Thank you for purchasing an Oriental Motor product. This operating manual describes product handling procedures and safety precautions.
- Please read it thoroughly to ensure safe operation.
- Always keep the manual where it is readily available.

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1 Screen transitions

Top screen

Monitor mode

Parameter mode

Mode

MODE

Parameter mode

MODE

Screen transitions

Speed

Position

Present alarm

I/O monitor

Application parameters

Operating current

Speed filter

Data setter (APP-8)

Operating current 0

Operating current 15

Operating current 0

Operating current 15

I/O input mode

Alarm signal output

C-ON input logic

END signal range

END signal offset

Push-motion current 0

Push-motion current 7

I/O monitor

Execute (blinking display)

Execute (blinking display)

Execute (blinking display)

Execute (blinking display)

I/O input mode

Alarm signal output

C-ON input logic

END signal range

END signal offset

Push-motion current 0

Push-motion current 7

I/O monitor

Execute (blinking display)

Execute (blinking display)

Execute (blinking display)

Execute (blinking display)

Do not perform push-motion operation with the DG II Series. Doing so may result in damage to the motor or gear part.

Use these keys to move.

Use this key to move or execute.

In the lower level except the top screen, press this key to return to the previous level.
• Do not perform push-motion operation with the DG II Series. Doing so may result in damage to the motor or gear part.

• The following limitations are present while the edit lock function is enabled.
  - Parameter mode, copy mode: These are displayed on the screen but cannot be operated.
  - Clearing of the alarm and warning records, reset of the electrical home: These are not displayed on the screen.
1 Screen transitions

Parameter mode

Application parameters

Return to electrical home operation (APP-6)

Manual operation

APP - 7

Data setter

APP - B

Operating speed of JOG operation

APP - 7 - 0 0

Acceleration and deceleration rate of JOG operation

APP - 7 - 0 1

Starting speed of JOG operation

APP - 7 - 0 2

Displayed speed on OPX-2

APP - B - 0 0

Deceleration rate of speed monitor

APP - B - 0 1

System parameters

PR - SYS

Operating current (APP-0)

Electronic gear

SYS - D

Electronic gear A1

SYS - D - 0 0

Electronic gear A2

SYS - D - 0 1

Electronic gear A3

SYS - D - 0 2

Electronic gear A4

SYS - D - 0 3

Electronic gear B

SYS - D - 0 4

Operation setting

SYS - I

Pulse input mode

SYS - I - 0 0

Smooth drive

SYS - I - 0 1

Excite position at first current on

SYS - I - 0 2

Auto return

SYS - I - 0 3

Rotation direction

SYS - I - 0 4

Use these keys to move.

Use this key to move or execute.

In the lower level except the top screen, press this key to return to the previous level.
Screen transitions

Monitor mode

Test mode

Copy mode

I/O test

Input test

Output test 1

Output test 2

JOG operation

In execution

Return to electrical home operation

Perform return to electrical home operation

Electrical home reset

Perform electrical home reset

Download

Data bank selection 0

Data bank selection 3

Upload

Data bank selection 0

Data bank selection 3

Verification

Parameter initialization

Initialize application parameters

Initialize system parameters

Initialize all parameters

Verification result:

Matched

Unmatched

Execute (blinking display)

Good

Error

Execute (blinking display)
2 Monitor mode

2.1 Overview of monitor mode

- Monitoring the operating status
  The speed and position of the motor can be monitored in real time.

- Checking alarms/warnings, clearing alarm/warning records, and resetting alarms
  - If an alarm or warning generates, since a corresponding alarm code or warning code will be displayed, the details of the alarm/warning can be checked.
  - Up to ten most recent alarms/warnings can be displayed, starting from the latest one.
  - The present alarm can be reset.
  - Alarm/warning records can be cleared.

- Checking I/O signals
  The ON/OFF status of each I/O signal for the driver can be checked.

2.2 Monitored items

- Speed
  The motor rotation speed can be checked (unit: r/min).
  Operating direction and display for each series are as follows.
  - **DG II Series:**
    When the output table rotates in the CW direction, "-" is displayed. When the output table rotates in the CCW direction, the sign is not displayed.
  - **EAS Series:**
    When the linear slide table moves to the motor side, "-" is displayed. When the linear slide table moves to opposite the motor side, the sign is not displayed.
  When setting the display method to absolute value, the sign indicating the rotation direction is not displayed. The value display format can be selected using the "displayed speed on OPX-2A" parameter [APP-8-00] (p.15). Also, the motor rotation speed can be displayed as rotation speed of the gear output shaft. For this setting, use the "deceleration rate of speed monitor" parameter [APP-8-01] (p.15).

