

NX-series Position Interface Unit NX-EC0/ECS/PG0

CSM_NX-EC0_ECS_PG0_DS_E_3_5

NX Units for fast and precise positioning control

• Incremental Encoder Input Unit (NX-EC0)

More precise timing control by synchronizing the position data with the EtherCAT® Distributed Clock



NX-EC0122

NX-EC0142

• SSI Input Unit (NX-ECS)

Synchronous Serial Interface (SSI) to connect external axes to the Sysmac system



NX-PG0242-5

NX-PG0342-5

• Pulse Output Unit (NX-PG0)

Positioning control with pulse outputs to command stepper motor drives and other pulse input motor drives

General Specifications

Item	Specification
Enclosure	Mounted in a panel
Grounding method	Ground to less than 100 Ω
Operating environment	Ambient operating temperature 0 to 55°C
	Ambient operating humidity 10% to 95% (with no condensation or icing)
	Atmosphere Must be free from corrosive gases.
	Ambient storage temperature -25 to 70°C (with no condensation or icing)
	Altitude 2,000 m max.
	Pollution degree Pollution degree 2 or less: Meets IEC 61010-2-201.
	Noise immunity Conforms to IEC61000-4-4, 2 kV (power supply line)
	Overvoltage category Category II: Meets IEC 61010-2-201.
	EMC immunity level Zone B
	Vibration resistance Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz, acceleration of 9.8 m/s ² , 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
Shock resistance	Conforms to IEC 60068-2-27. 147 m/s ² , 3 times each in X, Y, and Z directions
Applicable standards *	cULus: Listed (UL508) or Listed (UL 61010-2-201), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, LR

* Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

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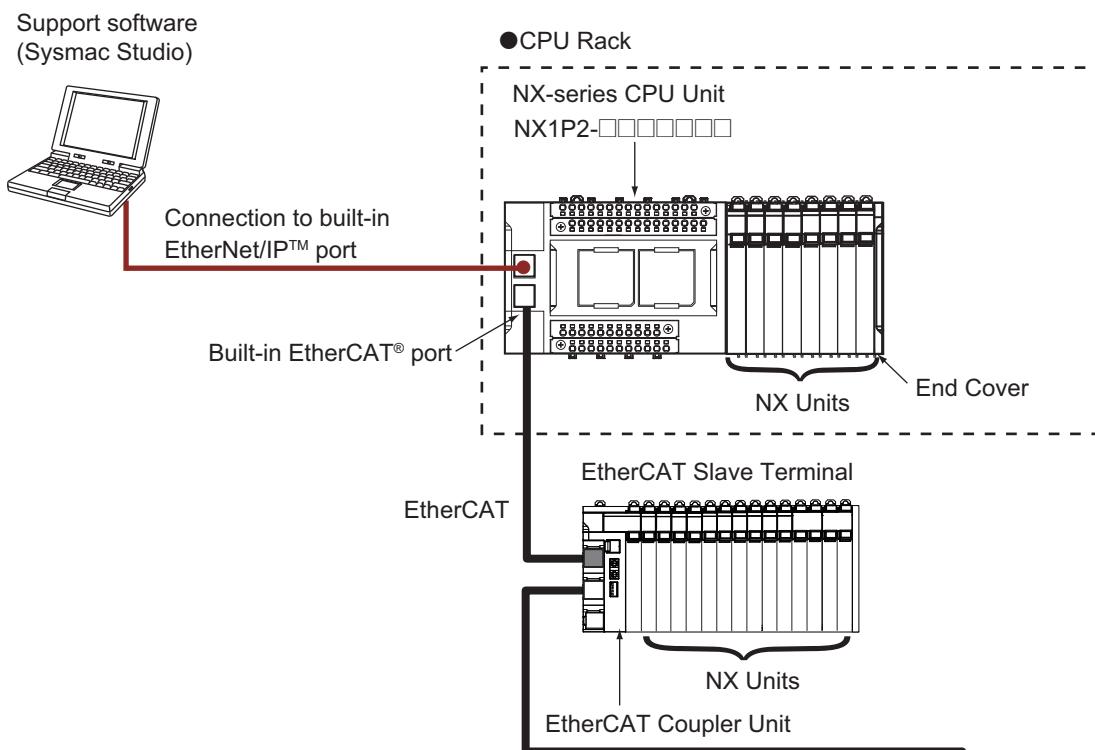
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System Configurations

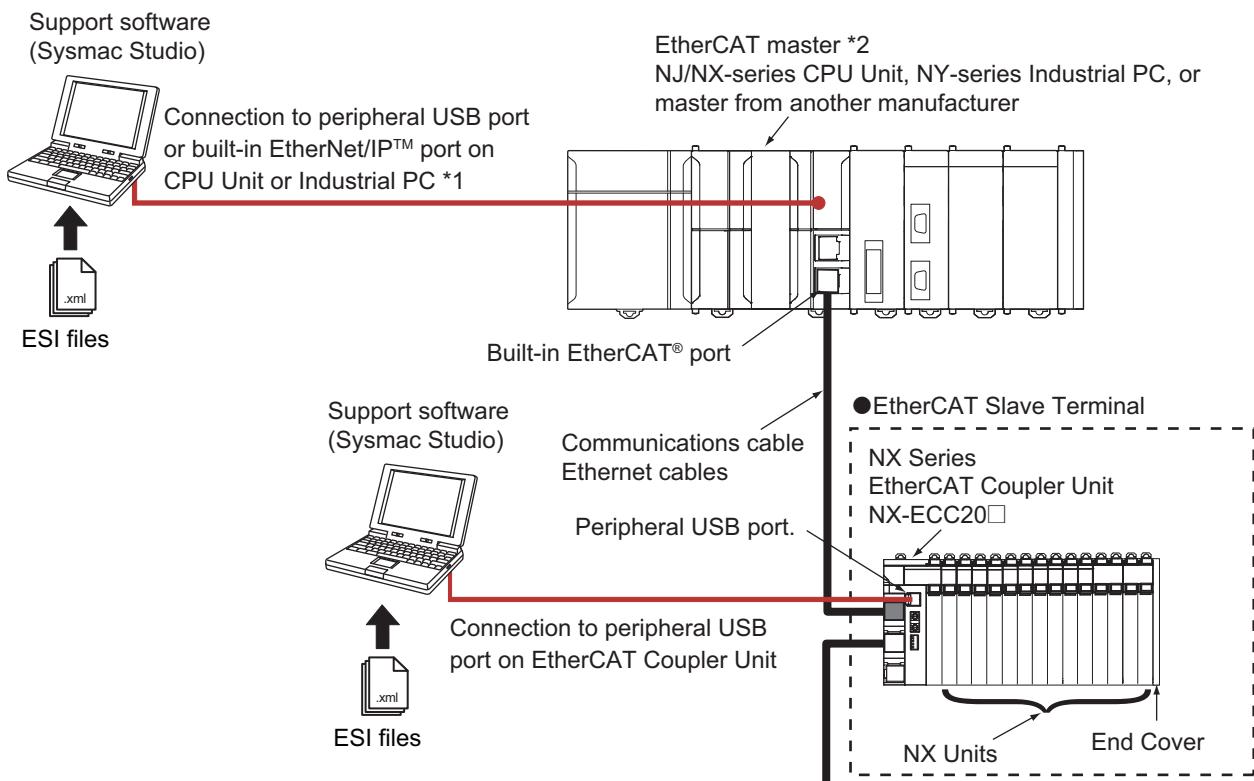
Connected to a CPU Unit

The following figure shows a system configuration when NX Units are connected to an NX-series CPU Unit.



Connected to an EtherCAT Coupler Unit

The following figure shows an example of the system configuration when an EtherCAT Coupler Unit is used as a Communications Coupler Unit.



*1. The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.

*2. An EtherCAT Slave Terminal cannot be connected to any of the OMRON CJ1W-NC□81/□82 Position Control Units even though they can operate as EtherCAT masters.

Note: To check whether NX Units can be connected to your CPU Unit or Communications Coupler Unit, refer to the version information.

Model Number Structure

NX-□□□□□-□

(1) (2) (3) (4) (5)

(1) Unit type

No.	Specification
EC0	Incremental Encoder Input Unit
ECS	Serial Encoder Input Unit (SSI Input Unit)
PG0	Pulse Output Unit

(2) Number of Channels

No.	Specification
1	1 channel
2	2 channels
3	4 channels

(3) I/O Specifications

The I/O specifications depend on the Unit type.

(4) Additional Functions

No.	Specification
2	Supports synchronous refreshing

(5) External connection terminals

No.	Specification
None	Screwless clamping terminal block
-5	MIL connector

Ordering Information

Applicable standards

Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

Position Interface: Incremental Encoder Input Units

Product name	Specification						Model		
	Number of channels	External inputs	Maximum response frequency	I/O refreshing method *	Number of I/O entry mappings	Remarks			
Incremental Encoder Input Unit	1 (NPN)	3 (NPN)	500 kHz	<ul style="list-style-type: none"> • Free-Run refreshing • Synchronous I/O refreshing • Task period prioritized refreshing 	1/1	24-V voltage input	NX-EC0112		
	1 (PNP)	3 (PNP)				Line receiver input	NX-EC0122		
	1	3 (NPN)	4 MHz		2/2	24-V voltage input	NX-EC0132		
		3 (PNP)				Line receiver input	NX-EC0142		
	2 (NPN)	None	500 kHz			24-V voltage input	NX-EC0212		
	2 (PNP)					Line receiver input	NX-EC0222		

* Refer to the I/O Refreshing Methods in the *USER'S MANUAL* (Cat. No. W524) for the communications cycles for each model.

Position Interface: SSI Input Units

Product name	Specification					Model
	Number of channels	Input/Output form	Maximum data length	Encoder power supply	Type of external connections	
SSI Input Unit	1	EIA standard RS-422-A	32 bits	24 VDC, 0.3 A/CH	Screwless push-in terminal block (12 terminals)	NX-ECS112
	2	EIA standard RS-422-A	32 bits	24 VDC, 0.3 A/CH	Screwless push-in terminal block (12 terminals)	NX-ECS212

Position Interface: Pulse Output Units

Product name	Specification							Model		
	Number of channels *1	External inputs	External outputs	Maximum pulse output speed	I/O refreshing method	Number of I/O entry mappings	Control output interface			
Pulse Output Unit	1 (NPN)	2 (NPN)	1 (NPN)	500 kpps	<ul style="list-style-type: none"> • Synchronous I/O refreshing • Task period prioritized refreshing *2 	1/1	Open collector output	NX-PG0112		
	1 (PNP)	2 (PNP)	1 (PNP)			2/2	Line driver output	NX-PG0122		
	2	5 inputs/CH (NPN)	3 outputs/CH (NPN)	4 Mpps		4/4		NX-PG0232-5		
		5 inputs/CH (PNP)	3 outputs/CH (PNP)					NX-PG0242-5		
	4	5 inputs/CH (NPN)	3 outputs/CH (NPN)					NX-PG0332-5		
		5 inputs/CH (PNP)	3 outputs/CH (PNP)					NX-PG0342-5		

*1. This is the number of pulse output channels.

*2. Unit version 1.2 or later and an NX-ECC203 EtherCAT Coupler Unit are required.

