROLINK-III Communications References

3.2.1 Alarm Displays

If an error occurs in the SERVOPACK, an alarm number will be displayed on the panel display. However, if $\Box\Box$ - $\Box\Box$ appears on the panel display, the display will indicate a SERVOPACK system error. Replace the SERVOPACK.

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

Example: Alarm A.E60

Status Not lit.
$$\longrightarrow$$
 Not lit. \longrightarrow Not lit.

3.2.2 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 Servomotor stopping method for alarms.

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

Alarm Reset Possibility

Yes: You can use an alarm reset to clear the alarm. However, this assumes that the cause of the alarm has been removed.

No: You cannot clear the alarm.

List of Alarms

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

3.2.2 List of Alarms

Continued from previous page.

		Continued	Servo-	Alarm
Alarm Number	Alarm Name	Alarm Meaning	motor Stop- ping Method	Reset Possi- ble?
A.041	Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) 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.XDDD (External Encoder Usage) do not match.	Gr.1	No
A.04A	Parameter Setting Error 2	There is an error in the bank members or bank data settings.	Gr.1	No
A.050	Combination Error	The capacities of the SERVOPACK and Servomotor do not match.	Gr.1	Yes
A.051	Unsupported Device Alarm	An unsupported device was connected.	Gr.1	No
A.070	Motor Type Change Detected	The connected motor is a different type of motor from the previously connected motor.	Gr.1	No
A.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 transformer or the heat sink overheated.	Gr.1	No
A.300	Regeneration Error	There is an error related to regeneration.		Yes
A.320	Regenerative Overload	A regenerative overload occurred.		Yes
A.330	Main Circuit Power Supply Wiring Error	 The AC power supply input setting or DC power supply input setting is not correct. The power supply wiring is not correct. 	Gr.1	Yes
A.400	Overvoltage	The main circuit DC voltage is too high.	Gr.1	Yes
A.410	Undervoltage	The main circuit DC voltage is too low.	Gr.2	Yes
A.510	Overspeed	The motor exceeded the maximum speed.	Gr.1	Yes
A.511	Encoder Output Pulse Overspeed	The pulse output speed for the setting of Pn212 (Number of Encoder Output Pulses) was exceeded.	Gr.1	Yes
A.520	Vibration Alarm	Abnormal oscillation was detected in the motor speed.	Gr.1	Yes
A.521	Autotuning Alarm	Vibration was detected during autotuning for the tuning-less function.	Gr.1	Yes
A.550	Maximum Speed Setting Error	The setting of Pn385 (Maximum Motor Speed) is greater than the maximum motor speed.	Gr.1	Yes
A.710	Instantaneous Overload	The Servomotor was operating for several seconds to several tens of seconds under a torque that largely exceeded the rating.	Gr.2	Yes
A.720	Continuous Overload	The Servomotor was operating continuously under a torque that exceeded the rating.	Gr.1	Yes
A.730	_	When the dynamic brake was applied, the rota-		
A.731	Dynamic Brake Overload	tional or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Gr.1	Yes
A.740	Inrush Current Limiting Resistor Overload	The main circuit power supply was frequently turned ON and OFF.	Gr.1	Yes
A.7A1	Internal Temperature Error 1 (Control Board Tempera- ture Error)	The surrounding temperature of the control PCB is abnormal.	Gr.2	Yes
			1	

Continued from previous page.

			Servo-	Alarm
Alarm Number	Alarm Name	Alarm Meaning	motor Stop- ping Method	Reset Possi- ble?
A.7A2	Internal Temperature Error 2 (Power Board Tempera- ture Error)	The surrounding temperature of the power PCB is abnormal.	Gr.2	Yes
A.7A3	Internal Temperature Sensor Error	An error occurred in the temperature sensor circuit.	Gr.2	No
A.7Ab	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Gr.1	Yes
A.810	Encoder Backup Alarm	The power supplies to the encoder all failed and the position data was lost.	Gr.1	No
A.820	Encoder Checksum Alarm	There is an error in the checksum results for encoder memory.	Gr.1	No
A.830	Encoder Battery Alarm	The battery voltage was lower than the specified level after the control power supply was turned ON.	Gr.1	Yes
A.840	Encoder Data Alarm	There is an internal data error in the encoder.	Gr.1	No
A.850	Encoder Overspeed	The encoder was operating at high speed when the power was turned ON.	Gr.1	No
A.860	Encoder Overheated	The internal temperature of encoder is too high.	Gr.1	No
A.8A0	External Encoder Error	An error occurred in the external encoder.	Gr.1	Yes
A.8A1	External Encoder Module Error	An error occurred in the Serial Converter Unit.	Gr.1	Yes
A.8A2	External Incremental Encoder Sensor Error	An error occurred in the external encoder.	Gr.1	Yes
A.8A3	External Absolute Encoder Position Error	An error occurred in the position data of the external encoder.	Gr.1	Yes
A.8A5	External Encoder Over- speed	An overspeed error occurred in the external encoder.	Gr.1	Yes
A.8A6	External Encoder Over- heated	An overheating error occurred in the external encoder.	Gr.1	Yes
A.b33	Current Detection Error 3	An error occurred in the current detection circuit.	Gr.1	No
A.b6A	MECHATROLINK Communications ASIC Error 1	ASIC error 1 occurred in MECHATROLINK communications.	Gr.1	No
A.b6b	MECHATROLINK Communications ASIC Error 2	ASIC error 2 occurred in MECHATROLINK communications.	Gr.2	No
A.bF0	System Alarm 0	Internal program error 0 occurred in the SERVO-PACK.	Gr.1	No
A.bF1	System Alarm 1	Internal program error 1 occurred in the SERVO-PACK.	Gr.1	No
A.bF2	System Alarm 2	Internal program error 2 occurred in the SERVO-PACK.	Gr.1	No
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

3.2.2 List of Alarms

Continued from previous page.

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.C10	Servomotor Out of Control	The Servomotor ran out of control.	Gr.1	Yes
A.C80	Encoder Clear Error or Multiturn Limit Setting Error	The multiturn data for the absolute encoder was not correctly cleared or set.	Gr.1	No
A.C90	Encoder Communications Error	Communications between the encoder and SER-VOPACK is not possible.	Gr.1	No
A.C91	Encoder Communications Position Data Acceleration Rate Error	An error occurred in calculating the position data of the encoder.	Gr.1	No
A.C92	Encoder Communications Timer Error	An error occurred in the communications timer between the encoder and SERVOPACK.	Gr.1	No
A.CA0	Encoder Parameter Error	The parameters in the encoder are corrupted.	Gr.1	No
A.Cb0	Encoder Echoback Error	The contents of communications with the encoder are incorrect.	Gr.1	No
A.CC0	Multiturn Limit Disagree- ment	Different multiturn limits have been set in the encoder and the SERVOPACK.	Gr.1	No
A.CF1	Reception Failed Error in Feedback Option Module Communications	Receiving data from the Feedback Option Module failed.	Gr.1	No
A.CF2	Timer Stopped Error in Feedback Option Module Communications	An error occurred in the timer for communications with the Feedback Option Module.	Gr.1	No
A.d00	Position Deviation Over- flow	The setting of Pn520 (Excessive Position Deviation Alarm Level) was exceeded by the position deviation while the servo was ON.	Gr.1	Yes
A.d01	Position Deviation Over- flow Alarm at Servo ON	The servo was turned ON after the position deviation exceeded the setting of Pn526 (Excessive Position Deviation Alarm Level at Servo ON) while the servo was OFF.	Gr.1	Yes
A.d02	Position Deviation Over- flow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 or Pn584 (Speed Limit Level at Servo ON) limits the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Excessive Position Deviation Alarm Level) is exceeded before the limit is cleared.	Gr.2	Yes
A.d10	Motor-Load Position Deviation Overflow	There was too much position deviation between the motor and load during fully-closed loop control.	Gr.2	Yes
A.E02	MECHATROLINK Internal Synchronization Error 1	A synchronization error occurred during MECHA-TROLINK communications with the SERVO-PACK.	Gr.1	Yes
A.E40	MECHATROLINK Trans- mission Cycle Setting Error	The setting of the MECHATROLINK communications transmission cycle is not correct.	Gr.2	Yes
A.E41	MECHATROLINK Commu- nications Data Size Set- ting Error	The setting of the MECHATROLINK communications data size is not correct.	Gr.2	Yes
A.E42	MECHATROLINK Station Address Setting Error	The setting of the MECHATROLINK station address is not correct.	Gr.2	No
A.E50*	MECHATROLINK Syn- chronization Error	A synchronization error occurred during MECHA-TROLINK communications.	Gr.2	Yes
A.E51	MECHATROLINK Syn- chronization Failed	Synchronization failed during MECHATROLINK communications.	Gr.2	Yes

Continued from previous page.

Alarm Number	Alarm Name	Alarm Meaning	Servo- motor Stop- ping Method	Alarm Reset Possi- ble?
A.E60*	Reception Error in MECHATROLINK Communications	Communications errors occurred continuously during MECHATROLINK communications.	Gr.2	Yes
A.E61	Synchronization Interval Error in MECHATROLINK Transmission Cycle	An error occurred in the transmission cycle during MECHATROLINK communications.	Gr.2	Yes
A.E63	MECHATROLINK Syn- chronization Frame Not Received	Synchronization frames were continuously not received during MECHATROLINK communications.	Gr.2	Yes
A.E72	Feedback Option Module Detection Failure	Detection of the Feedback Option Module failed.	Gr.1	No
A.Eb1	Safety Function Signal Input Timing Error	An error occurred in the input timing of the safety function signal.	Gr.1	No
A.EC8	Gate Drive Error 1	An error occurred in the gate drive circuit.	Gr.1	No
A.EC9	Gate Drive Error 2	An error occurred in the gate drive circuit.	Gr.1	No
A.Ed1	Command Execution Timeout	A timeout error occurred for a MECHATROLINK command.	Gr.2	Yes
A.F10	Power Supply Line Open Phase	The voltage was low for more than one second for phase R, S, or T when the main power supply was ON.	Gr.2	Yes
FL-1*				
FL-2*				
FL-3*	System Alarm	An internal program error occurred in the SER-	_	No
FL-4*	Oystelli Alallii	VOPACK.		INO
FL-5*				
FL-6*				
CPF00	Digital Operator Communications Error 1	Communications were not possible between the Digital Operator (model: JUSP-OP05A-1-E) and	_	No
CPF01	Digital Operator Communications Error 2	the SERVOPACK (e.g., a CPU error occurred).		No

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

The following alarm table gives the alarm name, cause, confirmation method, correction, reference, and inquiry location in order of the alarm numbers.

Alarm Inquiry Locations

Alarms are classified in the following three groups. The inquiry location depends on the alarm group.

Contact the specified inquiry location if you cannot solve a problem with the corrections given in the table.

A: Alarm Group: Motor and Encoder Alarms Inquiries: Harmonic Drive Systems Inc.

B: Alarm Group: Motor, Encoder, and SERVOPACK Alarms
Inquiries: Harmonic Drive Systems Inc. or your Yaskawa representative

C: Alarm Group: SERVOPACK Alarms Inquiries: Your Yaskawa representative

Alarm Troubleshooting Table

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The power supply voltage suddenly dropped.	Measure the power supply voltage.	Set the power supply voltage within the specified range, and initialize the parameter settings.	*1	
	The power supply was shut OFF while writing parameter settings.	Check the timing of shutting OFF the power supply.	Initialize the parameter settings and then set the parameters again.		
A.020: Parameter	The number of times that parameters were written exceeded the limit.	Check to see if the parameters were frequently changed from the host controller.	The SERVOPACK may be faulty. Replace the SERVOPACK. Reconsider the method for writing the parameters.		
Checksum Error (There is an error in the parameter data in the SER- VOPACK.)	A malfunction was caused by noise from the AC power supply, ground, static electricity, or other source.	Turn the power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, noise may be the cause.	Implement counter- measures against noise.	*1	С
	Gas, water drops, or cutting oil entered the SER-VOPACK and caused failure of the internal components.	Check the installation conditions.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	A failure occurred in the SERVO-PACK.	Turn the power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

			Continu	ed from previ	ous page.
Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.021: Parameter Format Error (There is an error in the parameter data format in the	The software version of the SER-VOPACK that caused the alarm is older than the software version of the parameters specified to write.	Read the product information to see if the software versions are the same. If they are different, it could be the cause of the alarm.	Write the parameters from another SERVO-PACK with the same model and the same software version, and then turn the power OFF and ON again.	*1	С
SERVOPACK.)	A failure occurred in the SERVO-PACK.	_	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	The power supply was shut OFF while setting a utility function.	Check the timing of shutting OFF the power supply.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
in the parameter data in the SER- VOPACK.)	A failure occurred in the SERVO-PACK.	Turn the power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, the SERVOPACK may have failed.	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.024: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVO-PACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.025: System Alarm (An internal pro- gram error occurred in the SERVOPACK.)	A failure occurred in the SERVO-PACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.030: Main Circuit Detector Error	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	С
	The SERVOPACK and Servomotor or Actuator do not match.	Check the combination of the SERVO-PACK and Servomotor or Actuator.	Use a suitable combination of SERVO-PACK and Servomotor or Actuator.	page 1-4	
A.040: Parameter Set-	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
ting Error (A parameter setting is outside of the setting range.)	A parameter setting is outside of the setting range.	Check the setting ranges of the parameters that have been changed.	Set the parameters to values within the setting ranges.	-	С
	The electronic gear ratio is outside of the setting range.	Check the electronic gear ratio. The ratio must be within the following range: 0.001 < (Pn20E/Pn210) < 64,000.	Set the electronic gear ratio in the following range: 0.001 < (Pn20E/Pn210) < 64,000.	*1	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.041: Encoder Output Pulse Setting Error	The setting of Pn212 (Number of Encoder Output Pulses) is outside of the setting range or does not satisfy the setting conditions.	Check the setting of Pn212.	Correct the setting of Pn212.	*1	С
	The speed of program jogging went below the setting range when the electronic gear ratio (Pn20E/Pn210) or the Servomotor was changed.	Check to see if the detection conditions*2 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1	
A.042: Parameter Com- bination Error	The speed of program jogging went below the setting range when Pn533 (Program Jogging Speed) was changed.	Check to see if the detection conditions*2 are satisfied.	Increase the setting of Pn533.	*1	С
	The movement speed of advanced autotuning went below the setting range when the electronic gear ratio (Pn20E/Pn210) or the Servomotor was changed.	Check to see if the detection conditions*3 are satisfied.	Decrease the setting of the electronic gear ratio (Pn20E/Pn210).	*1	
A.044: Semi-Closed/ Fully-Closed Loop Control Parameter Setting Error	The setting of the Fully-closed Module does not match the setting of Pn002 = n.X□□□ (External Encoder Usage).	Check the setting of Pn002 = n.X□□□.	Make sure that the setting of the Fully-closed Module agrees with the setting of Pn002 = n.X□□□.	*1	С
A.04A: Parameter Set- ting Error 2	For 4-byte parameter bank members, there are two consecutive members with nothing registered.	_	Change the number of bytes for bank members to an appropriate value.	-	С
	The total amount of bank data exceeds 64 (Pn900 × Pn901 > 64).	_	Reduce the total amount of bank data to 64 or less.	-	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.050: Combination Error	The SERVOPACK and Servomotor or Actuator capacities do not match each other.	Confirm that the following condition is met: 1/4 ≤ (Servomotor capacity/SERVO-PACK capacity) ≤ 4	Use a suitable capacity of SERVOPACK and Servomotor or Actuator.	page 1-4	
(The capacities of the SERVOPACK and Servomotor do not match.)	A failure occurred in the encoder.	Replace the encoder and check to see if the alarm still occurs.	The encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.051: Unsupported Device Alarm	An unsupported Serial Converter Unit or encoder (e.g., an external encoder) is con- nected to the SERVOPACK.	Check the product combination specifications.	Change to a correct combination of models.	-	С
A.070: Motor Type Change Detected (The connected	A Rotary Servo- motor was removed and a Linear Servomotor was connected.	-	Execute a Reset Motor Type Alarm operation. Then, turn the power supply to the SERVOPACK OFF and ON again.	*1	
motor is a different type of motor from the previously 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	С
A.0b0: Invalid Servo ON Command Alarm	The SV_ON (Servo ON) command was sent from the host controller after a utility function that turns ON the Servomotor was executed.	_	Turn the power supply to the SERVOPACK OFF and ON again. Or, execute a software reset.	*1	С

Continued from previous page.

Alarm Number:				ed from previ	
Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The Main Circuit Cable is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1	
	There is a short-circuit or ground fault in a Main Circuit Cable.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, and W.	The cable may be short-circuited. Replace the cable.		
	There is a short-circuit or ground fault inside the Servomotor.	Check for short-circuits across Servomotor phases U, V, and W, or between the ground and Servomotor phases U, V, or W.	The Servomotor may be faulty. Consult Har- monic Drive Systems Inc.		
A.100: Overcurrent	There is a short-circuit or ground fault inside the SERVOPACK.	Check for short-circuits across the Servomotor connection terminals U, V, and W on the SER-VOPACK, or between the ground and terminals U, V, or W.	The SERVOPACK may be faulty. Replace the SERVOPACK.		
Detected (An overcurrent flowed through the power trans- former or the heat	The regenerative resistor is not wired correctly or there is faulty contact.	Check the wiring.	Correct the wiring.	*1	В
sink overheated.)	The dynamic brake (DB, emergency stop executed from the SERVO-PACK) was frequently activated, or a DB overload alarm occurred.	Check the power consumed by the DB resistor to see how frequently the DB is being used. Or, check the alarm display to see if a DB overload alarm (A.730 or A.731) has occurred.	Change the SERVO-PACK model, operating methods, or the mechanisms so that the dynamic brake does not need to be used so frequently.	- page 2-21	
	The regenerative processing capacity was exceeded.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Recheck the operating conditions and load.		
	The SERVOPACK regenerative resistance is too small.	Check the regenerative load ratio in the SigmaWin+ Motion Monitor Tab Page to see how frequently the regenerative resistor is being used.	Change the regenerative resistance to a value larger than the SERVOPACK minimum allowable resistance.		

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.100: Overcurrent Detected (An overcurrent flowed through the power trans- former or the heat sink overheated.)	A heavy load was applied while the Servomotor was stopped or running at a low speed.	Check to see if the operating conditions exceed Servo Drive specifications.	Reduce the load applied to the Servomotor. Or, increase the operating speed.	-	C
	A malfunction was caused by noise.	Improve the noise environment, e.g. by improving the wiring or installation conditions, and check to see if the alarm still occurs.	Implement countermeasures against noise, such as correct wiring of the FG. Use an FG wire size equivalent to the SER-VOPACK's main circuit wire size.	-	
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	When using the built-in regenerative resistor, the jumper between the regenerative resistor terminals (B2 and B3) was removed.	Check to see if the jumper is connected between power supply terminals B2 and B3.*4	Correctly connect a jumper.	*1	
A.300: Regeneration Error	The External Regenerative Resistor or Regenerative Resistor Unit is not wired correctly, or was removed or dis- connected.	Check the wiring of the External Regen- erative Resistor or Regenerative Resis- tor Unit.*4	Correct the wiring of the External Regener- ative Resistor.		С
	A failure occurred in the SERVO-PACK.	_	While the main circuit power supply is OFF, turn the control power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.	-	

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
	The external regenerative resistance value or regenerative resistor capacity is too small, or there has been a continuous regeneration state.	Check the operating conditions and capacity again.	Change the regenerative resistance value or capacity. Recheck the operating conditions.	page 2-21	
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Actuator during operation.	Reconsider the system including the servo, machine, and operating conditions.	-	
A.320: Regenerative Overload	The setting of Pn600 (Regenerative Resistor Capacity) is smaller than the capacity of the External Regenerative Resistor.	Check to see if a Regenerative Resis- tor is connected and check the setting of Pn600.	Correct the setting of Pn600.	*1	В
	The setting of Pn603 (Regenera- tive Resistor Capacity) is smaller than the capacity of the External Regener- ative Resistor.	Check to see if a Regenerative Resis- tor is connected and check the setting of Pn603.	Correct the setting of Pn603.	*1	
	The external regenerative resistance is too high.	Check the regenerative resistance.	Change the regenerative resistance to a correct value or use an External Regenerative Resistor of an appropriate capacity.	page 2-21	
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.330: Main Circuit	The regenerative resistor was disconnected when the SERVOPACK power supply voltage was high.	Measure the resistance of the regenerative resistor using a measuring instrument.	If you are using the regenerative resistor built into the SERVO-PACK, replace the SERVOPACK. If you are using an External Regenerative Resistor, replace the External Regenerative Resistor.	-	
Power Supply Wiring Error (Detected when the main circuit power supply is turned ON.)	DC power was supplied when an AC power supply input was speci- fied in the settings.	Check the power supply to see if it is a DC power supply.	Correct the power supply setting to match the actual power supply.	*1	С
turneu ON.)	AC power was supplied when a DC power supply input was specified in the settings.	Check the power supply to see if it is an AC power supply.	Correct the power supply setting to match the actual power supply.		
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the AC/DC power supply voltage within the specified range.	-	
	The power supply is not stable or was influenced by a lightning surge.	Measure the power supply voltage.	Improve the power supply conditions, install a surge absorber, and then turn the power supply OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.400: Overvoltage (Detected in the	The voltage for AC power supply was too high during acceleration or deceleration.	Check the power supply voltage and the speed and torque during operation.	Set the AC power supply voltage within the specified range.	-	
main circuit power supply section of the SERVOPACK.)	The external regenerative resistance is too high for the operating conditions.	Check the operating conditions and the regenerative resistance.	Select a regenerative resistance value that is appropriate for the operating conditions and load.	page 2-21	С
	The moment of inertia ratio or mass ratio exceeded the allowable value.	Check to see if the moment of inertia ratio or mass ratio is within the allowable range.	Increase the deceleration time, or reduce the load.	-	
	A failure occurred in the SERVO-PACK.	_	While the main circuit power supply is OFF, turn the control power supply to the SERVO-PACK OFF and ON again. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.	- ontinued on t	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.410: Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.)	The power supply voltage went below the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	-	
	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*1	С
	The SERVOPACK fuse is blown out.	-	Replace the SERVO-PACK and connect a reactor to the DC reactor terminals (⊝1 and ⊝2) on the SER-VOPACK.	-	
	A failure occurred in the SERVO-PACK.	_	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 wiring of the Servomotor.	Make sure that the Servomotor is correctly wired.	-	
A.510: Overspeed (The motor	A reference value that exceeded the overspeed detec- tion level was input.	Check the input reference.	Reduce the reference value. Or, adjust the gain.		В
maximum speed.)	The motor exceeded the maximum speed.	Check the waveform of the motor speed.	Reduce the speed reference input gain and adjust the servo gain. Or, reconsider the operating conditions.		
Undervoltage (Detected in the main circuit power supply section of the SERVOPACK.) A.510: Overspeed (The motor exceeded the	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.511:	The encoder output pulse frequency exceeded the limit.	Check the encoder output pulse setting.	Decrease the setting of Pn212 (Number of Encoder Output Pulses).	*1	
Encoder Output	The encoder output pulse frequency exceeded the limit because the motor speed was too high.	Check the encoder output pulse setting and the motor speed.	Reduce the motor speed.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	Abnormal oscillation was detected in the motor speed.	Check for abnormal Actuator noise, and check the speed and torque wave- forms during opera- tion.	Reduce the motor speed. Or, reduce the setting of Pn100 (Speed Loop Gain).	*1	
A.520: Vibration Alarm	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of inertia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*1	С
	The vibration detection level (Pn312) is not suitable.	Check that the vibration detection level (Pn312) is suitable.	Set a suitable vibration detection level (Pn312).	*1	
A.521: Autotuning Alarm (Vibration was detected while executing the custom tuning,	The Actuator vibrated considerably while performing the tuningless 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	С
Easy FFT, or the tuning-less function.)	The Actuator vibrated considerably while performing custom tuning or EasyFFT.	Check the waveform of the motor speed.	Check the operating procedure of corresponding function and implement corrections.	*1	
A.550: Maximum Speed Setting Error	The setting of Pn316 (Maximum Motor Speed) is greater than the maximum speed.	Check the setting of Pn316, and the upper limits of the maximum motor speed setting and the encoder output resolution setting.	Set Pn316 to a value that does not exceed the maximum motor speed.	*1	С
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	*1	
A.710: Instantaneous Overload A.720:	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Consider the following: Reconsider the load and operating conditions. Select a Servomotor or Actuator again.	-	В
Continuous Overload	An excessive load was applied during operation because the Servomotor or Actuator was not driven because of mechanical problems.	Check the operation reference and motor speed.	Correct the mechanical problem.	-	
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The Servomotor or Actuator was rotated by an external force.	Check the operation status.	Implement measures to ensure that the Servomotor or Actuator 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 Servomotor or Actuator was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: Reduce the Servomotor or Actuator command speed. Decrease the moment of inertia ratio or mass ratio. Reduce the frequency of stopping with the dynamic brake.	_	В
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	
A.740: Inrush Current Limiting Resistor Overload (The main circuit power supply was frequently	The allowable frequency of the inrush current limiting resistor was exceeded when the main circuit power supply was turned ON and OFF.	_	Reduce the frequency of turning the main circuit power supply ON and OFF.	-	С
turned ON and OFF.)	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.7A2: Internal Temperature Error 2 (Power Board Temperature Error)	The surrounding temperature is too high.	Check the sur- rounding tempera- ture using a thermometer. Or, check the operating status with the SER- VOPACK installa- tion environment	Decrease the sur- rounding temperature by improving the SER- VOPACK installation conditions.	*1	
	An overload alarm was reset by turning OFF the power supply too many times.	monitor. Check the alarm display to see if there is an overload alarm.	Change the method for resetting the alarm.	-	
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С
	The SERVOPACK installation orientation is not correct or there is insufficient space around the SERVOPACK.	Check the SERVO- PACK installation conditions.	Install the SERVO- PACK according to specifications.	*1	
	A failure occurred in the SERVO-PACK.	-	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 SERVO-PACK.	-	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
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 SERVO-PACK. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	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: Encoder Backup Alarm (Detected at the encoder, but only when an abso-	The Encoder Cable was discon- nected and then connected again.	Check to see if the power supply was turned ON for the first time.	Check the encoder connection and set up the encoder.	*1	
	Power is not being supplied both from the control power supply (+5 V) from the SERVOPACK and from the battery power supply.	Check the encoder connector battery and the connector status.	Replace the battery or implement similar measures to supply power to the encoder, and set up the encoder.		A
lute encoder is used.)	A failure occurred in the encoder.	_	If the alarm still occurs after setting up the encoder again, the encoder may be faulty. Consult Har- monic Drive Systems Inc.	-	
	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.820: Encoder Check- sum Alarm (Detected at the encoder.)	A failure occurred in the encoder.	_	Set up the encoder again. If the alarm still occurs, the Servomo- tor, Actuator, or encoder may be faulty. Consult Har- monic Drive Systems Inc.	*1	A
5.165 d.5.1,	A failure occurred in the SERVO-PACK.	-	implement similar measures to supply power to the encoder, and set up the encoder. If the alarm still occurs after setting up the encoder again, the encoder may be faulty. Consult Harmonic Drive Systems Inc. The SERVOPACK may be faulty. Replace the SERVOPACK. Set up the encoder again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc. The SERVOPACK may be faulty. Replace the SERVOPACK. Correct the battery enaction. Replace the battery. *1 The SERVOPACK may *1		
A.830: Encoder Battery	The battery connection is faulty or a battery is not connected.	Check the battery connection.		*1	
Alarm (The absolute encoder battery voltage was lower than the speci-	The battery voltage is lower than the specified value.	Measure the battery voltage.	Replace the battery.	*1	А
fied level.)	A failure occurred in the SERVO-PACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	_	

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.840: Encoder Data Alarm	The encoder mal- functioned.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	A
(Detected at the encoder.)	The encoder mal- functioned due to noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.	-	
A.850: Encoder Over- speed (Detected at the	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	A
encoder.)	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
	The surrounding air temperature around the Servomotor or Actuator is too high.	Measure the sur- rounding air tem- perature around the Servomotor or Actu- ator.	Reduce the surrounding air temperature of the Servomotor or Actuator to 40° or less.	-	
	The Servomotor or Actuator is operating outside the continuous duty zone.	Use the accumulated load ratio to check the load.	Operate the Servomotor or Actuator within the continuous duty zone.	*1	Α
A.860: Encoder Over- heated (Detected at the encoder.)	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.8A0: External Encoder Error	A failure occurred in the external encoder.	_	Replace the external encoder.	_	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.8A1: External Encoder	A failure occurred in the external encoder.	-	Replace the external encoder.	-	С
Module Error	A failure occurred in the Serial Converter Unit.	-	Replace the Serial Converter Unit.	_	
A.8A2: External Incremental Encoder Sensor Error	A failure occurred in the external encoder.	-	Replace the external encoder.	-	С
A.8A3: External Absolute Encoder Position Error	A failure occurred in the external absolute encoder.	_	The external absolute encoder may be faulty. Refer to the encoder manufacturer's instruction manual for corrections.	-	С
A.8A5: External Encoder Overspeed	An overspeed error was detected in the external encoder.	Check the maximum speed of the external encoder.	Keep the external encoder below its maximum speed.	-	С
A.8A6: External Encoder Overheated	An overheating error was detected in the external encoder.	_	Replace the external encoder.	-	С
A.b33: Current Detection Error 3	A failure occurred in the current detection circuit.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.b6A: MECHATROLINK Communications ASIC Error 1	There is a fault in the SERVOPACK MECHATROLINK communications section.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.b6b: MECHATROLINK Communications ASIC Error 2	A malfunction occurred in the MECHATROLINK communications section due to noise.	_	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring. • Attach a ferrite core to the MECHATROLINK Communications Cable.	-	С
	There is a fault in the SERVOPACK MECHATROLINK communications section.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.bF0: System Alarm 0	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF1: System Alarm 1	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF2: System Alarm 2	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF3: System Alarm 3	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF4: System Alarm 4	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF5: System Alarm 5	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF6: System Alarm 6	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF7: System Alarm 7	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.bF8: System Alarm 8	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.C10: Servomotor Out of Control (Detected when the servo is turned ON.)	The order of phases U, V, and W in the motor wiring is not correct.	Check the Servo- motor wiring.	Make sure that the Servomotor is correctly wired.	-	
	A failure occurred in the encoder.	_	If the motor wiring is correct and the alarm still occurs after turning the power supply OFF and ON again, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.C80: Encoder Clear Error or Multiturn	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-	В
Limit Setting Error	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Alarm Number:	Possible Cause	Confirmation	Correction	Reference	Inquiries
Alarm Name	There is a faulty contact in the connector or the connector is not wired correctly for the encoder.	Check the condition of the encoder connector.	Reconnect the encoder connector and check the encoder wiring.	*1	
A.C90: Encoder Communications Error	There is a cable disconnection or short-circuit in the encoder. Or, the cable impedance is outside the specified values.	Check the condition of the Encoder Cable.	Use the Encoder Cable within the spec- ified specifications.	-	
	One of the following has occurred: corrosion caused by improper temperature, humidity, or gas, a short-circuit caused by entry of water drops or cutting oil, or faulty contact in connector caused by vibration.	Check the operating environment.	Improve the operating environment, and replace the cable. If the alarm still occurs, replace the SERVO-PACK.	*1	В
	A malfunction was caused by noise.	_	Correct the wiring around the encoder by separating the Encoder Cable from the Servomotor Main Circuit Cable or by grounding the encoder.	*1	
	A failure occurred in the SERVO-PACK.	_	Connect the Servo- motor or Actuator to another SERVO- PACK, and turn ON the control power supply. If no alarm occurs, the SERVO- PACK may be faulty. Replace the SERVO- PACK.	-	
	Noise entered on the signal lines because the Encoder Cable is bent or the sheath is damaged.	Check the condition of the Encoder Cable and connectors.	Check the Encoder Cable to see if it is installed correctly.	*1	
A.C91: Encoder Communications Position Data Acceleration Rate	The Encoder Cable is bundled with a high-cur- rent 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.	-	В
Error	There is variation in the FG potential because of the influence of machines on the Actuator 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.	ontinued on I	

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OFF and ON again. If the alarm still occurs,

the SERVOPACK may

be faulty. Replace the SERVOPACK.

Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs,

the Servomotor, Actu-

ator, or encoder may be faulty. Consult Har-

monic Drive Systems

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

the alarm still occurs.

the SERVOPACK may be faulty. Replace the SERVOPACK.

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Continued from previous page. Alarm Number: Possible Cause Confirmation Correction Reference Inquiries Alarm Name Implement counter-Noise entered on measures against *1 the signal line from noise for the encoder the encoder. wiring. Reduce machine Excessive vibration vibration. or shock was Check the operat-Correctly install the applied to the ing conditions. Servomotor, Actuator, encoder. or encoder. Turn the power supply to the SERVOPACK A.C92: OFF and ON again. If Encoder Commu-В the alarm still occurs, nications Timer A failure occurred the Servomotor, Actu-Error in the encoder. ator, or encoder may be faulty. Consult Harmonic Drive Systems Inc. Turn the power supply

A failure occurred

A failure occurred

A failure occurred in the SERVO-

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries		
A.Cb0: Encoder Echo- back Error	The encoder is wired incorrectly or there is faulty contact.	Check the wiring of the encoder.	Make sure that the encoder is correctly wired.	*1	A		
	The specifications of the Encoder Cable are not correct and noise entered on it.	_	Use a shielded twisted-pair wire cable or a screened twisted-pair cable with conductors of at least 0.12 mm ² .	-			
	The Encoder Cable is too long and noise entered on it.	_	The Encoder Cable wiring distance must be 20 m max.	-			
	There was variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Check the condition of the Encoder Cable and connectors.	Properly ground the machine to separate it from the FG of the encoder.	-			
	Excessive vibration or shock was applied to the encoder.	Check the operating conditions.	Reduce machine vibration. Correctly install the Servomotor, Actuator, or encoder.	-			
	A failure occurred in the encoder.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the Servomotor, Actuator, or encoder may be faulty. Consult Harmonic Drive Systems Inc.	-			
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-			
A.CC0: Multiturn Limit Disagreement	The multiturn limit of the encoder is different from that of the SERVO-PACK. Or, the multiturn limit of the SERVOPACK has been changed.	Check the setting of Pn205 in the SER-VOPACK.	Set Pn205 to a value that matches the specifications of the Servomotor or Actuator you are using. For details, refer to technical documents on the SHA-Y Series of AC Servo Actuators from Harmonic Drive Systems Inc.	-	A A		
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-			

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Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.CF1: Reception Failed Error in Feed- back Option Module Commu- nications	The cable between the Serial Con- verter Unit and SERVOPACK is not wired cor- rectly or there is a faulty contact.	Check the wiring of the external encoder.	Correctly wire the cable between the Serial Converter Unit and SERVOPACK.	*1	С
	A specified cable is not being used between Serial Converter Unit and SERVOPACK.	Check the wiring specifications of the external encoder.	Use a specified cable.	-	
	The cable between the Serial Con- verter Unit and SERVOPACK is too long.	Measure the length of the cable that connects the Serial Converter Unit.	The length of the cable between the Serial Converter Unit and SERVOPACK must be 20 m or less.	-	
	The sheath on cable between the Serial Converter Unit and SERVO-PACK is broken.	Check the cable that connects the Serial Converter Unit.	Replace the cable between the Serial Converter Unit and SERVOPACK.	-	
A.CF2: Timer Stopped Error in Feed- back Option Module Commu- nications	Noise entered the cable between the Serial Converter Unit and SERVO-PACK.	_	Correct the wiring around the Serial Converter Unit, e.g., separate I/O signal lines from the Main Circuit Cables or ground.	-	С
	A failure occurred in the Serial Converter Unit.	_	Replace the Serial Converter Unit.	-	
	A failure occurred in the SERVO-PACK.	_	Replace the SERVO-PACK.	-	

3.2.3 Troubleshooting Alarms

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Alarm Number:				ed from previ	
Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Circuit Cables.	Make sure that there are no faulty contacts in the wiring for the Servomotor and encoder.	-	
A.d00: Position Deviation Overflow (The setting of Pn520 (Excessive Position Deviation Alarm Level) was exceeded by the position deviation while the	The position command speed is too fast.	Reduce the position command speed and try operating the SERVOPACK.	Reduce the position reference speed or the reference acceleration rate, or reconsider the electronic gear ratio.	*1	
	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVOPACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference acceleration by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.	_	С
servo was ON.)	The setting of Pn520 (Excessive Position Deviation Alarm Level) is too low for the operat- ing conditions.	Check Pn520 (Excessive Position Deviation Alarm Level) to see if it is set to an appropri- ate value.	Optimize the setting of Pn520.	*1	
	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.d01: Position Deviation Overflow Alarm at Servo ON	The servo was turned ON after the position devia- tion exceeded the setting of Pn526 (Excessive Posi- tion Deviation Alarm Level at Servo ON) while the servo was OFF.	Check the position deviation while the servo is OFF.	Optimize the setting of Pn526 (Excessive Position Deviation Alarm Level at Servo ON).	*1	С
A.d02: Position Deviation Overflow Alarm for Speed Limit at Servo ON	If position deviation remains in the deviation counter, the setting of Pn529 (Speed Limit Level at Servo ON) will limit the speed when the servo is turned ON. This alarm occurs if a position reference is input and the setting of Pn520 (Excessive Position Deviation Alarm Level) is exceeded.	_	Optimize the setting of Pn520 (Excessive Position Deviation Alarm Level). Or, adjust the setting of Pn529 (Speed Limit Level at Servo ON).	*1	С

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.d10: Motor-Load Position Deviation	The motor direction and external encoder installation orientation are backward.	Check the motor direction and the external encoder installation orientation.	Install the external encoder in the opposite direction, or change the setting of Pn002 = n.X□□□ (External Encoder Usage) to reverse the direction.	*1	С
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.	-	
Δ F02·	The MECHA- TROLINK trans- mission cycle fluctuated.	-	Remove the cause of transmission cycle fluctuation at the host controller.	-	
A.E02: MECHATROLINK Internal Synchro- nization Error 1	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
A.E40: MECHATROLINK Transmission Cycle Setting Error	The setting of MECHATROLINK transmission cycle is outside of the specified range.	Check the setting of the MECHA- TROLINK transmis- sion cycle.	Set the MECHA- TROLINK transmis- sion cycle to an appropriate value.	-	С
A.E41: MECHATROLINK Communications Data Size Setting Error	The number of transmission bytes set on DIP switch S3 is not correct.	Check the MECHA-TROLINK communications data size of the host controller.	Reset DIP switch S3 to change the number of transmission bytes to an appropriate value.	*1	С
A.E42: MECHATROLINK Station Address Setting Error	The station address is outside of the setting range.	Check rotary switches S1 and S2 to see if the station address is between 03 and EF.	Check the setting of the station address of the host controller, and reset rotary switches S1 and S2 to change the address to an appropriate value between 03 and EF.	*1	C
	Two or more stations on the communications network have the same address.	Check to see if two or more stations on the communications network have the same address.	Check the setting of the station address of the host controller, and reset rotary switches S1 and S2 to change the address to an appropriate value between 03 and EF.		С
A.E50*5: MECHATROLINK Synchronization Error	The WDT data in the host controller was not updated normally.	Check to see if the WDT data is being updated at the host controller.	Correctly update the WDT data at the host controller.	_	С
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
			С	ontinued on r	next page.

Alarm Number:

3.2.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.E51: MECHATROLINK Synchronization Failed	The WDT data at the host controller was not updated correctly at the start of synchronous communications, so synchronous communications could not be started.	Check to see if the WDT data is being updated in the host controller.	Correctly update the WDT data at the host controller.	-	С
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.E60*5: Reception Error in MECHATROLINK Communications	MECHATROLINK wiring is not correct.	Check the MECHA-TROLINK wiring.	Correct the MECHA- TROLINK Communi- cations Cable wiring. Correctly connect the terminator.	-	
	A MECHA- TROLINK data reception error occurred due to noise.	_	Implement countermeasures against noise. (Check the MECHATROLINK Communications Cable and FG wiring, and implement measures such as attaching a ferrite core to the MECHATROLINK Communications Cable.)	_	С
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.E61: Synchronization Interval Error in MECHATROLINK Transmission Cycle	The MECHA- TROLINK trans- mission cycle fluctuated.	Check the setting of the MECHA- TROLINK transmis- sion cycle.	Remove the cause of transmission cycle fluctuation at the host controller.	-	
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С

Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	MECHATROLINK wiring is not correct.	Check the Servo- motor wiring.	Correct the MECHA- TROLINK Communi- cations Cable wiring.	-	
A.E63: MECHATROLINK Synchronization Frame Not Received	A MECHA- TROLINK data reception error occurred due to noise.	_	Implement countermeasures against noise. (Check the MECHATROLINK Communications Cable and FG wiring, and implement measures such as attaching a ferrite core to the MECHATROLINK Communications Cable.)	_	С
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.E72: Feedback Option Module Detec- tion Failure	There is a faulty connection between the SER-VOPACK and the Feedback Option Module.	Check the connection between the SERVOPACK and the Feedback Option Module.	Correctly connect the Feedback Option Module.	-	
	The Feedback Option Module was disconnected.	_	Reset the Option Module configuration error and turn the power supply to the SERVOPACK OFF and ON again.	*1	С
	A failure occurred in the Feedback Option Module.	_	Replace the Feedback Option Module.	_	
	A failure occurred in the SERVO-PACK.	_	Replace the SERVO-PACK.	_	
A.Eb1: Safety Function Signal Input Timing Error	The delay between activation of the /HWBB1 and /HWBB2 input signals for the HWBB was ten second or longer.	Measure the time delay between the / HWBB1 and / HWBB2 signals.	The output signal circuits or devices for / HWBB1 and /HWBB2 or the SERVOPACK input signal circuits may be faulty. Alternatively, the input signal cables may be disconnected. Check to see if any of these items are faulty or have been disconnected.	-	С
	A failure occurred in the SERVO-PACK.	_	Replace the SERVO-PACK.	_	

3.2.3 Troubleshooting Alarms

Continued from previous page.