- Position
  The present position of the motor with reference to the home position can be checked.
  If a resolution is set, an appropriate value based on the resolution is shown as steps.

- Present alarm
  When an alarm generates, a corresponding alarm code will be displayed.
  Also, the present alarm can be reset, and alarm records can be checked or cleared.

  **Note**
  - Do not turn off the driver power while an alarm is being reset or alarm records are being cleared (= while the display is blinking). Doing so may damage the data.
  - When operations are limited by the edit lock function, the alarm records cannot be cleared.
  - Some alarms cannot be reset on the OPX-2A. For details, refer to “Alarm code list” on OPX-2A p.7. To reset these alarms, you must cycle the power.
## Present warning

When a warning generates, a corresponding warning code will be displayed. You can also check or clear warning records.

- Do not turn off the driver power while warning records are being cleared (= while the display is blinking). Doing so may damage the data.
- When operations are limited by the edit lock function, the warning records cannot be cleared.
- You can also clear warning records by turning off the driver power.

### Warning code list

<table>
<thead>
<tr>
<th>Code</th>
<th>Warning name</th>
<th>Code</th>
<th>Warning name</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Overflow rotation during current on</td>
<td>25</td>
<td>Undervoltage</td>
</tr>
<tr>
<td>12</td>
<td>Overflow rotation during current off</td>
<td>30</td>
<td>Overload</td>
</tr>
<tr>
<td>21</td>
<td>Overheat</td>
<td>31</td>
<td>Overspeed</td>
</tr>
<tr>
<td>22</td>
<td>Overvoltage</td>
<td>70</td>
<td>Abnormal operation data</td>
</tr>
<tr>
<td>23</td>
<td>Main power supply error *</td>
<td>71</td>
<td>Electronic gear setting error</td>
</tr>
<tr>
<td>28</td>
<td>Sensor error during operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2D</td>
<td>Drive circuit error *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Main power supply error</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The LSD-A/LSD-C/LSD-S only.
I/O monitor

You can check the ON/OFF status of each I/O signal of the driver. Each digit on the 7-segment LED display corresponds to a signal. If the signal is ON, the corresponding digit is lit. If the signal is OFF, the digit is unlit.

- **Input signals**

- **Output signals**
3 Parameter mode

You can set parameters relating to Actuator operation and control. These parameters are saved in the driver.
Before setting parameters, read the USER MANUAL carefully to understand the basic operations, functions and other details of the driver.

Note
- Parameters have significant bearing on actuator operation. Before setting any parameter, make sure you fully understand the content of the parameter.
- When operations are limited by the edit lock function, the parameter mode cannot be operated.

3.1 Types of parameters

Application parameters and system parameters are handled in the parameter mode.

Application parameters
When an application parameter is changed, the new parameter becomes effective immediately.
Nine types of parameters are available on the levels below the application parameter screen.
These parameters are classified as follows.

<table>
<thead>
<tr>
<th>Parameter classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating current</td>
<td>Sets the operating current ratio to be assigned to the current setting switch.</td>
</tr>
<tr>
<td>Speed filter</td>
<td>Sets the speed filter time constant to be set to the speed filter setting switch.</td>
</tr>
<tr>
<td>I/O</td>
<td>Sets the parameters relating to I/O signals only.</td>
</tr>
<tr>
<td>Normal mode</td>
<td>Sets the parameters effective only in the normal mode.</td>
</tr>
<tr>
<td>Current control mode</td>
<td>Sets the parameters effective only in the current control mode.</td>
</tr>
<tr>
<td>Alarm/warning</td>
<td>Sets the condition under which each alarm or warning generates.</td>
</tr>
<tr>
<td>Return to electrical home operation</td>
<td>Sets the starting speed, acceleration/deceleration rate and operating speed to be used in the return to electrical home operation.</td>
</tr>
<tr>
<td>Manual operation</td>
<td>Sets the starting speed, acceleration/deceleration rate and operating speed to be used in JOG operation in the test mode.</td>
</tr>
<tr>
<td>Data setter</td>
<td>Sets the items to be displayed on the data setter.</td>
</tr>
</tbody>
</table>

System parameters
When a system parameter is changed, the new parameter will become effective only after the power is cycled. In the LSD-A/LSD-C/LSD-S, also cycle the 24 VDC power supply.
Two types of parameters are available on the levels below the system parameter screen. These parameters are classified as follows.

