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.

■ EU Directives

■ CE Marking

This product is affixed the CE Marking under the Low Voltage Directive and EMC Directive.

■ Low Voltage Directive

This product is certified by TÜV Rheinland under the EN 61800-5-1. (NXD20-A and NXD20-C only)

<table>
<thead>
<tr>
<th>Applicable Standards</th>
<th>Installation conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN50178, EN61800-5-1</td>
<td>To be incorporated in equipment.</td>
</tr>
</tbody>
</table>

■ EMC Directive

This product has received EMC compliance under the conditions specified in "Example of installation and wiring" on the USER MANUAL. The conformance of your mechanical equipment with the EMC Directive will vary depending on such factors as the configuration, wiring, and layout for other control system devices and electrical parts used with this product. It therefore must be verified through conducting EMC measures in a state where all parts including this product have been installed in the equipment.

<table>
<thead>
<tr>
<th>Applicable standards</th>
<th>EMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 55011 group 1 class A</td>
<td></td>
</tr>
<tr>
<td>EN 61000-6-4, EN 61800-3</td>
<td></td>
</tr>
<tr>
<td>EN 61000-3-2, EN 61000-3-3</td>
<td></td>
</tr>
<tr>
<td>EME</td>
<td>EN 61000-6-2, EN 61800-3</td>
</tr>
</tbody>
</table>

This product is not intended to be used on a low-voltage public network which supplies domestic premises; radio frequency interference is expected if used on such a network.

■ RoHS Directive

The products do not contain the substances exceeding the restriction values of RoHS Directive (2011/65/EU).

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### Introduction

**Before use**

Only qualified personnel of electrical and mechanical engineering should work with the product. Use the product correctly after thoroughly reading the section "Safety precautions." In addition, be sure to observe the contents described in this manual.

The product described in this manual has been designed and manufactured to be incorporated in general industrial equipment. Do not use for any other purpose. Oriental Motor Co., Ltd. is not responsible for any damage caused through failure to observe this warning.

**Structure of the manual**

The NX Series comes with the manuals specified below.

- **NX Series OPERATING MANUAL Motor** (Supplied with the product)
  This manual explains the motor functions and how to install the motor, among others.

- **NX Series OPERATING MANUAL Driver** (this document)
  This manual explains the driver functions and how to install the driver, among others.

- **NX Series USER MANUAL**
  This manual explains the motor and driver functions as well as how to install/connect and troubleshooting, among others.

### Regulations and Standards

**UL Standard and CSA Standard**

This product is recognized by UL under the UL and CSA Standards.

<table>
<thead>
<tr>
<th>Applicable Standards</th>
<th>Certification Body</th>
<th>Standards File No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 61800-5-1</td>
<td>UL</td>
<td>E171462</td>
</tr>
<tr>
<td>CSA C22.2 No.274</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WARNING FOR UL MARKING ON DRIVER**

- For UL standard (UL 61800-5-1), the product is recognized for the condition of Maximum Surrounding Air Temperature 50 °C (122 °F).
- Suitable For Use On A Circuit Capable Of Delivering Not More Than 5,000 A rms Symmetrical Amperes, 120 Volts or 240 Volts Maximum.
- Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electric Code and any additional local codes.
- Is listed UL Listed Inverse Time Circuit Breaker rated 240 Vac, 15 A.
- Solid State motor overload protection is provided in each model. (NXD20-A/C)
- Solid State motor overload protection reacts at 150% FLA or less. (NXD75-S)
- Drives have no provision for motor over temperature protection. Motor over temperature protection is required at end application.
- Do not touch the connection terminals on the driver while the power is supplied or for at least 10 minutes after turning off the power. Doing so may result in electric shock.
**Safety precautions**

The precautions described below are intended to prevent danger or injury to the user and other personnel through safe, correct use of the product. Use the product only after carefully reading and fully understanding these instructions.

![Warning]
Handling the product without observing the instructions that accompany a “Warning” symbol may result in serious injury or death.

![Caution]
Handling the product without observing the instructions that accompany a “Caution” symbol may result in injury or property damage.

![Note]
The items under this heading contain important handling instructions that the user should observe to ensure the safe use of the product.

**General**

- Do not use the product in explosive or corrosive environments, in the presence of flammable gases, locations subjected to splashing water, or near combustibles. Doing so may result in fire, electric shock or injury.
- Assign qualified personnel the task of installing, wiring, operating/controlling, inspecting and troubleshooting the product. Failure to do so may result in fire, electric shock or injury.
- Do not transport, install the product, perform connections or inspections when the power is on. Always turn the power off before carrying out these operations. Failure to do so may result in electric shock.
- The terminals on the driver’s front panel marked with a symbol indicate the presence of high voltage. Do not touch these terminals while the power is on to avoid the risk of fire or electric shock.
- When the driver generates an alarm (= any of the driver’s protective functions is triggered), the motor will stop and lose its holding torque. Accordingly, provide measures to hold the moving part in place in the event of an alarm. Failure to do so may result in injury or equipment damage.
- When the driver’s protection function is triggered, first remove the cause and then clear the protection function. Continuing the operation without removing the cause of the problem may cause malfunction of the motor and driver, leading to injury or damage to equipment.

**Installation**

- The driver is a Class I equipment. When installing the driver, do not touch the driver or ground the driver first. Failure to do so may cause electric shock.
- Install the driver in an enclosure in order to prevent electric shock or injury.

**Connection**

- Keep the driver’s input-power voltage within the specified range to avoid fire and electric shock.
- Connect the cables securely according to the wiring diagram in order to prevent fire and electric shock.
- Do not forcibly bend, pull or pinch the cable. Doing so may fire and electric shock.