Cables and Connectors for Line Driver Output Units with MIL Connectors

Product name	Specification	Model
Connector-Terminal Block Conversion Unit	MIL Connectors type (Push-in spring) 34-terminals	
	MIL Connectors type (Slim Connector) 34-terminals	
	MIL Connectors type (Slotted screw (rise up)) 34-terminals	
Cable for Connector-Terminal Block Conversion Unit	MIL Connectors type 34-terminals 	Cable length: 0.5 m XW2Z-050EE
		Cable length: 1 m XW2Z-100EE
		Cable length: 1.5 m XW2Z-150EE
		Cable length: 2 m XW2Z-200EE
		Cable length: 3 m XW2Z-300EE
		Cable length: 5 m XW2Z-500EE

Note: Each of NX-PG0232-5 and NX-PG0242-5 has one MIL connector. Therefore, one Connector-Terminal Block Conversion Unit is required. Each of NX-PG0332-5 and NX-PG0342-5 has two MIL connectors. Therefore, two Connector-Terminal Block Conversion Units are required.

Optional Products

Product name	Specification	Model
Unit/Terminal Block Coding Pins	For 10 Units (Terminal Block: 30 pins, Unit: 30 pins)	NX-AUX02
Product name	Specification	Model
Terminal Block	No. of terminals	Terminal number indications
	12	A/B
	16	A/B
	12	C/D
		None
		10 A
		NX-TBA122
		NX-TBA162
		NX-TBB122

Accessories

Not included.

Version Information

Connected to a CPU Unit

Refer to the user's manual for the CPU Unit details on the CPU Units to which NX Units can be connected.

NX Units		Corresponding unit versions/versions	
Model	Unit version	CPU Unit	Sysmac Studio
NX-EC0112	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0122	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-EC0132	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0142	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-EC0212	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0222	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-ECS112	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-ECS212	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-PG0112	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		Ver. 1.19
	Ver. 1.3		
NX-PG0122	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		Ver. 1.19
	Ver. 1.2		
	Ver. 1.3		
NX-PG0232-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0242-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0332-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0342-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19

Note: Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

Connected to an EtherCAT Coupler Unit

NX Units		Corresponding unit versions/versions		
Model	Unit version	EtherCAT Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio
NX-EC0112	Ver. 1.1	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.10
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-EC0122	Ver. 1.0	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.07
	Ver. 1.1	Ver. 1.3 * ^{2³}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-EC0132	Ver. 1.1	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.10
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-EC0142	Ver. 1.0	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.07
	Ver. 1.1	Ver. 1.3 * ^{2³}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-EC0212	Ver. 1.1	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.10
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-EC0222	Ver. 1.0	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.07
	Ver. 1.1	Ver. 1.3 * ^{2³}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-ECS112	Ver. 1.0	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.07
	Ver. 1.1	Ver. 1.3 * ^{2³}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-ECS212	Ver. 1.0	Ver. 1.1 * ¹	Ver. 1.06 * ¹	Ver. 1.07
	Ver. 1.1	Ver. 1.3 * ^{2³}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2³}		Ver. 1.13
NX-PG0112	Ver. 1.1	Ver. 1.0	Ver. 1.05	Ver. 1.10
	Ver. 1.2	Ver. 1.3 * ^{2⁴}		Ver. 1.13
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19
NX-PG0122	Ver. 1.0	Ver. 1.0	Ver. 1.05	Ver. 1.06
	Ver. 1.1	Ver. 1.3 * ^{2⁴}		Ver. 1.08
	Ver. 1.2	Ver. 1.3 * ^{2⁴}		Ver. 1.13
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19
NX-PG0232-5	Ver. 1.2	Ver. 1.3 * ^{2⁴}	Ver. 1.05	Ver. 1.15
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19
NX-PG0242-5	Ver. 1.2	Ver. 1.3 * ^{2⁴}	Ver. 1.05	Ver. 1.15
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19
NX-PG0332-5	Ver. 1.2	Ver. 1.3 * ^{2⁴}	Ver. 1.05	Ver. 1.15
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19
NX-PG0342-5	Ver. 1.2	Ver. 1.3 * ^{2⁴}	Ver. 1.05	Ver. 1.15
	Ver. 1.3	Ver. 1.3 * ^{2⁴}		Ver. 1.19

Note: Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

*1. You can use the following versions if time stamp refreshing is not used.

*2. To use task period prioritized refreshing, you must use the NX-ECC203.

*3. If you do not use task period prioritized refreshing, you can use EtherCAT Coupler Units which support Position Interface Units with unit version 1.1 or earlier.

*4. If you do not use task period prioritized refreshing, you can use EtherCAT Coupler Units with unit version 1.0.

Connected to an EtherNet/IP Coupler Unit

NX Units		Corresponding unit versions/versions					
Model	Unit version	Application with an NJ/NX/NY-series Controller *1			Application with a CS/CJ/CP-series PLC *2		
		EtherNet/IP Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio	EtherNet/IP Coupler Unit	Sysmac Studio	NX-IO Configurator *3
NX-EC0112	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0122	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1					Ver. 1.13	
	Ver. 1.2						
NX-EC0132	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0142	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1					Ver. 1.13	
	Ver. 1.2						
NX-EC0212	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0222	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1					Ver. 1.13	
	Ver. 1.2						
NX-ECS112	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1					Ver. 1.13	
	Ver. 1.2						
NX-ECS212	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1					Ver. 1.13	
	Ver. 1.2						
NX-PG0112	Ver. 1.1	---	---	---	---	---	---
	Ver. 1.2					---	
	Ver. 1.3					---	
NX-PG0122	Ver. 1.0	---	---	---	---	---	---
	Ver. 1.1					---	
	Ver. 1.2					---	
	Ver. 1.3					---	
NX-PG0232-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3					---	
NX-PG0242-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3					---	
NX-PG0332-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3					---	
NX-PG0342-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3					---	

Note: 1. Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

2. You cannot connect the relevant NX Unit or use the relevant NX Unit function if "—" is shown in the corresponding unit versions/versions column.

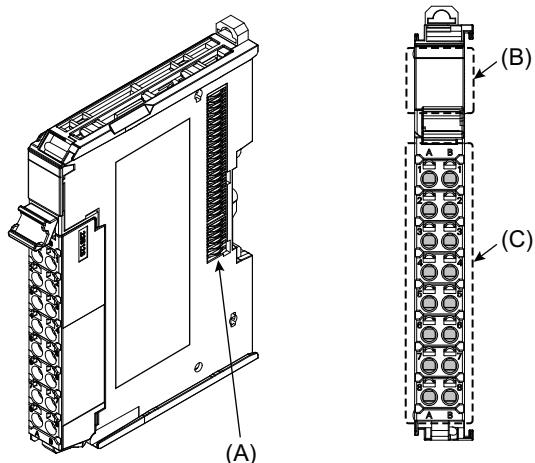
*1. Refer to the user's manual of the EtherNet/IP Coupler Unit for the unit versions of EtherNet/IP Units corresponding to EtherNet/IP Coupler Units.

*2. Refer to the user's manual of the EtherNet/IP Coupler Unit for the unit versions of CPU Units and EtherNet/IP Units corresponding to EtherNet/IP Coupler Units.

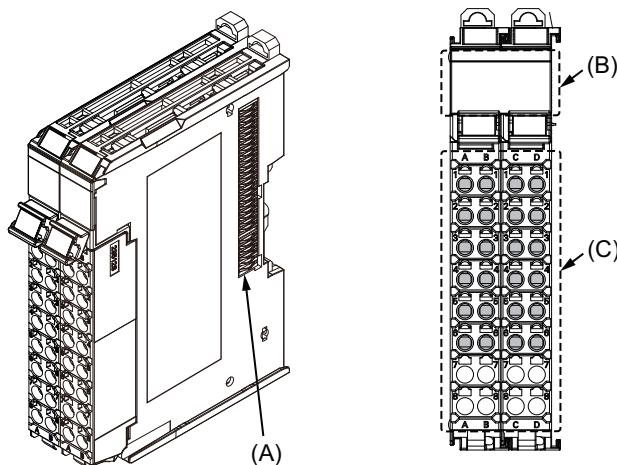
*3. For connection to an EtherNet/IP Coupler Unit with unit version 1.0, connection is supported only for a connection to the peripheral USB port on the EtherNet/IP Coupler Unit. You cannot connect by any other path. If you need to connect by another path, use an EtherNet/IP Coupler Unit with unit version 1.2 or later.

Screwless Clamping Terminal Block Type

12 mm Width

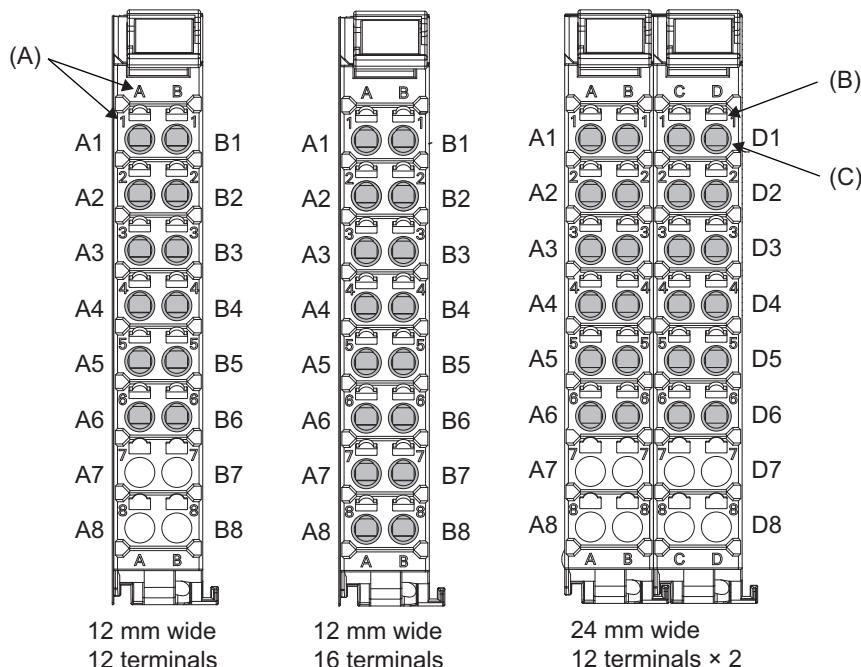


24 mm Width



Letter	Item	Specification
(A)	NX bus connector	This connector is used to connect to another Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The terminal block is used to connect to external devices. The number of terminals depends on the Unit.

Terminal Blocks



Letter	Item	Specification
(A)	Terminal number indication	The terminal number is identified by a column (A through D) and a row (1 through 8). Therefore, terminal numbers are written as a combination of columns and rows, A1 through A8 and B1 through B8. For a 24-mm-wide terminal block, the left side contains terminals A1 through A8 and B1 through B8. The right side contains terminals C1 through C8 and D1 through D8. The terminal number indication is the same regardless of the number of terminals on the terminal block, as shown above.
(B)	Release hole	A flat-blade screwdriver is inserted here to attach and remove the wiring.
(C)	Terminal hole	The wires are inserted into these holes.