<table>
<thead>
<tr>
<th>Parameter classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic gear</td>
<td>Sets the electronic gear.</td>
</tr>
<tr>
<td>Operation setting</td>
<td>Sets the pulse input mode, motor rotation direction, excitation position, return operation, and use of the smooth drive.</td>
</tr>
</tbody>
</table>
3.2 Setting example

Pressing the [SET] key in the parameter item screen enables parameter setting. How a parameter is set is explained below.

Example: Set operating current setting 0 to “50”

1. Press the [MODE] key to move to the parameter mode.
The “PAR” LED is lit.

2. Press the [SET] key.
The display changes to the application parameter screen.

3. Press the [SET] key.
The display changes to the operating current parameter screen.

4. Press the [SET] key.
The screen for setting operating current at CURRENT ‘0’ parameter is displayed.

5. Press the [SET] key. Use the [↑] [↓] [←] [→] keys to input “050.0.”

6. Press the [SET] key again.
The input value is set, and the display returns to the screen for setting operating current at CURRENT ‘0’ parameter.

**Note** If the value you have input is outside the setting range, “Error” will be displayed for 1 second. If this error display appears, input a different value that falls within the setting range.
## 3.3 Description of application parameters

### Operating current parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating current 0</td>
<td>APP-0-00</td>
<td></td>
<td></td>
<td>6.3</td>
</tr>
<tr>
<td>Operating current 1</td>
<td>APP-0-01</td>
<td></td>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td>Operating current 2</td>
<td>APP-0-02</td>
<td></td>
<td></td>
<td>18.8</td>
</tr>
<tr>
<td>Operating current 3</td>
<td>APP-0-03</td>
<td></td>
<td></td>
<td>25.0</td>
</tr>
<tr>
<td>Operating current 4</td>
<td>APP-0-04</td>
<td></td>
<td></td>
<td>31.3</td>
</tr>
<tr>
<td>Operating current 5</td>
<td>APP-0-05</td>
<td></td>
<td></td>
<td>37.5</td>
</tr>
<tr>
<td>Operating current 6</td>
<td>APP-0-06</td>
<td></td>
<td></td>
<td>43.8</td>
</tr>
<tr>
<td>Operating current 7</td>
<td>APP-0-07</td>
<td>Sets the operating current ratio to be assigned to the current setting switch.</td>
<td>0.0 to 100.0[%]</td>
<td>50.0</td>
</tr>
<tr>
<td>Operating current 8</td>
<td>APP-0-08</td>
<td></td>
<td></td>
<td>56.3</td>
</tr>
<tr>
<td>Operating current 9</td>
<td>APP-0-09</td>
<td></td>
<td></td>
<td>62.5</td>
</tr>
<tr>
<td>Operating current A</td>
<td>APP-0-10</td>
<td></td>
<td></td>
<td>68.8</td>
</tr>
<tr>
<td>Operating current B</td>
<td>APP-0-11</td>
<td></td>
<td></td>
<td>75.0</td>
</tr>
<tr>
<td>Operating current C</td>
<td>APP-0-12</td>
<td></td>
<td></td>
<td>81.3</td>
</tr>
<tr>
<td>Operating current D</td>
<td>APP-0-13</td>
<td></td>
<td></td>
<td>87.5</td>
</tr>
<tr>
<td>Operating current E</td>
<td>APP-0-14</td>
<td></td>
<td></td>
<td>93.8</td>
</tr>
<tr>
<td>Operating current F</td>
<td>APP-0-15</td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Speed filter parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed filter 0</td>
<td>APP-1-00</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Speed filter 1</td>
<td>APP-1-01</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Speed filter 2</td>
<td>APP-1-02</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Speed filter 3</td>
<td>APP-1-03</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Speed filter 4</td>
<td>APP-1-04</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Speed filter 5</td>
<td>APP-1-05</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Speed filter 6</td>
<td>APP-1-06</td>
<td>Sets the speed filter time constant to be set to the speed filter setting switch.</td>
<td>0 to 200[ms]</td>
<td>10</td>
</tr>
<tr>
<td>Speed filter 7</td>
<td>APP-1-07</td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Speed filter 8</td>
<td>APP-1-08</td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Speed filter 9</td>
<td>APP-1-09</td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Speed filter A</td>
<td>APP-1-10</td>
<td></td>
<td></td>
<td>70</td>
</tr>
<tr>
<td>Speed filter B</td>
<td>APP-1-11</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Speed filter C</td>
<td>APP-1-12</td>
<td></td>
<td></td>
<td>120</td>
</tr>
<tr>
<td>Speed filter D</td>
<td>APP-1-13</td>
<td></td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>Speed filter E</td>
<td>APP-1-14</td>
<td></td>
<td></td>
<td>170</td>
</tr>
<tr>
<td>Speed filter F</td>
<td>APP-1-15</td>
<td></td>
<td></td>
<td>200</td>
</tr>
</tbody>
</table>
### I/O parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O input mode</td>
<td>APP-2-00</td>
<td>Selects the input signal mode. For push-motion operation, refer to the following explanation on this page.</td>
<td>0:Positioning operation 1:Push-motion operation</td>
<td>0</td>
</tr>
<tr>
<td>Alarm code output</td>
<td>APP-2-01</td>
<td>Changes the setting to enable/ disable alarm code output.</td>
<td>0: Disable 1: Enable</td>
<td>0</td>
</tr>
<tr>
<td>C-ON input logic</td>
<td>APP-2-02</td>
<td>Changes the C-ON input logic.</td>
<td>0: Contact A 1: Contact B</td>
<td>0</td>
</tr>
<tr>
<td>END signal range</td>
<td>APP-2-03</td>
<td>Sets the output condition for END output.</td>
<td>0.0 to 18.0[°]</td>
<td>1.8</td>
</tr>
<tr>
<td>END signal offset</td>
<td>APP-2-04</td>
<td>Sets the output offset for END output.</td>
<td>−1.8 to 1.8[°]</td>
<td>0</td>
</tr>
<tr>
<td>Push-motion current 0</td>
<td>APP-2-05</td>
<td>Sets the operating current ratio for push-motion operation.</td>
<td>0.0 to 100.0[%]</td>
<td>30.0</td>
</tr>
<tr>
<td>Push-motion current 1</td>
<td>APP-2-06</td>
<td></td>
<td></td>
<td>40.0</td>
</tr>
<tr>
<td>Push-motion current 2</td>
<td>APP-2-07</td>
<td></td>
<td></td>
<td>50.0</td>
</tr>
<tr>
<td>Push-motion current 3</td>
<td>APP-2-08</td>
<td></td>
<td></td>
<td>60.0</td>
</tr>
<tr>
<td>Push-motion current 4</td>
<td>APP-2-09</td>
<td></td>
<td></td>
<td>70.0</td>
</tr>
<tr>
<td>Push-motion current 5</td>
<td>APP-2-10</td>
<td></td>
<td></td>
<td>80.0</td>
</tr>
<tr>
<td>Push-motion current 6</td>
<td>APP-2-11</td>
<td></td>
<td></td>
<td>90.0</td>
</tr>
<tr>
<td>Push-motion current 7</td>
<td>APP-2-12</td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Note** Do not perform push-motion operation with the DG Series. Doing so may result in damage to the motor or gear part.