**Operation**

- Turn off the driver power in the event of a power failure, or the motor may suddenly start when the power is restored and may cause injury or damage to equipment.
- Do not turn the FREE input to ON while the motor is operating. The motor will stop and lose its holding ability, which may result in injury or damage to equipment.

**Maintenance and inspection**

- Do not touch the connection terminals on the driver while the power is supplied or for at least 10 minutes after turning off the power. Before making wiring connections or carrying out checks, also wait for the CHARGE LED to turn off and check the voltage with a tester, etc. Failure to do so may result in electric shock.

**Repair, disassembly and modification**

- Do not disassemble or modify the driver. This may cause electric shock or injury. Refer all such internal inspections and repairs to the branch or sales office from which you purchased the product.

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**Caution**

**General**

- Do not use the driver beyond its specifications, or electric shock, injury or damage to equipment may result.
- Keep your fingers and objects out of the openings in the driver, or fire, electric shock or injury may result.
- Do not touch the driver during operation or immediately after stopping. The surface is hot and may cause a skin burn(s).

**Installation**

- To prevent the risk of damage to equipment, leave nothing around the driver that would obstruct ventilation.

**Connection**

- The driver’s data edit connector (CN4) and analog I/O signals connector (CN6) are not insulated. When grounding the positive terminal of the power supply, do not connect any equipment (PC, etc.) whose negative terminal is grounded. Doing so may cause the driver and these equipment to short, damaging both.

**Operation**

- Provide an emergency-stop device or emergency-stop circuit external to the equipment so that the entire equipment will operate safely in the event of a system failure or malfunction. Failure to do so may result in injury.
- Before supplying power to the driver, turn all input signals to the driver to OFF. Otherwise, the motor may start suddenly and cause injury or damage to equipment.
- When moving the motor output shaft by hand while the motor is at standstill, confirm first that the FREE input of the driver is turned ON. If the FREE input is not ON, an attempt to move the motor output shaft by hand may result in injury.
- Use a 24 VDC power supply that has been given reinforced insulation between the primary side and secondary side. Failure to do so may cause electric shock.
- Immediately when trouble has occurred, stop running and turn off the driver power. Failure to do so may result in fire, electric shock or injury.
- To prevent electric shock, use only an insulated screwdriver to adjust the driver’s switches.

**Maintenance and inspection**

- To prevent the risk of electric shock, do not touch the terminals while measuring the insulation resistance or conducting a voltage-resistance test.

**Disposal**

- Dispose the product correctly in accordance with laws and regulations, or instructions of local governments.

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**Precautions for use**

- Use the supplied cable to connect the motor and driver.
  Always use the supplied cable to connect the motor and driver. If a flexible cable or cable longer than 3 m (9.8 ft.) is to be used, an appropriate cable must be purchased separately.

- When conducting the insulation resistance measurement and the dielectric strength test, be sure to separate the connection between the motor and the driver.
  Conducting the insulation resistance measurement or dielectric strength test with the motor and driver connected may result in damage to the product.

- Preventing electrical noise
  Refer to USER MANUAL for measures with regard to noise.

- Saving data to the non-volatile memory
  Do not turn off the main power supply or 24 VDC power supply while writing the data to the non-volatile memory, and also do not turn off for 5 seconds after the completion of writing the data. Doing so may abort writing the data and cause an EEPROM error alarm to generate. The non-volatile memory can be rewritten approximately 100,000 times.
• Preventing leakage current
Stray capacitance exists between the driver’s current-carrying line and other
current-carrying lines, the earth and the motor, respectively. A high-frequency
current may leak out through such capacitance, having a detrimental effect
on the surrounding equipment. The actual leakage current depends on the
driver’s switching frequency, the length of wiring between the driver and
motor, and so on.

When providing a leakage current breaker, use the following products, for
example, which have high-frequency signal protection:
Mitsubishi Electric Corporation: NV series
Fuji Electric FA Components & Systems Co., Ltd.: EG and SG series

• Motor excitation at power ON
When the driver has been set to lock the servo after the motor stops in the
position control mode or speed control mode. Turning on the power supply
will not excite the motor. To excite the motor, you must turn the S-ON input
ON.

You can set the motor to be excited automatically after the power has been
turned on, by changing the applicable driver parameter using the data setter
OPX-2A or the data setting software MEKE02.

• If vertical drive (gravitational operation) such as elevator
applications is performed or if sudden start-stop operation of a
large inertial load is repeated frequently, connect an accessory
regeneration unit.

The factory setting is to use the internal regeneration resistor. Note, however,
that the internal regeneration resistor does not support continuous
regenerative operation, gravitational operation or other operations involving
up/down movements, or frequent repeating of sudden starting/stopping of
a large inertial load. If any of these operations must be performed, use the
accessory regeneration unit.

• Note on connecting a power supply whose positive terminal is
grounded
The data edit connector (CN4) and analog I/O signals connector (CN6) are
not insulated. When grounding the positive terminal of the power supply, do
not connect any equipment (PC, etc.) whose negative terminal is grounded.
Doing so may cause the driver and these equipment to short, damaging both.
Use the data setter OPX-2A to set data, etc.

**Preparation**

**Checking the product**
Verify that the items listed below are included. Report any missing or
damaged items to the branch or sales office from which you purchased the
product.