Alarm Number:				ed from previ	, 0
Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
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 SERVO- PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	С
		Check the Servo- motor or Actuator status when the command is exe- cuted.	Execute the SV_ON or SENS_ON command only when the Servomotor or Actuator is not operating.	-	
A.Ed1: Command Exe- cution Timeout	A timeout error occurred for a MECHATROLINK command.	For fully-closed loop control, check the status of the external encoder when the command is executed. For other types of control, check the status of the encoder when the command is executed.	Execute the SENS_ON command only when an external encoder or an encoder is connected.	-	С
A.F10:	The three-phase power supply wiring is not correct.	Check the power supply wiring.	Make sure that the power supply is correctly wired.	*1	
Power Supply Line Open Phase (The voltage was low for more than	The three-phase power supply is unbalanced.	Measure the voltage for each phase of the three-phase power supply.	Balance the power supply by changing phases.	-	С
one second for phase R, S, or T when the main power supply was ON.)	A failure occurred in the SERVO-PACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	O
FL-1*5: System Alarm FL-2*5: System Alarm FL-3*5: System Alarm FL-4*5: System Alarm FL-5*5: System Alarm FL-5*5: System Alarm	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	_	С

Continued from previous pa					
Alarm Number: Alarm Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
CPF00: Digital Operator Communications Error 1	There is a faulty connection between the Digital Operator and the SERVOPACK.	Check the connector contact.	Disconnect the connector and insert it again. Or, replace the cable.	-	С
	A malfunction was caused by noise.	_	Keep the Digital Operator or the cable away from sources of noise.	_	
CPF01: Digital Operator Communications Error 2	A failure occurred in the Digital Operator.	_	Disconnect the Digital Operator and then connect it again. If the alarm still occurs, the Digital Operator may be faulty. Replace the Digital Operator.	-	C
	A failure occurred in the SERVO-PACK.	_	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	· C

*1. Refer to the following manual for details.

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

*2. Detection Conditions

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

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

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

*3. Detection Conditions

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

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

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

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

^{*4.} The SERVOPACK will fail if the External Regenerative Resistor or Regenerative Resistor Unit is connected while the jumper is connected between the B2 and B3 terminals.

3.2.4 Warning Displays

3.2.4 Warning Displays

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

3.2.5 List of Warnings

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

Warning Number	Warning Name	Meaning	Resetting
A.900	Position Deviation Overflow	The position deviation exceeded the percentage set with the following formula: (Pn520 × Pn51E/100)	Required.
A.901	Position Deviation Overflow Alarm at Servo ON	The position deviation when the servo was turned ON exceeded the percentage set with the following formula: $(Pn526 \times Pn528/100)$	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 operation. The detection level is the same as A.520. Set whether to output an alarm or a warning by setting Pn310 (Vibration Detection Switch).	Required.
A.912	Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature of the control PCB is abnormal.	Required.
A.913	Internal Temperature Warning 2 (Power Board Temperature Error)	The surrounding temperature of the power PCB is abnormal.	Required.
A.920	Regenerative Overload	This warning occurs before an A.320 alarm (Regenerative Overload) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.921	Dynamic Brake Over- load	This warning occurs before an A.731 alarm (Dynamic Brake Overload) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.923	SERVOPACK Built-in Fan Stopped	The fan inside the SERVOPACK stopped.	Required.
A.930	Absolute Encoder Bat- tery Error	This warning occurs when the voltage of absolute encoder's battery is low.	Required.
A.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 Command Conditions)	A command was sent when the conditions for sending a command were not satisfied.	Automatically reset.*

Continued from previous page.

Warning Number	Warning Name	Meaning	Resetting
A.95b	Command Warning 2 (Unsupported Com- mand)	An unsupported command was sent.	Automatically reset.*
A.95d	Command Warning 4 (Command Interference)	There was command interference, particularly latch command interference.	Automatically reset.*
A.95E	Command Warning 5 (Subcommand Not Possible)	The subcommand and main command interfere with each other.	Automatically reset.*
A.95F	Command Warning 6 (Undefined Command)	An undefined command was sent.	Automatically reset.*
A.960	MECHATROLINK Communications Warning	A communications error occurred during MECHA-TROLINK communications.	Required.
A.971	Undervoltage	This warning occurs before an A.410 alarm (Undervoltage) occurs. If the warning is ignored and operation is continued, an alarm may occur.	Required.
A.97A	Command Warning 7 (Phase Error)	A command that cannot be executed in the current phase was sent.	Automatically reset.*
A.97b	Data Clamp Out of Range	The set command data was clamped to the minimum or maximum value of the allowable setting range.	Automatically reset.*
A.9A0	Overtravel	Overtravel was detected while the servo was ON.	Required.
A.9b0	Preventative Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	Required.

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

Note: Use Pn008 = n.□X□□ (Warning Detection Selection) to control warning detection. However, the following warnings are not affected by the setting of Pn008 = n.□X□□ and other parameter settings are required in addition to Pn008 = n.□X□□.

Warning	Parameters That Must Be Set to Select Warning Detection	Reference
A.911	Pn310 = n.□□□X (Vibration Detection Setting)	*
A.923	- (Not affected by the setting of Pn008 = n.□X□□.)	-
A.930	Pn008 = n.□□□X (Low Battery Voltage Alarm/Warning Selection)	*
A.94A to A.960 and A.97A to A.97b	Pn800=n.□□X□ (Warning Check Masks)	page 4-44
A.971	Pn008 = n.□□X□ (Function Selection for Undervoltage) (Not affected by the setting of Pn008 = n.□X□□.)	*
A.9A0	Pn00D = n.X□□□ (Overtravel Warning Detection Selection) (Not affected by the setting of Pn008 = n.□X□□.)	*
A.9b0	Pn00F = n.□□□X (Preventative Maintenance Selection)	*

^{*} 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)

3.2.6 Troubleshooting Warnings

The following warning table gives the warning name, cause, confirmation method, correction, reference, and inquiry location in order of the alarm numbers.

Warning Inquiry Locations

Warnings are classified in the following three groups. The inquiry location depends on the warning group.

Contact the specified inquiry location if you cannot solve a problem with the corrections given in the table.

- A: Warning Group: Motor and Encoder Warnings Inquiries: Harmonic Drive Systems Inc.
- B: Warning Group: Motor, Encoder, and SERVOPACK Warnings Inquiries: Harmonic Drive Systems Inc. or your Yaskawa representative
- C: Warning Group: SERVOPACK Warnings Inquiries: Your Yaskawa representative

Warning Troubleshooting Table

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The Servomotor U, V, and W wiring is not correct.	Check the wiring of the Servomotor's Main Circuit Cables.	Make sure that there are no faulty connections in the wiring for the Servomotor and encoder.	-	
	A SERVOPACK gain is too low.	Check the SERVO-PACK gains.	Increase the servo gain, e.g., by using autotuning without a host reference.	*	С
A.900: Position Deviation Overflow	The acceleration of the position reference is too high.	Reduce the reference acceleration and try operating the SERVOPACK.	Reduce the acceleration of the position reference using a MECHATROLINK command. Or, smooth the position reference acceleration by selecting the position reference filter (ACCFIL) using a MECHATROLINK command.	-	
	The excessive position deviation alarm level (Pn520 × Pn51E/100) is too low for the operating conditions.	Check excessive position deviation alarm level (Pn520 × Pn51E/100) to see if it is set to an appropriate value.	Optimize the settings of Pn520 and Pn51E.	*	
	A failure occurred in the SERVOPACK.	-	Turn the power supply to the SERVOPACK OFF and ON again. If the alarm still occurs, the SERVOPACK may be faulty. Replace the SERVOPACK.	-	

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.901: Position Deviation Overflow Alarm at Servo ON	The position deviation when the servo was turned ON exceeded the percentage set with the follow- ing formula: (Pn526 × Pn528/100)	_	Optimize the setting of Pn528 (Excessive Position Error Warning Level at Servo ON).	-	С
	The wiring is not correct or there is a faulty connection in the motor or encoder wiring.	Check the wiring.	Make sure that the Servomotor and encoder are correctly wired.	-	
A.910: Overload (warning before an A.710 or A.720 alarm occurs)	Operation was performed that exceeded the overload protection characteristics.	Check the motor overload characteristics and Run command.	Consider the following: Reconsider the load and operating conditions. Select a Servomotor or Actuator again.	-	
	An excessive load was applied during operation because the Servomotor was not driven because of mechanical problems.	Check the operation reference and motor speed.	Remove the mechanical problem.	-	В
	The overload warning level (Pn52B) is not suitable.	Check that the overload warning level (Pn52B) is suitable.	Set a suitable over- load warning level (Pn52B).	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-	
A.911: Vibration	Abnormal vibration was detected during Servomotor or Actuator operation.	Check for abnormal Servomotor or Actuator noise, and check the speed and torque wave- forms during opera- tion.	Reduce the motor speed. Or, reduce the servo gain with custom tuning.	*	
	The setting of Pn103 (Moment of Inertia Ratio) is greater than the actual moment of iner- tia or was greatly changed.	Check the moment of inertia ratio or mass ratio.	Set Pn103 (Moment of Inertia Ratio) to an appropriate value.	*	С
	The vibration detection level (Pn312) is not suitable.	Check that the vibration detection level (Pn312) is suitable.	Set a suitable vibration detection level (Pn312).	*	

3.2.6 Troubleshooting Warnings

Continued from previous page.

Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.912: Internal Temperature Warning 1 (Control Board Temperature Error)	The surrounding temperature is too high.	Check the surrounding temperature using a thermometer. Or, check the operating status with the SERVOPACK installation environment monitor.	Decrease the sur- rounding temperature by improving the SER- VOPACK installation conditions.	*	
	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.	-	
	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С
	The SERVO- PACK installa- tion orientation is not correct or there is insuffi- cient space around the SER- VOPACK.	Check the SERVO- PACK installation conditions.	Install the SERVO- PACK according to specifications.	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	

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Warning Number: Receible Cause Confirmation Correction Reference Institutes						
Warning Number. Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries	
	The surrounding temperature is too high.	Check the sur- rounding tempera- ture using a thermometer. Or, check the operat- ing status with the SERVOPACK instal- lation environment monitor.	Decrease the surrounding temperature by improving the SER-VOPACK installation conditions.	*		
	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.913: Internal Tempera- ture Warning 2 (Power Board Tem- perature Error)	There was an excessive load or operation was performed that exceeded the regenerative processing capacity.	Use the accumulated load ratio to check the load during operation, and use the regenerative load ratio to check the regenerative processing capacity.	Reconsider the load and operating conditions.	-	С	
	The SERVO- PACK installa- tion orientation is not correct or there is insuffi- cient space around the SER- VOPACK.	Check the SERVO- PACK installation conditions.	Install the SERVO- PACK according to specifications.	*		
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_		
	The power supply voltage exceeded the specified range.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-		
A.920: Regenerative Over- load (warning before an A.320 alarm occurs)	There is insufficient external regenerative resistance, regenerative resistor capacity, or SERVO-PACK capacity, or there has been a continuous regeneration state.	Check the operating conditions and capacity again.	Change the regenerative resistance value, regenerative resistance capacity, or SERVOPACK capacity. Recheck the operating conditions.	page 2-21	В	
	There was a continuous regeneration state because a negative load was continuously applied.	Check the load applied to the Ser- vomotor or Actuator during operation.	Reconsider the system including the servo, machine, and operating conditions.	-		

3.2.6 Troubleshooting Warnings

Continued from previous page.

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	The Servomotor or Actuator was rotated by an external force.	Check the operation status.	Implement measures to ensure that the Servomotor or Actuator will not be rotated by an external force.	-	
A.921: Dynamic Brake Overload (warning before an A.731 alarm occurs)	When the Servomotor or Actuator was stopped with the dynamic brake, the rotational or linear kinetic energy exceeded the capacity of the dynamic brake resistor.	Check the power consumed by the DB resistor to see how frequently the DB is being used.	Reconsider the following: Reduce the Servomotor or Actuator command speed. Decrease the moment of inertia or mass. Reduce the frequency of stopping with the dynamic brake.	-	В
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-	
A.923: SERVOPACK Built- in Fan Stopped	The fan inside the SERVO-PACK stopped.	Check for foreign matter inside the SERVOPACK.	Remove foreign matter from the SERVO-PACK. If the alarm still occurs, the SERVO-PACK may be faulty. Replace the SERVO-PACK.	-	С
A.930: Absolute Encoder	The battery con- nection is faulty or a battery is not connected.	Check the battery connection.	Correct the battery connection.	*	
Battery Error (The absolute encoder battery voltage was lower than the spec-	The battery voltage is lower than the specified value.	Measure the battery voltage.	Replace the battery.	*	В
ified level.)	A failure occurred in the SERVOPACK.	-	The SERVOPACK may be faulty. Replace the SERVO-PACK.	-	
A.94A: Data Setting Warning 1 (Parameter Number Error)	An invalid parameter number was used.	Check the command that caused the warning.	Use the correct parameter number.	-	С
A.94b: Data Setting Warn- ing 2 (Out of Range)	The set command data was clamped to the minimum or maximum value of the setting range.	Check the com- mand that caused the warning.	Set the parameter within the setting range.	-	С
A.94C: Data Setting Warning 3 (Calculation Error)	The calculation result of the setting is not correct.	Check the command that caused the warning.	Set the parameter within the setting range.	-	С
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 warning.	Set the correct parameter size.	-	С

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Warning Number: Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
A.94E: Data Setting Warning 5 (Latch Mode Error)	A latch mode error was detected.	Check the command that caused the warning.	Change the setting of Pn850 or the LT_MOD data for the LTMODON command sent by the host controller to an appropriate value. (This applies when using the MECHA-TROLINK-II-compatible profile.)	-	С
A.95A: Command Warning 1 (Unsatisfied Command Conditions)	The command conditions are not satisfied.	Check the command that caused the warning.	Send the command after the command conditions are satisfied.	_	С
A.95b: Command Warning 2 (Unsupported Command)	An unsupported command was received.	Check the command that caused the warning.	Do not send unsupported commands.	_	С
A.95d: Command Warning 4 (Command Inter- ference)	The command sending conditions for latch-related commands was not satisfied.	Check the command that caused the warning.	Send the command after the command conditions are satisfied.	-	С
A.95E: Command Warning 5 (Subcommand Not Possible)	The command sending conditions for subcommands was not satisfied.	Check the command that caused the warning.	Send the command after the conditions are satisfied.	-	С
A.95F: Command Warning 6 (Undefined Com- mand)	An undefined command was sent.	Check the command that caused the warning.	Do not send undefined commands.	-	С
	The MECHA- TROLINK Com- munications Cable is not wired correctly.	Check the wiring conditions.	Correct the MECHA- TROLINK communi- cations cable wiring.	*	
A.960: MECHATROLINK Communications Warning	A MECHA- TROLINK data reception error occurred due to noise.	Confirm the installation conditions.	Implement the following countermeasures against noise. • Check the MECHATROLINK Communications Cable and FG wiring and implement countermeasures to prevent noise from entering. • Attach a ferrite core to the MECHATROLINK Communications Cable.	-	С
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVO-PACK.	_	

3.2.6 Troubleshooting Warnings

Continued from previous page.

Warning Number: Describe Cause Confirmation Correction Reference Inquite					
Warning Name	Possible Cause	Confirmation	Correction	Reference	Inquiries
	For a 200-V SERVOPACK, the AC power supply voltage dropped below 140 V.	Measure the power supply voltage.	Set the power supply voltage within the specified range.	-	
	The power supply voltage dropped during operation.	Measure the power supply voltage.	Increase the power supply capacity.	-	
A.971: Undervoltage	A momentary power interruption occurred.	Measure the power supply voltage.	If you have changed the setting of Pn509 (Momentary Power Interruption Hold Time), decrease the setting.	*	С
	The SERVO- PACK fuse is blown out.	_	Replace the SERVO-PACK and connect a reactor.	*	
	A failure occurred in the SERVOPACK.	_	The SERVOPACK may be faulty. Replace the SERVOPACK.	-	
A.97A: Command Warning 7 (Phase Error)	A command that cannot be executed in the current phase was sent.	_	Send the command after the command conditions are satisfied.	-	С
A.97b: Data Clamp Out of Range	The set command data was clamped to the minimum or maximum value of the setting range.	_	Set the command data within the setting ranges.	-	С
A.9A0: Overtravel (Over- travel status was detected.)	Overtravel was detected while the servo was ON.	Check the status of the overtravel sig- nals on the input signal monitor.	Even if an overtravel signal is not shown by the input signal monitor, momentary overtravel may have been detected. Take the following precautions. Do not specify movements that would cause overtravel from the host controller. Check the wiring of the overtravel signals. Implement countermeasures against noise.	*	С
A.9b0: Preventative Mainte- nance Warning	One of the consumable parts has reached the end of its service life.	_	Replace the part. Contact your Yaskawa representative for replacement.	*	С

^{*} 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)

nce

Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

3.2.7

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

Problem	Possible Cause	Confirmation	Correction	Reference
	The control power supply is not turned ON.	Measure the voltage between control power supply terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the control power supply is turned ON.	-
	The main circuit power supply is not turned ON.	Measure the voltage across the main circuit power input terminals.	Turn OFF the power supply to the servo system. Correct the wiring so that the main circuit power supply is turned ON.	-
	The I/O signal connector (CN1) pins are not wired correctly or are disconnected.	Turn OFF the power supply to the servo system. Check the wiring condition of the I/O signal connector (CN1) pins.	Correct the wiring of the I/O signal connector (CN1) pins.	*1
	The wiring for the Servomotor Main Circuit Cables or Encoder Cable is disconnected.	Check the wiring conditions.	Turn OFF the power supply to the servo system. Wire the cable correctly.	-
Servomotor or Actuator Does Not Start	There is an overload on the Servomotor or Actuator.	Operate the Servomotor or Actuator with no load and check the load status.	Turn OFF the power supply to the servo system. Reduce the load or replace the Servomotor or Actuator with a Servomotor or Actuator with a larger capacity.	-
	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).	*1
	The SV_ON command was not sent.	Check the commands sent from the host controller.	Send the SV_ON command from the host controller.	-
	The SENS_ON (Turn ON Sensor) command was not sent.	Check the commands sent from the host controller.	Send the commands to the SERVOPACK in the correct sequence.	-
	The P-OT (Forward Drive Prohibit) or N-OT (Reverse Drive Prohibit) signal is still OFF.	Check the P-OT and N-OT signals.	Turn ON the P-OT and N-OT signals.	*1
	The safety input signals (/HWBB1 or /HWBB2) were not turned ON.	Check the /HWBB1 and /HWBB2 input signals.	Turn ON the /HWBB1 and /HWBB2 input signals. If you are not using the safety function, connect the Safety Jumper Connector (provided as an accessory) to CN8.	*1

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Continued from pre	Reference
	. Cooloio Gaage	Johnmadon	Turn ON the FSTP	. 1010101100
Servomotor or Actuator Does Not Start	The FSTP (Forced Stop Input) signal is still OFF.	Check the FSTP signal.	signal. • If you will not use the function to force the motor to stop, set Pn516 = n.□□□X (FSTP (Forced Stop Input) Signal Allocation) to disable the signal.	*1
	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
Servomotor or Actuator Moves	There is a mistake in the Servomotor wiring.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the Servomotor correctly.	_
Instanta- neously, and Then Stops	There is a mistake in the encoder wiring.	Turn OFF the power supply to the servo system. Check the wiring.	Wire the cable correctly.	-
Servomotor or Actuator Operation Is Unstable	There is a faulty connection in the Servomotor wiring.	The connector connections for the power line (U, V, and W phases) and the encoder may be unstable. Turn OFF the power supply to the servo system. Check the wiring.	Tighten any loose terminals or connectors and correct the wiring.	-
Servomotor or Actuator Moves with- out a Refer- ence Input	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	The setting of Pn001 = n.□□□X (Servo OFF or Alarm Group 1 Stopping Method) is not suitable.	Check the setting of Pn001 = n.□□□X.	Set Pn001 = n.□□□X correctly.	-
Dynamic Brake Does Not Operate	The dynamic brake resistor is disconnected.	Check the moment of inertia, motor speed, and dynamic brake frequency of use. If the moment of inertia, motor speed, or dynamic brake frequency of use is excessive, the dynamic brake resistance may be disconnected.	Turn OFF the power supply to the servo system. Replace the SERVO-PACK. To prevent disconnection, reduce the load.	-
	There was a failure in the dynamic brake drive circuit.	_	There is a defective component in the dynamic brake circuit. Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Continued from pre	Reference
	The Servomotor or Actuator vibrated considerably while performing the tuning-less function with the default settings.	Check the waveform of the motor speed.	Reduce the load so that the moment of inertia ratio is within the allowable value. Or increase the load level or reduce the rigidity level in the tuning-less level settings. If the situation is not improved, disable the tuning-less function (i.e., set Pn170 to n.□□□0) and execute autotuning either with or without a host reference.	*1
		Turn OFF the power supply to the servo system. Check the mounting state of the Servomotor or Actuator.	Tighten the mounting screws.	-
Abnormal	The machine mounting is not secure.	Turn OFF the power supply to the servo system. Check to see if there is misalignment in the coupling.	Align the coupling.	-
Noise from Servomotor or Actua- tor*2		Turn OFF the power supply to the servo system. Check to see if the coupling is balanced.	Balance the coupling.	_
	The bearings are defective.	Turn OFF the power supply to the servo system. Check for noise and vibration around the bearings.	Consult Harmonic Drive Systems Inc.	-
	There is a vibration source at the driven machine.	Turn OFF the power supply to the servo system. Check for any foreign matter, damage, or deformation in the machine's moving parts.	Consult with the machine manufacturer.	-
	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm² (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	_

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	Noise interference occurred because of incorrect Encoder Cable specifications.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it satisfies specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm ² (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because the Encoder Cable is too long.	Turn OFF the power supply to the servo system. Check the length of the Encoder Cable.	The Encoder Cable must be no longer than 20 m.	_
	Noise interference occurred because the Encoder Cable is damaged.	Turn OFF the power supply to the servo system. Check the Encoder Cable to see if it is pinched or the sheath is damaged.	Replace the Encoder Cable and correct the cable installation envi- ronment.	-
Abnormal Noise from Servomotor	The Encoder Cable was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
or Actua- tor* ²	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-
	There is a SERVOPACK pulse counting error due to noise.	Check to see if there is noise interference on the signal line from the encoder.	Turn OFF the power supply to the servo system. Implement countermeasures against noise for the encoder wiring.	_
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor or Actuator installation (mounting surface precision, securing state, and alignment).	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-
	A failure occurred in the encoder.	_	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*1
Servomotor	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	-
or Actuator Vibrates at Frequency of Approx.	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	-
200 to 400 Hz.	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	-
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	-
	The servo gains are not balanced.	Check to see if the servo gains have been correctly tuned.	Perform autotuning without a host reference.	*1
	The setting of Pn100 (Speed Loop Gain) is too high.	Check the setting of Pn100. The default setting is Kv = 40.0 Hz.	Set Pn100 to an appropriate value.	-
Large Motor Speed Overshoot	The setting of Pn102 (Position Loop Gain) is too high.	Check the setting of Pn102. The default setting is Kp = 40.0/s.	Set Pn102 to an appropriate value.	_
on Starting and Stop- ping	The setting of Pn101 (Speed Loop Integral Time Constant) is not appropriate.	Check the setting of Pn101. The default setting is Ti = 20.0 ms.	Set Pn101 to an appropriate value.	_
	The setting of Pn103 (Moment of Inertia Ratio or Mass Ratio) is not appropri- ate.	Check the setting of Pn103.	Set Pn103 to an appropriate value.	_
	The torque reference is saturated.	Check the waveform of the torque reference.	Use the mode switch.	_

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Correction	Reference
	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-
	There is a SERVOPACK pulse counting error due to noise.	Turn OFF the power supply to the servo system. Check to see if there is noise interference on the signal line from the encoder.	Implement counter- measures against noise for the encoder wiring.	-
Absolute Encoder Position Deviation	The encoder was subjected to excessive vibration or shock.	Check to see if vibration from the machine occurred. Check the mounting state of the Servomotor or Actuator.	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-
Error (The position that was saved in the host con-	A failure occurred in the encoder.	_	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-
troller when the power was turned OFF is dif- ferent from	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
the posi- tion when the power		Check the error detection section of the host controller.	Correct the error detection section of the host controller.	_
was next turned ON.)	Host Controller Multiturn Data or Absolute Encoder Position Data Reading Error	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.	-
		Check for noise interference in the cable between the SERVO-PACK and the host controller.	Implement counter- measures against noise and then perform parity checks again for the multiturn data or abso- lute encoder position data.	-
	The multiturn limit settings do not agree between the host controller and Pn205.	Check the multiturn limit settings on the host controller and in Pn205.	Set the same the multi- turn limit setting on the host controller and in Pn205.	*1

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

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Continued	trom	previous	page.

5	D		Continued from pre	
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	Check the operating condition of the overtravel limit switches.	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.	*1
		Check the settings of the overtravel input signal allocations (Pn50A/Pn50B).	Set the parameters to correct values.	*1
		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 operation 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 allocation of the P-OT or N-OT (Forward Drive Prohibit or Reverse Drive Prohibit) signal in Pn50A = n.X□□□ or Pn50B = n.□□□X.	Check to see if the P-OT signal is allocated in Pn50A = n.X□□□.	If another signal is allocated in Pn50A =n.X□□□, allocate the P-OT signal instead.	*1
		Check to see if the N-OT signal is allocated in Pn50B = n.□□□X.	If another signal is allocated in Pn50B =n.□□□X, allocate the N-OT signal instead.	
	The selection of the Servo- motor stopping method is not correct.	Check the servo OFF stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	*1
		Check the torque control stopping method set in Pn001 = n.□□□X or Pn001 = n.□□X□.	Select a Servomotor stopping method other than coasting to a stop.	
Improper Stop 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.	-
Position Deviation (without Alarm)	The encoder was subjected to excessive noise interference.	Turn OFF the power supply to the servo system. Check to see if the Encoder Cable is bundled with a high-current line or installed near a high-current line.	Correct the cable lay- out so that no surge is applied by high-current lines.	-
	There is variation in the FG potential because of the influence of machines on the Servomotor or Actuator side, such as a welder.	Turn OFF the power supply to the servo system. Check to see if the machines are correctly grounded.	Properly ground the machines to separate them from the FG of the encoder.	-

3.2.7 Troubleshooting Based on the Operation and Conditions of the Servomotor or Actuator

Continued from previous page.

Problem	Possible Cause	Confirmation	Continued from pre	Reference
	The encoder was subjected to excessive vibration or shock.	Turn OFF the power supply to the servo system. Check to see if vibration from the machine occurred. Check the Servomotor or Actuator installation (mounting surface precision, securing state, and alignment).	Reduce machine vibration. Or, improve the mounting state of the Servomotor or Actuator.	-
	The coupling between the machine and Servomotor or machine and Actuator is not suitable.	Turn OFF the power supply to the servo system. Check to see if position offset occurs at the coupling between machine and Servomotor or machine and Actuator.	Correctly secure the coupling between the machine and Servomotor or machine and Actuator.	-
Position Deviation (without Alarm)	Noise interference occurred because of incorrect I/O signal cable specifications.	Turn OFF the power supply to the servo system. Check the I/O signal cables to see if they satisfy specifications. Use shielded twisted-pair cables or screened twisted-pair cables with conductors of at least 0.12 mm ² (stranded wire).	Use cables that satisfy the specifications.	-
	Noise interference occurred because an I/O signal cable is too long.	Turn OFF the power supply to the servo system. Check the lengths of the I/O signal cables.	The I/O signal cables must be no longer than 3 m.	-
	An encoder fault occurred. (The pulse count does not change.)	_	Turn OFF the power supply to the servo system. Consult Harmonic Drive Systems Inc.	-
	A failure occurred in the SER-VOPACK.	_	Turn OFF the power supply to the servo system. Replace the SERVO-PACK.	-
	The surrounding air temperature is too high.	Measure the surrounding air temperature around the Servomotor or Actuator.	Reduce the surrounding air temperature to 40°C or less.	-
Servomotor or Actuator	The Servomotor or Actuator surface is dirty.	Turn OFF the power supply to the servo system. Visually check the surface for dirt.	Clean dirt, dust, and oil from the surface.	-
Overheated	There is an overload on the Servomotor or Actuator.	Check the load status with a monitor.	If there is an overload, reduce the load or select SERVOPACK and Servomotor or Actuator models with larger capacities.	-

^{*1.} Refer to the following manual for details.

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

^{*2.} Contact Harmonic Drive Systems Inc. if you cannot solve a problem with the corrections given in the table.

Parameter Lists

This chapter provides information on the parameters.

4.1	SERVOP	ACKs with MECHATROLINK-II Communications References 4-2
	4.1.1 4.1.2 4.1.3	Interpreting the Parameter Lists
4.2	SERVOP	ACKs with MECHATROLINK-III Communications References 4-43
	4.2.1 4.2.2 4.2.3	Interpreting the Parameter Lists
	4.2.4	List of MECHATROLINK-III Common Parameters
	4.2.5	Parameter Recording Table 4-87

4.1.1 Interpreting the Parameter Lists

4.1

SERVOPACKs with MECHATROLINK-II Communications References

4.1.1 Interpreting the Parameter Lists

Indicates when a change to the parameter will be effective.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Set- ting	When Enabled	Classifi- cation	Refer- ence	
	2	Basic Funct	ion Selections 0	0000h to 10B1h	-	0000h	After restart	Setup	-	
		There are the following two classifi • Setup • Tuning Refer to the following manual for d Σ-7-Series Σ-7S SERVOP MECHATROLINK-II Comm References Product Manu (Manual No.: SIEP S8000)								
			Rotation Direction Selection						rence	
Pn000	n.□□□X	0 Use	Use CCW as the forward direction.							
			1 Use	CW as the forward						
		n.□□X□ Reserved parameter (Do not change.)								
		n.□X□□	n.□X□□ Reserved parameter (Do not change.)							
			Rotary/Linear S	Servomotor Start	up Selection	When Encode	er Is Not Connec	ted Refe	rence	
		n.X□□□		When an encoder is not connected, start as SERVOPACK for Rotary Servomotor.					*1	
			1 Rese	erved settings (D	o not use.)					

Parameter Lists

List of Parameters 4.1.2

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

Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled		sifi- ion	Refer- ence
	2	Basic Fundations 0	ction Selec-	0000h to 10B1h	-	0000h	After restart	Se	tup	-
				ection Selection					Refer	ence
		n.□□□X		se CCW as the forw					*	1
			1 Us	se CW as the forwa	rd direction	. (Reverse R	otation Mode)			
Pn000		n.□□X□	Reserved pa	arameter (Do not c	hange.)					
		n.□X□□ Reserved parameter (Do not change.)								
			Rotary/Linea	ar Servomotor Sta	rtup Selecti	ion When Er	coder Is Not C	on-	Refer	ence
		n.X□□□		When an encoder is not connected, start as SERVOPACK for Rotary Servomotor.						1
			1 Re	eserved settings (Do	o not use.)					
	2	Application Selections	n Function 1	0000h to 1142h	ı	0000h	After restart	Se	tup	-
		,		•			·		·	
			Motor Stopp	oing Method for Se	ervo OFF ar	nd Group 1 A	Alarms		Refer	ence
			0 Sto	op the motor by ap	plying the c	lynamic brak	e.			
		n.□□□X		Stop the motor by the applying dynamic brake and then release the dynamic brake.					*	1
			2 Coast the motor to a stop without the dynamic brake.							
			Overtravel Stopping Method Reference						ence	
				ply the dynamic br			to a stop (use th	ne		
				celerate the motor e maximum torque				3 as		
Pn001		n.□□X□		celerate the motor e maximum torque				3 as	*	I
				ecelerate the motor 30A and then serve			eleration time s	et in		
			4 De	celerate the motor 30A and then let th	to a stop u ne motor co	sing the dec ast.	eleration time s	et in		
	Ī		Main Circuit	Power Supply AC	/DC Input S	Selection			Refer	ence
		- DVDD	O Inp	out AC power as the d L3 terminals (do	e main circu	it power sup		I, L2,		
		n.□X□□	1 an	out DC power as th d ⊖ 2 terminals or nverter or the share	the B1 and	I ⊝ 2 termin	1)	_	*	I
	Ī	n.XDDD	Reserved pa	arameter (Do not c	hange.)					
				, , , , , , , , , , , , , , , , , , , ,	. 5,					

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_		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2 Application Selections		Function 2		0000h to 4213h	-	0000 h	After restart	Setup	_
		n.00X	0 1 2 3	Use Use in the	gnore the settings of P_TLIM, N_TLIM, and TFF. Ise P_TLIM and N_TLIM as torque limits. Ise TFF as a torque feedback input. Ise P_TLIM or N_TLIM as the torque limit when P_CL or N_CL in the OPTION field is ON.					nce
Pn002		n.□X□□	Encoder 0	Usag	·	•		·	Refere	nce
			2		the encoder as a			coder.	*1	
			External	Enco	der Usage				Refere	nce
			0	Do r	not use an externa	al encoder.				
		n.X□□□	1		external encoder or rotation.	moves in th	ne forward d	irection for CCV	/	
		11.XUUU	2	Res	erved setting (Do	not use.)			_	
			3		external encoder or rotation.	moves in th	ne reverse di	rection for CCW	'	
			4	Res	erved setting (Do	not use.)				

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Application Selections	Function 6	0000h to 105Fh	-	0002h	Immediately	Setup	*1	
Pn006		Application Selections	6	nitor 1 Signal Select Motor speed (1 V/1 Speed reference (1 Torque reference (1 Position deviation () Position amplifier d Position reference (1 Load-motor position Positioning comple pleted: 0 V) Speed feedforward Torque feedforward Active gain (1st gai	,000 min ⁻¹) V/1,000 mi V/100% ra 0.05 V/refer eviation (aftension (aftension) on not use.) n deviation tion (position) (1 V/1,000) I (1 V/100%)	n-1) ted torque) ence unit) er electronic 1,000 min-1) (0.01 V/refer ning complet min-1) rated torque	gear) (0.05 V/e ence unit) ted: 5 V, positio	ncoder puls	e unit)	
			0C	Completion of posi- pleted: 0 V)	pletion of position reference distribution (completed: 5 V, not cold: 0 V)					
			0D	External encoder s	peed (1 V/1	,000 min ⁻¹ : v	alue at the mot	or shaft)		
			0E	Reserved setting (D	o not use.)					
			0F	Reserved setting (D	o not use.)					
			10	Main circuit DC vol	tage					
			11 to 5F	Reserved settings (Do not use.)				
		n.□X□□	Reserved p	parameter (Do not c	hange.)					
		n.X□□□ Reserved parameter (Do not change.)								

Continued from previous page.

Parameter No.	Size	١	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Application Selections		0000h to 105Fh	-	0000h	Immediately	Setup	*1		
			Analog Mo	nitor 2 Signal Selec	tion						
			00	Motor speed (1 V/1	,000 min ⁻¹)						
			01	Speed reference (1	V/1,000 mi	n ⁻¹)					
			02	Torque reference (1	V/100% ra	ted torque)					
			03	Position deviation (0.05 V/refer	ence unit)					
			04	Position amplifier de	eviation (aft	er electronic	gear) (0.05 V/e	ncoder pul	se unit)		
			05	Position reference s	speed (1 V/	1,000 min ⁻¹)					
			06	Reserved setting (D	deserved setting (Do not use.)						
			07	oad-motor position deviation (0.01 V/reference unit)							
D : 007		n.□□XX	08	Positioning completed: 0 V)	tion (positio	ning comple	ted: 5 V, positio	ning not co	om-		
Pn007			09	Speed feedforward	(1 V/1,000	min ⁻¹)					
			0A	Torque feedforward	(1 V/100%	rated torque	e)				
			0B		ctive gain (1st gain: 1 V, 2nd gain: 2 V)						
			0C	Completion of position pleted: 0 V)	tion referend	ce distributio	n (completed: 5	V, not cor	n-		
			0D	External encoder sp	peed (1 V/1	,000 min ⁻¹ : v	alue at the mot	or shaft)			
			0E	Reserved setting (D	o not use.)						
			0F	Reserved setting (D	o not use.)						
			10	Main circuit DC volt	tage						
			11 to 5F	11 to 5F Reserved settings (Do not use.)							
		n.□X□□ Reserved parameter (Do not change.)									
		n.X□□□	Reserved	parameter (Do not c	hange.)						
					. ,						
	2	Application Selections	n Function	0000h to 7121h	-	4000h	After restart	Setup	_		
			Low Batte	ry Voltage Alarm/Wa	rning Salar	rtion		Ref	erence		
		n.□□□X		Output alarm (A.830)				1101			
				Output warning (A.93		, 0	e.		*1		
			, ,	Satpat warming (, 1.00	0,101.1011.0	attory vortag	· ·				
			-	Selection for Underv				Ref	erence		
Pn008		~ UUVU		Do not detect underv							
FIIUUO		n.□□X□		Detect undervoltage		<u> </u>			*1		
			2 L	Detect undervoltage Pn425 (i.e., only in St	warning and ERVOPACK	l limit torque).	with Pn424 an	d			
			Warning D	etection Selection				Ref	erence		
		n.□X□□		Detect warnings.					0.00		
			1 [Do not detect warnin	gs except fo	or A.971.		pag	je 3-32		
		» VDDD	Books and	parameter (Danst	hange \			\			
		n.X000	neserved	parameter (Do not c	nange.)						

Default

Setting

0010h

Setting

Unit

• SERVOPACK Models SGD7S-3R8A and -5R5A: Use current

• SERVOPACK Models SGD7S-120A, -180A, and -330A: Use

Setting Range

0000h to 0121h

Use current control mode 1.

current control mode 2.

Use current control mode 2.

Reserved parameter (Do not change.)

control mode 1.

Speed Detection Method Selection

Use speed detection 1.

Current Control Mode Selection

Refer-

ence

Reference

*1

Reference

Classifi-

cation

Tuning

When

Enabled

After restart

as	*1
t in fter	
t in	
	Reference
е	
as r the	
as	*1
t in fter	
et in	
ued c	on next page.