#### About push-motion operation
Push-motion operation is a type of operation where pulses are input to continuously pressurize the load. Set an operating current value for push-motion operation in each push-motion current parameter from 0 to 7 (from [APP-2-05] to [APP-2-12]). The current value set in each parameter will be used to limit the output torque. You can select a desired current setting based on a combination of ON/OFF statuses of M0 to M2 inputs.

<table>
<thead>
<tr>
<th>Push-motion current parameter</th>
<th>Initial value (×0.1%)</th>
<th>M2</th>
<th>M1</th>
<th>M0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0[APP-2-05]</td>
<td>300</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>1[APP-2-06]</td>
<td>400</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>2[APP-2-07]</td>
<td>500</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>3[APP-2-08]</td>
<td>600</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>4[APP-2-09]</td>
<td>700</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>5[APP-2-10]</td>
<td>800</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>6[APP-2-11]</td>
<td>900</td>
<td>ON</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>7[APP-2-12]</td>
<td>1000</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>
### Normal mode parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standstill current</td>
<td>APP-3-00</td>
<td>Sets the standstill current as a percentage of the operating current.</td>
<td>0.0 to 50.0 [%]</td>
<td>50.0</td>
</tr>
<tr>
<td>Speed error gain 1</td>
<td>APP-3-01</td>
<td>Sets the speed error gain. When this value is increased, actuator vibration will decrease.</td>
<td>0 to 500</td>
<td>45</td>
</tr>
<tr>
<td>Speed error gain 2</td>
<td>APP-3-02</td>
<td>Sets the speed error gain. When this value is increased, actuator vibration at the time of speed change will decrease.</td>
<td>0 to 500</td>
<td>45</td>
</tr>
</tbody>
</table>

