Σ-7-Series AC Servo Drive
Digital Operator Operating Manual

Model: JUSP-OP05A-1-E
JUSP-OP07A-E
About this Manual

This manual describes the connection methods and provides the operating procedures for a Digital Operator for a Σ-7-Series Servo System.
Read and understand this manual to ensure correct usage of the Σ-7-Series AC Servo Drives.
Keep this manual in a safe place so that it can be referred to whenever necessary.

Outline of Manual

The contents of the chapters of this manual are described in the following table.
Refer to these chapters as required.

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<td>Parameter/Monitor Functions</td>
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<td>Utility Functions</td>
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<th>Classification</th>
<th>Document Name</th>
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<td>① Machine Controller and Servo Drive General Catalog</td>
<td>Machine Controller and AC Servo Drive Solutions Catalog</td>
<td>KAEP S800001 22</td>
<td>Describes the features and application examples for combinations of MP3000-Series Machine Controllers and Σ-7-Series AC Servo Drives.</td>
</tr>
<tr>
<td>② MP3300 Catalog</td>
<td>Machine Controller MP3300</td>
<td>KAEP C880725 03</td>
<td>Provides detailed information on MP3300 Machine Controllers, including features and specifications.</td>
</tr>
<tr>
<td>③ Σ-7-Series Catalog</td>
<td>AC Servo Drives Σ-7 Series</td>
<td>KAEP S800001 23</td>
<td>Provides detailed information on Σ-7-Series AC Servo Drives, including features and specifications.</td>
</tr>
<tr>
<td>④ Built-in Function Manuals</td>
<td>Σ-7-Series AC Servo Drive Σ-7C SERVOPACK Motion Control User’s Manual</td>
<td>SIEP S800002 03</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Machine Controller MP3000 Series Communications User’s Manual</td>
<td>SIEP C880725 12</td>
<td>Provides detailed information on the specifications, system configuration, and communications connection methods for the Ethernet communications that are used with MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.</td>
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<th>Classification</th>
<th>Document Name</th>
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<tr>
<td>Option Module</td>
<td>Machine Controller MP2000 Series Communication Module User’s Manual</td>
<td>SIEP C880700 04</td>
<td>Provide detailed information on the specifications and communications methods for the Communications Modules that can be mounted to MP3000-Series Machine Controllers and Σ-7-Series Σ-7C SERVOPACKs.</td>
</tr>
<tr>
<td></td>
<td>Machine Controller MP2000 Series I/O Module User’s Manual</td>
<td>SIEP C880700 34</td>
<td>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.</td>
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<th>Document No.</th>
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<tr>
<td></td>
<td>Σ-7-Series AC Servo Drive Σ-7S and Σ-7W SERVOPACK Safety Precautions</td>
<td>TOMP C710828 00</td>
<td>Provides detailed information for the safe usage of Σ-7-Series SERVOPACKs.</td>
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<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Safety Precautions Option Module</td>
<td>TOBP C720829 00</td>
<td>Provides detailed information for the safe usage of Option Modules.</td>
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<tr>
<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Installation Guide Command Option Module</td>
<td>TOBP C720829 01</td>
<td>Provides detailed procedures for installing the Command Option Module in a SERVOPACK.</td>
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<tr>
<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Installation Guide Fully-closed Module</td>
<td>TOBP C720829 03</td>
<td>Provides detailed procedures for installing the Fully-closed Module in a SERVOPACK.</td>
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<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Installation Guide Safety Module</td>
<td>TOBP C720829 06</td>
<td>Provides detailed procedures for installing the Safety Module in a SERVOPACK.</td>
</tr>
<tr>
<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Installation Guide INDEXER Module</td>
<td>TOBP C720829 02</td>
<td>Provides detailed procedures for installing the INDEXER Module in a SERVOPACK.</td>
</tr>
<tr>
<td></td>
<td>Σ-V-Series/Σ-V-Series for Large-Capacity Models/Σ-7-Series Installation Guide DeviceNet Module</td>
<td>TOBP C720829 07</td>
<td>Provides detailed procedures for installing the DeviceNet Module in a SERVOPACK.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Classification</th>
<th>Document Name</th>
<th>Document No.</th>
<th>Description</th>
</tr>
</thead>
</table>
| ⑦ Σ-7-Series  
Σ-7C SERVOPACK  
Product Manual | Σ-7-Series  
AC Servo Drive  
Σ-7C SERVOPACK  
Product Manual | SIEP S800002 04 | Provides detailed information on selecting Σ-7-Series Σ-7C SERVOPACKs; installing, connecting, setting, testing in trial operation, and tuning Servo Drives; writing, monitoring, and maintaining programs; and other information. |
| ⑧ Σ-7-Series  
Σ-7C SERVOPACK  
Troubleshooting  
Manual | Σ-7-Series  
AC Servo Drive  
Σ-7C SERVOPACK  
Troubleshooting  
Manual | SIEP S800002 07 | Provides detailed troubleshooting information for Σ-7-Series Σ-7C SERVOPACKs. |
| ⑨ Σ-7-Series  
Σ-7S/Σ-7W SERVOPACK  
Product Manuals | Σ-7-Series  
AC Servo Drive  
Σ-7S SERVOPACK  
with MECHATROLINK-III  
Communications  
References  
Product Manual | SIEP S800001 28 | Provide detailed information on selecting Σ-7-Series Σ-7S or Σ-7W SERVOPACKs and information on installing, connecting, setting, performing trial operation for, tuning, monitoring, and maintaining the Servo Drives. |
| | Σ-7-Series  
AC Servo Drive  
Σ-7S SERVOPACK  
with MECHATROLINK-II  
Communications  
References  
Product Manual | SIEP S800001 27 |
| | Σ-7-Series  
AC Servo Drive  
Σ-7S SERVOPACK  
with Analog Voltage/  
Pulse Train  
References  
Product Manual | SIEP S800001 26 | |

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<tr>
<th>Classification</th>
<th>Document Name</th>
<th>Document No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>⑨ Σ-7-Series Σ-7S/Σ-7W SERVOPACK Product Manuals</td>
<td>Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual</td>
<td>SIEP S800001 64</td>
<td>Provide detailed information on selecting Σ-7-Series Σ-7S or Σ-7W SERVOPACKs and information on installing, connecting, setting, performing trial operation for, tuning, monitoring, and maintaining the Servo Drives.</td>
</tr>
<tr>
<td></td>
<td>Σ-7-Series AC Servo Drive Σ-7S SERVOPACK Command Option Attachable Type with DeviceNet Module Product Manual</td>
<td>SIEP S800001 70</td>
<td></td>
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<tr>
<td></td>
<td>Σ-7-Series AC Servo Drive Σ-7W SERVOPACK with MECHATROLINK-III Communications References Product Manual</td>
<td>SIEP S800001 29</td>
<td></td>
</tr>
<tr>
<td>⑩ Σ-7-Series Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Product Manuals</td>
<td>Σ-7-Series AC Servo Drive Σ-7S/Σ-7W SERVOPACK with Hardware Option Specifications Dynamic Brake Product Manual</td>
<td>SIEP S800001 73</td>
<td>Provide detailed information on Hardware Options for Σ-7-Series SERVOPACKs.</td>
</tr>
<tr>
<td></td>
<td>Σ-7-Series AC Servo Drive Σ-7W/Σ-7C SERVOPACK with Hardware Option Specifications HWBB Function Product Manual</td>
<td>SIEP S800001 72</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Document Name</td>
<td>Document No.</td>
<td>Description</td>
</tr>
<tr>
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<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Σ-7-Series</td>
<td>AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Indexing Application</td>
<td>SIEP S800001 84</td>
<td>Product Manual</td>
</tr>
<tr>
<td>Σ-7-Series</td>
<td>AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Tracking Application</td>
<td>SIEP S800001 89</td>
<td>Product Manual</td>
</tr>
<tr>
<td>Σ-7-Series</td>
<td>AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Application with Special Motor, SGM7D Motor</td>
<td>SIEP S800001 91</td>
<td>Product Manual</td>
</tr>
<tr>
<td>Σ-7-Series</td>
<td>AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Press and Injection Molding</td>
<td>SIEP S800001 94</td>
<td>Product Manual</td>
</tr>
<tr>
<td>Σ-7-Series</td>
<td>AC Servo Drive Σ-7S SERVOPACK with FT/EX Specification for Transfer and Alignment Application</td>
<td>SIEP S800001 95</td>
<td>Product Manual</td>
</tr>
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</table>

Provide detailed information on the FT/EX Option for Σ-7-Series SERVOPACKs.
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<tr>
<th>Classification</th>
<th>Document Name</th>
<th>Document No.</th>
<th>Description</th>
</tr>
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<tr>
<td>Φ ō 7-Series</td>
<td>Σ-7-Series AC Servo Drive&lt;br&gt;Σ-7S SERVOPACK with FT/EX Specification for Torque/Force Assistance for Conveyance Application Product Manual</td>
<td>SIEP S800002 09</td>
<td>Provide detailed information on the FT/EX Option for Σ-7-Series SERVOPACKs.</td>
</tr>
<tr>
<td>ō Option Module</td>
<td>AC Servo Drives&lt;br&gt;Σ-V Series/Σ-V Series for Large-Capacity Models/&lt;br&gt;Σ-7 Series&lt;br&gt;User’s Manual&lt;br&gt;Safety Module</td>
<td>SIEP C720829 06</td>
<td>Provides detailed information required for the design and maintenance of a Safety Module.</td>
</tr>
<tr>
<td>ō Enclosed Documents</td>
<td>AC Servo Drive&lt;br&gt;Rotary Servomotor Safety Precautions</td>
<td>TOBP C230260 00</td>
<td>Provides detailed information for the safe usage of Rotary Servomotors and Direct Drive Servomotors.</td>
</tr>
<tr>
<td>ō Enclosed Documents</td>
<td>AC Servomotor&lt;br&gt;Linear Σ Series&lt;br&gt;Safety Precautions</td>
<td>TOBP C230800 00</td>
<td>Provides detailed information for the safe usage of Linear Servomotors.</td>
</tr>
</tbody>
</table>

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<tr>
<th>Classification</th>
<th>Document Name</th>
<th>Document No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Σ-7-Series Servomotor Product Manuals</td>
<td>Σ-7-Series AC Servo Drive Rotary Servomotor Product Manual</td>
<td>SIEP S800001 36</td>
<td>Provide detailed information on selecting, installing, and connecting the Σ-7-Series Servomotors.</td>
</tr>
<tr>
<td>Σ-7-Series AC Servo Drive Linear Servomotor Product Manual</td>
<td>SIEP S800001 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Σ-7-Series AC Servo Drive Direct Drive Servomotor Product Manual</td>
<td>SIEP S800001 38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Σ-7-Series Peripheral Device Selection Manual</td>
<td>Σ-7-Series AC Servo Drive Peripheral Device Selection Manual</td>
<td>SIEP S800001 32</td>
<td>Provides the following information in detail for Σ-7-Series Servo Systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Cables: Models, dimensions, wire materials, connector models, and connection specifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Peripheral devices: Model, specifications, diagrams, and selection (calculation) methods</td>
</tr>
<tr>
<td>Σ-7-Series MECHATROLINK Communications Command Manuals</td>
<td>Σ-7-Series AC Servo Drive MECHATROLINK-II Communications Command Manual</td>
<td>SIEP S800001 30</td>
<td>Provides detailed information on the MECHATROLINK-II communications commands that are used for a Σ-7-Series Servo System.</td>
</tr>
<tr>
<td></td>
<td>Σ-7-Series AC Servo Drive MECHATROLINK-III Communications Standard Servo Profile Command Manual</td>
<td>SIEP S800001 31</td>
<td>Provides detailed information on the MECHATROLINK-III communications standard servo profile commands that are used for a Σ-7-Series Servo System.</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Classification</th>
<th>Document Name</th>
<th>Document No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Manuals</td>
<td>Machine Controller MP3000 Series Ladder Programming Manual</td>
<td>SIEP C880725 13</td>
<td>Provides detailed information on the ladder programming specifications and instructions for MP3000-Series Machine Controllers and ( \Sigma )-7-Series ( \Sigma )-7C SERVOPACKs.</td>
</tr>
<tr>
<td></td>
<td>Machine Controller MP3000 Series Motion Programming Manual</td>
<td>SIEP C880725 14</td>
<td>Provides detailed information on the motion programming and sequence programming specifications and instructions for MP3000-Series Machine Controllers and ( \Sigma )-7-Series ( \Sigma )-7C SERVOPACKs.</td>
</tr>
<tr>
<td>Operation Interface</td>
<td>( \Sigma )-7-Series AC Servo Drive Digital Operator Operating Manual</td>
<td>This manual  (SIEP S800001 33)</td>
<td>Describes the operating procedures for a Digital Operator for a ( \Sigma )-7-Series Servo System.</td>
</tr>
<tr>
<td>Operating Manuals</td>
<td>AC Servo Drive Engineering Tool SigmaWin+ Operation Manual</td>
<td>SIET S800001 34</td>
<td>Provides detailed operating procedures for the SigmaWin+ Engineering Tool for a ( \Sigma )-7-Series Servo System.</td>
</tr>
</tbody>
</table>
Technical Terms Used in This Manual

The following terms are used in this manual.

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servomotor</td>
<td>A Σ-7-Series Rotary Servomotor, Direct Drive Servomotor, or Linear Servomotor.</td>
</tr>
<tr>
<td>Rotary Servomotor</td>
<td>A generic term used for a Σ-7-Series Rotary Servomotor (SGMMV, SGM7J, SGM7A, SGM7P, or SGM7G) or a Direct Drive Servomotor (SGM7D, SGM7E, SGM7F, SGMCV, or SGMCS). The descriptions will specify when Direct Drive Servomotors are excluded.</td>
</tr>
<tr>
<td>Linear Servomotor</td>
<td>A Σ-7-Series Linear Servomotor (SGLG, SGLF, or SGLT).</td>
</tr>
<tr>
<td>SERVOPACK</td>
<td>A Σ-7-Series Servo Amplifier.</td>
</tr>
<tr>
<td>Servo Drive</td>
<td>The combination of a Servomotor and SERVOPACK.</td>
</tr>
<tr>
<td>Servo System</td>
<td>A servo control system that includes the combination of a Servo Drive with a host controller and peripheral devices.</td>
</tr>
<tr>
<td>servo ON</td>
<td>Supplying power to the motor.</td>
</tr>
<tr>
<td>servo OFF</td>
<td>Not supplying power to the motor.</td>
</tr>
<tr>
<td>base block (BB)</td>
<td>Shutting OFF the power supply to the motor by shutting OFF the base current to the power transistor in the SERVOPACK.</td>
</tr>
<tr>
<td>servo lock</td>
<td>A state in which the motor is stopped and is in a position loop with a position reference of 0.</td>
</tr>
<tr>
<td>Main Circuit Cable</td>
<td>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.</td>
</tr>
<tr>
<td>SigmaWin+</td>
<td>The Engineering Tool for setting up and tuning Servo Drives or a computer in which the Engineering Tool is installed.</td>
</tr>
</tbody>
</table>
Differences in Terms for Rotary Servomotors and Linear Servomotors

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

<table>
<thead>
<tr>
<th>Rotary Servomotors</th>
<th>Linear Servomotors</th>
</tr>
</thead>
<tbody>
<tr>
<td>torque</td>
<td>force</td>
</tr>
<tr>
<td>moment of inertia</td>
<td>mass</td>
</tr>
<tr>
<td>rotation</td>
<td>movement</td>
</tr>
<tr>
<td>forward rotation and reverse</td>
<td>forward movement and reverse</td>
</tr>
<tr>
<td>CW and CCW pulse trains</td>
<td>forward and reverse pulse trains</td>
</tr>
<tr>
<td>rotary encoder</td>
<td>linear encoder</td>
</tr>
<tr>
<td>absolute rotary encoder</td>
<td>absolute linear encoder</td>
</tr>
<tr>
<td>incremental rotary encoder</td>
<td>incremental linear encoder</td>
</tr>
<tr>
<td>unit: min⁻¹</td>
<td>unit: mm/s</td>
</tr>
<tr>
<td>unit: N·m</td>
<td>unit: N</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>When Enabled</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn100 Speed Loop Gain</td>
<td>Use the encoder according to encoder specifications.</td>
<td>After startup</td>
<td>Setup</td>
</tr>
<tr>
<td>Settings</td>
<td>Default Setting</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>Unit</td>
<td>0.1 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>When Enabled</td>
<td>Immediately</td>
<td></td>
</tr>
</tbody>
</table>

- Parameters for Selecting Functions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>When Enabled</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn002</td>
<td>Use the encoder according to encoder specifications.</td>
<td>After startup</td>
<td>Setup</td>
</tr>
<tr>
<td>n.0000</td>
<td>Use the encoder as an incremental encoder.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n.1000</td>
<td>Use the encoder as a single-turn absolute encoder.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notation Example

<table>
<thead>
<tr>
<th>Notation</th>
<th>Digit Notation</th>
<th>Meaning</th>
<th>Numeric Value Notation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn002</td>
<td>n.0000</td>
<td>Indicates the first digit from the right in Pn002.</td>
<td>Pn002 = n.0001</td>
<td>Indicates that the first digit from the right in Pn002 is set to 1.</td>
</tr>
<tr>
<td>Pn002</td>
<td>n.1000</td>
<td>Indicates the second digit from the right in Pn002.</td>
<td>Pn002 = n.1001</td>
<td>Indicates that the second digit from the right in Pn002 is set to 1.</td>
</tr>
<tr>
<td>Pn002</td>
<td>n.2000</td>
<td>Indicates the third digit from the right in Pn002.</td>
<td>Pn002 = n.2001</td>
<td>Indicates that the third digit from the right in Pn002 is set to 1.</td>
</tr>
<tr>
<td>Pn002</td>
<td>n.3000</td>
<td>Indicates the fourth digit from the right in Pn002.</td>
<td>Pn002 = n.3001</td>
<td>Indicates that the fourth digit from the right in Pn002 is set to 1.</td>
</tr>
</tbody>
</table>
◆ Trademarks

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

◆ Visual Aids

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

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

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

**Example**
Indicates operating or setting examples.

**Information**
Indicates supplemental information to deepen understanding or useful information.
# Safety Precautions

## Safety Information

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

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>Indicates precautions that, if not heeded, are likely to result in loss of life, serious injury, or fire.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Indicates precautions that, if not heeded, could result in loss of life, serious injury, or fire.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Indicates precautions that, if not heeded, could result in relatively serious or minor injury, or in fire.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>Indicates precautions that, if not heeded, could result in property damage.</td>
</tr>
</tbody>
</table>
Safety Precautions That Must Always Be Observed

General Precautions

DANGER

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

WARNING

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

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

NOTICE

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

**CAUTION**

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

**NOTICE**

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

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

Transportation Precautions

**CAUTION**

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

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

## Installation Precautions

CAUTION

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

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

● Use the product in an environment that is appropriate for the product specifications.
If you use the product in an environment that exceeds product specifications, the product may fail or be damaged.

● A SERVOPACK or Servomotor is a precision device. Do not drop it or subject it to strong shock.
There is a risk of failure or damage.

● Always install a SERVOPACK in a control panel.

● Do not allow any foreign matter to enter a SERVOPACK or a Servomotor with a Cooling Fan and do not cover the outlet from the Servomotor’s cooling fan.
There is a risk of failure.
## Wiring Precautions

### DANGER

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

### WARNING

- Wiring and inspections must be performed only by qualified engineers. There is a risk of electric shock or product failure.
- Check all wiring and power supplies carefully. Incorrect wiring or incorrect voltage application to the output circuits may cause short-circuit failures. If a short-circuit failure occurs as a result of any of these causes, the holding brake will not work. This could damage the machine or cause an accident that may result in death or injury.
- Connect the AC and DC power supplies to the specified SERVO-PACK terminals.
  - Connect an AC power supply to the L1, L2, and L3 terminals and the L1C and L2C terminals on the SERVOPACK.
  - Connect a DC power supply to the B1/ and 2 terminals and the L1C and L2C terminals on the SERVOPACK. There is a risk of failure or fire.
- If you use a SERVOPACK with the Dynamic Brake Hardware Option, connect an External Dynamic Brake Resistor that is suitable for the machine and equipment specifications to the specified terminals. There is a risk of unexpected operation, machine damage, burning, or injury when an emergency stop is performed.
CAUTION

- Wait for at least six minutes after turning OFF the power supply (with a SERVOPACK for a 100-VAC power supply input, wait for at least nine minutes) and then make sure that the CHARGE indicator is not lit before starting wiring or inspection work. Do not touch the power supply terminals while the CHARGE lamp is lit 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.
- Observe the following precautions when wiring the SERVOPACK’s main circuit terminals.
  - Turn ON the power supply to the SERVOPACK only after all wiring, including the main circuit terminals, has been completed.
  - If a connector is used for the main circuit terminals, remove the main circuit connector from the SERVOPACK before you wire it.
  - Insert only one wire per insertion hole in the main circuit terminals.
  - When you insert a wire, make sure that the conductor wire (e.g., whiskers) does not come into contact with adjacent wires.
- 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

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>● 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.</td>
</tr>
<tr>
<td>● Do not radically change the settings of the parameters. There is a risk of unstable operation, machine damage, or injury.</td>
</tr>
<tr>
<td>● 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.</td>
</tr>
<tr>
<td>● For trial operation, securely mount the Servomotor and disconnect it from the machine. There is a risk of injury.</td>
</tr>
<tr>
<td>● Forcing the motor to stop for overtravel is disabled when the Jog (Fn002), Origin Search (Fn003), or Easy FFT (Fn206) utility function is executed. Take necessary precautions. There is a risk of machine damage or injury.</td>
</tr>
<tr>
<td>● When an alarm occurs, the Servomotor will coast to a stop or stop with the dynamic brake according to the SERVOPACK Option and settings. The coasting distance will change with the moment of inertia of the load and the resistance of the External Dynamic Brake Resistor. Check the coasting distance during trial operation and implement suitable safety measures on the machine.</td>
</tr>
<tr>
<td>● Do not enter the machine's range of motion during operation. There is a risk of injury.</td>
</tr>
<tr>
<td>● Do not touch the moving parts of the Servomotor or machine during operation. There is a risk of injury.</td>
</tr>
</tbody>
</table>
Design the system to ensure safety even when problems, such as broken signal lines, occur. For example, the P-OT and N-OT signals are set in the default settings to operate on the safe side if a signal line breaks. Do not change the polarity of this type of signal.

When overtravel occurs, the power supply to the motor is turned OFF and the brake is released. If you use the Servomotor to drive a vertical load, set the Servomotor to enter a zero-clamped state after the Servomotor stops. Also, install safety devices (such as an external brake or counterweight) to prevent the moving parts of the machine from falling.

Always turn OFF the servo before you turn OFF the power supply. If you turn OFF the main circuit power supply or control power supply during operation before you turn OFF the servo, the Servomotor will stop as follows:
• If you turn OFF the main circuit power supply during operation without turning OFF the servo, the Servomotor will stop abruptly with the dynamic brake.
• If you turn OFF the control power supply without turning OFF the servo, the stopping method that is used by the Servomotor depends on the model of the SERVOPACK. For details, refer to the manual for the SERVOPACK.
• If you use a SERVOPACK with the Dynamic Brake Hardware Option, the Servomotor stopping methods will be different from the stopping methods used without the Option or with other Hardware Options. For details, refer to the following manual.

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

- When you adjust the gain during system commissioning, use a measuring instrument to monitor the torque waveform and speed waveform and confirm that there is no vibration. If a high gain causes vibration, the Servomotor will be damaged quickly.

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

- An alarm or warning may occur if communications are performed with the host controller while the SigmaWin+ or Digital Operator is operating. If an alarm or warning occurs, it may interrupt the current process and stop the system.

- 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.
**Troubleshooting Precautions**

### CAUTION

- Wait for at least six minutes after turning OFF the power supply (with a SERVOPACK for a 100-VAC power supply input, wait for at least nine minutes) and then make sure that the CHARGE indicator is not lit before starting wiring or inspection work. Do not touch the power supply terminals while the CHARGE lamp is lit 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.

### DANGER

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

### WARNING

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

- When an alarm occurs, remove the cause of the alarm and ensure safety. Then reset the alarm or turn the power supply OFF and ON again to restart operation. There is a risk of injury or machine damage.

- If the Servo ON signal is input to the SERVOPACK and an alarm is reset, the Servomotor may suddenly restart operation. Confirm that the servo is OFF and ensure safety before you reset an alarm. There is a risk of injury or machine damage.

- Always insert a magnetic contactor in the line between the main circuit power supply and the main circuit power supply terminals on the SERVOPACK so that the power supply can be shut OFF at the main circuit power supply. If a magnetic contactor is not connected when the SERVOPACK fails, a large current may flow, 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.
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Revision History
This chapter describes the types and connections of Digital Operators that you can use with Σ-7-Series SERVOPACKs, as well as the names of parts, how to change between functions, and the status indications.

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1.2 Part Names and Functions . . . . . . 1-6
1.3 Changing Functions . . . . . . . . . . . 1-8
1.4 Status Indications . . . . . . . . . . . . . 1-9
A Digital Operator is used to display and set parameters in a SERVO-PACK.

You can use the following three types of Digital Operators with Σ-7-Series SERVOPACKs.

- Digital Operator for Σ-7-Series SERVOPACKs: JUSP-OP07A-E
- Digital Operator for Σ-V-Series and Σ-7-Series SERVOPACKs: JUSP-OP05A-1-E
- Digital Operators for Σ-III-Series SERVOPACKs: JUSP-OP05A and JUSP-OP05A-E

The connection methods between these Digital Operators and Σ-7-Series SERVOPACKs are described below.
Digital Operator for Σ-7-Series SERVO-PACKs: JUSP-OP07A-E

The software of the Σ-7-Series SERVOPACK must be version 0026 or higher to use the Digital Operator for Σ-7-Series SERVOPACKs (JUSP-OP07A-E). Connect to the CN7 connector on the SERVOPACK.

Information
You can check the software version of the SERVOPACK with utility function Fn012. Refer to the following section for the procedure to check the software version.