- Driver.......................................................... 1 unit
- CN1 connector (6 pins)............................... 1 pc.
- CN2 connector (3 pins)............................... 1 pc.
- CN3 connector (7 pins)............................... 1 pc.
- CN7 connector (36 pins)............................. 1 pc.
- Connector wiring lever (for CN2, CN3)............ 1 pc.
- OPERATING MANUAL (Driver (this document))......... 1 copy

**Combinations of motors and drivers**
- Indicates the cable length. ● indicates the gear ratio.

**Standard type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX45A-□</td>
<td>NXM45A</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX45C-□</td>
<td>NXM45C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX410A-□</td>
<td>NXM410A</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX410C-□</td>
<td>NXM410C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX620A-□</td>
<td>NXM620A</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX620C-□</td>
<td>NXM620C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX640A-□</td>
<td>NXM640A</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX975A-□</td>
<td>NXM975A</td>
<td>NXD20-C</td>
</tr>
</tbody>
</table>

**Standard type with electromagnetic brake**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX45MA-□</td>
<td>NXM45M</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX45MC-□</td>
<td>NXM45C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX410A-□</td>
<td>NXM410M</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX410C-□</td>
<td>NXM410C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX620A-□</td>
<td>NXM620M</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX620C-□</td>
<td>NXM620C</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX640MS-□</td>
<td>NXM640M</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX975MS-□</td>
<td>NXM975M</td>
<td>NXD20-C</td>
</tr>
</tbody>
</table>

**PS geared type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX65AA-PS-□</td>
<td>NXM65A-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX65AC-PS-□</td>
<td>NXM65A-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX610AA-PS-□</td>
<td>NXM610A-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX610AC-PS-□</td>
<td>NXM610A-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX920AA-PS-□</td>
<td>NXM920A-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX920AC-PS-□</td>
<td>NXM920A-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX940AS-PS-□</td>
<td>NXM940A-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX940CM-PS-□</td>
<td>NXM940M-PS-□</td>
<td>NXD20-C</td>
</tr>
</tbody>
</table>

**PS geared type with electromagnetic brake**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX65MA-PS-□</td>
<td>NXM65M-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX65MC-PS-□</td>
<td>NXM65M-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX610MA-PS-□</td>
<td>NXM610M-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX610MC-PS-□</td>
<td>NXM610M-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX920MA-PS-□</td>
<td>NXM920M-PS-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX920MC-PS-□</td>
<td>NXM920M-PS-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX940MS-PS-□</td>
<td>NXM940M-PS-□</td>
<td>NXD20-A</td>
</tr>
</tbody>
</table>

**PJ geared type**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX810AA-J-□</td>
<td>NXM810A-J-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX810AC-J-□</td>
<td>NXM810A-J-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX820AA-J-□</td>
<td>NXM820A-J-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX820AC-J-□</td>
<td>NXM820A-J-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX1040AS-J-□</td>
<td>NXM1040A-J-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX1075AS-J-□</td>
<td>NXM1075A-J-□</td>
<td>NXD75-S</td>
</tr>
</tbody>
</table>

**PJ geared type with electromagnetic brake**

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model</th>
<th>Driver model</th>
</tr>
</thead>
<tbody>
<tr>
<td>NX810MA-J-□</td>
<td>NXM810M-J-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX810MC-J-□</td>
<td>NXM810M-J-□</td>
<td>NXD20-C</td>
</tr>
<tr>
<td>NX820MA-J-□</td>
<td>NXM820M-J-□</td>
<td>NXD20-A</td>
</tr>
<tr>
<td>NX820MC-J-□</td>
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<td>NXD20-C</td>
</tr>
<tr>
<td>NX1040MS-J-□</td>
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<td>NXD75-S</td>
</tr>
<tr>
<td>NX1075MS-J-□</td>
<td>NXM1075M-J-□</td>
<td>NXD75-S</td>
</tr>
</tbody>
</table>
- **ν** indicates A (single shaft) or M (with electromagnetic brake).
- **□** indicates the cable length.
- **◆** indicates the gear ratio.
- The model names of motors (UL recognized) apply to the condition before a gearhead is assembled.