### Current control mode parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position loop gain</td>
<td>APP-4-00</td>
<td>Sets the position loop gain. When this value is increased, the motor response will increase. Note, however, that an excessively large value may increase the actuator overshoot or cause hunting.</td>
<td>1 to 50</td>
<td>10</td>
</tr>
<tr>
<td>Speed loop gain</td>
<td>APP-4-01</td>
<td>Sets the speed loop gain. When this value is increased, the actuator overshoot can be suppresses. Note, however, that an excessively large value may cause the actuator to oscillate.</td>
<td>10 to 200</td>
<td>180</td>
</tr>
<tr>
<td>Speed loop integral time constant</td>
<td>APP-4-02</td>
<td>Sets the integral time constant for speed loop. When this value is decreased, the actuator response will increase. Note, however, that an excessively small value may increase the actuator overshoot or cause hunting.</td>
<td>10.0 to 200.0 [ms]</td>
<td>100.0</td>
</tr>
<tr>
<td>Anti-vibration control</td>
<td>APP-4-03</td>
<td>Changes the setting to enable/disable anti-vibration control.</td>
<td>0: Disable 1: Enable</td>
<td>0</td>
</tr>
<tr>
<td>Frequency of anti-vibration control</td>
<td>APP-4-04</td>
<td>Sets the frequency of anti-vibration. When this setting is used, residual vibration can be suppressed at positioning even when the motor is assembled into a machine whose rigidity is low. As a result, compliance will increase.</td>
<td>3.00 to 100.00 [Hz]</td>
<td>7.00</td>
</tr>
</tbody>
</table>
### Alarm warning parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal operation data warning</td>
<td>APP-5-00</td>
<td>Changes the setting to enable/disable the abnormal operation data warning output.</td>
<td>0: Disable 1: Enable</td>
<td>0</td>
</tr>
<tr>
<td>Overflow rotation alarm during current on</td>
<td>APP-5-01</td>
<td>Sets the condition under which an overflow rotation alarm during current on generates, as an amount of rotation of the motor shaft.</td>
<td>0.01 to 300.00 [rev]</td>
<td>3.00</td>
</tr>
<tr>
<td>Overflow rotation warning during current off</td>
<td>APP-5-02</td>
<td>Sets the condition under which an overflow rotation warning during current off generates, as an amount of rotation of the motor shaft.</td>
<td>0.01 to 300.00 [rev]</td>
<td>100.00</td>
</tr>
<tr>
<td>Overload alarm</td>
<td>APP-5-03</td>
<td>Sets the condition under which an overload alarm generates.</td>
<td>0.1 to 30.0 [s]</td>
<td>5.0</td>
</tr>
<tr>
<td>Overflow rotation warning during current on</td>
<td>APP-5-04</td>
<td>Sets the condition under which an overflow rotation warning during current on warning generates, as an amount of rotation of the motor shaft.</td>
<td>0.01 to 300.00 [rev]</td>
<td>3.00</td>
</tr>
<tr>
<td>Overvoltage warning</td>
<td>APP-5-05</td>
<td>Sets the voltage at which an overvoltage warning generates.</td>
<td>320 to 450 (15.0 to 63.0°) [V]</td>
<td>435 (63.0°)</td>
</tr>
<tr>
<td>Undervoltage warning</td>
<td>APP-5-06</td>
<td>Sets the voltage at which an undervoltage warning generates.</td>
<td>120 to 280 (15.0 to 63.0°) [V]</td>
<td>120 (18.0°)</td>
</tr>
<tr>
<td>Overheat warning</td>
<td>APP-5-07</td>
<td>Sets the temperature at which an overheat warning generates.</td>
<td>40 to 85 [°C]</td>
<td>85</td>
</tr>
<tr>
<td>Overload warning</td>
<td>APP-5-08</td>
<td>Sets the condition under which an overload warning generates.</td>
<td>0.1 to 30.0 [s]</td>
<td>5.0</td>
</tr>
<tr>
<td>Overspeed warning</td>
<td>APP-5-09</td>
<td>Sets the speed at which an overspeed warning generates.</td>
<td>1 to 5000 [r/min]</td>
<td>4500</td>
</tr>
</tbody>
</table>

* The descriptions in ( ) apply to the LSD-K.