3.2.17 Display Software Version (Fn012)
Digital Operator for Σ-V-Series and Σ-7-Series SERVOPACKs: JUSP-OP05A-1-E

To use the Digital Operator for Σ-V-Series and Σ-7-Series SERVOPACKs (JUSP-OP05A-1-E), connect it to the CN3 connector on the SERVO-PACK.
Digital Operators for Σ-III-Series SERVOPACKs: JUSP-OP05A and JUSP-OP05A-E

You can use the Digital Operators for Σ-III-Series SERVOPACKs (JUSP-OP05A and JUSP-OP05A-E) with a Σ-7- Series SERVOPACK. To do so, use the JZSP-CVS05-A3-E Digital Operator Converter Cable to connect to the SERVOPACK. Connect to the CN3 connector on the SERVOPACK.
Display and Indicators

The Digital Operator has a display area of five lines with 17 characters per line. (It uses an LCD.) It also has five indicators that show status, such as the servo ON status and positioning completion status. The indicators are described in the following table.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVON</td>
<td>Lit while the servo is ON. Not lit while the servo is OFF.</td>
</tr>
<tr>
<td>COIN</td>
<td>Lit when positioning is completed.</td>
</tr>
<tr>
<td>VCMP</td>
<td>Lit during speed coincidence.</td>
</tr>
<tr>
<td>TGON</td>
<td>Lit while the motor is operating.</td>
</tr>
<tr>
<td>REF</td>
<td>Lit when the speed reference input is larger than the rotation detection level (Pn502). Position control: Lit while a reference pulse is being input. Torque control: Lit while the torque reference input exceeds 10% of the rated torque.</td>
</tr>
<tr>
<td>CHARGE</td>
<td>Lit while the main circuit power supply is ON.</td>
</tr>
</tbody>
</table>
## Operation Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Alarm Reset](image) | Resets alarms.  
(An alarm cannot be reset until the cause of the alarm is removed.) |
| ![Mode](image) | Changes the mode of the Digital Operator.  
- When setting parameters, moves the cursor as follows:  
  From the parameter number area to the setting area  
  From the setting area to the parameter number area  
- When setting parameters, saves the settings in the SERVOPACK.  
- Changes the display to the selected utility function to execute a utility function.  
- Moves the cursor to the bottom line in Parameter/Monitor Mode. If this key is pressed again, it moves the cursor up one line.  
- In Utility Mode, moves the cursor up four lines at a time. |
| ![Data](image) | Turns the servo ON and OFF as required to execute utility functions.  
For example, this is necessary to execute jogging or advanced autotuning. |
| ![Cursor](image) | Move the cursor to the right and left in Parameter/Monitor Mode.  
- Changes between parameters and monitors as follows:  
  From Un to Pn  
  From Pn to Un  
- Increment/decrement the parameter number, setting, monitor number, or utility number.  
- When jogging, operates the motor in forward or reverse. |
| ![Parameter Copy](image) | In Parameter Copy Mode, reads the parameters in the SERVOPACK to the Digital Operator. |
| ![Write](image) | In Parameter Copy Mode, writes the parameters in the Digital Operator to the SERVOPACK.  
In Parameter/Monitor Mode, saves the current display status.  
When the power is turned OFF and ON again, the same display will appear as the initial display. |

Note: “Cursor” indicates the position on the display that is flashing.
1.3 Changing Functions

When you connect the Digital Operator to the SERVOPACK and turn ON the power supply to the SERVOPACK, the Initial Display will appear and then the Parameter/Monitor Mode Main Menu will be displayed. Press the Mode Key to change the mode.

**Initial Display**
- Displayed for approx. two seconds.

**Axis Selection Display**
- This display appears for a Σ-7W SERVOPACK. You can select the axis number. The line for the axis number that you select will flash.

**Parameter/Monitor Mode Main Menu Display**
- **Parameters**
  - You can display and set the parameters in the SERVOPACK.
- **Monitors**
  - You can display numeric values and signal status that indicate the speed, position, and torque data in the SERVOPACK. The display on the left shows monitoring.

**Utility Mode Main Menu Display**
- You can set up the SERVOPACK and adjust servo gains, perform maintenance, etc.

**Parameter Copy Mode Main Menu Display**
- You can copy parameters from a SERVOPACK to the Digital Operator or write parameters from the Digital Operator to a SERVOPACK.
1.4 Status Indications

The status of the SERVOPACK is displayed at the upper left of the display. An abbreviation of the current mode is displayed at the upper right of the display.

If you are connected to a Σ-7S SERVOPACK, “1” will be displayed. If you are connected to a Σ-7W SERVOPACK, “1” will be displayed if you select axis 1 and “2” will be displayed if you select axis 2.

<table>
<thead>
<tr>
<th>Status</th>
<th>U n 0 0 0</th>
<th>U n 0 0 2</th>
<th>U n 0 0 8</th>
<th>U n 0 0 D</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

Mode:
- PRM/MON: Parameter/Monitor Mode
- FUNCTION: Utility Mode
- COPY: Parameter Copy Mode

Test without Motor In-progress Display

An asterisk is displayed before the status while a test without a motor is being executed.

<table>
<thead>
<tr>
<th>1 * BB</th>
<th>P R M / M O N</th>
<th>U n 0 0 0</th>
<th>U n 0 0 2</th>
<th>U n 0 0 8</th>
<th>U n 0 0 D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
</tbody>
</table>

Example of Display during a Test without a Motor

Alarm Display for Communications Errors

One of the following communications error displays will appear if an error occurs in communications between the SERVOPACK and Digital Operator. There may be a faulty connection at a connector. Check the connections. If you can find no problems, turn the power supply OFF and ON again. If the communications error is still displayed, replace the Digital Operator or SERVOPACK.

<table>
<thead>
<tr>
<th>CPF00</th>
<th>CPF01</th>
</tr>
</thead>
<tbody>
<tr>
<td>C O M - E R R ( O P &amp; S V )</td>
<td>C O M - E R R ( O P &amp; S V )</td>
</tr>
</tbody>
</table>
This chapter describes operating procedures for the parameter/monitor functions.

2.1 Parameters .......................... 2-2
   2.1.1 Setting Parameters ............... 2-2
   2.1.2 Types of Parameters ............... 2-6

2.2 Monitors ............................ 2-7
   2.2.1 Monitor Items ..................... 2-7
   2.2.2 Interpreting the Monitor Displays ... 2-10
   2.2.3 Monitor Display Operations ......... 2-14
This section describes how to set parameters in the Parameter/Monitor Mode.

There are two types of notations used for parameters, one for parameters that require selection of a function and one for parameters that require numeric settings.

Note: This manual does not provide details on parameters. Refer to the manual for your SERVOPACK.

### Operation Example 1: Setting a Parameter That Requires Selection of a Function

Some parameters, such as Pn000 (Basic Function Selections 0) and Pn001 (Application Function Selections 1) require you to set each digit. The following example shows how to set Pn000 = n.□□□X (Rotation Direction Selection) to 1 (reverse rotation).

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Parameter/Monitor Mode Main Menu.</td>
<td>![Parameter/Monitor Mode Main Menu]</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key or Key to move the cursor to Un.</td>
<td>![Parameter/Monitor Mode Main Menu]</td>
</tr>
<tr>
<td>3</td>
<td>Press the Key or Key to change from Un to Pn.</td>
<td>![Parameter/Monitor Mode Main Menu]</td>
</tr>
</tbody>
</table>

Continued on next page.
2.1 Parameters
2.1.1 Setting Parameters

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Press the <strong>DATA</strong> Key.</td>
<td>The cursor will move from the parameter number to the setting. The first digit on the right in the setting will flash.</td>
</tr>
</tbody>
</table>

|        | **DATA** Key | | |
|--------|--------------|--------|
|        | **B B**      | **P R M / M O N** |
|        | **P n 0 0 0 = n.0 0 0 .0** | |
|        | **U n 0 0 2 = 0 0 0 .0** | |
|        | **U n 0 0 8 = 0 0 0 0 0 0 0 0 0** | |
|        | **U n 0 0 D = 0 0 0 0 0 0 0 0 0 0** | |

| 5    | Press the **A** Key once to set Pn000 = n.00000X to 1. | |

|        | **A** Key | | |
|--------|----------|--------|
|        | **B B**  | **P R M / M O N** |
|        | **P n 0 0 0 = n.0 0 0 .1** | |
|        | **U n 0 0 2 = 0 0 0 .0** | |
|        | **U n 0 0 8 = 0 0 0 0 0 0 0 0** | |
|        | **U n 0 0 D = 0 0 0 0 0 0 0 0 0** | |

| 6    | Press the **DATA** Key. | The parameter setting is written to the SERVOPACK and the cursor moves to the parameter number. If you have changed a parameter for which the power supply must be turned OFF and ON again, an A.941 alarm (Change of Parameters Requires Restart) will be displayed.* |

|        | **DATA** Key | | |
|--------|-------------|--------|
|        | **A . 9 4 1** | **P R M / M O N** |
|        | **P n 0 0 0 = n.0 0 0 .1** | |
|        | **U n 0 0 2 = 0 0 0 .0** | |
|        | **U n 0 0 8 = 0 0 0 0 0 0 0 0** | |
|        | **U n 0 0 D = 0 0 0 0 0 0 0 0 0** | |

| 7    | Turn the SERVOPACK power supply OFF and ON again. | The new parameter settings will be enabled. |

* An A.941 alarm is not displayed for SERVOPACKs other than Analog Voltage/Pulse Train Reference SERVOPACKs.
## Operation Example 2: Setting a Parameter That Requires a Numeric Setting

The following example shows how to set Pn304 (Jogging Speed) to 1,000 min⁻¹.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [MODE] Key to display the Parameter/Monitor Mode Main Menu.</td>
<td>1:BB PRM/MON&lt;br&gt;Un000 = 00000&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
<tr>
<td>2</td>
<td>Press the [&lt;] Key or [&gt;] Key to move the cursor to Un.</td>
<td>1:BB PRM/MON&lt;br&gt;Un000 = 00000&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
<tr>
<td>3</td>
<td>Press the [A] Key or [V] Key to change from Un to Pn.</td>
<td>1:BB PRM/MON&lt;br&gt;Pn000 = n0000&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
<tr>
<td>4</td>
<td>Press the [&gt;] Key once to move the cursor to the right of Pn.</td>
<td>1:BB PRM/MON&lt;br&gt;Pn000 = n0000&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
<tr>
<td>5</td>
<td>Press the [&lt;] Key or [&gt;] Key to change the digit and the [A] Key or [V] Key to change the numeric value to display Pn304.</td>
<td>1:BB PRM/MON&lt;br&gt;Pn304 = 00500&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
<tr>
<td>6</td>
<td>Press the [DATA] Key.</td>
<td>1:BB PRM/MON&lt;br&gt;Pn304 = 00500&lt;br&gt;Un002 = 00000&lt;br&gt;Un008 = 00000000000&lt;br&gt;Un00D = 00000000000</td>
</tr>
</tbody>
</table>

The cursor will move from the parameter number to the setting. (The first digit on the right in the setting will flash.)

Continued on next page.
### 2.1 Parameters

#### 2.1.1 Setting Parameters

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the &lt; Key twice to move the cursor to the hundreds digit of Pn304.</td>
<td><img src="image" alt="Parameter Setting" /></td>
</tr>
<tr>
<td>8</td>
<td>Use the ▲ Key, ■ Key, &lt; Key, and &gt; Key to change the setting from 500 to 1,000.</td>
<td><img src="image" alt="Parameter Setting" /></td>
</tr>
<tr>
<td>9</td>
<td>Press the DATA Key.</td>
<td><img src="image" alt="Parameter Setting" /></td>
</tr>
</tbody>
</table>

Note: Even if you press the [ ] Key without pressing the DATA Key to move to another mode, such as the Utility Mode, any changes to the parameter settings are stored in the SERVOPACK.
2.1 Parameters

2.1.2 Types of Parameters

There are the following two types of SERVOPACK parameters.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup Parameters</td>
<td>Parameters for the basic settings that are required for operation.</td>
</tr>
<tr>
<td>Tuning Parameters</td>
<td>Parameters that are used to adjust servo performance.</td>
</tr>
</tbody>
</table>

The tuning parameters are not displayed by default when you use the Panel Operator or Digital Operator. To display and set the tuning parameters, set Pn00B to n.□□□1 (Display all parameters).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>When Enabled</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pn00B</td>
<td>n.□□□0 (default setting)</td>
<td>After restart</td>
<td>Setup</td>
</tr>
<tr>
<td>n.□□□1</td>
<td>Display all parameters.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The setting method for each type of parameter is described below.
- Setup Parameters
  Setup parameters are set individually.
- Tuning Parameters
  Normally the user does not need to set the tuning parameters individually.

Use the various utility tuning functions to set the related tuning parameters to increase the response even further for the conditions of your machine. Refer to the following sections for details.

- 3.2.28 Advanced Autotuning without Reference (Fn201) on page 3-70
- 3.2.29 Advanced Autotuning with Reference (Fn202) on page 3-79
- 3.2.30 One-Parameter Tuning (Fn203) on page 3-84

You can also set the tuning parameters individually to make adjustments.

Refer to the following section for information on the parameter setting procedures.

- 2.1.1 Setting Parameters on page 2-2
This section describes how to display and operate monitors in the Parameter/Monitor Mode.

## 2.2 Monitors

### 2.2.1 Monitor Items

<table>
<thead>
<tr>
<th>Un No.</th>
<th>Content of Display</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un000</td>
<td>Motor Speed</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Un001</td>
<td>Speed Reference</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Un002</td>
<td>Torque Reference (percentage of rated torque)</td>
<td>%</td>
</tr>
<tr>
<td>Un003</td>
<td>Rotary Servomotors: Rotational Angle 1 (number of encoder pulses from origin within one encoder rotation displayed in decimal)</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td></td>
<td>Linear Servomotor: Electrical Angle 1 (linear encoder pulses from the polarity origin displayed in decimal)</td>
<td>Linear encoder pulses</td>
</tr>
<tr>
<td>Un004</td>
<td>Rotary Servomotors: Rotational Angle 2 (electrical angle from polarity origin)</td>
<td>deg</td>
</tr>
<tr>
<td></td>
<td>Linear Servomotor: Electrical Angle 2 (electrical angle from polarity origin)</td>
<td>deg</td>
</tr>
<tr>
<td>Un005</td>
<td>Input Signal Monitor</td>
<td>–</td>
</tr>
<tr>
<td>Un006</td>
<td>Output Signal Monitor</td>
<td>–</td>
</tr>
<tr>
<td>Un007</td>
<td>Input Reference Pulse Speed (displayed only during position control)</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Un008</td>
<td>Position Error Amount (displayed only during position control)</td>
<td>Reference units</td>
</tr>
<tr>
<td>Un009</td>
<td>Accumulated Load Ratio (percentage of rated torque: effective torque in cycles of 10 seconds)</td>
<td>%</td>
</tr>
<tr>
<td>Un00A</td>
<td>Regenerative Load Ratio (percentage of processable regenerative power: regenerative power consumption in cycles of 10 seconds)</td>
<td>%</td>
</tr>
</tbody>
</table>

Continued on next page.
## 2.2 Monitors

### 2.2.1 Monitor Items

<table>
<thead>
<tr>
<th>Un No.</th>
<th>Content of Display</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un00B</td>
<td>Power Consumed by DB Resistance (percentage of processable power at DB activation: displayed in cycles of 10 seconds)</td>
<td>%</td>
</tr>
<tr>
<td>Un00C</td>
<td>Input Reference Pulse Counter</td>
<td>Reference units</td>
</tr>
<tr>
<td>Un00D</td>
<td>Feedback Pulse Counter</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td>Un00E</td>
<td>Fully-Closed Loop Feedback Pulse Counter</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td>Un010</td>
<td>Upper Limit Setting of Motor Maximum Speed/Upper Limit Setting of Encoder Output Resolution</td>
<td>–</td>
</tr>
<tr>
<td>Un011</td>
<td>Polarity Sensor Signal Monitor</td>
<td>–</td>
</tr>
<tr>
<td>Un012</td>
<td>Total Run Time</td>
<td>100 ms</td>
</tr>
<tr>
<td>Un013</td>
<td>Feedback Pulse Counter</td>
<td>Reference units</td>
</tr>
<tr>
<td>Un014</td>
<td>Effective Gain Monitor (gain settings 1 = 1, gain settings 2 = 2)</td>
<td>–</td>
</tr>
<tr>
<td>Un015</td>
<td>Safety I/O Signal Monitor</td>
<td>–</td>
</tr>
<tr>
<td>Un020</td>
<td>Rated Motor Speed</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Un021</td>
<td>Maximum Motor Speed</td>
<td>min⁻¹</td>
</tr>
<tr>
<td>Un025</td>
<td>SERVOPACK Installation Environment Monitor</td>
<td>%</td>
</tr>
<tr>
<td>Un026*¹</td>
<td>Servomotor Installation Environment Monitor</td>
<td>%</td>
</tr>
<tr>
<td>Un027</td>
<td>Built-in Fan Remaining Life Ratio</td>
<td>%</td>
</tr>
<tr>
<td>Un028</td>
<td>Capacitor Remaining Life Ratio</td>
<td>%</td>
</tr>
<tr>
<td>Un029</td>
<td>Surge Prevention Circuit Remaining Life Ratio</td>
<td>%</td>
</tr>
<tr>
<td>Un02A</td>
<td>Dynamic Brake Circuit Remaining Life Ratio</td>
<td>%</td>
</tr>
<tr>
<td>Un02F</td>
<td>Overheat Protection Input</td>
<td>0.01 V</td>
</tr>
<tr>
<td>Un030*²</td>
<td>Current Backlash Compensation Value</td>
<td>0.1 reference units</td>
</tr>
<tr>
<td>Un031*²</td>
<td>Backlash Compensation Value Setting Limit</td>
<td>0.1 reference units</td>
</tr>
<tr>
<td>Un032</td>
<td>Power Consumption</td>
<td>W</td>
</tr>
<tr>
<td>Un033</td>
<td>Consumed Power</td>
<td>0.001 Wh</td>
</tr>
<tr>
<td>Un034</td>
<td>Cumulative Power Consumption</td>
<td>Wh</td>
</tr>
<tr>
<td>Un040</td>
<td>Absolute Encoder Multiturn Data</td>
<td>–</td>
</tr>
</tbody>
</table>

Continued from previous page. Continued on next page.
Continued from previous page.

<table>
<thead>
<tr>
<th>Un No.</th>
<th>Content of Display</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un041</td>
<td>Position within One Rotation of Absolute Encoder</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td>Un042</td>
<td>Lower Bits of Absolute Encoder Position</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td>Un043</td>
<td>Upper Bits of Absolute Encoder Position</td>
<td>Encoder pulses</td>
</tr>
<tr>
<td>Un084</td>
<td>Linear Encoder Pitch*3</td>
<td>pm</td>
</tr>
<tr>
<td>Un085</td>
<td>Linear Encoder Pitch Exponent*3</td>
<td>–</td>
</tr>
</tbody>
</table>

*1. This applies to the following motors. The display will show 0 for all other models. SGM7A, SGM7J, SGM7G, SGM7P, SGMCV, SGM7D, SGM7E, and SGM7F

*2. These monitors cannot be used for Analog Voltage/Pulse Train Reference SERVO-PACKs.

*3. Scale pitch = Un084 × 10^Un085 [pm]
2.2 Monitors
2.2.2 Interpreting the Monitor Displays

2.2.2 Interpreting the Monitor Displays

Input Signal Monitor

The input signal monitor (Un005) is displayed as shown below. The top indicates OFF (high level) and the bottom indicates ON (low level). Undefined digits are always shown as being ON.

```
     Un005 = 000001
     87654321 Digit
```

- **Σ-7S Analog Voltage/Pulse Train Reference SERVOPACKs**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-40</td>
<td>/S-ON (Servo ON) signal</td>
</tr>
<tr>
<td>2</td>
<td>CN1-41</td>
<td>/P-CON (Proportional Control) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-42</td>
<td>P-OT (Forward Drive Prohibit) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-43</td>
<td>N-OT (Reverse Drive Prohibit) signal</td>
</tr>
<tr>
<td>5</td>
<td>CN1-44</td>
<td>/ALM-RST (Alarm Reset) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-45</td>
<td>/P-CL (Forward External Torque Limit) signal</td>
</tr>
<tr>
<td>7</td>
<td>CN1-46</td>
<td>/N-CL (Reverse External Torque Limit) signal</td>
</tr>
<tr>
<td>8</td>
<td>CN1-47</td>
<td>SEN (Absolute Data Request) signal*2</td>
</tr>
</tbody>
</table>

*1. The default settings are given.
*2. You cannot change the allocation.

- **Σ-7S MECHATROLINK-II or MECHATROLINK-III Communications Reference SERVOPACKs**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-13</td>
<td>/SI0 (General-purpose Sequence Input 0) signal</td>
</tr>
<tr>
<td>2</td>
<td>CN1-7</td>
<td>P-OT (Forward Drive Prohibit) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-8</td>
<td>N-OT (Reverse Drive Prohibit) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-9</td>
<td>/DEC (Origin Return Deceleration Switch) signal</td>
</tr>
<tr>
<td>5</td>
<td>CN1-10</td>
<td>/EXT1 (External Latch Input 1) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-11</td>
<td>/EXT2 (External Latch Input 2) signal</td>
</tr>
<tr>
<td>7</td>
<td>CN1-12</td>
<td>/EXT3 (External Latch Input 3) signal</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>Reserved.</td>
</tr>
</tbody>
</table>

* The default settings are given.
### 2.2 Monitors

#### 2.2.2 Interpreting the Monitor Displays

**Σ-7W MECHATROLINK-III Communications Reference SERVOPACKs When Axis 1 Is Displayed**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name* (You can change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-3</td>
<td>P-OT (Forward Drive Prohibit) signal</td>
</tr>
<tr>
<td>2</td>
<td>CN1-4</td>
<td>N-OT (Reverse Drive Prohibit) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-5</td>
<td>/DEC (Origin Return Deceleration Switch) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-6</td>
<td>/EXT1 (External Latch Input 1) signal</td>
</tr>
<tr>
<td>5</td>
<td>CN1-7</td>
<td>/EXT2 (External Latch Input 2) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-8</td>
<td>/EXT3 (External Latch Input 3) signal</td>
</tr>
<tr>
<td>7</td>
<td>–</td>
<td>Reserved.</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>Reserved.</td>
</tr>
</tbody>
</table>

* The default settings are given.

**Σ-7W MECHATROLINK-III Communications Reference SERVOPACKs When Axis 2 Is Displayed**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name* (You can change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-9</td>
<td>P-OT (Forward Drive Prohibit) signal</td>
</tr>
<tr>
<td>2</td>
<td>CN1-10</td>
<td>N-OT (Reverse Drive Prohibit) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-11</td>
<td>/DEC (Origin Return Deceleration Switch) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-12</td>
<td>/EXT1 (External Latch Input 1) signal</td>
</tr>
<tr>
<td>5</td>
<td>CN1-13</td>
<td>/EXT2 (External Latch Input 2) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-14</td>
<td>/EXT3 (External Latch Input 3) signal</td>
</tr>
<tr>
<td>7</td>
<td>–</td>
<td>Reserved.</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>Reserved.</td>
</tr>
</tbody>
</table>

* The default settings are given.
2.2 Monitors
2.2.2 Interpreting the Monitor Displays

## Output Signal Monitor

The output signal monitor (Un006) is displayed as shown below. The top indicates OFF (high level) and the bottom indicates ON (low level). Undefined digits are always shown as being ON.

![Un006 Display](image)

- **Σ-7S Analog Voltage/Pulse Train Reference SERVOPACKs**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Output Pin Number</th>
<th>Signal Name*1 (You can change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-31 and CN1-32</td>
<td>ALM (Servo Alarm) signal*2</td>
</tr>
<tr>
<td>2</td>
<td>CN1-25 and CN1-26</td>
<td>/COIN (Positioning Completion) signal or /V-CMP (Speed Coincidence Detection) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-27 and CN1-28</td>
<td>/TGON (Rotation Detection Output) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-29 and CN1-30</td>
<td>/S-RDY (Servo Ready) signal</td>
</tr>
<tr>
<td>5</td>
<td>CN1-37</td>
<td>ALO1 (Alarm Code Output) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-38</td>
<td>ALO2 (Alarm Code Output) signal</td>
</tr>
<tr>
<td>7</td>
<td>CN1-39</td>
<td>ALO3 (Alarm Code Output) signal</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*1. The default settings are given.
*2. You cannot change the allocation.

- **Σ-7S MECHATROLINK-II or MECHATROLINK-III Communications Reference SERVOPACKs**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name*1 (You can change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-3 and CN1-4</td>
<td>ALM (Servo Alarm) signal*2</td>
</tr>
<tr>
<td>2</td>
<td>CN1-1 and CN1-2</td>
<td>/BK (Brake) signal</td>
</tr>
<tr>
<td>3</td>
<td>CN1-23 and CN1-24</td>
<td>/SO2 (General-purpose Sequence Output 2) signal</td>
</tr>
<tr>
<td>4</td>
<td>CN1-25 and CN1-26</td>
<td>/SO3 (General-purpose Sequence Output 3) signal</td>
</tr>
<tr>
<td>5</td>
<td>–</td>
<td>Reserved.</td>
</tr>
<tr>
<td>6</td>
<td>–</td>
<td>Reserved.</td>
</tr>
<tr>
<td>7</td>
<td>–</td>
<td>Reserved.</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>Reserved.</td>
</tr>
</tbody>
</table>

*1. The default settings are given.
*2. You cannot change the allocation.
2.2.2 Interpreting the Monitor Displays

- **Σ-7W MECHATROLINK-III Communications Reference SERVOPACKs**

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Input Pin Number</th>
<th>Signal Name*¹ (You can change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN1-19 and CN1-20</td>
<td>ALM (Servo Alarm) signal for axis 1*²</td>
</tr>
<tr>
<td>2</td>
<td>CN1-21 and CN1-22</td>
<td>ALM (Servo Alarm) signal for axis 2*²</td>
</tr>
<tr>
<td>3</td>
<td>CN1-23 and CN1-24</td>
<td>/BK (Brake) signal for axis 1</td>
</tr>
<tr>
<td>4</td>
<td>CN1-25 and CN1-26</td>
<td>/BK (Brake) signal for axis 2</td>
</tr>
<tr>
<td>5</td>
<td>CN1-27 and CN1-28</td>
<td>/SO3 (General-purpose Sequence Output 3) signal</td>
</tr>
<tr>
<td>6</td>
<td>CN1-29 and CN1-30</td>
<td>/SO4 (General-purpose Sequence Output 4) signal</td>
</tr>
<tr>
<td>7</td>
<td>CN1-31 and CN1-32</td>
<td>/SO5 (General-purpose Sequence Output 5) signal</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>Reserved.</td>
</tr>
</tbody>
</table>

*1. The default settings are given.
*2. You cannot change the allocation.

**Safety I/O Signal Monitor**

The safety I/O signal monitor (Un015) is displayed as shown below. The top indicates OFF (high level) and the bottom indicates ON (low level). Undefined digits are always shown as being ON.

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Output Pin Number</th>
<th>Signal Name (You cannot change the allocations.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CN8-3 and CN8-4</td>
<td>/HWBB1 (Hard Wire Base Block Input 1) signal</td>
</tr>
<tr>
<td>2</td>
<td>CN8-5 and CN8-6</td>
<td>/HWBB2 (Hard Wire Base Block Input 2) signal</td>
</tr>
<tr>
<td>3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
To describe monitor display operations, the following example shows how to display Un000 (Motor Speed) on line 1, Un002 (Torque Reference) on line 2, Un005 (Input Signal Monitor) on line 3, and Un006 (Output Signal Monitor) on line 4, and then how to save the display status. (The example shows how to change the default setting.)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the Key to display the Parameter/Monitor Mode Main Menu. | \[\begin{array}{ccc}
1:BB & PRM/MON \\
Un000=00000 & Motor Speed \\
Un002=00000 & Torque Reference \\
Un006=0000000000 & Input Signal Monitor \\
Un006=0000000000 & Output Signal Monitor
\end{array}\] |
| 2    | Press the Key once to move the cursor to the bottom line. | \[\begin{array}{ccc}
1:BB & PRM/MON \\
Un000=00000 & Motor Speed \\
Un002=00000 & Torque Reference \\
Un008=0000000000 & Input Signal Monitor \\
Un00D=0000000000 & Output Signal Monitor
\end{array}\] |
| 3    | Use the Key or Key to display Un006. | \[\begin{array}{ccc}
1:BB & PRM/MON \\
Un000=00000 & Motor Speed \\
Un002=00000 & Torque Reference \\
Un008=0000000000 & Input Signal Monitor \\
Un006=0000000000 & Output Signal Monitor
\end{array}\] |
| 4    | Press the Key once to move the cursor up one line. | \[\begin{array}{ccc}
1:BB & PRM/MON \\
Un000=00000 & Motor Speed \\
Un002=00000 & Torque Reference \\
Un008=0000000000 & Input Signal Monitor \\
Un006=0000000000 & Output Signal Monitor
\end{array}\] |

Continued on next page.
## 2.2 Monitors

### 2.2.3 Monitor Display Operations

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 5 | Use the \(\text{▲}\) Key or \(\text{▼}\) Key to display Un005. | **1 : BB**  
**Un000** = 0 0 0 0 0 0  
**Un002** = 0 0 0 0 0 0  
**Un005** =  
**Un006** =  
The desired items are now displayed. |
| 6 | Press the \(\text{WRITE}\) Key. | **1 : BB**  
**Un000** = 0 0 0 0 0 0  
**Un002** = 0 0 0 0 0 0  
**Un005** =  
**Un006** =  
The indicator on the key will flash and the display status will be saved. Note: Do not turn OFF the power supply to the SERVOPACK while the display status is being saved. |
This chapter provides an outline of the utility functions and describes the operating procedures for them.