Applicable Terminal Blocks for Each Unit Model

Unit model	Terminal Blocks				
	Model	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity
NX-EC0122	NX-TBA162	16	A/B	None	10 A
NX-EC0222	NX-TBA122	12	A/B	None	10 A
NX-EC0142	NX-TBA122	12	A/B	None	10 A
	NX-TBB122		C/D		
NX-ECS122	NX-TBA122	12	A/B	None	10 A
NX-ECS212	NX-TBA122	12	A/B	None	10 A
NX-PG0112	NX-TBA162	16	A/B	None	10 A
NX-PG0122					

Applicable Wires

Using Ferrules

If you use ferrules, attach the twisted wires to them.

Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.

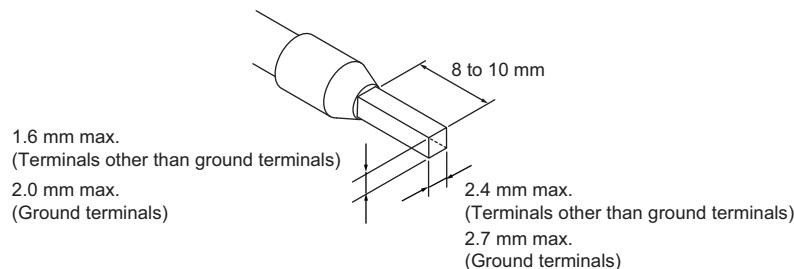
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal type	Manufacturer	Ferrule model	Applicable wire (mm ² (AWG))	Crimping tool	
Terminals other than ground terminals	Phoenix Contact	AI0,34-8	0.34 (#22)	Phoenix Contact (The figure in parentheses is the applicable wire size.) CRIMPFOX 6 (0.25 to 6 mm ² , AWG 24 to 10)	
		AI0,5-8	0.5 (#20)		
		AI0,5-10			
		AI0,75-8	0.75 (#18)		
		AI0,75-10			
		AI1,0-8	1.0 (#18)		
		AI1,0-10			
		AI1,5-8	1.5 (#16)		
		AI1,5-10			
		AI2,5-10	2.0 *1		
Ground terminals	Weidmuller	H0.14/12	0.14 (#26)	Weidmuller (The figure in parentheses is the applicable wire size.) PZ6 Roto (0.14 to 6 mm ² , AWG 26 to 10)	
Terminals other than ground terminals		H0.25/12	0.25 (#24)		
		H0.34/12	0.34 (#22)		
		H0.5/14	0.5 (#20)		
		H0.5/16			
		H0.75/14	0.75 (#18)		
		H0.75/16			
		H1.0/14	1.0 (#18)		
		H1.0/16			
		H1.5/14	1.5 (#16)		
		H1.5/16			

*1. Some AWG 14 wires exceed 2.0 mm² and cannot be used in the screwless clamping terminal block.

When you use any ferrules other than those in the above table, crimp them to the twisted wires so that the following processed dimensions are achieved.



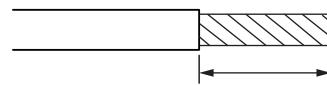
Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, use the following table to determine the correct wire specifications.

Terminals		Wire type				Wire size	Conductor length (stripping length)
		Twisted wires		Solid wire			
Classification	Current capacity	Plated	Unplated	Plated	Unplated		
All terminals except ground terminals	2 A or less	Possible	Possible	Possible	Possible	0.08 to 1.5 mm ² AWG28 to 16	8 to 10 mm
	Greater than 2 A and 4 A or less		Not Possible	Possible *1	Not Possible		
	Greater than 4 A		Possible *1	Not Possible	Not Possible		
Ground terminals	---	Possible	Possible	Possible *2	Possible *2	2.0 mm ²	9 to 10 mm

*1 Secure wires to the screwless clamping terminal block. Refer to the Securing Wires in the USER'S MANUAL for how to secure wires.

*2 With the NX-TB□□□1 Terminal Block, use twisted wires to connect the ground terminal. Do not use a solid wire.

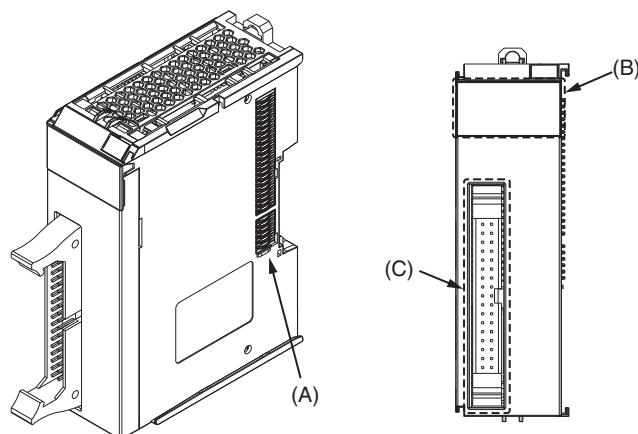


Conductor length (stripping length)

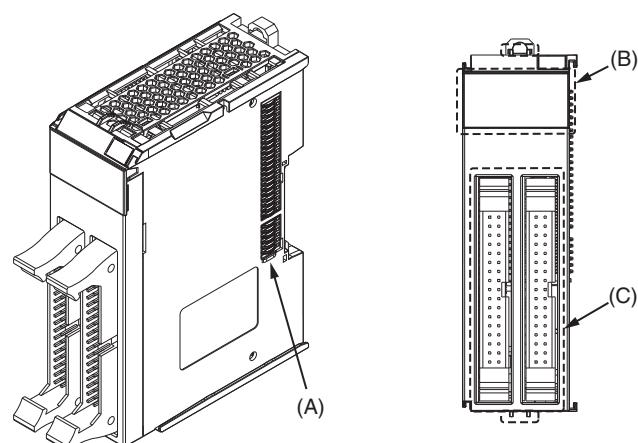
<Additional Information> If more than 2 A will flow on the wires, use plated wires or use ferrules.

MIL Connector Type (1 Connector with 34 terminals)

30 mm Width

**MIL Connector Type (2 Connectors with 34 terminals)**

30 mm Width

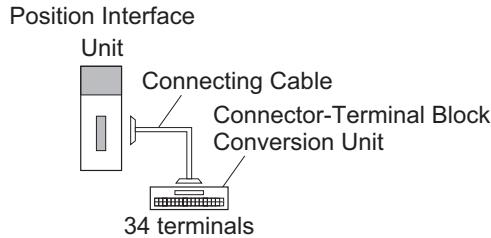


Letter	Item	Specification
(A)	NX bus connector	This connector is used to connect to another Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The connectors are used to connect to external devices. The number of connectors with 34 terminals depends on the Unit.

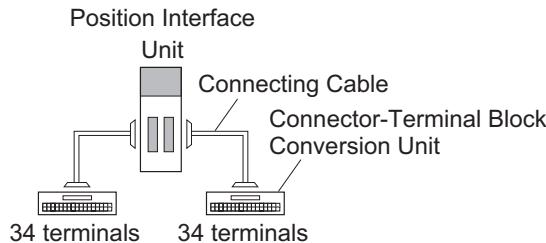
Connecting to Connector-Terminal Block Conversion Units

Connection Examples

(a) NX-PG0232-5 and NX-PG0242-5



(b) NX-PG0332-5 and NX-PG0342-5



Connecting Cable

The table below shows applicable connecting cables.

Model	Manufacturer
XW2Z-□□□EE	OMRON Corporation

The cable length from the Unit to an external device connected through the Connector-Terminal Block Conversion Units should not be longer than the specified cable length for the Unit.

Refer to the Specification for each units.

Connector-Terminal Block Conversion Unit

The table below shows applicable Connector-Terminal Block Conversion Units.

Model	Manufacturer
XW2K-34G-T	OMRON Corporation
XW2D-34G6	
XW2R-E34GD-T	

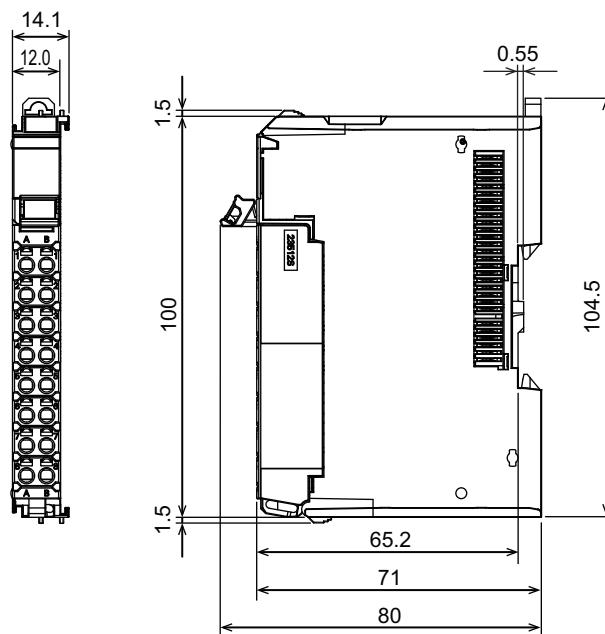
Each of NX-PG0232-5 and NX-PG0242-5 has one MIL connector. Therefore, one Connector-Terminal Block Conversion Unit is required.

Each of NX-PG0332-5 and NX-PG0342-5 has two MIL Connectors. Therefore, two Connector-Terminal Block Conversion Units are required.