### Return to electrical home operation parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating speed of return operation</td>
<td>APP-6-00</td>
<td>Sets the operating speed of return to electrical home operation.</td>
<td>1 to 4000 [r/min]</td>
<td>30</td>
</tr>
<tr>
<td>Acceleration and deceleration rate of return operation</td>
<td>APP-6-01</td>
<td>Sets the acceleration and deceleration rate of return to electrical home operation.</td>
<td>0.01 to 1000.00 [ms/(1000 r/min)]</td>
<td>100.00</td>
</tr>
<tr>
<td>Starting speed of return operation</td>
<td>APP-6-02</td>
<td>Sets the starting speed of return to electrical home operation.</td>
<td>0 to 4000 [r/min]</td>
<td>30</td>
</tr>
</tbody>
</table>
### Manual operation parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating speed of JOG operation</td>
<td>APP-7-00</td>
<td>Sets the operating speed of JOG operation.</td>
<td>1 to 4000 [r/min]</td>
<td>30</td>
</tr>
<tr>
<td>Acceleration and deceleration rate of JOG operation</td>
<td>APP-7-01</td>
<td>Sets the acceleration and deceleration rate of JOG operation.</td>
<td>0.01 to 1000.00 [ms/(1000 r/min)]</td>
<td>100.00</td>
</tr>
<tr>
<td>Starting speed of JOG operation</td>
<td>APP-7-02</td>
<td>Sets the starting speed of JOG operation.</td>
<td>0 to 4000 [r/min]</td>
<td>30</td>
</tr>
</tbody>
</table>

### Data setter parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displayed speed on OPX-2A</td>
<td>APP-8-00</td>
<td>Selects the display method of monitored speed.</td>
<td>0: Signed 1: Absolute value</td>
<td>0</td>
</tr>
<tr>
<td>Deceleration rate of speed monitor</td>
<td>APP-8-01</td>
<td>Sets the gear ratio for speed monitor. (Gear ratio of the DGII Series: 18)</td>
<td>1.0 to 100.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### 3.4 Description of system parameters

#### Electronic gear parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic gear A1</td>
<td>SYS-0-00</td>
<td>Sets the denominator of electronic gear to be assigned to the resolution setting switch. (4 options are available.)</td>
<td>1 to 1000</td>
<td>10</td>
</tr>
<tr>
<td>Electronic gear A2</td>
<td>SYS-0-01</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Electronic gear A3</td>
<td>SYS-0-02</td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Electronic gear A4</td>
<td>SYS-0-03</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Electronic gear B</td>
<td>SYS-0-04</td>
<td>Sets the numerator of electronic gear to be assigned to the resolution setting switch.</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Sets the resolution of the motor output shaft. The value of each resolution setting switch (No.3, No.4) can be changed as follows using the electronic gear parameters [SyS-0-00] to [SyS-0-04]. Note that the calculated value must be inside the setting range specified below:

Resolution setting range: 100 to 10000 P/R

<table>
<thead>
<tr>
<th>No.4</th>
<th>CS0 or OFF</th>
<th>CS1 or ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD-A/LSD-C/LSD-S</td>
<td>D0</td>
<td>D1</td>
</tr>
<tr>
<td>CS0</td>
<td>CS1</td>
<td>OFF</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>NO</td>
</tr>
</tbody>
</table>
### Operation setting parameters

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Display on the OPX-2A</th>
<th>Description</th>
<th>Setting range</th>
<th>Initial value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse input mode</td>
<td>SYS-1-00</td>
<td>Selects the pulse input mode.</td>
<td>0: Setting by the pulse input mode selector switch&lt;br&gt;1: 2-pulse input mode, negative logic&lt;br&gt;2: 2-pulse input mode, positive logic&lt;br&gt;3: 1-pulse input mode, negative logic&lt;br&gt;4: 1-pulse input mode, positive logic&lt;br&gt;5: Phase difference mode, × 1&lt;br&gt;6: Phase difference mode, × 2&lt;br&gt;7: Phase difference mode, × 4</td>
<td>0</td>
</tr>
<tr>
<td>Smooth drive</td>
<td>SYS-1-01</td>
<td>Changes the setting to enable/disable the smooth drive.</td>
<td>0: Disable&lt;br&gt;1: Enable</td>
<td>1</td>
</tr>
<tr>
<td>Excite position at first current on</td>
<td>SYS-1-02</td>
<td>Selects the position at which the motor is excited after the power has been turned on.</td>
<td>0: Detected position&lt;br&gt;1: Electrical angle 0°</td>
<td>0</td>
</tr>
<tr>
<td>Auto return</td>
<td>SYS-1-03</td>
<td>Sets whether or not to automatically return the motor, when the current is turned on, to the position where it was stopped.</td>
<td>0: Disable&lt;br&gt;1: Enable</td>
<td>0</td>
</tr>
<tr>
<td>Rotation direction *</td>
<td>SYS-1-04</td>
<td>Selects rotation direction of the motor.</td>
<td>0: + = CCW&lt;br&gt;1: + = CW</td>
<td>1</td>
</tr>
</tbody>
</table>

* The moving direction varies as follows by the parameter setting.