	1 Use speed detection 2.								
	I	n.X000	Reserved	l parameter (Do not c	hange.)				
	2	Application Selections	Function A	0000h to 1044h	-	0001h	After restart	Setu	ıp –
			Motor S	topping Method for G	iroup 2 Alar	ms			Reference
			0	Apply the dynamic b stopping method set			to a stop (use t	he	
			1	Decelerate the moto the maximum torque status after stopping	. Use the se				
		n.□□□X	2	Decelerate the moto the maximum torque	erate the motor to a stop using the torque set in Pn406 as aximum torque and then let the motor coast.				
			3	Decelerate the moto Pn30A. Use the setti stopping.					
			4	Decelerate the moto					
				Pn30A and then let t	THE THOUGH CC	ası.			
Pn00A			Stopping	Method for Forced)dSt.			Reference
Pn00A			Stopping 0		Stops rake or coas	st the motor	to a stop (use t	he	Reference
Pn00A				Method for Forced S	Stops rake or coast in Pn001 = r to a stop us. Use the se	st the motor n. \(\sigma \sing the torce	que set in Pn40	6 as	Reference
Pn00A		n.□□X□	0	Apply the dynamic b stopping method set Decelerate the moto the maximum torque	Stops rake or coast in Pn001 = r to a stop us. Use the sell. r to a stop us.	st the motor n.□□□X). sing the torotting of Pn00 sing the torotting the torotting the torotting the torotting the torotting the torotting sing the torotting the torotting sing sing sing sing sing sing sing s	que set in Pn40 01 = n.□□□X fo	6 as or the	Reference
Pn00A		n.00X0	0	Apply the dynamic b stopping method set Decelerate the moto the maximum torque status after stopping Decelerate the moto	rake or coast in Pn001 = r to a stop us. Use the sell. r to a stop us and then le	st the motor n. \(\pi \pi \pi \pi \). Ising the torous ting of Pn00 sing the torous the motor of the motor	que set in Pn40 11 = n. \(\sigma\) \(\sigma\	6 as or the 6 as set in	
Pn00A		n.□□X□	0 1 2	Apply the dynamic b stopping method set Decelerate the moto the maximum torque status after stopping Decelerate the moto the maximum torque Decelerate the moto Pn30A. Use the setti	Stops rake or coast in Pn001 = r to a stop use. Use the set in Pn001 r to a stop use and then leter to a stop use r to a stop user r to a stop u	st the motor n. \(\pi \pi \pi \) \(que set in Pn40 1 = n. \(\sigma\) \(\sigma\) \(\sigma\) \(\sigma\) que set in Pn40 coast. eleration time s for the status	6 as or the 6 as set in after	
Pn00A		n.00X0	0 1 2 3 4	Apply the dynamic b stopping method set Decelerate the moto the maximum torque status after stopping Decelerate the moto the maximum torque Decelerate the moto Pn30A. Use the setti stopping.	Stops rake or coast in Pn001 = r to a stop us. Use the sell. r to a stop us and then left of Pn001 r to a stop using of Pn001 r to a stop us the motor coast	st the motor n. \(\pi \pi \pi \) \(que set in Pn40 1 = n. \(\sigma\) \(\sigma\) \(\sigma\) \(\sigma\) que set in Pn40 coast. eleration time s for the status	6 as or the 6 as set in after	
Pn00A			0 1 2 3 4 Reserve	Apply the dynamic b stopping method set Decelerate the moto the maximum torque status after stopping Decelerate the moto the maximum torque Decelerate the moto Pn30A. Use the setti stopping. Decelerate the moto Pn30A and then let to stopping the moto Pn30A and then let to stopping the moto Pn30A and then let to stopping.	Stops rake or coast in Pn001 = r to a stop us. Use the sell. r to a stop us and then leser to a stop using of Pn001 r to a stop using of Pn001 r to a stop using of Pn001 che motor cochange.)	st the motor n. \(\pi \pi \pi \) \(que set in Pn40 1 = n. \(\sigma\) \(\sigma\) \(\sigma\) \(\sigma\) que set in Pn40 coast. eleration time s for the status	6 as or the 6 as set in after	

Parameter

No.

Pn009

Size

2

n.□□□X

n.□□X□

 $n.\square X \square \square$

Name

1

2

Application Function Selections 9

Continu

Continued from previous page.

							Continued t	ioni piev	ious page.	
Parameter No.	Size	1	Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi cation	- Refer- ence	
	2	Application:	on Function s B	0000h to 1121h	-	0000h	After restart	Setup	-	
			Operator Pa	arameter Display Se	election			Re	ference	
		n.□□□X	0 Di	splay only setup par	rameters.				*1	
			1 Di	splay all parameters	S.				1	
			Motor Stopp	oing Method for Gr	oup 2 Alarn	าร		Re	ference	
			0 St	3						
Pn00B		n.□□X□		oply the dynamic broopping method set			o a stop (use th	ne	*1	
			2 Se	et the stopping met	nod with Pn	00A = n.□□	I□X.			
			Power Input	Selection for Thre	e-phase SE	RVOPACK		Re	ference	
		- UVUU	<u> </u>	se a three-phase po	•					
		n.□X□□	1 Us	se a three-phase po pply input.		•	ngle-phase pow	ver	*1	
	n.X□□□ Reserved parameter (Do not change.)									
	2	Applications Selections	on Function s C	0000h to 0131h	_	0000h	After restart	Setup	*1	
			Function Selection for Test without a Motor							
		n.□□□X	0 D	isable tests without	a motor.					
			1 E	nable tests without	a motor.					
			Encoder Resolution for Tests without a Motor							
					without a ivi	otor				
Pn00C		n.□□X□		se 13 bits. se 20 bits.						
FIIUUC		11.00/0		se 20 bits.						
				se 24 bits.						
			3 0	36 24 Dit3.						
				pe Selection for Te		a Motor				
		n.□X□□		se an incremental e						
			1 U	se an absolute enco	oder.					
		n.X□□□	Reserved p	arameter (Do not c	hange.)					
	2	Application:	on Function s D	0000h to 1001h	-	0000h	After restart	Setup	*1	
		n.□□□X	Reserved p	arameter (Do not c	hange.)					
		n.□□X□	Reserved p	arameter (Do not c	hange.)					
Pn00D		n.□X□□	Reserved p	arameter (Do not c	hange.)					
	•		Overtravel '	Warning Detection	Selection					
		n.X□□□	0 D	o not detect overtra	vel warning	S				
			1 D	etect overtravel war	nings.					
	L									

O	•		
Continued	trom	nravialie	naga
OOHUHUGU	110111	DIGNIOUS	Dage

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2	Application Selections	r Function F	0000h to 2011h	-	0000h	After restart	Setup	-			
			Preventative	Refere	nce							
	n.□□□X			Do not detect preventative maintenance warnings. Detect preventative maintenance warnings.								
Pn00F			I Dete									
		n.□□X□	Reserved parameter (Do not change.)									
		n.□X□□	Reserved pa	rameter (Do not c	hange.)							
		n.X□□□	Reserved pa	rameter (Do not c	hange.)							
		1					T	I	I			
Pn021	2	not change		-	-	0000h	-	-	_			
Pn022	2	Reserved p	parameter (Do e.)	-	-	0000h	-	-	_			
Pn040	2	Reserved p	parameter (Do e.)	-	-	0000h	-	-	_			
	2	Application Selections		0000h to 1111h	-	0000h	After restart	Setup	*1			
Pn081		n	0 Ou 1 Ou Reserved pa	se Output Selectitput phase-C puls tput phase-C puls rameter (Do not crameter (Do not crameter (Do not corameter (Do not	es only in thes in both the hange.)			etions.				
Pn100	2	Speed Loc	op Gain	10 to 20,000	0.1 Hz	400	Immediately	Tuning	*1			
Pn101	2	Speed Loc Time Cons	op Integral stant	15 to 51,200	0.01 ms	2000	Immediately	Tuning	*1			
Pn102	2	Position Lo		10 to 20,000	0.1/s	400	Immediately	Tuning	*1			
Pn103	2	Moment of	f Inertia Ratio	0 to 20,000	1%	100	Immediately	Tuning	*1			
Pn104	2	Second Sp Gain	peed Loop	10 to 20,000	0.1 Hz	400	Immediately	Tuning	*1			
Pn105	2	Second Sp Integral Tir	ne Constant	15 to 51,200	0.01 ms	2000	Immediately	Tuning	*1			
Pn106	2	Second Po Gain	osition Loop	10 to 20,000	0.1/s	400	Immediately	Tuning	*1			
Pn109	2	Feedforwa	rd	0 to 100	1%	0	Immediately	Tuning	*1			
Pn10A	2	Feedforwa Constant	rd Filter Time	0 to 6,400	0.01 ms	0	Immediately	Tuning	*1			

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	Whe Enabl		Clas		Refer- ence	
	2 Gain Application Selections			0000h to 5334h	_	0000h	- Se		Set	tup –		
				1	II.	I.	I					
			Mode Switch	ching Selection				When Enabled		Reference		
				se the internal torquevel setting: Pn10C)		as the cond	lition					
		n.□□□X	1 U:	se the speed reference: Pn10D).		condition (lev	el set-					
			2	se the acceleration reference as the condition (level etting: Pn10E).					Immedi- ately		*1	
Pn10B			3 Ui	se the position deving: Pn10F).	deviation as the condition (level set-							
			4 D	o not use mode swi	itching.							
			Speed Loop	Control Method					nen bled	Refe	rence	
		n.□□X□		control				After		*1		
				I-P control Reserved settings (Do not use.)					restart		*1	
	n.□X□□ Reserved parameter (Do not change.)											
	n.XDDD Reserved parameter (Do not change.)											
	_		. 1.000.100 р	arameter (20 met e								
Pn10C	2	Mode Swit for Torque	ching Level Reference	0 to 800	1%	200	Immediately		Tun	ing	*1	
Pn10D	2	Mode Swit for Speed	ching Level Reference	0 to 10,000	1 min ⁻¹	0	Immedi	ately	Tun	ing	*1	
Pn10E	2	Mode Swit	ching Level ration	0 to 30,000	1 min ⁻¹ /s	0	Immedi	ately	Tun	ing	*1	
Pn10F	2	Mode Swit for Position	ching Level n Deviation	0 to 10,000	1 refer- ence unit	0	Immedi	ately	Tun	ing	*1	
Pn11F	2	Position In Constant	tegral Time	0 to 50,000	0.1 ms	0	Immedi	ately	Tun	ing	*1	
Pn121	2	Friction Co Gain	mpensation	10 to 1,000	1%	100	Immediately		Tun	ing	*1	
Pn122	2	Second Fr pensation	iction Com- Gain	10 to 1,000	1%	100	Immediately		Tun	ing	*1	
Pn123	2	Friction Co Coefficient	mpensation	0 to 100	1%	0	Immedi	ately	Tun	ing	*1	
Pn124	2		mpensation Correction	-10,000 to 10,000	0.1 Hz	0	Immedi	ately	Tun	ing	*1	
Pn125	2	Friction Co Gain Corre	ection	1 to 1,000	1%	100	Immedi	ately	Tun	ing	*1	
Pn131	2	Gain Switch	ching Time 1	0 to 65,535	1 ms	0	Immedi	ately	Tun	ing	*1	
Pn132	2	Gain Switch	ching Time 2	0 to 65,535	1 ms	0	Immedi	ately	Tun	ing	*1	
Pn135	2	Time 1	ching Waiting	0 to 65,535	1 ms	0	Immedi	ately	Tun	ing	*1	
Pn136	2	Gain Switch Time 2	ching Waiting	0 to 65,535	1 ms	0	Immedi	ately	Tun	ing	*1	

Default

Setting

Setting

Unit

Setting Range

Refer-

Classifi-

cation

When

Enabled

		At ti -	Onlin Outli	- -							
	2	Automatic ing Selecti		cn-	0000h to 0052h	_	0000h	Immediately	Tuning	*1	
			Octor October October								
			Gain Switching Selection								
			0	Use manual gain switching. The gain is switched manually with G_SEL in the Option field.							
			1		Reserved setting (Do not use.)						
		n.□□□X	'		Use automatic gain switching pattern 1.						
			2	The	gain is switched	automatical	ly from the fir				
					tching condition A ond gain to the fir						
				Sec	ond gain to the iii	st gairt wrie	ii switching t	CONTUINION A IS TH	ot satistieu.		
Pn139			Gain Swi	itchii	ng Condition A						
			0	/CC	OIN (Positioning Co	ompletion O	utput) signal	turns ON.			
			1	/CC	OIN (Positioning Co	ompletion O	utput) signal	turns OFF.			
		n.□□X□	2	/NE	AR (Near Output)	signal turns	ON.				
			3	/NE	AR (Near Output)	signal turns	OFF.				
			4	Pos	sition reference filt	er output is	0 and position	on reference inp	ut is OFF.		
			5	Pos	sition reference inp	out is ON.					
		n. 🗆 X 🗆 🗆	Posoryog	ל חמו	rameter (Do not c	hango)					
		11.0700	neserved	ı pai	ameter (Do not c	nange.)					
		n.X□□□	Reserved	d pai	rameter (Do not c	hange.)					
Pn13D	2	Current Ga	ain Level		100 to 2,000	1%	2000	Immediately	Tuning	*1	
FIII3D		Model Foll		`	100 to 2,000	1 /0	2000	IIIIIIediately	running		
	2	trol-Relate			0000h to 1121h	-	0100h	Immediately	Tuning	_	
		"			il.		1.			l .	
			Model Following Control Selection Refere								
			Model Fo	ollow	ing Control Selec	ction			Refer	ence	
		n.□□□X					I.				
		n.□□□X	0 [Do n	ot use model follo	wing contro	1.		Refer		
		n.□□□X	0 [1 [Do n Jse i	ot use model follo model following co	wing contro	l.		*	1	
		n.□□□X	0 [1 U	Do n Jse i Sup	ot use model follo model following co pression Selection	wing contro ontrol. on				1	
		n.000X	0 [1 l	Do n Jse i Sup Do n	ot use model follo model following co opression Selection ot perform vibration	wing contro ontrol. on on suppress	ion.		Refer	ence	
			0 [1 Vibration 0 [1 F	Do no Use i Sup Do no Perfo	ot use model follo model following co ppression Selection ot perform vibration orm vibration supp	ontrol. on suppress ression for a	ion. a specific fre		*	ence	
			0 [1 Vibration 0 [1 F	Do no Use i Sup Do no Perfo	ot use model follo model following co opression Selection ot perform vibration	ontrol. on suppress ression for a	ion. a specific fre		Refer	ence	
Pn140			0 [1 U Vibration 0 [1 F 2 F	Do no Use i Sup Do no Perfo Perfo	ot use model follo model following co ppression Selection ot perform vibration orm vibration supp	wing contro ontrol. on on suppress ression for a ression for t	ion. a specific fre wo specific		Refer	ence	
Pn140			0 [1 U Vibration 0 [1 F 2 F	Jo no Jose i Sup Do no Perfo Perfo	ot use model follo model following co opression Selection ot perform vibration orm vibration supporm vibration supp	on suppress ression for a ression for the	ion. a specific fre wo specific	frequencies.	Refer	ence	
Pn140		n.□□X□	0 [1 U Vibration 0 [1 F 2 F	Do no Sup Do no Performante Sup Do Sup Do tion	ot use model follo model following co oppression Selection of perform vibration form vibration supporm vibration supporm oppression Adjustation not adjust vibration of autotuning wit	on suppress ression for a ression for a result of the suppression for the suppression to	ion. a specific fre two specific on on automatic reference, a	frequencies.	Refer	ence	
Pn140			0 [1 Vibration 0 [1 F 2 F	Jse i Jse i Sup Do no Perfo Perfo I Sup Do tion hos	ot use model follo model following co oppression Selection of perform vibration form vibration supportm vibration supportm vibration supportment of adjust vibration of autotuning with the reference, and control of autotuning with the reference of a second of autotuning with the reference of autotuning with reference of autotuning wit	on suppress ression for a ression for the suppression suppression for the suppression for the suppression for the suppression for the suppression suppression tunir	ion. a specific fre two specific ion on automatic reference, a	frequencies. cally during executotuning with a	Refer	ence	
Pn140		n.□□X□	0 [1 Vibration 0 [1 F 2 F	Jse i Jse i Sup Do n Perfo Perfo Do tion hos	ot use model follo model following co oppression Selection of perform vibration form vibration supporm vibration supporm oppression Adjustation not adjust vibration of autotuning wit	on suppress ression for the suppression for the suppression to the suppression to the suppression to the suppression to the suppression automatuminession au	ion. a specific fre two specific fon on automatic reference, and on	frequencies. cally during execution of the control	Refer	ence	
Pn140		n.□□X□	0 [1 1 1 1 1 1 1 1 1 1	Do no	ot use model follo model following co oppression Selection of perform vibration form vibration support vibration support oppression Adjustation of autotuning with a for autotuning with the reference, and coust vibration supports with the reference of autotuning supports with the reference of autotuning suppo	on suppress ression for a ression for a suppression for a suppression to the suppression to the suppression automatus to suppression automatus to suppression automatus ression automatus reference on the suppression automatus reference on the suppressio	ion. a specific fre two specific fon on automatic reference, and on	frequencies. cally during execution of the control	Refer	ence	
Pn140		n.□□X□	0 [1 U Vibration 0 [1 F 2 F Vibration 0 1 1	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration adjust vibration of autotuning with the reference, and coust vibration support vibration s	on suppress ression for a ression for a suppression for a suppression to the suppression to the suppression automatical to t	ion. a specific free two specific on on automatic reference, and on onmatically du ice, autotunin	cally during executor with a ring execution on gwith a host r	Reference Property of the following states and the following states are also as a finite state of the following states are also as a finite state of the following states are also as a finite state of the following states are also as a finite state of the following states are also as a finite state of the finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state of the finite states are also as a finite state	ence	
Pn140		n.□□X□	0 E 1 U Vibration 0 E 2 F Vibration 0 1 Speed Fe	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration support vibration of autotuning with of autotuning without a function of autotuning vitrous vibration support vibration suppor	on suppress ression for a ression for a suppression for a suppression for a suppression to the suppression automatic formatic for	ion. a specific freewo specific ion on automatic reference, and omatically du one, autotunic	frequencies. cally during executors with a ring execution ong with a host r Selection	Refer Refer Refer Refer Refer Refer	ence	
Pn140		n.□□X□	0 [1 U Vibration 0 [1 F 2 F Vibration 0 1 1	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration adjust vibration of autotuning with the reference, and coust vibration support vibration s	on suppress ression for a ression for a suppression for a suppression for a suppression to the suppression automatic formatic for	ion. a specific freewo specific ion on automatic reference, and omatically du one, autotunic	frequencies. cally during executors with a ring execution ong with a host r Selection	Refer Refer Cu- a * Refer Refer * Refer *	ence	
Pn140		n.□□X□	O E 1 U Vibration 0 E 1 F 2 F Vibration 0 1 Speed Fe 0	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration support vibration of autotuning with a compression Adjust vibration of autotuning without a compression support vibration supp	on suppress ression for a ression for a suppression for a suppression for a suppression suppression automatical sustainable for the suppression automatical suppression suppression suppression suppression suppression suppression suppression suppression suppre	ion. a specific free two specific from on automatic reference, and specific from the following from the foll	frequencies. cally during executors with a host representation of the secution of the secutio	Refer Refer Refer Refer Refer Refer	ence	
Pn140		n.□□X□	0 E 1 U Vibration 0 E 2 F Vibration 0 1 Speed Fe	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration support vibration of autotuning with a ference, and coust vibration support vibration supp	on suppress ression for a ression for a suppression for a suppression for a suppression suppression automatical sustainable for the suppression automatical suppression suppression suppression suppression suppression suppression suppression suppression suppre	ion. a specific free two specific from on automatic reference, and specific from the following from the foll	frequencies. cally during executors with a host representation of the secution of the secutio	Refer Refer Cu- a * Refer Refer * Refer *	ence	
Pn140		n.□□X□	O E 1 U Vibration 0 E 1 F 2 F Vibration 0 1 Speed Fe 0	Do no	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration support vibration of autotuning with a compression Adjust vibration of autotuning without a compression support vibration supp	on suppress ression for a ression for a suppression for a suppression for a suppression suppression automatical sustainable for the suppression automatical suppression suppression suppression suppression suppression suppression suppression suppression suppre	ion. a specific free two specific from on automatic reference, and specific from the following from the foll	frequencies. cally during executors with a host representation of the secution of the secutio	Refer Refer Cu- a * Refer Refer * Refer *	ence	
Pn140	2	n. 🗆 X 🗆 🗆	O E 1 U Vibration 0 E 1 F 2 F Vibration 0 1 Speed Fe 0 1	Do n Use I U	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration support vibration of autotuning with a compression Adjust vibration of autotuning without a compression support vibration supp	on suppress ression for a ression for a suppression for a suppression for a suppression suppression automatical sustainable for the suppression automatical suppression suppression suppression suppression suppression suppression suppression suppression suppre	ion. a specific free two specific from on automatic reference, and specific from the following from the foll	frequencies. cally during executors with a host representation of the secution of the secutio	Refer Refer Cu- a * Refer Refer * Refer *	ence	
Pn141		n.□X□ n.□X□□ n.X□□□ Model Follitrol Gain	O I I I I I I I I I I I I I I I I I I I	Do n Use I U	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration of autotuning with of autotuning without a forward (VFF)/Toronot use model following ether.	wing control ontrol. on suppress ression for a ression for a ression for a suppression suppression automated by the sustem tuning ression automated by the sustem tuning. Que Feedfor owing control and 0.1/s	ion. a specific free two specific from on automatic reference, and specific from from from from from from from from	frequencies. cally during execution on the secution of the se	Refer Refer Refer Refer Tuning	ence	
	2 2	n. 🗆 X 🗆 🗆	O I I I I I I I I I I I I I I I I I I I	Do n Use I U	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration of autotuning with of autotuning without a note, and custom to cust vibration support vibr	wing control ontrol. on suppress ression for a ression for a ression for the suppression automatic formatic fo	ion. a specific free two specific from on automatic reference, and g. commatically during autotuning from auto	frequencies. cally during executors with a host representation of the control of	Refer Refer Refer Refer Refer * * Refer * * Refer * * * Refer * * * * * * * * * * * * *	ence	
Pn141 Pn142	2	n.□□X□ n.□X□□ n.X□□□ Model Follitrol Gain Model Follitrol Gain C Model Follitrol Gain C	O I I I I I I I I I I I I I I I I I I I	Do n Use I U	pression Selection of perform vibration supports ion Adjust vibration of autotuning with a treference, and coust vibration supportuning without a not adjust vibration of autotuning without a not and custom of autotuning without a not and custom orward (VFF)/Toronot use model following either.	ontrol. on suppress ression for a ression for the suppression for the suppression for the suppression automatic sustainable s	ion. a specific free two specific fon on automatic reference, arg. omatically du ice, autotunia ward (TFF) \$ rol and speed speed/torqu 500 1000	cally during executoring execution on with a host respection of torque feedforward Immediately Immediately	Reference * Reference * Reference * Reference * Tuning Tuning	ence	
Pn141		n.□□X□ n.□□X□□ n.X□□□ Model Follitrol Gain Model Follitrol Gain C	O I I I I I I I I I I I I I I I I I I I	Do n Use I U	ot use model following compression Selection of perform vibration support vibration support vibration support vibration support vibration support vibration of autotuning with of autotuning without a forward (VFF)/Toronot use model following ether.	wing control ontrol. on suppress ression for a ression for a ression for a suppression suppression automated by the sustem tuning ression automated by the sustem tuning. Que Feedfor owing control and 0.1/s	ion. a specific free two specific from on automatic reference, and specific from from from from from from from from	frequencies. cally during execution on the secution of the se	Refer Refer Refer Refer Tuning	ence	

Parameter

No.

Size

Name

Continued from previous page.

Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Class	ifi-	Refer- ence
Pn144	2		owing Con- the Reverse	0 to 10,000	0.1%	1000	Immediately	Tunir	ng	*1
Pn145	2	Vibration S Frequency	Suppression 1 A	10 to 2,500	0.1 Hz	500	Immediately	Tuning		*1
Pn146	2	Vibration S Frequency	Suppression 1 B	10 to 2,500	0.1 Hz	700	Immediately	Tunir	ng	*1
Pn147	2		owing Con- Feedforward Ition	0 to 10,000	0.1%	1000	Immediately	Tuning		*1
Pn148	2	Second Moing Contro	odel Follow- I Gain	10 to 20,000	0.1/s	500	Immediately	Tunir	ng	*1
Pn149	2		odel Follow- I Gain Correc-	500 to 2,000	0.1%	1000	Immediately	Tuning		*1
Pn14A	2	Vibration S Frequency	Suppression 2	10 to 2,000	0.1 Hz	800	Immediately	Tuning		*1
Pn14B	2	Vibration S Correction	Suppression 2	10 to 1,000	1%	100	Immediately	Tunir	ng	*1
	2	Control-Retions	elated Selec-	0000h to 0021h	-	0021h	After restart	Tunir	ng	-
Pn14F	1	n.00X	Model Following Control Type Selection 0 Use model following control type 1. 1 Use model following control type 2. Tuning-less Type Selection 0 Use tuning-less type 1. 1 Use tuning-less type 2. 2 Use tuning-less type 3. Reserved parameter (Do not change.)							
	2		nance Con- d Selections	0000h to 0011h	-	0010h	Immediately	Tunir	ng	
	r	n.□□□X		Anti-Resonance Control Selection 0 Do not use anti-resonance control.						
			1 Use anti-resonance control. *1							
			Anti-Resonance Control Adjustment Selection Reference							
Pn160	r	n.00X0	0 tion	Do not adjust anti-resonance control automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.						*1
			Adjust anti-resonance control automatically during execution of autotuning without a host reference, autotuning with a host reference, and custom tuning.							
	r	n.□X□□	Reserved pa	rameter (Do not c	hange.)					
	r	n.X000	Reserved pa	rameter (Do not c	hange.)					
Pn161	2	Anti-Resor	nance Fre-	10 to 20,000	0.1 Hz	1000	Immediately	Tunir	ng	*1
Pn162	2		nance Gain	1 to 1,000	1%	100	Immediately	Tunir	ng	*1
Pn163	2		nance Damp-	0 to 300	1%	0	Immediately	Tunir	ng	*1
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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	- Refer- ence	
Pn164	2		nance Filter stant 1 Cor-	-1,000 to 1,000	0.01 ms	0	Immediately	Tuning	*1	
Pn165	2		nance Filter stant 2 Cor-	-1,000 to 1,000	0.01 ms	0	Immediately	Tuning	*1	
Pn166	2	Anti-Resor ing Gain 2	nance Damp-	0 to 1,000	1%	0	Immediately	Tuning	*1	
	2	Turing loss Function							*1	
Pn170		n.000X n.00X0	Tuning-less S 0 Disc 1 Ena Speed Contro 0 Use 1 Use Rigidity Leve 0 to 7 Set Tuning-less L	Entrol.	When Enabled After restart When Enabled After restart When Enabled Immediately When Enabled					
Pn205	2	n.X□□□ Multiturn L	0 to 2 Set the load level for the tuning-less function. Multiturn Limit 0 to 65,535 1 rev 65535 After restart Setu							
	2	Position Cotion Select	ontrol Func- ons 0000h to 2210h – 0010h After restart Setup –							
	n.□□□X Reserved parameter (Do not change.) n.□□X□ Reserved parameter (Do not change.)									
	n.□X□□ Reserved parameter (Do not change.)									
Pn207			/COIN (Positioning Completion Output) Signal Output Timing							
		n.X000	0 san	Output when the absolute value of the position deviation is the same or less than the setting of Pn522 (Positioning Completed Width).						
			1 or le and	Output when the absolute value of the position error is the same						
Pn20A	4	Number of Encoder S	External cale Pitches	4 to 1,048,576	1 scale pitch/rev- olution	32768	After restart	Setup	*1	
Pn20E	4	Electronic (Numerato	Gear Ratio r)	1 to 1,073,741,824	1	64	After restart	Setup	*1	
Pn210	4	Electronic (Denomina	Gear Ratio tor)	1 to 1,073,741,824	1	1	After restart	Setup	*1	
	1	Niumahar of	Franker	16+0	l .	l .	I .	1	1	

Number of Encoder Output Pulses

Pn212

16 to 1,073,741,824

1 P/Rev

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After restart

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Setup

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Fully-close Selections	d Control	0000h to 1003h	-	0000h	After restart	Setup	*1		
		n.□□□X	Reserved pa	arameter (Do not c	hange.)						
Pn22A		n.□□X□	Reserved pa	arameter (Do not c	hange.)						
		n.□X□□	Reserved pa	Reserved parameter (Do not change.)							
		n.X□□□	Fully-closed Control Speed Feedback Selection 0 Use motor encoder speed.								
			1 Use external encoder speed.								
	2 Position Control Expansion Function Selections 0000h to 0001h – 0000h After restart Setup *1								*1		
			Backlash Co	ompensation Direc	tion						
		n.□□□X		mpensate forward							
Pn230											
	-	n.□□X□									
	n.□X□□ Reserved parameter (Do not change.)										
	n.X□□□ Reserved parameter (Do not change.)										
Pn231	4	Backlash (Compensation	-500,000 to 500,000	0.1 reference units	0	Immediately	Setup	*1		
Pn233	2	Backlash (Compensa- Constant	0 to 65,535	0.01 ms	0	Immediately	Setup	*1		
Pn281	2	Encoder C	utput Resolu-	1 to 4,096	1 edge/ pitch	20	After restart	Setup	*1		
Pn304	2	Jogging S	peed	0 to 10,000	1 min ⁻¹	500	Immediately	Setup	*1		
Pn305	2	Soft Start I	Acceleration	0 to 10,000	1 ms	0	Immediately	Setup	*2		
Pn306	2	Soft Start Time	Deceleration	0 to 10,000	1 ms	0	Immediately	Setup	*2		
Pn308	2	Speed Fee Time Cons	edback Filter stant	0 to 65,535	0.01 ms	0	Immediately	Setup	*1		
Pn30A	2		on Time for and Forced	0 to 10,000	1 ms	0	Immediately	Setup	*1		
Pn30C	2	Speed Fee Average M Time	edforward lovement	0 to 5,100	0.1 ms	0	Immediately	Setup	*1		
	2	Vibration E Selections		0000h to 0002h	_	0000h	Immediately	Setup	*1		
Pn310		n.□□□X	0 Do	etection Selection o not detect vibration. utput a warning (A.911) if vibration is detected.							
1 110 10		n DEVE	1	utput an alarm (A.5	,	on is detecte					
	-	n.□□X□		arameter (Do not c	,						
	-	n.□X□□	1	arameter (Do not c	,						
		n.X□□□	Reserved pa	arameter (Do not c	hange.)						

Setup

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
Pn311	2	Vibration Detection Sensitivity	50 to 500	1%	100	Immediately	Tuning	*1		
Pn312	2	Vibration Detection Level	0 to 5,000	1 min ⁻¹	50	Immediately	Tuning	*1		
Pn316	2	Maximum Motor Speed	0 to 65,535	1 min ⁻¹	10000	After restart	Setup	*1		
Pn324	2	Moment of Inertia Cal- culation Starting Level	0 to 20,000	1%	300	Immediately	Setup	*1		
Pn401	2	First Stage First Torque Reference Filter Time Constant	0 to 65,535	0.01 ms	100	Immediately	Tuning	*1		
Pn402	2	Forward Torque Limit	0 to 800	1%*3	800	Immediately	Setup	*1		
Pn403	2	Reverse Torque Limit	0 to 800	1%*3	800	Immediately	Setup	*1		
Pn404	2	Forward External Torque Limit	0 to 800	1%*3	100	Immediately	Setup	*1		
Pn405	2	Reverse External Torque Limit	0 to 800	1%*3	100	Immediately	Setup	*1		
Pn406	2	Emergency Stop Torque	0 to 800	1%*3	800	Immediately	Setup	*1		
Pn407	2	Speed Limit during Torque Control	0 to 10,000	1 min ⁻¹	10000	Immediately	Setup	*1		

0000h

		Notch F	ilter Selection 1	When Enabled	Reference	
	n.□□□X	0	Disable first stage notch filter.	Immedi-	*1	
		1	Enable first stage notch filter.	ately		
				140		
		Speed L	imit Selection	When Enabled	Reference	
Pn408	n.□□X□	0	Use the smaller of the maximum motor speed and the setting of Pn407 as the speed limit.	After	*1	
		1	Use the smaller of the overspeed alarm detection speed and the setting of Pn407 as the speed limit.	restart	1	
		Notch F	ilter Selection 2	When Enabled	Reference	
	n.□X□□	0	Disable second stage notch filter.	Immedi-	*1	
		1	Enable second stage notch filter.	ately		
				VA /II		
	· VOOD	Friction	Compensation Function Selection	When Enabled	Reference	
	n.X□□□	0	0 Disable friction compensation.		*1	
		1	Enable friction compensation.	ately		

0000h to 1111h

Torque-Related Function Selections

2

Pn409	2	First Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1
Pn40A	2	First Stage Notch Filter Q Value	50 to 1,000	0.01	70	Immediately	Tuning	*1
Pn40B	2	First Stage Notch Filter Depth	0 to 1,000	0.001	0	Immediately	Tuning	*1
Pn40C	2	Second Stage Notch Filter Frequency	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1
Pn40D	2	Second Stage Notch Filter Q Value	50 to 1,000	0.01	70	Immediately	Tuning	*1
Pn40E	2	Second Stage Notch Filter Depth	0 to 1,000	0.001	0	Immediately	Tuning	*1
Pn40F	2	Second Stage Second Torque Reference Filter Frequency	100 to 5,000	1 Hz	5000	Immediately	Tuning	*1
Pn410	2	Second Stage Second Torque Reference Filter Q Value	50 to 100	0.01	50	Immediately	Tuning	*1

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence
Pn412	2	First Stage Torque Re Time Cons	ference Filter	0 to 65,535	0.01 ms	100	Immediately	Tuning	*1
	2	Torque-Re tion Select	lated Func- tions 2	0000h to 1111h	-	0000h	Immediately	Setup	*1
						•			
			Notch Filter	Selection 3					
		n.□□□X	0 Di	sable third stage no	otch filter.				
			1 Er	nable third stage no	otch filter.				
	lī		Notch Filter	Selection 4					
Pn416		n.□□X□	0 Di	sable fourth stage	notch filter.				
			1 Er	nable fourth stage r	notch filter.				
			Notch Filter	Selection 5					
		n.□X□□	0 Di	sable fifth stage no	tch filter.				
			1 Er	nable fifth stage not	tch filter.				
	n.X□□□ Reserved parameter (Do not change.)								
	Trootived parameter (50 not ondinge.)								
Pn417	2	Third Stag	e Notch Filter	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1
F11417		Frequency		,	1 172	3000	irrimediately	Tuning	•
Pn418	2	Third Stage Notch Filter Q Value		50 to 1,000	0.01	70	Immediately	Tuning	*1
Pn419	2	Third Stage Notch Filter Depth		0 to 1,000	0.001	0	Immediately	Tuning	*1
Pn41A	2	Fourth Sta ter Freque	ige Notch Fil- ncy	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1
Pn41B	2	Fourth Stater Q Value	ige Notch Fil- e	50 to 1,000	0.01	70	Immediately	Tuning	*1
Pn41C	2	Fourth Stater Depth	ige Notch Fil-	0 to 1,000	0.001	0	Immediately	Tuning	*1
Pn41D	2	Fifth Stage Frequency	e Notch Filter	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1
Pn41E	2	Fifth Stage Q Value	e Notch Filter	50 to 1,000	0.01	70	Immediately	Tuning	*1
Pn41F	2	Fifth Stage Depth	e Notch Filter	0 to 1,000	0.001	0	Immediately	Tuning	*1
Pn423	2	Reserved p	parameter (Do e.)	_	_	0000h	_	_	_
Pn424	2	Torque Lin cuit Voltag	nit at Main Cir Je Drop	0 to 100	1%*3	50	Immediately	Setup	*1
Pn425	2	Release Time for Torque Limit at Main Circuit Voltage Drop		0 to 1,000	1 ms	100	Immediately	Setup	*1
Pn426	2	Torque Feedforward Average Movement Time		0 to 5,100	0.1 ms	0	Immediately	Setup	*1
Pn427	2	not change		_	_	0	_	_	_
Pn456	2	Sweep Tor ence Amp	rque Refer- litude	1 to 800	1%	15	Immediately	Tuning	*1

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2	Notch Filte Selections	er Adjustment 1	0000h to 0101h	-	0101h	Immediately	Tuning	*1			
								I.	I			
			Notch Filter Adjustment Selection 1									
		n.□□□X		not adjust the first ing without a host ing.								
				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 par	rameter (Do not c	hange.)							
			Notch Filter A	Adjustment Select	tion 2							
		n.□X□□	0 fun	not adjust the sec ction is enabled or otuning with a hos	during exec	cution of auto	otuning without					
			1 tion	ust the second stance of is enabled or dur otuning with a hos	ing execution	on of autotun	ing without a h					
	l	n.XDDD	Reserved parameter (Do not change.)									
	-			(9-1,							
	2	Gravity Co Related Se	mpensation- elections	0000h to 0001h	-	0000h	After restart	Setup	*1			
		n.□□□X		pensation Selection								
				isable gravity compensation.								
Pn475	1 Enable gravity compensation.											
		n.□□X□	Reserved para	ameter (Do not cha	ange.)							
		n.□X□□	Reserved par	ameter (Do not cha	ange.)							
	l	n.XDDD	Reserved para	ameter (Do not cha	ter (Do not change.)							
			1.50	())	<u> </u>							
Pn476	2	Gravity Co Torque	mpensation	-1,000 to 1,000	0.1%	0	Immediately	Tuning	*1			
Pn502	2	Rotation D	etection Level	1 to 10,000	1 min ⁻¹	20	Immediately	Setup	*1			
Pn503	2	Speed Coi Detection Width	incidence Signal Output	0 to 100	1 min ⁻¹	10	Immediately	Setup	*1			
Pn506	2	Brake Refe OFF Delay	erence-Servo Time	0 to 50	10 ms	0	Immediately	Setup	*1			
Pn507	2	Brake Refe put Speed	erence Out- Level	0 to 10,000	1 min ⁻¹	100	Immediately	Setup	*1			
Pn508	2	Servo OFF mand Wait	-Brake Com- ting Time	10 to 100	10 ms	50	Immediately	Setup	*1			
Pn509	2	Momentar ruption Ho	y Power Inter- old Time	20 to 50,000	1 ms	20	Immediately	Setup	*1			

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Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	When Enabled	Class		Refer ence			
	2	Input Sign 1	al Sele	ctions	0000h to FFF2h	-	1881h	After restart	Setu	ıp	-			
	-	n.□□□X n.□□X□		eserved parameter (Do not change.)										
]	n.ロXロロ	Rese	Reserved parameter (Do not change.)										
			P-OT	(Forwa	rd Drive Prohibit)	Signal Alloc	cation			Refe	rence			
			0	Enable	forward drive whe	en CN1-13 i	nput signal i	s ON (closed).						
			1	Enable	forward drive whe	en CN1-7 in	put signal is	ON (closed).						
			2	Enable	forward drive whe	en CN1-8 in	put signal is	ON (closed).						
			3	Enable	forward drive whe	en CN1-9 in	put signal is	ON (closed).						
Pn50A			4	Enable	forward drive whe	en CN1-10 i	nput signal i	s ON (closed).						
			5	Enable	forward drive whe	en CN1-11 i	nput signal i	s ON (closed).						
			6	6 Enable forward drive when CN1-12 input signal is ON (closed).										
		n.X□□□	7	7 Set the signal to always prohibit forward drive.						*	1			
			8	8 Set the signal to always enable forward drive.										
			9	9 Enable forward drive when CN1-13 input signal is OFF (open).										
			Α	A Enable forward drive when CN1-7 input signal is OFF (open).							ı			
			В	B Enable forward drive when CN1-8 input signal is OFF (open).										
			С	C Enable forward drive when CN1-9 input signal is OFF (open).										
			D Enable forward drive when CN1-10 input signal is OFF (open).											
			Е	Enable	forward drive whe	en CN1-11 i	nput signal i	s OFF (open).						
			F	Enable	forward drive whe	en CN1-12 i	nput signal i	s OFF (open).						