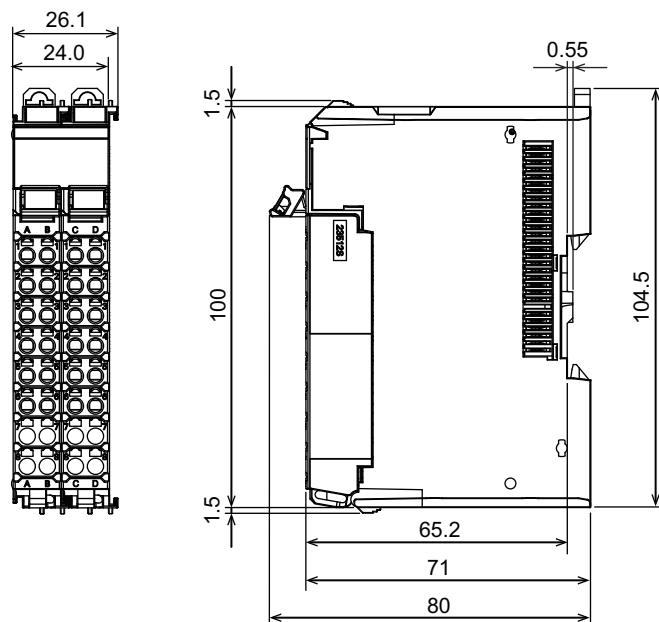
Dimensions

Screwless Clamping Terminal Block Type

12 mm Width

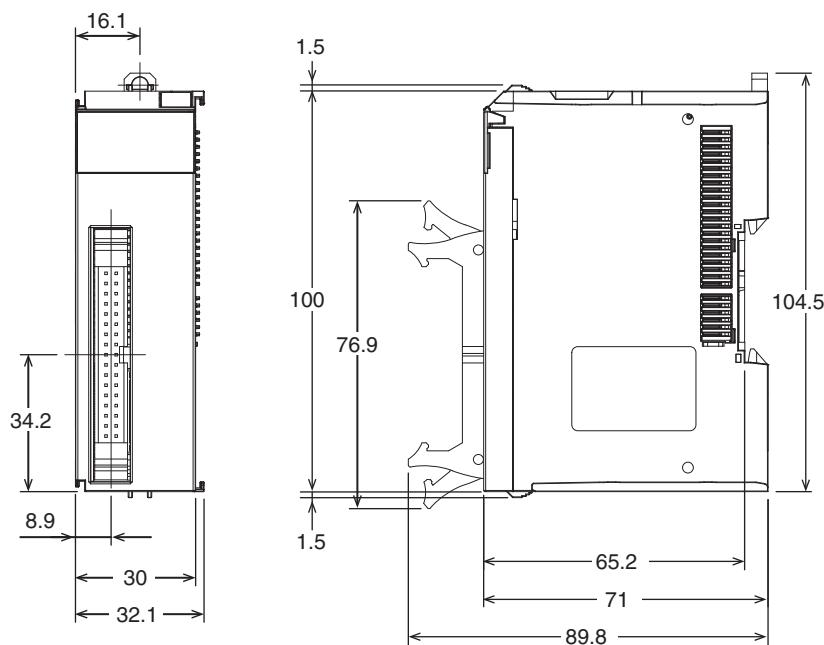


24 mm Width

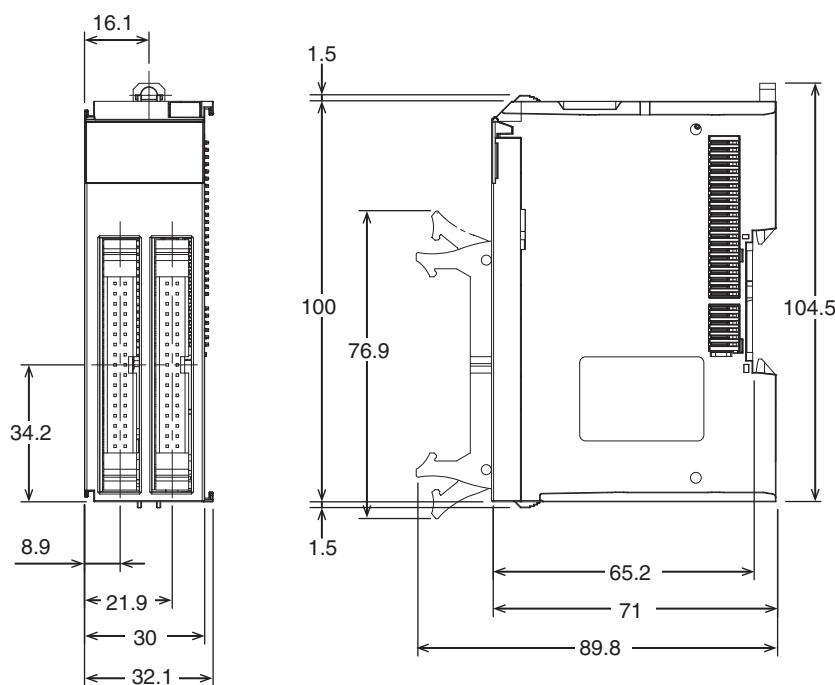


MIL Connector Type (1 Connector with 34 terminals)

30 mm Width

**MIL Connector Type (2 Connectors with 34 terminals)**

30 mm Width

**Related Manual**

Man. No	Model	Manual	Application	Description
W524	NX-EC0□□□ NX-ECS□□□ NX-PG0□□□	NX-series Position Interface Units User's Manual	Learning how to use NX-series Position Interface Units	The hardware, setup methods, and functions of the NX-series Incremental Encoder Input Units, SSI Input Units, and Pulse Output Unit are described.

More precise timing control by synchronizing the position data with the EtherCAT® Distributed Clock

- Process encoder input data using the MC Function Modules of the NJ/NX/NY5 Controllers
- Time-stamp inputs enables high-precision timing control in combination with time-stamp outputs



Features

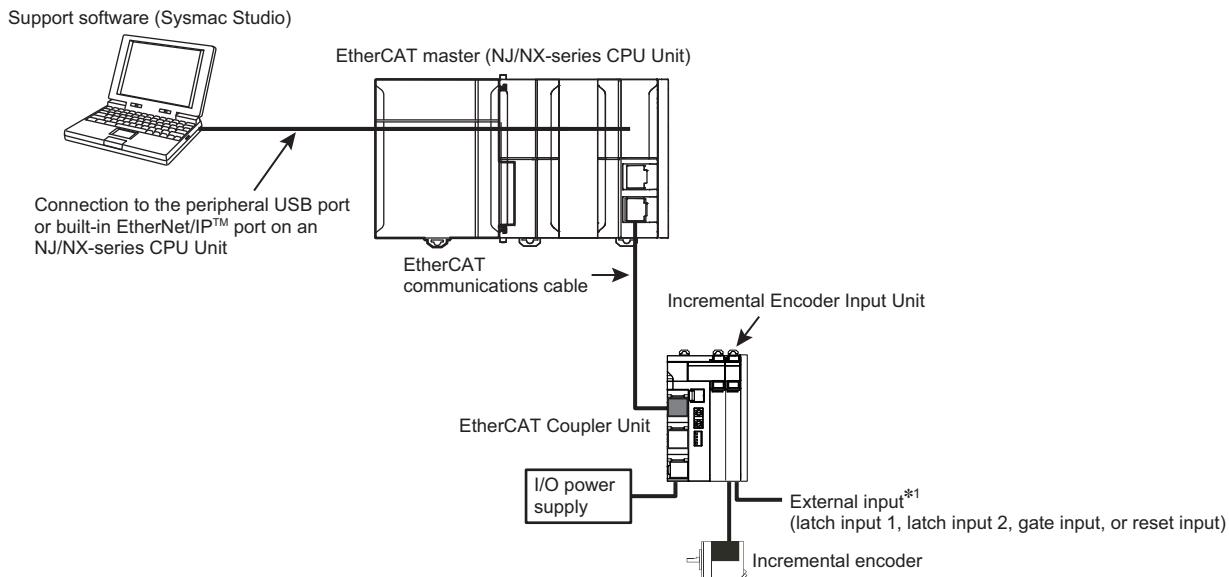
- Open collector output type and line driver output type Incremental Encoders can be connected
- High-speed remote I/O control with communications cycle as fast as 125 μ s*1
- Free-run refreshing, synchronous I/O refreshing, or task period prioritized refreshing*2 with the NX1P2 CPU Unit or EtherCAT Coupler Unit
- The MC Function Modules of the NJ/NX/NY5 Controllers allows the encoder to be used as a motion axis
- Latching (1 internal signal and 2 input signals from external devices)
- Pulse Period Measurement
- 32 bit counters (80000000 to 7FFFFFFF HEX)
- Maximum counting rate: 4 MHz (Line receiver: 4 MHz, Open collector: 500 kHz)
- Time Stamping
- Maximum and minimum counter value setting
- Connect to the CJ PLC using the EtherNet/IP™ bus coupler

*1. When using the NX-EC0□□ together with the NX701-□□□□ and NX-ECC203.

*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configuration

The following figure shows a system configuration when an Incremental Encoder Input Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



*1. You can specify functions for up to two external inputs to a One-input Incremental Encoder Input Unit. You cannot use external inputs for a Two-input Unit.

Incremental Encoder Input Unit Specifications

● Incremental Encoder Input Unit

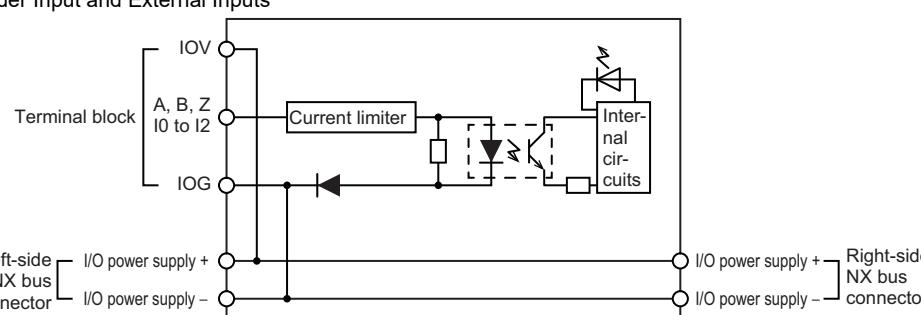
NX-EC0112

Unit name	Incremental Encoder Input Unit	Model	NX-EC0112
Number of channels	1 channel	Type of external connections	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		Input signals	Counter: Phases A, B, and Z External Inputs: 3
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	-2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	OFF voltage	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase differential pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	NPN		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%, -15%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.
ON/OFF response time	1 µs max./2 µs max.		
Internal I/O common processing	NPN		
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections IOG: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.15 W max. Connected to a Communications Coupler Unit 0.85 W max. 	Current consumption from I/O power supply	None
Weight	70 g max.		
Circuit layout	<p>Encoder Input and External Inputs</p>		
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>		

* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	Protection	None

NX-EC0122

Unit name	Incremental Encoder Input Unit	Model	NX-EC0122		
Number of channels	1 channel	Type of external connections	Screwless push-in terminal block (16 terminals)		
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *				
Indicators		Input signals	Counter: Phases A, B, and Z External Inputs: 3		
Input form	Voltage input (24 V)				
Counting unit	Pulses				
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs				
Counter range	-2,147,483,648 to 2,147,483,647 pulses				
Counter functions					
Counter type	Ring counter or linear counter				
Counter controls	Gate control, counter reset, and counter preset				
Latch function	Two external input latches and one internal latch				
Measurements	Pulse rate measurement and pulse period measurement				
Voltage input specifications					
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage	19.6 VDC min./3 mA min.		
Input current	4.2 mA typical (24 VDC)	OFF voltage	4.0 VDC max./1 mA max.		
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase difference pulse input x4: 125 kHz), Phase Z: 125 kHz				
Internal I/O common processing	PNP				
External input specifications					
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage/ON current	15 VDC min./3 mA min.		
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.		
ON/OFF response time	1 µs max./2 µs max.				
Internal I/O common processing	PNP				
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Photocoupler isolation		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.		
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections IOG: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections		
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.30 W max. Connected to a Communications Coupler Unit 0.95 W max. 	Current consumption from I/O power supply	None		
Weight	70 g max.				
Circuit layout	<p>Encoder Input and External Inputs</p> 				
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>				