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- **3.2.10 Manually Adjust Torque Reference Offset (Fn00B)**  3-27
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3.1 Introduction

3.1.1 Utility Functions

In Utility Mode, Fn numbers are displayed and you can execute the utility functions to operate and adjust the SERVOPACK. The following table lists the utility functions.

<table>
<thead>
<tr>
<th>Fn No.</th>
<th>Name</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn000</td>
<td>Display Alarm History</td>
<td>Displays a history of up to the last 10 alarms.</td>
<td>–</td>
</tr>
<tr>
<td>Fn002</td>
<td>Jog</td>
<td>Used to operate the motor with the keys on the Digital Operator.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn003</td>
<td>Origin Search</td>
<td>Used to operate the motor with the keys on the Digital Operator, detect the origin within one rotation, and stop the motor there.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn004</td>
<td>Jog Program</td>
<td>Operates the motor according to a preset program pattern.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn005</td>
<td>Initialize Parameters</td>
<td>Initializes the parameters to the default settings.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn006</td>
<td>Clear Alarm History</td>
<td>Clears the alarm history.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn008</td>
<td>Reset Absolute Encoder</td>
<td>Resets any absolute encoder alarms, and resets the multiturn data to zero.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn009</td>
<td>Autotune Analog (Speed/Torque) Reference Offset</td>
<td>Automatically adjusts the speed or torque analog reference offset.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn0A</td>
<td>Manually Adjust Speed Reference Offset</td>
<td>Used to manually adjust the speed reference offset.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn0B</td>
<td>Manually Adjust Torque Reference Offset</td>
<td>Used to manually adjust the torque reference offset.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn0C</td>
<td>Adjust Analog Monitor Output Offset</td>
<td>Used to manually adjust the analog monitor output offset.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn0D</td>
<td>Adjust Analog Monitor Output Gain</td>
<td>Used to manually adjust the analog monitor output gain.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn0E</td>
<td>Autotune Motor Current Detection Signal Offset</td>
<td>Automatically adjusts the motor current detection signal offsets.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn0F</td>
<td>Manually Adjust Motor Current Detection Signal Offset</td>
<td>Used to manually adjust the motor current detection signal offsets.</td>
<td>Wrt –</td>
</tr>
<tr>
<td>Fn10</td>
<td>Write Prohibition Setting</td>
<td>Prohibits or permits changing the settings of the parameters.</td>
<td>–</td>
</tr>
<tr>
<td>Fn11</td>
<td>Display Servomotor Model</td>
<td>Displays the model of the motor.</td>
<td>–</td>
</tr>
</tbody>
</table>

Continued on next page.
### Utility Functions

<table>
<thead>
<tr>
<th>Fn No.</th>
<th>Name</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn012</td>
<td>Display Software Version</td>
<td>Displays the software version of the SERVOPACK.</td>
<td></td>
</tr>
<tr>
<td>Fn013</td>
<td>Multiturn Limit Setting after Multiturn Limit Disagree-</td>
<td>Resets an A.CC0 alarm that occurred when the multiturn limit was changed and sets a new limit.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn014</td>
<td>Reset Option Module Configuration Error</td>
<td>Clears alarms that have been detected in a specified Option Module.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn01B</td>
<td>Initialize Vibration Detection Level</td>
<td>Automatically adjusts the detection level for vibration alarms and warnings.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn01E</td>
<td>Display SERVOPACK and Servomotor IDs</td>
<td>Displays the models, serial numbers, and manufacturing dates of the SERVOPACK and motor that are stored in the Feedback Option Module.</td>
<td></td>
</tr>
<tr>
<td>Fn01F</td>
<td>Display Servomotor ID from Feedback Option Module</td>
<td>Displays the encoder ID.</td>
<td></td>
</tr>
<tr>
<td>Fn020</td>
<td>Set Absolute Linear Encoder Origin</td>
<td>Uses the current position as the origin and stores the phase information of the motor from the origin in the SERVOPACK.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>Fn021</td>
<td>Reset Motor Type Change Detected Status</td>
<td>Deletes detection alarms.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn030</td>
<td>Software Reset</td>
<td>Internally performs a software reset of the SERVOPACK and performs the same calculations as when the power is turned OFF and ON again, including parameter calculations.</td>
<td></td>
</tr>
<tr>
<td>Fn080</td>
<td>Polarity Detection</td>
<td>Detects the polarity and stores the phase information of the motor from the origin in the SERVOPACK.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn200</td>
<td>Tuning-less Level Setting</td>
<td>Sets the level for the tuning-less function.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn201</td>
<td>Advanced Autotuning without Reference</td>
<td>Uses automatic operation to automatically set the servo gains and filters.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn202</td>
<td>Advanced Autotuning with Reference</td>
<td>Automatically sets the servo gains and filters during motor operation.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn203</td>
<td>One-Parameter Tuning</td>
<td>Used to manually adjust the servo during operation using a speed or position reference input from the host controller.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn204</td>
<td>Adjust Anti-resonance Control</td>
<td>Suppresses continuous vibration (oscillation) of approximately 100 Hz to 1,000 Hz.</td>
<td>Wrt</td>
</tr>
</tbody>
</table>

Continued from previous page.
### 3.1 Introduction

#### 3.1.1 Utility Functions

<table>
<thead>
<tr>
<th>Fn No.</th>
<th>Name</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn205</td>
<td>Vibration Suppression</td>
<td>Suppresses low and transient vibration (oscillation) of approximately 1 Hz to 100 Hz.</td>
<td>Wrt</td>
</tr>
<tr>
<td>Fn206</td>
<td>Easy FFT</td>
<td>Slightly rotates the SERVOPACK several times for a certain period to cause the machine to vibrate, detects the resonance frequencies, and sets the notch filters.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>FnB03</td>
<td>Edit/Save Program Table</td>
<td>Used to edit or save program tables.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB04</td>
<td>Edit/Save ZONE Table</td>
<td>Used to edit or save ZONE tables.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB05</td>
<td>Edit/Save Jog Speed Table</td>
<td>Used to edit or save jog speed tables.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB06</td>
<td>Initialize Program Table</td>
<td>Initializes a program table to the default settings.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB07</td>
<td>Initialize ZONE Table</td>
<td>Initializes a ZONE table to the default settings.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB08</td>
<td>Initialize Jog Speed Table</td>
<td>Initializes a jog speed table to the default settings.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB09</td>
<td>Set Absolute Encoder Origin</td>
<td>Changes the setting of PnB25 (Absolute Position Offset) and overwrites the current position with the specified position.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB0A</td>
<td>INDEXER Status Monitor</td>
<td>Displays the internal status of the INDEXER Module, such as the current position and I/O signal status.</td>
<td>–</td>
</tr>
<tr>
<td>FnB0B</td>
<td>Initialize INDEXER Parameter Settings</td>
<td>Initializes the parameters in the SERVOPACK and INDEXER Module to the default settings.</td>
<td>Wrt OFF</td>
</tr>
<tr>
<td>FnB0C</td>
<td>Reset INDEXER Alarm</td>
<td>Resets alarms in the SERVOPACK and INDEXER Module and deletes the alarm history from the INDEXER Module.</td>
<td>Wrt</td>
</tr>
<tr>
<td>FnB0D</td>
<td>Display INDEXER Alarm History</td>
<td>Displays the alarm history from the SERVOPACK and INDEXER Module.</td>
<td>–</td>
</tr>
</tbody>
</table>

Note: 1. Utility functions with “Wrt” in the Remarks column cannot be executed if the parameters are write-prohibited (e.g., if Fn010 is set to 0001). **(NO-OP is displayed if you attempt to change to utility functions from the main menu in Utility Mode while the parameters are write-prohibited.)**

2. Utility functions with “OFF” in the Remarks column cannot be executed if the /S-ON (Servo ON) input signal is ON. **(NO-OP is displayed if you attempt to change to utility functions from the main menu in Utility Mode while the /S-ON signal is ON.)**

3. A JUSP-OP05A-1-E Digital Operator is required to use the Fn01E (Display SERVOPACK and Servomotor IDs) and Fn01F (Display Servomotor ID from Feedback Option Module) utility functions.
This section provides the operating procedures for the Utility Mode execution displays that you can select from the Utility Mode Main Menu. The Utility Mode Main Menu is displayed when you press the 
Key in Parameter/Monitor Mode.

Use the \( \text{ or } \) Key to select the utility function you want to execute and press the \( \) Key to change to the execution display for that function.

Press the \( \) Key to scroll four lines at a time. (Three lines will be skipped and the fourth line will be displayed.)

If you select a utility function that cannot be executed, the status display will flash \( \text{NO-OP} \) for approximately one second when you press the \( \) Key or \( \) Key.

**Example**

If you attempt to jog (Fn002) when the parameters are write-prohibited (i.e., when Fn010 is set to 0001), the display will change as shown below.

The following term definitions are used in this section.

**Servo Ready**
- The main circuit power supply is ON.
- There are no alarms.
- There is no hard wire base block (HWBB).
- If an absolute encoder is being used, outputting the position data from the absolute encoder to the host controller has been completed when the SEN (Absolute Data Request) input signal turns ON (high level). However, this condition does not apply to utility functions for which the host controller is not used.
3.2 Operating Procedures for Utility Functions

3.2.1 Display Alarm History (Fn000)

### 3.2.1 Display Alarm History (Fn000)

You can use this utility function to display a history of up to the last 10 alarms.
You can check the alarm numbers and time stamps of the alarms that have occurred.
A time stamp gives the total operation time to the point at which the alarm occurred in increments of 100 ms from when the control power supply and main circuit power supply were turned ON. The total operating time is recorded continuously for approximately 13 years.

#### Example

**Time Stamp Display Example**

If **36000** is displayed,

\[
3,600,000 \text{ ms} = 3,600 \text{ s} = 60 \text{ min} = 1 \text{ h}
\]

Therefore, the total operating time in hours is 1 hour.

### Preparations

No preparations are required.
3.2 Operating Procedures for Utility Functions

3.2.1 Display Alarm History (Fn000)

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the \( \text{FUNCTION} \) Key to display the Utility Mode Main Menu, and then use the \( \text{A} \) Key or \( \text{V} \) Key to select Fn000. | 1:BB FUNCTION
Fn207:V-Monitor
Fn000:Alm History
Fn002:JOG
Fn003:Z-Search |
| 2    | Press the \( \text{DATA} \) Key. | The Fn000 (Display Alarm History) display will appear. |
| 3    | Press the \( \text{A} \) Key or \( \text{V} \) Key to scroll through the alarm history. | The alarms that have occurred will be displayed. |
| 4    | Press the \( \text{FUNCTION} \) Key. | The display will return to the Utility Mode Main Menu. |

Note: 1. If the same alarm occurs consecutively within one hour, it is not saved in the alarm history. If it occurs after an hour or more, it is saved.
2. “----” is displayed if no alarm has occurred.
3. You can clear the alarm history with the Fn006 (Clear Alarm History) utility function. The alarm history is not cleared when you reset alarms or turn OFF the power supply to the SERVOPACK.
4. The CPF00 and CPF01 alarms (Digital Operator Communications Error 1 and 2) are Digital Operator alarms. They are not recorded in the alarm history.
5. Warnings are not recorded in the alarm history.
3.2 Operating Procedures for Utility Functions

3.2.2 Jog (Fn002)

### Jog (Fn002)

You can use this utility function to operate the motor in the forward or reverse direction with the keys on the Digital Operator.

For safety, do not jog the motor while the motor is connected to the load (i.e., do not couple the axis to the machine). Also, to prevent the motor from falling over, secure it to the machine.

The range of motion of your machine must be considered when you set the jogging speed. The jogging speed is set in Pn304 (Jogging Speed).

Note: The P-OT (Forward Drive Prohibit) input signal and N-OT (Reverse Drive Prohibit) input signal are disabled during jogging.

### Preparations

Always check the following before you execute jogging.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.2 Jog (Fn002)

**Operating Procedure**

The following procedure shows how to jog the motor at a jogging speed of 1,000 min\(^{-1}\). (The default setting is 500 min\(^{-1}\).)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [Left Shift] Key to display the Utility Mode Main Menu, and then use the [Up] Key or [Down] Key to select Fn002.</td>
<td>![Table Row](1:BB FUNCTION Fn000:Alm History Fn002:JOG Fn003:Z-Search Fn004:Program JOG)</td>
</tr>
<tr>
<td>2</td>
<td>Press the [Data] Key.</td>
<td>The Fn002 (Jog) execution display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Press the [Data] Key.</td>
<td>The cursor will move to the setting for Pn304 (Jogging Speed).</td>
</tr>
<tr>
<td>4</td>
<td>Use the [Left] Key, [Right] Key, [Up] Key, and [Down] Key to set Pn304 (Jogging Speed) to 1,000.</td>
<td>![Table Row](1:BB JOG Pn304=00500 Un000=00000 Un002=00000 Un00D=00000000000)</td>
</tr>
<tr>
<td>5</td>
<td>Press the [Data] Key.</td>
<td>The setting will be saved and the cursor will move to the parameter number.</td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2 Operating Procedures for Utility Functions
#### 3.2.2 Jog (Fn002)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6</strong></td>
<td>Press the <strong>JOG</strong> Key.</td>
</tr>
</tbody>
</table>
| **7** | Press the **A** Key to rotate the motor forward at 1,000 min⁻¹. Press the **V** Key to rotate the motor in reverse at 1,000 min⁻¹. Inspect the Servomotor for the following conditions.  
• Make sure there is no abnormal vibration.  
• Make sure there is no abnormal noise.  
• Make sure that the temperature does not increase abnormally. |
| **8** | Press the **JOG** Key. |
| **9** | Press the **FUNCTION** Key. |
| **10** | Turn the SERVOPACK power supply OFF and ON again. |

The status display will change to **RUN** and the motor will change to the servo ON state.

```
1:RUN JOG
Pn304=01000
Un000=00000
Un002=00000
Un00D=0000000000
```

The status display will change to **BB** and the motor will change to the servo OFF state.

```
1:BB JOG
Pn304=01000
Un000=00000
Un002=00000
Un00D=0000000000
```

The display will return to the Utility Mode Main Menu.

```
1:BB FUNCTION
Fn000:Alm History
Fn002:JOG
Fn003:Z-Search
Fn004:Program JOG
```
3.2 Operating Procedures for Utility Functions

3.2.3 Origin Search (Fn003)

You can use this utility function to operate the motor with the keys on the Digital Operator, move the motor to the origin within one rotation, and clamp the motor there.

Use an origin search when it is necessary to align the origin within one rotation with the machine origin. The following motor speeds are used.

- Rotary Servomotors: $60 \text{ min}^{-1}$
- Direct Drive Servomotors: $6 \text{ min}^{-1}$
- Linear Servomotors: $15 \text{ mm/s}$

Note: 1. Make sure the load is not coupled when you execute an origin search.
   2. The POT (Forward Drive Prohibit) input signal and N-OT (Reverse Drive Prohibit) input signal are disabled during an origin search.

Preparations

Always check the following before you execute an origin search.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.

Operating Procedure

The following procedure shows how to operate the motor in the forward direction and stop at the origin within one rotation.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the $\text{[\textsc{func}]}$ Key to display the Utility Mode Main Menu, and then use the $\text{[\textsc{up}]}$ Key or $\text{[\textsc{down}]}$ Key to select Fn003. | $1:\text{BB FUNCTION}$  
$\text{Fn002:JOG}$  
$\text{Fn003:Z-Search}$  
$\text{Fn004:Program JOG}$  
$\text{Fn005:Prm Init}$ |
| 2    | Press the $\text{[data]}$ Key. | The Fn003 (Origin Search) execution display will appear.  
$1:\text{BB Z-Search}$  
$\text{Un000} = 00000$  
$\text{Un002} = 00000$  
$\text{Un003} = 0000000074$  
$\text{Un00D} = 0000000000$ |

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.3 Origin Search (Fn003)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Press the [ ] Key.</td>
<td>The status display will change to <strong>1:RUN</strong> and the motor will change to the servo ON state. Note: If the Servomotor is already at the origin, <strong>Complete</strong> will be displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1:RUN</strong> Z-Search</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un000 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un002 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un003 = 000000000000000000000000000</td>
</tr>
<tr>
<td>4</td>
<td>Press the [ ] Key. The Servomotor will rotate in the forward direction and stop at the origin within one rotation. (Press the [ ] Key to operate the motor in the reverse direction and stop at the phase-C position.) Hold down the key until the motor stops.</td>
<td>If the origin search is completed normally, <strong>Complete</strong> will be displayed in the upper right corner of the display.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1:RUN</strong> Complete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un000 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un002 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un003 = 000000000000000000000000000</td>
</tr>
<tr>
<td>5</td>
<td>Press the [ ] Key.</td>
<td>The status display will change to <strong>1:BB</strong> and the motor will change to the servo OFF state. The display will change from <strong>Complete</strong> to <strong>Z-Search</strong>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1:BB</strong> Z-Search</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un000 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un002 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Un003 = 000000000000000000000000</td>
</tr>
<tr>
<td>6</td>
<td>Press the [ ] Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>1:BB</strong> FUNCTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fn002:JOG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fn003:Z-Search</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fn004:Program JOG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fn005:Prm Init</td>
</tr>
</tbody>
</table>

7 Turn the SERVOPACK power supply OFF and ON again.

7
3.2 Operating Procedures for Utility Functions

3.2.4 Jog Program (Fn004)

You can use this utility function to perform continuous operation with a preset operation pattern, travel distance, movement speed, acceleration/deceleration time, waiting time, and number of movements.

**Preparations**

Always check the following before you execute program jogging.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.
- The range of machine motion and the safe movement speed of your machine must be considered when you set the travel distance and movement speed.
- There must be no overtravel.

**Operation**

The program for jogging is set in advance with the following parameters. Consider the range of machine motion and the safe movement speed of your machine, and set the travel distance and movement speed correctly.

<table>
<thead>
<tr>
<th>Program Jogging Element</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Pattern</td>
<td>Pn530=n.☐☐☐X</td>
</tr>
<tr>
<td>Travel Distance</td>
<td>Pn531</td>
</tr>
<tr>
<td>Movement Speed</td>
<td>Pn533*</td>
</tr>
<tr>
<td>Acceleration/Deceleration Time</td>
<td>Pn534</td>
</tr>
<tr>
<td>Waiting Time</td>
<td>Pn535</td>
</tr>
<tr>
<td>Number of Movements</td>
<td>Pn536</td>
</tr>
</tbody>
</table>

* Parameter Pn585 is used for a Linear Servomotor.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn004.</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn004.</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td>Press the Key.</td>
</tr>
<tr>
<td>3</td>
<td>Check the preset parameters. Press the Key to display Pn530. Press the Key to change the display as follows: Pn530 → Pn531 → Pn533 → Pn534 → Pn535 → Pn536</td>
<td>Check the preset parameters. Press the Key to display Pn530. Press the Key to change the display as follows: Pn530 → Pn531 → Pn533 → Pn534 → Pn535 → Pn536</td>
</tr>
<tr>
<td>4</td>
<td>Press the Key.</td>
<td>Press the Key.</td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.4 Jog Program (Fn004)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 5    | Press the ▲ Key (forward movement start) or ▼ Key (reverse movement start) according to the initial direction of the operation pattern. | Operation will start after the waiting time that is set in Pn535.  
1: RUN  
Pn531 = 00032768  
Pn533 = 00500  
Pn534 = 00100  
Pn536 = 00010  
Note: If you press the ▼ Key again, base block status will be entered and the motor will stop even during operation.  
When the set program jogging operation has been completed, the status display will change to 1:END for approximately one second.  
1: END  
Pn531 = 00032768  
Pn533 = 00500  
Pn534 = 00100  
Pn536 = 00010  
It will then return to RUN. |
| 6    | Press the EDIT Key. | Base block status is entered and the display will return to the Utility Mode Main Menu. |
| 7    | Turn the SERVOPACK power supply OFF and ON again. | – |

Note: When you check the parameter settings in step 3, you can change any of the settings.
You can use this utility function to initialize the parameters to the default settings.

## Preparations
Always check the following before you initialize the parameter settings.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.

## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [MEN] Key to display the Utility Mode Main Menu, and then use the [A] Key or [V] Key to select Fn005.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:BB FUNCTION&lt;br&gt;Fn004:Program JOG&lt;br&gt;Fn005:Prm Init&lt;br&gt;Fn006:AlmHist Clr&lt;br&gt;Fn008:Mturn Clr</td>
</tr>
<tr>
<td>2</td>
<td>Press the [DATA] Key.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:BB Parameter Init&lt;br&gt;Start : [DATA]&lt;br&gt;Return: [SET]</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.5 Initialize Parameters (Fn005)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Press the Key.</td>
<td>The parameters will be initialized. <strong>Parameter Init</strong> will flash on the display while the parameters are being initialized. It will stop flashing when processing has been completed and the following status displays will appear.</td>
</tr>
<tr>
<td></td>
<td>Note: Press the Key to cancel initializing the parameters. The display will return to the Utility Mode Main Menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turn the SERVOPACK power supply OFF and ON again.</td>
<td>The parameter settings are now enabled.</td>
</tr>
</tbody>
</table>

1:A.941

**Parameter Init**

Start: [DATA]

Return: [SET]
3.2 Operating Procedures for Utility Functions
3.2.6 Clear Alarm History (Fn006)

## Clear Alarm History (Fn006)

You can use this utility function to clear the alarm history. This utility function is the only way to clear the alarm history. The alarm history is not cleared when you reset alarms or turn OFF the power supply to the SERVOPACK.

### Preparations

Always check the following before you clear the alarm history.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).

### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [\text{SET}] Key to display the Utility Mode Main Menu, and then use the [\text{A}] Key or [\text{V}] Key to select \text{Fn006}.</td>
<td>\text{1:BB FUNCTION}\n\text{Fn005:Prm Init}\n\text{Fn006:AlmHist Clr}\n\text{Fn008:Mturn Clr}\n\text{Fn009:Ref Adj}\nThe Fn006 (Clear Alarm History) execution display will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [\text{data}] Key.</td>
<td>\text{1:BB Alarm History}\n\text{Data Clear}\n\text{Start: [DATA]}\n\text{Return: [SET]} The alarm history will be cleared. When processing has been completed, the status display will flash <strong>DONE</strong> for approximately one second and then return to <strong>1:BB</strong>.</td>
</tr>
<tr>
<td>3</td>
<td>Press the [\text{data}] Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>

Note: Press the \[\text{SET}\] Key to cancel clearing the alarm history. The display will return to the Utility Mode Main Menu.
3.2 Operating Procedures for Utility Functions

3.2.7 Reset Absolute Encoder (Fn008)

You must reset (initialize) the absolute encoder at the following times.

- When starting the system for the first time
- When an A.810 alarm (Encoder Backup Alarm) occurs
- When an A.820 alarm (Encoder Checksum Alarm) occurs
- When you want to reset the multiturn data in the absolute encoder

Note: 1. You cannot reset alarms from the SERVOPACK to clear the A.810 alarm (Encoder Backup Alarm) or the A.820 alarm (Encoder Checksum Alarm). Always use the operation to reset the absolute encoder to clear these alarms.

2. If an A.8□□ alarm (Internal Encoder Monitoring Alarm) occurs, turn OFF the power supply to reset the alarm.

Preparations

Always check the following before you reset an absolute encoder.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.7 Reset Absolute Encoder (Fn008)

**Operating Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the <strong>KEY</strong> Key to display the Utility Mode Main Menu, and then use the <strong>A</strong> Key or <strong>V</strong> Key to select Fn008.</td>
<td>1:A.810 FUNCTION&lt;br&gt;Fn006:AlmHist Clr&lt;br&gt;Fn008:Multturn Clr&lt;br&gt;Fn009:Ref Adj&lt;br&gt;Fn00A:Vel Adj</td>
</tr>
<tr>
<td>2</td>
<td>Press the <strong>EXIT</strong> Key.</td>
<td>The Fn008 (Reset Absolute Encoder) execution display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Press the <strong>A</strong> Key to go from PGCL1 to PGCL5.</td>
<td>1:A.810 Multturn Clear&lt;br&gt;PGCL1</td>
</tr>
<tr>
<td>4</td>
<td>Press the <strong>EXIT</strong> Key.</td>
<td>The absolute encoder will be reset. When processing has been completed, the status display will flash <strong>DONE</strong> for approximately one second and then return to 1:A.810.</td>
</tr>
<tr>
<td>5</td>
<td>Press the <strong>EXIT</strong> Key.</td>
<td>1:A.810 Multturn Clear&lt;br&gt;PGCL5</td>
</tr>
<tr>
<td>6</td>
<td>Turn the power supply OFF and ON again.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The parameter settings are now enabled and the alarm will have been cleared.</td>
</tr>
</tbody>
</table>

\(1:A.810\)\n
\(\text{FUNCTION}\)\n
\(\text{Fn006:AlmHist Clr}\)\n
\(\text{Fn008:Multturn Clr}\)\n
\(\text{Fn009:Ref Adj}\)\n
\(\text{Fn00A:Vel Adj}\)

\(1:A.810\)\n
\(\text{Multturn Clear}\)\n
\(\text{PGCL1}\)\n
\(\text{PGCL5}\)
3.2.8 Autotune Analog (Speed/Torque) Reference Offset (Fn009)

You can use this utility function to measure the offset to automatically adjust the reference voltage.
The measured offset is saved in the SERVOPACK.

Example

1. The offset does not use a parameter, so it will not change even if the parameter settings are initialized.
2. You cannot use this utility function if a position loop is created with the host controller. Use the Fn00A (Manually Adjust Speed Reference Offset) and Fn00B (Manually Adjust Torque Reference Offset) parameters to adjust the offsets.