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence					
	2	Input Signa 2	al Selections	0000h to FFFFh	-	8882h	After restart	Setup	-					
			N OT (Boyer	ac Drive Brobibit	Signal Alloy	action		Po	ference					
			`	se Drive Prohibit) able reverse drive			al is ON (closed		referice					
				able reverse drive			•							
				able reverse drive		<u> </u>								
				able reverse drive			,							
				able reverse drive										
				able reverse drive		. 0	,	,						
				able reverse drive										
		n.□□□X		t the signal to alwa			-	,						
			8 Se	t the signal to alwa		*1								
				able reverse drive			al is OFF (open).						
			A En	able reverse drive	when CN1-7	7 input signa	l is OFF (open).							
			B En	able reverse drive	when CN1-8	3 input signa	l is OFF (open).							
			C En	able reverse drive	when CN1-9	9 input signa	l is OFF (open).							
			D En	Enable reverse drive when CN1-10 input signal is OFF (open).										
			E En	able reverse drive	when CN1-	11 input sign	al is OFF (open).						
			F En	able reverse drive	when CN1-	12 input sign	al is OFF (open).						
D - 50D]	n.□□X□ Reserved parameter (Do not change.)												
Pn50B	Ī		/P-CL (Forwa	ard External Torqu	ıe Limit İnpi	ut) Signal All	ocation	Re	ference					
				Active when CN1-13 input signal is ON (closed).										
				Active when CN1-7 input signal is ON (closed).										
				Active when CN1-8 input signal is ON (closed).										
			3 Ac	tive when CN1-9 in	nput signal i	s ON (closed	i).							
			4 Ac	tive when CN1-10	input signal	is ON (close	ed).							
			5 Ac	tive when CN1-11	input signal	is ON (close	ed).							
			6 Ac	tive when CN1-12	input signal	is ON (close	ed).							
		n.□X□□	7 Th	e signal is always a	active.				*1					
			8 Th	e signal is always i	nactive.				1					
			9 Ac	tive when CN1-13	input signal	is OFF (ope	n).							
			A Ac	tive when CN1-7 in	nput signal i	s OFF (open)).							
			B Ac	tive when CN1-8 i	nput signal i	s OFF (open)).							
			C Ac	tive when CN1-9 i	nput signal i	s OFF (open)).							
			D Ac	tive when CN1-10	input signal	is OFF (ope	n).							
			E Ac	tive when CN1-11	input signal	is OFF (ope	n).							
			F Ac	tive when CN1-12	input signal	is OFF (ope	n).							
			/N-CL (Reve	rse External Torqu	ue Limit Inp	ut) Signal Al	ocation	Re	ference					
		n.X□□□		e allocations are the que Limit Input) si			orward External		*1					
	_		· '					· · · · · · · · · · · · · · · · · · ·						

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Clas	sifi-	Refer- ence			
	2	Output Sig	gnal Selec-	0000h to 6666h	-	0000h	After restart	Set	up	-			
							1						
			/COIN (Posi	tioning Completion	n Output) S	ignal Allocat	ion		Refe	erence			
			0 Di	sabled (the above s	signal outpu	t is not used).						
		n.□□□X	1 Ou	Output the signal from the CN1-1 or CN1-2 output terminal.									
			2 Ot	utput the signal from	m the CN1-2	23 or CN1-2	4 output termin	al.		*1			
			3 Ot	utput the signal fror	m the CN1-2	25 or CN1-2	6 output termin	al.					
			4 to 6 Re	eserved settings (De	o not use.)								
Pn50E			/V-CMP (Sp	eed Coincidence [Detection O	utput) Signa	l Allocation		Refe	erence			
		n.□□X□		e allocations are thn) signal allocation		the /COIN (P	ositioning Com	ple-	:	*1			
			/TGON (Rot	ation Detection Ou	utput) Signa	I Allocation			Refe	erence			
		n.□X□□	0 to 6	*1									
			/S-RDY (Se	vo Ready) Signal	Allocation				Refe	erence			
		n.X□□□		e allocations are the notation		the /COIN (P	ositioning Com	ple-		*1			
	2	Output Sig	gnal Selec-	0000h to 6666h	_	0100h	After restart	Set	up	_			
							I.						
			/CLT (Torque Limit Detection Output) Signal Allocation							erence			
			0 Di	sabled (the above s	signal outpu	t is not used).						
		~ UUUV	1 Ou	utput the signal from	m the CN1-	1 or CN1-2 c	output terminal.						
		n.□□□X	2 Ot	utput the signal from	m the CN1-2	23 or CN1-2	4 output termin	al.		*1			
			3 Ot	utput the signal fror	m the CN1-2	25 or CN1-2	6 output termin	al.					
			4 to 6 Re	eserved settings (De	o not use.)								
Pn50F			/VLT (Speed	Limit Detection) S	Signal Alloc	ation			Refe	erence			
		n.□□X□		e allocations are that utput) signal allocat		the /CLT (Tor	que Limit Detec	ction		*1			
			/BK (Brake)	Output) Signal Allo	cation				Refe	erence			
		n.□X□□	Tr	e allocations are th		the /CLT (Tor	aue Limit Dete	ction					
				utput) signal allocat						*1			
			/WARN (Wa	rning Output) Sign	al Allocatio	n			Refe	erence			
		n.X□□□		e allocations are that the allocate the signal		the /CLT (Tor	que Limit Detec	ction		*1			
			<u> </u>										

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence				
	2	Output Sig tions 3	ınal Selec-	0000h to 0666h	-	0000h	After restart	Setup	-				
			/NFAR (Near	· Output) Signal Al	llocation			Refe	erence				
				Disabled (the above signal output is not used).									
				tput the signal from									
		n.□□□X		tput the signal from			•	al.	*1				
Pn510				tput the signal fror									
				served settings (Do									
		n. 🗆 🗆 X 🗆		rameter (Do not c									
		n. 🗆 X 🗆 🗆		rameter (Do not c	,								
			-	`									
		n.XDDD	neserveu pa	rameter (Do not c	nange.)								
	2	Input Sign	al Selections	0000h to FFFFh	_	6543h	After restart	Setup	*1				
					L			I.					
			/DEC (Origin	Return Decelerat	ion Switch	Input) Signa	l Allocation						
			0 Ac	tive when CN1-13	input signal	l is ON (close	ed).						
			1 Ac	1 Active when CN1-7 input signal is ON (closed).									
			2 Ac	tive when CN1-8 ir	nput signal i	s ON (closed	I).						
			3 Ac	tive when CN1-9 ir	nput signal i	s ON (closed	i).						
			4 Ac	tive when CN1-10	input signa	l is ON (close	ed).						
			5 Ac	tive when CN1-11	input signa	l is ON (close	ed).						
			6 Ac	tive when CN1-12	input signa	l is ON (close	ed).						
		n.□□□X	7 The	e signal is always a	active.								
				,									
			9 Ac	1 0 (1)									
				1 0 (1)									
				C Active when CN1-9 input signal is OFF (open).									
				tive when CN1-10									
Pn511				tive when CN1-11			·						
			F Ac	tive when CN1-12	input signa	l is OFF (ope	n).						
			/EXT1 (Exter	nal Latch Input 1)	Signal Allo	cation							
			0 to 3 The	e signal is always i	nactive.								
			4 Ac	tive when CN1-10	input signa	l is ON (close	ed).						
				tive when CN1-11									
		n.□□X□		tive when CN1-12									
			D Ac	tive when CN1-10	input signa	l is OFF (ope	n).						
				tive when CN1-11	·		·						
				tive when CN1-12	. 0	l is OFF (ope	n).						
			7 to C The	e signal is always i	nactive.								
			/EXT2 (Exter	nal Latch Input 2)	Signal Allo	cation							
		n.□X□□	O to F	e allocations are the			kternal Latch In	put 1) signa	al allo-				
			/EXT3 (Exter	nal Latch Input 3)	Signal Allo	cation							
		n.X□□□		e allocations are th	e same as	the /EXT1 (Ex	kternal Latch In	put 1) signa	al allo-				
			cat	ions.									

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Class	sifi-	Refer- ence				
140.	2	Output Sig Settings	gnal Inverse	0000h to 1111h	-	0000h	After restart	Setu		*1				
		1 0					<u> </u>							
			Output Sign	Output Signal Inversion for CN1-1 and CN1-2 Terminals										
		n.□□□X	0 Th	ne signal is not inve	rted.									
Pn512			1 Th	ne signal is inverted										
			Output Sign	al Inversion for CN	11-23 and C	CN1-24 Term	ninals							
		n.□□X□	0 Th	0 The signal is not inverted.										
			1 Th	1 The signal is inverted.										
			Output Sign	al Inversion for CN	11-25 and C	N1-26 Term	ninals							
		n.□X□□	0 Tr	0 The signal is not inverted.										
			1 Th	ne signal is inverted										
		n.X□□□	Reserved pa	arameter (Do not c	hange.)									
	2	Output Sig tions 4	gnal Selec-	0000h to 0666h	-	0000h	After restart	Setu	qı	-				
		n.□□□X	□□X Reserved parameter (Do not change.)											
		n.□□X□	Reserved parameter (Do not change.)											
	İ		/PM (Prever	ntative Maintenanc	e Output) S	signal Alloca	tion		Refer	ence				
Pn514			`	sabled (the above s	' '	<u> </u>			110101	01100				
				utput the signal fror										
		n.□X□□		utput the signal fror				al.	*	1				
				utput the signal fror			•							
				eserved settings (Do			-							
		n.XDDD	Reserved pa	arameter (Do not c	hange.)									
	ľ													

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No.	Size	Name	Setting Range	Unit	Setting	Enabled	cation	ence
	2	Input Signal Selections 7	0000h to FFFFh	1	8888h	After restart	Setup	ı

	FSTP (Fo	rced Stop Input) Signal Allocation	Reference				
	0	Enable drive when CN1-13 input signal is ON (closed).					
	1	Enable drive when CN1-7 input signal is ON (closed).					
	2	Enable drive when CN1-8 input signal is ON (closed).					
	3	Enable drive when CN1-9 input signal is ON (closed).					
	4	Enable drive when CN1-10 input signal is ON (closed).					
	5	Enable drive when CN1-11 input signal is ON (closed).					
	6	Enable drive when CN1-12 input signal is ON (closed).					
n.□□□X	7	Set the signal to always prohibit drive (always force the motor to stop).					
	8	Set the signal to always enable drive (always disable forcing the motor to stop).	*1				
	9	Enable drive when CN1-13 input signal is OFF (open).					
	А	Enable drive when CN1-7 input signal is OFF (open).					
	В	Enable drive when CN1-8 input signal is OFF (open).					
	С	Enable drive when CN1-9 input signal is OFF (open).					
	D	Enable drive when CN1-10 input signal is OFF (open).					
	E	Enable drive when CN1-11 input signal is OFF (open).					
	F	Enable drive when CN1-12 input signal is OFF (open).					
n.□□X□	Reserved	I 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.)

Pn51B	4	Motor-Load Position Deviation Overflow Detection Level	0 to 1,073,741,824	1 refer- ence unit	1000	Immediately	Setup	*1
Pn51E	2	Position Deviation Over- flow Warning Level	10 to 100	1%	100	Immediately	Setup	page 3- 32
Pn520	4	Position Deviation Over- flow Alarm Level	1 to 1,073,741,823	1 refer- ence unit	5242880	Immediately	Setup	*1 page 3-2
Pn522	4	Positioning Completed Width	0 to 1,073,741,824	1 refer- ence unit	7	Immediately	Setup	*1
Pn524	4	Near Signal Width	1 to 1,073,741,824	1 refer- ence unit	10737418 24	Immediately	Setup	*1
Pn526	4	Position Deviation Over- flow Alarm Level at Servo ON	1 to 1,073,741,823	1 refer- ence unit	5242880	Immediately	Setup	*1
Pn528	2	Position Deviation Over- flow Warning Level at Servo ON	10 to 100	1%	100	Immediately	Setup	*1
Pn529	2	Speed Limit Level at Servo ON	0 to 10,000	1 min ⁻¹	10000	Immediately	Setup	*1
Pn52A	2	Multiplier per Fully- closed Rotation	0 to 100	1%	20	Immediately	Tuning	*1
Pn52B	2	Overload Warning Level	1 to 100	1%	20	Immediately	Setup	*1
Pn52C	2	Base Current Derating at Motor Overload Detection	10 to 100	1%	100	After restart	Setup	*1

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								Continued t	rom previo	us page.		
Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Program J Related Se			0000h to 0005h	-	0000h	Immediately	Setup	*1		
			Program		ging Operation P							
			0		iiting time in Pn53 vements in Pn536		rd by travel o	listance in Pn53	31) × Numbe	er of		
			1		iiting time in Pn53 vements in Pn536		se by travel o	listance in Pn53	1) × Numbe	er of		
			2	mov (Wa	Waiting time in Pn535 → Forward by travel distance in Pn531) \times Number of novements in Pn536 Waiting time in Pn535 → Reverse by travel distance in Pn531) \times Number of novements in Pn536							
Pn530		n.□□□X	3	mov (Wa	Vaiting time in Pn535 → Reverse by travel distance in Pn531) × Number of novements in Pn536 Vaiting time in Pn535 → Forward by travel distance in Pn531) × Number of novements in Pn536							
			4	in P Pn5	/aiting time in Pn535 → Forward by travel distance in Pn531 → Waiting time Pn535 → Reverse by travel distance in Pn531) × Number of movements in n536							
			5		liting time in Pn53 2n535 → Forward 536							
		n.□□X□	Reserved	par	rameter (Do not c	hange.)						
	n.□X□□		Reserved parameter (Do not change.)									
		n.X□□□	Reserved	par	rameter (Do not c	hange.)						
		D	·. .		41.	4						
Pn531	4	Program J Distance			1 to 1,073,741,824	1 refer- ence unit	32768	Immediately	Setup	*1		
Pn533	2	Program J ment Spec	ed		1 to 10,000	1 min ⁻¹	500	Immediately	Setup	*1		
Pn534	2	Program J eration/De Time		cel-	2 to 10,000	1 ms	100	Immediately	Setup	*1		
Pn535	2	Program J ing Time	ogging Wa	it-	0 to 10,000	1 ms	100	Immediately	Setup	*1		
Pn536	2	Program J ber of Mov	ogging Nu /ements	m-	0 to 1,000	1 time	1	Immediately	Setup	*1		
Pn550	2	Analog Mo Voltage	onitor 1 Off	set	-10,000 to 10,000	0.1 V	0	Immediately	Setup	*1		
Pn551	2	Analog Mo Voltage	onitor 2 Off	set	-10,000 to 10,000	0.1 V	0	Immediately	Setup	*1		
Pn552	2	Analog Monification	onitor 1 Ma	g-	-10,000 to 10,000	× 0.01	100	Immediately	Setup	*1		
Pn553	2	Analog Monification	onitor 2 Ma	g-	-10,000 to 10,000	× 0.01	100	Immediately	Setup	*1		
Pn55A	2	Power Cor Monitor Ur	nsumption nit Time		1 to 1,440	1 min	1	Immediately	Setup	-		
Pn560	2	Residual V Detection			1 to 3,000	0.1%	400	Immediately	Setup	*1		
Pn561	2	Overshoot Level	Detection		0 to 100	1%	100	Immediately	Setup	*1		
Pn600	2	Regenerat Capacity*4		r	Depends on model.*5	10 W	0	Immediately	Setup	*1		
Pn601	2	Dynamic E tor Allowal Consumpt	ble Energy	:-	0 to 65,535	10 J	0	After restart	Setup	*6		
Pn603	2	Regenerat tance	ive Resis-		0 to 65,535	10 mΩ	0	Immediately	Setup	*1		
Pn604	2	Dynamic E tance	Brake Resis	;-	0 to 65,535	10 mΩ	0	After restart	Setup	*6		
		•			*		•			•		

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Communio trols	cations Con-	0000h to 0F73h	_	0040h	Immediately	Setup	*2	
				<u>.</u>						
			MECHATE	OLINK Communica	tions Check	Mask for D	ebugging			
			0 Do	not mask.						
		n.□□□X	1 Igi	nore MECHATROLIN	K communi	cations error	s (A.E60).			
			2 Igi	nore WDT errors (A.E	50).					
				nore both MECHATR fors (A.E50).	OLINK com	munications	errors (A.E60) a	and WDT		
			Warning C	heck Masks						
			0 Do not mask.							
Pn800			1 Igi	3 3 7						
		n.□□X□	2 Igi							
			3 Igi	3 Ignore both A.94□ and A.95□ warnings.						
				3						
				nore both A.94 and						
				nore both A.95 and						
			7 Ignore A.94□, A.95□, and A.96□ warnings.							
	n.□X□□ Reserved parameter (Do not change.)									
	n.X□□□ Reserved parameter (Do not change.)									
	2		n Function 6 (Software	0000h to 0103h	_	0003h	Immediately	Setup	*1	
				·						
			Software Limit Selection							
		n.□□□X		Disable forward software limit.						
			Disable reverse software limit. Disable both forward and reverse software limits.							
Pn801			3 Disable both forward and reverse software limits.							
		n.□□X□	Reserved	parameter (Do not o	change.)					
			Software Limit Check for References							
		n.□X□□		not perform softwa			nces.			
			1 Pe	rform software limit	checks for r	eferences.				
		n.X□□□	Reserved	parameter (Do not c	change.)					
Pn803	2	Origin Rar	nge	0 to 250	1 refer-	10	Immediately	Setup	*2	
Pn804	4		oftware Lim	-1,073,741,823 to	1 refer-	10737418	Immediately	Setup	*1	
Pn806	4		oftware Lim	1,073,741,823 -1,073,741,823 to	ence unit	-10737	Immediately	Setup	*1	
Pn808	4	Absolute E	Encoder Orig	in -1,073,741,823 to	ence unit	41823 0	Immediately	Setup	*1	
		Offset		1,073,741,823	ence unit	J	*8	Cotap		
Pn80A	2	First Stage eration Co	e Linear Acc onstant	el- 1 to 65,535	10,000 reference units/s ²	100	Immediately *9	Setup	*2	
Pn80B	2		tage Linear on Constant	1 to 65,535	10,000 reference units/s ²	100	Immediately	Setup	*2	
Pn80C	2	Acceleration Switching	on Constant Speed	0 to 65,535	100 reference units/s	0	Immediately	Setup	*2	

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Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence
Pn80D	2	First Stage Deceleration		stant	1 to 65,535	10,000 reference units/s ²	100	Immediately	Setup	*2
Pn80E	2	Second Stage Linear Deceleration Constant			1 to 65,535	10,000 reference units/s ²	100	Immediately *9	Setup	*2
Pn80F	2	Deceleration Constant Switching Speed			0 to 65,535	100 reference units/s	0	Immediately *9	Setup	*2
Pn810	2	Exponentia tion/Decele			0 to 65,535	100 reference units/s	0	Immediately	Setup	*2
Pn811	2	Exponentia tion/Decele Constant			0 to 5,100	0.1 ms	0	Immediately	Setup	*2
Pn812	2	Movement Time	Averag	е	0 to 5,100	0.1 ms	0	Immediately	Setup	*2
Pn814	4	External Positioning Final Travel Distance		-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	Immediately	Setup	*2	
	2	2 Origin Return Mode Set tings			0000h to 0001h	-	0000h	Immediately	Setup	*2
			Origin	Returr	Direction					
	1	n.□□□X	0	Return in forward direction.						
D 040			1	Retu	rn in reverse direction.					
Pn816			D							
		n.□□X□	Reserv	/ed pai	rameter (Do not c	nange.)				
	ı	n.□X□□	Reserv	ed pa	rameter (Do not c	hange.)				
	,	n.X000	Reserv	red na	rameter (Do not c	hange)				
			110001	rou pui	Tameter (Be not e	nango.,				
Pn817	2	Origin App	roach S	peed	0 to 65,535	100 reference units/s	50	Immediately	Setup	*2
Pn818 *12	2	Origin App	roach S	peed	0 to 65,535	100 reference units/s	5	Immediately	Setup	*2
Pn819	4	Final Trave Origin Retu		ce for	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	Immediately	Setup	*2

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Parameter No.	Size	N	lame		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Input Signa Selections			0000h to AAAAh	-	0000h	Immediately	Setup	*2	
	Ī		IO12 Signal Mapping								
			0 D	o no	ot map.						
			1 N	lonit	or CN1-13 input	terminal.					
			2 N	Monitor CN1-7 input terminal.							
		n.□□□X		Monitor CN1-8 input terminal.							
Pn81E				Monitor CN1-9 input terminal.							
				Monitor CN1-10 input terminal.							
					or CN1-11 input						
			7 N	lonit	or CN1-12 input	terminal.					
		IO13 Signal Mapping									
		n.□□X□	0 to 7 The mappings are the same as the IO12 signal mappings.								
			IO14 Sign	al N	/anning						
		n.□X□□	0 to 7 The mappings are the same as the IO12 signal mappings.								
	-	IO15 Signal Mapping									
		n.X□□□				nomo oo tha	IO10 signal	manninga			
	_		0 10 7	0 to 7 The mappings are the same as the IO12 signal mappings.							
		Г				Г	Г	T	Г	T	
	2	Command tions	Data Alloc	a-	0000h to 1111h	_	0000h	After restart	Setup	*2	
			Option Field Allocation								
		n.□□□X			le option field allo	cation.					
					e option field allo						
D=01F			D. W. C				12				
Pn81F		~ DDVD			trol Command TF	F/ILIM AIIC	ocation				
		n.□□X□			le allocation.						
			' '	Ιαυι	e allocation.					_	
	ı	n.□X□□	Reserved	par	ameter (Do not c	hange.)					
		n.X□□□	Reserved	par	ameter (Do not c	hange.)					
					, , , , , ,					_	
Pn820	4	Forward La	atching Are	а	-2,147,483,648 to 2,147,483,647	1 refer- ence unit	0	Immediately	Setup	*2	
Pn822	4	Reverse La	atching Are	a	-2,147,483,648 to 2,147,483,647	1 refer- ence unit	0	Immediately	Setup	*2	

Name

4.1.2 List of Parameters

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No.	Siz		name	Setting Range	Unit	Setting	Enabled	cation	ence				
	2	Option M tion	Monitor 1 Selec-	0000h to FFFFh	-	0000h	Immediately	Setup	*2				
				,		I							
		Setting			Mor	nitor							
	Н	igh-Speed	Monitor Region										
	0	000h	Motor speed [1000000h/overspeed detection speed]										
	0	001h	Speed reference [1000000h/overspeed detection speed]										
	0	002h	Torque [1000000h/maximum torque]										
	0	1003h	Position deviation (lower 32 bits) [reference units]										
	0	004h	Position deviati	on (upper 32 bits)	[reference (units]							
	0	00Ah	Encoder count	(lower 32 bits) [ref	erence unit	s]							
	_0	00Bh	Encoder count	(upper 32 bits) [re	ference unit	ts]							
	0	00Ch	FPG count (low	er 32 bits) [referer	nce units]								
	_0	00Dh	FPG count (upp	oer 32 bits) [refere	nce units]								
	L	ow-Speed	Monitor Region	l e									
	0	010h	Un000: Motor s	speed [min ⁻¹]									
	0	011h	Un001: Speed	Reference [min ⁻¹]									
	0	012h											
	0	013h		Jn002: Torque Reference [%] Jn003: Rotational Angle 1 [encoder pulses] Jumber of encoder pulses from origin within one encoder rotation displayed in decimal									
	0	014h	Un004: Rotational Angle 2 [deg] Electrical angle from polarity origin										
	0	015h	Un005: Input Signal Monitor										
	0	016h	Un006: Output Signal Monitor										
Pn824	0	017h	Un007: Input Reference Speed [min ⁻¹]										
	0	018h	Un008: Position Deviation [reference units]										
	0	019h	Un009: Accumulated Load Ratio [%]										
	0	01Ah	Un00A: Regene	Jn00A: Regenerative Load Ratio [%]									
	0	01Bh	Un00B: Dynam	Jn00B: Dynamic Brake Resistor Power Consumption [%]									
	0	01Ch	Un00C: Input F	n00C: Input Reference Pulse Counter [reference units]									
	0	01Dh	Un00D: Feedba	DD: Feedback Pulse Counter [encoder pulses]									
	0	01Eh	Un00E: Fully-cl	osed Loop Feedb	ack Pulse C	Counter [exter	rnal encoder res	solution]					
	0	023h	Initial multiturn	data [Rev]									
	0	024h	Initial increment	al data [pulses]									
	0	040h	Un025: SERVC	PACK Installation	Environmer	nt Monitor							
	0	041h	Un026: Servom	otor Installation E	nvironment	Monitor							
	_0	042h	Un027: Built-in	Fan Remaining Li	fe Ratio								
	_0	043h	Un028: Capaci	tor Remaining Life	Ratio								
	0	044h	Un029: Surge F	Prevention Circuit	Remaining I	Life Ratio							
	0	045h	Un02A: Dynam	ic Brake Circuit Re	emaining Lif	e Ratio							
	_0	046h	Un032: Instanta	aneous Power									
	0	047h	Un033: Power	Consumption									
	_0	048h	Un034: Cumula	tive Power Consu	ımption								
	С	ommunica	ations Module O	nly									
	_	080h	Previous value	of latched feedbac	ck position ((LPOS) [refer	ence units]						
	Α	II Areas											
		Other alues	Reserved setting	gs (Do not use.)									
	-	uiuoo											
							Contin	nued on ne					

Setting

Setting Range

Default

Continued	from	nrevious	nage
Continued	HOIH	previous	paye.

_							Continued i	· ·			
Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Option Mo tion	nitor 2 Selec-	0000h to FFFFh	-	0000h	Immediately	Setup	*2		
Pn825		0000h to 0080h	The setting	s are the same as	those for the	e Option Mo	nitor 1 Selection	n.			
Pn827	2	Linear Dec Constant 1	eleration for Stopping	1 to 65,535	10,000 reference units/s ²	100	Immediately	Setup	*2		
Pn829	2		iting Time (for Deceleration	0 to 65,535	10 ms	0	Immediately	Setup	*2		
	2	Option Fiel 1	d Allocations	0000h to 1E1Eh	-	1813h	After restart	Setup	*2		
			ACCFIL Allo	cation (Option)							
			0 Allo	cate bits 0 and 1 to	ACCFIL.						
			1 Allo	1 Allocate bits 1 and 2 to ACCFIL.							
			2 Allo								
		n.□□□X									
				cate bits 7 and 8 to							
				cate bits 8 and 9 to							
				cate bits 10 and 11							
Pn82A				cate bits 10 and 12							
				cate bits 12 and 13							
				cate bits 13 and 14							
			E Allo	cate bits 14 and 15	to ACCFIL						
			ACCFIL Allo	cation Enable/Dis	able Selecti	ion					
		n.□□X□	0 Disa	able ACCFIL allocat	ion.						
			1 Ena	ble ACCFIL allocati	ion.						
			0 051 111	(2)					_		
		n.□X□□		cation (Option)		A O O FILL					
			0 to E The	settings are the sa	ime as for tr	ie accrit a	liocations.				
			G_SEL Alloc	cation Enable/Disa	ble Selection	on					
		n. X🗆 🗆 🗆		ble G_SEL allocati							
				ble G_SEL allocation							
			1								

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Parameter	Φ				Setting	Default	When	Classifi-	Refer-				
No.	Size	١	Name	Setting Range	Unit	Setting	Enabled	cation	ence				
	2	Option Fie	eld Allocations	0000h to 1F1Fh	_	1D1Ch	After restart	Setup	*2				
	V_PPI Allocation (Option)												
				ate bit 0 to V_PPI.									
				ate bit 1 to V_PPI.									
				ate bit 2 to V_PPI.									
			3 Alloc	ate bit 3 to V_PPI.									
			4 Alloc	ate bit 4 to V_PPI.									
			5 Alloc	ate bit 5 to V_PPI.									
			6 Alloc	ate bit 6 to V_PPI.									
		n.□□□X	7 Alloc	ate bit 7 to V_PPI.									
				ate bit 8 to V_PPI.									
				ate bit 9 to V_PPI.									
				ate bit 10 to V_PP									
Pn82B				ate bit 11 to V_PP									
				ate bit 12 to V_PP									
				ate bit 13 to V_PP									
				cate bit 14 to V_PP									
			I Alloc	ate bit 15 to V_FF	1.								
			V_PPI Alloca	tion Enable/Disab	le Selectio	n							
		n.□□X□	0 Disa	ble V_PPI allocatio	n.								
			1 Enak	ole V_PPI allocation	٦.								
			D DI CI D A	llocation (Option)									
		n.□X□□		settings are the sa	me as for th	ne V PPI allo	cations						
			0 10 1 1110	ootiii igo aro tirio da	1110 00 101 11	10 1_1 1 1 4110	outione.						
			P_PI_CLR A	llocation Enable/D	isable Sele	ction							
		n.X□□□	0 Disa	ble P_PI_CLR alloc	cation.								
			1 Enak	ole P_PI_CLR alloc	ation.								
				1	1	I	1	1	1				
	2	Option Fie	eld Allocations	0000h to 1F1Fh	-	1F1Eh	After restart	Setup	*2				
		1 0											
			P_CL Alloca	tion (Ontion)									
		n.□□□X		settings are the sa	me as for th	ne V_PPI allo	cations.						
			P_CL Alloca	tion Enable/Disab	le Selection	1							
		n.□□X□	0 Disa	ble P_CL allocation	า.								
Pn82C			1 Enak	ole P_CL allocation	l.								
			NI OL ALI	(2 .:)									
		n.□X□□	N_CL Alloca		ma aa far th	a V. DDI alla	aatiana						
			0 to F The	settings are the sa	ine as for tr	ie v_PPI allo	cations.						
			N CL Alloca	tion Enable/Disab	le Selection	1							
		n.X□□□		ble N_CL allocation									
				ole N_CL allocation									
				_ : :::::::::::::::::::::::::::::::::::									

Size	N	ame		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
2	Option Fiel 4	ld Allocations		0000h to 1F1Ch	-	0000h	After restart	Setup	*2	
		BANK_	BANK_SEL1 Allocation (Option)							
		0	Alloca	ate bits 0 to 3 to E	BANK_SEL1					
		1	Alloca	ate bits 1 to 4 to E	BANK_SEL1					
		2	Alloca	ate bits 2 to 5 to E	BANK_SEL1					
		3	Alloca	ate bits 3 to 6 to E	BANK_SEL1					
		4								
	п.ПППХ	5								
	п.ввах									
		_								
		C	Alloca	ate bits 12 to 15 to	o BANK_SE	:L1.				
		BANK_	SEL1	Allocation Enable	e/Disable Se	election				
1	n.□□X□	0	Disab	le BANK_SEL1 al	location.					
		1	Enabl	e BANK_SEL1 all	ocation.					
		IT DIO	ADLE	All ti (Oti -						
1	n.□X□□			` '	·	o V DDI alla	ootiono			
_		0 10 F	THE S	ettings are trie sa	ine as iof lf	ie v_rri allo	calions.			
Ī		LT_DIS	ABLE	Allocation Enable	e/Disable Se	election				
1	n.X□□□	0	Disab	le LT_DISABLE al	location.					
		1	Enabl	e LT_DISABLE all	ocation.					
	2	Ontion Fiel	Part	BANK_SEL1 / O Allocations 1 Allocations 2 Allocations 3 Allocations 4 Allocations 5 Allocations 6 Allocations 7 Allocations 8 Allocations 9 Allocations A Allocations BANK_SEL1 / O Disabtetions 1 Enabletions 2 Enabletio	BANK_SEL1 Allocation (Option O Allocate bits 0 to 3 to E 1 Allocate bits 1 to 4 to E 2 Allocate bits 2 to 5 to E 3 Allocate bits 3 to 6 to E 4 Allocate bits 4 to 7 to E 5 Allocate bits 5 to 8 to E 6 Allocate bits 7 to 10 to 8 Allocate bits 8 to 11 to 9 Allocate bits 9 to 12 to A Allocate bits 10 to 13 t B Allocate bits 10 to 13 t B Allocate bits 12 to 15 t C Allocate bits 12 to 15 t BANK_SEL1 Allocation Enable O Disable BANK_SEL1 all n.□X□□ LT_DISABLE Allocation (Option O to F The settings are the sa LT_DISABLE Allocation Enable O Disable LT_DISABLE allocation Enable O Disable LT_DISABLE allocation Enable O Disable LT_DISABLE allocation Enable O Disable LT_DISABLE allocation Enable O Disable LT_DISABLE allocation Enable	BANK_SEL1 Allocation (Option) O Allocate bits 0 to 3 to BANK_SEL1 1 Allocate bits 1 to 4 to BANK_SEL1 2 Allocate bits 2 to 5 to BANK_SEL1 3 Allocate bits 3 to 6 to BANK_SEL1 4 Allocate bits 4 to 7 to BANK_SEL1 5 Allocate bits 5 to 8 to BANK_SEL1 6 Allocate bits 6 to 9 to BANK_SEL1 7 Allocate bits 7 to 10 to BANK_SEL 8 Allocate bits 8 to 11 to BANK_SEL 9 Allocate bits 9 to 12 to BANK_SEL A Allocate bits 10 to 13 to BANK_SE A Allocate bits 11 to 14 to BANK_SE C Allocate bits 12 to 15 to BANK_SE C Allocate bits 12 to 15 to BANK_SE D Disable BANK_SEL1 allocation. 1 Enable BANK_SEL1 allocation. 1 Enable BANK_SEL1 allocation. D The settings are the same as for the Interpolation. LT_DISABLE Allocation Enable/Disable Section. D Disable LT_DISABLE allocation.	BANK_SEL1 Allocation (Option) 0 Allocate bits 0 to 3 to BANK_SEL1. 1 Allocate bits 2 to 5 to BANK_SEL1. 2 Allocate bits 3 to 6 to BANK_SEL1. 3 Allocate bits 4 to 7 to BANK_SEL1. 4 Allocate bits 5 to 8 to BANK_SEL1. 5 Allocate bits 6 to 9 to BANK_SEL1. 6 Allocate bits 7 to 10 to BANK_SEL1. 8 Allocate bits 8 to 11 to BANK_SEL1. 9 Allocate bits 9 to 12 to BANK_SEL1. A Allocate bits 10 to 13 to BANK_SEL1. C Allocate bits 12 to 15 to BANK_SEL1. B Allocate bits 10 to 13 to BANK_SEL1. C Allocate bits 12 to 15 to BANK_SEL1. C Allocate bits 12 to 15 to BANK_SEL1. C Allocate bits 12 to 15 to BANK_SEL1. C The settings are the same as for the V_PPI alloundary. IT_DISABLE Allocation Enable/Disable Selection 0 Disable LT_DISABLE allocation.	After restart Pank Sel Allocation Double Doub	BANK_SEL1 Allocation (Option) 0 Allocate bits 0 to 3 to BANK_SEL1. 1 Allocate bits 1 to 4 to BANK_SEL1. 2 Allocate bits 2 to 5 to BANK_SEL1. 3 Allocate bits 3 to 6 to BANK_SEL1. 4 Allocate bits 4 to 7 to BANK_SEL1. 5 Allocate bits 5 to 8 to BANK_SEL1. 6 Allocate 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 Allocate bits 8 to 11 to BANK_SEL1. A Allocate bits 9 to 12 to BANK_SEL1. A Allocate bits 10 to 13 to BANK_SEL1. C Allocate bits 11 to 14 to BANK_SEL1. B Allocate bits 12 to 15 to BANK_SEL1. C Allocate bits 12 to 15 to BANK_SEL1. LT_DISABLE Allocation (Option) 0 to F The settings are the same as for the V_PPI allocations. LT_DISABLE Allocation Enable/Disable Selection 0 Disable LT_DISABLE allocation.	

Continued from previous page.

Parameter	Size	N	ame	Setting Range	Setting	Default	When	Classifi-	Refer-		
No.			ld Allocations		Unit	Setting	Enabled	cation	ence		
	2	5	iu Allocations	0000h to 1D1Fh	_	0000h	After restart	Setup	*2		
		n.□□□X	Reserved par	rameter (Do not c	hange.)						
		n.□□X□	Reserved parameter (Do not change.)								
	Ī		OUT_SIGNAL	_ Allocation (Option	on)						
			0 Alloca	ate bits 0 to 2 to 0	DUT_SIGNA	L.					
				ate bits 1 to 3 to 0							
				ate bits 2 to 4 to 0							
				ate bits 3 to 5 to 0 ate bits 4 to 6 to 0							
D 005				ate bits 5 to 7 to 0							
Pn82E		n.□X□□	6 Alloca	ate bits 6 to 8 to 0	DUT_SIGNA	L.					
			7 Alloca	ate bits 7 to 9 to 0	DUT_SIGNA	L.					
				ate bits 8 to 10 to							
				ate bits 9 to 11 to							
				ate bits 10 to 12 t ate bits 11 to 13 t							
				ate bits 12 to 14 t							
			-	ate bits 13 to 15 t							
			OUT SIGNAL	_ Allocation Enab	le/Disable S	Selection					
		n.X□□□		ole OUT_SIGNAL							
			1 Enab	le OUT_SIGNAL a	Illocation.						
	2	Motion Set	ttings	0000h to 0001h	-	0000h	After restart	Setup	*2		
			Linear Accele	eration/Decelerati	on Constan	t Selection					
			0 Use F	Pn80A to Pn80F a			of Pn834 to Pr	n840 are			
		n.□□□X	0 Use Fignor	Pn80A to Pn80F a ed.)	ınd Pn827. (The settings					
Pn833		n.□□□X	0 Use fignor	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ınd Pn827. (The settings					
Pn833		n.000X n.00X0	0 Use Fignor 1 Use Fignor	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ind Pn827. (The settings			=		
Pn833			0 Use Fignor 1 Use Fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.)	The settings	The settings					
Pn833		n.00X0 n.0X00	0 Use Fignor 1 Use Fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c	The settings hange.)	The settings					
Pn833		n.□□X□	0 Use Fignor 1 Use Fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c	The settings hange.)	The settings					
Pn833		n.00X0 n.0X00 n.X000	0 Use Fignor 1 Use Fignor Reserved par Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c	The settings hange.) hange.)	The settings					
Pn833		n.□X□ n.□X□□ n.X□□□ First Stage	0 Use fignor 1 Use fignor Reserved par Reserved par Reserved par Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c rameter (Do not c	The settings hange.) Thange.) Thange.) Thange.) Thange.)	The settings			*2		
		n.□X□ n.□X□□ n.X□□□ First Stage eration Co	0 Use fignor 1 Use fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c rameter (Do not c	The settings hange.) hange.) hange.) 10,000 reference units/s²	The settings	o Pn80F and Pr	n827 are	*2		
		n.□X□ n.□X□□ n.X□□□ First Stage eration Co Second St	0 Use fignor 1 Use fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not corameter (Do not corameter (Do not corameter) 1 to 20,971,520	thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference	The settings	o Pn80F and Pr	n827 are	*2		
Pn834	4	n.□X□ n.□X□□ n.X□□□ First Stage eration Co Second St Acceleration	0 Use Fignor 1 Use Fignor Reserved par	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not c rameter (Do not c rameter (Do not c	thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s²	The settings of Pn80A to	Pn80F and Pr	n827 are			
Pn834	4	n.□X□ n.□X□□ n.X□□□ First Stage eration Co Second St Acceleration	0 Use Fignor 1 Use Fignor Reserved part Reserved part Reserved part Reserved part Reserved part Constant 2	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not corameter (Do not corameter (Do not corameter) 1 to 20,971,520	thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 1 reference unit/s²	The settings of Pn80A to	Pn80F and Pr	n827 are			
Pn834 Pn836	4	n.□\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	0 Use Fignor 1 Use Fignor Reserved par Reserved par Reserved par Reserved par Reserved par Constant 2 Con Constant Speed 2	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not co	thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 1 reference unit/s	The settings of Pn80A to	Immediately Immediately *9 Immediately *9	Setup	*2		
Pn834 Pn836	4	n.□□X□ n.□X□□ n.X□□□ First Stage eration Co Second St Acceleration Acceleration Switching First Stage	0 Use Fignor 1 Use Fignor Reserved par Reserved par Reserved par Reserved par Reserved par Constant 2 Con Constant Speed 2	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not corameter (Do not corameter (Do not corameter) 1 to 20,971,520 1 to 20,971,520 0 to	thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 1 reference unit/ s 10,000 reference	The settings of Pn80A to	Immediately Immediately *9 Immediately *9	Setup	*2		
Pn834 Pn836 Pn838	4 4	n.□□X□ n.□□□ n.X□□□ First Stage eration Co Second St Acceleration Acceleration Switching First Stage Deceleration	0 Use Fignor 1 Use Fignor 1 Use Fignor Reserved par Reser	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not co	thange.) thange.) thange.) thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 1 reference units/s² 10,000 reference unit/s s 10,000 reference units/s²	The settings of Pn80A to 100 100 0	Immediately *9 Immediately *9 Immediately *9 Immediately *9	Setup Setup Setup	*2		
Pn834 Pn836 Pn838	4 4	n.□□X□ n.□□X□□ n.X□□□ First Stage eration Co Second St Acceleration Acceleration Switching First Stage Deceleration Second St	0 Use Fignor 1 Use Fignor 1 Use Fignor Reserved par Reser	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not corameter (Do not corameter (Do not corameter) 1 to 20,971,520 1 to 20,971,520 0 to 2,097,152,000 1 to	thange.) thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s²	The settings of Pn80A to 100 100 0	Immediately *9 Immediately *9 Immediately *9 Immediately *9	Setup Setup Setup	*2		
Pn834 Pn836 Pn838 Pn83A	4 4 4	n.□□X□ n.□□X□□ n.X□□□ First Stage eration Co Second St Acceleration Acceleration Switching First Stage Deceleration Second St Deceleration	0 Use Fignor 1 Use Fignor 1 Use Fignor Reserved par Reser	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not c	thange.) thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s²	100 100	Immediately Immediately Immediately Immediately Immediately Immediately Immediately	Setup Setup Setup Setup	*2		
Pn834 Pn836 Pn838 Pn83A	4 4 4	n.□□X□ n.□□X□□ n.X□□□ First Stage eration Co Second St Acceleration Acceleration Switching First Stage Deceleration Second St Deceleration	0 Use fignor 1 Use fignor Reserved par Constant 2 Con Constant 2 Con Constant 2 Con Constant 2 Con Constant 2 Con Constant 2 Con Constant 2 Con Constant 2	Pn80A to Pn80F a ed.) Pn834 to Pn840. (ed.) Pn834 to Pn840. (ed.) rameter (Do not corameter (Do not c	thange.) thange.) thange.) thange.) thange.) thange.) 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s² 10,000 reference units/s²	100 100	Immediately Immediately Immediately Immediately Immediately Immediately Immediately	Setup Setup Setup Setup	*2		

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Parameter No.	Size	N	lame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
Pn840	4	Linear Dec Constant	celeration 2 for Stopping	1 to 20,971,520	10,000 reference units/s ²	100	Immediately	Setup	*2		
Pn842 *11	4	Second O Approach		0 to 20,971,520	100 refer- ence units/s	0	Immediately *9	Setup	*2		
Pn844 *12	4	Second O Approach		0 to 20,971,520	100 reference units/s	0	Immediately	Setup	*2		
Pn850	2	Number o Sequence		0 to 8	-	0	Immediately	Setup	*2		
Pn851	2	Continuou Sequence		0 to 255	-	0	Immediately	Setup	*2		
	2	Latch Sec Settings	uence 1 to 4	0000h to 3333h	_	0000h	Immediately	Setup	*2		
	- -	n.□□□X	0 Phase 1 EXT1 2 EXT2 3 EXT3	nce 1 Signal Sele e C signal signal signal							
Pn852		n.□□X□		ettings are the sa		e for the Late	ch Sequence 1	Signal Selec)- -		
		n.□X□□	Latch Sequence 3 Signal Selection 1 to 3 to 3 to 3 to 3 to 3 to 3 to 3 to								
		n.X000	XDDD								
	2	Latch Sec Settings	uence 5 to 8	0000h to 3333h	-	0000h	Immediately	Setup	*2		
		n.□□□X	0 Phase 1 EXT1 2 EXT2	nce 5 Signal Sele e C signal signal signal	ction						
Pn853		n.□□X□		nce 6 Signal Sele ettings are the sa		e for the Lato	ch Sequence 5	Signal Seled)-		
		n.□X□□	Latch Sequence 7 Signal Selection								
		n.X000		nce 8 Signal Sele ettings are the sa		e for the Late	ch Sequence 5	Signal Selec	>- 		
Pn880	2		ddress Moni- aintenance,	40h to 5Fh	-	-	-	Setup	_		

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Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
Pn882	2	ting Moni	sion Cycle Set- itor [x 0.25 μs] tenance, read	Oh to FFFFh	-	-	-	Setup	-		
Pn883	2	Setting M mission of	ications Cycle fonitor [trans- cycles] (for nce, read only)	0 to 32	-	-	-	Setup	-		
	2	Commun trols 2	ications Con-	0000h to 0001h	-	0000h	Immediately	Setup	-		
			MECHATROLI	NK Communication	ons Error H	olding Brake	Signal Setting	ı			
	n.	пппх		ain the status set b			OFF command	when a ME	CHA-		
Pn884			1 Apply	the holding brake	when a ME	CHATROLINI	K communication	ons error oc	curs.		
	n.		Reserved para	ameter (Do not ch	neter (Do not change.)						
	n.		Reserved para	Reserved parameter (Do not change.)							
	n.	XDDD	Reserved para	ameter (Do not ch	ange.)						
Pn88A	2	Monitor	ROLINK Error Counter tenance, read	0 to 65,535	-	0	-	Setup	_		
Pn890 to Pn89E	4	tor during	d Data Moni- g Alarm/Warn- tenance, read	Oh to FFFFFFFh	-	Oh	-	Setup	*2		
Pn8A0 to Pn8AE	4	during Al	e Data Monitor arm/Warning tenance, read	Oh to FFFFFFFh	-	Oh	_	Setup	*2		
Pn900	2	Number of Banks	of Parameter	0 to 16	-	0	After restart	Setup	*2		
Pn901	2	Number of Bank Me	of Parameter mbers	0 to 15	_	0	After restart	Setup	*2		
Pn902 to Pn910	2	Paramete ber Defin	er Bank Mem- ition	0000h to 08FFh	-	0000h	After restart	Setup	*2		
Pn920 to Pn95F	2		er Bank Data ed in nonvolatile	0000h to FFFFh	-	0000h	Immediately	Setup	*2		

- *1. Refer to the following manual for details.
 - \square Σ -7-Series Σ -7S SERVOPACK with MECHATROLINK-II Communications References Product Manual (Manual No.: SIEP S800001 27)
- *2. Refer to the following manual for details.
 - $\ \square$ Σ -7-Series AC Servo Drive MECHATROLINK-II Communications Command Manual (Manual No.: SIEP S800001
- *3. Set a percentage of the motor rated torque.
- *4. Normally set this parameter to 0. If you use an External Regenerative Resistor, set the capacity (W) of the External Regenerative Resistor.
- *5. The upper limit is the maximum output capacity (W) of the SERVOPACK.
- *6. These parameters are for SERVOPACKs with the dynamic brake option. Refer to the following manual for details. Σ -7-Series AC Servo Drive Σ -7S/ Σ -7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- *7. Enabled only when Pn61A is set to n.□□□2 or n.□□□3.
- *8. The parameter setting is enabled after SENS_ON command execution is completed.
- *9. 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.
- *10. The settings are updated only if the reference is stopped (i.e., only if DEN is set to 1).
- *11. The setting of Pn842 is valid while Pn817 is set to 0.
- *12. The setting of Pn844 is valid while Pn818 is set to 0.