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor model (UL recognized)</th>
<th>Driver model</th>
<th>Input Voltage</th>
<th>Frequency</th>
<th>Current</th>
<th>Output Voltage</th>
<th>Frequency</th>
<th>Current</th>
<th>Output</th>
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</thead>
<tbody>
<tr>
<td>NX45A-□</td>
<td>NXM45</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>1.9 A</td>
<td>Three-phase</td>
<td>0-119 V</td>
<td>0.91 A</td>
<td>50 W</td>
</tr>
<tr>
<td>NX45C-□</td>
<td>NXM45</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>1.2 A/</td>
<td>Single-phase</td>
<td>0-119 V</td>
<td>0.91 A</td>
<td>50 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>0.7 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX410A-□</td>
<td>NXM410</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>2.9 A</td>
<td>Three-phase</td>
<td>0-144 V</td>
<td>1.12 A</td>
<td>100 W</td>
</tr>
<tr>
<td>NX410C-□</td>
<td>NXM410</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>1.8 A/</td>
<td>Single-phase</td>
<td>0-144 V</td>
<td>1.0 A</td>
<td>100 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.0 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX65A-PS ◊</td>
<td>NXM65A</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>1.9 A</td>
<td>Three-phase</td>
<td>0-119 V</td>
<td>0.91 A</td>
<td>50 W</td>
</tr>
<tr>
<td>NX65C-PS ◊</td>
<td>NXM65C</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>1.2 A/</td>
<td>Single-phase</td>
<td>0-119 V</td>
<td>0.91 A</td>
<td>50 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>0.7 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX610A-PS ◊</td>
<td>NXM610A</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>2.9 A</td>
<td>Three-phase</td>
<td>0-144 V</td>
<td>1.12 A</td>
<td>100 W</td>
</tr>
<tr>
<td>NX610C-PS ◊</td>
<td>NXM610C</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>1.8 A/</td>
<td>Single-phase</td>
<td>0-144 V</td>
<td>1.0 A</td>
<td>100 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.0 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX620A-□</td>
<td>NXM620</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>4.6 A</td>
<td>Three-phase</td>
<td>0-152 V</td>
<td>1.8 A</td>
<td>200 W</td>
</tr>
<tr>
<td>NX620C-□</td>
<td>NXM620</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>2.8 A/</td>
<td>Single-phase</td>
<td>0-152 V</td>
<td>1.6 A</td>
<td>200 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.6 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX640S-□</td>
<td>NXM640</td>
<td>NXD75-S</td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>2.8 A</td>
<td>Three-phase</td>
<td>0-162 V</td>
<td>3.2 A</td>
<td>400 W</td>
</tr>
<tr>
<td>NX810A-J-◊</td>
<td>NXM810A</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>2.8 A</td>
<td>Three-phase</td>
<td>0-141 V</td>
<td>1.1 A</td>
<td>100 W</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>NX810C-J-◊</td>
<td>NXM810C</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>1.8 A/</td>
<td>Single-phase</td>
<td>0-141 V</td>
<td>1.0 A</td>
<td>100 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.0 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX820A-J-◊</td>
<td>NXM820A</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>4.6 A</td>
<td>Three-phase</td>
<td>0-152 V</td>
<td>1.8 A</td>
<td>200 W</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>NX820C-J-◊</td>
<td>NXM820C</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>2.8 A/</td>
<td>Single-phase</td>
<td>0-152 V</td>
<td>1.6 A</td>
<td>200 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.6 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX920A-PS ◊</td>
<td>NXM920A</td>
<td>NXD20-A</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>4.6 A</td>
<td>Three-phase</td>
<td>0-152 V</td>
<td>1.8 A</td>
<td>200 W</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>NX920C-PS ◊</td>
<td>NXM920C</td>
<td>NXD20-C</td>
<td>Single-phase/</td>
<td>100-115 V</td>
<td>2.8 A/</td>
<td>Single-phase</td>
<td>0-152 V</td>
<td>1.6 A</td>
<td>200 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>1.6 A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX940S-PS ◊</td>
<td>NXM940S</td>
<td>NXD75-S</td>
<td>Three-phase</td>
<td>200-230 V</td>
<td>2.8 A</td>
<td>Three-phase</td>
<td>0-162 V</td>
<td>3.2 A</td>
<td>400 W</td>
</tr>
<tr>
<td>NX975S-□</td>
<td>NXM975S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX1075S-J-◊</td>
<td>NXM1075S</td>
<td>NXD975-J</td>
<td>Single-phase</td>
<td>100-115 V</td>
<td>4.7 A</td>
<td>Three-phase</td>
<td>0-160 V</td>
<td>5.9 A</td>
<td>750 W</td>
</tr>
</tbody>
</table>
### Names and functions of parts (Example: NXD20-C)

#### LED
- **Function:** Indicate the status of the driver.
  - POWER (green): This LED is lit while the main power is input.
  - ALARM (red): This LED will blink when an alarm is generated.
  - POS (green): This LED is lit in the position control mode.
  - SPD (green): This LED is lit in the speed control mode.
  - TRQ (green): This LED is lit in the torque control mode.
  - TEN (green): This LED is lit in the torque control mode.

#### Control mode setting switches (SW1-1, 1-2)
- **Description:** These switches are used to set the control mode of the driver (position control, speed control, torque control or tension control).

#### Absolute system setting switch (SW1-3)
- **Description:** This switch is effective in the position control mode. Set the switch when the absolute function of the driver is used by connecting the accessory battery.
  - ON: Enable the absolute function.
  - OFF: Disable the absolute function.
  - Factory setting is “OFF.”

#### Pulse input mode selector switch (SW1-4)
- **Description:** In the position control mode, this switch toggles the driver between the 1-pulse input mode and 2-pulse input mode according to the pulse output mode of the controller.
  - ON: 1-pulse input mode, negative logic.
  - OFF: 2-pulse input mode, negative logic.
  - Factory setting depends on the destination country.

#### Mechanical rigidity setting switch (SW2)
- **Description:**
  - Position control mode or speed control mode:
    - The switch sets the gain adjustment level according to the mechanical rigidity. The factory setting is “6.”
  - Torque control mode:
    - Not used.
  - Tension control mode:
    - The switch sets the minimum speed in the simple mode. The factory setting is “6.” The switch is not used in high function mode I or high function mode II.

#### Internal potentiometers (VR1, VR2)
- **Position control mode:**
  - VR1: This switch sets the damping control frequency.
  - VR2: Not used.
- **Speed control mode:**
  - VR1: This switch sets the speed command value.
  - VR2: This switch sets the acceleration/deceleration time.
- **Torque control mode:**
  - VR1: This switch sets the torque command value.
  - VR2: This switch sets the speed limit.
- **Tension control mode:**
  - VR1: This switch sets the tension command value.
  - VR2: This switch sets the speed limit.

#### Data edit connector (CN4)
- **Description:** Connect a PC in which the data setting software MEXE02 has been installed, or the data setter OPX2A.

#### Encoder connector (CN5)
- **Description:** Connect the motor encoder via a cable for encoder.

#### Analog I/O signals connector (CN6)
- **Description:** Connect the analog I/O signals.

#### I/O signals connector (CN7)
- **Description:** Connect the I/O signals of the controller.

#### Protective earth terminal
- **Description:** Ground this terminal using a grounding wire of AWG16 (1.25 mm²) or larger.

#### Power supply input terminal (CN3)
- **Description:**
  - Single-phase 100-115 VAC
  - L, N: Connect single-phase 100-115 VAC.
  - Single-phase 200-230 VAC
  - L1, L2, L3: Connect single-phase 200-230 VAC.
  - L3: Not used.
  - Three-phase 200-230 VAC
  - L1, L2, L3: Connect a three-phase 200-230 VAC.
  - NC: Not used.