Preparations

Always check the following before you automatically adjust the analog (speed/torque) reference offset.
• The parameters must not be write-prohibited (Fn010 must be set to 0000).
• The servo must be OFF.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Turn OFF the servo.</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Input a reference voltage of 0 V.</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select <strong>Fn009</strong>.</td>
<td>The <strong>Fn009 (Autotune Analog (Speed/Torque) Reference Offset)</strong> execution display will appear.</td>
</tr>
<tr>
<td>4</td>
<td>Press the Key.</td>
<td>The offsets for the analog voltage references (speed and torque) will be tuned automatically. When processing has been completed, the status display will flash <strong>DONE</strong> for approximately one second and then return to <strong>1:BB</strong>.</td>
</tr>
<tr>
<td>5</td>
<td>Press the Key. Note: Press the Key to cancel automatically adjusting the analog (speed/torque) reference offsets. The display will return to the Utility Mode Main Menu.</td>
<td></td>
</tr>
</tbody>
</table>

**1:BB FUNCTION**
- **Fn008: Mturn Clr**
- **Fn009: Ref Adj**
- **Fn00A: Vel Adj**
- **Fn00B: Trq Adj**

**Start**: [DATA]
**Return**: [SET]
3.2.9 Manually Adjust Speed Reference Offset (Fn00A)

You can use this utility function to directly input an offset to adjust the speed reference. The offset is adjusted manually in the following cases.

• When a position loop is created with the host computer and the position deviation when the Servomotor is stopped by a servo lock is to be set to 0
• To intentionally set the offset to a desired value
• To check an offset that was set automatically

**Example**
The offset does not use a parameter, so it will not change even if the parameter settings are initialized.

**Preparations**
Always check the following before you manually adjust the speed reference offset.

• The parameters must not be write-prohibited (Fn010 must be set to 0000).
## 3.2 Operating Procedures for Utility Functions

### 3.2.9 Manually Adjust Speed Reference Offset (Fn00A)

## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input a reference voltage of 0 V.</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Press the [Key to display the Utility Mode Main Menu, and then use the [Key or ] Key to select Fn00A.</td>
<td>The Fn00A (Manually Adjust Speed Reference Offset) execution display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Press the [Key.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Turn ON the /S-ON (Servo ON) input signal.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Press the [Key or ] Key to adjust the speed reference offset so that the motor speed goes to 0.</td>
<td>The speed reference offset is saved in the SERVOPACK. When the data has been written, the status display will flash DONE for approximately one second and then return to 1:RUN.</td>
</tr>
<tr>
<td>6</td>
<td>Press the [Key.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Press the [Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>
3.2.10 Manually Adjust Torque Reference Offset (Fn00B)

You can use this utility function to directly input an offset to adjust the torque reference. The offset is adjusted manually in the following cases.

- To intentionally set the offset to a desired value
- To check an offset that was set automatically

Example

The offset does not use a parameter, so it will not change even if the parameter settings are initialized.

Preparations

Always check the following before you manually adjust the torque reference offset.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input a reference voltage of 0 V.</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn00B.</td>
<td>The Fn00B (Manually Adjust Torque Reference Offset) execution display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Press the Key.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Turn ON the /S-ON (Servo ON) input signal.</td>
<td>1:RUN Torque Adjust ZADJT=-00004 Tref = 00000</td>
</tr>
<tr>
<td>5</td>
<td>Press the Key or Key to adjust the torque reference offset so that the motor torque goes to 0.</td>
<td>The torque reference offset is written to the SERVOPACK. When the data has been written, the status display will flash DONE for approximately one second and then return to 1:RUN.</td>
</tr>
<tr>
<td>6</td>
<td>Press the Key.</td>
<td>1:RUN Torque Adjust ZADJT=-0000Z Tref = 00000</td>
</tr>
<tr>
<td>7</td>
<td>Press the Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>
3.2 Operating Procedures for Utility Functions

3.2.1 Adjust Analog Monitor Output Offset (Fn00C)

You can use this utility function to manually adjust the analog monitor output offsets for the torque reference monitor and motor speed monitor. You can adjust the torque reference monitor and motor speed monitor offsets individually.

These offsets are adjusted at the factory. You normally do not need to use this utility function.

Note: 1. These offsets are not initialized even if you execute the Fn005 (Initialize Parameters) utility function.
   2. When you adjust the offsets, connect to the measuring device that you will actually use when the output voltage is 0 V (e.g., for the speed monitor, when the servo is OFF and the motor shaft is not moving).

Preparations

Always check the following before you adjust offset of the analog monitor output.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn00C.</td>
<td>1:BB FUNCTION&lt;br&gt;Fn00B:Trq Adj&lt;br&gt;Fn00C:MonZero Adj&lt;br&gt;Fn00D:MonGain Adj&lt;br&gt;Fn00E:Cur AutoAdj</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td>The Fn00C (Adjust Analog Monitor Output Offset) execution display will appear.</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.11 Adjust Analog Monitor Output Offset (Fn00C)

Adjust the offset for channel 1 (the torque reference monitor).
Press the [A] Key or [V] Key to adjust the offset. Adjust the offset so that the value measured by the measuring devices is as close to 0 V as possible.

3. Press the [A] Key or [V] Key to adjust the offset. Adjust the offset so that the value measured by the measuring devices is as close to 0 V as possible.

The cursor will move to channel 2.


5. Press the [A] Key or [V] Key to adjust the offset. Adjust the offset so that the value measured by the measuring devices is as close to 0 V as possible.

The adjustment results are written to the SERVOPACK. When the data has been written, the status display will flash DONE for approximately one second and then return to 1:BB.


The display will return to the Utility Mode Main Menu.


---

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Adjust the offset for channel 1 (the torque reference monitor). Press the [A] Key or [V] Key to adjust the offset. Adjust the offset so that the value measured by the measuring devices is as close to 0 V as possible.</td>
<td>1:BB Zero ADJ CH1 = -00005 CH2 = 00001 Un002 = 00000 Un000 = 00000</td>
</tr>
<tr>
<td>4</td>
<td>Press the [A] Key.</td>
<td>The cursor will move to channel 2.</td>
</tr>
<tr>
<td>5</td>
<td>Adjust the offset for channel 2 (the motor speed monitor). Press the [A] Key or [V] Key to adjust the offset. Adjust the offset so that the value measured by the measuring devices is as close to 0 V as possible.</td>
<td>1:BB Zero ADJ CH1 = -00005 CH2 = 00006 Un002 = 00000 Un000 = 00000</td>
</tr>
<tr>
<td>6</td>
<td>Press the [A] Key.</td>
<td>The adjustment results are written to the SERVOPACK. When the data has been written, the status display will flash DONE for approximately one second and then return to 1:BB.</td>
</tr>
<tr>
<td>7</td>
<td>Press the [A] Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>

Continued from previous page.
3.2.12 Adjust Analog Monitor Output Gain (Fn00D)

You can use this utility function to manually adjust the analog monitor output gains for the torque reference monitor and motor speed monitor. You can adjust the torque reference monitor and motor speed monitor gains individually.

These gains are adjusted at the factory. You normally do not need to use this utility function.

The setting range for the analog monitor output gains is -128 to 127 (× 0.4%).

The center value of the gain adjustment range is 100%.

For example, if you set -125, the gain will be 100% - (125 × 0.4%), or 50%. Therefore, the monitor output voltage will be reduced by 1/2. Also, if you set 125, the gain will be 100% + (125 × 0.4%), or 150%. Therefore, the monitor output voltage will be increased by a factor of 1.5.

Note: These offsets are not initialized even if you execute the Fn005 (Initialize Parameters) utility function.

Preparations

Always check the following before you adjust gain of the analog monitor output.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [ ] Key to display the Utility Mode Main Menu, and then use the [ ] Key or [ ] Key to select Fn00D.</td>
<td>1:BB FUNCTION&lt;br&gt;Fn00C: MonZero Adj&lt;br&gt;Fn00D: MonGain Adj&lt;br&gt;Fn00E: Cur Auto Adj&lt;br&gt;Fn00F: Cur Manu Adj</td>
</tr>
</tbody>
</table>
### 3.2 Operating Procedures for Utility Functions

#### 3.2.12 Adjust Analog Monitor Output Gain (Fn00D)

---

**Step** | **Operation** | **Result**
--- | --- | ---
3 | Adjust the gain for channel 1 (the torque reference monitor). Use the **A** Key or **V** Key to change the gain adjustment range. | **1:BB**

| **Gain ADJ** |
| CH1= 00125 |
| CH2= -00001 |
| Un002= 00000 |
| Un000= 00000 |

4 | Press the **A** Key. | The cursor will move to channel 2.

| **1:BB** |
| **Gain ADJ** |
| CH1= 00125 |
| CH2= -00001 |
| Un002= 00000 |
| Un000= 00000 |

5 | Adjust the gain for channel 2 (the motor speed monitor). Use the **A** Key or **V** Key to change the gain adjustment range. | **1:BB**

| **Gain ADJ** |
| CH1= 00125 |
| CH2= -00125 |
| Un002= 00000 |
| Un000= 00000 |

6 | Press the **A** Key. | The settings are written to the SERVOPACK. When the data has been written, the status display will flash **DONE** for approximately one second and then return to **1:BB**.

| **1:BB** |
| **Gain ADJ** |
| CH1= 00125 |
| CH2= -00125 |
| Un002= 00000 |
| Un000= 00000 |

7 | Press the **A** Key. | The display will return to the Utility Mode Main Menu.

| **1:BB** |
| **FUNCTION** |
| Fn00C: MonZero Adj |
| Fn00D: MonGain Adj |
| Fn00E: Cur AutoAdj |
| Fn00F: Cur ManuAdj |

---

Continued from previous page.
3.2.13 Autotune Motor Current Detection Signal Offset (Fn00E)

The adjustment that is made by this utility function is completed at the factory. There is normally no reason to execute it.

Execute this utility function if you think the torque ripple is abnormally large due to the current detection signal offset.

Note: This offset is not initialized even if you execute the Fn005 (Initialize Parameters) utility function.

Preparations

Always check the following before you automatically adjust the motor current detection signal offset.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [SET] Key to display the Utility Mode Main Menu, and then use the [A] Key or [V] Key to select Fn00E.</td>
<td>The Fn00E (Autotune Motor Current Detection Signal Offset) execution display will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [SET] Key.</td>
<td>The offset of the motor current detection signal will be automatically adjusted. When processing has been completed, the status display will flash DONE for approximately one second and then return to 1:BB.</td>
</tr>
<tr>
<td>3</td>
<td>Press the [SET] Key. Note: Press the [SET] Key to cancel the automatic adjustment. The display will return to the Utility Mode Main Menu.</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Operating Procedures for Utility Functions

3.2.14 Manually Adjust Motor Current Detection Signal Offset (Fn00F)

The adjustment that is made by this utility function is completed at the factory. There is normally no reason to execute it.

Execute this utility function in the following cases.

- If you think the torque ripple is abnormally large due to the current detection signal offset
- If you execute the Fn00E (Autotune Motor Current Detection Signal Offset) utility function and the torque ripple is still large.

Observe the following precautions when you execute this utility function.

- Do not couple the motor shaft to the machine (operate the motor with no load) and operate the motor at 100 min⁻¹.
- Monitor the torque reference with the SigmaWin+ or the analog monitor and adjust the offset to minimize the torque ripple.
- Adjust the offsets for the phase-U current and phase-V current of the Servomotor so that they are balanced. Alternately adjust both offsets several times.

Note: These offsets are not initialized even if you execute the Fn005 (Initialize Parameters) utility function.

Preparations

Always check the following before you manually adjust the motor current detection signal offset.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the 1:BB Key to display the Utility Mode Main Menu, and then use the A Key or V Key to select Fn00F.</td>
<td>1:BB FUNCTION&lt;br&gt;Fn00F:Cur ManuAdj&lt;br&gt;Fn010:Prm Protect&lt;br&gt;Fn011:Motor Info&lt;br&gt;Fn012:Soft Ver&lt;br&gt;The Fn00F (Manually Adjust Motor Current Detection Signal Offset) execution display will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the A Key.</td>
<td>1:BB Manual Offset-ADJ of Motor Current&lt;br&gt;ZADJIU=-00009&lt;br&gt;ZADJIV=-00006</td>
</tr>
<tr>
<td>3</td>
<td>Turn ON the /S-ON (Servo ON) input signal.</td>
<td>1:RUN Manual Offset-ADJ of Motor Current&lt;br&gt;ZADJIU=-00009&lt;br&gt;ZADJIV=-00006</td>
</tr>
<tr>
<td>4</td>
<td>Adjust the offset for phase U. Use the A Key or V Key to change the offset. Change the offset by about 10 in the direction that reduces the torque ripple. Adjustment range: -512 to 511</td>
<td>1:RUN Manual Offset-ADJ of Motor Current&lt;br&gt;ZADJIU=-00019&lt;br&gt;ZADJIV=-00006&lt;br&gt;Note: ZADJIU: Zero adjustment of the phase-U current.</td>
</tr>
<tr>
<td>5</td>
<td>Press the A Key.</td>
<td>The cursor will move to the offset for phase V.</td>
</tr>
</tbody>
</table>
### 3.2 Operating Procedures for Utility Functions

#### 3.2.14 Manually Adjust Motor Current Detection Signal Offset (Fn00F)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 6    | Adjust the offset for phase V. Use the ▲ Key or ▼ Key to change the offset. Change the offset by about 10 in the direction that reduces the torque ripple. | 1:RUN  
    | Manual Offset-ADJ of Motor Current  
    | ZADJIU = -00019  
    | ZADJIV = -00016  
    | Note: ZADJIV: Zero adjustment of the phase-V current. |
| 7    | Repeat the above steps (to adjust phase U and then phase V) until the torque ripple cannot be improved any further regardless of whether you increase or decrease the offsets. Then, reduce the amount by which you change the offsets and repeat the same process. | ‒ |
| 8    | Press the DATA Key.                                                       | The adjustment results are written to the SERVOPACK. When the data has been written, the status display will flash DONE for approximately one second and then return to 1:RUN.  
    |     | 1:RUN  
    |     | Manual Offset-ADJ of Motor Current  
    |     | ZADJIU = -00019  
    |     | ZADJIV = -00016  |
| 9    | Press the [ ] Key.                                                        | The display will return to the Utility Mode Main Menu.  
    |     | 1:RUN  
    |     | FUNCTION  
    |     | Fn00F: Cur ManuAdj  
    |     | Fn010: Prm Protect  
    |     | Fn011: Motor Info  
    |     | Fn012: Soft Ver |
3.2 Operating Procedures for Utility Functions

3.2.15 Write Prohibition Setting (Fn010)

3.2.15 Write Prohibition Setting (Fn010)

You can use this utility function to restrict executing the utility functions to prevent careless changes to the parameter settings.

When you prohibit writing, writing parameters and executing utility functions are restricted as described below.

- Parameters: The settings of parameters cannot be changed. If you attempt to change the setting of a parameter, NO-OP will flash on the display and the display will return to the Main Menu.

- Utility functions: Some of the utility functions cannot be executed. If you attempt to execute one of these utility functions, NO-OP will flash on the display and the display will return to the Main Menu. The following table shows which utility functions cannot be executed.

<table>
<thead>
<tr>
<th>Fn No.</th>
<th>Function</th>
<th>When Writing Is Prohibited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn000</td>
<td>Display Alarm History</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn002</td>
<td>Jog</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn003</td>
<td>Origin Search</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn004</td>
<td>Jog Program</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn005</td>
<td>Initialize Parameters</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn006</td>
<td>Clear Alarm History</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn008</td>
<td>Reset Absolute Encoder</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn009</td>
<td>Autotune Analog (Speed/Torque) Reference Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00A</td>
<td>Manually Adjust Speed Reference Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00B</td>
<td>Manually Adjust Torque Reference Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00C</td>
<td>Adjust Analog Monitor Output Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00D</td>
<td>Adjust Analog Monitor Output Gain</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00E</td>
<td>Autotune Motor Current Detection Signal Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn00F</td>
<td>Manually Adjust Motor Current Detection Signal Offset</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn010</td>
<td>Write Prohibition Setting</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn011</td>
<td>Display Servomotor Model</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn012</td>
<td>Display Software Version</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn013</td>
<td>Multiturn Limit Setting after Multiturn Limit Disagreement Alarm</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn014</td>
<td>Reset Option Module Configuration Error</td>
<td>Cannot be executed.</td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.15 Write Prohibition Setting (Fn010)

Continued from previous page.

<table>
<thead>
<tr>
<th>Fn No.</th>
<th>Function</th>
<th>When Writing Is Prohibited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn01B</td>
<td>Initialize Vibration Detection Level</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn01E</td>
<td>Display SERVOPACK and Servomotor IDs</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn01F</td>
<td>Display Servomotor ID from Feedback Option Module</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn020</td>
<td>Set Absolute Linear Encoder Origin</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn030</td>
<td>Software Reset</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>Fn080</td>
<td>Polarity Detection</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn200</td>
<td>Tuning-less Level Setting</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn201</td>
<td>Advanced Autotuning without Reference</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn202</td>
<td>Advanced Autotuning with Reference</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn203</td>
<td>One-Parameter Tuning</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn204</td>
<td>Adjust Anti-resonance Control</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn205</td>
<td>Vibration Suppression</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>Fn206</td>
<td>Easy FFT</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB03</td>
<td>Edit/Save Program Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB04</td>
<td>Edit/Save ZONE Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB05</td>
<td>Edit/Save Jog Speed Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB06</td>
<td>Initialize Program Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB07</td>
<td>Initialize ZONE Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB08</td>
<td>Initialize Jog Speed Table</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB09</td>
<td>Set Absolute Encoder Origin</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB0A</td>
<td>INDEXER Status Monitor</td>
<td>Can be executed.</td>
</tr>
<tr>
<td>FnB0B</td>
<td>Initialize INDEXER Parameter Settings</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB0C</td>
<td>Reset INDEXER Alarm</td>
<td>Cannot be executed.</td>
</tr>
<tr>
<td>FnB0D</td>
<td>Display INDEXER Alarm History</td>
<td>Can be executed.</td>
</tr>
</tbody>
</table>

### Preparations

No preparations are required.
## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the **Key to display the Utility Mode Main Menu, and then use the **Key or **Key to select **. | **FUNCTION  
**
Fn00F:Cur ManuAdj  
Fn010:Prm Protect  
Fn011:Motor Info  
Fn012:Soft Ver |
| 2    | Press the **Key. | The Fn010 (Write Prohibition Setting) execution display will appear. |
| 3    | Press the **Key to set 0001.  
Note: To enable writing the settings of parameters, change the setting to 0000. | **Parameter  
Write Protect  
P. 0000 |
| 4    | Press the **Key. | **Parameter  
Write Protect  
P. 0001 |
| 5    | Turn the SERVOPACK power supply OFF and ON again. | The parameter setting is now enabled. |
3.2.16 Display Servomotor Model (Fn011)

You can use this utility function to display the model, voltage, capacity, encoder type, and encoder resolution of the Servomotor that is connected to the SERVOPACK. If the SERVOPACK has custom specifications, the specifications number is also displayed.

Preparations
No preparations are required.

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn011.</td>
<td>![Operation Table]</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.16 Display Servomotor Model (Fn011)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2*</td>
<td>Press the [Esc] Key.</td>
<td>The Fn011 (Display Servomotor Model) execution display will appear. The motor and encoder information will be displayed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Servomotor Model</th>
<th>No.</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>SGM7A</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>SGM7P</td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>SGM7G</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>SGM7D</td>
<td></td>
</tr>
<tr>
<td>AD</td>
<td>SGM7J</td>
<td></td>
</tr>
<tr>
<td>AE</td>
<td>SGM7E</td>
<td></td>
</tr>
<tr>
<td>AF</td>
<td>SGM7F</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>SGMCS-00C</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>SGMCS-00D</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>SGMCS-00B</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>SGMCS-00E</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>SGMCS-00L</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>SGMCS-00M</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>SGMCS-00N</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>SGMCS-00R</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>SGMCV-00C</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>SGMCV-00D</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>SGMCV-00E</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>SGMCV-00L</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>SGMCV-00M</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>SGMCV-00N</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>SGMCV-00R</td>
<td></td>
</tr>
</tbody>
</table>

Servomotor capacity
Encoder type
Incremental encoder
Multiturn absolute encoder
Single-turn absolute encoder

1:BB FUNCTION
Fn010: Prm Protect
Fn011: Motor Info
Fn012: Soft Ver
Fn013: MturnLmSet

3 | Press the \[SET\] Key. | The display will return to the Utility Mode Main Menu. |

Continued from previous page.
* The displayed information is as follows for a Linear Servomotor:

<table>
<thead>
<tr>
<th>Servomotor Model</th>
<th>No.</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td>Linear Servomotor</td>
</tr>
</tbody>
</table>

1:BB

**MtInfo**

**TYPE** 40 A C 2 0 0 V

**ENCORDER** 01 8 bit

<table>
<thead>
<tr>
<th>Encoder type</th>
<th>No.</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental linear encoder</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>Absolute linear encoder</td>
<td>01</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Linear Encoder Scale Pitch Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

Servomotor input voltage
Servomotor capacity
3.2.17 Display Software Version (Fn012)

You can use this utility function to display the software version of the SERVOPACK and the software version of the connected encoder.

Preparations

No preparations are required.

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn012.</td>
<td>The Fn012 (Display Software Version) execution display will appear and the software versions of the SERVOPACK and encoder will be displayed.</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Press the Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>
3.2.18 Multiturn Limit Setting after Multiturn Limit Disagreement Alarm (Fn013)

If you change the value of the multiturn limit (Pn205) when an absolute encoder is being used, an A.CC0 alarm (Multiturn Limit Disagreement) will be output. You can use this utility function to reset that alarm and change the value of the multiturn limit.

Preparations

Always check the following before you set the multiturn limit when an A.CC0 alarm (Multiturn Limit Disagreement) alarm has occurred.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
</tr>
</thead>
</table>
| 1    | Press the **Key** to display the Utility Mode Main Menu, and then use the **Key** or **Key** to select **Fn013**. | **1:A.CC0 FUNCTION**  
Fn012: Soft Ver  
Fn013: MturnLmSet  
Fn014: Opt Init  
Fn01B: Vib lvl Init |
| 2    | Press the **Key**. | The Fn013 (Multiturn Limit Setting after Multiturn Limit Disagreement Alarm) execution display will appear. |
| 3    | Press the **Key**.  
Note: If you press the **Key** instead of the **Key**, the multiturn limit will not be updated. | The multiturn limit will be set. When processing has been completed, the status display will flash **DONE** for approximately one second and then return to **1:A.CC0**. |
| 4    | Press the **Key**. | The display will return to the Utility Mode Main Menu. |
| 5    | Turn the SERVOPACK power supply OFF and ON again. | The parameter setting is now enabled and the alarm will have been cleared. |
3.2.19 Reset Option Module Configuration Error (Fn014)

If Option Modules are attached to the SERVOPACK, the SERVOPACK detects the presence and models of the connected Option Models. If it finds any errors, it outputs alarms. You can use this utility function to reset those alarms.

Note: 1. This utility function is the only way to reset errors for Option Modules. The errors are not reset when you reset alarms or turn OFF the power supply to the SERVOPACK.
2. Always remove the cause of an alarm before you reset the alarm.

Preparations

Always check the following before you reset the Option Module detection alarm.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the **SET** Key to display the Utility Mode Main Menu, and then use the **A** Key or **V** Key to select **Fn014**. | **1:BB FUNCTION**  
**Fn013: Mturn Lm Set**  
**Fn014: Opt Init**  
**Fn01B: VibLvl Init**  
**Fn01E: SvMotOp ID**     |
| 2    | Press the **Inv** Key.                                                     | The Fn014 (Reset Option Module Configuration Error) execution display will appear.                               |
| 3    | Use the **A** Key or **V** Key to select the Option Module for which to reset the alarm. | **1:BB Opt Init**  
**01: Command Opt**  
**02: Safety Opt**  
**03: Feedback Opt**     |
| 4    | Press the **Inv** Key.                                                     | The detected alarm will be reset. When processing has been completed, the status display will flash **DONE** for approximately one second and then return to **1:BB**. |
| 5    | Press the **SET** Key.                                                     | The display will return to the Utility Mode Main Menu.                                                           |
| 6    | Turn the SERVOPACK power supply OFF and ON again.                         | The parameter settings are now enabled.                                                                          |
3.2.20 Initialize Vibration Detection Level (Fn01B)

You can detect machine vibration during operation to automatically adjust the settings of Pn312 or Pn384 (Vibration Detection Level) to detect A.520 alarms (Vibration Alarm) and A.911 warnings (Vibration Warning) more precisely.

This utility function detects specific vibration components in the Servo-motor speed. If the detected vibration exceeds the detection level calculated with the following formula, an alarm or warning occurs according to Pn310 (Vibration Detection Selections).

- Rotary Servomotors

\[
\text{Detection level} = \frac{\text{Vibration detection level (Pn312 [min^{-1}]) \times Vibration detection sensitivity (Pn311 [%])}}{100}
\]

- Linear Servomotors

\[
\text{Detection level} = \frac{\text{Vibration detection level (Pn384 [mm/s]) \times Vibration detection sensitivity (Pn311 [%])}}{100}
\]

Use this utility function if A.520 or A.911 alarms are not output at a suitable time when vibration is detected with the default vibration detection level (Pn312 or Pn384). Otherwise, it is not necessary to execute this utility function.

There will be discrepancies in the detection sensitivity for vibration alarms and warnings depending on the condition of your machine. If there is a discrepancy, use the following formula to adjust Pn311 (Vibration Detection Sensitivity).

Preparations

Always check the following before you initialize the vibration detection level.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The test without a motor function must be disabled (Pn00C = n.□□□0).
3.2 Operating Procedures for Utility Functions

3.2.20 Initialize Vibration Detection Level (Fn01B)

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the **Key to display the Utility Mode Main Menu, and then use the **Key or **Key to select Fn01B. | **1:RUN FUNCTION
Fn014: Opt Init
Fn01B: Vblvl Init
Fn01E: SvMotOp ID
Fn01F: FBOpMot ID** |
| 2    | Press the **Key. | The Fn01B (Initialize Vibration Detection Level) execution display will appear. **1:RUN
Vibration Detect Level Init
Start: [DATA]
Return: [SET]** |
| 3    | Press the **Key. | **Init** will flash on the display and the vibration level will be updated. Note: The vibration detection level will be continuously updated until you press the **Key again.  |
| 4    | Press the **Key. | The vibration detection level will be initialized. When processing has been completed, the status display will flash **DONE** for approximately one second and then return to **1:RUN. Also, Pn312 (Vibration Detection Level) will be updated.  |

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.20 Initialize Vibration Detection Level (Fn01B)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1:RUN FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn014:Opt Init</td>
</tr>
<tr>
<td>Fn01B:Viblvl Init</td>
</tr>
<tr>
<td>Fn01E:SvcMotOp ID</td>
</tr>
<tr>
<td>Fn01F:FBOpMot ID</td>
</tr>
</tbody>
</table>
3.2 Operating Procedures for Utility Functions

3.2.21 Display SERVOPACK and Servomotor IDs (Fn01E)

**Display SERVOPACK and Servomotor IDs (Fn01E)**

You can use this utility function to display ID information on the SERVOPACK and on the Servomotor, encoder, and Option Module that are connected to it. However, ID information for some Option Modules (e.g., the SGDV-OF01A) is not stored in the SERVOPACK. **Not Available** will be displayed for these Option Modules.

You can use this utility function to display the following items.