Parameter Lists

4.1.3 Parameter Recording Table

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

Parameter No.	Default Setting	Name	When Enabled
Pn000	0000h	Basic Function Selections 0	After restart
Pn001	0000h	Application Function Selections 1	After restart
Pn002	0000h	Application Function Selections 2	After restart
Pn006	0002h	Application Function Selections 6	Immediately
Pn007	0000h	Application Function Selections 7	Immediately
Pn008	4000h	Application Function Selections 8	After restart
Pn009	0010h	Application Function Selections 9	After restart
Pn00A	0001h	Application Function Selections A	After restart
Pn00B	0000h	Application Function Selections B	After restart
Pn00C	0000h	Application Function Selections C	After restart
Pn00D	0000h	Application Function Selections D	After restart
Pn00F	0000h	Application Function Selections F	After restart
Pn021	0000h	Reserved parameter	_
Pn022	0000h	Reserved parameter	_
Pn040	0000h	Reserved parameter	_
Pn081	0000h	Application Function Selections 81	After restart
Pn100	400	Speed Loop Gain	Immediately
Pn101	2000	Speed Loop Integral Time Constant	Immediately
Pn102	400	Position Loop Gain	Immediately
Pn103	100	Moment of Inertia Ratio	Immediately
Pn104	400	Second Speed Loop Gain	Immediately
Pn105	2000	Second Speed Loop Integral Time Constant	Immediately
Pn106	400	Second Position Loop Gain	Immediately
Pn109	0	Feedforward	Immediately
Pn10A	0	Feedforward Filter Time Constant	Immediately
Pn10B	0000h	Gain Application Selections	*1
Pn10C	200	Mode Switching Level for Torque Reference	Immediately
Pn10D	0	Mode Switching Level for Speed Reference	Immediately
Pn10E	0	Mode Switching Level for Acceleration	Immediately
Pn10F	0	Mode Switching Level for Position Deviation	Immediately
Pn11F	0	Position Integral Time Constant	Immediately

4.1.3 Parameter Recording Table

Continued from previous page.

Name Enabled Pn121 100 Friction Componation Gain Immediately Pn122 100 Second Friction Componation Gain Immediately Second Friction Componation Gain Immediately Pn123 O Friction Componation Immediately Pn124 O Friction Componation Immediately Pn125 100 Friction Componation Immediately Immediately Pn126 O Priction Componation Immediately Immediately Pn131 O Gain Switching Time 1 Immediately Immediately Pn132 O Gain Switching Time 1 Immediately Immediately Pn135 O Gain Switching Waiting Immediately Immediately Pn136 O Gain Switching Waiting Immediately Imm	Daggara 1		Continued from p	
Pn122 100 Second Friction Compensation Sation Gain Immediately coefficient Pn123 0 Friction Compensation Coefficient Immediately coefficient Pn124 0 Friction Compensation Froquency Correction Immediately correction Pn125 100 Friction Compensation Gain Correction Immediately correction Pn131 0 Gain Switching Time 1 Immediately Immediately Gain Switching Time 2 Immediately Immediately Gain Switching Waiting Time 1 Immediately Immediately Immediately Gain Switching Waiting Time 2 Immediately Immediately Immediately Gain Switching Waiting Time 2 Immediately Immediately Immediately Immediately Gain Switching Control Related Selections 1 Immediately Immediately Immediately Gain Gain Correction Immediately Immediately Immediately Gain Correction Immediately Immediately Immediately Gain Correction Immediately Immediately Immediately Gain Correction Immediately Immediately Immediately Gain Correction Immediately Immediately Gain Corre	Parameter No.	Default Setting	Name	When Enabled
Pn123 0 Friction Compensation Coefficient Friction Compensation Frequency Correction Immediately Pn125 100 Friction Compensation Frequency Correction Immediately Pn136 100 Friction Compensation Frequency Correction Immediately Correction Immediately Correction Immediately Pn132 0 Gain Switching Time 1 Immediately Pn132 0 Gain Switching Time 1 Immediately Pn132 0 Gain Switching Time 1 Immediately Pn136 0 Gain Switching Time 2 Immediately Pn136 0 Gain Switching Waiting Immediately Pn139 0000h Automatic Gain Switching Switching Immediately Pn139 0000h Gain Switching Switch	Pn121	100	Friction Compensation Gain	Immediately
Pn124 0 Friction Compensation Frequency Correction	Pn122	100		Immediately
Pn125 100 Friction Compensation Gain Correction Immediately Pn131 0 Gain Switching Time 1 Immediately Pn132 0 Gain Switching Time 1 Immediately Pn132 0 Gain Switching Time 2 Immediately Pn135 0 Gain Switching Waiting Immediately Time 2 Immediately Pn136 0 Gain Switching Waiting Immediately Time 2 Immediately Time 2 Immediately Pn139 0000h Automatic Gain Switching Selections 1 Immediately Pn130 2000 Current Gain Level Immediately Pn140 0100h Model Following Control Related Selections Model Following Control Gain Correction Immediately Pn141 500 Model Following Control Gain Correction Immediately Model Following Control Gain Correction Immediately Bn142 1000 Model Following Control Gain Correction Immediately Biss in the Forward Direction Model Following Control Biss in the Forward Direction Model Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Model Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Woodle Following Control Biss in the Forward Direction Immediately Pn145 500 Pn146 700 Vibration Suppression 1 Immediately Pn146 700 Second Model Following Control Speed Feedforward Compensation Model Following Control Gain Correction Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn148 100 Control Gain Correction Immediately Pn148 100 Control Gain Correction Immediately Pn148 100 Control Related Selections After restart Correction Control Gain Correction Immediately Pn148 100 Anti-Resonance Control Related Selections Immediately Pn148 100 Anti-Resonance Control Immediately Immediately Pn148 100 Anti-Resonance Gain Correction Immediately Immediately Pn148 100 Anti-Resonance Control Immediately Immediately Pn148 100 Anti-Resonance Gain Correction Immediately Immed	Pn123	0		Immediately
Pn125 100	Pn124	0		Immediately
Pn132 0 Gain Switching Time 2 Immediately Immediately Time 1 Pn135 0 Gain Switching Waiting Time 1 Immediately Immediately Time 2 Pn136 0 Gain Switching Waiting Time 2 Immediately Immediately Immediately Immediately Selections 1 Pn139 0000h Automatic Gain Switching Selections 1 Immediately Immediately Immediately Selections 1 Pn140 0100h Model Following Control Related Selections 3 Immediately Immediately Immediately Immediately Gain Correction 3 Pn141 500 Model Following Control Gain Correction 3 Immediately Im	Pn125	100	Correction	Immediately
Pn135 0 Gain Switching Waiting Time 1 Immediately Immediately Time 2 Immediately Immediately Immediately Time 2 Immediately Immediately Immediately Time 2 Immediately Immediately Immediately Time 2 Immediately Immediately Immediately Selections 1 Immediately Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Immediately Requested Selections Immediately Immediately Immediately Immediately Requested Selections Immediately Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Immediately Immediately Immediately Immediately Related Selections Immediately Immediately Immediately Immediately Immediately Immediately Immediately Immediately Immediately Immediately Imme			9	-
Pn136	Pn132	0		Immediately
Pn139 0000h Selections 1 Immediately Pn13D 2000 Current Gain Level Immediately Pn140 0100h Model Following Control Related Selections 1 Immediately Pn141 500 Model Following Control Gain Correction Immediately Pn142 1000 Model Following Control Gain Correction Immediately Model Following Control Gain Correction Immediately Pn143 1000 Model Following Control Bias in the Forward Direction Immediately Model Following Control Bias in the Forward Direction Immediately Dn144 1000 Model Following Control Bias in the Reverse Direction Immediately Dn145 500 Wibration Suppression 1 Frequency A Wibration Suppression 1 Immediately Frequency B Model Following Control Speed Feedforward Compensation Model Following Control Speed Feedforward Compensation Model Following Control Speed Feedforward Compensation Second Model Following Control Gain Correction Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Control Gain Correction Immediately Pn148 100 Second Model Following Control Gain Correction Immediately Pn148 100 Vibration Suppression 2 Immediately Pn148 100 Vibration Suppression 2 Immediately Pn148 100 Control Gain Correction Immediately Pn148 100 Anti-Resonance Control-Related Selections After restart Pn160 0010h Anti-Resonance Gain Correction Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Frequency Immediately Immediately Anti-Resonance Gain Correction Immediately Anti-Resonance Frequency Immediately Immediately Anti-Resonance Frequency Immediately Immediately Anti-Resonance Frequency Immediately Immediately Anti-Resonance Frequency Immediately Immediately Anti-Resonance Filter Time Immediately Immediately Immediately Anti-Resonance Filter Time Immediately Im	Pn135	0	Time 1	Immediately
Pn13D 2000 Current Gain Level Immediately Pn140 0100h Model Following Control-Related Selections Immediately Pn141 500 Model Following Control Related Selections Immediately Pn142 1000 Model Following Control Gain Correction Immediately Pn143 1000 Model Following Control Gain Correction Immediately Pn144 1000 Model Following Control Bias in the Forward Direction Pn145 500 Model Following Control Bias in the Forward Direction Pn146 700 Model Following Control Bias in the Reverse Direction Pn147 1000 Model Following Control Bias in the Reverse Direction Pn148 500 Wibration Suppression 1 Immediately Frequency A Immediately Frequency B Model Following Control Speed Feedforward Compensation Pn148 500 Second Model Following Control Gain Correction Immediately Control Gain Correction Pn148 800 Wibration Suppression 2 Frequency Model Following Control Gain Correction Immediately Control Gain Correction Control Gain Correction Immediately Control Gain Correction Control Gain Correction Immediately Control Gain Correction Control Gain Correction Immediately Control Gain Correction Control Gain Correctio	Pn136	0	Time 2	Immediately
Pn140 0100h Model Following Control-Related Selections Immediately Pn141 500 Model Following Control Gain Immediately Pn142 1000 Model Following Control Gain Correction Immediately Pn143 1000 Model Following Control Bias in the Forward Direction Immediately Pn144 1000 Model Following Control Bias in the Reverse Direction Immediately Pn145 500 Vibration Suppression 1 Frequency A Immediately Pn146 700 Vibration Suppression 1 Frequency B Immediately Pn147 1000 Second Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 </td <td></td> <td>0000h</td> <td>Selections 1</td> <td>,</td>		0000h	Selections 1	,
Pn141 500 Model Following Control Gain Correction Immediately Pn142 1000 Model Following Control Gain Correction Immediately Pn143 1000 Model Following Control Bias in the Forward Direction Immediately Pn144 1000 Model Following Control Bias in the Reverse Direction Immediately Pn145 500 Vibration Suppression 1 Frequency A Immediately Pn146 700 Vibration Suppression 1 Frequency B Immediately Pn147 1000 Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn149 1000 Vibration Suppression 2 Frequency Immediately Pn149 1000 Vibration Suppression 2 Immediately Immediately Pn149 1000 Vibration Suppression 2 Immediately Immediately Pn149 1000	Pn13D	2000		Immediately
Pn142 1000 Gain Model Following Control Gain Correction Immediately Pn143 1000 Model Following Control Bias in the Forward Direction Model Following Control Bias in the Forward Direction Immediately Pn144 1000 Model Following Control Bias in the Reverse Direction Immediately Pn145 500 Vibration Suppression 1 Immediately Pn146 700 Vibration Suppression 1 Immediately Pn147 1000 Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn14A 800 Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14B 100 Control Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections After restart Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn140	0100h	Related Selections	Immediately
Pn143 1000 Gain Correction Immediately Model Following Control Bias in the Forward Direction Immediately the Forward Direction Model Following Control Bias in the Reverse Direction Immediately the Forward Direction Immediately the Forward Direction Immediately the Forward Direction Immediately the Forward Direction Immediately the Forward Direction Immediately Pn145 500 Vibration Suppression 1 Immediately Frequency A Vibration Suppression 1 Immediately Frequency B Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Vibration Suppression 2 Immediately Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14B 100 Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn162 100 Anti-Resonance Frequency Immediately Pn163 0 Anti-Resonance Gain Correction Immediately Pn164 0 Anti-Resonance Damping Immediately Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately Immediately Pn164 0 Immediately Immedia	Pn141	500	Gain	Immediately
Pn143 1000 Bias in the Forward Direction Immediately Pn144 1000 Model Following Control Bias in the Reverse Direction Immediately Pn145 500 Vibration Suppression 1 Frequency A Immediately Pn146 700 Vibration Suppression 1 Frequency B Immediately Pn147 1000 Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn14A 800 Vibration Suppression 2 Immediately Immediately Pn14B 100 Vibration Suppression 2 Immediately Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Damping Gain Correction Immediately Pn163 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn142	1000	Gain Correction	Immediately
Pn144 1000 Bias in the Reverse Direction Immediately Pn145 500 Vibration Suppression 1 Frequency A Immediately Pn146 700 Vibration Suppression 1 Frequency B Immediately Pn147 1000 Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Correction Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn14A 800 Vibration Suppression 2 Frequency Immediately Pn14B 100 Vibration Suppression 2 Frequency Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Damping Gain Immediately Pn163 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn143	1000	Bias in the Forward Direc-	Immediately
Pn146 700 Frequency A Vibration Suppression 1 Immediately Pn147 1000 Model Following Control Speed Feedforward Compensation Immediately Pn148 500 Second Model Following Control Gain Immediately Pn149 1000 Second Model Following Control Gain Correction Immediately Pn14A 800 Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14B 100 Control Gain Correction Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Gain Immediately Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately I	Pn144	1000	Bias in the Reverse Direc-	Immediately
Pn147 1000 Frequency B Model Following Control Speed Feedforward Compensation Pn148 500 Second Model Following Control Gain Immediately Pn149 1000 Second Model Following Control Gain Correction Pn14A 800 Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14B 100 Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Gain Immediately Pn164 0 Immediately Pn164 1 Immediately Pn165 Immediately Pn166 Immediately Pn167 Immediately Pn168 Immediately Pn168 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn169 Immediately Pn160 Immediately Pn161 Immediately	Pn145	500	Vibration Suppression 1 Frequency A	Immediately
Pn1471000Speed Feedforward CompensationImmediatelyPn148500Second Model Following Control GainImmediatelyPn1491000Second Model Following Control Gain CorrectionImmediatelyPn14A800Vibration Suppression 2 FrequencyImmediatelyPn14B100Vibration Suppression 2 CorrectionImmediatelyPn14F0021hControl-Related SelectionsAfter restartPn1600010hAnti-Resonance Control-Related SelectionsImmediatelyPn1611000Anti-Resonance FrequencyImmediatelyPn162100Anti-Resonance Gain CorrectionImmediatelyPn1630Anti-Resonance Damping GainImmediatelyPn1640Anti-Resonance Filter Time Constant 1 CorrectionImmediately	Pn146	700	Frequency B	Immediately
Pn149 1000 Second Model Following Control Gain Second Model Following Control Gain Correction Immediately Pn14A 800 Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Pn163 0 Anti-Resonance Damping Gain Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn147	1000	Speed Feedforward Compensation	Immediately
Pn144 800 Control Gain Correction Vibration Suppression 2 Immediately Pn14B 100 Vibration Suppression 2 Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Pn163 0 Anti-Resonance Damping Gain Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn148	500		Immediately
Pn14B 100 Frequency Wibration Suppression 2 Correction Immediately Pn14F 0021h Control-Related Selections After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Pn163 0 Anti-Resonance Damping Gain Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn149	1000	Control Gain Correction	Immediately
Pn14F 0021h Correction After restart Pn160 0010h Anti-Resonance Control-Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Gain Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn14A	800		Immediately
Pn1600010hAnti-Resonance Control-Related SelectionsImmediatelyPn1611000Anti-Resonance FrequencyImmediatelyPn162100Anti-Resonance Gain CorrectionImmediatelyPn1630Anti-Resonance Damping GainImmediatelyPn1640Anti-Resonance Filter Time Constant 1 CorrectionImmediately	Pn14B		Correction	Immediately
Pn160 0010n Related Selections Immediately Pn161 1000 Anti-Resonance Frequency Immediately Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Gain Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn14F	0021h		After restart
Pn162 100 Anti-Resonance Gain Correction Immediately Pn163 0 Anti-Resonance Damping Gain Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn160	0010h		
Pn162 100 rection Immediately Pn163 0 Anti-Resonance Damping Gain Immediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn161	1000		Immediately
Pn163 0 Gain Infinediately Pn164 0 Anti-Resonance Filter Time Constant 1 Correction Immediately	Pn162	100		Immediately
Constant 1 Correction Immediately	Pn163	0	Gain	Immediately
Continued on next page	Pn164	0	Constant 1 Correction	

Parameter	Default Catting	Name	When
No.	Default Setting		Enabled
Pn165	0	Anti-Resonance Filter Time Constant 2 Correction	Immediately
Pn166	0	Anti-Resonance Damping Gain 2	Immediately
Pn170	1401h	Tuning-less Function- Related Selections	*1
Pn205	65535	Multiturn Limit	After restart
Pn207	0010h	Position Control Function Selections	After restart
Pn20A	32768	Number of External Encoder 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
Pn22A	0000h	Fully-closed Control Selections	After restart
Pn230	0000h	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
Pn304	500	Jogging Speed	Immediately
Pn305	0	Soft Start Acceleration Time	Immediately
Pn306	0	Soft Start Deceleration Time	Immediately
Pn308	0	Speed Feedback Filter Time Constant	Immediately
Pn30A	0	Deceleration Time for Servo OFF and Forced Stops	Immediately
Pn30C	0	Speed Feedforward Average Movement Time	Immediately
Pn310	0000h	Vibration Detection Selections	Immediately
Pn311	100	Vibration Detection Sensitivity	Immediately
Pn312	50	Vibration Detection Level	Immediately
Pn316	10000	Maximum Motor Speed	After restart
Pn324	300	Moment of Inertia Calculation Starting Level	Immediately
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

4.1.3 Parameter Recording Table

Continued from previous page.

		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn407	10000	Speed Limit during Torque Control	Immediately
Pn408	0000h	Torque-Related Function Selections	*1
Pn409	5000	First Stage Notch Filter Frequency	Immediately
Pn40A	70	First Stage Notch Filter Q Value	Immediately
Pn40B	0	First Stage Notch Filter Depth	Immediately
Pn40C	5000	Second Stage Notch Filter Frequency	Immediately
Pn40D	70	Second Stage Notch Filter Q Value	Immediately
Pn40E	0	Second Stage Notch Filter Depth	Immediately
Pn40F	5000	Second Stage Second Torque Reference Filter Frequency	Immediately
Pn410	50	Second Stage Second Torque Reference Filter Q Value	Immediately
Pn412	100	First Stage Second Torque Reference Filter Time Con- stant	Immediately
Pn416	0000h	Torque-Related Function Selections 2	Immediately
Pn417	5000	Third Stage Notch Filter Frequency	Immediately
Pn418	70	Third Stage Notch Filter Q Value	Immediately
Pn419	0	Third Stage Notch Filter Depth	Immediately
Pn41A	5000	Fourth Stage Notch Filter Frequency	Immediately
Pn41B	70	Fourth Stage Notch Filter Q Value	Immediately
Pn41C	0	Fourth Stage Notch Filter Depth	Immediately
Pn41D	5000	Fifth Stage Notch Filter Frequency	Immediately
Pn41E	70	Fifth Stage Notch Filter Q Value	Immediately
Pn41F	0	Fifth Stage Notch Filter Depth	Immediately
Pn423	0000h	Reserved parameter	_
Pn424	50	Torque Limit at Main Circuit Voltage Drop	Immediately
Pn425	100	Release Time for Torque Limit at Main Circuit Voltage Drop	Immediately
Pn426	0	Torque Feedforward Average Movement Time	Immediately
Pn427	0	Reserved parameter	-
Pn456	15	Sweep Torque Reference Amplitude	Immediately

Parameter	Default Setting	Continued from Name	When
No.	Delault Setting		Enabled
Pn460	0101h	Notch Filter Adjustment Selections 1	Immediately
Pn475	0000h	Gravity Compensation- Related Selections	After restart
Pn476	0	Gravity Compensation Torque	Immediately
Pn502	20	Rotation Detection Level	Immediately
Pn503	10	Speed Coincidence Detection Signal Output Width	Immediately
Pn506	0	Brake Reference-Servo OFF Delay Time	Immediately
Pn507	100	Brake Reference Output Speed Level	Immediately
Pn508	50	Servo OFF-Brake Com- mand Waiting Time	Immediately
Pn509	20	Momentary Power Interruption Hold Time	Immediately
Pn50A	1881h	Input Signal Selections 1	After restart
Pn50B	8882h	Input Signal Selections 2	After restart
Pn50E	0000h	Output Signal Selections 1	After restart
Pn50F	0100h	Output Signal Selections 2	After restart
Pn510	0000h	Output Signal Selections 3	After restart
Pn511	6543h	Input Signal Selections 5	After restart
Pn512	0000h	Output Signal Inverse Settings	After restart
Pn514	0000h	Output Signal Selections 4	After restart
Pn516	8888h	Input Signal Selections 7	After restart
Pn51B	1000	Motor-Load Position Deviation Overflow Detection Level	Immediately
Pn51E	100	Position Deviation Over- flow Warning Level	Immediately
Pn520	5242880	Position Deviation Over- flow Alarm Level	Immediately
Pn522	7	Positioning Completed Width	Immediately
Pn524	1073741824	Near Signal Width	Immediately
Pn526	5242880	Position Deviation Over- flow Alarm Level at Servo ON	Immediately
Pn528	100	Position Deviation Over- flow Warning Level at Servo ON	Immediately
Pn529	10000	Speed Limit Level at Servo ON	Immediately
Pn52A	20	Multiplier per Fully-closed Rotation	Immediately
Pn52B	20	Overload Warning Level	Immediately
Pn52C	100	Base Current Derating at Motor Overload Detection	After restart
Pn530	0000h	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately

4.1.3 Parameter Recording Table

Continued from previous page.

		Continued from p	
Parameter No.	Default Setting	Name	When Enabled
Pn533	500	Program Jogging Movement Speed	Immediately
Pn534	100	Program Jogging Acceleration/Deceleration Time	Immediately
Pn535	100	Program Jogging Waiting Time	Immediately
Pn536	1	Program Jogging Number of Movements	Immediately
Pn550	0	Analog Monitor 1 Offset Voltage	Immediately
Pn551	0	Analog Monitor 2 Offset Voltage	Immediately
Pn552	100	Analog Monitor 1 Magnifi- cation	Immediately
Pn553	100	Analog Monitor 2 Magnifi- cation	Immediately
Pn55A	1	Power Consumption Monitor Unit Time	Immediately
Pn560	400	Residual Vibration Detection Width	Immediately
Pn561	100	Overshoot Detection Level	Immediately
Pn600	0	Regenerative Resistor Capacity	Immediately
Pn601	0	Dynamic Brake Resistor Allowable Energy Consumption	After restart
Pn603	0	Regenerative Resistance	Immediately
Pn604	0	Dynamic Brake Resistance	After restart
Pn800	0040h	Communications Controls	Immediately
Pn801	0003h	Application Function Selections 6 (Software Limits)	Immediately
Pn803	10	Origin Range	Immediately
Pn804	1073741823	Forward Software Limit	Immediately
Pn806	-1073741823	Reverse Software Limit	Immediately
Pn808	0	Absolute Encoder Origin Offset	Immedi- ately*2
Pn80A	100	First Stage Linear Acceleration Constant	Immedi- ately*3
Pn80B	100	Second Stage Linear Acceleration Constant	Immedi- ately*3
Pn80C	0	Acceleration Constant Switching Speed	Immedi- ately*3
Pn80D	100	First Stage Linear Deceleration Constant	Immedi- ately*3
Pn80E	100	Second Stage Linear Deceleration Constant	Immedi- ately*3
Pn80F	0	Deceleration Constant Switching Speed	Immedi- ately*3
Pn810	0	Exponential Acceleration/ Deceleration Bias	Immedi- ately*3
Pn811	0	Exponential Acceleration/ Deceleration Time Constant	Immedi- ately*3
Pn812	0	Movement Average Time	Immedi- ately*3

Continued from previous p						
Parameter No.	Default Setting	Name	When Enabled			
Pn814	100	External Positioning Final Travel Distance	Immedi- ately*3			
Pn816	0000h	Origin Return Mode Set- tings	Immedi- ately*3			
Pn817	50	Origin Approach Speed 1	Immedi- ately*3			
Pn818	5	Origin Approach Speed 2	Immedi- ately*3			
Pn819	100	Final Travel Distance for Origin Return	Immedi- ately*3			
Pn81E	0000h	Input Signal Monitor Selections	Immediately			
Pn81F	0000h0010h	Command Data Allocations	After restart			
Pn820	0	Forward Latching Area	Immediately			
Pn822	0	Reverse Latching Area	Immediately			
Pn824	0000h	Option Monitor 1 Selection	Immediately			
Pn825	0000h	Option Monitor 2 Selection	Immediately			
Pn827	100	Linear Deceleration Constant 1 for Stopping	Immedi- ately*3			
Pn829	0	SVOFF Waiting Time (for SVOFF at Deceleration to Stop)	Immediately			
Pn82A	1813h	Option Field Allocations 1	After restart			
Pn82B	1D1Ch	Option Field Allocations 2	After restart			
Pn82C	1F1Eh	Option Field Allocations 3	After restart			
Pn82D	0000h	Option Field Allocations 4	After restart			
Pn82E	0000h	Option Field Allocations 5	After restart			
Pn833	0000h	Motion Settings	After restart			
Pn834	100	First Stage Linear Acceleration Constant 2	Immedi- ately*3			
Pn836	100	Second Stage Linear Acceleration Constant 2	Immedi- ately*3			
Pn838	0	Acceleration Constant Switching Speed 2	Immedi- ately*3			
Pn83A	100	First Stage Linear Deceleration Constant 2	Immedi- ately*3			
Pn83C	100	Second Stage Linear Deceleration Constant 2	Immedi- ately*3			
Pn83E	0	Deceleration Constant Switching Speed 2	Immedi- ately*3			
Pn840	100	Linear Deceleration Constant 2 for Stopping	Immedi- ately*3			
Pn842	0	Second Origin Approach Speed 1	Immedi- ately*3			
Pn844	0	Second Origin Approach Speed 2	Immedi- ately*3			
Pn850	0	Number of Latch Sequences	Immediately			
Pn851	0	Continuous Latch Sequence Count	Immediately			
Pn852	0000h	Latch Sequence 1 to 4 Settings	Immediately			

4.1.3 Parameter Recording Table

Continued from previous page.

Parameter No.	Default Setting	Name	When Enabled
Pn853	0000h	Latch Sequence 5 to 8 Settings	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 [x 0.25 μs] (for maintenance, read only)	_
Pn883	_	Communications Cycle Setting Monitor [transmis- sion cycles] (for mainte- nance, read only)	-
Pn884	0000h	Communications Controls 2	Immediately
Pn88A	0	MECHATROLINK Receive Error Counter Monitor (for maintenance, read only)	-
Pn890 to Pn89E	Oh	Command Data Monitor during Alarm/Warning (for maintenance, read only)	-
Pn8A0 to Pn8AE	Oh	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	0000h	Parameter Bank Member Definition	After restart
Pn920 to Pn95F	0000h	Parameter Bank Data (Not saved in nonvolatile memory.)	Immediately

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

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

*2. 4.1.2 List of Parameters on page 4-3

^{*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.

4.2.1 Interpreting the Parameter Lists

"After restart" indicates parameters that will be effective after one of the following is executed.

- The power supply is turned OFF and ON again.
- The CONFIG command is sent.
- A software reset is executed.

Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence
	2	Basic Fund	ction Selections 0	0000h to 10B1h	=	0000h	After restart	Setup	-
profile. • M2	Parameters that are valid only for a MECHATROLINK-II-compatible profile.								
Pn000			Rotation Direct	ion Selection				Refere	ence
M3	n	n.□□□X	0 Use 0	CCW as the forward	d direction.			*1	
			1 Use C	CW as the forward	direction. (Re	everse Rotati	on Mode)		
	n	n.□□X□	Reserved para	meter (Do not cha	nge.)				
	n	n.□X□□	Reserved para	meter (Do not cha	nge.)				
	n.X□□□ Rotary/Linear Servomotor Startup Selection When Encoder Is Not Connected F								ence
	When an encoder is not connected, start as SERVOPACK for Rotary Servomotor.							*1	
			1 Reser	ved setting (Do no	t use.)				

List of Servo Parameters 4.2.2

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

Parameter No.	Size	Name			Setting Range	Setting Unit	Default Setting	When Enabled	Clas		Refer- ence
	2	Basic Fur	nction Sele	ections 0	000h0 to 10B1h	-	0000h	After restart	Set	up	-
				Rotation Direction Selection						Refe	rence
	n	.□□□X	1	Use CCW as the forward direction. Use CW as the forward direction. (Reverse Rotation Mode)						. *	*1
	n	.0000				,					
Pn000		······································									
	n	.0X00	1		eter (Do not char	O ,					
			Rotary/L nected	inear Ser	vomotor Startup	Selection	When Enc	oder Is Not Co	n-	Refe	rence
	n	.X000	0		n encoder is not Servomotor.	connected	, start as SE	ERVOPACK for			*1
			1	Reserve	ed setting (Do not	use.)					
								T			
	2	Applications 1	on Functio	n Selec-	0000h to 1142h	_	0000h	After restart	Set	up	-
			Motor Stopping Method for Servo OFF and Group 1 Alarms						Refe	rence	
	n	.000X	0	Stop the motor by applying the dynamic brake.Stop the motor by the applying dynamic brake and then r			00				
		.000%	1		the dynamic brake.					*	1
			2	Coast th	ne motor to a sto	p without t	he dynamic	brake.			
			Overtrav	el Stoppi	ing Method					Refe	rence
			0		ne dynamic brake g method set in F			a stop (use the	е		
			1			notor to a stop using the torque set in Pn406 rque and then servo-lock the motor.		as			
Pn001	n	.□□X□	2		ate the motor to imum torque and				as	*	*1
			3		ate the motor to and then servo-lo	a stop using the deceleration time set in			t in		
			4		ate the motor to and then let the r			eration time se	t in		
			Main Cir	cuit Pow	er Supply AC/D0	C Input Sel	ection			Refe	rence
			0	Input AC	D power as the m terminals (do not	ain circuit p	ower suppl		L2,		
	n	.DXDD	1	and ⊖ :	C power as the m 2 terminals or the er or the shared o	e B1 and ⊖		, 0	-	*	*1
	n	.X000	Reserved	d parame	eter (Do not char	nge.)					

Default

Setting

0011h

Setting

Unit

Setting Range

0000h to 4213h

Reserved setting (Do not use.)

MECHATROLINK Command Position and Speed Control Option

cation

Setup

Refer-

ence

Reference

When

Enabled

After restart

	0	r
_	220	ב

	n.□□□X	2 3	Reserve	M as the torque d setting (Do no	t use.)				*2		
		3	Reserve	d setting (Do no							
			3 Reserved setting (Do not use.)								
		Torque C	ontrol Op	otion				Ref	erence		
	n.□□X□	0	Reserve	d setting (Do no	ot use.)				*2		
		1	Use the	speed limit for	orque contr	rol (VLIM) as	s the speed limi	it.	*2		
Pn002		Encoder	Usage					Ref	erence		
		0									
	n.□X□□	1	Use the	encoder as an	ncremental	encoder.			*1		
		2	Use the	encoder as a si	ngle-turn al	osolute enc	oder.				
		Evternal	Encoder	Heade				Ref	erence		
		0		use an external	ancoder			nei	Elelic		
				ernal encoder m		forward dire	ection for CCW				
	n.X□□□	1	motor ro		0 100 111 1110	ioi wara aire	3011011101 0011				
	11.7000	2	Reserve	d setting (Do no	t use.)				-		
		3	The external encoder moves in the reverse direction for CCW								
		1	motor rotation. 4 Reserved setting (Do not use.)								
		7	11030170	a setting (bo ne	n usc.)						
	a Applicat	tion Function	n Selec-	0000h to		00001		•	T.		
	2 tions 6		00.00	105Fh	_	0002h	Immediately	Setup	*		
	Analog Monitor 1 Signal Selection										
		00									
		01	Speed reference (1 V/1,000 min ⁻¹)								
		02	Torque reference (1 V/100% rated torque)								
		03	Position deviation (0.05 V/reference unit)								
		04	Position amplifier deviation (after electronic gear) (0.05 V/encode						se uni		
		05	Positio	Position reference speed (1 V/1,000 min ⁻¹)							
		06									
		07									
	n.□□XX	08		oning completio	n (positionin	ng complete	ed: 5 V, position	ing not co	m-		
n006	II.LLAX	00	pieted: U V)								
		09		V/1,000 min ⁻¹)							
		OA OB		Torque feedforward (1 V/100% rated torque)							
		0C	OB Active gain (1st gain: 1 V, 2nd gain: 2 V) Completion of position reference distribution (completed: 5 V, nd						n-		
			pleted: 0 V)								
		OD OF			•	ou min ': vai	lue at the moto	r snaπ)			
		0E 0F	0E Reserved setting (Do not use.)								
			3(
		_	10 Main circuit DC voltage								
		11 to 5F Reserved settings (Do not use.)									
	n.□X□□	Reserved	d parame	ter (Do not cha	nge.)						
		Reserved parameter (Do not change.)									

Parameter

No.

Size

2

Name

Application Function Selections 2

4.2.2 List of Servo Parameters

Continued from previous page.

								Continued						
Parameter No.	Size	Name			Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence				
	2	Applications 7	on Function	Selec-	0000h to 105Fh	-	0000h	Immediately	Setup	*1				
		Analog Monitor 2 Signal Selection												
			00 Motor speed (1 V/1,000 min ⁻¹)											
			01											
			02		e reference (1 V/		·			<u></u>				
			03		on deviation (0.0		<u>'''</u>							
			04		on amplifier devia			ear) (0.05 V/en	coder puls	e unit)				
			05		on reference spe	,	Ŭ	, (
			06		ved setting (Do r		,			<u></u>				
			07	Load-	motor position d	eviation (0.0	01 V/referer	nce unit)						
	n	.□□XX	08	Position	oning completion	(positionin	g complete	d: 5 V, position	ning not cor	m-				
Pn007			09		d feedforward (1	V/1 000 mii	n ⁻¹)							
			0A		e feedforward (1	-								
			0B							<u></u>				
			0C	Completion of position reference distribution (completed: 5 V, not com-										
			0D	pieted: 0 V)										
			OE Reserved setting (Do not use.)											
			OF Reserved setting (Do not use.)											
			10		circuit DC voltage									
			11 to 5F Reserved settings (Do not use.)											
	n.□X□□ Reserved parameter (Do not change.)													
	n.X□□□ Reserved parameter (Do not change.)													
	2	Applications 8	on Function	Selec-	0000h to 7121h	-	4000h	After restart	Setup	-				
		1			I.			II.	I					
	Low Battery Voltage Alarm/Warning Selection								Refer	ence				
	n	.000X			alarm (A.830) for									
			Output warning (A.930) for low battery voltage. ** 1 Output warning (A.930) for low battery voltage. ** ** ** ** ** ** ** ** **							<u> </u>				
			Function Selection for Undervoltage Reference											
			0 Do not detect undervoltage.											
Pn008	n.	.DDXD	1 [Detect u	ındervoltage war	ning and lir	nit torque a	t host controlle	er.	I				
			2 [Detect u Pn425 (undervoltage war i.e., only in SER\	ning and Iir 'OPACK).	mit torque v	vith Pn424 and	I					
			Warning D	etectio	n Selection				Refer	ence				
	n.	X	0 0	Detect v	varnings.					0.00				
			1 [Do not d	detect warnings	except for A	A.971.		page	J-82				
	r	.X000	Reserved	naramo	iter (Do not char	ine)								
	n.XDDD Reserved parameter (Do not change.)													