#### Power supply input terminal (CN3)
- **Description:** Connect the accessory regeneration unit. If no regeneration unit is connected, plug in the CN1 connector to short the TH1 and TH2 terminals.

#### Electromagnetic brake terminal (CN1) [MB1, MB2]
- **Description:**
  - MB1: Electromagnetic brake − (black)
  - MB2: Electromagnetic brake + (white)

#### CHARGE LED (red)
- **Description:**
  - This LED is lit while the main power is input.
  - After the main power has been turned off, the LED will turn off once the residual voltage in the driver drops to a safe level.

#### Motor connector (CN2)
- **Description:**
  - Connect the lead wires from the cable for electromagnetic brake (24 VDC).
  - MB1: Electromagnetic brake − (black)
  - MB2: Electromagnetic brake + (white)

#### Internal potentiometers (VR1, VR2)
- **Description:**
  - POS (green): This switch sets the position control mode.
  - SPD (green): This switch sets the speed control mode.
  - TRQ (green): This switch sets the torque control mode.
  - TEN (green): This switch sets the tension control mode.

#### 24 VDC power supply input terminal (CN1) [24V]
- **Description:** Connect 24 VDC. Once a 24 VDC power supply is connected, you can check the contents of alarms that have generated even when the main power is cut off. If a motor with an electromagnetic brake is used, be sure to connect a 24 VDC power supply for the electromagnetic brake power.

#### Regeneration resistor thermal input terminal (CN1) [TH1, TH2]
- **Description:** Connect the accessory regeneration unit. If no regeneration unit is connected, plug in the CN1 connector to short the TH1 and TH2 terminals.

#### Internal potentiometers (VR1, VR2)
- **Description:**
  - VR1: This switch sets the tension command value.
  - VR2: This switch sets the speed command value.

#### Protective earth terminal
- **Description:** Ground this terminal using a grounding wire of AWG16 (1.25 mm²) or larger.

#### Battery connector (bottom)
- **Description:** Connect the accessory battery when using the absolute function of the driver in the position control mode.
## Installation

### Location for installation

The driver is designed and manufactured for installation in equipment. Install it in a well-ventilated location that provides easy access for inspection. The location must also satisfy the following conditions:

- Inside an enclosure that is installed indoors (provide vent holes)
- Operating ambient temperature 0 to +50 °C (+32 to +122 °F) (non-freezing)
- Operating ambient humidity 85% or less (non-condensing)
- Area that is free of explosive atmosphere or toxic gas (such as sulfuric gas) or liquid
- Area not exposed to direct sun
- Area free of excessive amount of dust, iron particles or the like
- Area subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of excessive salt
- Area not subject to continuous vibration or excessive shocks
- Area free of excessive electromagnetic noise (from welders, power machinery, etc.)
- Area not subject to splashing water (rain, water droplets), oil (oil droplets) or other liquids
- Area free of radioactive materials, magnetic fields or vacuum
- 1,000 m (3,300 ft.) or lower above sea level

### Installation direction

The driver is designed so that heat is dissipated via air convection and conduction through the enclosure. When two or more drivers are to be installed side by side, provide 20 mm (0.79 in.) and 50 mm (1.97 in.) clearances in the horizontal and vertical directions, respectively. When installing the driver in an enclosure, use two screws (three screws for NXD75-S) to secure the driver through the mounting holes. Screws (M4) are not supplied. Please provide separately.

- **NXD20-A, NXD20-C**
  - 35 (1.38)
  - 20 (0.79) or more
  - 60 (2.36)
  - 20 (0.79) or more

- **NXD75-S**
  - 90 (3.54)
  - 60 (2.36)
  - 90 (3.54)
  - 90 (3.54)

Unit: [mm (in.)]

**memo**

- Install the driver in an enclosure whose pollution degree is 2 or better environment, or whose degree of protection is IP54 minimum.
- Do not install any equipment that generates a large amount of heat or noise near the driver.
- Do not install the driver underneath the controller or other equipment vulnerable to heat.
- Check ventilation if the ambient temperature of the driver exceeds 50 °C (122 °F).
- Be sure to install the driver vertically (vertical position).

## Connection

### Connection method for connectors

#### Wiring the CN1 connector

1. Strip the insulation cover of the lead wire by 7 mm (0.28 in.)
2. Insert each lead wire into the CN1 connector and tighten the screw using a screwdriver

![Wiring the CN1 connector](image)

Connector screw size: M2.
Tightening torque: 0.22 to 0.25 N·m (31 to 35 oz-in)

#### Wiring the CN2/CN3 connectors

1. Strip off the cable sheath based on the strip gauge.
2. Push the connector wiring lever in the direction of the arrow.
3. Insert the cable.

You can also use a flat-tip screwdriver.

![Wiring the CN2/CN3 connectors](image)

Screw (M2.5)
Tightening torque: 0.5 to 0.55 N·m (71 to 78 oz-in)

#### Wiring the CN6/CN7 connectors

1. Align the washer in the depression in the case.
2. Insert the cable while pushing down the screwdriver.
3. Place the spring clamp on the I/O signal cable.
4. Insert the screwdriver here.

![Wiring the CN6/CN7 connectors](image)

Screw (M2)
Screw (M2.5)
Cable clamp
Connector
Case
Align the spring washer outside the case.
### Connecting the motor

#### Connection example (The electromagnetic brake motor)

- **CN1 connector**
  - Connect to CN1*
  - Connect to CN2*
  - Connect to CN5*

- **Cable for electromagnetic brake**
  - Cable for encoder/Encoder cable

- **Motor cable**
  - Cable for motor

- **Electromagnetic brake cable**
  - 24 VDC±10%
  - -
  - +
  - MB1
  - MB2

- **Connect to CN1**
  - U
  - V
  - W

- **Tightening torque:** 1.2 N·m (170 oz-in.)