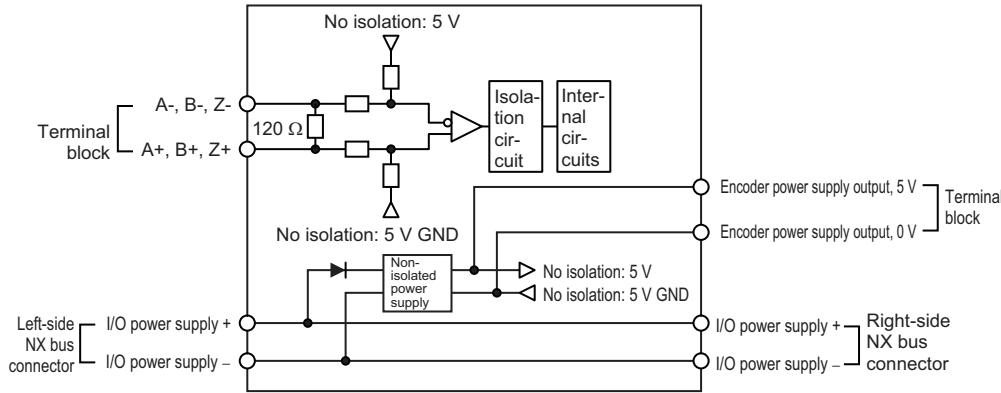
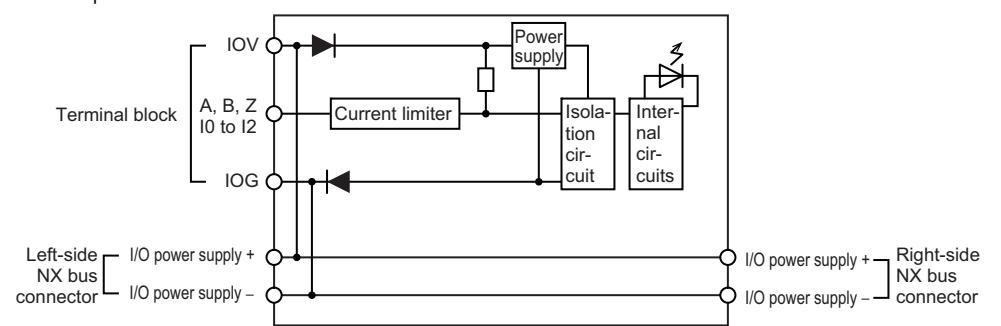
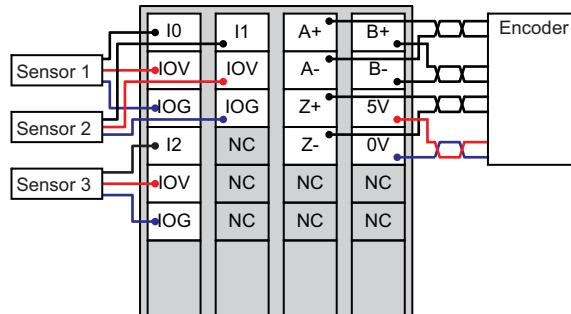
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	Protection	None

NX-EC0132

Unit name	Incremental Encoder Input Unit	Model	NX-EC0132
Number of channels	1 channel	Type of external connections	Screwless clamping terminal block (12 terminals x 2)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		Input signals	Counter: Phases A, B, and Z External Inputs: 3
Input form	Line receiver input		
Counting unit	Pulses		
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	-2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Line driver specifications			
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V_{IT+} : 0.1 V min.
Input impedance	$120 \Omega \pm 5\%$	Low level input voltage	V_{IT-} : -0.1 V min.
Hysteresis voltage	V_{phys} ($V_{IT+} - V_{IT-}$): 60 mV		
Maximum response frequency	Phases A and B: Single-phase 4 MHz (phase differential pulse input x4: 1 MHz), Phase Z: 1 MHz		
5-V power supply for encoder	Output voltage: 5 VDC $\pm 5\%$ Output current: 500 mA max.		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC $\pm 20\%$, -15%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	3.5 mA typical (24 VDC)	OFF voltage/OFF current	5.0 VDC max./1 mA max.
ON/OFF response time	1 μ s max./1 μ s max.		
Internal I/O common processing	NPN		
Dimensions	12 x 100 x 71 mm (W x H x D)	Isolation method	Digital isolator
Insulation resistance	20 M Ω min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC $\pm 20\%$, -15%)	Current capacity of I/O power supply terminals	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.95 W max.	Current consumption from I/O power supply	Unit current consumption: 30 mA max. Consumption from encoder 5-V power supply: 0.28 x Encoder current consumption mA
Weight	130 g max.		

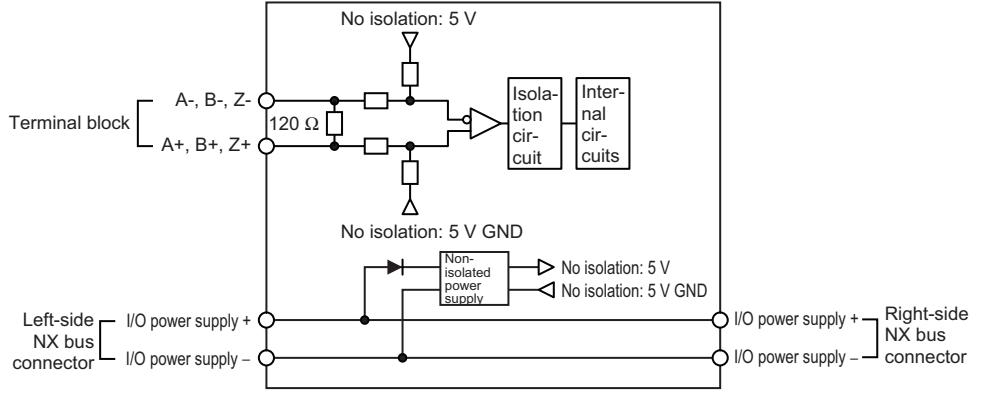
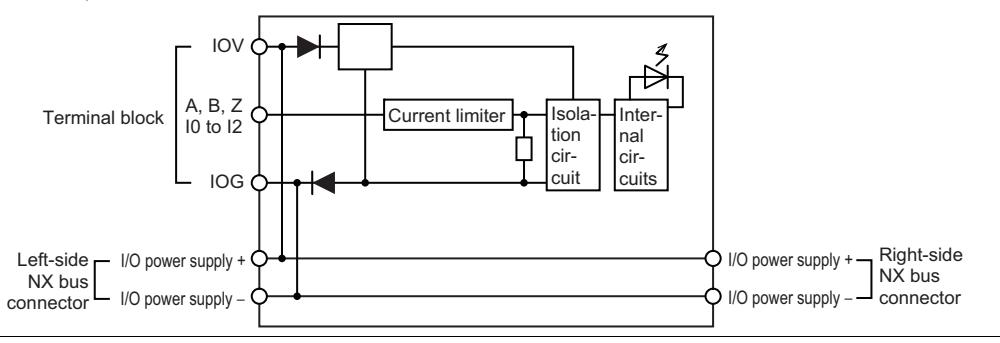
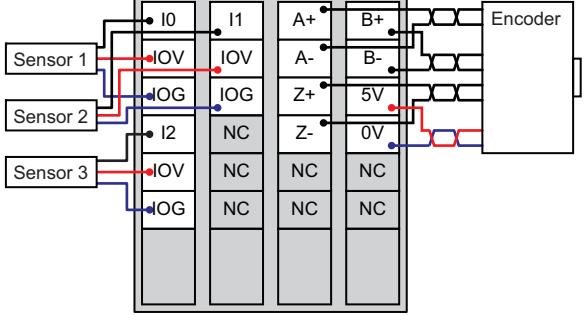
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Circuit layout	Encoder Input
	 <p>Encoder Input circuit diagram showing power supply connections and internal circuitry for A-, B-, Z-, A+, B+, Z+, 5V, and 0V terminals. The diagram includes a 120 Ω resistor, a 5V power supply, an isolation circuit, and internal circuits.</p>
	External Inputs
	 <p>External Inputs circuit diagram showing power supply connections and internal circuitry for IOV, A, B, Z, I0 to I2, and IOG terminals. The diagram includes a current limiter, a power supply, an isolation circuit, and internal circuits.</p>
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>
Terminal connection diagram	 <p>Terminal connection diagram showing connections for Sensors 1, 2, and 3 to IOV, IOG, and NC pins. The connections are as follows:</p> <ul style="list-style-type: none"> Sensor 1: IOV → I0, IOG → I2 Sensor 2: IOV → I1, IOG → I2 Sensor 3: IOV → I0, IOG → I2 Encoder power supply: 5V → A+, 0V → B+, Z+, A-, B-, Z-, 5V/0V → Z+, 0V → Z-
Failure detection	None
	Protection
	None

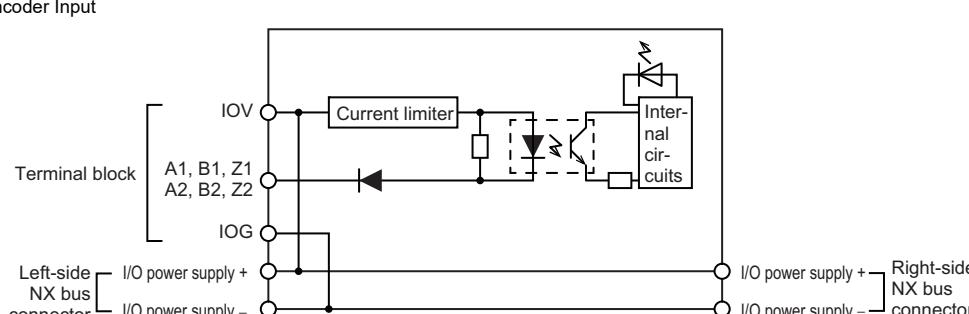
NX-EC0142

Unit name	Incremental Encoder Input Unit	Model	NX-EC0142
Number of channels	1 channel	Type of external connections	Screwless push-in terminal block (12 terminals × 2)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		Input signals	Counter: Phases A, B, and Z External Inputs: 3
Input form	Line receiver input		
Counting unit	Pulses		
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	-2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Line driver specifications			
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V _{IT+} : 0.1 V min.
Input impedance	120 Ω ± 5%	Low level input voltage	V _{IT-} : -0.1 V min.
Hysteresis voltage	V _{hys} (V _{IT+} – V _{IT-}): 60 mV		
Maximum response frequency	Phases A and B: Single-phase 4 MHz (phase difference pulse input x4: 1 MHz), Phase Z: 1 MHz		
5-V power supply for encoder	Output voltage: 5 VDC Output current: 500 mA max.		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	3.5 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	PNP		
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.50 W max. • Connected to a Communications Coupler Unit 1.05 W max.	Current consumption from I/O power supply	Unit current consumption: 30 mA max. Consumption from encoder 5-V power supply: 0.28 × Encoder current consumption mA
Weight	130 g max.		

* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

	<p>Encoder Input</p>  <p>Terminal block: A-, B-, Z-; 120 Ω; 5V; Non-isolation: 5V GND; Non-isolated power supply; Isolation circuit; Internal circuits; I/O power supply +; I/O power supply -; Left-side NX bus connector; Right-side NX bus connector.</p> <p>External Inputs</p>  <p>Terminal block: IOV; A, B, Z I0 to I2; IOG; Current limiter; 5V; Non-isolation: 5V GND; Non-isolated power supply; Isolation circuit; Internal circuits; I/O power supply +; I/O power supply -; Left-side NX bus connector; Right-side NX bus connector.</p>
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>
Terminal connection diagram	
Failure detection	None
Protection	None

NX-EC0212

Unit name	Incremental Encoder Input Unit	Model	NX-EC0212		
Number of channels	2 channels	Type of external connections	Screwless clamping terminal block (12 terminals)		
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *				
Indicators		Input signals	Counter: Phases A, B, and Z External Inputs: None		
Input form	Voltage input (24 V)				
Counting unit	Pulses				
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs				
Counter range	-2,147,483,648 to 2,147,483,647 pulses				
Counter functions					
Counter type	Ring counter or linear counter				
Counter controls	Gate control, counter reset, and counter preset				
Latch function	Two external input latches and one internal latch				
Measurements	Pulse rate measurement and pulse period measurement				
Voltage input specifications					
Input voltage	20.4 to 28.8 VDC (24 VDC +20%, -15%)	ON voltage	19.6 VDC min./3 mA min.		
Input current	4.2 mA typical (24 VDC)	OFF voltage	4.0 VDC max./1 mA max.		
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase differential pulse input x4: 125 kHz), Phase Z: 125 kHz				
Internal I/O common processing	NPN				
External input specifications					
Input voltage	---	ON voltage/ON current	---		
Input current	---	OFF voltage/OFF current	---		
ON/OFF response time	---				
Internal I/O common processing	---				
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Photocoupler isolation		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.		
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal		
NX Unit power consumption	• Connected to a CPU Unit 1.15 W max. • Connected to a Communications Coupler Unit 0.85 W max.	Current consumption from I/O power supply	None		
Weight	70 g max.				
Circuit layout	<p>Encoder Input</p> 				
Installation orientation and restrictions	<p>Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.</p>				

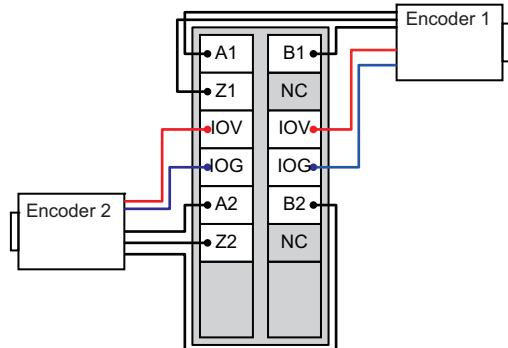
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram	
Failure detection	None
Protection	None

NX-EC0222

Unit name	Incremental Encoder Input Unit	Model	NX-EC0222
Number of channels	2 channels	Type of external connections	Screwless push-in terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators	EC0222 ■ TS ■ CH1 ■ A1 ■ B1 ■ Z1 ■ CH2 ■ A2 ■ B2 ■ Z2	Input signals	Counter: Phases A, B, and Z External Inputs: None
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	-2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	OFF voltage	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase difference pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	PNP		
External input specifications			
Input voltage	—	ON voltage/ON current	—
Input current	—	OFF voltage/OFF current	—
ON/OFF response time	—		
Internal I/O common processing	—		
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.30 W max. • Connected to a Communications Coupler Unit 0.95 W max.	Current consumption from I/O power supply	None
Weight	70 g max.		
Circuit layout	Encoder Input 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		

* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
		Failure detection	

Failure detection	None	Protection	None

NX-series SSI Input Unit

NX-ECS□□□

Synchronous Serial Interface (SSI) to connect external axes to the Sysmac system

- Process SSI encoder input data using the MC Function Modules of the NJ/NX/NY5 Controllers
- SSI to connect an absolute encoder or linear encoder



Features

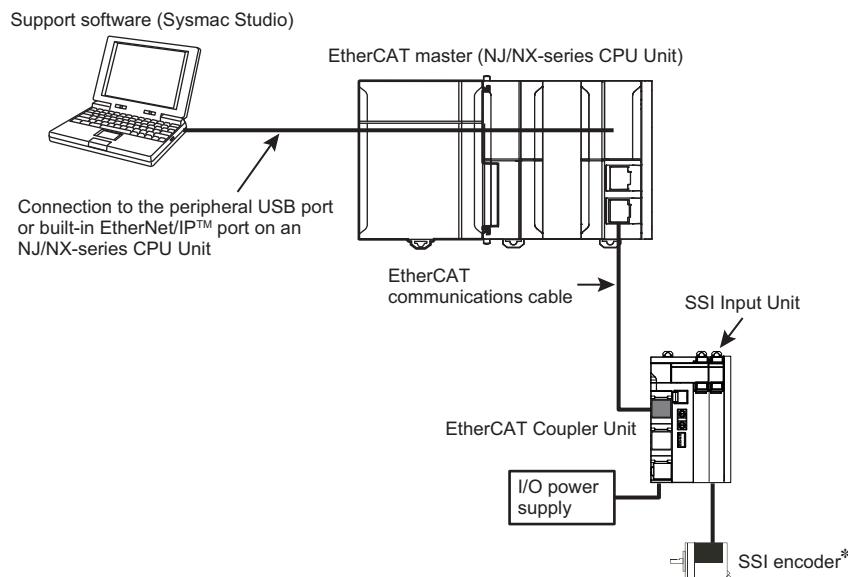
- SSI clock frequency up to 2 MHz
- High-speed remote I/O control with communications cycle as fast as $125 \mu\text{s}$ ^{*1}
- Free-run refreshing, synchronous I/O refreshing, or task period prioritized refreshing^{*2} with the NX1P2 CPU Unit or EtherCAT Coupler Unit
- The MC Function Modules of the NJ/NX/NY5 Controllers allows the encoder to be used as a motion axis
- Choice of SSI Coding Methods (No conversion, binary code, or gray code)
- Time Stamping
- Multi-turn and single-turn encoders supported
- Data Refresh Status (Data refreshing can be checked on the host controller.)
- Maximum connecting SSI cable length: 400 m
- Connect to the CJ PLC using the EtherNet/IP™ bus coupler

*1. When using the NX-EC01□□ together with the NX701-□□□□□ and NX-ECC203.

*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configuration

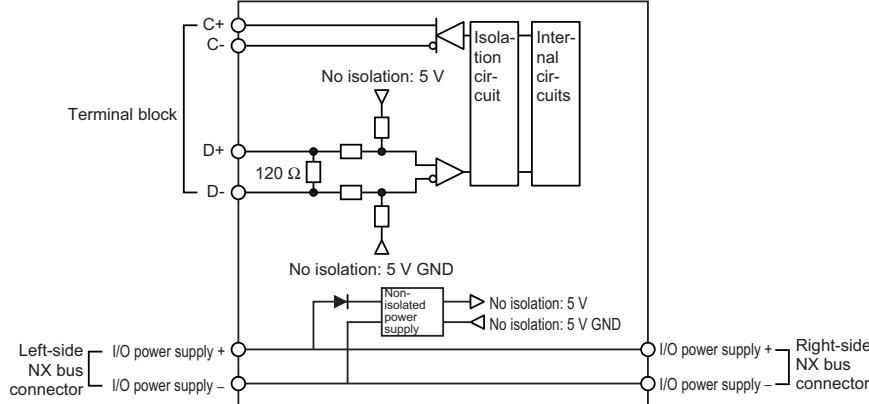
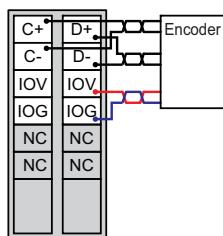
The following figure shows a system configuration when an SSI Input Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



* The SSI encoder is supplied with 24-VDC power from the SSI Input Unit.

SSI Input Unit Specifications

SSI Input Unit 1 channel NX-ECS112

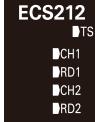
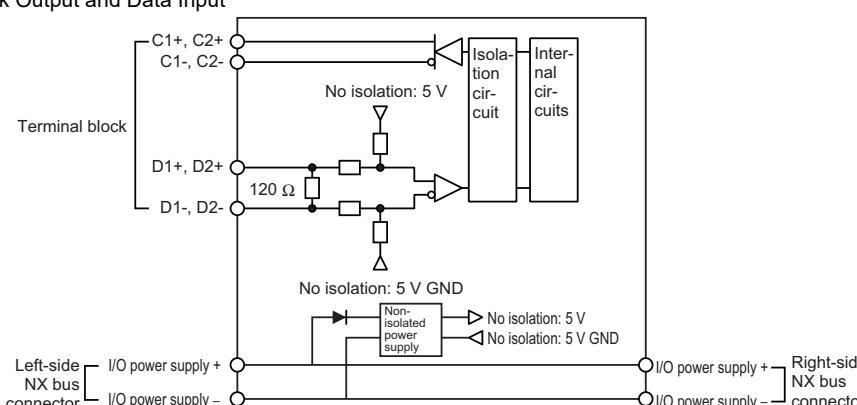
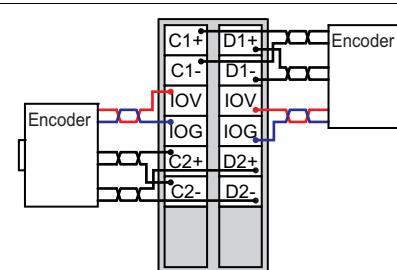
Unit name	SSI Input Unit	Model	NX-ECS112		
Number of channels	1 channel	Type of external connections	Screwless push-in terminal block (12 terminals)		
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *1				
Indicators		Input signals	External inputs: 2 Data input (D+, D-) External outputs: 2 Clock output (C+, C-)		
I/O interface	Synchronized serial interface (SSI)				
Clock output	EIA standard RS-422-A line driver levels				
Data input	EIA standard RS-422-A line receiver levels				
Maximum data length	32 bits (The single-turn, multi-turn, and status data length can be set.)				
Coding method	No conversion, binary code, or gray code				
Baud Rate	100 kHz, 200 kHz, 300 kHz, 400 kHz, 500 kHz, 1.0 MHz, 1.5 MHz, or 2.0 MHz				
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Digital isolator		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.		
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal		
NX Unit power consumption	• Connected to a CPU Unit 1.20 W max. • Connected to a Communications Coupler Unit 0.85 W max.	Current consumption from I/O power supply	20 mA		
Maximum transmission distance *2	Baud Rate	Maximum transmission distance			
	100 kHz	400 m			
	200 kHz	190 m			
	300 kHz	120 m			
	400 kHz	80 m			
	500 kHz	60 m			
	1.0 MHz	25 m			
	1.5 MHz	10 m			
	2.0 MHz	5 m			
Weight	65 g				
Circuit layout	<p>SSI Clock Output and Data Input</p> 				
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: No restrictions</p>				
Terminal connection diagram					
Failure detection	None	Protection	None		

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Refer to information on the I/O refreshing methods in the W524 manual for the communications cycles for each model.

*2. The maximum transmission distance for an SSI Input Unit depends on the baud rate due to the delay that can result from the responsiveness of the connected encoder and cable impedance. The maximum transmission distance is only a guideline. Review the specifications for the cables and encoders in the system and evaluate the operation of the equipment before use.