<table>
<thead>
<tr>
<th>ID Information</th>
<th>Displayed Items</th>
</tr>
</thead>
</table>
| SERVOPACK ID Information        | • SERVOPACK model  
                               | • SERVOPACK serial number  
                               | • SERVOPACK manufacturing date  
                               | • SERVOPACK input voltage  
                               | • Maximum applicable motor capacity [W]  
                               | • Maximum applicable rated motor current [Arms] |
| Motor ID Information            | • Servomotor model  
                               | • Servomotor serial number  
                               | • Servomotor manufacturing date  
                               | • Servomotor input voltage [V]  
                               | • Servomotor capacity [W]  
                               | • Rated motor current [Arms] |
| Encoder ID Information          | • Encoder model  
                               | • Servomotor serial number  
                               | • Encoder manufacturing date  
                               | • Encoder type/resolution |
| Safety Option Module ID Informa-| • Safety Option Module model  
                               | tion*  
                               | • Safety Option Module serial number  
                               | • Safety Option Module manufacturing date  
                               | • Safety Option Module ID |
| Feedback Option Module ID Informa-| • Feedback Option Module model  
                               | tion*  
                               | • Feedback Option Module serial number (reserved area)  
                               | • Feedback Option Module manufacturing date  
                               | • Feedback Option Module ID |

* If an Option Module is not connected, **Not connect** will be displayed after the Module name.
### Preparations

No preparations are required.

### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the <strong>SELECT</strong> Key to display the Utility Mode Main Menu, and then use the <strong>A</strong> Key or <strong>V</strong> Key to select <strong>Fn01E</strong>.</td>
<td>The <strong>Fn01E</strong> (Display SERVOPACK and Servomotor IDs) execution display will appear. The SERVOPACK information will be displayed first.</td>
</tr>
<tr>
<td>2</td>
<td>Press the <strong>DATA</strong> Key.</td>
<td>The motor information will be displayed.</td>
</tr>
<tr>
<td>3</td>
<td>Press the <strong>DATA</strong> Key.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2.21 Display SERVOPACK and Servomotor IDs (Fn01E)

#### Step 4
Press the \[ \text{Mode} \] Key.

- **Operation**: The encoder information will be displayed.
- **Result**: The encoder information will be displayed.

<table>
<thead>
<tr>
<th>Serial number</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTTAI-B24RH</td>
<td></td>
</tr>
<tr>
<td>K247-0225E00200</td>
<td>14.02 24bit-ABS</td>
</tr>
</tbody>
</table>

- **Note**: Use the \[ < \] Key or \[ > \] Key to display hidden information.

#### Step 5
Press the \[ Stop \] Key.

- **Operation**: The display will return to the Utility Mode Main Menu.
- **Result**: The display will return to the Utility Mode Main Menu.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fn01B: Vibe</td>
<td>Initialisation</td>
</tr>
<tr>
<td>Fn01E: SvMotOpID</td>
<td></td>
</tr>
<tr>
<td>Fn01F: FBOpMotID</td>
<td></td>
</tr>
<tr>
<td>Fn020: S-Orig Set</td>
<td></td>
</tr>
</tbody>
</table>
3.2.22 Display Servomotor ID from Feedback Option Module (Fn01F)

You can use this utility function to display the Servomotor and encoder ID information from the Feedback Option Module connected to the SERVOPACK.

You can use this utility function to display the following items.

<table>
<thead>
<tr>
<th>ID Information</th>
<th>Displayed Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor ID Information</td>
<td>• Servomotor model</td>
</tr>
<tr>
<td></td>
<td>• Servomotor order number</td>
</tr>
<tr>
<td></td>
<td>• Servomotor input voltage [V]</td>
</tr>
<tr>
<td></td>
<td>• Servomotor capacity [W]</td>
</tr>
<tr>
<td></td>
<td>• Rated motor current [Arms]</td>
</tr>
<tr>
<td>Encoder ID Information</td>
<td>• Encoder model</td>
</tr>
<tr>
<td></td>
<td>• Servomotor serial number</td>
</tr>
<tr>
<td></td>
<td>• Encoder type/resolution (The resolution is displayed in</td>
</tr>
<tr>
<td></td>
<td>number of bits and in rotations/revolution.)</td>
</tr>
<tr>
<td>Parameter File ID</td>
<td>• Parameter file source ID (14 characters)</td>
</tr>
<tr>
<td>Information</td>
<td>• Parameter file version (4 digits hexadecimal)</td>
</tr>
</tbody>
</table>
### Preparations

No preparations are required.

### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the Key, and then use the Key or Key to select Fn01F. | The Fn01F (Display Servomotor ID from Feedback Option Module) execution display will appear. The Servomotor ID information will be displayed first.
| 2    | Press the Key. | The encoder ID information will be displayed. |
| 3    | Press the Key. | |

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.22 Display Servomotor ID from Feedback Option Module (Fn01F)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 4    | Press the data Key. | The parameter file ID information will be displayed:*3  
|      |            | ![Parameter file information](image) |
| 5    | Press the inspect Key. | The display will return to the Utility Mode Main Menu.  
|      |            | ![Utility Mode Main Menu](image) |

*1. The following display will appear if a Feedback Option Module is not connected.

```
1:BB    FBOpMtID
        Not connect
```

*2. The following display will appear if a Feedback Option Module is connected but there is no Servomotor or encoder information in the Option Module.

```
1:BB    FBOpMtID
        Not available
```

*3. Use the < Key or > Key to display hidden information.
3.2.23 Set Origin (Fn020)

You can use this utility function to set the current position of the external absolute encoder as the origin when you are using a Linear Servomotor or when you are using an external absolute encoder for fully-closed loop control.

The external absolute encoders from the following manufacturers are supported.

- Environmental Resistant Absolute Linear Scale from Mitutoyo Corporation
  ABS ST780A Series
  Model: ABS ST78□A/ST78□AL

Preparations

Always check the following before you set origin.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select <strong>Fn020</strong>.</td>
<td>The Fn020 (Set Origin) execution display will appear.</td>
</tr>
</tbody>
</table>
| 2    | Press the Key. | 1:BB  
Scale Origin Set  
ORGSET1 |
| 3    | Press the Key or Key to display **ORGSET5**. | 1:BB  
Scale Origin Set  
ORGSET5 |
| 4    | Press the Key. | Setting the origin will be started. **Scale Origin Set** will flash on the display while the origin is being set. It will stop flashing when setting the origin has been completed and the following status displays will appear.  
- SERVOPACKs with Analog Voltage/Pulse Train References  
  1:BB → DONE → 1:A.941  
- SERVOPACKs with Other References  
  1:BB → DONE → 1:BB  
  1:A.941  
Scale Origin Set |
| 5    | Turn the SERVOPACK power supply OFF and ON again. | The parameter setting is now enabled. |
3.2.24 Reset Motor Type Change Detected Status (Fn021)

After an A.070 (Motor Type Change Detected) alarm occurs, you must reset the Motor Type Change Detected status.

Preparations

Always check the following before you reset the Motor Type Change Detected.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- An A.070 (Motor Type Change Detected) alarm must have occurred.

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select Fn021.</td>
<td>1:A.070 FUNCTION Fn020:S-Orig Set Fn021:Motor Init Fn030:Soft Reset Fn080:Pole Detect</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td>The Motor Type Change Detected status will be reset. When processing has been completed, the status display will flash DONE for approximately one second and then return to 1:A.070.</td>
</tr>
<tr>
<td>3</td>
<td>Press the Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
<tr>
<td>4</td>
<td>Turn the SERVOPACK power supply OFF and ON again.</td>
<td>The parameter setting is now enabled and the alarm will have been cleared.</td>
</tr>
</tbody>
</table>
3.2.25 Software Reset (Fn030)

You can use this utility function to internally perform a software reset of the SERVOPACK. This utility function is used when resetting alarms and changing the settings of parameters that normally require turning the power supply to the SERVOPACK OFF and ON again. This utility function can be used to change those parameters without turning the power supply to the SERVOPACK OFF and ON again.

Note: 1. Execute this utility function only after confirming that the servo is OFF and that the motor is stopped (including not turning due to inertia or an external force).
2. This utility function resets the SERVOPACK independently of the host controller. The SERVOPACK carries out the same processing as when the power supply is turned ON and outputs the ALM (Servo Alarm) output signal. The status of other output signals may be forcibly changed.

Preparations

Always check the following before you perform a software reset.
- The servo must be OFF.
- The Servomotor must be stopped (including not turning due to inertia or an external force).
### 3.2.25 Software Reset (Fn030)

#### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the [FUNCTION] Key to display the Utility Mode Main Menu, and then use the [A] Key or [V] Key to select Fn030. | **1:BB** FUNCTION  
Fn020: S-Orig Set  
Fn030: Soft Reset  
Fn080: Pole Detect  
Fn200: TuneLvl Set  |
| 2    | Press the [ UPPER ARROW] Key.                                             | The Fn030 (Software Reset) execution display will appear.              |
| 3    | Press the [A] Key to display **RESET5**.                                 | **1:BB**  
Software Reset  
RESET5 |
| 4    | Press the [ LOWER ARROW] Key.                                            | A software reset will be executed. After the software reset starts, **RESET5** will no longer be displayed.  
**1:BB**  
Software Reset |

After the reset has been completed, the display that appears when the power is turned ON will be displayed. The display will then enter the Parameter/Monitor Mode.

**File First Loading Please Wait...**

Continued on next page.
Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the SET Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>

- **1:BB FUNCTION**
- **Fn020: S-Orig Set**
- **Fn030: Soft Reset**
- **Fn080: Pole Detect**
- **Fn200: Tune Lvl Set**
3.2.26 Polarity Detection (Fn080)

You can use this utility function to detect the polarity and store motor phase information in the SERVOPACK. Executing this utility function eliminates the need to detect the polarity every time you turn ON the power supply so that you can start operation immediately.

Preparations

Always check the following before you execute polarity detection settings.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be OFF.
- The servo must be in ready status.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the [SELECT] Key to display the Utility Mode Main Menu, and then use the [▲] Key or [▼] Key to select **Fn080**. | **1:BB**  
**FUNCTION**  
Fn030:Soft Reset  
Fn080:Pole Detect  
Fn200:TuneLvl Set  
Fn201:AAT |
| 2    | Press the [DATA] Key.                                                     | **1:BB**  
**Magnetic Pole Detect**  
**Level = 0040** |
| 3    | Press the [DATA] Key.                                                     | The Fn080 (Polarity Detection) execution display will appear.          |
| 4    | Press the [JOG/SVON] Key.                                                | **1:P DET**  
**Magnetic Pole Adjustment**  
**Return:[SET]** |

When polarity detection has been completed, the following display will appear.

**1:BB**  
**Magnetic Pole Detect**  
**Return:[SET]**

Continued on next page.
### 3.2.26 Polarity Detection (Fn080)

The display will return to the Utility Mode Main Menu.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the [SET] Key.</td>
<td>The display will return to the Utility Mode Main Menu.</td>
</tr>
</tbody>
</table>

- **1:BB FUNCTION**
- **Fn030:Soft Reset**
- **Fn080:Pole Detect**
- **Fn200:TuneLvl Set**
- **Fn201:AAT**
3.2.27 Tuning-less Level Setting (Fn200)

You can use this utility function to set the tuning-less rigidity and load levels.

Preparations
Always check the following before you set the tuning-less rigidity and load levels.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be in ready status.
- The tuning-less function must be enabled (Pn170 = n.☐☐☐1).
- The test without a motor function must be disabled (Pn00C = n.☐☐☐0).
### 3.2.27 Tuning-less Level Setting (Fn200)

#### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [SET] Key to display the Utility Mode Main Menu, and then use the [A] Key or [V] Key to select Fn200.</td>
<td>The display to set the tuning-less load level will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [RUN] Key.</td>
<td></td>
</tr>
</tbody>
</table>
| 3    | - If there is overshooting in the response waveform or if the allowable load moment of inertia is exceeded (i.e., outside of product specifications), press the [A] Key to change the mode setting to 2.  
- If you hear high-frequency noise, press the [V] Key to change the mode setting to 0.  
- In all other cases, leave the mode set to 1.  
Note: You can also change the load level with Pn170 = n.X□□□ (Tuning-less Load Level). | Continued on next page. |
| 4    | Press the [RUN] Key. | The display to set the tuning-less rigidity level will appear. |

---

Note: If the display does not change and NO-OP is displayed, writing is prohibited (Fn010 = 0001). Change Fn010 (Write Prohibition Setting) to 0000 to enable writing and repeat the procedure.
3.2 Operating Procedures for Utility Functions

3.2.27 Tuning-less Level Setting (Fn200)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the Key or the Key to select the rigidity level. Set the rigidity level to a value between 0 and 7. The larger the value, the higher the gain and the better the response will be. (The default setting is 4.) Note: 1. Vibration may occur if the rigidity level is too high. Lower the rigidity level if vibration occurs. If you hear a high frequency, press the Key to automatically set a notch filter to the vibration frequency. 2. If you change the rigidity level, automatically set notch filters will be canceled. If vibration occurs, however, the notch filters will be set again. 3. You can also change the rigidity level with Pn170 = n.XX (Rigidity Level).</td>
<td><img src="image" alt="TunLvISet" /> This is displayed when the second notch filter is set.</td>
</tr>
<tr>
<td>6</td>
<td>Press the Key.</td>
<td><img src="image" alt="DONE" /> The status display will flash DONE and the setting will be saved in the SERVOPACK.</td>
</tr>
<tr>
<td>7</td>
<td>Press the Key.</td>
<td><img src="image" alt="Fn030" /> <img src="image" alt="Fn200" /> <img src="image" alt="Fn201" /> <img src="image" alt="Fn202" /> The display will return to the status shown in step 1. This concludes setting the tuning-less level.</td>
</tr>
</tbody>
</table>
3.2 Operating Procedures for Utility Functions

3.2.28 Advanced Autotuning without Reference (Fn201)

3.2.28 Advanced Autotuning without Reference (Fn201)

You can use this utility function to perform automatic round-trip operation within a set range. During the operation, the SERVOPACK will be tuned automatically according to machine characteristics.

You can perform advanced autotuning without connecting the host controller.

Advanced autotuning adjusts the following items.
- Moment of inertia ratio
- Gains (e.g., position loop gain and speed loop gain)
- Filters (torque reference filter and notch filters)
- Friction compensation
- Anti-resonance control
- Vibration suppression (mode = 2 or 3)

Preparations

Always check the following before you perform advanced autotuning. If the settings are not suitable, **NO-OP** will be displayed and advanced autotuning will not be performed.
- The main circuit power supply must be ON.
- There must be no overtravel.
- The servo must be OFF.
- The control method must not be set to torque control.
- The gain selection switch must be set to manual (Pn139 = n.0000).
- Gain settings 1 must be selected.
- The test without a motor function must be disabled (Pn00C = n.0000).
- There must be no alarms or warnings.
- There must be no hard wire base block (HWBB).
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The tuning-less function must be disabled (Pn170 = n.0000), or the tuning-less function must be enabled (Pn170 = n.1: default setting) and moment of inertia estimation must be set (Jcalc = ON).
• If you start advanced autotuning while the SERVOPACK is in speed control, the SERVOPACK will change to position control automatically to perform advanced autotuning. The SERVOPACK will return to speed control after completing the adjustment. To perform advanced autotuning in speed control, set the mode to 1.
• Reference pulse input multiplication switching is disabled during advanced autotuning.

For details, refer to the manual for your SERVOPACK.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [SET] Key to display the Utility Mode Main Menu, and then use the [A] Key or [V] Key to select Fn201.</td>
<td>The initial setting display for advanced autotuning will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [■■] Key.</td>
<td>Status display</td>
</tr>
<tr>
<td>3</td>
<td>Use the [A] Key, [V] Key, and [■■] Key to set the items in steps 3-1 to 3-4.</td>
<td></td>
</tr>
</tbody>
</table>

#### 3-1 Jcalc (Calculating Moment of Inertia)
- Specify whether to calculate the moment of inertia. Normally select ON.
  - ON: Calculate the moment of inertia (default setting).
  - OFF: Do not calculate the moment of inertia.
- Note: If the moment of inertia ratio is already known from the machine specifications, set the value in Pn103 (Moment of Inertia Ratio) and set Jcalc to OFF.

#### 3-2 Mode
- Set the mode.
  1: Tunes the SERVOPACK for response and stability (standard adjustment level).
  2: Tunes the SERVOPACK for positioning (default setting).
  3: Tunes the SERVOPACK for positioning, giving priority to suppression of overshooting.

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.28 Advanced Autotuning without Reference (Fn201)

3-3

- **Type**
  Select the type according to the machine element to drive. If there is noise or if the gain does not increase, better results may be obtained by changing the rigidity type. Select the type according to the following guidelines.
  1: Belt drive mechanisms
  2: Ball screw drive mechanisms (default setting)
  3: Rigid systems in which the Servomotor is directly coupled to the machine (without gear or other drive system)

3-4

- **Stroke (Travel Distance)**
  Set the travel distance.
  - Travel distance setting range: -99,990,000 to 99,990,000 reference units
  - Minimum setting increment: 1,000 reference units
  - The negative direction is for reverse rotation, and the positive direction is for forward rotation. The travel distance from the current position is given.
  - Default setting: Approx. 3 rotations
  - If the Servomotor’s encoder resolution is 16,777,216 (24 bits), the stroke (travel distance) will be set to 800,000. If the default electronic gear ratio is used (Pn20E = 64 and Pn210 = 1), then
    \[
    \frac{800,000 \times 64}{16,777,216} \approx 3 \text{ (revolutions)}
    \]
  - Note: 1. Set the parameters so that the number of motor rotations is at least 0.5. Otherwise, ERROR will be displayed and advanced autotuning will not be possible.
  - 2. To calculate the moment of inertia and ensure precise tuning, we recommend that you set the number of motor rotations to approximately 3.
  - 3. For an SGMCS or SGMCV Direct Drive Servomotor, the default setting for the number of motor rotations is approximately 0.3.

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Press the <strong>DATA</strong> Key.</td>
<td>The execution display for advanced autotuning will appear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn103 = 00000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn100 = 0040.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn101 = 0020.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn102 = 0040.0</td>
</tr>
</tbody>
</table>

5    | Press the **JOE** Key.     | The servo will be turned ON and the display will change from BB to RUN. |
|      |                            | Note: If the mode is set to 2 or 3, Pn141 will be displayed instead of Pn102. |
|      |                            | 1: RUN                    | AAT                      |
|      |                            | Pn103 = 00000             |                          |
|      |                            | Pn100 = 0040.0            |                          |
|      |                            | Pn101 = 0020.00           |                          |
|      |                            | Pn141 = 0050.0            |                          |

---

Continued on next page.
Press the \textbf{A} Key if the stroke is set to a positive value, or press the \textbf{V} Key if the stroke is set to a negative value.

\begin{center}
\begin{tabular}{|c|c|}
\hline
\textbf{Step} & \textbf{Operation} & \textbf{Result} \\
\hline
6 & Calculation of the moment of inertia will start. & \begin{verbatim}
1 : RUN
A A T
P n 1 0 3 = 0 0 3 0 0
P n 1 0 0 = 0 0 4 0 . 0
P n 1 0 1 = 0 0 2 0 . 0
P n 1 4 1 = 0 0 5 0 . 0
\end{verbatim} \\
& While the moment of inertia is being & Display Example: After Calculating the Moment of Inertia
& calculated, the setting of Pn103 will & \\
& flash and \textbf{1:ADJ} will flash instead of & \\
& \textbf{1:RUN}. & \\
& When calculating the moment of & \\
& inertia has been completed, the display & \\
& will stop flashing and the & \\
& moment of inertia will be displayed. & \\
& The servo will remain ON, but auto- & \\
& matic operation will stop temporar- & \\
& ily. & \\
\hline
\end{tabular}
\end{center}

Note: 1. Calculating the moment of inertia will not start if the sign of the stroke does not agree with the key that is pressed (\textbf{A} Key or \textbf{V} Key).

2. If \textbf{Jcalc} is set to \textbf{OFF}, calculating the moment of inertia will not start and the setting of Pn103 will be displayed.

3. If \textbf{NO-OP} or \textbf{ERROR} is displayed during operation, press the \textbf{\textregistered} Key to cancel the operation and refer to the following section to correct the problem.

3.2.28 Advanced Autotuning without Reference (Fn201) - Troubleshooting Problems in the Operation on page 3-76

Continued from previous page.

Continued on next page.
Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the <strong>DATA</strong> Key. Note: To end the operation by calculating only the moment of inertia ratio without adjusting the gains, press the <strong>DATA</strong> Key.</td>
<td>The calculated moment of inertia will be saved in the SERVOPACK. <strong>DONE</strong> will flash on the display for one second, and then the status display will return to <strong>1:ADJ</strong>.</td>
</tr>
<tr>
<td>8</td>
<td>Press the <strong>A</strong> Key or the <strong>V</strong> Key.</td>
<td>Automatic operation will start again and the filter and gain will be automatically set. <strong>1:ADJ</strong> will flash on the display during autotuning. <strong>ERROR</strong> will be displayed if there is machine resonance or if the adjustments cannot be made sufficiently for another reason. If that occurs, make adjustments using one-parameter tuning (Fn203). If adjustments are completed normally, the servo will be turned OFF. The status display will flash <strong>END</strong> as shown below for approximately two seconds and then return to <strong>1:ADJ</strong>.</td>
</tr>
<tr>
<td>9</td>
<td>Press the <strong>DATA</strong> Key. Note: Press the <strong>DATA</strong> Key to cancel saving the settings. The display will return to the status shown in step 1.</td>
<td>The adjusted settings will be saved in the SERVOPACK. The status display will flash <strong>DONE</strong> as shown below for approximately one second and then return to <strong>1:A.941</strong>.</td>
</tr>
<tr>
<td>10</td>
<td>Turn the power supply OFF and ON again.</td>
<td>The parameter settings are now enabled.</td>
</tr>
</tbody>
</table>
Troubleshooting Problems in the Operation

This section provides information on troubleshooting problems that can occur in the operation.

◆ **NO-OP Flashes on the Display**

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main circuit power supply is OFF.</td>
<td>Turn ON the main circuit power supply.</td>
</tr>
<tr>
<td>An alarm or warning occurred.</td>
<td>Remove the cause of the alarm or warning.</td>
</tr>
<tr>
<td>Overtraveling occurred.</td>
<td>Remove the cause of overtraveling.</td>
</tr>
<tr>
<td>Gain settings 2 was selected with the</td>
<td>Disable automatic gain switching.</td>
</tr>
<tr>
<td>gain selection.</td>
<td></td>
</tr>
<tr>
<td>The HWBB was activated.</td>
<td>Release the HWBB.</td>
</tr>
</tbody>
</table>

◆ **ERROR Flashes on the Display**

<table>
<thead>
<tr>
<th>Error</th>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The gain adjustment was not successfully completed.</td>
<td>• Increase the setting of Pn522 (Positioning Completed Width).</td>
</tr>
<tr>
<td></td>
<td>Machine vibration is occurring or the /COIN (Positioning Completion) output</td>
<td>• Change the mode from 2 to 3.</td>
</tr>
<tr>
<td></td>
<td>signal is turning ON and OFF when the Servomotor stops.</td>
<td>• If machine vibration occurs, suppress the vibration with the anti-resonance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control function and the vibration suppression function.</td>
</tr>
<tr>
<td></td>
<td>An error occurred during calculation of the moment of inertia.</td>
<td>Refer to the following section.</td>
</tr>
<tr>
<td></td>
<td>[3.2.28 Advanced Autotuning without Reference (Fn201) -</td>
<td>◆ Errors during Calculation of Moment of Inertia on page 3-78</td>
</tr>
<tr>
<td></td>
<td>Errors during Calculation of Moment of Inertia on page 3-78</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Travel distance setting error</td>
<td>Increase the travel distance. (We recommend that you set the number of motor</td>
</tr>
<tr>
<td></td>
<td>The travel distance is set to approximately 0.5 rotation or less, which is</td>
<td>rotations to approximately 3.)</td>
</tr>
<tr>
<td></td>
<td>less than the minimum travel distance for adjustment. For a Direct Drive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Servomotor (SGMCS or SGMCV), it is set to 0.05 rotations.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
### Error Probable Cause Corrective Action

<table>
<thead>
<tr>
<th>Error</th>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The /COIN signal did not turn ON within approximately 10 seconds after positioning adjustment was completed.</td>
<td>The positioning completed width is too narrow or proportional control (P control) is being used.</td>
<td>Increase the setting of Pn522. If proportional control is set, turn OFF the /P-CON (Proportional Control) signal.</td>
</tr>
</tbody>
</table>
| The moment of inertia was not calculated while the tuning-less function was enabled. | Jcalc was set to OFF when the tuning-less function was enabled. | • Disable the tuning-less function.  
• Set Jcalc to ON. |

Continued from previous page.
# Errors during Calculation of Moment of Inertia

The following table gives the probable causes of errors that may occur during calculation of the moment of inertia (J\(\text{calc} = \text{ON}\)), along with corrective actions for the errors.

<table>
<thead>
<tr>
<th>Error Display</th>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| Err1          | The SERVOPACK started calculating the moment of inertia but the calculation was not completed. | • Increase the setting of Pn100 (Speed Loop Gain).  
• Increase the setting of the stroke. |
| Err2          | The moment of inertia fluctuated greatly and did not converge within 10 tries. | Calculate the moment of inertia based on the machine specifications, set the value in Pn103, and execute advanced autotuning with the J\(\text{calc}\) set to OFF. |
| Err3          | Low-frequency vibration was detected.                                          | Double the setting of Pn324 (Moment of Inertia Calculation Starting Level).       |
| Err4          | The torque limit was reached.                                                  | • If you are using the torque limit, increase the torque limit.  
• Double the setting of Pn324 (Moment of Inertia Calculation Starting Level). |
| Err5          | The speed control section changed to proportional control during calculation of the moment of inertia, e.g., the / P-CON (Proportional Control) signal was input. | Use PI control when calculating the moment of inertia. |
3.2 Operating Procedures for Utility Functions

3.2.29 Advanced Autotuning with Reference (Fn202)

You can use this utility function to automatically achieve optimum tuning of the SERVOPACK in response to operation references (pulse train references) from the host controller. This utility function is normally performed to fine-tune the SERVOPACK after advanced autotuning of the SERVOPACK has been performed.

If the moment of inertia ratio is set correctly in Pn103, this utility function can be performed without performing advanced autotuning.

The following items are adjusted.
- Gains (e.g., position loop gain and speed loop gain)
- Filters (torque reference filter and notch filters)
- Friction compensation
- Anti-resonance control
- Vibration suppression

Preparations

Always check the following before you perform advanced autotuning with a reference input.
If the settings are not suitable, NO-OP will be displayed and advanced autotuning will not be performed.
- The servo must be in ready status.
- There must be no overtravel.
- The servo must be OFF.
- Position control must be selected if the Servomotor power is ON (i.e., when the servo is ON).
- The gain selection switch must be set to manual (Pn139 = n.□□□□□0).
- Gain settings 1 must be selected.
- The test without a motor function must be disabled (Pn00C = n.□□□□□0).
- There must be no warnings.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- Tuning-less function must be disabled (Pn170 = n.□□□□□0).

For details, refer to the manual for your SERVOPACK.
Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Key to display the Utility Mode Main Menu, and then use the Key or Key to select <strong>Fn202</strong>.</td>
<td>The initial setting display for advanced autotuning with a reference input will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td>Status display</td>
</tr>
<tr>
<td>3</td>
<td>Use the Key, Key, and Key to set the items in steps 3-1 and 3-2.</td>
<td>Note: If the initial setting display does not appear and the status display changes to NO-OP, refer to the following section and correct the problem.</td>
</tr>
</tbody>
</table>

### 3.2.29 Advanced Autotuning with Reference (Fn202)

#### Preparations

**Mode**
Set the mode.
1: Tunes the SERVOPACK for response and stability (standard adjustment level).
2: Tunes the SERVOPACK for positioning (default setting).
3: Tunes the SERVOPACK for positioning, giving priority to suppression of overshooting.