**DGII** Series:
- When setting the "rotation direction" parameter to 0 and operating in the positive direction, the output table rotates in the CW direction.
- When setting the "rotation direction" parameter to 1 and operating in the positive direction, the output table rotates in the CCW direction.

**EAS** Series:
- When setting the "rotation direction" parameter to 0 and operating in the positive direction, the linear slide table moves to the motor side.
- When setting the "rotation direction" parameter to 1 and operating in the positive direction, the linear slide table moves to opposite the motor side.

**Note**

When the "auto return" parameter (SYS-1-03) is set to enable, the motor automatically start return operation to the position where the motor last stopped if the motor is excited by turning the C-ON (current-on) input ON or turning the FREE (free) input OFF.

### 3.5 Initializing parameters

You can revert parameters saved in the driver to their initial values.
For details, refer to 5.5, “Initializing driver parameters” on p.21.
4 Test mode

4.1 Overview of test mode

• I/O test
  You can check the ON/OFF status of each input signal of the driver.
  You can also switch the ON/OFF status of each output signal on the OPX-2A.
  There is also an I/O test function with which you can check the connection status of the driver.

• JOG operation
  You can operate the motor using the keys on the OPX-2A.

• Return to electrical home operation
  You can perform an operation that returns the motor to its electrical home position.

• Electrical home reset
  You can set the current position as the electrical home position.

• What happens when the [SET] key is pressed while the actuator is operating
  While the motor is operating, you cannot move to any lower from the top screen of the test mode. Pressing the [SET] key will generate an error, and “oPE-Err” will be shown.
  Be sure to stop the motor operation before pressing the [SET] key.

  Note
  • Stop the actuator operation before changing to the test mode.
  • When you move from the top screen of the test mode to a lower level, the CW/CCW input and RETURN input will be disabled.
  • When you move from the I/O test or electrical home reset screen to a lower level, all I/O signals and operations will be disabled.

4.2 I/O test

There is also an I/O test function with which you can check the connection status of the driver. Each digit on the 7-segment LED display corresponds to a signal. If the signal is ON, the corresponding digit is lit. If the signal is OFF, the digit is unlit. The output signal can be switched to a ON/OFF status using the [↑] [↓] keys, and "O" is displayed when the output signal is ON, while "-" is displayed when the output signal is OFF.

- Input signals
  - CCW
  - CW
  - FREE
  - P-RESET/M2
  - RETURN/M1
  - M0
  - CS/T-MODE
  - CCM
  - CLR/ALM-RST
  - C-ON

- Output signals
  - END
  - WNG
  - ALM
  - TIM2/AL2
  - TLC/AL1
  - READY/AL0
  - Output signal ON
  - Output signal OFF
### 4.3 JOG operation

You can operate the motor using the keys on the **OPX-2A**.

When pressing the \[ \uparrow \] key once, the motor rotates by one step in the positive direction. If the key is kept pressing, the motor rotates in the positive direction continuously.

When pressing the \[ \downarrow \] key once, the motor rotates by one step in the negative direction. If the key is kept pressing, the motor rotates in the negative direction continuously.

- **DG II** Series:
  - Positive direction: The output table rotates in the CCW direction.
  - Negative direction: The output table rotates in the CW direction.

- **EAS** Series:
  - Positive direction: The linear slide table moves to opposite the motor side.
  - Negative direction: The linear slide table moves to the motor side.

The operating speed corresponds to the value set in the operating speed of JOG operation parameter \[ APP-7-00 \].

If the value set in the starting speed of JOG operation parameter \[ APP-7-02 \] is greater than the value set in the operating speed of JOG operation parameter \[ APP-7-00 \], the starting speed of JOG operation is used.

**Note**

In JOG operation, the actuator operates at the set operating speed while the applicable key is pressed. Before executing JOG operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that actuator operation will not cause any dangerous situation.

### 4.4 Return to electrical home operation

You can perform an operation that returns the motor to its electrical home position.

**Note**

The actuator operates at the set operating speed in return-to-electrical home operation. Before executing return-to-electrical home operation, consider the status of the equipment and condition of its surroundings to confirm thoroughly that actuator operation will not cause any dangerous situation.

### 4.5 Electrical home reset

You can set the current position as the electrical home position.

**Note**

If operations are limited by the edit lock function, the electrical home position cannot be reset.
5 Copy mode

The OPX-2A has four data banks, and parameters can be saved in each of these data banks. Since an EEPROM is used for the data memory, stored parameters will be retained even after the power is turned off.

In the copy mode, you can download parameters saved in the OPX-2A to the driver. You can also upload parameters saved in the driver to the OPX-2A.