- **Black**
- **White**
- **Red**
- **White**
- **Black**

- **Note**
  - Be certain the I/O signals cable is as short as possible. The maximum input frequency will decrease as the cable length increases.

- **Memo**
  - When installing the motor to a moving part, use an accessory flexible cable offering excellent flexibility.

#### Connecting the I/O signals

Solder the I/O signal cable (AWG28 to 24-0.08 to 0.2 mm^2) to the CN7 connector (36 pins). Use a shielded cable for I/O signals.

- **Connector pin assignment**
  - (viewed from soldering side)
  - **CN7**
  - U
  - V
  - W

- **Electromagnetic brake control signal output**
  - *WARNING:
  - The lead wires of the cable for electromagnetic brake have polarities, so connect them in the correct polarity. If the lead wires are connected with their polarities reversed, the electromagnetic brake will not operate properly.
  - Have the connector plugged in securely. Insecure connector connection may cause malfunction or damage to the motor or driver.
  - When plugging/unplugging the connector of the motor cable, turn off the power and wait for the CHARGE LED to turn off. The residual voltage may cause electric shock.

- **Connector function table (Position control mode)**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Ground connection</td>
</tr>
<tr>
<td>3</td>
<td>ASG+</td>
<td>A-phase pulse line-driver output</td>
</tr>
<tr>
<td>4</td>
<td>ASG−</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>BSG+</td>
<td>B-phase pulse line-driver output</td>
</tr>
<tr>
<td>6</td>
<td>BSG−</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>ZSG1+</td>
<td>Z-phase pulse line-driver output</td>
</tr>
<tr>
<td>8</td>
<td>ZSG1−</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>ALM+</td>
<td>Alarm output</td>
</tr>
<tr>
<td>10</td>
<td>ALM−</td>
<td></td>
</tr>
</tbody>
</table>
| 11      | WNG+ / MOVE+ / MBC+ | Warning output/ Motor moving output/
|         |                      | Electromagnetic brake control signal output* |
| 12      | WNG− / MOVE− / MBC− |                                    |
| 13      | END+                 | Positioning complete output         |
| 14      | END−                 |                                    |
| 15      | READY+ / AL0+ / P-OUT+ | Operation ready complete output/
|         |                      | Alarm code output bit 0* / Position data output bit 0 |
| 16      | READY− / AL0− / P-OUT− |                                    |
| 17      | TLC+ / AL1+ / P-OUT+ | Torque limit output / Alarm code output bit 1 * / Position data output bit 0 |
| 18      | TLC− / AL1− / P-OUT− |                                    |
| 19      | ZSG2+ / NEAR+ / AL2+ / P-OUT+ | Z-phase pulse open-collector output / Near position output* |
| 20      | ZSG2− / NEAR− / AL2− / P-OUT− | Alarm code output bit 2 * / Position data output bit 1 |
| 21      | GND                  | Ground connection                   |
| 22      | IN-COM               | Input common                        |
| 23      | S-ON                 | Servo on input                      |
| 24      | CLR/ALM-RST/P-CK     | Deviation clear input / Alarm reset input / Position data transmission clock input |
| 25      | P-REQ                | Position data request input         |
| 26      | TL                   | Torque limit enable input           |
Pin No. | Signal name | Name
---|---|---
27 | M0 | Data selection input
28 | M1 | Position preset input
30 | FREE | Shaft free input
31 | CW+/PLS+ | CW pulse input/Pulse input
32 | CW−/PLS− | CW pulse/pulse input for 24 V
33 | CW+24 V/PLS+24 V | CW pulse input/direction input for 24 V
34 | CCW+24 V/DIR+24 V | CCW pulse input/direction input
35 | CCW+/DIR+ | CCW pulse input/Direction input
36 | CCW−/DIR− | CCW pulse input/Direction input

* The signal will become effective if the applicable setting has been changed using the data setter OPX-2A or the data setting software MEXE02.

Functions of the connector vary depending on the control mode. Check the USER MANUAL for other control modes except position control mode.

### Connecting the analog I/O signals

About the connector (20 pins) for the analog I/O connector (CN6), use the accessory set (Accessory).

Solder the analog I/O cable (AWG28 to 24: 0.08 to 0.2 mm²) to the CN6 connector. Use a shielded cable for analog I/O signals.

#### Connector pin assignment (viewed from soldering side)

#### Connecting method of the connector (CN6)

Tightening torque: 0.3 to 0.35 N·m (42 to 49 oz-in)

#### Connector function table

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V-REF</td>
<td>Analog speed (command/limit) input</td>
<td>Terminal used to input an analog speed (command/limit).</td>
</tr>
<tr>
<td>2</td>
<td>SG</td>
<td>Signal ground</td>
<td>Ground for analog I/Os.</td>
</tr>
<tr>
<td>3</td>
<td>P-VREF</td>
<td>Reference voltage output for analog speed (command/limit) input</td>
<td>A power supply output used to connect a variable resistor to the analog speed (command/limit) input.</td>
</tr>
<tr>
<td>4</td>
<td>P-TREF</td>
<td>Reference voltage output for analog torque (command/limit) input</td>
<td>Power supply output used to connect a variable resistor to the analog torque (command/limit) input.</td>
</tr>
<tr>
<td>5</td>
<td>T-REF</td>
<td>Analog torque (command/limit) input</td>
<td>Terminal used to input an analog torque (command/limit).</td>
</tr>
<tr>
<td>6</td>
<td>SG</td>
<td>Signal ground</td>
<td>Ground for analog I/Os.</td>
</tr>
<tr>
<td>7</td>
<td>V-MON</td>
<td>Analog speed monitor output</td>
<td>Voltage corresponding to the monitored analog speed is output from here.</td>
</tr>
</tbody>
</table>

### Connecting the main power supply

Use the CN3 connector (7 pins) to connect the power supply cable (AWG16 to 14: 1.25 to 2.0 mm²) to the main power supply connector (CN3) on the driver.