**Type**
Select the type according to the machine element to drive. If there is noise or if the gain does not increase, better results may be obtained by changing the rigidity type. Select the type according to the following guidelines.
1: Belt drive mechanisms
2: Ball screw drive mechanisms (default setting)
3: Rigid systems in which the Servomotor is directly coupled to the machine (without gear or other drive system)

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.29 Advanced Autotuning with Reference (Fn202)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Press the DAT key.</td>
<td>The execution display for advanced autotuning with a reference input will appear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="Display" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: If the mode is set to 1, Pn102 will be displayed instead of Pn141. If the mode is set to 2 or 3, Pn141 will be displayed.</td>
</tr>
<tr>
<td>5</td>
<td>Input the /S-ON (Servo ON) input signal from an external device.</td>
<td>The status display will change from 1:BB to 1:ADJ.</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Display" /></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tuning will be started. 1:ADJ will flash on the display during autotuning. Note: Tuning is not executed while 1:BB is displayed.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Input a reference from the host controller and then press the ▲ Key or ▼ Key.</td>
<td><img src="image" alt="Display" /></td>
</tr>
<tr>
<td></td>
<td>If tuning is completed normally, the status display will flash END as shown below for approximately one second and then return to 1:ADJ.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Display" /></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2.29 Advanced Autotuning with Reference (Fn202)

The adjusted settings will be saved in the SERVOPACK. The status display will flash **DONE** as shown below for approximately one second and then **1:A.941** will be displayed.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the [Run] Key.</td>
<td>The adjusted settings will be saved in the SERVOPACK. The status display will flash <strong>DONE</strong> as shown below for approximately one second and then <strong>1:A.941</strong> will be displayed.</td>
</tr>
</tbody>
</table>
|      | Note: Press the [ ] Key to cancel saving the adjusted values. The display will return to the status shown in step 1. | **DONE** AAT  
Pn103 = 00300  
Pn100 = 0100.0  
Pn101 = 0006.36  
Pn141 = 0150.0 |
| 8    | Turn the power supply OFF and ON again to enable the new settings. | - |
Troubleshooting Problems in the Operation

This section provides information on troubleshooting problems that can occur in the operation.

◆ NO-OP Flashes on the Display

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main circuit power supply is OFF.</td>
<td>Turn ON the main circuit power supply.</td>
</tr>
<tr>
<td>An alarm or warning occurred.</td>
<td>Remove the cause of the alarm or warning.</td>
</tr>
<tr>
<td>Overtraveling occurred.</td>
<td>Remove the cause of overtraveling.</td>
</tr>
<tr>
<td>Gain settings 2 was selected with the gain selection.</td>
<td>Disable automatic gain switching.</td>
</tr>
<tr>
<td>The HWBB was activated.</td>
<td>Release the HWBB.</td>
</tr>
</tbody>
</table>

◆ ERROR Flashes on the Display

<table>
<thead>
<tr>
<th>Error</th>
<th>Probable Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| The gain adjustment was not successfully completed.                    | Machine vibration is occurring or the /COIN (Positioning Completion) output signal is turning ON and OFF when the Servomotor stops. | • Increase the setting of Pn522 (Positioning Completed Width).  
• Change the mode from 2 to 3.  
• If machine vibration occurs, suppress the vibration with the anti-resonance control function and the vibration suppression function. |
| The /COIN signal did not turn ON within approximately 10 seconds after positioning adjustment was completed. | The positioning completed width is too narrow or proportional control (P control) is being used. | Increase the setting of Pn522. If proportional control is set, turn OFF the /P-CON (Proportional Control) signal. |
You can use this utility function to manually adjust the servo during operation using a speed or position reference input from the host controller. This utility function allows you to automatically set related servo gain settings to balanced conditions by tuning the SERVOPACK with one or two tuning levels.

The following items are adjusted.
- Gains (e.g., position loop gain and speed loop gain)
- Filters (torque reference filter and notch filters)
- Friction compensation
- Anti-resonance control

**Preparations**

Always check the following before you perform one-parameter tuning.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be in ready status.
- There must be no overtravel.
- If speed control is used, tuning mode 0 or 1 must be set.
- Tuning-less function must be disabled (Pn170 = n.\[\text{\textbullet}\\text{\textbullet}\\text{\textbullet}\].0).
  (This is to prevent tuning the SERVOPACK again with the tuning-less function after using one-parameter tuning.)
- The test without a motor function must be disabled (Pn00C = n.\[\text{\textbullet}\\text{\textbullet}\\text{\textbullet}\].0).
## Operating Procedure

### Speed Control Mode

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the **Key to display the Utility Mode Main Menu, and then use the **Key or **Key to select **.</td>
<td>The current setting of Pn103 (Moment of Inertia Ratio) will be displayed.</td>
</tr>
<tr>
<td>2</td>
<td>Press the **Key.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To change the moment of inertia ratio, use the **Key or **Key to move the cursor and use the **Key or **Key to change the value.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Press the **Key.</td>
<td>The initial setting display for one-parameter tuning will appear.</td>
</tr>
<tr>
<td>5</td>
<td>Use the **Key, **Key, and **Key to set the items in steps 5-1 and 5-2.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.30 One-Parameter Tuning (Fn203)

**Tuning Mode**
- Set the tuning mode. Select tuning mode 0 or 1.
  - 0: Tunes while giving priority to stability.
  - 1: Tunes while giving priority to response.

**Type**
- Select the type according to the machine element to drive. If there is noise or if the gain does not increase, better results may be obtained by changing the rigidity type. Select the type according to the following guidelines.
  - 1: Belt drive mechanisms
  - 2: Ball screw drive mechanisms (default setting)
  - 3: Rigid systems in which the Servomotor is directly coupled to the machine (without gear or other drive system)

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 5-1  | Tuning Mode | Set the tuning mode. Select tuning mode 0 or 1.  
0: Tunes while giving priority to stability.  
1: Tunes while giving priority to response. |
| 5-2  | Type | Select the type according to the machine element to drive. If there is noise or if the gain does not increase, better results may be obtained by changing the rigidity type. Select the type according to the following guidelines.  
1: Belt drive mechanisms  
2: Ball screw drive mechanisms (default setting)  
3: Rigid systems in which the Servomotor is directly coupled to the machine (without gear or other drive system) |
| 6    | Input the /S-ON (Servo ON) input signal from an external device. | The status display will change from 1:BB to 1:RUN. |
| 7    | Input a reference from the host controller and check the response. | – |
| 8    | Press the \[\text{set}\] Key. | The current setting will be displayed. |
| 9    | Press the \[\text{set}\] Key. | A display to set the tuning level will appear. |

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.30 One-Parameter Tuning (Fn203)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>If readjustment is required, input a reference from the host controller, select the digit with the (&lt;) Key or (&gt;) Key, change the level with the (A) Key or (V) Key, and check the response. If readjustment is not required, go to step 11. Note: The higher the level, the better the response will be. If the value is too large, however, vibration will occur.</td>
<td></td>
</tr>
</tbody>
</table>

- **Note:** If vibration occurs and the vibration is large enough, the SERVO-PACK will automatically detect the vibration frequencies and set a notch filter or anti-resonance control. If notch filters are set, NF1 and NF2 will be displayed on the bottom row of the display. If anti-resonance control is set, ARES will be displayed on the bottom row of the display. If the vibration is small, press the \(\downarrow\) Key to force a search for the vibration frequency. |

- **Step:** 1:RUN OnePrmTun
  - **LEVEL:** 0050
  - NF1 NF2 ARES

- **Step:** 1:RUN OnePrmTun
  - **LEVEL:** 0070
  - NF1 NF2 ARES

- **Step:** 1:RUN OnePrmTun
  - Pn100=0050.0
  - Pn101=0016.0
  - Pn102=0050.0

- **Step:** Press the \(\text{data}\) Key. |
  - A confirmation display for after adjusting the tuning level will appear.

- **Step:** Press the \(\text{data}\) Key. |
  - Note: 1. Press the \(\text{kisup}\) Key to cancel saving the data. The display will return to the status shown in step 1. 
  - 2. Press the \(<\) Key to readjust the level without saving the values. |
  - The adjusted settings will be saved in the SERVOPACK and DONE will be displayed.

- **Step:** Press the \(\text{data}\) Key. |
  - Note: Press the \(\text{kisup}\) Key to cancel saving the data. The display will return to the status shown in step 1. 
  - Press the \(<\) Key to readjust the level without saving the values. |

- **Step:** Press the \(\text{data}\) Key. |
  - The adjusted settings will be saved in the SERVOPACK and DONE will be displayed.
## Position Control Mode

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the **SET** Key to display the Utility Mode Main Menu, and then use the **A** Key or **V** Key to select **Fn203**. | **1:RUN** **FUNCTION**  
**Fn202**: Ref-AAT  
**Fn203**: OnePrmTun  
**Fn204**: A-Vib Sup  
**Fn205**: Vib Sup  

The moment of inertia ratio that is currently set in Pn103 will be displayed.  

Note: If the Initial Setting Display does not appear and the status display changes to **NO-OP**, refer to the following section and correct the problem.  

3.2.30 One-Parameter Tuning (Fn203) - Preparations on page 3-84  

| 2    | Press the **par** Key.                                                  | -                                                                                                 |
| 3    | To change the moment of inertia ratio, use the **<** Key or **>** Key to move the cursor and use the **A** Key or **V** Key to change the value. | The Initial Setting Display for one-parameter tuning will appear.  

1:BB **OnePrmTun**  
Setting  
Tuning Mode = 2  
Type = 2  

5-1 and 5-2. |
| 4    | Press the **par** Key.                                                  | -                                                                                                 |
| 5    | Use the **A** Key, **V** Key, and ** Scroll** Key to set the items in settings 5-1 and 5-2. | -                                                                                                 |

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.30 One-Parameter Tuning (Fn203)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-1</td>
<td><strong>Tuning Mode</strong>&lt;br&gt;Set the tuning mode. Select tuning mode 2 or 3.&lt;br&gt;0: Tunes while giving priority to stability.&lt;br&gt;1: Tunes while giving priority to response.&lt;br&gt;2: Tunes the SERVOPACK for positioning.&lt;br&gt;3: Tunes the SERVOPACK for positioning, giving priority to suppression of overshooting.</td>
<td></td>
</tr>
<tr>
<td>5-2</td>
<td><strong>Type</strong>&lt;br&gt;Select the type according to the machine element to drive. If there is noise or if the gain does not increase, better results may be obtained by changing the rigidity type. Select the type according to the following guidelines.&lt;br&gt;1: Belt drive mechanisms&lt;br&gt;2: Ball screw drive mechanisms (default setting)&lt;br&gt;3: Rigid systems in which the Servomotor is directly coupled to the machine (without gear or other drive system)</td>
<td></td>
</tr>
</tbody>
</table>
| 6    | Input the /S-ON (Servo ON) input signal from an external device. | The status display will change from **1:BB** to **1:RUN**.  

| 1:RUN | OnePrmTun Setting | Tuning Mode = 2  
Type = 2 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Input a reference from the host controller and check the response.</td>
<td>–</td>
</tr>
</tbody>
</table>
| 8    | Press the **Data** Key. | The current setting will be displayed.  

| 1:RUN | OnePrmTun | Pn100=0040.0  
Pn101=0020.00  
Pn141=0050.0 |
|-------|------------|----------------|
| 9    | Press the **Data** Key. | A display to set the feedforward level and feedback level will appear.  

| 1:RUN | OnePrmTun | FF LEVEL=0050.0  
FB LEVEL=0040.0 |
3.2 Operating Procedures for Utility Functions

3.2.30 One-Parameter Tuning (Fn203)

If readjustment is required, input a reference from the host controller, select the digit with the ◄ Key or ► Key, change the FF level and FB level with the ▲ Key or ◀ Key, and check the response. If readjustment is not required, go to step 11.

Note: 1. If the FF level is changed when the Servomotor is in operation, the new FF level will not be used immediately. The changes will take effect after the Servomotor comes to a stop with no reference input and then the Servomotor starts operation.

2. If the FF level is changed too much during operation, vibration may occur because the response would be changed rapidly when the settings take effect.

3. The FF LEVEL will flash until the machine reaches the setting of the FF level. If the Servomotor does not stop within approximately 10 seconds after changing the setting, a timeout will occur. The setting will be automatically returned to the previous value.

4. The higher the value of the FF level, the shorter the positioning time will be and the better the response will be. If the level is too high, however, overshooting or vibration may occur. Overshooting will be reduced if the setting of the FB level is increased.

Note: If vibration occurs and the vibration is large enough, the SERVO-PACK will automatically detect the vibration frequencies and set a notch filter or anti-resonance control. If notch filters are set, NF1 and NF2 will be displayed on the bottom row of the display. If anti-resonance control is set, ARES will be displayed on the bottom row of the display.

If the vibration is small, press the Key to force a search for the vibration frequency.

A confirmation display for after tuning will appear.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Press the Key.</td>
<td>1: RUN OnePrmTun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF LEVEL=0050.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FB LEVEL=0040.0</td>
</tr>
<tr>
<td>11</td>
<td>Press the Key.</td>
<td>1: RUN OnePrmTun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FF LEVEL=0050.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FB LEVEL=0040.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NF1 NF2 ARE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn100=0040.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn101=0020.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pn141=0050.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NF1</td>
</tr>
</tbody>
</table>

Continued from previous page.
Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Press the [DATA] Key.</td>
<td>The adjusted settings will be saved in the SERVOPACK and <strong>DONE</strong> will be displayed.</td>
</tr>
</tbody>
</table>
|      | Note: 1. Press the [SET] Key to cancel saving the data. The display will return to the status shown in step 1. | **DONE** OnePgmTun  
Pn100 = 0040.0  
Pn101 = 0020.0  
Pn141 = 0050.0  
NF1 |
|      | 2. Press the [ ] Key to readjust the level without saving the values. |                                                                                                                                 |

Press the [DATA] Key.

Note: 1. Press the [SET] Key to cancel saving the data. The display will return to the status shown in step 1.
2. Press the [ ] Key to readjust the level without saving the values.
3.2 Operating Procedures for Utility Functions

3.2.31 Adjust Anti-resonance Control (Fn204)

3.2.31 Adjust Anti-resonance Control (Fn204)

You can use this utility function to increase the effectiveness of vibration suppression after one-parameter tuning. This utility function is effective for suppression of continuous vibration frequencies from 100 to 1,000 Hz that occur when the control gain is increased.

Perform one-parameter tuning (Fn203) if required to increase the response after performing this utility function. If the anti-resonance gain is increased, e.g., when one-parameter tuning is performed, vibration may occur again. If that occurs, perform this function again to fine-tune the parameters.

Preparations

Always check the following before you execute anti-resonance control adjustment.

• The parameters must not be write-prohibited (Fn010 must be set to 0000).
• The servo must be in ready status.
• There must be no overtravel.
• The control method must not be set to torque control.
• Tuning-less function must be disabled (Pn170 = n.□□□□0).
• The test without a motor function must be disabled (Pn00C = n.□□□□0).
### Operating Procedure

#### Adjusting Anti-resonance Control for the First Time

- **Unknown Vibration Frequency**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the <strong>Key</strong> to display the Utility Mode Main Menu, and then use the <strong>Key</strong> or <strong>Key</strong> to select <strong>Fn204</strong>.</td>
<td><strong>1:RUN</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Fn203: OnePrmTun</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Fn205: Vib Sup</em></td>
</tr>
<tr>
<td>2</td>
<td>Press the <strong>Key</strong>.</td>
<td><strong>Status display</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Tuning Mode = 0</strong></td>
</tr>
<tr>
<td></td>
<td>Note: If the initial setting display does not appear and the status display changes to <strong>NO-OP</strong>, refer to the following section and correct the problem.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Use the <strong>Key</strong> or <strong>Key</strong> to set <strong>Tuning Mode</strong> to 0.</td>
<td><strong>1:RUN</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Tuning Mode = 0</strong></td>
</tr>
</tbody>
</table>

**Continued on next page.**
### 3.2 Operating Procedures for Utility Functions

#### 3.2.31 Adjust Anti-resonance Control (Fn204)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>Operating Procedures for Utility Functions</td>
<td>The following display will appear and detection of the vibration frequency will start. During detection, freq will flash on the display. Return to step 3 if vibration is not detected.</td>
</tr>
<tr>
<td>4</td>
<td>Press the [RUN] Key.</td>
<td>Note: If vibration is not detected even when vibration is occurring, lower the setting of Pn311 (Vibration Detection Sensitivity). If the setting of this parameter is lowered, the detection sensitivity will be increased. Vibration may not be detected accurately if the setting is too small. The vibration frequency will be displayed at freq if vibration is detected.</td>
</tr>
<tr>
<td>5</td>
<td>Press the [RUN] Key.</td>
<td>The cursor will move to damp and freq will stop flashing.</td>
</tr>
</tbody>
</table>

Continued from previous page.

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.31 Adjust Anti-resonance Control (Fn204)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Use the <code>&lt;</code> Key or <code>&gt;</code> Key to move the cursor and the <code>[</code> Key or <code>]</code> Key to set the damping gain. Note: Increase the damping gain by approximately 0% to 200% in 10% increments while checking the effect on vibration. If vibration reduction is still insufficient at a gain of 200%, cancel the setting, and lower the control gain by using a different method, such as one-parameter tuning.</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>7</td>
<td>If fine-tuning of the frequency is necessary, press the <code>scroll</code> Key. The cursor will move from <code>damp</code> to <code>freq</code>. Go to step 8. If fine-tuning is not required, go to step 9.</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>8</td>
<td>Use the <code>&lt;</code> Key or <code>&gt;</code> Key to move the cursor and the <code>[</code> Key or <code>]</code> Key to fine-tune the frequency.</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
<tr>
<td>9</td>
<td>Press the <code>data</code> Key. Note: Press the <code>[</code> Key to cancel saving the data. The display will return to the status shown in step 1.</td>
<td><img src="image_url" alt="Image" /></td>
</tr>
</tbody>
</table>

The adjusted settings will be saved in the SERVOPACK. The status display will flash **DONE** as shown below for approximately one second and then return to **1:RUN**.

**Measured Waveform Example**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:RUN</td>
<td>Vib Sup</td>
<td>freq = 0400 Hz damp = 0120</td>
</tr>
<tr>
<td>1:RUN</td>
<td>Vib Sup</td>
<td>freq = 0420 Hz damp = 0120</td>
</tr>
<tr>
<td>1:RUN</td>
<td>Vib Sup</td>
<td>freq = 0420 Hz damp = 0120</td>
</tr>
<tr>
<td>1:RUN</td>
<td>Vib Sup</td>
<td>freq = 0420 Hz damp = 0120</td>
</tr>
</tbody>
</table>

**Deviation**

**Torque reference**

**Positioning Completion signal**
### Known Vibration Frequency

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Press the [▲] Key to display the Utility Mode Main Menu, and then use the [▲] Key or [▼] Key to select *Fn204*. | **1:RUN**  
**FUNCTION**  
*Fn203: OnePrmTun*  
*Fn204: A-Vib Sup*  
*Fn205: Vib Sup*  
*Fn206: Easy FFT*  
The Tuning Mode Selection Display will appear. |
| 2    | Press the [▲] Key. | Note: If the initial setting display does not appear and the status display changes to **NO-OP**, refer to the following section and correct the problem. |
| 3    | Use the [▲] Key or [▼] Key to set **Tuning Mode** to 1. | **1:RUN**  
**FUNCTION**  
**Tuning Mode = 0** |
| 4    | Press the [▲] Key. | **1:RUN**  
**FUNCTION**  
**Tuning Mode = 1**  
The following display will appear and **freq** will flash.  
[Measured Waveform Example](#) |

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.31 Adjust Anti-resonance Control (Fn204)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Use the <code>&lt;</code> Key or <code>&gt;</code> Key to move the cursor and the <code>▲</code> Key or <code>▼</code> Key to adjust the frequency.</td>
<td>The cursor will move to <code>damp</code>.</td>
</tr>
<tr>
<td>6</td>
<td>Press the <code>-scroll</code> Key.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Use the <code>&lt;</code> Key or <code>&gt;</code> Key to move the cursor and the <code>▲</code> Key or <code>▼</code> Key to adjust the damping gain. Note: Increase the damping gain by approximately 0% to 200% in 10% increments while checking the effect on vibration. If vibration reduction is still insufficient at a gain of 200%, cancel the setting, and lower the control gain by using a different method, such as one-parameter tuning.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>If fine-tuning of the frequency is necessary, press the <code>scroll</code> Key. The cursor will move from <code>damp</code> to <code>freq</code>. Go to step 9. If fine-tuning is not required, go to step 10.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
3.2.31 Adjust Anti-resonance Control (Fn204)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Use the &lt; Key or &gt; Key to move the cursor and the A Key or V Key to fine-tune the frequency.</td>
<td>1:RUN</td>
</tr>
<tr>
<td>10</td>
<td>Press the MAX Key.</td>
<td>The adjusted settings will be saved in the SERVOPACK. The status display will flash <strong>DONE</strong> as shown below for approximately one second and then return to 1:RUN.</td>
</tr>
</tbody>
</table>

◆ Fine-Tuning after Adjusting Anti-resonance Control

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the MAX Key to display the Utility Mode Main Menu, and then use the A Key or V Key to select Fn204.</td>
<td>1:RUN</td>
</tr>
<tr>
<td>2</td>
<td>Press the MAX Key.</td>
<td>The following display will appear.</td>
</tr>
</tbody>
</table>

Note: If the initial setting display does not appear and the status display changes to **NO-OP**, refer to the following section and correct the problem.  
3.2.31 Adjust Anti-resonance Control (Fn204) - Preparations on page 3-92

Continued on next page.
### 3.2.31 Adjust Anti-resonance Control (Fn204)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Press the [DATA] Key.</td>
<td>The following display will appear and <strong>damp</strong> will flash.</td>
</tr>
<tr>
<td></td>
<td>Use the [&lt;] Key or [&gt;] Key to move the cursor and the [▲] Key or [▼] Key to set the damping gain.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Note: Increase the damping gain by approximately 0% to 200% in 10% increments while checking the effect on vibration. If vibration reduction is still insufficient at a gain of 200%, cancel the setting, and lower the control gain by using a different method, such as one-parameter tuning.</td>
<td><img src="image" alt="Display" /></td>
</tr>
<tr>
<td>5</td>
<td>If fine-tuning of the frequency is necessary, press the [DATA] Key. The cursor will move from <strong>damp</strong> to <strong>freq</strong>. Go to step 6. If fine-tuning is not required, go to step 7.</td>
<td><img src="image" alt="Display" /></td>
</tr>
<tr>
<td>6</td>
<td>Use the [&lt;] Key or [&gt;] Key to move the cursor and the [▲] Key or [▼] Key to fine-tune the frequency.</td>
<td><img src="image" alt="Display" /></td>
</tr>
<tr>
<td>7</td>
<td>Press the [DATA] Key.</td>
<td>The adjusted settings will be saved in the SERVOPACK. The status display will flash <strong>DONE</strong> as shown below for approximately one second and then return to <strong>1:RUN</strong>.</td>
</tr>
</tbody>
</table>

Note: Press the [DATA] Key to cancel saving the data. The display will return to the status shown in step 1.
3.2.32  Vibration Suppression (Fn205)

You can use this utility function to suppress transitional vibration at a low frequency from 1 to 100 Hz, which is generated mainly when the machine vibrates during positioning.

Vibration suppression is set automatically when advanced autotuning or advanced autotuning with a reference input is executed. In most cases, this utility function is not necessary. Use this utility function only if fine-tuning is required or readjustment is required as a result of a failure to detect vibration.

Perform one-parameter tuning (Fn203) if required to improve the response after performing this utility function.

Preparations

Always check the following before you execute vibration suppression.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo must be in ready status.
- There must be no overtravel.
- Position control must be used.
- Tuning-less function must be disabled (Pn170 = n.□□□0).
- The test without a motor function must be disabled (Pn00C = n.□□□0).
## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input an operation reference, repeatedly perform a positioning operation, and perform steps 2 on.</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Press the ( \text{ \textit{\textbf{DATA}}} ) Key to display the Utility Mode Main Menu, and then use the ( \text{ \textit{\textbf{DATA}}} ) Key or ( \text{ \textit{\textbf{DATA}}} ) Key to select ( \text{ \textit{\textbf{DATA}}} ) Key.</td>
<td>The frequency will be detected and the following display will appear.</td>
</tr>
<tr>
<td></td>
<td>1:RUN</td>
<td>Measure ( f = 010.4 ) Hz</td>
</tr>
<tr>
<td></td>
<td>FUNCTION</td>
<td>Setting ( f = 050.0 ) Hz</td>
</tr>
<tr>
<td></td>
<td>Fn204:A-Vib Sup</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fn205:Vib Sup</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fn206:Easy FFT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fn207:V-Monitor</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Press the ( \text{ \textit{\textbf{DATA}}} ) Key.</td>
<td>The detected frequency is displayed at <strong>Measure f</strong>.</td>
</tr>
<tr>
<td></td>
<td>1:RUN</td>
<td>The setting frequency is displayed at <strong>Setting f</strong>. The default value is the setting of Pn145 (Vibration Suppression 1 Frequency A).</td>
</tr>
<tr>
<td></td>
<td>Vib Sup</td>
<td>Note: 1. If the setting frequency and actual operating frequency are different, <strong>Setting</strong> will flash.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Frequency detection will not be performed if there is no vibration or if the vibration frequency is outside the range of detectable frequencies. The following display will appear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:RUN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measure ( f = - - - - - ) Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Setting ( f = 050.0 ) Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If a vibration frequency is not detected, prepare a means of detecting and measuring the vibration. If you measure the vibration frequency, go to step 5 and manually set the measured vibration frequency at <strong>Setting f</strong>.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continued on next page.</td>
</tr>
</tbody>
</table>
3.2 Operating Procedures for Utility Functions

3.2.32 Vibration Suppression (Fn205)


The value displayed at Measure $f$ will be set as the Setting $f$ value.

5. If the vibration is not completely suppressed, use the [<] Key or [>] Key to move the cursor and the [A] Key or [V] Key to fine-tune the frequency at Setting $f$. If fine-tuning the frequency is not necessary, go to step 7.

Note: If the setting frequency and actual operating frequency are different, Setting will flash.


The Setting will stop flashing and the currently displayed frequency will be set for the vibration suppression function.

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Press the [INC] Key.</td>
<td>The value displayed at Measure $f$ will be set as the Setting $f$ value.</td>
</tr>
<tr>
<td>5</td>
<td>If the vibration is not completely suppressed, use the [&lt;] Key or [&gt;] Key to move the cursor and the [A] Key or [V] Key to fine-tune the frequency at Setting $f$. If fine-tuning the frequency is not necessary, go to step 7.</td>
<td>Note: If the setting frequency and actual operating frequency are different, Setting will flash.</td>
</tr>
<tr>
<td>6</td>
<td>Press the [DATA] Key.</td>
<td>The Setting will stop flashing and the currently displayed frequency will be set for the vibration suppression function.</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.32 Vibration Suppression (Fn205)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the <strong>DATA</strong> Key. Note: Press the <strong>t</strong> Key to cancel saving the data. The display will return to the status shown in step 1.</td>
<td>The adjusted setting will be saved in the SERVOPACK. The status display will flash <strong>DONE</strong> as shown below for approximately one second and then return to <strong>RUN</strong>.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>DONE</th>
<th>Vib Sup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure f = - - - - Hz</td>
<td>Setting f = 012.4 Hz</td>
<td></td>
</tr>
</tbody>
</table>
3.23 Easy FFT (Fn206)

You can use this utility function to send a frequency waveform reference from the SERVOPACK to the Servomotor and operate the Servomotor at very low speed several times over a certain period to cause machine vibration. The SERVOPACK detects the resonance frequency from the generated vibration and makes notch filter settings according to the detected resonance frequencies. The notch filters are effective for eliminating high-frequency vibration and noise.