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	3	1	7
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Parameter No.	2 Size	Application	Name		Cotting Dange	Setting	Default	When	Class	siii-	Refer-								
	2	Application			Setting Range	Unit	Setting	Enabled	catio	on	ence								
		tions 9	n Function	Selec-	0000h to 0121h	-	0010h	After restart	Tuni	ng	_								
	n.□□□X Reserved parameter (Do not change.)																		
			Current Control Mode Selection 0 Use current control mode 1.								ence								
			0		OPACK Models S	-	BA and -5R5	A: Use current	t										
D - 000	n.l		1		l mode 1. DPACK Models S	GD7S-120	A -18∩A a	nd -330A·		*	1								
Pn009					irrent control mo		71, 10071, a	110 00071.											
			2	Use curi	rent control mode	∋ 2.													
			-		Method Selection	n				Refer	ence								
	n.l		0	- '	ed detection 1. ed detection 2.					*	i								
	n \	XDDD			ter (Do not char	190)													
	11.7		neserveu	parame	ter (Do not char	ige.)													
		Annlicatio	n Function	Selec-	0000h to				_										
_	2	tions A		1 00100	0044h	_	0001h	After restart	Setu	dr									
				Motor Stopping Method for Group 2 Alarms Apply the dynamic brake or coast the motor to a stop (use the							rence								
			0	stopping method set in Pn001 = n.□□□X). Decelerate the motor to a stop using the torque set in Pn406 as															
			1	the max	rate the motor to kimum torque. Us after stopping.	a stop usir se the settir	ng the torquing of Pn001	e set in Pn406 = n.□□□X fo	r the										
	n.	n.□□□X	2	Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.							*1								
											3		Use the setting	a stop using the deceleration time set in of Pn001 = n.□□□X for the status after					
			4		ate the motor to and then let the			eration time se	et in										
Pn00A			Stopping		d for Forced Sto					Refe	rence								
			0		ne dynamic brak g method set in			a stop (use th	ne										
		Decelerate the motor to a stop using the torque set in Pn4 the maximum torque. Use the setting of Pn001 = n.□□□X																	
	n.	n.00X0	2	status after stopping. Decelerate the motor to a stop using the torque set in Pn406 as the maximum torque and then let the motor coast.							*1								
			Decelerate the motor to a stop using the deceleration time set in Pn30A. Use the setting of Pn001 = n. □□□□X for the status after stopping.																
			4		rate the motor to and then let the			eration time se	et in										
	n.	.0X00	Reserved	d parame	eter (Do not cha	nge.)													
	n.	.X000	Reserved	d parame	eter (Do not cha	nge.)													

4.2.2 List of Servo Parameters

Continued from previous page.

_								Continued				
Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled		ssifi- ition	Refer- ence	
	2	Applicati tions B	on Functio	on Selec-	0000h to 1121h	_	0000h	After restart	Se	etup	_	
			Operator	Paramet	er Display Selec	tion				Refer	ence	
	n.l	□□□Х	0	Display o	only setup param	eters.				*	,	
			1	Display a	all parameters.					*1		
			Motor St	opping M	lethod for Group	2 Alarms				Refer	ence	
			0	Stop the	motor by setting	g the speed	l reference	to 0.				
Pn00B	n.l		1	Apply the dynamic brake or coast the motor to a stop (use the stopping method set in Pn001 = n.□□□X).							1	
			2									
			D							D. (-		
			Power In	•	tion for Three-pree-phase power					Refer	ence	
	n.l				ree-phase power			ale-phase powe	er	*	1	
			1	supply in			ar ao a o	gio prideo peri				
	n.	XDDD	Reserved	d paramet	ter (Do not chan	ge.)						
	(, , , , , , , , , , , , , , , , , , ,											
	2	Applicati	on Functio	on Selec-	0000h to	_	0000h	After restart	Se	etup	*1	
		tions C			0131h		000011	Altor restart	00	rup		
		.000X	Function Selection for Test without a Motor									
	n.		1	Disable tests without a motor. Enable tests without a motor.								
		n.00X0	Encoder 0	Use 13	on for Tests with	out a Moto	or					
Pn00C	n		1	Use 20								
			2	Use 22								
			3	Use 24	bits.							
			Encoder	r Type Sel	ection for Tests	without a N	Motor					
	n.	.0X00	Encoder Type Selection for Tests without a Motor 0 Use an incremental encoder.									
			1 Use an absolute encoder.									
	n.	.X000	Reserve	d parame	eter (Do not char	nge.)						
					(1 1 1 1	<i>3-</i> /						
		Applicati	on Functio	on Selec-	0000h to		00001-	Λ 64 a a a 4 a 4	0.		*1	
	2	tions D			1001h	-	0000h	After restart	56	etup	*1	
	_		.									
	n.	.000X	Reserve	d parame	eter (Do not char	nge.)						
	n.	.00X0	Reserve	d parame	eter (Do not char	nge.)						
Pn00D	n.	.0X00	Reserve	d parame	eter (Do not char	nge.)						
				•	`	0 ,						
	n	.X000	Overtrav	1	ng Detection Sel							
	11.		1		overtravel warnin							

								Continued				
Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Applica tions F	ition Functio	n Selec-	0000h to 2011h	-	0000h	After restart	Setup	_		
			Preventa	ative Mair	ntenance Warnin	g Selection	n		Refere	nce		
	r	n.000X	0	Do not de	etect preventative	e maintenar	nce warning	S.	*1			
Pn00F			1	Detect preventative maintenance warnings.								
	r	n.□□X□	Reserve	Reserved parameter (Do not change.)								
	r	n.□X□□	Reserve	Reserved parameter (Do not change.)								
	r	n.X000	Reserve	Reserved parameter (Do not change.)								
Pn021	2	Reserv not cha	ed parameto ange.)	er (Do	_	-	0000h	_	_	-		
Pn022	2	Reserv not cha	ed paramet ange.)	er (Do	-	-	0000h	_	-	-		
Pn040	2	Reserv not cha	ed parameto ange.)	er (Do	-	-	0000h	-	-	-		
	2	Applica	ition Functio	n Selec-	0000h to 1111h	-	0000h	After restart	Setup	*1		
			Phase-C	se-C Pulse Output Selection								
	n.□□□X		0	0 Output phase-C pulses only in the forward direction.								
Pn081			1	1 Output phase-C pulses in both the forward and reverse directions.								
111001	r	n.□□X□	Reserve	Reserved parameter (Do not change.)								
			России	d navama	star (Da nat abor	200						
	n.□X□□ Reserved parameter (Do not change.)											
	n.XDDD Reserved parameter (Do not change.)											
						,						
Pn100	2		Loop Gain		10 to 20,000	0.1 Hz	400	Immediately	Tuning	*1		
Pn101	2	Speed Consta	Loop Integr nt	al Time	15 to 51,200	0.01 ms	2000	Immediately	Tuning	*1		
Pn102	2	Positio	n Loop Gair	1	10 to 20,000	0.1/s	400	Immediately	Tuning	*1		
Pn103	2		nt of Inertia I		0 to 20,000	1%	100	Immediately	Tuning	*1		
Pn104	2		d Speed Loc	<u>'</u>	10 to 20,000	0.1 Hz	400	Immediately	Tuning	*1		
Pn105	2		d Speed Loo ne Constant		15 to 51,200	0.01 ms	2000	Immediately	Tuning	*1		
Pn106	2	Second	d Position Lo	oop Gain	10 to 20,000	0.1/s	400	Immediately	Tuning	*1		
Pn109	2	Feedfo	rward		0 to 100	1%	0	Immediately	Tuning	*1		
Pn10A	2	Feedfo Consta	rward Filter nt	Time	0 to 6,400	0.01 ms	0	Immediately	Tuning	*1		

Continued from previous page.

D												us page.	
Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	Wh Enal	-	Class		Refer- ence	
	2	Gain App	lication Se	lections	0000h to 5334h	-	0000h	_		Setu	р	_	
		1											
			Mode Sv	vitching	Selection				Whe Enab		Refer	rence	
			0		internal torque r etting: Pn10C).	eference as	the conditi	ion					
	n.	.000X	1	•	speed reference	as the con	idition (level	set-					
			2		acceleration reference as the condition (level Pn10E).				Immedi- ately *1		1		
Pn10B			3	Use the ting: Pn	e position deviation as the condition (level set- n10F).								
			4	Do not i	use mode switch	ing.							
			Speed Lo	oop Con	trol Method				Whe Enab		Reference		
	n.	.00X0	0	PI contr					After		*1		
			1 2 and 3	I-P cont	rol ed settings (Do n	ot use)			resta		*1		
	n.	.0X00	Reserved	d parame	eter (Do not char	nge.)							
	n.	XDDD	Reserved	d parame	eter (Do not char	nge.)							
Pn10C	2	Mode Sw	ritching Le	vel for	0 to 800	1%	200	Immoo	liatalı	Tunin		*1	
FILLOC		Torque Re	eference ritching Le		0 10 600	1 70	200	Immed	пасету	Tunir	ig	*1	
Pn10D	2	Speed Re	eference		0 to 10,000	1 min ⁻¹	0	Immed	liately	Tunir	ng	*1	
Pn10E	2	Mode Sw Accelerat	itching Lei ion	vel for	0 to 30,000	1 min ⁻¹ /s	0	Immed	liately	Tunir	ng	*1	
Pn10F	2	Mode Sw Position [ritching Le Deviation	vel for	0 to 10,000	1 refer- ence unit	0	Immed	liately	Tunir	ng	*1	
Pn11F	2	stant	ntegral Tin		0 to 50,000	0.1 ms	0	Immed	liately	Tunir	ng	*1	
Pn121	2	Gain	compensat		10 to 1,000	1%	100	Immed	diately	Tunir	ng	*1	
Pn122	2	sation Ga			10 to 1,000	1%	100	Immed	diately	Tunir	ng	*1	
Pn123	2	Coefficier			0 to 100	1%	0	Immed	liately	Tunir	ng	*1	
Pn124	2	quency C			-10,000 to 10,000	0.1 Hz	0	Immed	liately	Tunir	ng	*1	
Pn125	2	Gain Corr			1 to 1,000	1%	100	Immed	liately	Tunir	ng	*1	
Pn131	2		ching Tim		0 to 65,535	1 ms	0	Immed	,	Tunir	ng	*1	
Pn132	2		ching Tim		0 to 65,535	1 ms	0	Immed	liately	Tunir	ng	*1	
Pn135	2	Gain Swit Time 1	ching Wai	ting	0 to 65,535	1 ms	0	Immed	liately	Tunir	ng	*1	
Pn136	2	Gain Swit Time 2	ching Wai	ting	0 to 65,535	1 ms	0	Immed	liately	Tunir	ng	*1	

Lists
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								Continued	from previo	ous page.			
Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2	Automatic Selections		vitching	0000h to 0052h	_	0000h	Immediately	Tuning	*1			
			0 : 0		1 11								
			Gain Sw	ritching S									
			0	The gair	nual gain switchi n is switched ma 'CMD_IO).	ng. nually with	G-SEL in th	e servo comm	and output	sig-			
	n.	.000X	1	Reserve	ed setting (Do no	t use.)							
			2	The gair switching	omatic gain switen is switched aut ng condition A is gain to the first (omatically f satisfied. T	rom the first he gain is sv	witched autom	atically fror				
Pn139			Gain Sw	itchina C	ondition A								
			0	Gain Switching Condition A O /COIN (Positioning Completion Output) signal turns ON.									
			1		Positioning Comp								
	n	.00X0	2	,	(Near Output) sig		, , ,	urrio OTT.					
	11. 44		3		(Near Output) sig								
			4		reference filter o			reference inni	ıt is OFF				
			5		reference input		and position	reference impo	at is Off.				
			<u> </u>										
	n.	n.□X□□ Reserved parameter (Do not change.)											
	n.	n.X□□□ Reserved parameter (Do not change.)											
Dn12D	0	Curront	ain Lavel		100 to 2 000	10/	2000	Immediatele	Tunina	* 1			
Pn13D	2	Current G Model Fol			100 to 2,000 0000h to	1%	2000	Immediately	Tuning	uning *1			
	2	Tuning	_										
	Model Following Control Selection								Refer	ence			
	n		0						neiel	Reference			
	n.	.000X		Do not use model following control. Use model following control.									
			_ '										
			Vibratio	ibration Suppression Selection					Refer	ence			
		.00X0	0	Do not perform vibration suppression.									
	n.		1										
			2	Perform vibration suppression for two specific frequencies.									
Pn140			Vibratia	n Cuppro	ssion Adiustman	at Colootics			Dofo:	onoc			
111140			vibratio	,	ssion Adjustmen			lly during	Refer	ence			
			0		adjust vibration s autotuning withou								
	n.	.0X00		host refe	erence, and cust	om tuning.			*1				
					ibration suppres				f				
			1		ing without a hos and custom tuni		e, autotuning	g with a host re	et-				
			Speed F	_	ard (VFF)/Torque		` '		Refer	ence			
		VOCC	0		use model follow	ing control	and speed/	torque feedfor-	-				
	n.	.X000		ward to		1 -1 - 1	1/1	Consider the Constant	*1				
			1	Use mo togethe	del following cor r.	itrol and sp	eed/torque	teedforward					
			I	J 5 2 2 2 2									
		Model Fol	llowing C	ontrol									
Pn141	2	Gain	nowing C	OHUOI	10 to 20,000	0.1/s	500	Immediately	Tuning	*1			
Pn142	2	Model Fol		ontrol	500 to 2,000	0.1%	1000	Immediatoly	Tuning	*1			
r11142		Gain Corr	rection		300 10 ∠,000	0.1%	1000	Immediately	Tuning	-1			
Pn1//2	2	Model Fol	llowing C	ontrol	0 to 10,000	0.1%	1000	Immediatoly	Tuning	* 1			
F11143	-	tion	e rorward	ı Direc-	0 10 10,000	0.1%	1000	minediately	ruriirig	-1			
Pn143	2	Bias in the	llowing C e Forward	ontrol d Direc-	1000	Immediately	Tuning ued on ne	*1					

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Parameter No.	Size		Name State S		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence					
Pn144	2	Model Fol Bias in the tion			0 to 10,000	0.1%	1000	Immediately	Tuning	*1					
Pn145	2	Vibration Frequence		on 1	10 to 2,500	0.1 Hz	500	Immediately	Tuning	*1					
Pn146	2	Vibration Frequency	Suppressi	on 1	10 to 2,500	0.1 Hz	700	Immediately	Tuning	*1					
Pn147	2	Model Fol Speed Fe pensation	edforward	ntrol Com-	0 to 10,000	0.1%	1000	Immediately	Tuning	*1					
Pn148	2	Second M Control G		wing	10 to 20,000	0.1/s	500	Immediately	Tuning	*1					
Pn149	2	Second M Control G	Nodel Follo ain Correc	wing ction	500 to 2,000	0.1%	1000	Immediately	Tuning	*1					
Pn14A	2	Vibration Frequency		on 2	10 to 2,000	0.1 Hz	800	Immediately	Tuning	*1					
Pn14B	2	Vibration Correction	Suppressi n	on 2	10 to 1,000	1%	100	Immediately	Tuning	*1					
	2	Control-R	elated Sel	ections	0000h to 0021h	-	0021h	After restart	Tuning	_					
	n	пппх	Model Fo		Control Type Seldel following con				Refe	rence					
	11.		1		del following con	, , , , , , , , , , , , , , , , , , ,				*1					
			Tuning-le	es Tyne	Selection				Reference						
Pn14F			0		ing-less type 1.				11010	101100					
	n.		1	Use tun	ing-less type 2.					*1					
			2	Use tun	ing-less type 3.										
	n.□X□□ Reserved parameter (Do not change.)														
	n.X□□□ Reserved parameter (Do not change.)														
	2 Anti-Resonance Control-Related Selections 0000h to 0011h - 0010h Immediately Tuning								Tuning	-					
			Anti-Res	onance (Control Selection	า			Refe	rence					
	n.	пппх	0	0 Do not use anti-resonance control.											
			1 Use anti-resonance control.												
			Anti-Res		Control Adjustme					rence					
Pn160	n.	ппхп	0	tion of a	adjust anti-reson autotuning withou e, and custom to	it a host ref			host	*1					
			1	autotun	anti-resonance co ing without a hos nd custom tuning	st reference			of	- 1					
	n		Reserved		eter (Do not char	,									
	n.	XDDD	Reserved	i parame	eter (Do not char	ige.)									
Pn161	2	Anti-Resc	nance Fre	quency	10 to 20,000	0.1 Hz	1000	Immediately	Tuning	*1					
Pn162	2	Anti-Reso rection	nance Ga	in Cor-	1 to 1,000	1%	100	Immediately	Tuning	*1					
Pn163	2	Anti-Reso Gain	nance Da	mping	0 to 300	1%	0	Immediately	Tuning	*1					
Pn164	2	Anti-Reso Constant			-1,000 to 1,000	0.01 ms	0	Immediately	Tuning	*1					
Pn165	2	Anti-Reso Constant			-1,000 to 1,000	0.01 ms	0	Immediately	Tuning	*1					
	_														

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Pn166 2 Anti-Resonance Damping Gain 2 0 to 1,000 1% 0 Immediately Tuning 2 Tuning-less Function-Related Selections 0000h to 2711h - 1401h - Setup	*1							
2 Tuning-less Function- Related Selections 0000h to 2711h - 1401h - Setup	*1							
Pn170 Tuning-less Selection O Disable tuning-less function. 1 Enable tuning-less function. Speed Control Method O Use for speed control. 1 Use for speed control and use host controller for position control. Rigidity Level O to 7 Set the rigidity level. Tuning-less Load Level Octable Level for the training-less function. Where Enable Control Method O to 7 Set the rigidity level. Tuning-less Load Level Control Level Contr	d d d d d d d d d d d d d d d d d d d							
0 to 2 Set the load level for the tuning-less function.								
Pn205 2 Multiturn Limit 0 to 65,535 1 rev 65535 After restart Setup	*1							
2 Position Control Function 0000h to 2210h - 0010h After restart Setup	_							
n.□□□X Reserved parameter (Do not change.) n.□□X□ Reserved parameter (Do not change.)	Reserved parameter (Do not change.)							
n.□X□□ Reserved parameter (Do not change.)								
/COIN (Positioning Completion Output) Signal Output Timing	Refer- ence							
Output when the absolute value of the position deviation is the same or less than the setting of Pn522 (Positioning Completed Width).	*1							
and the reference after the position reference filter is 0.								
Output when the absolute value of the position error is the same or less than the setting of Pn522 (Positioning Completed Width) and the reference input is 0.								
1 scale								
Pn20A 4 Number of External Encoder Scale Pitches 4 to 1,048,576 pitch/revolution 32768 After restart Setup	*1							
Pn20E 4 Electronic Gear Ratio (Numerator) 1 to 1,073,741,824 1 16 After restart Setup	*1							
Pn2104Electronic Gear Ratio (Denominator)1 to 1,073,741,82411After restartSetup	*1							
Pn212 4 Number of Encoder Output Pulses 16 to 1,073,741,824 1 P/Rev 2048 After restart Setup	*1							

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t	When	Classifi-	Refer-								
J	Enabled	cation	ence								

							Continued	d from previous page.					
Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence				
	2	Fully-clos tions	ed Control Selec-	0000h to 1003h	_	0000h	After restart	Setup	*1				
									1				
Pn22A	n	.000X	Reserved parame	eter (Do not cha	nge.)								
	n	.00X0	Reserved parame	eter (Do not cha	nge.)								
	n	.DXDD	Reserved parame	eter (Do not cha	nge.)								
			Fully-closed Cont	•		tion							
	n	.X000		tor encoder specernal encoder sp									
	_		. 000 0/1.	oa. 000 a.o. op									
	2	Position (Function	Control Expansion Selections	0000h to 0001h	-	0000h	After restart	Setup	*1				
					1	I		1					
	n	.000X	Backlash Comper										
Pn230	11	.000	Compensate forward references.Compensate reverse references.										
FIIZOU	n	.00X0	Reserved parame	eter (Do not cha	nge.)								
	n	.0X00	Reserved parame	eter (Do not cha	nge.)								
	n	.X000	Reserved parame	eter (Do not cha	nge.)								
	-												
Pn231	4	Backlash	Compensation	-500,000 to 500,000	0.1 reference units	0	Immediately	Setup	*1				
Pn233	2	Backlash Time Con	Compensation stant	0 to 65,535	0.01 ms	0	Immediately	Setup	*1				
Pn281	2	Encoder (Output Resolution	1 to 4,096	1 edge/ pitch	20	After restart	Setup	*1				
Pn304	2	Jogging S		0 to 10,000	1 min ⁻¹	500	Immediately	Setup	*1				
Pn305	2	Soft Start Time	Acceleration	0 to 10,000	1 ms	0	Immediately	Setup	*2				
Pn306	2	Soft Start Time	Deceleration	0 to 10,000	1 ms	0	Immediately	Setup	*2				
Pn308	2	Speed Fe Time Con	edback Filter stant	0 to 65,535	0.01 ms	0	Immediately	Setup	*1				
Pn30A	2		ion Time for Servo Forced Stops	0 to 10,000	1 ms	0	Immediately	Setup	*1				
Pn30C	2		edforward Aver- ement Time	0 to 5,100	0.1 ms	0	Immediately	Setup	*1				
	2	Vibration tions	Detection Selec-	0000h to 0002h	_	0000h	Immediately	Setup	*1				
				·	·		.						
			Vibration Detection										
	n	.000X		detect vibration.									
Pn310				a warning (A.911	<u>, </u>								
F11010			2 Output	an alarm (A.520)	ir vibration	is detected	•		<u> </u>				
	n	.00X0	Reserved parame	eter (Do not cha	nge.)								
	n	.0X00	Reserved parame	eter (Do not cha	nge.)								
	n	.X000	Reserved parame	eter (Do not cha	nge.)								
		V (ik !!	Datastics O										
Pn311	2	tivity	Detection Sensi-	50 to 500	1%	100	Immediately	Tuning	*1				

Default

Setting

50

10000

300

100

800

800

100

100

800

10000

0000h

Setting

Unit

1 min⁻¹

1 min⁻¹

1%

0.01 ms

1%*3

1%*3

1%*3

1%*3

1%*³

1 min⁻¹

Setting Range

0 to 5,000

0 to 65,535

0 to 20,000

0 to 65,535

0 to 800

0 to 10,000

0000h to 1111h

cation

Tuning

Setup

Setup

Tuning

Setup

Setup

Setup

Setup

Setup

Setup

Setup

Refer-

ence

*1 *1

*1

*1

*1

*1

*1

*1

*1

When

Enabled

Immediately

After restart

Immediately

Immediately

Immediately

Immediately

Immediately

Immediately

Immediately

Immediately

		Whe Enab		Refe	rence
		Imme ate		:	*1
		Whe Enab		Refe	rence
tio	nd the on mit.	After restart		*1	
		Whe Enab		Refe	rence
		Imme ate		:	*1
	Wh Enab				rence
		Imme ate			*1
	Immed	diately	Tur	ning	*1
	Immed	diately	Tur	ning	*1
	Immed	diately	Tur	ning	*1
	Immed	diately	Tur	ning	*1
	Immed	diately	Tur	ning	*1
	Immed	diately	Tur	ning	*1
_					

		Notch F	ilter Selection 1	When Enabled	Reference		
	n.□□□X	0	Disable first stage notch filter.	Immedi-	*1		
		1	Enable first stage notch filter.	ately	- 1		
		Speed L	imit Selection	When Enabled	Reference		
	n.□□X□	0	After	*1			
Pn408		1	Use the smaller of the overspeed alarm detection speed and the setting of Pn407 as the speed limit.	restart			
		_					
		Notch F	ilter Selection 2	When Enabled	Reference		
	n.□X□□	0	Disable second stage notch filter.	Immedi-	*1		
		1	Enable second stage notch filter.	ately	*1		
		_			1		
		Friction Compensation Function Selection When Enabled F					

Disable friction compensation. Enable friction compensation.

50 to 5,000

50 to 1,000

0 to 1,000

50 to 5,000

50 to 1,000

0 to 1.000

100 to 5,000

50 to 100

0 to 65,535

1 Hz

0.01

0.001

1 Hz

0.01

0.001

1 Hz

0.01

 $0.01 \, \text{ms}$

5000

70

0

5000

70

0

Parameter

No

Pn312

Pn316

Pn324

Pn401

Pn402

Pn403

Pn404

Pn405

Pn406

Pn407

Pn409

Pn40A

Pn40B

Pn40C

Pn40D

Pn40E

Pn40F

Pn410

Pn412

Size

2

2

2

2

2

2

2

2

2

2

2

Limit

Selections

n.XDDD

auency

Value

Frequency

Q Value

Depth

quency

Value

stant

2

2

2

2

2

2

2

2

2

0

First Stage Notch Filter Fre-

First Stage Notch Filter Q

Second Stage Notch Filter

Second Stage Notch Filter

Second Stage Notch Filter

Second Stage Second Torque Reference Filter Fre-

Second Stage Second Torque Reference Filter Q

First Stage Second Torque Reference Filter Time Con-

First Stage Notch Filter

Name

Vibration Detection Level

Maximum Motor Speed

tion Starting Level First Stage First Torque

Forward Torque Limit

Reverse Torque Limit

Forward External Torque

Reverse External Torque

Emergency Stop Torque

Speed Limit during Torque

Torque-Related Function

Moment of Inertia Calcula-

Reference Filter Time Con-

5000 Immediately Tuning 50 **Immediately** Tuning 100 Immediately Tuning

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Parameter	υ Name					Catting Dangs	Setting	Default	When	Classifi-	Refer-			
No.	Si					Setting Range	Unit	Setting	Enabled	cation	ence			
	2		que-Re ections	elated Fur s 2	iction	0000h to 1111h	-	0000h	Immediately	Setup	*1			
				Notch Filter Selection 3										
	r	n. 🗆 🗆 🛭	⊐X	0		third stage notch								
				1	Enable 1	third stage notch	filter.							
					O Disable fourth stage notch filter.									
Pn416	r	ո.□□>	ΚU	0		fourth stage note								
	r	n.□X□□			tch Filter Selection 5 0 Disable fifth stage notch filter.									
				1										
	r	n.X□□	10	Reserved	d parame	eter (Do not char	nge.)							
	-													
Pn417	2		rd Stag	ge Notch I	Filter	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1			
Pn418	2	Thir Valu		ge Notch I	-ilter Q	50 to 1,000	0.01	70	Immediately	Tuning	*1			
Pn419	2		Third Stage Notch Filter Depth			0 to 1,000	0.001	0	Immediately	Tuning	*1			
Pn41A	2		irth Sta quenc	age Notch y	Filter	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1			
Pn41B	2	Valu	ne	age Notch		50 to 1,000	0.01	70	Immediately	Tuning	*1			
Pn41C	2	Dep	oth	age Notch		0 to 1,000	0.001	0	Immediately	Tuning	*1			
Pn41D	2		n Stag ency	e Notch F	ilter Fre-	50 to 5,000	1 Hz	5000	Immediately	Tuning	*1			
Pn41E	2	Fifth Valu		e Notch F	ilter Q	50 to 1,000	0.01	70	Immediately	Tuning	*1			
Pn41F	2	Dep	oth	e Notch F		0 to 1,000	0.001	0	Immediately	Tuning	*1			
Pn423	2		served chang	paramete ge.)	er (Do	-	-	0000	-	_	-			
Pn424	2			mit at Maii ge Drop	n Cir-	0 to 100	1%*3	50	Immediately	Setup	*1			
Pn425	2	Lim age	it at M Drop	ime for To Iain Circui	t Volt-	0 to 1,000	1 ms	100	Immediately	Setup	*1			
Pn426	2	age	Move	edforward ement Tim	е	0 to 5,100	0.1 ms	0	Immediately	Setup	*1			
Pn427	2	not	chang			-	-	0	-	-	-			
Pn456	2		eep To plitude	orque Refe	rence	1 to 800	1%	15	Immediately	Tuning	*1			

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Parameter No.	Size		Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Notch Filt Selections	er Adjustment s 1	0000h to 0101h	_	0101h	Immediately	Tuning	*1	
				Adjustment Selection						
	n.	.000X		not adjust the first staing without a host refing.						
				ust the first stage no nout a host reference						
Pn460	n.	.DDXD	Reserved par	rameter (Do not char	nge.)					
			Notch Filter A	Adjustment Selection	า 2					
	n.	.0X00	0 fund	not adjust the second ction is enabled or du otuning with a host re	ıring execut					
			1 tion	is enabled or during	e notch filter automatically when the tuning-less func- g execution of autotuning without a host reference, reference, and custom tuning.					
	n.	n.X□□□ Reserved parameter (Do not change.)								
			1		3 7					
	2	Gravity C	ompensation- Selections	0000h to 0001h	_	0000h	After restart	Setup	*1	
	n.□□□X Gravity Compensation Selection									
			0 Disa							
Pn475			1 Enable gravity compensation.							
	n.	.DDXD	Reserved para	ameter (Do not chang	je.)					
	n.	.0X00	Reserved para	ameter (Do not chang	je.)					
	n.	XDDD	Reserved para	ameter (Do not chang	je.)					
				-						
Pn476	2	Gravity Control	ompensation	-1,000 to 1,000	0.1%	0	Immediately	Tuning	*1	
Pn502	2	Rotation I	Detection Leve	l 1 to 10,000	1 min ⁻¹	20	Immediately	Setup	*1	
Pn503	2		oincidence Det al Output Width		1 min ⁻¹	10	Immediately	Setup	*1	
Pn506	2	Brake Re	ference-Servo y Time	0 to 50	10 ms	0	Immediately	Setup	*1	
Pn507	2	Brake Res	ference Output vel	0 to 10,000	1 min ⁻¹	100	Immediately	Setup	*1	
Pn508	2	Servo OF mand Wa	F-Brake Com- iting Time	10 to 100	10 ms	50	Immediately	Setup	*1	
Pn509	2	Momenta tion Hold	ry Power Interr Time	rup- 20 to 50,000	1 ms	20	Immediately	Setup	*1	

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Parameter No.	Size	Name			Setting Range	Setting Unit	Default Setting	When Enabled	Classic	
	2	Input Sig	ınal Sel	ections 1	0000h to FFF2h	-	1881h	After restart	Setup) –
Pn50A	n.	DDDX DDDD	Rese Rese	rved parame rved parame rved parame (Forward Dr Enable forw Enable forw Enable forw Enable forw Enable forw Enable forw		nge.) nal Allocat CN1-13 inp CN1-7 inpu CN1-8 inpu CN1-9 inpu CN1-10 inp	ion ut signal is t signal is C t signal is C t signal is C ut signal is C ut signal is	ON (closed). IN (closed). IN (closed). IN (closed). ON (closed). ON (closed).		eference
	n.	XDDD	7		nal to always pro			014 (010304).		*1
			8	Set the sign	nal to always ena	ble forward	d drive.			*1
			9		vard drive when ((1)		
			A		vard drive when ('	-	· · · · ·		
			В		able forward drive when CN1-8 input signal is OFF (open).					
			С		vard drive when (· ·				
			D		vard drive when (<u> </u>		,		
			F		vard drive when (· · · · · · · · · · · · · · · · · · ·				
			'	2.100101010	.a.a anvo whom	12 mp	at orginal to	o (opon).		

Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classif		
	2	Input Sigr	nal Selecti	ons 2	0000h to FFFFh	-	8882h	After restart	Setup	_	
			N-OT (R	everse D	rive Prohibit) Sig	nal Allocat	ion		R	eference	
			0	Enable i	reverse drive whe	en CN1-13	input signal	is ON (closed)).		
			1	Enable i	reverse drive whe	en CN1-7 in	put signal i	s ON (closed).			
			2	Enable i	reverse drive whe	en CN1-8 in	put signal i	s ON (closed).			
			3	Enable i	reverse drive whe	en CN1-9 in	put signal i	s ON (closed).			
			4	Enable i	reverse drive whe	en CN1-10	input signal	is ON (closed)).		
			5	Enable i	reverse drive whe	en CN1-11	input signal	is ON (closed)).		
			6	Enable i	reverse drive whe	en CN1-12	input signal	is ON (closed)).		
	n.		7	Set the	signal to always	prohibit rev	erse drive.			*1	
			8	Set the	signal to always	enable reve	rse drive.			-	
			9	Enable i	reverse drive whe	en CN1-13	input signal	is OFF (open)			
			Α	Enable i	reverse drive whe	en CN1-7 ir	put signal i	s OFF (open).			
			В	Enable i	reverse drive whe	en CN1-8 ir	put signal i	s OFF (open).			
			С	Enable i	reverse drive whe	en CN1-9 ir	put signal i	s OFF (open).			
			D	Enable i	reverse drive whe	en CN1-10	input signal	is OFF (open)			
			Е	Enable i	reverse drive whe	en CN1-11	input signal	is OFF (open)			
			F	Enable i	reverse drive whe	en CN1-12	input signal	is OFF (open)			
	n.□□X□ Reserved parameter (Do not change.)										
Pn50B											
			7 F-CL (F	I	•	. ,			n.	eference	
			1	Active when CN1-13 input signal is ON (closed). Active when CN1-7 input signal is ON (closed).							
			2		vhen CN1-8 inpu						
			3		vhen CN1-9 inpu	-					
			4		when CN1-10 inp						
			5		when CN1-11 inp						
			6		when CN1-12 inp						
	n		7		nal is always acti		011 (010000)·			
	• • •		8		nal is always inac					*1	
			9	Ŭ	vhen CN1-13 inp		OFF (open)				
			A		hen CN1-7 inpu						
			В		vhen CN1-8 inpu		· · · ·				
			C		hen CN1-9 inpu						
			D		vhen CN1-10 inp	0	· · · /				
			E		when CN1-11 inp						
			F		when CN1-12 inp		· · · ·				
					•				_		
	n	XDDD	/N-CL (F		xternal Torque L	. ,			R	eference	
	11.	700U	0 to F		cations are the s Limit Input) signa			ward External		*1	

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Parameter	Φ					Setting	Default	When	Class	ifi- Refer-	
No.	Size		Name		Setting Range	Unit	Setting	Enabled	catio		
	2	Output Si	gnal Seled	ctions 1	0000h to 6666h	-	0000h	After restart	Setu	ıp –	
					I					l .	
			/COIN (F	Positionin	g Completion O	utput) Sign	al Allocatio	n		Reference	
			0	Disable	d (the above sign	al output is	not used).				
	n.	пппх	1	1 Output the signal from the CN1-1 or CN1-2 output terminal.							
			2	Output	the signal from th	ne CN1-23	or CN1-24	output termina	ıl.	*1	
			3			nal from the CN1-25 or CN1-26 output terminal.					
			4 to 6	Reserve	ed setting (Do not	t use.)					
Pn50E			/V-CMP	C (Speed Coincidence Detection Output) Signal Allocation						Reference	
	n.	ппхп	0 to 6		cations are the s nal allocations.	ame as the	/COIN (Pos	sitioning Comp	ole-	*1	
			/TGON (N (Rotation Detection Output) Signal Allocation							
	n.			1				sitioning Comp		Reference *1	
	n.□X□□ 0 to 6 The allocations are the same as the /COIN (Positioning Completion) signal allocations.										
			/S-RDY	(Servo Re	eady) Signal Allo	cation				Reference	
	n.	XDDD	0 to 6		cations are the s	ame as the	/COIN (Pos	sitioning Comp	ole-	*1	
			II.	, ,							
	2	Output Si	gnal Seled	ctions 2	0000h to 6666h	-	0100h	After restart	Setu	ıp –	
					I				I		
			/CLT (To	rque Limi	it Detection Outp	out) Signal	Allocation			Reference	
			0	Disable	d (the above sign	al output is	not used).				
	n	пппх	1	Output	the signal from th	ne CN1-1 o	r CN1-2 ou	tput terminal.			
			2		the signal from th			· ·		*1	
			3		the signal from th		or CN1-26	output termina	ıl.		
			4 to 6	Reserve	d setting (Do not	t use.)					
Pn50F			/VLT (Sp	eed Limit	t Detection) Sign	al Allocation	on			Reference	
	n.	ппхп	0 to 6		cations are the s signal allocations		/CLT (Torq	ue Limit Detec	tion	*1	
			/BK (Bra	ke Outni	ıt) Signal Allocat	ion				Reference	
	n.		0 to 6	The allo	cations are the s signal allocations	ame as the	/CLT (Torq	ue Limit Detect		*1	
			/\/\ DNI /							Deference	
	n.	XDDD			Output) Signal A		/CLT (Torqu	ıe Limit Detect		Reference	
			0 to 6	The allocations are the same as the /CLT (Torque Limit Detection Output) signal allocations.				*1			
	1				-						

Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
		Signal Selections 3	0000h to 0666h	_	0000h	After restart	Setup	_	
			0000						
		/NEAR (Near Out	tnut) Signal Alloc	ation			Refe	erence	
			d (the above sign		not used)		11616	er er ice	
			the signal from the			tout terminal.			
	n.□□□X		the signal from th				al.	*1	
Pn510		3 Output	the signal from th	ne CN1-25	or CN1-26	output termina	al.		
		4 to 6 Reserved setting (Do not use.)							
	n.□□X□ Reserved parameter (Do not change.)								
	n.□X□□ Reserved parameter (Do not change.)								
	n.X□□□	Reserved parame	eter (Do not char	ige.)					
						1	T	T	
	2 Input Sig	gnal Selections 5	0000h to FFFFh	-	6543h	After restart	Setup	*1	
			+				1	1	
		/DEC (Origin Ret	urn Deceleration	Switch Inp	out) Signal	Allocation			
		0 Active v	when CN1-13 inp	ut signal is	ON (closed).			
		1 Active v	1 Active when CN1-7 input signal is ON (closed).						
		2 Active v	when CN1-8 inpu	t signal is C	N (closed).				
		3 Active v	when CN1-9 inpu	t signal is C	N (closed).				
		4 Active v	when CN1-10 inp	ut signal is	ON (closed).			
			when CN1-11 inp		`	·			
			when CN1-12 inp		ON (closed).			
	n.□□□X	<u> </u>	nal is always activ						
			nal is always inac		OFF (
			when CN1-13 inp		,				
			A Active when CN1-7 input signal is OFF (open).						
		B Active when CN1-8 input signal is OFF (open). C Active when CN1-9 input signal is OFF (open).							
			when CN1-10 inp			<u> </u>			
Pn511			when CN1-11 inp	_					
FIISTI		F Active v	when CN1-12 inp	ut signal is	OFF (open)				
		/EXT1 (External L	atch Input 1) Sig	ınal Allocat	tion				
		<u> </u>	nal is always inac						
			when CN1-10 inp		ON (closed).			
		5 Active v	when CN1-11 inp	ut signal is	ON (closed).			
	n.□□X□	6 Active	when CN1-12 inp	ut signal is	ON (closed).			
		D Active v	when CN1-10 inp	ut signal is	OFF (open)				
		E Active v	when CN1-11 inp	ut signal is	OFF (open)				
		F Active v	when CN1-12 inp	ut signal is	OFF (open)				
		7 to C The sig	nal is always inac	tive.					
		/EXT2 (External L	_atch Input 2) Sig	ınal Allocat	tion				
	n.□X□□	0 to F The allocations	ocations are the s	ame as the	/EXT1 (Ext	ernal Latch Inp	out 1) signa	ıl allo-	
		/EXT3 (External L	_atch Input 3) Sic	ınal Allocat	tion				
	n.X□□□		ocations are the s			ernal Latch Inp	out 1) signa	ıl allo-	
		cations							

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2	Output S tings	ignal Inver	rse Set-	0000h to 1111h	_	0000h	After restart	Setup	*1			
			Output 9	Signal Inv	ersion for CN1-	1 and CN1-	-2 Terminals	S					
	n.	.000X	0 The signal is not inverted.										
			1	1 The signal is inverted.									
			Output Signal Inversion for CN1-23 and CN1-24 Terminals										
Pn512	n.	X_	0	The signal is not inverted.									
			1	1 The signal is inverted.									
			Output Signal Inversion for CN1-25 and CN1-26 Terminals										
	n.□X□□		0	0 The signal is not inverted.									
			1	The sign	nal is inverted.								
	n.	.X000	Reserve	d parame	eter (Do not char	nge.)							
	2 Output Signal Selections 4			0000h to 0666h	-	0000h	After restart	Setup	-				
	n.	.000X	Reserve	d parame	eter (Do not char	nge.)							
	n.	.00X0	Reserve	d parame	eter (Do not char	nge.)							
			/PM (Pre	eventative	e Maintenance C	output) Sigr	nal Allocatio	on	Refe	rence			
Pn514			0	Disable	d (the above sign	al output is	not used).						
	n	.0X00	1	Output	the signal from th	ne CN1-1 o	r CN1-2 ou	tput terminal.					
	r).		2	Output	the signal from th	ne CN1-23	or CN1-24	output termina	l.	*1			
			3	Output	the signal from th	ne CN1-25	or CN1-26	output termina	l.				
			4 to 6 Reserved setting (Do not use.)										
	n.	.X000	Reserve	d parame	eter (Do not char	nge.)							