- Do not wire the power supply cable of the driver in the same cable duct with other power line or motor cable. Doing so may cause malfunction due to noise.
- Before plugging/unplugging the CN3 connector, turn off the power and wait for the CHARGE LED to turn off. Failure to do so may cause electric shock due to residual voltage.

#### The current capacity for the power supply

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NX45</td>
<td>1.9 A or more</td>
<td>1.2 A or more</td>
<td>0.7 A or more</td>
</tr>
<tr>
<td>NX410</td>
<td>2.9 A or more</td>
<td>1.8 A or more</td>
<td>1.0 A or more</td>
</tr>
<tr>
<td>NX65</td>
<td>1.9 A or more</td>
<td>1.2 A or more</td>
<td>0.7 A or more</td>
</tr>
<tr>
<td>NX610</td>
<td>2.9 A or more</td>
<td>1.8 A or more</td>
<td>1.0 A or more</td>
</tr>
<tr>
<td>NX620</td>
<td>4.6 A or more</td>
<td>2.8 A or more</td>
<td>1.6 A or more</td>
</tr>
<tr>
<td>NX640</td>
<td>–</td>
<td>–</td>
<td>2.8 A or more</td>
</tr>
<tr>
<td>NX810</td>
<td>2.8 A or more</td>
<td>1.8 A or more</td>
<td>1.0 A or more</td>
</tr>
<tr>
<td>NX820</td>
<td>2.8 A or more</td>
<td>1.8 A or more</td>
<td>1.0 A or more</td>
</tr>
<tr>
<td>NX940</td>
<td>–</td>
<td>–</td>
<td>2.8 A or more</td>
</tr>
<tr>
<td>NX975</td>
<td>–</td>
<td>–</td>
<td>4.7 A or more</td>
</tr>
<tr>
<td>NX1040</td>
<td>2.9 A or more</td>
<td>–</td>
<td>4.7 A or more</td>
</tr>
<tr>
<td>NX1075</td>
<td>–</td>
<td>–</td>
<td>4.7 A or more</td>
</tr>
</tbody>
</table>

**Note**

The current capacity for the power supply as shown below is the value when operating the motor in the continuous duty region. When operating in the limited duty region, the current will flow maximum three times as much as the continuous region. Refer to the USER MANUAL for the continuous duty region and limited duty region.
**Grounding the driver**

Be sure to ground the protective earth terminal (screw size: M4) of the driver. Tightening torque: 1.2 N·m (170 oz·in).

You can ground either of the two protective earth terminals. The terminal not grounded should be connected to the protective earth lead of the motor cable.

Use a grounding wire (AWG16 to 14: 1.25 to 2.0 mm²), and do not share the protective earth terminal with a welder or any other power equipment.

When grounding the protective earth terminal, use a round terminal and affix the grounding point near the driver.

**Connecting the 24 VDC power supply input, regeneration resistor and electromagnetic brake**

Use the CN1 connector (6 pins) to connect the 24 VDC power supply input, regeneration resistor thermal input and electromagnetic brake. Connect the lead wire (AWG28 to 16: 0.08 to 1.25 mm²).

<table>
<thead>
<tr>
<th>Display</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24V+</td>
<td>24 VDC power supply input (Be sure to connect this pin when an electromagnetic brake is used.)</td>
</tr>
<tr>
<td>24V−</td>
<td></td>
</tr>
<tr>
<td>TH1</td>
<td>Regeneration resistor thermal input (If this pin is not used, short it using a jumper wire.)</td>
</tr>
<tr>
<td>TH2</td>
<td></td>
</tr>
<tr>
<td>MB1</td>
<td>Electromagnetic brake – (Connect the black lead wire of the electromagnetic brake.)</td>
</tr>
<tr>
<td>MB2</td>
<td>Electromagnetic brake + (Connect the white lead wire of the electromagnetic brake.)</td>
</tr>
</tbody>
</table>

**Connecting method of the connector (CN1)**

Tightening torque: 0.4 N·m (56 oz·in)

**Connecting the electromagnetic brake**

Refer to “Connecting the motor” on p.7.

**Connecting the 24 VDC power supply input**

Once a 24 VDC power supply is connected, you can check the contents of alarms that have generated even when the main power is cut off. Since the 24 VDC power supply is not used for operating the motor, connect it as necessary.

When the electromagnetic brake motor is used, be sure to connect the 24 VDC power supply of the following capacity.

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without</td>
<td>With</td>
</tr>
<tr>
<td></td>
<td>electromagnetic</td>
<td>electromagnetic</td>
</tr>
<tr>
<td></td>
<td>brake</td>
<td>brake</td>
</tr>
<tr>
<td>NX45, NX410</td>
<td>DC24 V±10%</td>
<td>0.4 A or more</td>
</tr>
<tr>
<td>NX65, NX610</td>
<td></td>
<td>0.7 A or more</td>
</tr>
<tr>
<td>NX620, NX640</td>
<td></td>
<td>0.8 A or more</td>
</tr>
<tr>
<td>NX810, NX820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX920, NX940</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NX975, NX1040, NX1075</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Connecting the regeneration unit**

- **When the internal regeneration resistor is used**

  The driver has an internal regeneration resistor. The driver is shipped with the TH1 and TH2 terminals of CN1, and RG2 and RG3 terminals of CN3, shorted respectively to enable the internal regeneration resistor.