Execute this utility function after the Servomotor power is turned OFF if operation of the SERVOPACK results in high-frequency noise and vibration.

Preparations

Always check the following before you execute Easy FFT.
• The parameters must not be write-prohibited (Fn010 must be set to 0000).
• The servo must be OFF.
• The servo must be in ready status.
• There must be no overtravel.
• The test without a motor function must be disabled (Pn00C = n.□□□□0).
• An external reference must not be input.
# Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [ ] Key to display the Utility Mode Main Menu, and then use the [ ] Key or [ ] Key to select <strong>Fn206</strong>.</td>
<td>The Easy FFT execution display will appear.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [ ] Key.</td>
<td>Note: If the initial setting display does not appear and the status display changes to <strong>NO-OP</strong>, refer to the following section and correct the problem.</td>
</tr>
<tr>
<td>3</td>
<td>The cursor will be at the setting of <strong>Input</strong>. Use the [ ] Key or [ ] Key to set the reference amplitude. Reference amplitude range: 1 to 800</td>
<td>Note: First, execute the utility function with the default value. Increasing the reference amplitude will increase the detection accuracy, but the vibration and noise from the machine will also increase. Increase the reference amplitude a little at a time.</td>
</tr>
</tbody>
</table>
| 4    | Press the [ ] Key.                                                       | Power will be supplied to the motor and the display will change as shown below. **1:BB → 1:RUN**  
**Setting → Ready**  
**Input = 0.15%** |
3.2 Operating Procedures for Utility Functions

3.2.33 Easy FFT (Fn206)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the [ ] Key for forward operation or the [ ] Key for reverse operation.</td>
<td>The motor will repeatedly perform round-trip operation within 1/4th of a rotation and the SERVOPACK will measure the resonance frequency. During detection, Measure will flash on the display.</td>
</tr>
</tbody>
</table>

```
1:RUN  Easy FFT
Measure
Input = 015%
```

If detection processing is completed normally, the detected results and notch filter value will be displayed. Measure will change to Result.

```
1:RUN  Easy FFT
Result
Input = 015%
Res = 1250 Hz
Filter1 1250 Hz
```

Note: 1. If a notch filter has been set and is being used, an asterisks will be displayed on the second line.
   If the first notch filter has already been set, the second notch filter value will be displayed. If the first and second notch filters have already been set, only the result of frequency detection will be displayed.
   
2. If you press the [ ] Key during motor operation, the motor will stop and the frequency will not be detected.

3. If the frequency could not be successfully detected, No Measure will be displayed.

4. If you press the [ ] Key after the frequency is detected, power is no longer supplied to the motor (base block).

Continued from previous page.

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.33 Easy FFT (Fn206)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 6    | Press the **Key.**  
     | **Note:** To exit the Easy FFT utility function at this point, press the **Key.**  
     | The power supply to the Servomotor will be turned OFF and the display will return to the Utility Mode Main Menu. | The display will return to **Ready.**  
     | **1:RUN** Easy FFT  
     | **Result**  
     | **Input = 015 %** |
| 7    | Press the **Key.** | The optimum notch filter frequencies (Pn408, Pn409, and Pn40C) are automatically changed according to the resonance frequencies and the values are saved in the SERVOPACK.  
     | If the first notch filter has already been set, the second notch filter value is set. If the first and second notch filters have already been set, the filter values are not changed.  
     | **Note:** Pn408 = n [ ] 1 (Use first stage notch filter),  
     | Pn409 = 1375 Hz (First Stage Notch Filter Frequency)  
     | Pn408 = n [ ] 1 [ ] (Use second stage notch filter),  
     | Pn40C = 1375 Hz (Second Stage Notch Filter Frequency)  
     | **DONE** Easy FFT  
     | **Result**  
     | **Input = 015 %**  
     | **Result = 1250 Hz**  
     | **Filter1 = 1250 Hz** |
| 8    | Press the **Key.** | The display will return to the Utility Mode Main Menu.  
     | **1:BB** FUNCTION  
     | Fn205:Vib Sup  
     | Fn206:Easy FFT  
     | Fn207:V-Monitor  
     | Fn000:Alm History |
| 9    | Turn the SERVOPACK power supply OFF and ON again. | The parameter setting is now enabled. |
3.2 Operating Procedures for Utility Functions
3.2.34 Program Table Edit/Save (FnB03)

3.2.34 Program Table Edit/Save (FnB03)

This function edits and saves program tables. Saving a program table to flash memory after editing it ensures that the data will be retained even after the control power has been turned off.

◆ Codes Displayed on the Program Table Editing Screen

Refer to the following manual for information on interpreting the displays.

Σ-7-Series Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)

### Preparation

Always check the following before you edit or save a program table.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The program must not be running or on hold.
- A program table save operation must not be in progress for any means other than the digital operator.
- Execution of the RES command must not be in progress.

### Editing Program Table

The operating procedure when setting the acceleration (ACC) in program step 5 is explained here.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the  key to open the Utility Function Mode main menu, and move the cursor with the  keys to select FnB03.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
## 3.2 Operating Procedures for Utility Functions
### 3.2.34 Program Table Edit/Save (FnB03)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Press the key to view the FnB03 operation screen.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>POS000 = STOP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>POS001 = STOP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>POS002 = STOP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>POS003 = STOP</td>
</tr>
<tr>
<td>3</td>
<td>Move the cursor using the keys and keys (or the + and keys) to select the article and program step of the program table to be edited. Refer to the following section for details on the methods to move the cursor. Method for Moving the Cursor on page 3-110.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC002 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC003 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC004 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC005 = :</td>
</tr>
<tr>
<td>4</td>
<td>Press the key to move the cursor to the setting side of the table.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC002 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC003 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC004 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC005 = -</td>
</tr>
<tr>
<td>5</td>
<td>Move the cursor with the keys, and change the table settings with the keys.* Refer to the following section for detailed setting methods for each item. Details on How to Set Table Settings on page 3-111.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC002 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC003 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC004 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC005 = 000001000</td>
</tr>
<tr>
<td>6</td>
<td>On pressing the key, the setting is entered and the cursor returns to the program table article and program step side.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC002 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC003 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC004 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC005 = 00001000</td>
</tr>
<tr>
<td>7</td>
<td>Repeat steps 3 to 6 to set the program table. On completing the setting of all the program tables to be used, save the program tables to flash memory by following the procedure in Saving Program Tables on page 3-113.</td>
<td>BB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC002 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC003 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC004 = :</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACC005 = 00001000</td>
</tr>
</tbody>
</table>

*If setting is attempted in an operation prohibited state, it will not be possible to change the setting. In this case, make the setting again by referring to Preparation on page 3-108.
◆ Method for Moving the Cursor

The values within the frames in the figure below are the articles and steps of the program table displayed at the digital operator.

* You can move 4 rows at a time by holding down the ▲ or ▼ key. By using the ▲ key at the same time as these keys, you can move 30 rows at a time.
Details on How to Set Table Settings

Details on the setting method for step 5 in Editing Program Table on page 3-108 are shown below.

If the number of display digits is exceeded when Expansion Mode is enabled (PnB54 = 1), the table name will be abbreviated. Refer to the following manual for details.

Σ-7-Series Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)

◆ POS: Target Position

◆ SPD: Positioning Speed

◆ RDST: Registration Distance

◆ RSPD: Registration Speed

◆ ACC: Acceleration

If the value becomes less than 0, “−” is displayed.

If the value becomes less than 1, “−” is displayed.
3.2 Operating Procedures for Utility Functions

3.2.34 Program Table Edit/Save (FnB03)

◆ DEC: Deceleration

Move cursor

\[ \text{DEC000=12345678} \]

Change deceleration

\[ \text{DEC000=13345678} \]

If the value becomes less than 1, 
"." is displayed.

◆ POUT: Programmable Output Signals

Move cursor

\[ \text{POUT000=NAZ:NAZ} \]

Change programmable output signal

\[ \text{POUT000=NNZ:NAZ} \]

Pressing the \( \text{A} \) key changes the display in the following order.

\( N \rightarrow A \rightarrow Z \rightarrow \)

Pressing the \( \text{V} \) key changes the display in the reverse order.

◆ EVENT: Pass Condition

Move cursor

\[ \text{EVT000=T12345} \]

Change elapsed time

\[ \text{EVT000=T22345} \]

Move cursor

\[ \text{EVT000=NT12345} \]

Change elapsed time

\[ \text{EVT000=NT22345} \]

Move cursor

\[ \text{EVT000=DT12345} \]

Change elapsed time

\[ \text{EVT000=DT22345} \]

Move cursor

\[ \text{EVT000=SEL012345} \]

Change elapsed time

\[ \text{EVT000=SELT22345} \]

Move cursor

\[ \text{EVT000=SEL112345} \]

Change elapsed time

\[ \text{EVT000=SELT12345} \]

Move cursor

\[ \text{EVT000=SEL2712345} \]

Change elapsed time

\[ \text{EVT000=SEL7T2345} \]

Move cursor

\[ \text{EVT000=} \]

Change pass condition

◆ LOOP: Number of Executions

Move cursor

\[ \text{LOOP000=00001} \]

Change number of executions

\[ \text{LOOP000=01001} \]

◆ NEXT: PGMSTEP to be Executed Next

Move cursor

\[ \text{NEXT000=00000} \]

Change next PGMSTEP to be executed

\[ \text{NEXT000=00255} \]

If the value becomes less than 0, 
"END" is displayed.
## Saving Program Tables

The operating procedure for saving program tables is shown below.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the program table editing screen.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the program table save operation screen.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Move the cursor with the keys to select “STORE”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note: Selecting “CANCEL” and pressing the key will return the display to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the program table editing screen.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Press the key to start saving the program table to flash memory.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do not turn off the control power supply until saving has been completed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>normally.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>When saving to flash memory has been completed normally, the display</td>
<td></td>
</tr>
<tr>
<td></td>
<td>returns to the program table editing screen.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td></td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the program table editing screen. In this case, make the setting again by referring to *Preparation* on page 3-108.
3.2 Operating Procedures for Utility Functions

3.2.35 ZONE Table Edit/Save (FnB04)

This function edits and saves ZONE tables. Saving a ZONE table to flash memory after editing it ensures that the data will be retained even after the control power has been turned off.

◆ Codes Displayed on the ZONE Table Editing Screen

Refer to the following manual for information on interpreting the displays.

Σ-7-Series Σ-7S SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)

<table>
<thead>
<tr>
<th>ZONE Number</th>
<th>ZONE P</th>
<th>ZONE N</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ZP000</td>
<td>ZN000</td>
</tr>
<tr>
<td>1</td>
<td>ZP001</td>
<td>ZN001</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>31</td>
<td>ZP031</td>
<td>ZN031</td>
</tr>
</tbody>
</table>

Preparation

Always check the following before you edit or save a ZONE table.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- A ZONE table save operation must not be in progress for any means other than the digital operator.

Editing ZONE Tables

The operating procedure when setting ZONE N in ZONE number 5 is explained here.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the key to open the Utility Function Mode main menu, and move the cursor with the keys to select FnB04.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the FnB04 operation screen.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
### 3.2 Operating Procedures for Utility Functions

#### 3.2.35 ZONE Table Edit/Save (FnB04)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Move the cursor using the <code>&lt;</code> and <code>&gt;</code> keys and <code>A</code> and <code>V</code> keys to select the ZONE table number to be edited. Refer to the following section for details on the methods to move the cursor. <img src="image" alt="Method for Moving the Cursor on page 3-110" /></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Press the <code>mem</code> key to move the cursor to the setting side of the table.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Move the cursor using the <code>&lt;</code> and <code>&gt;</code> keys and change the ZONE boundary values using the <code>A</code> and <code>V</code> keys.*</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>On pressing the <code>mem</code> key, the setting is entered and the cursor returns to the ZONE table number side.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Repeat steps 3 to 6 to set the ZONE table. On completing the setting of all the ZONE tables to be used, save the ZONE tables to flash memory by following the procedure in <em>Saving ZONE Tables</em> on page 3-117.</td>
<td></td>
</tr>
</tbody>
</table>

*If setting is attempted in an operation prohibited state, it will not be possible to change the setting. In this case, make the setting again by referring to *Preparation* on page 3-114.*
3.2 Operating Procedures for Utility Functions

3.2.35 ZONE Table Edit/Save (FnB04)

◆ Method for Moving the Cursor

The values within the frames in the figure below are the ZONE table numbers displayed at the digital operator.

* You can move 3 rows at a time by holding down the ▲ or ▼ key.
Saving ZONE Tables

The operating procedure for saving ZONE tables is shown below.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 1    | Display the ZONE table editing screen. | BB ZoneEdit  
ZP000=+0000000000  
ZP001=+0000000000  
ZP002=+0000000000  
ZP003=+0000000000 |
| 2    | Press the \[\text{white}\] key to view the ZONE table save screen. | BB ZoneEdit  
STORE ZONE TABLE?  
CANCEL STORE |
| 3    | Move the cursor with the \[<\] keys to select “STORE”.  
Note: Selecting “CANCEL” and pressing the \[\text{black}\] key will return the display to the ZONE table editing screen. | BB ZoneEdit  
STORE ZONE TABLE?  
CANCEL STORE |
| 4    | Press the \[\text{black}\] key to start saving the ZONE table to flash memory.*  
Do not turn off the control power supply until saving has been completed normally. | BB ZoneEdit  
Storing now...  
Please wait. |
| 5    | When saving to flash memory has been completed normally, the display returns to the ZONE table editing screen. | BB ZoneEdit  
ZP000=+0000000000  
ZP001=+0000000000  
ZP002=+0000000000  
ZP003=+0000000000 |
| 6    | Press the \[\text{utility}\] key to return to the Utility Function Mode main menu. | BB FUNCTION  
FnB03 PGM Edit  
FnB04 ZONE Edit  
FnB05 JSPD Edit  
FnB06 PGM Init |

* If the \[\text{black}\] key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the ZONE table editing screen. In this case, make the setting again by referring to Preparation on page 3-114.
This function edits and saves JOG speed tables. Saving a JOG speed table to flash memory after editing it ensures that the data will be retained even after the control power has been turned off.

Refer to the following manual for information on interpreting the displays.

\[
\Sigma-7-Series \Sigma-7S \text{SERVOPACK Command Option Attachable Type with INDEXER Module Product Manual (Manual No.: SIEP S800001 64)}
\]

**Preparation**

Always check the following before you edit or save a jog speed table.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- A JOG speed table save operation must not be in progress for any means other than the digital operator.

**Editing JOG Speed Tables**

The operating procedure when setting the value for JOG speed table number 5 is explained here.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the [FUNCTION] key to open the Utility Function Mode main menu, and move the cursor with the [A] and [V] keys to select FnB05.</td>
<td>[BB FUNCTION] [FnB04 ZONE Edit] [FnB05 JSPD Edit] [FnB06 PGM Init] [FnB07 ZONE Init]</td>
</tr>
<tr>
<td>2</td>
<td>Press the [Fn] key to view the FnB05 operation screen.</td>
<td>[BB Jspd Edit] [JSPD000=0000100] [JSPD001=0000100] [JSPD002=0000100] [JSPD003=0000100]</td>
</tr>
<tr>
<td>3</td>
<td>Move the cursor using the [A] and [V] keys to select the JOG speed table number to be edited. Pressing the [V] key when the cursor is on JOG speed table number 0 moves it to number 15. Pressing the [A] key when the cursor is on JOG speed table number 15 moves it to number 0.</td>
<td>[BB Jspd Edit] [JSPD002=0000100] [JSPD003=0000100] [JSPD004=0000100] [JSPD005=0000100]</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.36 JOG Speed Table Edit/Save (FnB05)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Press the key to move the cursor to the setting side of the table.</td>
<td>BB JspdEdit JSPD002=00001000 JSPD003=00001000 JSPD004=00001000 JSPD005=00001000</td>
</tr>
<tr>
<td>5</td>
<td>Move the cursor with the keys, and change the JOG speed setting with the keys.*</td>
<td>BB JspdEdit JSPD002=00001000 JSPD003=00001000 JSPD004=00001000 JSPD005=12345678</td>
</tr>
<tr>
<td>6</td>
<td>On pressing the key, the setting is entered and the cursor returns to the JOG speed table number side.</td>
<td>BB JspdEdit JSPD002=00001000 JSPD003=00001000 JSPD004=00001000 JSPD005=12345678</td>
</tr>
<tr>
<td>7</td>
<td>Repeat steps 3 to 6 to set the JOG speed table. On completing the setting of all the JOG speed tables to be used, save the JOG speed tables to flash memory by following the procedure in Saving JOG Speed Tables on page 3-119.</td>
<td><strong>If setting is attempted in an operation prohibited state, it will not be possible to change the setting. In this case, make the setting again by referring to Preparation on page 3-118.</strong></td>
</tr>
</tbody>
</table>

**Saving JOG Speed Tables**

The operating procedure for saving JOG speed tables is shown below.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the JOG speed table editing screen.</td>
<td>BB JspdEdit JSPD002=00001000 JSPD003=00001000 JSPD004=00001000 JSPD005=00001000</td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the JOG speed table save screen.</td>
<td>BB JspdEdit STORE JSPD TABLE? CANCEL STORE</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2.37 Program Table Initialization (FnB06)

This function initializes the program tables and restores the settings on shipment from the factory.

**Preparation**

Always check the following before you initialize a program table.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The program must not be running or on hold.
- A program table save operation must not be in progress for any means other than the digital operator.
- Execution of the RES command must not be in progress.

---

### Step 3
Move the cursor with the keys to select “STORE”.

Note: Selecting “CANCEL” and pressing the key will return the display to the JOG speed table editing screen.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>STORE JSPD TABLE?</td>
<td>CANCEL STORE</td>
</tr>
</tbody>
</table>

### Step 4
Press the key to start saving the JOG speed table to flash memory.*

Do not turn off the control power supply until saving has been completed normally.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing now... Please wait.</td>
<td></td>
</tr>
</tbody>
</table>

### Step 5
When saving to flash memory has been completed normally, the display returns to the JOG speed table editing screen.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSPD000=00001000 JSPD001=00001000 JSPD002=00001000 JSPD003=00001000</td>
<td></td>
</tr>
</tbody>
</table>

### Step 6
Press the key to return to the Utility Function Mode main menu.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTION Function B04 ZONE Edit Function B05 JSPD Edit Function B06 PGM Init Function B07 ZONE Init</td>
<td></td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error,” is displayed for approximately 2 seconds and then the display returns to the JOG speed table editing screen. In this case, make the setting again by referring to Preparation on page 3-118.
### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the ➧ key to open the Utility Function Mode main menu, and move the cursor with the ➤ ➣ keys to select FnB06.</td>
<td>BB FUNCTION FnB05 JSPD Edit FnB06 PGM Init FnB07 ZONE Init FnB08 JSPD Init</td>
</tr>
<tr>
<td>2</td>
<td>Press the ➧ key to view the FnB06 operation screen.</td>
<td>BB PgmInit Start : [DATA] Return : [SET]</td>
</tr>
<tr>
<td>3</td>
<td>Press the ➧ key to start program table initialization.* Do not turn off the control power supply until initialization has been completed normally.</td>
<td>BB PgmInit Restoring now... Please wait.</td>
</tr>
<tr>
<td>4</td>
<td>To cancel the FnB06 operation, press the ➧ key before pressing the ➧ key. The display returns to the Utility Function Mode main menu without executing the operation.</td>
<td>BB PgmInit Done. Press [SET] key.</td>
</tr>
<tr>
<td>5</td>
<td>When program table initialization has been completed normally, “Done.” is displayed.</td>
<td>BB FUNCTION FnB05 JSPD Edit FnB06 PGM Init FnB07 ZONE Init FnB08 JSPD Init</td>
</tr>
<tr>
<td>5</td>
<td>Press the ➧ key to return to the Utility Function Mode main menu.</td>
<td>BB FUNCTION FnB05 JSPD Edit FnB06 PGM Init FnB07 ZONE Init FnB08 JSPD Init</td>
</tr>
</tbody>
</table>

* If the ➧ key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB06 operation screen. In this case, make the setting again by referring to Preparation on page 3-120.
3.2 Operating Procedures for Utility Functions
3.2.38 ZONE Table Initialization (FnB07)

## 3.2.38 ZONE Table Initialization (FnB07)

This function initializes ZONE tables and restores the settings on shipment from the factory.

### Preparation

Always check the following before you initialize a ZONE table.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- A ZONE table save operation must not be in progress for any means other than the digital operator.
- Execution of the RES command must not be in progress.

### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the Utility Function Mode main menu, and move the cursor with the keys to select FnB07.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the FnB07 operation screen.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Press the key to start ZONE table initialization.* Do not turn off the control power supply until initialization has been completed normally. To cancel the FnB07 operation, press the key before pressing the key. The display returns to the Utility Function Mode main menu without executing the operation.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
3.2.39 JOG Speed Table Initialization (FnB08)

This function initializes JOG speed tables and restores the default settings.

**Preparation**

Always check the following before you initialize a JOG speed table.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- A JOG speed table save operation must not be in progress for any means other than the digital operator.
- Execution of the RES command must not be in progress.

**Operating Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the key to open the Utility Function Mode main menu, and move the cursor with the keys to select FnB08.</td>
<td>BB FUNCTION FnB07 ZONE Init FnB08 JSPD Init FnB09 ZSET</td>
</tr>
<tr>
<td>4</td>
<td>When ZONE table initialization has been completed normally, “Done.” is displayed.</td>
<td>BB Zone Init Done. Press [SET] key.</td>
</tr>
<tr>
<td>5</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td>BB FUNCTION FnB06 PGM Init FnB07 ZONE Init FnB08 JSPD Init FnB09 ZSET</td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB07 operation screen. In this case, make the setting again by referring to Preparation on page 3-122.
3.2 Operating Procedures for Utility Functions

3.2.39 JOG Speed Table Initialization (FnB08)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 2    | Press the **key to view the FnB08 operation screen. | **BB** JspdInit  
  Start: [DATA]  
  Return: [SET] |
| 3    | Press the **key to start JOG speed table initialization.*  
  Do not turn off the control power supply until initialization has been completed normally.  
  To cancel the FnB08 operation, press the **key before pressing the **key. The display returns to the Utility Function Mode main menu without executing the operation. | **BB** JspdInit  
  Restoring now...  
  Please wait.  |
| 4    | When JOG speed table initialization has been completed normally, “Done.” is displayed. | **BB** JspdInit  
  Done.  
  Press [SET] key. |
| 5    | Press the **key to return to the Utility Function Mode main menu. | **BB** FUNCTION  
  FnB07 ZONE Init  
  FnB08 JSPD Init  
  FnB09 ZSET  
  FnB0A Monitor |

* If the **key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB08 operation screen. In this case, make the setting again by referring to Preparation on page 3-123.
This utility function replaces the current position with a specified position. Also updates PnB25 with the absolute position offset value to achieve the position specified by this utility function.

**DANGER**

- This function replaces the coordinates of the reference position and is therefore very dangerous. After executing this function, check that the new coordinates match the reference position before starting operation.

**Preparation**

Always check the following before you perform the absolute encoder origin setting.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- Distribution of position references must not be in progress.
- The absolute position offset value must not be outside the range for PnB25.
- An absolute encoder must be connected and Pn002 must be set to n.0000.

**Operating Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the key to open the Utility Function Mode main menu, and move the cursor with the keys to select FnB09.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.40 Absolute Encoder Origin Setting (FnB09)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Press the key to view the FnB09 operation screen.</td>
<td>![Result Image]</td>
</tr>
<tr>
<td>3</td>
<td>Move the cursor with the keys, and change the setting for the position whose current position is to be replaced with the keys.</td>
<td>![Result Image]</td>
</tr>
<tr>
<td>4</td>
<td>Press the key to start origin setting.* Do not turn off the control power supply until origin setting has been completed normally. To cancel the FnB09 operation, press the key before pressing the key. The display returns to the Utility Function Mode main menu without executing the operation.</td>
<td>![Result Image]</td>
</tr>
<tr>
<td>5</td>
<td>When origin setting has been completed normally, “Done.” is displayed.</td>
<td>![Result Image]</td>
</tr>
<tr>
<td>6</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td>![Result Image]</td>
</tr>
<tr>
<td>7</td>
<td>Check that the current distributed position (PUN) and the current (actual) motor position (PFB) have changed to the specified positions by executing FnB0A.</td>
<td></td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB09 operation screen. In this case, make the setting again by referring to Preparation on page 3-125.
# INDEXER Status Monitor (FnB0A)

This function shows the internal status of the INDEXER Module, such as the current position and input/output signals.

## Preparation

None

## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the key to open the Utility Function Mode main menu, and move the cursor with the keys to select FnB0A.</td>
<td>BB FUNCTION&lt;br&gt;FnB09 ZSET&lt;br&gt;FnB0A Monitor&lt;br&gt;FnB0B Prm Init&lt;br&gt;FnB0C ALM Reset</td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the FnB0A operation screen.</td>
<td>BB Monitor&lt;br&gt;ALM=BB&lt;br&gt;ERR=None&lt;br&gt;PFB=+12345678&lt;br&gt;PGMSTEP=12345</td>
</tr>
<tr>
<td>3</td>
<td>Use the keys to change the monitor display content.</td>
<td>BB Monitor&lt;br&gt;STS=POS&lt;br&gt;PUN=+12345678&lt;br&gt;PFB=+12345678&lt;br&gt;POS=+12345678</td>
</tr>
<tr>
<td>4</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td>BB FUNCTION&lt;br&gt;FnB09 ZSET&lt;br&gt;FnB0A Monitor&lt;br&gt;FnB0B Prm Init&lt;br&gt;FnB0C ALM Reset</td>
</tr>
</tbody>
</table>
### Monitor Display Content List

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Display Content</th>
<th>Display Example</th>
<th>Units</th>
<th>Serial Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALM</td>
<td>Alarm or Warning</td>
<td></td>
<td></td>
<td>ALM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = A.□□□:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A SERVOPACK alarm/warning is in effect (□□□ is the alarm/warning code).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = E□□A:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>An INDEXER Module alarm is in effect (E□□A is the alarm code).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = HBB:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>During hard wire base block</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = P-OT:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forward run prohibited (Over travel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = N-OT:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse run prohibited (Over travel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = P-LS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Forward software limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = N-LS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reverse software limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = BB:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Base blocked</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = HOLD:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positioning interrupted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = INPOS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positioning completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = NEAR:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Near position status reached in positioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = RUN:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Motor running</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ALM = . :</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Status other than above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ERR</td>
<td>Most Recent (Closest) Error</td>
<td>• ERR = NONE: No error</td>
<td></td>
<td>ERR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ERR = E□□□E: Error code</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
Continued from previous page.