It is also possible to verify parameters in the OPX-2A against the corresponding parameters in the driver, or revert driver parameters to their initial values.

5.1 Overview of copy mode

- **Download**
  Copy parameters saved in the OPX-2A to the driver.

- **Upload**
  Copy parameters saved in the driver to the OPX-2A.

- **Verification**
  Verify parameters in the OPX-2A against the corresponding parameters in the driver.

- **Initializing driver parameters**
  Revert parameters saved in the driver to their initial values.

- **What happens when the [SET] key is pressed while the actuator is operating**
  While the motor is operating, you cannot move to any lower level from the top screen of the copy mode. Pressing the [SET] key will generate an error, and “oPE-Err” will be shown. Be sure to stop the actuator operation before pressing the [SET] key.

- **What happens when the [SET] key is pressed while the edit lock is enabled**
  While the edit lock is enabled, you cannot move to any lower level from the top screen of the copy mode. Pressing the [SET] key will generate an error, and “LocK-Err” will be shown. Be sure to cancel the edit lock before pressing the [SET] key. Refer to Before Use for the procedure to cancel the edit lock.

  **Note**
  - Stop the actuator operation before changing to the copy mode.
  - When you move from the top screen of the copy mode to a lower level, the CW/CCW input and RETURN input will be disabled.
  - When operations are limited by the edit lock function, the copy mode cannot be operated.
  - Data cannot be copied between the LSD-A/LSD-C/LSD-S and LSD-K.
5.2 Downloading to the driver

In this operation, parameters of the specified data bank number are downloaded to the driver. If a download error occurs, a code indicating the nature of the error will blink on the display. Download will not be performed and the display will return to the top screen of download.

<table>
<thead>
<tr>
<th>Blinking display</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prod-Err</td>
<td>The product series of the driver to which data is downloaded is wrong.</td>
<td>• Check the product series of the driver. • Check the data bank number on the OPX-2A.</td>
</tr>
<tr>
<td>Head-Err</td>
<td>An error occurred while data was being downloaded.</td>
<td>Perform download again. If the same error occurs, the data saved in the OPX-2A may be damaged. Upload the applicable data to set the OPX-2A data again.</td>
</tr>
<tr>
<td>bcc-Err</td>
<td>The specified data bank number does not contain parameters.</td>
<td>Check the data bank number.</td>
</tr>
<tr>
<td>no-data</td>
<td>An error occurred while data was being written.</td>
<td>Perform download again.</td>
</tr>
</tbody>
</table>

**Note**
- System parameters that have been changed will become effective after the power is cycled. If the system parameters have been changed as a result of the download, cycle the driver power. In the LSD-A/LSD-C/LSD-S, if a 24 VDC power supply is used, also cycle the 24 VDC power supply.
- Do not turn off the driver power while the download is still in progress (= while the display is blinking). Doing so may damage the data.

5.3 Uploading to the OPX-2A

In this operation, parameters saved in the driver is uploaded to the specified data bank number.

**Note**
Do not turn off the driver power while the upload is still in progress (= while the display is blinking). Doing so may damage the data.
5.4 Verifying parameters

In this operation, parameters in the specified data bank number are verified against the corresponding parameters saved in the driver.

If the verification finds that the two sets of parameters match, “Good” will be shown. If the two do not match, “Error” will be shown.

If a verification error occurs, a code indicating the nature of the error will blink on the display.

Verification will not be performed and the display will return to the top screen of verification.

<table>
<thead>
<tr>
<th>Blanking display</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prod - Err</td>
<td>The product series of the driver against which data is verified is wrong.</td>
<td>• Check the product series of the driver.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check the data bank number on the OPX-2A.</td>
</tr>
<tr>
<td>Head - Err</td>
<td>An error occurred while data was being verified.</td>
<td>Perform verification again. If the same error occurs, the data saved in the OPX-2A may be damaged. Upload the applicable data to set the OPX-2A data again.</td>
</tr>
<tr>
<td>Bcc - Err</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No - Data</td>
<td>The specified data bank number does not contain parameters.</td>
<td>Check the data bank number.</td>
</tr>
</tbody>
</table>

5.5 Initializing driver parameters

In this operation, parameters saved in the driver are reverted to their initial values.

- System parameters that have been changed will become effective after the power is cycled. If the system parameters have been changed as a result of the initialization, cycle the driver power. In the LSD-A/LSD-C/LSD-S, if a 24 VDC power supply is used, also cycle the 24 VDC power supply.
- Do not turn off the driver power while the initialization is still in progress (= while the display is blinking). Doing so may damage the data.
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