SSI Input Unit 2 channel NX-ECS212

Unit name	SSI Input Unit	Model	NX-ECS212		
Number of channels	2 channels	Type of external connections	Screwless push-in terminal block (12 terminals)		
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *1				
Indicators		Input signals	External inputs: 2 Data input (D+, D-) External outputs: 2 Clock output (C+, C-)		
I/O interface	Synchronized serial interface (SSI)				
Clock output	EIA standard RS-422-A line driver levels				
Data input	EIA standard RS-422-A line receiver levels				
Maximum data length	32 bits (The single-turn, multi-turn, and status data length can be set.)				
Coding method	No conversion, binary code, or gray code				
Baud Rate	100 kHz, 200 kHz, 300 kHz, 400 kHz, 500 kHz, 1.0 MHz, 1.5 MHz, or 2.0 MHz				
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	Digital isolator		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.		
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal		
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.9 W max.	Current consumption from I/O power supply	30 mA		
Maximum transmission distance *2	Baud Rate	Maximum transmission distance			
	100 kHz	400 m			
	200 kHz	190 m			
	300 kHz	120 m			
	400 kHz	80 m			
	500 kHz	60 m			
	1.0 MHz	25 m			
	1.5 MHz	10 m			
Weight	65 g				
Circuit layout					
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: No restrictions</p>				
Terminal connection diagram					
Failure detection	None	Protection	None		

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Refer to information on the I/O refreshing methods in the W524 manual for the communications cycles for each model.

*2. The maximum transmission distance for an SSI Input Unit depends on the baud rate due to the delay that can result from the responsiveness of the connected encoder and cable impedance. The maximum transmission distance is only a guideline. Review the specifications for the cables and encoders in the system and evaluate the operation of the equipment before use.

Positioning control with pulse outputs to command stepper motor drives and other pulse input motor drives

- The MC Function Modules of the NJ/NX/NY5 Controllers enable pulse outputs for motor control
- The same motion control instructions as those for Servomotor control can be used to program single-axis PTP control and interpolation
- Non-networked motors, such as DD motors, stepper motors, and DC motors, can be connected



Features

- The MC Function Modules of the NJ/NX/NY5 Controller allows you to connect with as many axes as the NJ/NX/NY5 Controller can control
- High-speed remote I/O control with communications cycle as fast as 125 μ s*1
- Free-run refreshing or task period prioritized refreshing*2 with the EtherCAT Coupler Unit
- Latching (2 external latch inputs)
- Open collector pulse outputs up to 500 kHz or line driver pulse outputs up to 4 MHz
- Line driver output models with two or four channels

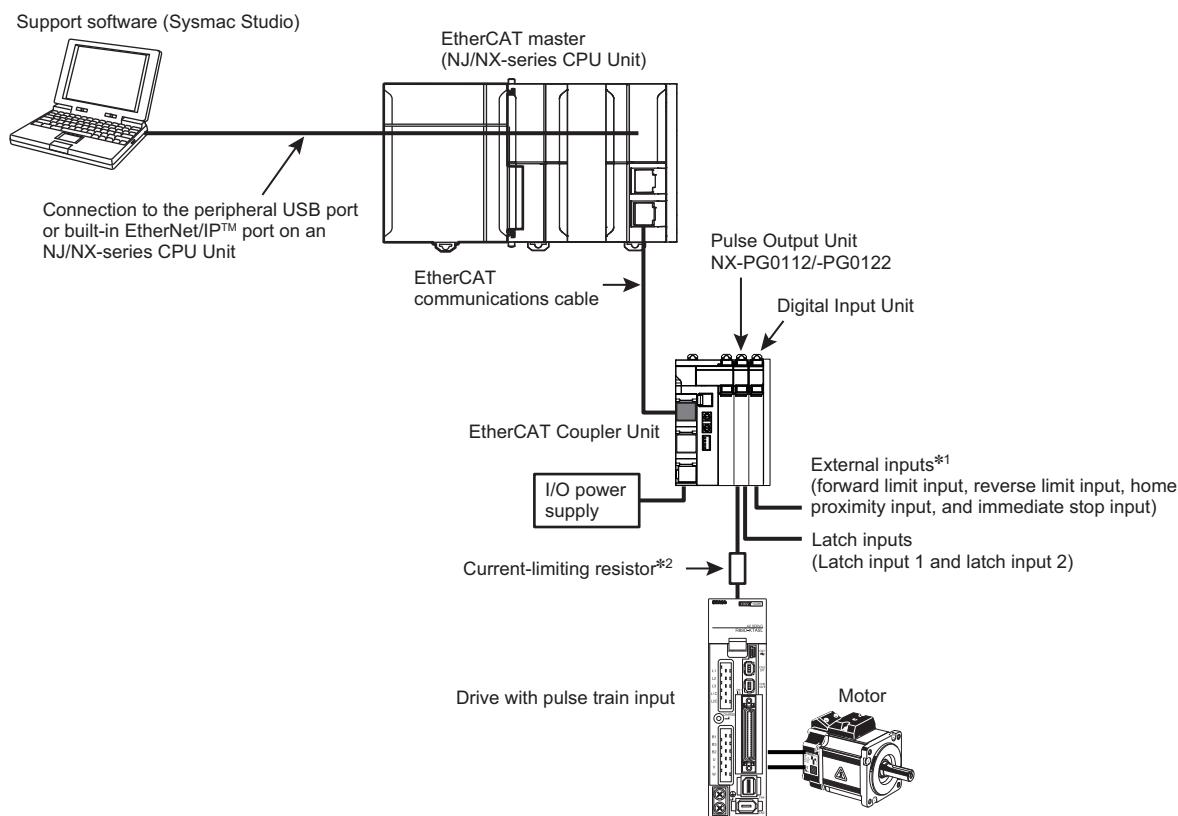
*1. When using the NX-EC01□□ together with the NX701-□□□□□ and NX-ECC203.

*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configurations

NX-PG0112/-PG0122

The following figure shows a system configuration when the NX-PG0112/-PG0122 Pulse Output Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



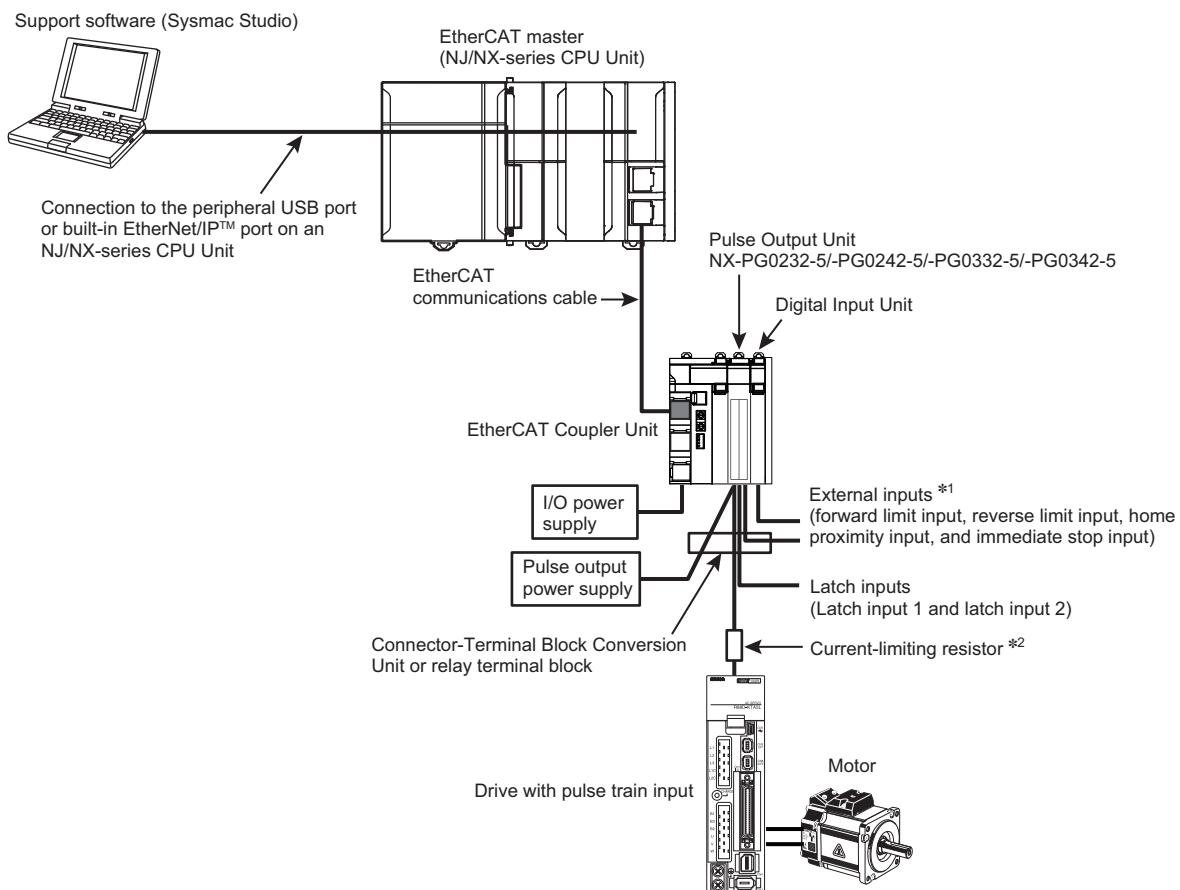
*1. When the Unit is connected to an NJ-series CPU, you can use these inputs by adding a Digital Input Unit and assigning MC Function Module functions.

*2. The pulse output from a Pulse Output Unit is a 24-VDC PNP open collector output. Connect an external current-limiting resistor according to the input specifications of the connected motor drive.

Example: For a G5-series Servo Drive, connect a 2-kΩ (1/2-W) resistor in series.

NX-PG0232-5/-PG0242-5/-PG0332-5/-PG0342-5

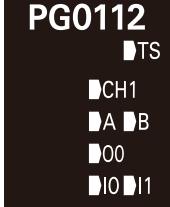
The following figure shows a system configuration when the NX-PG0232-5/-PG0242-5/-PG0332-5/-PG0342-5 Pulse Output Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



- *1. When the Unit is connected to an NJ/NX-series CPU, you can use these inputs by assigning MC Function Module functions to external inputs inside a Pulse Output Unit or to inputs of a Digital Input Unit that is added. For information on Digital Input Units, refer to the *NX-series Digital I/O Units User's Manual* (Cat. No. W521). For NX-PG0232-5, NX-PG0242-5, NX-PG0332-5, and NX-PG0342-5 Pulse Output Units, the number of available external inputs that can be used in always ON status is restricted by ambient operating temperature and installation orientation.
- *2. The pulse output from a Pulse Output Unit is a 24-VDC open collector output. When it is used as a control output for a motor drive such as an error counter reset output, connect an external current-limiting resistor according to the input specifications of the connected motor drive. A line drive output does not need a current limiting resistor.