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Display Content</th>
<th>Display Example</th>
<th>Units</th>
<th>Serial Command</th>
</tr>
</thead>
</table>
| IN2          | INDEXER Module Input Signal | $\text{IN2} = \begin{array}{cccccccccc}
|               |                 | Upper level: Photocoupler ON  \\
|               |                 | Lower level: Photocoupler OFF  \\
|               |                 | 1110 9 8 7 6 5 4 3 2 1 digit entities | - | IN2 |
|               |                 |                |       |                |
|               | Display Digit Number | Signal Name |
| 1            | 1/ MODE0/1 |
| 2            | 2/ START-STOP; \\
|              | / HOME    |
| 3            | 3/ PGMRES; \\
|              | / JOGP    |
| 4            | 4/ SEL0; \\
|              | / JOGN    |
| 5            | 5/ SEL1; \\
|              | / JOG0    |
| 6            | 6/ SEL2; \\
|              | / JOG1    |
| 7            | 7/ SEL3; \\
|              | / JOG2    |
| 8            | 8/ SEL4; \\
|              | / JOG3    |
| 9            | 9/ SEL5 |
| 10           | 10/ SEL6  |
| 11           | 11/ SEL7  |                |       |                |

Continued on next page.
### 3.2.41 INDEXER Status Monitor (FnB0A)

#### Display Code | Display Content | Display Example | Units | Serial Command
---|---|---|---|---
OUT2 | INDEXER Module Output Signal | OUT2 = 💡💡💡💡💡💡💡💡💡💡💡 |  | OUT2

Upper level: Photocoupler ON
Lower level: Photocoupler OFF

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Signal Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/INPOSITION</td>
</tr>
<tr>
<td>2</td>
<td>/POUT0</td>
</tr>
<tr>
<td>3</td>
<td>/POUT1</td>
</tr>
<tr>
<td>4</td>
<td>/POUT2</td>
</tr>
<tr>
<td>5</td>
<td>/POUT3</td>
</tr>
<tr>
<td>6</td>
<td>/POUT4</td>
</tr>
<tr>
<td>7</td>
<td>/POUT5</td>
</tr>
<tr>
<td>8</td>
<td>/POUT6</td>
</tr>
<tr>
<td>9</td>
<td>/POUT7</td>
</tr>
</tbody>
</table>

Continued on next page.
### Operating Procedures for Utility Functions

#### 3.2.41 INDEXER Status Monitor (FnB0A)

---

Continued from previous page.

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Display Content</th>
<th>Display Example</th>
<th>Units</th>
<th>Serial Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS</td>
<td>Status Flag</td>
<td></td>
<td></td>
<td>STS</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>STS = 7654321</strong> digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 6 5 4 3 2 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper level: ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower level: OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Display Digit Number

<table>
<thead>
<tr>
<th>Display Digit Number</th>
<th>Status Flag</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INPOSITION (Positioning complete)</td>
</tr>
<tr>
<td>2</td>
<td>NEAR (Near position)</td>
</tr>
<tr>
<td>3</td>
<td>DEN (positioning reference distribution completed)</td>
</tr>
<tr>
<td>4</td>
<td>When positioning or program operation is interrupted (on hold)</td>
</tr>
<tr>
<td>5</td>
<td>During program operation</td>
</tr>
<tr>
<td>6</td>
<td>When the current (torque) is being limited</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Code</th>
<th>Reference</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUN</td>
<td>Reference unit</td>
<td>PUN</td>
</tr>
<tr>
<td>PFB</td>
<td>Reference unit</td>
<td>PFB</td>
</tr>
<tr>
<td>POS</td>
<td>Reference unit</td>
<td>POS</td>
</tr>
<tr>
<td>DST</td>
<td>Reference unit</td>
<td>DST</td>
</tr>
</tbody>
</table>

---

Continued on next page.
This function restores the default settings and initializes the parameters of both the SERVOPACK and the INDEXER Module.

- Always carry out initialization of the parameter settings in the servo OFF status. It cannot be done in the servo ON status.
- To bring the settings into effect, always turn the SERVOPACK power supply off and back on after this operation.
- When you execute Fn005, only the SERVOPACK parameters are initialized. The INDEXER Module parameters are not initialized. To initialize the INDEXER Module parameters, execute FnB0B.

**Preparation**

Always check the following before you initialize the INDEXER parameter settings.

- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The servo OFF status must be established.
- Initializing the parameter settings must not be in progress for any tool.
• The RES command must not being executed.

**Operating Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the key to open the Utility Function Mode main menu, and move the cursor with the keys to select FnB0B.</td>
<td>BB FUNCTION FnB0A Monitor FnB0B Prm Init FnB0C ALM Reset FnB0D Indexer ALM</td>
</tr>
<tr>
<td>2</td>
<td>Press the key to view the FnB0B operation screen.</td>
<td>BB PrmInit Start: [DATA] Return: [SET]</td>
</tr>
<tr>
<td>3</td>
<td>Press the key to start initialization of the parameters.* Do not turn off the control power supply until initialization has been completed normally.</td>
<td>BB PrmInit Restoring now... Please wait.</td>
</tr>
<tr>
<td>4</td>
<td>To cancel the FnB0B operation, press the key before pressing the key. The display returns to the Utility Function Mode main menu without executing the operation.</td>
<td>BB PrmInit Done. Press [SET] key.</td>
</tr>
<tr>
<td>5</td>
<td>When parameter initialization has been completed normally, “Done.” is displayed.</td>
<td>BB FUNCTION FnB0A Monitor FnB0B Prm Init FnB0C ALM Reset FnB0D Indexer ALM</td>
</tr>
<tr>
<td>6</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To bring the settings into effect, turn the SERVOPACK power supply off and back on.</td>
<td></td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB0B operation screen. In this case, make the setting again by referring to Preparation on page 3-132.
3.2 Operating Procedures for Utility Functions

3.2.43 INDEXER Alarm Reset (FnB0C)

This function resets alarms at both the SERVOPACK and INDEXER Module, and clears the alarm history at the INDEXER Module.

- INDEXER Module alarms are not reset by the “ALARM RESET” button of the digital operator. To reset INDEXER Module alarms, execute alarm resetting with FnB0C.
- Eliminate the causes of alarms before resetting them.
- When you execute Fn006, only the SERVOPACK alarm history is cleared. The INDEXER Module alarm history is not cleared. To clear the INDEXER Module alarm history, execute alarm history clearance with FnB0C.

**Preparation**

**◆ When Resetting Alarms**

None

**◆ When Clearing the Alarm History**

Always check the following before you clear the alarm history.
- The parameters must not be write-prohibited (Fn010 must be set to 0000).
- The ALMTRCCLR command must not being executed.
- The RES command must not being executed.

**Operating Procedure**

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the  key to open the Utility Function Mode main menu, and move the cursor with the  keys to select FnB0C.</td>
<td>![A. AEF FUNCTION FnB0B Prm Init FnB0C ALM Reset FnB0D Indexer ALM Fn000 Alm History]</td>
</tr>
<tr>
<td>2</td>
<td>Press the  key to view the FnB0C operation screen.</td>
<td>![A. AEF AlmReset Mode=ALM state Start: [DATA] Return: [SET]]</td>
</tr>
</tbody>
</table>

Continued on next page.
3.2 Operating Procedures for Utility Functions

3.2.44 INDEXER Alarm History Display (FnB0D)

This function displays the history of alarms that have occurred at the SERVOPACK and INDEXER Module.

**Preparation**

None

---

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>■ When Resetting Alarms &lt;br&gt;Use the keys to select “ALM state”.</td>
<td>A. AEF AlarmReset Mode=ALM state &lt;br&gt;Start: [DATA] Return: [SET]</td>
</tr>
<tr>
<td>3-2</td>
<td>■ When Clearing the Alarm History &lt;br&gt;Use the keys to select “ALM History”</td>
<td>A. AEF AlarmReset Mode=ALM History &lt;br&gt;Start: [DATA] Return: [SET]</td>
</tr>
<tr>
<td>4</td>
<td>Press the key to reset the alarms or clear the alarm history.*</td>
<td>A. AEF AlarmReset Resetting...</td>
</tr>
<tr>
<td></td>
<td>To cancel the FnB0C operation, press the key before pressing the key. The display returns to the Utility Function Mode main menu without executing the operation.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>When alarm resetting or alarm history clearance is completed, the display returns to the Mode selection screen.</td>
<td>BB AlarmReset Mode=ALM state &lt;br&gt;Start: [DATA] Return: [SET]</td>
</tr>
<tr>
<td>6</td>
<td>Press the key to return to the Utility Function Mode main menu.</td>
<td>BB FUNCTION FnB0B Prm Init FnB0C Alarm Reset FnB0D Indexer ALM Fn000 Alarm History</td>
</tr>
</tbody>
</table>

* If the key is pressed in an operation prohibited state, “Error.” is displayed for approximately 2 seconds and then the display returns to the FnB0C operation screen. In this case, make the setting again by referring to Preparation.
## Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Press the ( \text{key} ) to open the Utility Function Mode main menu, and move the cursor with the ( \text{key} ) keys to select FnB0D.</td>
<td>[ \text{FnB0C ALM Reset} ] [ \text{FnB0D INDEXER ALM} ] [ \text{Fn000 Alarm History} ] [ \text{Fn002 JOG} ]</td>
</tr>
<tr>
<td>2</td>
<td>Press the ( \text{key} ) to view the alarm history. If no alarms occur, “NONE” is displayed.</td>
<td>[ \text{AlmTrace} ]. [ \text{ALM0=A. F10} ] [ \text{ALM1=E19A} ] [ \text{ALM2=None} ] [ \text{ALM3=None} ]</td>
</tr>
<tr>
<td>3</td>
<td>Use the ( \text{key} ) keys to scroll the alarm history.</td>
<td>[ \text{AlmTrace} ]. [ \text{ALM1=E19A} ] [ \text{ALM2=None} ] [ \text{ALM3=None} ] [ \text{ALM4=None} ]</td>
</tr>
<tr>
<td>4</td>
<td>Press the ( \text{key} ) to return to the Utility Function Mode main menu.</td>
<td>[ \text{FnB0C ALM Reset} ] [ \text{FnB0D INDEXER ALM} ] [ \text{Fn000 Alarm History} ] [ \text{Fn002 JOG} ]</td>
</tr>
</tbody>
</table>

### Information

To clear the alarm history, execute the Reset INDEXER Alarm (FnB0C) utility function with Mode set to ALM History (clear alarm history). The alarm history is not cleared when you reset an alarm (Mode = ALM state) or when the control power supply to the SERVOPACK is turned OFF. Refer to the following section for the procedure.

INDEXER Alarm Reset (FnB0C) on page 3-134
This chapter describes operating procedures for the parameter copy functions.

4.1 Introduction ........................................ 4-2
  4.1.1 Parameter Copy Mode Functions .............. 4-2

4.2 Operating Procedures in Parameter Copy Mode . 4-3
  4.2.1 Reading Parameters from the SERVOPACK (SERVO→OP) .............. 4-3
  4.2.2 Writing Parameters to the SERVOPACK (OP→SERVO) ............... 4-6
  4.2.3 Verifying Parameters (VERIFY) ................. 4-10
  4.2.4 Parameter Block List Display (LIST) ............ 4-14
4.1 Introduction

4.1.1 Parameter Copy Mode Functions

4.1 Introduction

The Digital Operator for Σ-7-Series Servo Systems has a storage area of seven blocks of parameters. One block is used for one SERVOPACK. In Parameter Copy Mode, you can use these parameter blocks.

Note: The parameter copy functions are not supported for Σ-7W SERVOPACKs. To copy parameters for Σ-7W SERVOPACKs, use the parameter editing functions of the SigmaWin+. Refer to the following manual for details.

AC Servo Drive Engineering Tool SigmaWin+ Operation Manual (SIET S800001 34)

4.1.1 Parameter Copy Mode Functions

You can execute the following four functions in Parameter Copy Mode.

<table>
<thead>
<tr>
<th>Display</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: SERVO→OP</td>
<td>Copies SERVOPACK parameters to the Digital Operator.</td>
</tr>
<tr>
<td>2: OP→SERVO</td>
<td>Writes the parameters saved in the Digital Operator to the SERVOPACK.</td>
</tr>
<tr>
<td>3: VERIFY</td>
<td>Compares the parameters in the SERVOPACK and the Digital Operator, and displays the results.</td>
</tr>
<tr>
<td>4: LIST</td>
<td>Displays the parameter blocks that are saved in the Digital Operator.</td>
</tr>
</tbody>
</table>
This section describes the operating procedures for the functions that you can select from the Main Menu in Parameter Copy Mode. Press the \[ \text{Menu} \] Key to display the Parameter Copy Mode Main Menu. Use the \[ \text{A} \] Key or \[ \text{V} \] Key to select the function you want to execute, and then press the \[ \text{Data} \] Key to change to the execution display for that function.

### Parameter Copy Mode Main Menu Display

1: BB COPY  
1: SERVO → OP  
2: OP → SERVO  
3: VERIFY  
4: LIST

The selected function will flash.

**Parameter Copy Mode Main Menu Display**

### 4.2.1 Reading Parameters from the SERVOPACK (SERVO→OP)

This function reads the parameters saved in the SERVOPACK, and saves them in one of the seven blocks in the storage area in the Digital Operator.

#### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the Parameter Copy Mode Main Menu, and then use the [ \text{A} ] Key or [ \text{V} ] Key to select SERVO→OP.</td>
<td>The currently selected function will flash.</td>
</tr>
<tr>
<td></td>
<td>Press the [ \text{Data} ] Key.</td>
<td>The Parameter Block Selection Display will appear.</td>
</tr>
</tbody>
</table>

Continued on next page.
## 4.2 Operating Procedures in Parameter Copy Mode

### 4.2.1 Reading Parameters from the SERVOPACK (SERVO→OP)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Use the ▲ Key or ▼ Key to select the parameter block (00 to 06) in the Digital Operator in which to save the parameters from the SERVOPACK.</td>
<td>1:BB SERVO→OP 00:***** 01:***** 02:***** 03:*****</td>
</tr>
<tr>
<td>4</td>
<td>Press the READ Key.</td>
<td>The Parameter Read Execution Display will appear. 1:BB SERVO→OP 00:***** Start: [READ] Return: [MODE]</td>
</tr>
<tr>
<td>5</td>
<td>Press the READ Key.</td>
<td>Reading the parameters from the SERVOPACK will start. 1:BB SERVO→OP 00:***** Reading Parameters... &lt;&lt;SERVO&gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>Note: Press the EXIT Key to cancel reading the parameters. The Parameter Block Selection Display will return.</td>
<td>When the parameters have been read from the SERVOPACK, Completed will be displayed. 1:BB SERVO→OP 00:***** Completed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After Completed is displayed, the Parameter Block Selection Display will appear. The SERVOPACK model number of the selected block (“SGD7S-R70” in this example) will be displayed. 1:BB SERVO→OP 00:SGD7S-R70 01:***** 02:***** 03:*****</td>
</tr>
</tbody>
</table>
4.2 Operating Procedures in Parameter Copy Mode

4.2.1 Reading Parameters from the SERVOPACK (SERVO→OP)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Press the Key.</td>
<td>The display will return to the Parameter Copy Mode Main Menu.</td>
</tr>
</tbody>
</table>

Additional Information on Reading Parameters

- If a parameter block that already contains data is selected and the parameters are read, the data in the parameter block is overwritten.
- Press the Key to cancel the operation while reading parameters. Canceled will be displayed and the display will return to the Parameter Block Selection Display.
- If you cancel the reading operation or if the Digital Operator is disconnected from the SERVOPACK during the reading operation, the selected parameter block will become an empty block (“****”).
- During the reading operation, the current process will be displayed sequentially on the Digital Operator as shown below. The reading operation requires approximately 10 seconds.
- When the reading operation has been completed, part of the SERVOPACK model number will be registered as the name of block where the parameters are saved. Blocks that contain parameters that were read from the same SERVOPACK will have the same name.


4.2 Operating Procedures in Parameter Copy Mode

4.2.2 Writing Parameters to the SERVOPACK (OP → SERVO)

You can use this function to write the parameters that are saved in the selected block in the Digital Operator to a SERVOPACK.

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the Parameter Copy Mode</td>
<td>The currently selected function will flash.</td>
</tr>
<tr>
<td></td>
<td>Main Menu, and then use the [A] Key or [V] Key to select OP → SERVO.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Press the [data] Key.</td>
<td>The Parameter Block Selection Display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Use the [A] Key or [V] Key to select the parameter block (00 to 06) in the Digital Operator to write to the SERVOPACK.</td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
4.2 Operating Procedures in Parameter Copy Mode

4.2.2 Writing Parameters to the SERVOPACK (OP → SERVO)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 5    | Press the WRITE Key. | Writing the parameters to the SERVOPACK will start.  

| 00: | S GD7 S-R70  

Reading Parameters..  

<< OP >> |

Note: While the power is supplied to the motor (i.e., while RUN is displayed) or while writing the parameters is prohibited, Not Available will be displayed if the WRITE Key is pressed and the parameters will not be written.

Completed will be displayed when the parameters have been read from the specified block in the Digital Operator and saved in the SERVOPACK. Also A.941 (Change of Parameters Requires Restart) will be displayed.

| 1: | A.941 OP → SERVO  

00: S GD7 S-R70  

Completed |

After Completed is displayed, the Parameter Block Selection Display will appear.

| 1: | A.941 OP → SERVO  

00: S GD7 S-R70  

01:****  

02:****  

03:**** |

Continued on next page.
### 4.2 Operating Procedures in Parameter Copy Mode

#### 4.2.2 Writing Parameters to the SERVOPACK (OP → SERVO)

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Press the [NEXT] Key.</td>
<td><strong>The display will return to the Parameter Copy Mode Main Menu.</strong>&lt;br&gt;1: A.941 COPY&lt;br&gt;1: SERVO → OP&lt;br&gt;2: OP → SERVO&lt;br&gt;3: VERIFY&lt;br&gt;4: LIST</td>
</tr>
<tr>
<td>7</td>
<td>Turn the power supply OFF and ON again.</td>
<td><strong>A.941</strong> (Change of Parameters Requires Restart) will disappear.</td>
</tr>
</tbody>
</table>
Additional Information on Writing Parameters

- Do not disconnect the Digital Operator from the SERVOPACK while the parameters are being written. The writing process will be canceled. If the Digital Operator is disconnected, some of the parameters may not have been written. Repeat the operation. Turning the power OFF and ON again before re-executing the writing operation may cause a A.020 (Parameter Checksum Error) or A.040 (Parameter Setting Error) alarm. To clear an alarm, initialize the parameters (Fn005).
- If an empty block (****) is selected to write parameters, No Data will be displayed and nothing will be written.
- If you specify writing a parameter block to a SERVOPACK with a different voltage or capacity, Unmatched Parameters will be displayed and the parameters will not be written.
- If writing parameters is prohibited, Not Available will be displayed when the servo is turned ON and the parameters will not be written.
- During the writing operation, the current process will be displayed sequentially on the Digital Operator as shown below. The writing operation requires approximately 10 seconds.
- After the parameters have been written to the SERVOPACK, turn the power OFF then ON again. The servo will not turn ON until the power supply is turned OFF and ON again.

Reading Parameters from the Digital Operator

```
1: BB OP→SERVO
00: SGD7S-R70
Reading Parameters..
<< OP >>
```

Writing Parameters to the SERVOPACK

```
1: A.941 OP→SERVO
00: SGD7S-R70
Writing Parameters..
<< SERVO >>
```

Operation Completed

```
1: A.941 OP→SERVO
00: SGD7S-R70
Completed
```

Note: You cannot use the [ ] Key during this display to cancel processing.
## 4.2.3 Verifying Parameters (VERIFY)

You can use this function to compare the parameters that are saved in the selected block in the Digital Operator with the parameters in the SERVOPACK, and display the results.

### Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the Parameter Copy Mode Main Menu, and then use the Key or Key to select VERIFY.</td>
<td>The currently selected function will flash.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Press the Key.</td>
<td>The Parameter Block Selection Display will appear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Use the Key or Key to select the parameter block (00 to 06) in the Digital Operator to compare with the parameters in the SERVOPACK.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Press the Key.</td>
<td>The Parameter Verify Execution Display will appear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page.
4.2 Operating Procedures in Parameter Copy Mode

4.2.3 Verifying Parameters (VERIFY)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Press the Key.</td>
<td>Comparing the parameters will be started.</td>
</tr>
<tr>
<td></td>
<td>Note: Press the Key to cancel comparison and return to the Parameter Block Selection Display.</td>
<td>Completed will be displayed when the parameters have been read from the specified block in the Digital Operator, the parameters have been read from the SERVOPACK, and the parameters have been compared.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After Completed is displayed, the comparison results will be displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: If any unmatched parameters were found, the numbers of the unmatched parameters are displayed in a list. If there are more than four unmatched parameters, use the Key or Key to scroll through the parameter number list. Any parameters displayed as Pn*** in the unmatched parameter list are reserved parameters.</td>
</tr>
</tbody>
</table>

Continued on next page.
### 4.2 Operating Procedures in Parameter Copy Mode

#### 4.2.3 Verifying Parameters (VERIFY)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the [L] Key.</td>
<td>The display will return to the Parameter Copy Mode Main Menu.</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>00</td>
<td>SGD7 S - R70</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>******</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>******</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>******</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Press the [L] Key.</td>
<td>The display will return to the Parameter Copy Mode Main Menu.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:BB</td>
<td>COPY</td>
<td></td>
</tr>
<tr>
<td>1:SERVO→OP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:OP→SERVO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:VERIFY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:LIST</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Additional Information on Verifying Parameters

- If an empty block (****) is selected to verify parameters, No Data will be displayed and nothing will be compared. (Press the Key to return to the Parameter Block Selection Display.)
- Press the Key to cancel the operation while comparing parameters. Canceled will be displayed and the display will return to the Parameter Block Selection Display.
- During the comparison operation, the current process will be displayed sequentially on the Digital Operator as shown below. The comparison operation requires approximately 10 seconds.
- If you specify verifying a parameter block with a SERVOPACK with a different model, Unmatched Parameters will be displayed and the parameters will not be compared.

![Diagram of Parameter Verification Process]

Reading Parameters from the Digital Operator

<table>
<thead>
<tr>
<th>1:BB VERIFY</th>
<th>00:SGD7S-R70 Reading Parameters..</th>
<th>&lt;&lt; OP &gt;&gt;</th>
</tr>
</thead>
</table>

Comparing Parameters

<table>
<thead>
<tr>
<th>1:BB VERIFY</th>
<th>00:SGD7S-R70 Verifying Parameters..</th>
<th>&lt;&lt; OP-SERVO &gt;&gt;</th>
</tr>
</thead>
</table>

Operation Completed

<table>
<thead>
<tr>
<th>1:BB VERIFY</th>
<th>00:SGD7S-R70 Completed</th>
</tr>
</thead>
</table>
4.2 Operating Procedures in Parameter Copy Mode

4.2.4 Parameter Block List Display (LIST)

You can use this function to display the current usage of the seven parameter blocks in the Digital Operator. You can also delete the parameters for a specified block. The procedure to delete a parameter block is given below.

Operating Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display the Parameter Copy Mode Main Menu, and then use the [] Key or [] Key to select LIST.</td>
<td>The currently selected function will flash. 1:BB COPY 1:SERVO→OP 2:OP→SERVO 3:VERIFY 4:LIST.</td>
</tr>
<tr>
<td>2</td>
<td>Press the [DAR] Key.</td>
<td>The Parameter Block Selection Display will appear.</td>
</tr>
<tr>
<td>3</td>
<td>Use the [A] Key or [V] Key to select the parameter block (00 to 06) to delete in the Digital Operator.</td>
<td>1:BB LIST 00:SGD7S-R70 01:**** 02:**** 03:****</td>
</tr>
</tbody>
</table>

Continued on next page.
### 4.2.4 Parameter Block List Display (LIST)

Continued from previous page.

<table>
<thead>
<tr>
<th>Step</th>
<th>Operation</th>
<th>Result</th>
</tr>
</thead>
</table>
| 5    | Press the **WRITE** Key. | Deleting the parameter block will be started.  

```
1:BB LIST  
00:SGD7S-R70  
Deleting Parameters..
```

Note: If power is supplied to the motor (i.e., if RUN is displayed) when the **WRITE** Key is pressed, **Not Available** will be displayed and the parameters will not be deleted. When the selected parameter block has been deleted, **Completed** will be displayed.

```
1:BB LIST  
00:SGD7S-R70  
 Completed
```

After **Completed** is displayed, the Parameter Block Selection Display will appear. “****” will be displayed for the deleted block to indicate that it is an empty block.

```
1:BB LIST  
00:****  
01:****  
02:****  
03:****
```

| 6    | Press the **SELECT** Key. | The display will return to the Parameter Copy Mode Main Menu.  

```
1:BB COPY  
1:SERVO→OP  
2:OP→SERVO  
3:VERIFY  
4:LIST
```
Additional Information on Deleting Parameter Blocks

- If an empty block (****) is selected to delete, **No Data** will be displayed and nothing will be done. (Press the [ENT] Key to return to the Parameter Block Selection Display.)
- If the Digital Operator is disconnected from the SERVOPACK during the deletion operation, the selected parameter block will become an empty block (****).
- During the block deletion operation, the current process will be displayed sequentially on the Digital Operator as shown below. The deletion operation requires approximately two seconds.

Deleting the Selected Parameter Block

```
Deleting Parameters...
```

Operation Completed

```
Completed
```

# Revision History

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

## MANUAL NO. SIEP S800001 33A <0>-1

Published in Japan November 2015

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<thead>
<tr>
<th>Date of Publication</th>
<th>Rev. No.</th>
<th>WEB No.</th>
<th>Section</th>
<th>Revised Contents</th>
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<tr>
<td>March 2017</td>
<td>&lt;4&gt;</td>
<td>0</td>
<td>Preface</td>
<td>Partly revised.</td>
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<td></td>
<td>1.1</td>
<td>Newly added: Digital Operator Types and Connections</td>
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<td>3.2.5, 3.2.23, 3.2.28</td>
<td>Revision: Operating procedure</td>
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<td></td>
<td>3.2.9, 3.2.10, 3.2.14</td>
<td>Revision: Information on preparations</td>
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<td>&lt;3&gt;</td>
<td>0</td>
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<td>3</td>
<td>Addition: Reset Motor Type Change Detected Status (Fn021)</td>
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<td>December 2016</td>
<td>&lt;2&gt;</td>
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<td>Preface</td>
<td>Partly revised.</td>
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<td>3.2.16</td>
<td>Addition: Information on Direct Drive Servomotors (SGM7D and SGM7E)</td>
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<td>June 2016</td>
<td>&lt;1&gt;</td>
<td>0</td>
<td>3.2.33 to 3.2.43</td>
<td>Newly added.</td>
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<td>&lt;0&gt;</td>
<td>1</td>
<td>Front cover</td>
<td>Revision: Format</td>
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<td></td>
<td>Preface</td>
<td>Revision: Related document (AC Servo Drive Engineering Tool SigmaWin+ Operation Manual)</td>
</tr>
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<td></td>
<td></td>
<td>4.1</td>
<td>Addition: Note in introduction to parameter copy functions</td>
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<td></td>
<td>Back cover</td>
<td>Revision: Address and format</td>
</tr>
<tr>
<td>April 2014</td>
<td>–</td>
<td>–</td>
<td></td>
<td>First edition</td>
</tr>
</tbody>
</table>
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