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	- Refer- ence			
	2	Input Sig	gnal Selection	ons 7	0000h to FFFFh	_	8888h	After restart	Setup	-			
	_		1										
			FSTP (For	ced Stop	Stop Input) Signal Allocation					ference			
			0	Enable	drive when CN1	-13 input si	gnal is ON (closed).					
			1	Enable	drive when CN1	-7 input sig	nal is ON (c	losed).					
			2	Enable	drive when CN1	-8 input sig	nal is ON (c	losed).					
			3	Enable	drive when CN1	-9 input sig	nal is ON (c	losed).					
			4	Enable	drive when CN1	-10 input si	gnal is ON (closed).					
			5	Enable									
			6	Enable	drive when CN1	-12 input si	gnal is ON (closed).					
	n.E] ПО	7	Set the stop).	Set the signal to always prohibit drive (always force the motor to stop).								
Pn516			8	Set the motor t	signal to always o stop).	enable driv	ve (always d	isable forcing t	he	*1			
			9	Enable	drive when CN1	-13 input si	gnal is OFF	(open).					
			А	Enable	drive when CN1	-7 input sig	nal is OFF (d	open).					
			В	Enable	drive when CN1	-8 input sig	nal is OFF (d	open).					
			С	Enable	Enable drive when CN1-9 input signal is OFF (open).								
			D	Enable	Enable drive when CN1-10 input signal is OFF (open).								
			Е	Enable	Enable drive when CN1-11 input signal is OFF (open).								
			F		drive when CN1	· · · · · · · · · · · · · · · · · · ·	<u> </u>	• • •					
	n [Reserved		er (Do not chan		<u> </u>	(- /					
		n.□X□□ Reserved parameter (Do not change.)											
	n.X□□□ Reserved parameter (Do not change.)												
Pn51B	4		oad Positior rflow Detec		0 to 1,073,741,824	1 refer- ence unit	1000	Immediately	Setup	*1			
Pn51E	2	Position	Deviation Crning Level	ver-	10 to 100	1%	100	Immediately	Setup	page 3-			
Pn520	4		Deviation C	ver-	1 to 1,073,741,823	1 refer- ence unit	5242880	Immediately	Setup	*1, page 3-49			
Pn522	4	Positioni Width	ing Comple	ed	0 to 1,073,741,824	1 refer- ence unit	7	Immediately	Setup	*1			
Pn524	4	Near Sig	ınal Width		1 to 1,073,741,824	1 refer- ence unit	1073741 824	Immediately	Setup	*1			
Pn526	4		Deviation C m Level at		1 to 1,073,741,823	1 refer- ence unit	5242880	Immediately	Setup	*1			
Pn528	2		Deviation C ning Level a		10 to 100	1%	100	Immediately	Setup	*1			
Pn529	2	Speed L ON	imit Level a	t Servo	0 to 10,000	1 min ⁻¹	10000	Immediately	Setup	*1			
Pn52A	2	Multiplie Rotation	r per Fully-c	losed	0 to 100	1%	20	Immediately	Tuning	*1			
Pn52B	2	Overload	d Warning L	evel	1 to 100	1%	20	Immediately	Setup	*1			
Pn52C	2	Overload Warning Level Base Current Derating at Motor Overload Detection			10 to 100	1%	100	After restart	Setup	*1			
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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence
140.	2	Program Selection	Jogging-F	Related	0000h to 0005h	-	0000h	Immediately	Setup	*1
			Program	Jogging	Operation Patte	ern				
			0		time in Pn535 - ents in Pn536	→ Forward b	by travel dis	tance in Pn53	1) × Numbe	er of
			1		time in Pn535 – ents in Pn536	→ Reverse b	y travel dis	tance in Pn53	1) × Numbe	er of
			2	moveme (Waiting	time in Pn535 – ents in Pn536 time in Pn535 – ents in Pn536				,	
Pn530	n.	пппх	3	moveme (Waiting	time in Pn535 - ents in Pn536 time in Pn535 - ents in Pn536		•		•	
			4	in Pn53 Pn536	time in Pn535 – 5 → Reverse by	travel distar	nce in Pn53	31) × Number o	of movemer	nts in
			5	(Waiting time in Pn535 \rightarrow Reverse by travel distance in Pn531 \rightarrow Waiting time in Pn535 \rightarrow Forward by travel distance in Pn531) \times Number of movements in Pn536						
	n.	ппхп	Reserved	d parame	eter (Do not char	nge.)				
	n.		Reserved	d parame	eter (Do not char	nge.)				
		XDDD	Reserve	d narame	eter (Do not char	nge)				
	n.X□□□ Reserved parameter (Do not change.)									
		Program	Jogging Ti	ravol	1 to	1 refer-				
Pn531	4	Distance			1,073,741,824	ence unit	32768	Immediately	Setup	*1
Pn533	2	Program ment Spe	Jogging M ed	love-	1 to 10,000	1 min ⁻¹	500	Immediately	Setup	*1
Pn534	2		Jogging A leration Ti		2 to 10,000	1 ms	100	Immediately	Setup	*1
Pn535	2	Program Time	Jogging V	/aiting	0 to 10,000	1 ms	100	Immediately	Setup	*1
Pn536	2	Program of Movem	Jogging N nents	lumber	0 to 1,000	Times	1	Immediately	Setup	*1
Pn550	2	Analog M Voltage	onitor 1 C	ffset	-10,000 to 10,000	0.1 V	0	Immediately	Setup	*1
Pn551	2	Analog M Voltage	onitor 2 C	ffset	-10,000 to 10,000	0.1 V	0	Immediately	Setup	*1
Pn552	2	Analog M cation	onitor 1 N	lagnifi-	-10,000 to 10,000	× 0.01	100	Immediately	Setup	*1
Pn553	2	Analog M cation	onitor 2 N	lagnifi-	-10,000 to 10,000	× 0.01	100	Immediately	Setup	*1
Pn55A	2	Power Co tor Unit T	nsumptio ime	n Moni-	1 to 1,440	1 min	1	Immediately	Setup	-
Pn560	2	Residual 'tion Width	Vibration [Detec-	1 to 3,000	0.1%	400	Immediately	Setup	*1
Pn561	2	Overshoo	t Detectio	n Level	0 to 100	1%	100	Immediately	Setup	*1

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Parameter No.	Size	N	ame	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Output Sign Method Sele	al Reference ections 1	0000h to 1111h	_	0000h	After restart	Setup	*1	
		n.□□□X	SO1 Output S	ignal Reference	Method Se	lection				
			0 Outp	out parameter-ass	signed SO1	signal.			_	
			1 Outp	out OR of parame IO.	eter-assigne	ed SO1 sign	al and signal s	et by SVC-		
		n.□□X□	SO2 Output S	ignal Reference	Method Se	lection				
		0 Output parameter-assigned SO2 signal.								
Pn56A			1 Outp	out OR of parame).	ter-assigne	d SO2 signa	al and signal se	et by SVCM	- -	
		n.□X□□ SO3 Output Signal Reference Method Selection								
			0 Output parameter-assigned SO3 signal.							
			1 Outp	out OR of parame).	ter-assigne	d SO3 signa	al and signal se	et by SVCM	1-	
		n.XDDD	Reserved para	ameter (Do not c	hange.)					
			•	· · · · · · · · · · · · · · · · · · ·	<u> </u>				_	
Pn56B	2	Reserved pa		_	-	0000h	-	_	-	
Pn600	2	Regenerative Capacity*4	e Resistor	Depends on model.*5	10 W	0	Immediately	Setup	*1	
Pn601	2	Dynamic Bra Allowable Er sumption		0 to 65,535	10 J	0	After restart	Setup	*6	
Pn603	2	Regenerative	e Resistance	0 to 65,535	10 mΩ	0	Immediately	Setup	*1	
Pn604	2	Dynamic Bra	ake Resistance	0 to 65,535	10 mΩ	0	After restart	Setup	*6	

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2	Commun	ications	Controls	0000h to 1FF3h	_	1040h	Immediately	Setup	_			
	-				1	I		II.					
			MECH	ATROLINK	Communication	ns Check M	ask for Del	ougging					
			0	Do not m						_			
	nГ	⊐□□Х	1	Ignore ME	ECHATROLINK c	ommunicat	ions errors ((A.E60).					
	11.6		2	Ignore WI	DT errors (A.E50)).				_			
			3	Ignore bo errors (A.	th MECHATROL E50).	INK commu	ınications eı	rrors (A.E60) aı	nd WDT	<u> </u>			
			Warnin	g Check N	Masks								
			0	Do not m	ask.					_			
			1	Ignore da	ta setting warnin	gs (A.94 □)				_			
			2	Ignore co	mmand warnings	s (A.95 □).				<u> </u>			
			3	Ignore bo	th A.94□ and A.	95 □ warnir	ngs.						
			4	Ignore co	mmunications w	arnings (A.9	96□).						
Pn800			5	-	th A.94□ and A.								
			6	Ü	th A.95□ and A.								
	n.L		7		94□, A.95□, and								
			8	Ü	ta setting warnin	• •				_			
				 9 Ignore A.94□, A.97A, and A.97b warnings. A Ignore A.95□, A.97A, and A.97b warnings. 									
			B Ignore A.94□, A.95□, A.97A, and A.97b warnings.										
			C Ignore A.96□, A.97A, and A.97b warnings.										
			D										
			E	-	95□, A.96□, A.9								
			F	Ignore A.S	94 □ , A.95 □ , A.9	96 □ , A.97A	, and A.97b	warnings.					
	n.□X□□ Reserved parameter (Do not change.)												
			Automatic Warning Clear Selection for Debugging*7										
		(000 3 ^{*7}	Retain warnings for debugging.										
	IVI	13	1	Automatio	cally clear warnin	gs (MECHA	TROLINK-II	II specification)					
										_			
		Applications 6 (S		ion Selec- Limits)	0000h to 0103h	_	0003h	Immediately	Setup	*1			
			Softwa	re Limit Se	election								
			0	Enable bo	oth forward and r	everse soft	ware limits.						
	n.E	□□X	1	Disable fo	orward software I	imit.							
			2	Disable re	everse software li	mit.				_			
Pn801			3	Disable b	oth forward and	reverse soff	ware limits.						
	n.E		Reserv	ed parame	eter (Do not char	nge.)							
			Softwa	re Limit CI	heck for Referen	ces							
	n.E		0	Do not pe	erform software li	mit checks	for reference	es.		_			
			1	Perform s	software limit che	cks for refe	rences.						
	n V	/000	Pagany	ad narama	otor (Do not obo	200)				_			
	11.3		neserv	eu parame	eter (Do not char	ige.)							
Pn803	2	Origin Ra	nge		0 to 250	1 refer- ence unit	10	Immediately	Setup	*2			
Pn804	4	Forward	Software	Limit	-1,073,741,823 to	1 refer- ence unit	1073741 823	Immediately	Setup	*1			
	1,073,741,823 ence unit 823 Continued on pay												

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Parameter	Size		Name	Setting Range	Setting	Default	When	Classifi-	Refer-
No.	S		ivaille		Unit	Setting	Enabled	cation	ence
Pn806	4	Reverse S	oftware Limit	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	-10737 41823	Immediately	Setup	*1
Pn808	4	Absolute E Offset	Encoder Origin	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	0	Immedi- ately *8	Setup	*1
Pn80A	2	First Stage tion Const	e Linear Accelera- cant	1 to 65,535	10,000 refer- ence units/s ²	100	Immedi- ately *9	Setup	*2
Pn80B	2		tage Linear on Constant	1 to 65,535	10,000 refer- ence units/s ²	100	Immedi- ately *9	Setup	*2
Pn80C	2	Acceleration Switching	on Constant Speed	0 to 65,535	100 ref- erence units/s	0	Immedi- ately *9	Setup	*2
Pn80D	2	First Stage ation Cons	e Linear Deceler- stant	1 to 65,535	10,000 refer- ence units/s ²	100	Immedi- ately *9	Setup	*2
Pn80E	2		tage Linear on Constant	1 to 65,535	10,000 refer- ence units/s ²	100	Immedi- ately *9	Setup	*2
Pn80F	2	Decelerati Switching	on Constant Speed	0 to 65,535	100 ref- erence units/s	0	Immedi- ately *9	Setup	*2
Pn810	2	Exponenti Decelerati	al Acceleration/ on Bias	0 to 65,535	100 ref- erence units/s	0	Immedi- ately *10	Setup	*2
Pn811	2		al Acceleration/ on Time Con-	0 to 5,100	0.1 ms	0	Immedi- ately *10	Setup	*2
Pn812	2	Movemen	t Average Time	0 to 5,100	0.1 ms	0	Immedi- ately *10	Setup	*2
Pn814	4	External P Travel Dist	ositioning Final ance	-1,073,741,823 to 1,073,741,823	1 refer- ence unit	100	Immediately	Setup	*2
	2	Origin Ret tings	urn Mode Set-	0000h to 0001h	_	0000h	Immediately	Setup	*11
		-	Origin Return Dire	ection					
Pn816	n.			forward direction					_
			1 Return in	reverse direction					
M2 *12	n.		Reserved parame	eter (Do not char	nge.)				
	n.		Reserved parame	eter (Do not char	nge.)				
	n.	XDDD	Reserved parame	eter (Do not char	nge.)				
Pn817 *13	2	Origin App	proach Speed 1	0 to 65,535	100 ref- erence units/s	50	Immedi- ately *9	Setup	*2
Pn818 *14	2	Origin App	proach Speed 2	0 to 65,535	100 ref- erence units/s	5	Immedi- ately *9	Setup	*2
					1				

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Parameter No.	Size	Name Input Signal Monitor Selec-			Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Input Signations	nal Monito	or Selec-	0000h to 7777h	-	0000h	Immediately	Setup	*11	
		I			ı	I			I.	I.	
			IO12 Sig	gnal Mapı	oing						
			0	Do not m	ap.						
					N1-13 input tern						
					N1-7 input termi						
	n.				N1-8 input termi						
Pn81E	4 Monitor CN1-9 input terminal. 5 Monitor CN1-10 input terminal.										
PIIOTE				Monitor CN1-10 input terminal.							
M2 *12					N1-12 input tern					_	
_					·						
	n.		O to 7 The mappings are the same as the IO12 signal mappings.								
	n.			gnal Map _l							
			0 to 7	The mapp	oings are the san	ne as the IC)12 signal m	nappings.			
	n	XDDD	IO15 Signal Mapping								
	11.		0 to 7	The mapp	oings are the san	ne as the IC)12 signal m	nappings.		_	
	2	Comman	d Data All	locations	0000h to	_	0010h	After restart	Setup	*11	
		Commun	a Bata 7 III		1111h		001011	7 ittol Tootait	Остар		
	_									_	
			Option Field Allocation								
	n.	пппх			ption field allocat						
Pn81F										_	
M2 *12					Command TFF/T	TLIM Alloca	ition				
IVIZ	n.			Disable al						<u>—</u>	
			! !	Ellable all	ocation.					_	
	n.		Reserve	d parame	eter (Do not char	nge.)					
	n.	XDDD	Reserve	d parame	eter (Do not char	nge.)					
					-2,147,483,648	1 refer-			2 (_	
Pn820	4	Forward I	_atching A	Area	to 2,147,483,647	ence unit	0	Immediately	Setup	*2	
	-2,147,483,648 1 refer						_				
Pn822	4	Reverse I	_atching A	Area	to 2,147,483,647	ence unit	0	Immediately	Setup	*2	
	2,147,483,647										

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	ı
	2	Option Monitor 1 Selection	0000h to FFFFh	-	0000h	Immediately	Setup	*2	
						•			-

Setting	Monitor
High-Speed	d Monitor Region
0000h	Motor speed [1000000h/overspeed detection speed]
0001h	Speed reference [1000000h/overspeed detection speed]
0002h	Torque [1000000h/maximum torque]
0003h	Position deviation (lower 32 bits) [reference units]
0004h	Position deviation (upper 32 bits) [reference units]
000Ah	Encoder count (lower 32 bits) [reference units]
000Bh	Encoder count (upper 32 bits) [reference units]
000Ch	FPG count (lower 32 bits) [reference units]
000Dh	FPG count (upper 32 bits) [reference units]
Low-Speed	d Monitor Region
0010h	Un000: Motor speed [min ⁻¹]
0011h	Un001: Speed Reference [min ⁻¹]
0012h	Un002: Torque Reference [%]
0013h	Un003: Rotational Angle 1 [encoder pulses] Number of encoder pulses from origin within one encoder rotation displayed in deci
0014h	Un004: Rotational Angle 2 [deg] Electrical angle from polarity origin
0015h	Un005: Input Signal Monitor
0016h	Un006: Output Signal Monitor
0017h	Un007: Input Reference Speed [min ⁻¹]
0018h	Un008: Position Deviation [reference units]
0019h	Un009: Accumulated Load Ratio [%]
001Ah	Un00A: Regenerative Load Ratio [%]
001Bh	Un00B: Dynamic Brake Resistor Power Consumption [%]
001Ch	Un00C: Input Reference Pulse Counter [reference units]
001Dh	Un00D: Feedback Pulse Counter [encoder pulses]
001Eh	Un00E: Fully-closed Loop Feedback Pulse Counter [external encoder resolution]
0023h	Initial multiturn data [Rev]
0024h	Initial incremental data [pulses]
0040h	Un025: SERVOPACK Installation Environment Monitor
0041h	Un026: Servomotor Installation Environment Monitor
0042h	Un027: Built-in Fan Remaining Life Ratio
0043h	Un028: Capacitor Remaining Life Ratio
0044h	Un029: Surge Prevention Circuit Remaining Life Ratio
0045h	Un02A: Dynamic Brake Circuit Remaining Life Ratio
0046h	Un032: Instantaneous Power
0047h	Un033: Power Consumption
0047H	Un034: Cumulative Power Consumption
	ations Module Only
0080h	Previous value of latched feedback position (LPOS1) [encoder pulses]
0081h	Previous value of latched feedback position (LPOS2) [encoder pulses]
0084h	Continuous Latch Status (EX STATUS)
All Areas	Softendodo Edion Otatuo (EX OTATOO)
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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Option M	onitor 2	Selection	0000h to FFFFh	-	0000h	Immediately	Setup	*2	
Pn825		000h to 084h	The s	ettings are	re the same as those for the Option Monitor 1 Selection.						
Pn827	2	Linear De stant 1 fo			1 to 65,535	10,000 refer- ence units/s ²	100	Immedi- ately *8	Setup	*2	
Pn829	2	SVOFF W SVOFF at Stop)			0 to 65,535	10 ms	0	Immedi- ately *8	Setup	*2	
	2	Option Fi	eld Alloc	cations 1	0000h to 1E1Eh	-	1813h	After restart	Setup	*11	
			ACCFI	L Allocation	n (Option)						
			0		oits 0 and 1 to A0						
			1	Allocate bits 1 and 2 to ACCFIL.							
			2		oits 2 and 3 to AC						
			3		oits 3 and 4 to AC						
			5		oits 4 and 5 to A0 oits 5 and 6 to A0						
			6		oits 6 and 7 to AC					 ;	
	n.	n.□□□X		7 Allocate bits 7 and 8 to ACCFIL.							
			8	Allocate bits 8 and 9 to ACCFIL.							
			9	Allocate bits 9 and 10 to ACCFIL.							
Pn82A			А	Allocate b	oits 10 and 11 to	ACCFIL.					
			В	Allocate b	oits 11 and 12 to	ACCFIL.					
M2 *12			С	Allocate b	oits 12 and 13 to	ACCFIL.					
			D	Allocate b	oits 13 and 14 to	ACCFIL.					
			Е	Allocate b	oits 14 and 15 to	ACCFIL.					
			ACCFI	L Allocatio	n Enable/Disable	e Selection					
	n.	ппхп	0	1	CCFIL allocation						
			1	Enable A0	CCFIL allocation.						
			G SFI	Allocation	(Option)						
	n.		0 to E		igs are the same	as for the	ACCFIL allo	cations.			
					<u> </u>						
			G_SEL	Allocation	Enable/Disable	Selection					
	n.	XDDD	0	Disable G	_SEL allocation.						
			1	Enable G	_SEL allocation.						
								Continu	ied on ne	vt paga	

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Option Fie	eld Alloc	ations 2	0000h to 1F1Fh	-	1D1Ch	After restart	Setup	*11	
			V PPI	Allocation	(Option)						
			0		oit 0 to V_PPI.						
			1		oit 1 to V_PPI.						
			2	Allocate b	oit 2 to V_PPI.						
			3	Allocate b	oit 3 to V_PPI.						
			4		oit 4 to V_PPI.						
			5		oit 5 to V_PPI.						
	_		6 7		oit 6 to V_PPI.						
	n.	.000X	8		oit 7 to V_PPI. oit 8 to V_PPI.						
			9		oit 9 to V_PPI.						
D 00D			A		oit 10 to V_PPI.						
Pn82B			В		oit 11 to V_PPI.						
M2 *12			С	Allocate b	oit 12 to V_PPI.						
			D	Allocate b	oit 13 to V_PPI.						
			Е	Allocate b	oit 14 to V_PPI.						
		\	F	Allocate b	oit 15 to V_PPI.						
			V_PPI	Allocation	Enable/Disable	Selection					
	n.	.00X0	0	Disable V	_PPI allocation.						
			1	Enable V_	PPI allocation.						
	P_PI_CLR Allocation (Option)										
	n.	X	0 to F The settings are the same as for the V_PPI allocations.								
			To to 1 The settings are the same as for the V_PP1 allocations.								
			P_PI_CLR Allocation Enable/Disable Selection								
	n.	.X000	0 Disable P_PI_CLR allocation.								
			1 Enable P_PI_CLR allocation.								
	2	Option Fig	eld Alloc	ations 3	0000h to 1F1Fh	_	1F1Eh	After restart	Setup	*11	
	n	.000X	P_CL A	Illocation (
	11.		0 to F	The setting	ngs are the same	as for the	V_PPI alloca	itions.			
			- o								
	_				Enable/Disable S	Selection					
Pn82C	n.	.00X0	0		_CL allocationCL allocation.						
M2 *12			'	LITABLET	_OL anocation.						
ш			N_CL A	Allocation	(Option)						
	n.	.0X00	0 to F		ngs are the same	as for the	V_PPI alloca	ations.			
										_	
					Enable/Disable S	Selection					
	n.	.X000	0 Disable N_CL allocation.								
			1	1 Enable N_CL allocation.							

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	Option Fi	eld Alloc	ations 4	0000h to 1F1Ch	-	0000h	After restart	Setup	*11	
			BANK_	SEL1 Allo	cation (Option)						
			0	Allocate b	oits 0 to 3 to BAN	IK_SEL1.					
			1	Allocate b	its 1 to 4 to BAN	IK_SEL1.					
			2	Allocate b	its 2 to 5 to BAN	IK_SEL1.					
			3	Allocate b	oits 3 to 6 to BAN	IK_SEL1.					
			4	Allocate b	oits 4 to 7 to BAN	IK_SEL1.					
	n.	пппх	5	Allocate b	oits 5 to 8 to BAN	IK_SEL1.					
			6	Allocate bits 6 to 9 to BANK_SEL1.							
			7	Allocate bits 7 to 10 to BANK_SEL1. Allocate bits 8 to 11 to BANK SEL1.							
			8								
Pn82D			9		oits 9 to 12 to BA						
M2 *12			Α		oits 10 to 13 to B						
M2 *12			В	Allocate b	oits 11 to 14 to B	ANK_SEL1					
			С	Allocate b	oits 12 to 15 to B	ANK_SEL1					
			BANK_	SEL1 Alloc	cation Enable/Di	sable Sele	ction				
	n.		0	Disable B	ANK_SEL1 alloca	ation.					
			1	Enable BA	ANK_SEL1 alloca	ition.					
	_		1							_	
	n.				cation (Option)						
			0 to F	The settin	gs are the same	as for the \	V_PPI alloca	ations.			
			LT_DIS	SABLE Allo	cation Enable/Di	sable Sele	ction				
	n.	XDDD	0	Disable L	Γ_DISABLE alloca	ation.					
			1	Enable LT		ition.					
			_								

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	Option Fi	eld Alloc	ations 5	0000h to 1D1Fh	_	0000h	After restart	Setup	*11		
			ь		. (5	`				_		
	n.		Reserv	ed parame	eter (Do not char	nge.)						
	n.		Reserv	ed parame	eter (Do not char	nge.)						
			OUT_S	IGNAL AII	ocation (Option)							
			0	Allocate b	oits 0 to 2 to OUT	_SIGNAL.						
			1	Allocate b	oits 1 to 3 to OUT	_SIGNAL.						
			2	Allocate b	oits 2 to 4 to OUT	_SIGNAL.						
			3	Allocate b	oits 3 to 5 to OUT	_SIGNAL.						
Pn82E			4	Allocate b	oits 4 to 6 to OUT	_SIGNAL.						
			5	Allocate b	oits 5 to 7 to OUT	_SIGNAL.						
M2 *12	n.		6	Allocate b	oits 6 to 8 to OUT	_SIGNAL.						
_			7	Allocate b	oits 7 to 9 to OUT	_SIGNAL.						
			8	Allocate k	oits 8 to 10 to OU	JT_SIGNAL						
			9	Allocate b	oits 9 to 11 to OU	JT_SIGNAL						
			А	Allocate b	oits 10 to 12 to C	UT_SIGNA	L.					
			В	Allocate b	oits 11 to 13 to C	UT_SIGNA	L.					
			С	Allocate k	oits 12 to 14 to C	UT_SIGNA	L.					
			D		oits 13 to 15 to C							
		OUT_SIGNAL Allocation Enable/Disable Selection										
			OUT_S	IGNAL All	ocation Enable/[Disable Sel	ection					
	n.	XDDD	0	Disable C	OUT_SIGNAL allo	cation.						
			1	Enable O	UT_SIGNAL alloc	ation.						
	2 Motion Settings 0000h to 0001h - 0000h After restart Setup											
	_				000 In							
			Linear Acceleration/Deceleration Constant Selection Use Pn80A to Pn80F and Pn827. (The settings of Pn834 to									
	n	пппх	0		OA to Pn80F and	Pn827. (Th	e settings o	of Pn834 to Pn	840 are			
D - 000	11.			ignored.)								
Pn833			1 Use Pn834 to Pn840. (The settings of Pn80A to Pn80F and Pn827 are ignored.)									
	n		Reserv	Reserved parameter (Do not change.)								
					•	<u> </u>						
	n.		Reserv	ed parame	eter (Do not char	ige.)						
	n.	XDDD	Reserv	ed parame	eter (Do not char	nge.)						
						10,000						
Pn834	4			Accelera-	1 to	refer-	100	Immediately	Setup	*2		
	.	tion Cons	stant 2		20,971,520	ence units/s ²		*9	20100			
						10,000						
Pn836	4	Second S	Stage Lir	near	1 to	refer-	100	Immediately	Setup	*2		
1 11030	"	Accelerat	tion Con	stant 2	20,971,520	ence units/s ²	100	*9	Setup	- 2		
Pn838	4	Accelerat			0 to	1 refer- ence	0	Immediately	Setup	*2		
	L ˙	Switching	g Speed	2	2,097,152,000	unit/s		*9	L			
						10,000						
Pn83A	4	First Stag ation Cor		Deceler-	1 to 20,971,520	refer- ence	100	Immediately	Setup	*2		
		ation COI	istailt Z		20,311,320	units/s ²		-9				
		Continued on next pa										

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Parameter No.	Size	0120		Origin Approach Command Acceleration/Dec Rate Of Latch ces Ous Latch ce Count equence 1 to 4 S Latch Sequen 0 Phase 1 EXT1: 2 EXT2: 3 EXT3:		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
Pn83C	4	1				1 to 20,971,520	10,000 refer- ence units/s ²	100	Immediately	Setup	*2		
Pn83E	4	-				0 to 2,097,152,000	1 refer- ence unit/s	0	Immediately	Setup	*2		
Pn840	4	1				1 to 20,971,520	10,000 refer- ence units/s ²	100	Immediately	Setup	*2		
Pn842 *13	4		Second C Speed 1	Origin Ap	proach	0 to 20,971,520	100 ref- erence units/s	0	Immediately	Setup	*2		
Pn844 *14	4		Second C Speed 2	Origin Ap	proach	0 to 20,971,520	100 ref- erence units/s	0	Immediately	Setup	*2		
Pn846	2			ccelerati		0 to 50	1%	0	Immedi- ately *9	Setup	_		
Pn850	2		Number of Sequence			0 to 8	-	0	Immediately	Setup	*2		
Pn851	2		Continuou			0 to 255	-	0	Immediately	Setup	*2		
	2	-	Latch Sectings	quence ⁻	I to 4 Set-	0000h to 3333h	-	0000h	Immediately	Setup	*2		
											_		
					•	1 Signal Selection	n						
					Phase C						_		
		n.			EXT1 signal								
						XT2 signal							
				3	EXT3 sign	nai					_		
Pn852				Latch S	Sequence 2	2 Signal Selection	n						
111002		n.		0 to 3		ngs are the same	as those fo	or the Latch	Sequence 1 S	Signal Selec	;- 		
				Latch S	Sequence :	3 Signal Selection	n						
		n.		0 to 3	The settin	igs are the same	as those fo	or the Latch	Sequence 1 S	ignal Selec	-		
				Latch S	Sequence 4	4 Signal Selection	n						
		n.	X000	0 to 3	The settin	ngs are the same	as those fo	or the Latch	Sequence 1 S	Signal Selec	;-		

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Parameter No.	Size		Name		Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence
	2	Latch Sectings	quence (5 to 8 Set-	0000h to 3333h	-	0000h	Immediately	Setup	*2
			Latch S	Sequence :	5 Signal Selection	on				
			0	Phase C						
	n.	X	1	EXT1 sign	nal					
			2	EXT2 signal						
			3 EXT3 signal							_
			Latch Sequence 6 Signal Selection							
Pn853	n.	.00X0	0 to 3	The settin	gs are the same	as those fo	or the Latch	Sequence 5 S	Signal Selec	-
			Latch S	Sequence	7 Signal Selection	on				
	n.	.DXDD	0 to 3		gs are the same		or the Latch	Sequence 5 S	Signal Selec	-
			Latch S	Seauence 8	3 Signal Selection	on				
	n.	n.XDDD Latch Sequence 8 Signal Selection O to 3 The settings are the same as those for the Latch Sequence 5 Signal Selection.								
	2	SVCMD_ Monitor A	IO Input Allocation	Signal	0000h to 1717h	-	0000h	Immediately	Setup	*2
	l _									_
			Input Signal Monitor Allocation for CN1-13 (SVCMD_IO)							
			0		Allocate bit 24 (IO_STS1) to CN1-13 input signal monitor.					
			1	Allocate bit 25 (IO_STS2) to CN1-13 input signal monitor.						_
			2		Allocate bit 26 (IO_STS3) to CN1-13 input signal monitor.					
	n.	X	3	Allocate bit 27 (IO_STS4) to CN1-13 input signal monitor. Allocate bit 28 (IO_STS5) to CN1-13 input signal monitor.						_
			5		oit 28 (IO_STS5)					_
Pn860			6		oit 30 (IO_STS7) t					_
			7		oit 31 (IO_STS8) 1					
M3 *7			CN1-1	3 Input Sig	nal Monitor Ena	ble/Disable	e Selection			
	n.	X_	0	Disable al	location for CN1	-13 input s	ignal monito	or.		_
			1	Enable all	ocation for CN1-	·13 input si	gnal monito	r.		
		.DXDD	Input S	Signal Moni	itor Allocation fo	or CN1-7 (S	SVCMD_IO)			
	11.		0 to 7	The settin	gs are the same	as the CN	1-13 allocat	ions.		_
	l —		CN1-7 Input Signal Monitor Enable/Disable Selection							
			CN1-7	Input Sign	al Monitor Enab	ie/Disable	Selection			
	n.	XDDD	CN1-7		al Monitor Enab location for CN1			<u>. </u>		

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Parameter No.	Size	Name	Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence			
	2 SVCMD Monitor	_IO Input Signal Allocations 2	0000h to 1717h	-	0000h	Immediately	Setup	*2			
	n.□□□X		nitor Allocation fo			ions.					
Pn861	n.□□X□	0 Disable a	nal Monitor Enab Illocation for CN1	-8 input sig	nal monitor.						
M3 *7	n.□X□□	n.□X□□ Input Signal Monitor Allocation for CN1-9 (SVCMD_IO) 0 to 7 The settings are the same as the CN1-13 allocations.									
	n.X□□□	0 Disable a	nal Monitor Enab allocation for CN1 llocation for CN1-	-9 input sig	nal monitor.						
	2 SVCMD Monitor	_IO Input Signal Allocations 3	0000h to 1717h	-	0000h	Immediately	Setup	*2			
	n.□□□X	· · · ·	nitor Allocation fo	,		,					
Pn862	n.□□X□	n.□□X□									
įΨΟ	n.□X□□	n.□X□□ Input Signal Monitor Allocation for CN1-11 (SVCMD_IO) 0 to 7 The settings are the same as the CN1-13 allocations.									
	n.X□□□	0 Disable a	gnal Monitor Ena allocation for CN1 llocation for CN1-	-11 input si	gnal monito						
	2 SVCMD Monitor	_IO Input Signal Allocations 4	0000h to 1717h	_	0000h	Immediately	Setup	*2			
	n.□□□X		nitor Allocation fo								
Pn863 M3 *7	n.□□X□	0 Disable a	gnal Monitor Ena allocation for CN1- llocation for CN1-	-12 input si	gnal monito						
	n.□X□□	Reserved param	eter (Do not char	nge.)							
	n.X□□□	Reserved param	eter (Do not char	nge.)							

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Parameter No.	Size	Name			Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence	
	2	SVCMD_ Monitor A	IO Outpu Allocation	ut Signal ns 1	0000h to 1717h	_	0000h	Immediately	Setup	*2	
		Output Signal Monitor Allocation for CN1-1 and CN1-2 (SVCMD_IO)									
			0		it 24 (IO_STS1) t		·				
			1		oit 25 (IO_STS2) t						
	n	пппх	2	2 Allocate bit 26 (IO_STS3) to CN1-1/CN1-2 output signal monitor. 3 Allocate bit 27 (IO_STS4) to CN1-1/CN1-2 output signal monitor.							
	11.			 Allocate bit 27 (IO_STS4) to CN1-1/CN1-2 output signal monitor. Allocate bit 28 (IO_STS5) to CN1-1/CN1-2 output signal monitor. 							
			5	11,111,							
Pn868			6								
1 11000			7	Allocate b	oit 31 (IO_STS8) t	o CN1-1/C	N1-2 outpu	it signal monito	or.	_	
M3 *7			CN1-1/	′CN1-2 Ou	tput Signal Mon	itor Enable	/Disable Se	election			
	n.	ппхп	0		location for CN1					_	
			1	Enable all	ocation for CN1-	1/CN1-2 o	utput signal	monitor.		_	
			Output	Signal Mo	nitor Allocation	for CN1-23	3 and CN1-	24 (SVCMD IC	O)		
	n.		Output Signal Monitor Allocation for CN1-23 and CN1-24 (SVCMD_IO) 0 to 7 The settings are the same as the CN1-1/CN1-2 allocations.								
		CN1-23/CN1-24 Output Signal Monitor Enable/Disable Selection									
	n.	XDDD	0		Disable allocation for CN1-23/CN1-24 output signal monitor.						
		^	1		ocation for CN1-		· ·				
	SVCMD_IO Output Signal			ıt Signal	0000h to						
	2 Monitor Allocations 2			1717h	_	0000h	Immediately	Setup	*2		
	n.□□□X Output Signal Mo							O)			
	0 to 7 The setting			ngs are the same as the CN1-1/CN1-2 allocations.							
Pn869			CN1-2	5/CN1-26	Output Signal M	onitor Enal	ble/Disable	Selection			
M3 *7	n.				ocation for CN1-25/CN1-26 output signal monitor.						
			1	Enable all	ocation for CN1-	25/CN1-26	output sigi	nal monitor.			
	n.	ОХОО	Reserv	ed parame	eter (Do not char	nge.)					
	n.	XDDD	Reserv	ed parame	eter (Do not char	nae.)					
		<u> </u>	11000.1	ou parame	(20 1101 01101	.90./					
Pn880	2	Station A			03h to EFh	-	0	Immediately	Setup		
Pn881	2	(for maintenance, read only) Set Transmission Byte Count Monitor [bytes] (for		Byte rtes] (for	17, 32, 48	_	0	Immediately	Setup	_	
	maintenance, read only)										
Pn882	2	Monitor [i maintena	× 0.25 μ:		Oh to FFFFh	_	0	Immediately	Setup	_	
Pn883	Communications Cycle Setting Monitor [transmission cycles] (for maintenance, read only)		ransmis-	0 to 32	-	0	Immediately	Setup	_		
								0 1!	ied on ne		

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D						0.11.	D. (- 11	NA/II-		' 0		
Parameter No.	Size	Name :			Setting Range	Setting Unit	Default Setting	When Enabled	Classifi- cation	Refer- ence		
	2	2 Communications Controls 2			0000h to 0001h	_	0000h	Immediately	Setup	*2		
			MECH	MECHATROLINK Communications Error Holding Brake Signal Setting								
Pn884	n.E	DOOX	0	Maintain the status set by the BRK_ON or BRK_OFF command when a MECHA-TROLINK communications error occurs.								
M3 *7			1	Apply the h	olding brake wh	en a MECH	IATROLINK	communicatio	ns error oc	curs.		
INIO	n.E		Reserv	ed paramet	er (Do not chanç	je.)						
	n.E	IXDD	Reserved parameter (Do not change.)									
	n.X		Reserv	eserved parameter (Do not change.)								
	-											
Pn88A	2	Error Co	ounter M	K Receive onitor e, read only)	0 to 65,535	_	0	Immediately	Setup	-		
Pn890 to Pn8A6	4	during A	Alarm/Wa	Monitor arning e, read only)	Oh to FFFFFFFh	_	0h	Immediately	Setup	*2		
Pn8A8 to Pn8BE	4	Respon during A (for main	Alarm/Wa		Oh to FFFFFFFh	_	0h	Immediately	Setup	*2		
Pn900	2	Number Banks	of Para	meter	0 to 16	-	0	After restart	Setup	*2		
Pn901	2	Number of Parameter Bank Members		0 to 15	-	0	After restart	Setup	*2			
Pn902 to Pn910	2	2 Parameter Bank Member Definition		0000h to 08FFh	-	0h	After restart	Setup	*2			
Pn920 to Pn95F	2	Parame (Not say memory	ed in no	Data nvolatile	0000h to FFFFh	-	Oh	Immediately	Setup	*2		

- *1. Refer to the following manual for details.
 - Σ-7-Series Σ-7S SERVOPACK with MECHATROLINK-III Communications References Product Manual (Manual No.: SIEP S800001 28)
- *2. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive MECHATROLINK-III Communications Standard Servo Profile Command Manual (Manual No.: SIEP S800001 31)
- *3. Set a percentage of the motor rated torque.
- *4. Normally set this parameter to 0. If you use an External Regenerative Resistor, set the capacity (W) of the External Regenerative Resistor.
- *5. The upper limit is the maximum output capacity (W) of the SERVOPACK.
- *6. These parameters are for SERVOPACKs with the dynamic brake option. Refer to the following manual for details
 - Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Dynamic Brake Hardware Option Specifications Product Manual (Manual No.: SIEP S800001 73)
- *7. This parameter is valid only when the MECHATROLINK-III standard servo profile is used.
- *8. The parameter setting is enabled after SENS_ON command execution is completed.
- *9. 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.
- *10. The settings are updated only if the reference is stopped (i.e., only if DEN is set to 1).
- *11. Refer to the following manual for details.
 - Σ-7-Series AC Servo Drive MECHATROLINK-II Communications Command Manual (Manual No.: SIEP S800001 30)
- *12. This parameter is valid only when the MECHATROLINK-II-compatible profile is used.
- *13. The setting of Pn842 is valid while Pn817 is set to 0.
- *14. The setting of Pn844 is valid while Pn818 is set to 0.

Parameter Lists

Interpreting the MECHATROLINK-III Common Parameter List

4.2.3

Indicates when a change to the parameter will be effective.

"After restart" indicates parameters that will be effective after one of the following is executed.

- The power supply is turned OFF and ON again.
- · The CONFIG command is sent.
- A software reset is executed.

Parameter No.	Size	Name	Setting Range	Setting Unit [Resolution]	Default Set- ting	When Enabled	Classifi- cation
61 PnAC2	4	Speed Loop Gain	1,000 to 2,000,000	0.001 Hz [0.1 Hz]	40000	Immediately	Tuning

You can set the parameter in increments of the setting unit.

However, if a unit is given in square brackets, the setting is automatically converted to the resolution given in the square brackets.

4.2.4 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	N	ame	Setting Range	Setting Unit [Resolution]	Default Setting	When Enabled	Classifi- cation
	4	Encoder Type Selection (read only)		Oh to 1h	-	-	_	
01								
PnA02		0000h	Absolute enc	oder				
		0001h	Incremental e	encoder				
	4	Motor Type (read only)	Selection	Oh to 1h	-	_	-	
02								_
PnA04		0000h	Rotary Servo	motor				atio
		0001h	Linear Servo	motor				or m
								infe
	4	Semi-close closed Sele only)		Oh to 1h	-	-	_	Device information
03								
PnA06		0000h	Semi-closed					
		0001h	Fully-closed					
04 PnA08	4	Rated Motor Speed (read only)		Oh to FFFFFFFh	1 min ⁻¹	-	-	
05 PnA0A	4	Maximum ((read only)	Output Speed	Oh to FFFFFFFh	1 min ⁻¹	-	_	

4.2.4 List of MECHATROLINK-III Common Parameters

Continued from previous page.