- **When the accessory regeneration unit is used**

  Use the accessory regeneration unit if gravitational operation or other operation involving up/down movement, or sudden starting/stopping of a large inertia load, will be repeated frequently.

**Connecting the battery**

1. Hold the driver with its bottom facing up and plug the connector attached at the end of the battery lead wires into the battery connector.
2. Hook the tabs on the battery connector onto the mating parts on the driver.
3. Push in the battery holder carefully by ensuring that the lead wires are not pinched.
• Installing or removing the battery must be performed by qualified personnel with expert knowledge of the handling of the driver and battery.
• Remove the battery if the driver is not turned on for an extended period exceeding the data retention period. Failure to do so may cause the battery fluid to leak or battery performance to drop.
• When installing or removing the battery, cut off the main power supply and 24 VDC power supply of the driver.
• Once the battery is disconnected, the absolute motor position stored in the driver will be lost. After the battery has been installed, be sure to set the absolute motor position again.

Connecting the data setter
Connect the cable for OPX-2A or communication cable for the data setting software, to CN4 on the driver.

Caution
The driver's data edit connector (CN4) and analog I/O signals connector (CN6) are not insulated. When grounding the positive terminal of the power supply, do not connect any equipment (PC, etc.) whose negative terminal is grounded. Doing so may cause the driver and these equipment to short, damaging both.

Setting

<table>
<thead>
<tr>
<th>Control mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position control mode</td>
<td>The switch sets the gain adjustment level according to the mechanical rigidity.</td>
</tr>
<tr>
<td>Speed control mode</td>
<td>Not used.</td>
</tr>
<tr>
<td>Torque control mode</td>
<td>Not used.</td>
</tr>
<tr>
<td>Tension control mode</td>
<td>The switch sets the minimum speed in the simple mode. The switch is not used in high function mode I or high function mode II.</td>
</tr>
</tbody>
</table>

Internal potentiometers (VR1, VR2)

Control mode Internal Description
Position control mode VR1 This switch sets the damping control frequency.
VR2 This switch sets the speed command value.
Speed control mode VR1 This switch sets the acceleration/deceleration time.
VR2 Not used.
Torque control mode VR1 This switch sets the torque command value.
VR2 This switch sets the speed limit.
Tension control mode VR1 This switch sets the tension command value.
VR2 This switch sets the speed limit.

Inspection
It is recommended that periodic inspections be conducted for the items listed below after each operation of the motor. If an abnormal condition is noted, discontinue any use and contact your nearest office.

During inspection
• Check for a blocked opening of the driver case.
• Are any of the driver mounting screws or power connection terminal screws loose?
• Are there any strange smells or appearances in the power elements and filtering capacitors within the driver?

The driver uses semiconductor elements, so be extremely careful when handling them. Static electricity may damage the driver.

The pulse input mode (SW1-4)
ON: 1-pulse input mode, negative logic
OFF: 2-pulse input mode, negative logic
Each mode can only be set with a negative logic using the pulse input mode selector switch. To select a positive logic, set the applicable parameter using the OPX-2A or MEXE02. The factory setting depends on the destination country.

Mechanical rigidity setting switch (SW2)

Control mode Description
Position control mode The switch sets the gain adjustment level according to the mechanical rigidity.
Speed control mode Not used.
Torque control mode Not used.
Tension control mode The switch sets the minimum speed in the simple mode. The switch is not used in high function mode I or high function mode II.

Control mode setting switches (SW1-1, 1-2)
These switches are used to set the control mode of the driver (position control, speed control, torque control or tension control).

Absolute system (SW1-3)
Install the accessory battery. When the battery is connected, the current position will be retained even in the event of power outage or after the driver power is cut off.
ON: Enable the absolute function
OFF: Disable the absolute function (factory setting)
Driver specifications

<table>
<thead>
<tr>
<th>Operation environment</th>
<th>Degree of protection</th>
<th>IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ambient temperature</td>
<td>0 to +50 °C (+32 to +122 °F) (non-freezing)</td>
</tr>
<tr>
<td></td>
<td>Humidity</td>
<td>85% or less (non-condensing)</td>
</tr>
<tr>
<td></td>
<td>Altitude</td>
<td>Up to 1,000 m (3,300 ft.) above sea level</td>
</tr>
<tr>
<td></td>
<td>Surrounding atmosphere</td>
<td>No corrosive gas, dust, water or oil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Storage environment</th>
<th>Ambient temperature</th>
<th>−20 to +60 °C (−4 to +140 °F) (non-freezing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Humidity</td>
<td>85% or less (non-condensing)</td>
</tr>
<tr>
<td></td>
<td>Altitude</td>
<td>Up to 3,000 m (10,000 ft.) above sea level</td>
</tr>
<tr>
<td></td>
<td>Surrounding atmosphere</td>
<td>No corrosive gas, dust, water or oil</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipping environment</th>
<th>Ambient temperature</th>
<th>−20 to +60 °C (−4 to +140 °F) (non-freezing)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Humidity</td>
<td>85% or less (non-condensing)</td>
</tr>
<tr>
<td></td>
<td>Altitude</td>
<td>Up to 3,000 m (10,000 ft.) above sea level</td>
</tr>
<tr>
<td></td>
<td>Surrounding atmosphere</td>
<td>No corrosive gas, dust, water or oil</td>
</tr>
</tbody>
</table>

Note

- Maximum Surrounding Air Temperature 40-50 °C. When the surrounding air temperature exceeds 40 °C, continuous motor output power shall be within the derating curve. (NXD20-A and NXD20-C)
- Maximum Surrounding Air Temperature 50 °C. When the surrounding air temperature exceeds 45 °C, continuous motor output power shall be within the derating curve. (NXD75-S)