						Contir	nued from prev	ious page.		
Parameter No.	Size	Na	ıme	Setting Range	Setting Unit [Resolution]	Default Setting	When Enabled	Classifi- cation		
06 PnA0C	4	Speed Multi (read only)	iplier	-1,073,741,823 to 1,073,741,823	-	-	_			
07 PnA0E	4	Rated Torqu (read only)	ıe	Oh to FFFFFFFh	1 N·m	-	_	nation		
08 PnA10	4	Maximum C Torque (read		Oh to FFFFFFFh	1 N·m	-	_	inform		
09 PnA12	4	Torque Mult (read only)	iplier	-1,073,741,823 to 1,073,741,823	-	-	_	Device information		
0A PnA14	4	Resolution (read only)		Oh to FFFFFFFh	1 pulse/rev	_	_			
21 PnA42	4	Electronic Gear Ratio (Numerator)		1 to 1,073,741,824	-	1	After restart			
22 PnA44	4	Electronic Gear Ratio (Denominator)		1 to 1,073,741,824	-	1	After restart			
23 PnA46	4	Absolute Er gin Offset	ncoder Ori-	-1,073,741,823 to 1,073,741,823	1 reference unit	0	Immedi- ately*1			
24 PnA48	4	Multiturn Lir Setting	mit	0 to 65,535	1 Rev	65535	After restart			
	4	Limit Setting	g	0h to 33h	_	0000h	After restart			
		Bit 0	P-OT (0	: Enabled, 1: Disabled)			ons		
		Bit 1	N-OT (0	: Enabled, 1: Disabled	1)			cati		
25		Bit 2	Reserve	d.	ocific					
PnA4A		Bit 3	Reserve	_						
		Bit 4	P-SOT (0: Disabled, 1: Enable	ed)			i.		
		Bit 5	N-SOT (0: Disabled, 1: Enable	ed)			Machine specifications		
		Bits 6 to 31	Reserve	d.				Σ		
26				4 070 744 000 1		107071100				
PnA4C	4	Forward So		-1,073,741,823 to 1,073,741,823	1 reference unit	107374182 3	Immediately			
27 PnA4E	4	Reserved pa not change.	arameter (Do .)	-	-	0	Immediately			
28 PnA50	4	Reverse So	ftware Limit	-1,073,741,823 to 1,073,741,823	1 reference unit	-1073741 823	Immediately			
29 PnA52	4	not change.	arameter (Do .)	-	-	0	Immediately			
	4	Speed Unit Selection*2		Oh to 4h	-	0	After restart			
		0000h	Reference u	nits/s						
41 PnA82		0001h	Reference u							
PIIA62		0002h	Ŭ	(%) of rated speed*3						
		0003h	min ^{-1*3}							
	0004h Maximum m		otor speed/40000000)h*4			8			
						tting				
	Speed Base Unit Selec-					Unit settings				
42		tion*3, *4						Unii		
PnA84 4 the following formula: -3 to 3 - 0		After restart								
		Speed unit	selection (41							
		PnA82) × 10								
	4	Selection Uni	IL	0h	-	0	After restart			
43				1		!	+			
PnA86		0000h	Reference u	nits						

Continued from previous page.

Parameter No.	Size	Name		Setting Range	Setting Unit [Resolution]	Default Setting	When Enabled	Classifi- cation	
44 PnA88	4	Position Base L Selection (Set the value o the following for Position unit se (43 PnA86) x 10	f n from mula: ection	0 –		0	After restart		
	4	Acceleration Ur	it Selec-	0h	-	0	After restart		
45 PnA8A		0000h Refe	rence uni	ts/s ²					
46 PnA8C	4	Acceleration Ba Selection (Set the value o the following for Acceleration un tion (45 PnA8A)	f n from mula: t selec-	4 to 6	-	4	After restart		
	4	Torque Unit Selection		1h or 2h	-	1	After restart		
47 PnA8E		0001h Percentage (%) of rated torque rque/40000000h*5					
48 PnA90	Torque Base Unit Selection*5 (Set the value of n fron the following formula: Torque unit selection (4 PnA8E) × 10 ⁿ)			-5 to 0	-	0	After restart	Unit settings	
	4	Supported Unit (read only)	Systems	-	_	0601011Fh	-	Unit	
		0 111 11							
		Speed Units Bit 0	Poforo	Reference units/s (1: Enabled)					
		Bit 1		ence units/s (1. Lilabi					
		Bit 2		ntage (%) of rated spe	· · · · · · · · · · · · · · · · · · ·				
		Bit 3		(rpm) (1: Enabled)					
		Bit 4		num motor speed/400	00000h (1: Enabl	ed)			
		Bits 5 to 7	Reser	ved (0: Disabled).	· · · · · · · · · · · · · · · · · · ·	,			
		Position Units							
49		Bit 8	Refere	ence units (1: Enabled	i)				
PnA92		Bits 9 to 15	Reser	ved (0: Disabled).					
		Acceleration Ur	its						
		Bit 16	Refere	ence units/s² (1: Enab	led)		·		
Bit 17 ms (acceleration time		cceleration time requi	red to reach rate	d speed) (0: D	isabled)				
	Bits 18 to 23 Reserved (0: Disabled).								
		Torque Units							
		Bit 24	N·m (0): Disabled)					
		Bit 25	Percer	ntage (%) of rated tor	que (1: Enabled)				
	Bit 26 Maximum torque/4000000h (1: Enabled)								
		Bits 27 to 31	Reser	ved (0: Disabled).					

4.2.4 List of MECHATROLINK-III Common Parameters

Continued from previous page.

_							ued from prev			
Parameter No.	Size	Na	ame	Setting Range	Setting Unit [Resolution]	Default Setting	When Enabled	Classifi- cation		
61 PnAC2	4	Speed Loop	p Gain	1,000 to 2,000,000	0.001 Hz [0.1 Hz]	40000	Immediately			
62 PnAC4	4	Speed Loop Time Const	p Integral ant	150 to 512,000	1 μs [0.01 ms]	20000	Immediately			
63 PnAC6	4	Position Lo	op Gain	1,000 to 2,000,000	0.001/s [0.1/s]	40000	Immediately			
64 PnAC8	4	Feedforward Compensation		0 to 100	1%	0	Immediately			
65 PnACA	4	Position Loop Integral Time Constant		Position Loop Integral Time Constant		0 to 5,000,000	1 μs [0.1 ms]	0	Immediately	
66 PnACC	4	Positioning Width	Completed	0 to 1,073,741,824	1 reference unit	7	Immediately			
67 PnACE	4	Near Signal	l Width	1 to 1,073,741,824	1 reference unit	107374182 4	Immediately			
81 PnB02	4	Exponential tion/Decele Constant		0 to 510,000	1 μs [0.1 ms]	0	Immedi- ately*6			
82 PnB04	4	Average Mo Time	ovement	0 to 510,000	1 μs [0.1 ms]	0	Immedi- ately*6			
83 PnB06	4	External Po Final Travel	sitioning Distance	-1,073,741,823 to 1,073,741,823	1 reference unit	100	Immediately			
84 PnB08	4	Origin Appr	oach Speed	Oh to 3FFFFFFh	10 ⁻³ min ⁻¹	× 5,000 ref- erence units/s con- verted to 10 ⁻³ min ⁻¹	Immediately			
85 PnB0A	4	Origin Retu Speed	rn Creep	Oh to 3FFFFFFFh	10 ⁻³ min ⁻¹	× 500 reference units/s converted to 10 ⁻³ min ⁻	Immediately	Tuning		
86 PnB0C	4	Final Travel Origin Retu	Distance for rn	-1,073,741,823 to 1,073,741,823	1 reference unit	100	Immediately			
	4	Fixed Monit	tor Selection	0h to Fh	-	1	Immediately			
87 PnB0E		000Bh Reserved (ur 000Ch CMN1 (coming 000Dh CMN2 (coming 000Eh OMN1 (options)		ndefined value). ndefined value). mon monitor 1) mon monitor 2) nal monitor 2) nal monitor 2)						

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Parameter						Setting Unit	ים י	efault	When
No.	Size	N	ame	Setting I	Range	[Resolution]		etting	Enabled
8	4	Fixed Monitor Selection 2		Oh to	Fh	-		0	Immediately
B10		0000h to 000Fh	The settings are the same as those for Fixed Monitor Selection 1.						
	4	SEL_MON (CMN1) Mon- itor Selection 1 Oh to 9h – 0 Imme						Immediately	
		0000h	TPOS (target position in reference coordinate system)						
		0001h	IPOS (reference position in reference coordinate system)						
		0002h	POS_OFFSET (offset set in POS_SET (Set Coordinate System) command)						
		0003h	TSPD (target speed)						
		0004h	SPD_LIM (speed limit)						
		0005h	TRQ_LIM (torque limit) SV_STAT (servo actual operating status)						
			00h: Pos 01h: Spe 02h: Torc Byte 3: Re	se 2 se 3 irrent control r ition control m ed control m que control m	node ode ode				
			Bit	Name	Des	scription	Value	Se	etting
			Bit 0						
			Rit 0	IT RDV1	latch de	sing status for	0	Latch of not yet cessed	
			Bit 0	LT_RDY1	latch de	sing status for stection for 1 in SVCM-		not yet	pro- d. ssing latch on in
) nB12		0006h			latch de LT_REQ D_CTRL Process latch de	sing status for tection for 11 in SVCM- region sing status for tection for	0	not yet cessed Proces detecti progres	ssing latch on in sss. detection
		0006h	Bit 0	LT_RDY1	latch de LT_REQ D_CTRL Process latch de	sing status for tection for the sycom- tent in SVCM- region region status for tection for the sycom-	0 1 0	Processed Latch of not yet cessed Processed Pr	sing latch on in ss. detection pro-d. sing latch on in spro-d. sing latch on in ss.
312		0006h			latch de LT_REQ D_CTRL Process latch de LT_REQ	sing status for tection for the sycom- tent in SVCM- region region status for tection for the sycom-	0 1 0	not yet cessed detection progressed testion of yet cessed detection progressed detection progressed progressed testion progress	sing latch on in ss. detection pro-l. ssing latch on in ss. consisting latch on in st. consisting latc
312		0006h	Bit 1		latch de LT_REQ D_CTRL Process latch de LT_REQ	sing status for tection for the sycom- tent in SVCM- region region status for tection for the sycom-	0 1 0	not yet cessed detection progressed testion of yet cessed detection progressed detection progressed progressed testion progress	sing latch on in ss. detection pro-d. sing latch on in spro-d. sing latch on in ss. C
		0006h			latch de LT_REQ D_CTRL Process latch de LT_REQ	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0	not yet cessed Proces detecti progres Latch on the yet cessed Proces detecti progres Phase Externa signal	sing latch on in ss. detection pro-d. sing latch on in spro-d. sing latch on in ss. C all input 1 all input
		0006h	Bit 1	LT_RDY1	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1	not yet cessed Proces detecti progre: Latch on the yet cessed detecti progre: Proces detecti progre: Phase Externa signal Externa signal	sing latch on in ss. detection pro- d. sing latch on in ss. detection pro- d. sing latch on in ss. C C all input 1 all input 2 all input
312		0006h	Bit 1	LT_RDY1	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 2	not yet cessed detecti progres Latch on tyet cessed detecti progres detecti progres Externa signal i Externa signal i Externa	sing latch on in ss. detection pro- l. ssing latch on in ss. C al input 1 al input 2 al input 3
B12		0006h	Bit 1 Bits 2 and 3	LT_RDY1	Process latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL Latch si	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3	Process detecting progress detection progress detec	sing latch on in ss. detection pro- d. ssing latch on in ss. C all input 1 all input 2 all input 3 C all input all input 3 C all input 3
		0006h	Bit 1	LT_RDY1	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3 0 0	Processed detection progressed detection	sing latch on in ss. detection pro- d. ssing latch on in ss. C all input 1 all input 3 C all input 1 all input 1 all input 1 all input 1
B12		0006h	Bits 2 and 3	LT_RDY1	Process latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL Latch si	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3 0 1	not yet cessed Process detecti progres Latch of not yet cessed Process detecti progres Phase Externa signal Externa signal Sexterna signal Externa signal Externa signal Externa signal Externa signal Externa signal Sexterna	sing latch on in ss. detection pro- d. ssing latch on in ss. C all input 1 all input 2 all input 1 all input 1 all input 1 all input 2 all input 1 all input 2 all input 1
312		0006h	Bits 2 and 3	LT_RDY1	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL Latch si	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3 0 1 2	not yet cessed Process detecti progre: Latch of not yet cessed Process detecti progre: Phase Externa signal Externa signal Phase Externa signal Externa sign	sing latch on in ss. detection pro- d. ssing latch on in ss. C all input all input all input all input all input all input all input all input all input all input all input all input all input all input all input all input
312		0006h	Bits 2 and 3	LT_RDY1 LT_SEL1R LT_SEL2R	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL Latch si	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3 0 1 2	not yet cessed Process detecti progre: Latch of not yet cessed Process detecti progre: Phase Externa signal Externa signal Phase Externa signal Externa sign	sing latch on in ss. detection pro- d. ssing latch on in ss. C all input 1 all input 2 all input 1 all input 1 all input 1 all input 2 all input 1 all input 2 all input 1
			Bits 2 and 3 Bits 4 and 5	LT_RDY1 LT_SEL1R LT_SEL2R Reserved (C	latch de LT_REQ D_CTRL Process latch de LT_REQ D_CTRL Latch si Latch si Latch si	sing status for tection for the status for the status for the status for tection for the status	0 1 0 1 0 1 2 3 0 1 2 3 itial enc	not yet cessed Proces detecti progre: Latch on the yet cessed Proces detecti progre: Phase Externa signal of Externa sig	sing latch on in ss. detection pro-l. sing latch on in ss. detection pro-l. sing latch on in ss. C all input 1 all input 2 all input 1 all input 1 all input 2 all input 1 all input 2 all input 3 c all input 1 all input 2 all input 3 c all i

4.2.4 List of MECHATROLINK-III Common Parameters

Continued from previous page.

Parameter	0:	Size Name		Cattian Danas	Setting Unit	Default	When	Classifi-
No.	Size			Setting Range	[Resolution]	Setting	Enabled	cation
	4	SEL_MON (CMN2) Mor itor Selection 2		0h to 9h	_	0	Immediately	
8A PnB14	0000h to 0009h The settings are the same as those for SEL_MON Monitor Selection 1.							
8B PnB16	4	Origin Dete	ection Width	0 to 250	1 reference unit	10	Immediately	
8C PnB18	4	Forward Torque Limit		0 to 800	1%	100	Immediately	
8D PnB1A	4	Reverse Torque Limit		0 to 800	1%	100	Immediately	
8E PnB1C	4	Zero Speed Detection Range		1,000 to 10,000,000	10 ⁻³ min ⁻¹	20000	Immediately	
8F PnB1E	4	Speed Coincidence Signal Detection Width		0 to 100,000	10 ⁻³ min ⁻¹	10000	Immediately	ameter
	4	Servo Command Control Field Enable/Disable Selections (read only)		-	-	0FFF3F3Fh	_	Command-related parameters
		Bit 0	CMD_	D_PAUSE (1: Enabled)				
		Bit 1	CMD_	CANCEL (1: Enabled	Com			
		Bits 2 and	3 STOP	_MODE (1: Enabled)				
	Bits 4 and 5 Bits 6 and 7 Bit 8		5 ACCF	ACCFIL (1: Enabled)				
				Reserved (0: Disabled).				
90 PnB20				LT_REQ1 (1: Enabled)				
		Bit 9		LT_REQ2 (1: Enabled)				
	Bits 10 and 11 Bits 12 and 13			LT_SEL1 (1: Enabled)				
				LT_SEL2 (1: Enabled)				
		Bits 14 and		rved (0: Disabled).				
		Bits 16 to		MON1 (1: Enabled)				
		Bits 20 to		MON2 (1: Enabled)				
		Bits 24 to		MON3 (1: Enabled)				
		Bits 28 to	31 Reser	Reserved (0: Disabled).				

Setting Unit

[Resolution]

Setting Range

CMD_PAUSE_CMP (1: Enabled)

Reserved (0: Disabled).

Reserved (0: Disabled)

L_CMP1 (1: Enabled)

L_CMP2 (1: Enabled)

M_RDY (1: Enabled)

SV_ON (1: Enabled)

Reserved (0: Disabled).

SEL_MON1 (1: Enabled)

SEL_MON2 (1: Enabled)

SEL_MON3 (1: Enabled)

Reserved (0: Disabled).

Reserved (0: Disabled).

V_PPI (1: Enabled)

P_PPI (1: Enabled)

P_CL (1: Enabled)

N_CL (1: Enabled)

G_SEL (1: Enabled) G_SEL (0: Disabled)

Reserved (0: Disabled).

BANK_SEL (1: Enabled)

SO1 to SO3 (1: Enabled)

Reserved (0: Disabled).

Reserved (0: Disabled).

POS_RDY (1: Enabled) PON (1: Enabled)

ACCFIL (1: Enabled)

CMD_CANCEL_CMP (1: Enabled)

Parameter

No.

PnB22

92 PnB24 Size

4

Name

Servo Status Field

Bit 0

Bit 1

Bit 8

Bit 9

Bit 10

Bit 11 Bit 12

Bit 13

Bits 14 and 15

Bits 16 to 19

Bits 20 to 23

Bits 24 to 27

Bits 28 to 31

only)

Bit 4

Bit 5

Bit 6

Bit 7

Bit 8

Bits 9 to 11 Bits 12 to 15

Bits 16 to 19

Bits 20 to 22

Bits 24 to 31

Bit 23

Bits 0 to 3

4

Output Bit Enable/Dis-

able Selections (read

Bit 2 and 3

Bits 4 and 5

Bits 6 and 7

Enable/Disable Selections (read only)

Default

Setting

0FFF3F33h

007F01F0h

Enabled

Classifi-

cation

4.2.4 List of MECHATROLINK-III Common Parameters

Continued from previous page.

Parameter No.	Size	Name		Setting Range	Setting Unit [Resolution]	Default Setting	When Enabled	Classifi- cation
	4	Input Bit Enable/Di Selections (read or		-	-	FFOFFEFEh	-	
		Bit 0		ved (0: Disabled).				
		Bit 1		(1: Enabled)				
		Bit 2		(1: Enabled)				
		Bit 3		(1: Enabled)				
		Bit 4		(1: Enabled)				
		Bit 5	EXT2	(1: Enabled)				
		Bit 6	EXT3	(1: Enabled)				S S
		Bit 7	ESTP	(1: Enabled)				nete
		Bit 8	Reser	ved (0: Disabled).				rac
		Bit 9	BRK_	ON (1: Enabled)				<u>8</u>
93 PnB26		Bit 10	P-SO	T (1: Enabled)				atec
PNB26		Bit 11	N-SO	T (1: Enabled)				Command-related parameters
		Bit 12	DEN	(1: Enabled)				and
		Bit 13	NEAF	R (1: Enabled)				Ĕ
		Bit 14	PSET	(1: Enabled)				Co
		Bit 15	ZPOII	NT (1: Enabled)				
		Bit 16	T_LIN	1 (1: Enabled)				
		Bit 17	V_LIN	1 (1: Enabled)				
		Bit 18	V_CN	1P (1: Enabled)				
		Bit 19	ZSPD	(1: Enabled)				
		Bits 20 to 23	Reser	ved (0: Disabled).				
		Bits 24 to 31	I0_ST	S1 to I0_STS8 (1: En	abled)		·	

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

^{*2.} When using fully-closed loop control, set the reference units/s.

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

^{*4.} If you set the Speed Unit Selection (parameter 41) to 0004h, set the Speed Base Unit Selection (parameter 42) to 0.

^{*5.} If you set the Torque Unit Selection (parameter 47) to 0002h, set the Torque Base Unit Selection (parameter 48) to 0.

^{*6.} Change the setting when the reference is stopped (i.e., while DEN is set to 1). If you change the setting during operation, the reference output will be affected.

4.2.5

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

Parameter No.	Default Setting	Name	When Enabled
Pn000	0000h	Basic Function Selections 0	After restart
Pn001	0000h	Application Function Selections 1	After restart
Pn002	0011h	Application Function Selections 2	After restart
Pn006	0002h	Application Function Selections 6	Immediately
Pn007	0000h	Application Function Selections 7	Immediately
Pn008	4000h	Application Function Selections 8	After restart
Pn009	0010h	Application Function Selections 9	After restart
Pn00A	0001h	Application Function Selections A	After restart
Pn00B	0000h	Application Function Selections B	After restart
Pn00C	0000h	Application Function Selections C	After restart
Pn00D	0000h	Application Function Selections D	After restart
Pn00F	0000h	Application Function Selections F	After restart
Pn021	0000h	Reserved parameter	_
Pn022	0000h	Reserved parameter	_
Pn040	0000h	Reserved parameter	_
Pn081	0000h	Application Function Selections 81	After restart
Pn100	400	Speed Loop Gain	Immediately
Pn101	2000	Speed Loop Integral Time Constant	Immediately
Pn102	400	Position Loop Gain	Immediately
Pn103	100	Moment of Inertia Ratio	Immediately
Pn104	400	Second Speed Loop Gain	Immediately
Pn105	2000	Second Speed Loop Integral Time Constant	Immediately
Pn106	400	Second Position Loop Gain	Immediately
Pn109	0	Feedforward	Immediately
Pn10A	0	Feedforward Filter Time Constant	Immediately
Pn10B	0000h	Gain Application Selections	*1
Pn10C	200	Mode Switching Level for Torque Reference	Immediately
Pn10D	0	Mode Switching Level for Speed Reference	Immediately
Pn10E	0	Mode Switching Level for Acceleration	Immediately
Pn10F	0	Mode Switching Level for Position Deviation	Immediately
Pn11F	0	Position Integral Time Constant	Immediately

Continued from previous page.

Continued from previous p				
Parameter No.	Default Setting	Name	When Enabled	
Pn121	100	Friction Compensation Gain	Immediately	
Pn122	100	Second Friction Compensation Gain	Immediately	
Pn123	0	Friction Compensation Coefficient	Immediately	
Pn124	0	Friction Compensation Frequency Correction	Immediately	
Pn125	100	Friction Compensation Gain Correction	Immediately	
Pn131	0	Gain Switching Time 1	Immediately	
Pn132	0	Gain Switching Time 2	Immediately	
Pn135	0	Gain Switching Waiting Time 1	Immediately	
Pn136	0	Gain Switching Waiting Time 2	Immediately	
Pn139	0000h	Automatic Gain Switching Selections 1	Immediately	
Pn13D	2000	Current Gain Level	Immediately	
Pn140	0100h	Model Following Control- Related Selections	Immediately	
Pn141	500	Model Following Control Gain	Immediately	
Pn142	1000	Model Following Control Gain Correction	Immediately	
Pn143	1000	Model Following Control Bias in the Forward Direction	Immediately	
Pn144	1000	Model Following Control Bias in the Reverse 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 Compensation	Immediately	
Pn148	500	Second Model Following Control Gain	Immediately	
Pn149	1000	Second Model Following Gain Control Correction	Immediately	
Pn14A	800	Vibration Suppression 2 Frequency	Immediately	
Pn14B	100	Vibration Suppression 2 Correction	Immediately	
Pn14F	0011h	Control-Related Selections	After restart	
Pn160	0010h	Anti-Resonance Control- Related Selections	Immediately	
Pn161	1000	Anti-Resonance Frequency	Immediately	
Pn162	100	Anti-Resonance Gain Correction	Immediately	
Pn163	0	Anti-Resonance Damping Gain	Immediately	
Pn164	0	Anti-Resonance Filter Time Constant 1 Correction	Immediately	

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Parameter No.	Default Setting	Name	When Enabled	
Pn165	0	Anti-Resonance Filter Time Constant 2 Correction	Immediately	
Pn166	0	Anti-Resonance Damping Gain 2	Immediately	
Pn170	1401h	Tuning-less Function- Related Selections	*1	
Pn205	65535	Multiturn Limit	After restart	
Pn207	0010h	Position Control Function Selections	After restart	
Pn20A	32768	Number of External 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	0000h	Fully-closed Control Selections	After restart	
Pn230	0000h	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	
Pn304	500	Jogging Speed	Immediately	
Pn305	0	Soft Start Acceleration Time	Immediately	
Pn306	0	Soft Start Deceleration Time	Immediately	
Pn308	0	Speed Feedback Filter Time Constant	Immediately	
Pn30A	0	Deceleration Time for Servo OFF and Forced Stops	Immediately	
Pn30C	0	Speed Feedforward Average Movement Time	Immediately	
Pn310	0000h	Vibration Detection Selections	Immediately	
Pn311	100	Vibration Detection Sensitivity	Immediately	
Pn312	50	Vibration Detection Level	Immediately	
Pn316	10000	Maximum Motor Speed	After restart	
Pn324	300	Moment of Inertia Calculation Starting Level	Immediately	
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	

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Parameter No.	Default Setting	Name	When Enabled	
Pn407	10000	Speed Limit during Torque Control	Immediately	
Pn408	0000h	Torque-Related Function Selections	*1	
Pn409	5000	First Stage Notch Filter Frequency	Immediately	
Pn40A	70	First Stage Notch Filter Q Value	Immediately	
Pn40B	0	First Stage Notch Filter Depth	Immediately	
Pn40C	5000	Second Stage Notch Filter Frequency	Immediately	
Pn40D	70	Second Stage Notch Filter Q Value	Immediately	
Pn40E	0	Second Stage Notch Filter Depth	Immediately	
Pn40F	5000	Second Stage Second Torque Reference Filter Frequency	Immediately	
Pn410	50	Second Stage Second Torque Reference Filter Q Value	Immediately	
Pn412	100	First Stage Second Torque Reference Filter Time Con- stant	Immediately	
Pn416	0000h	Torque-Related Function Selections 2	Immediately	
Pn417	5000	Third Stage Notch Filter Frequency	Immediately	
Pn418	70	Third Stage Notch Filter Q Value	Immediately	
Pn419	0	Third Stage Notch Filter Depth	Immediately	
Pn41A	5000	Fourth Stage Notch Filter Frequency	Immediately	
Pn41B	70	Fourth Stage Notch Filter Q Value	Immediately	
Pn41C	0	Fourth Stage Notch Filter Depth	Immediately	
Pn41D	5000	Fifth Stage Notch Filter Frequency	Immediately	
Pn41E	70	Fifth Stage Notch Filter Q Value	Immediately	
Pn41F	0	Fifth Stage Notch Filter Depth	Immediately	
Pn423	0000h	Reserved parameter	_	
Pn424	50	Torque Limit at Main Circuit Voltage Drop	Immediately	
Pn425	100	Release Time for Torque Limit at Main Circuit Voltage Drop	Immediately	
Pn426	0	Torque Feedforward Average Movement Time	Immediately	
Pn427	0	Reserved parameter	-	
Pn456	15	Sweep Torque Reference Amplitude	Immediately	

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Parameter No.	Default Setting	Name	When Enabled
Pn460	0101h	Notch Filter Adjustment Selections 1	Immediately
Pn475	0000h	Gravity Compensation- Related Switches	After restart
Pn476	0	Gravity Compensation Torque	Immediately
Pn502	20h	Rotation Detection Level	Immediately
Pn503	10	Speed Coincidence Detection Signal Output Width	Immediately
Pn506	0	Brake Reference-Servo OFF Delay Time	Immediately
Pn507	100	Brake Reference Output Speed Level	Immediately
Pn508	50	Servo OFF-Brake Com- mand Waiting Time	Immediately
Pn509	20	Momentary Power Interruption Hold Time	Immediately
Pn50A	1881h	Input Signal Selections 1	After restart
Pn50B	8882h	Input Signal Selections 2	After restart
Pn50E	0000h	Output Signal Selections 1	After restart
Pn50F	0100h	Output Signal Selections 2	After restart
Pn510	0000h	Output Signal Selections 3	After restart
Pn511	6543h	Input Signal Selections 5	After restart
Pn512	0000h	Output Signal Inverse Settings	After restart
Pn514	0000h	Output Signal Selections 4	After restart
Pn516	8888h	Input Signal Selections 7	After restart
Pn51B	1000	Motor-Load Position Deviation Overflow Detection Level	Immediately
Pn51E	100	Position Deviation Over- flow Warning Level	Immediately
Pn520	5242880	Position Deviation Over- flow Alarm Level	Immediately
Pn522	7	Positioning Completed Width	Immediately
Pn524	1073741824	Near Signal Width	Immediately
Pn526	5242880	Position Deviation Over- flow Alarm Level at Servo ON	Immediately
Pn528	100	Position Deviation Over- flow Warning Level at Servo ON	Immediately
Pn529	10000	Speed Limit Level at Servo ON	Immediately
Pn52A	20	Multiplier per Fully-closed Rotation	Immediately
Pn52B	20	Overload Warning Level	Immediately
Pn52C	100	Base Current Derating at Motor Overload Detection	After restart
Pn52D	50	Reserved parameter	_
Pn530	0000h	Program Jogging-Related Selections	Immediately
Pn531	32768	Program Jogging Travel Distance	Immediately

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Parameter No.	Default Setting	Name	When Enabled	
Pn533	500	Program Jogging Movement Speed	Immediately	
Pn534	100	Program Jogging Acceleration/Deceleration Time	Immediately	
Pn535	100	Program Jogging Waiting Time	Immediately	
Pn536	1	Program Jogging Number of Movements	Immediately	
Pn550	0	Analog Monitor 1 Offset Voltage	Immediately	
Pn551	0	Analog Monitor 2 Offset Voltage	Immediately	
Pn552	100	Analog Monitor 1 Magnifi- cation	Immediately	
Pn553	100	Analog Monitor 2 Magnifi- cation	Immediately	
Pn55A	1	Power Consumption Monitor Unit Time	Immediately	
Pn560	400	Residual Vibration Detection Width	Immediately	
Pn561	100	Overshoot Detection Level	Immediately	
Pn56A	0000h	Output Signal Reference Method Selections 1	After restart	
Pn56B	0000h	Reserved parameter	After restart	
Pn600	0	Regenerative Resistor Capacity	Immediately	
Pn601	0	Dynamic Brake Resistor Allowable Energy Consumption	After restart	
Pn603	0	Regenerative Resistance	Immediately	
Pn604	0	Dynamic Brake Resistance	After restart	
Pn800	1040h	Communications Controls	Immediately	
Pn801	0003h	Application Function Selections 6 (Software Limits)	Immediately	
Pn803	10	Origin Range	Immediately	
Pn804	1073741823	Forward Software Limit	Immediately	
Pn806	-1073741823	Reverse Software Limit	Immediately	
Pn808	0	Absolute Encoder Origin Offset	Immedi- ately*2	
Pn80A	100	First Stage Linear Acceleration Constant	Immedi- ately*3	
Pn80B	100	Second Stage Linear Acceleration Constant	Immedi- ately*3	
Pn80C	0	Acceleration Constant Switching Speed	Immedi- ately*3	
Pn80D	100	First Stage Linear Deceleration Constant	Immedi- ately*3	
Pn80E	100	Second Stage Linear Deceleration Constant	Immedi- ately*3	
Pn80F	0	Deceleration Constant Switching Speed	Immedi- ately*3	
Pn810	0	Exponential Acceleration/ Deceleration Bias	Immedi- ately*3	

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Parameter No.	Default Setting	Name	When Enabled	
Pn811	0	Exponential Acceleration/ Deceleration Time Constant	Immedi- ately*3	
Pn812	0	Movement Average Time	Immedi- ately*3	
Pn814	100	External Positioning Final Travel Distance	Immedi- ately*3	
Pn816	0000h	Origin Return Mode Set- tings	Immedi- ately*3	
Pn817	50	Origin Approach Speed 1	Immedi- ately*3	
Pn818	5	Origin Approach Speed 2	Immedi- ately*3	
Pn819	100	Final Travel Distance for Origin Return	Immedi- ately*3	
Pn81E	0000h	Input Signal Monitor Selections	Immediately	
Pn81F	0010h	Command Data Allocations	After restart	
Pn820	0	Forward Latching Area	Immediately	
Pn822	0	Reverse Latching Area	Immediately	
Pn824	0000h	Option Monitor 1 Selection	Immediately	
Pn825	0000h	Option Monitor 2 Selection	Immediately	
Pn827	100	Linear Deceleration Constant 1 for Stopping	Immedi- ately*3	
Pn829	0	SVOFF Waiting Time (for SVOFF at Deceleration to Stop)	Immediately	
Pn82A	1813h	Option Field Allocations 1	After restart	
Pn82B	1D1Ch	Option Field Allocations 2	After restart	
Pn82C	1F1Eh	Option Field Allocations 3	After restart	
Pn82D	0000h	Option Field Allocations 4	After restart	
Pn82E	0000h	Option Field Allocations 5	After restart	
Pn833	0000h	Motion Settings	After restart	
Pn834	100	First Stage Linear Acceleration Constant 2	Immedi- ately*3	
Pn836	100	Second Stage Linear Acceleration Constant 2	Immedi- ately*3	
Pn838	0	Acceleration Constant Switching Speed 2	Immedi- ately*3	
Pn83A	100	First Stage Linear Deceleration Constant 2	Immedi- ately*3	
Pn83C	100	Second Stage Linear Deceleration Constant 2	Immedi- ately*3	
Pn83E	0	Deceleration Constant Switching Speed 2	Immedi- ately*3	
Pn840	100	Linear Deceleration Constant 2 for Stopping	Immedi- ately*3	
Pn842	0	Second Origin Approach Speed 1	Immedi- ately*3	
Pn844	0	Second Origin Approach Speed 2	Immedi- ately*3	

Continued from previous page.

Parameter	Defer # O	Name a	When
No.	Default Setting	Name	Enabled
Pn846	0	POSING Command Scurve Acceleration/Deceleration Rate	Immedi- ately*3
Pn850	0	Number of Latch Sequences	Immediately
Pn851	0	Continuous Latch Sequence Count	Immediately
Pn852	0000h	Latch Sequence 1 to 4 Settings	Immediately
Pn853	0000h	Latch Sequence 5 to 8 Settings	Immediately
Pn860	0000h	SVCMD_IO Input Signal Monitor Allocations 1	Immediately
Pn861	0000h	SVCMD_IO Input Signal Monitor Allocations 2	Immediately
Pn862	0000h	SVCMD_IO Input Signal Monitor Allocations 3	Immediately
Pn863	0000h	SVCMD_IO Input Signal Monitor Allocations 4	Immediately
Pn868	0000h	SVCMD_IO Output Signal Monitor Allocations 1	Immediately
Pn869	0000h	SVCMD_IO Output Signal Monitor Allocations 2	Immediately
Pn880	0	Station Address Monitor (for maintenance, read only)	Immediately
Pn881	0	Set Transmission Byte Count Monitor [bytes] (for maintenance, read only)	Immediately
Pn882	0	Transmission Cycle Setting Monitor [× 0.25 μs] (for maintenance, read only)	Immediately
Pn883	0	Communications Cycle Setting Monitor [transmis- sion cycles] (for mainte- nance, read only)	Immediately
Pn884	0000h	Communications Controls 2	Immediately
Pn88A	0	MECHATROLINK Receive Error Counter Monitor (for maintenance, read only)	Immediately
Pn890 to Pn8A6	Oh	Command Data Monitor during Alarm/Warning (for maintenance, read only)	Immediately
Pn8A8 to Pn8BE	Oh	Response Data Monitor during Alarm/Warning (for maintenance, read only)	Immediately
Pn900	0	Number of Parameter Banks	After restart
Pn901	0	Number of Parameter Bank Members	After restart
Pn902 to Pn910	0h	Parameter Bank Member Definition	After restart
Pn920 to Pn95F	Oh	Parameter Bank Data (Not saved in nonvolatile memory.)	Immediately
01 PnA02	-	Encoder Type Selection (read only)	- on post page

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Parameter	Default Catting	Continued from p	When
No.	Default Setting	Name	Enabled
02 PnA04	_	Motor Type Selection (read only)	_
03 PnA06	-	Semi-closed/Fully-closed Selection (read only)	-
04 PnA08	-	Rated Motor Speed (read only)	-
05 PnA0A	-	Maximum Output Speed (read only)	-
06 PnA0C	-	Speed Multiplier (read only)	-
07 PnA0E	-	Rated Torque (read only)	-
08 PnA10	_	Maximum Output Torque (read only)	_
09 PnA12	-	Torque Multiplier (read only)	_
0A PnA14	_	Resolution (read only)	_
21 PnA42	1	Electronic Gear Ratio (Numerator)	After restart
22 PnA44	1	Electronic Gear Ratio (Denominator)	After restart
23 PnA46	0	Absolute Encoder Origin Offset	Immedi- ately*2
24 PnA48	65535	Multiturn Limit Setting	After restart
25 PnA4A	0000h	Limit Setting	After restart
26 PnA4C	1073741823	Forward Software Limit	Immediately
27 PnA4E	0	Reserved (Do not change.)	Immediately
28 PnA50	-1073741823	Reverse Software Limit	Immediately
29 PnA52	0	Reserved (Do not change.)	Immediately
41 PnA82	Oh	Speed Unit Selection	After restart
42 PnA84	0	Speed Base Unit Selection	After restart
43 PnA86	0h	Position Unit Selection	After restart
44 PnA88	0	Position Base Unit Selection	After restart
45 PnA8A	0h	Acceleration Unit Selection	After restart
46 PnA8C	4	Acceleration Base Unit Selection	After restart
47 PnA8E	1	Torque Unit Selection	After restart
48 PnA90	0	Torque Base Unit Selection	After restart
49 PnA92	0601011Fh	Supported Unit Systems (read only)	_

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Parameter No.	Default Setting	Name	When Enabled		
61 PnAC2	40000	Speed Loop Gain	Immediately		
62 PnAC4	20000	Speed Loop Integral Time Constant	Immediately		
63 PnAC6	40000	Position Loop Gain	Immediately		
64 PnAC8	0	Feedforward Compensation	Immediately		
65 PnACA	0	Position Loop Integral Time Constant	Immediately		
66 PnACC	7	Positioning Completed Width	Immediately		
67 PnACE	1073741824	Near Signal Width	Immediately		
81 PnB02	0	Exponential Acceleration/ Deceleration Time Constant	Immedi- ately*3		
82 PnB04	0	Movement Average Time	Immedi- ately ^{*3}		
83 PnB06	100	External Positioning Final Travel Distance	Immediately		
84 PnB08	× 5,000h reference units/s converted to 10 ⁻³ min ⁻¹	Origin Approach Speed	Immediately		
85 PnB0A	× 500h reference units/s converted to 10 ⁻³ min ⁻¹	Origin Return Creep Speed	Immediately		
86 PnB0C	100	Final Travel Distance for Origin Return	Immediately		
87 PnB0E	1h	Fixed Monitor Selection 1	Immediately		
88 PnB10	Oh	Fixed Monitor Selection 2	Immediately		
89 PnB12	0h	SEL_MON (CMN1) Monitor Selection 1	Immediately		
8A PnB14	Oh	SEL_MON (CMN2) Monitor Selection 2	Immediately		
8B PnB16	10	Origin Detection Width	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 Coincidence Signal Detection Width	Immediately		
90 PnB20	0FFF3F3Fh	Servo Command Control Field Enable/Disable Selec- tions (read only)	_		
91 PnB22	0FFF3F33h	Servo Status Field Enable/ Disable Selections (read only)	-		
92 PnB24	007F01F0h	Output Bit Enable/Disable Selections (read only)	_		
93 PnB26	FF0FFEFEh	Input Bit Enable/Disable Selections (read only)	_		

Parameter Lists

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

 ### 4.2 SERVOPACKs with MECHATROLINK-III Communications References on page 4-43
- *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.

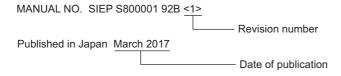


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Revision History

The date of publication, revision number, and web revision number are given at the bottom right of the back cover. Refer to the following example.



Date of Publication	Rev. No.	Section	Revised Contents
September 2018	<4>	2.1.1	Revision: Value of built-in regenerative resistor power loss
		Chapter 3	Deletion: A.942
		Back cover	Revision: Address
December 2017	<3>	All chapters	Partly revised.
August 2017	<2>	All chapters	Addition: Information on SGD7S-5R5A
			Addition: Information on specifications for single-phase, 200-VAC power supply input
			Addition: Information on specifications for single-phase, 200-VAC power supply input and external dynamic brake resistor
		Preface	Partly revised.
		Back cover	Revision: Address
March 2017	<1>	All chapters	Partly revised. Addition: Information on MECHATROLINK-II Communications Reference SERVOPACKs with the FT81 specification
		Preface	Revision: Information on standards
		1.3, 2.1.2, 2.2.2	Addition: Information on MAB09, MAB12, MAB15, and MAA21 Servomotors
		3.2.2, 3.2.3	Addition: A.bF5, A.bF6, A.bF7, A.bF8, and FL-6
		4.2.2	Addition: Pn475, Pn476, Pn022, Pn56A, and Pn56B Deletion: Pn52D
		Back cover	Revision: Address
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Σ -7-Series AC Servo Drive

Σ -7S SERVOPACK with FT/EX Specification for Application with Special Motor, Harmonic Drive Systems Actuator **Product Manual**

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