Pulse Output Unit Specifications

Pulse Output Unit (Open collector output, NPN type) NX-PG0112

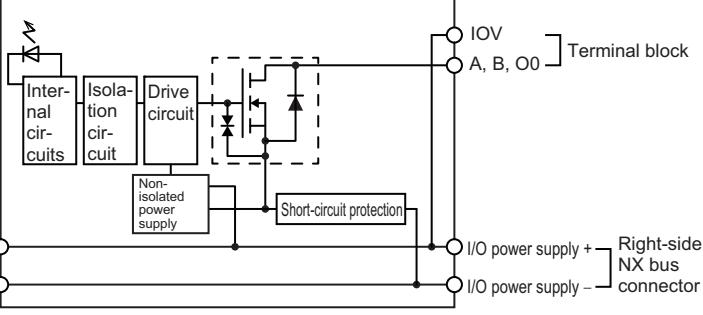
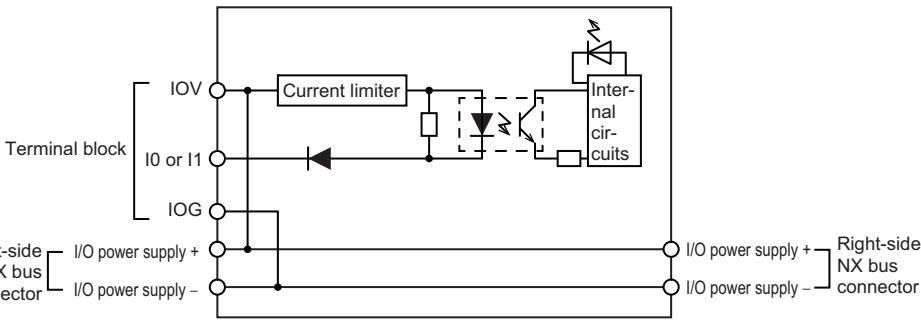
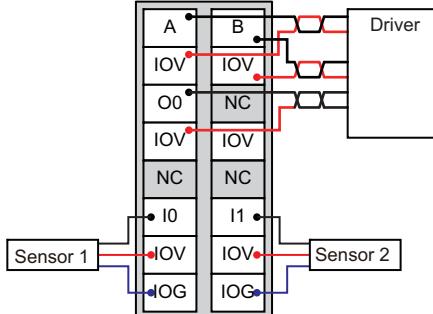
Unit name	Pulse Output Unit	Model	NX-PG0112
Number of axes	1	Type of external connections	Screwless clamping terminal block (16 terminals)
I/O refreshing method ^{*1}	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		I/O signals	Inputs: 2, External inputs Outputs: 3, The outputs are the forward direction pulse output, reverse direction pulse output, and external output (one of each output).
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Open collector output		
Unit of control	Pulses		
Maximum pulse output speed	500 kpps		
Pulse output method	Forward/reverse direction outputs or Pulse + direction outputs		
Position control range	-2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 500,000 pps		
Positioning ^{*2}			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.
ON/OFF response time	1 µs max./2 µs max.		
Internal I/O common processing	NPN		
Pulse output and external output specifications			
Rated voltage	24 VDC	Residual voltage	1.0 V max.
Load voltage range	15 to 28.8 VDC	Leakage current	0.1 mA max.
Maximum load current	30 mA		
ON/OFF response time	Pulse output: Refer to "NX-series Position Interface Units User's Manual (W524-E1)". External output: 5 µs max./5 µs max.		
Internal I/O common processing	NPN		
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.15 W max. Connected to a Communications Coupler Unit 0.80 W max. 	Current consumption from I/O power supply	20 mA max.
Weight	70 g max.	Cable length	3 m max.

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

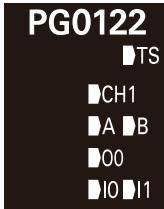
*2. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

Circuit layout	<p>Pulse Output and External Output</p> 			
	<p>External Inputs</p> 			
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>			
Terminal connection diagram				
Failure detection	<table border="1" data-bbox="822 1388 1129 1403"> <tr> <td>None</td> <td>Protection</td> <td>None</td> </tr> </table>	None	Protection	None
None	Protection	None		

Pulse Output Unit (Open collector output, PNP type) NX-PG0122

Unit name	Pulse Output Unit		Model	NX-PG0122										
Number of axes	1		Type of external connections	Screwless push-in terminal block (16 terminals)										
I/O refreshing method ^{*1}	Synchronous I/O refreshing or task period prioritized refreshing													
Indicators			I/O signals	Inputs: 2, External inputs ^{*2} Outputs: 3, The outputs are the forward direction pulse output, reverse direction pulse output, and external output ^{*3} (one of each output).										
Control method	Open-loop control through pulse string output													
Controlled drive	Servo drive with a pulse train input or a stepper motor drive													
Pulse output form	Open collector output													
Control unit	Pulses													
Maximum pulse output speed	500 kpps													
Pulse output method	Forward/reverse direction pulse outputs or pulse + direction outputs													
Position control range	-2,147,483,648 to 2,147,483,647 pulses													
Velocity control range	1 to 500,000 pps													
Positioning ^{*4}	<table border="1"> <tr> <td>Single-axis position control</td><td>Absolute positioning, relative positioning, and interrupt feeding</td></tr> <tr> <td>Single-axis velocity control</td><td>Velocity control (velocity feeding in Position Control Mode)</td></tr> <tr> <td>Single-axis synchronized control</td><td>Cam operation and gear operation</td></tr> <tr> <td>Single-axis manual operation</td><td>Jogging</td></tr> <tr> <td>Auxiliary function for single-axis control</td><td>Homing, stopping, and override changes</td></tr> </table>				Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding	Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)	Single-axis synchronized control	Cam operation and gear operation	Single-axis manual operation	Jogging	Auxiliary function for single-axis control	Homing, stopping, and override changes
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding													
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)													
Single-axis synchronized control	Cam operation and gear operation													
Single-axis manual operation	Jogging													
Auxiliary function for single-axis control	Homing, stopping, and override changes													
External input specifications														
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/-15%)	ON voltage/ON current	15 VDC min./3 mA min.											
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.											
ON/OFF response time	1 µs max./2 µs max.													
Internal I/O common processing	PNP													
External output specifications														
Rated voltage	24 VDC													
Load voltage range	15 to 28.8 VDC	Residual voltage	1.0 V max.											
Maximum load current	30 mA	Leakage current	0.1 mA max.											
ON/OFF response time	Pulse output: Refer to "NX-series Position Interface Units User's Manual (W524-E1)". 5 µs max./5 µs max.													
Internal I/O common processing	PNP													
Dimensions	12 × 100 × 71 mm (W×H×D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator											
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.											
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/-15%)	Current capacity of I/O power supply terminals	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal											

*1. The I/O refreshing method is automatically set according to the connected CPU Unit or Communications Coupler Unit.

*2. You can use the external inputs as latch inputs.

*3. You can use the external output as error counter reset outputs.

*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC.

For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.30 W max. Connected to a Communications Coupler Unit 0.90 W max. 	Current consumption from I/O power supply	20 mA max.
Weight	70 g max.	Cable length	3 m max.
Circuit layout			<p>Pulse Output and External Output</p> <p>Left-side I/O power supply + I/O power supply - NX bus connector</p> <p>Right-side I/O power supply + I/O power supply - NX bus connector</p> <p>Terminal block</p> <p>IOG</p> <p>A, B, O0</p> <p>Non-isolated power supply</p> <p>Short-circuit protection</p> <p>Internal circuits</p> <p>Isolation circuit</p> <p>Drive circuit</p> <p>Internal circuits</p> <p>Current limiter</p> <p>IOV</p> <p>I0 or I1</p> <p>IOG</p> <p>Left-side I/O power supply + I/O power supply - NX bus connector</p> <p>Right-side I/O power supply + I/O power supply - NX bus connector</p>
External Inputs			
Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: There are no restrictions.</p>		
Terminal connection diagram	<p>Driver</p> <p>A, B, IOG, O0, NC, IOG, NC, IO, I1, IOV, IOG</p> <p>Sensor 1</p> <p>Sensor 2</p>		
Failure detection	None	Protection	None

Pulse Output Unit (Line driver output, NPN type) 2 channels NX-PG0232-5

Unit name	Pulse Output Unit	Model	NX-PG0232-5
Number of channels	2 channels	Type of external connections	MIL connector (34 terminals ×1)
I/O refreshing method ^{*1}	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		I/O signals	Inputs: 5 per channel. External inputs ^{*2} Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) ^{*3}
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	-2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning ^{*4}			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, -10%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 µs max./2 µs max. External inputs 2 to 4: 20 µs max./400 µs max.		
Internal I/O common processing	NPN		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V _{IT+} : 0.1 V min.
Input impedance	120 Ω ± 5%	Low level input voltage	V _{IT-} : -0.1 V max.
Hysteresis voltage	V _{hys} (V _{IT+} - V _{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	Residual voltage	1.0 V max.
Maximum load current	30 mA	Leakage current	0.1 mA max.
ON/OFF response time	External output 0: 5 µs max./5 µs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	NPN		

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

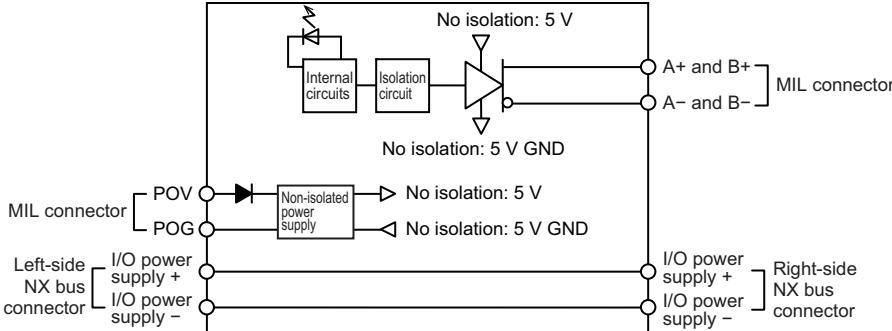
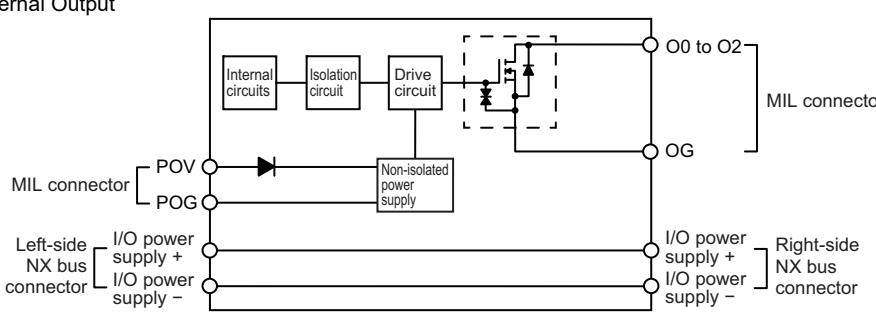
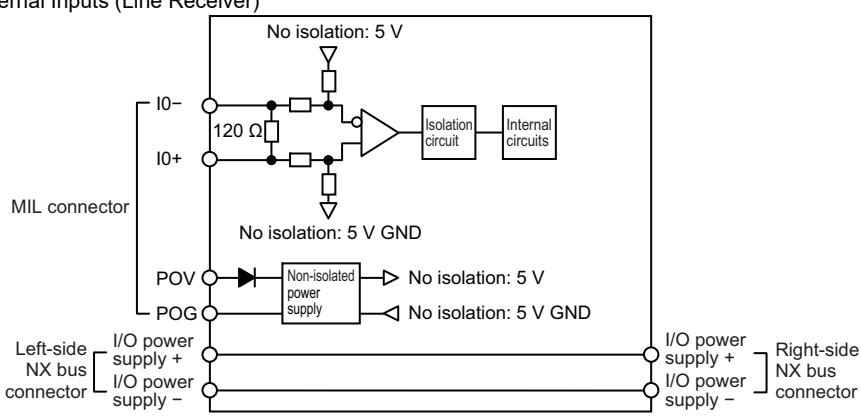
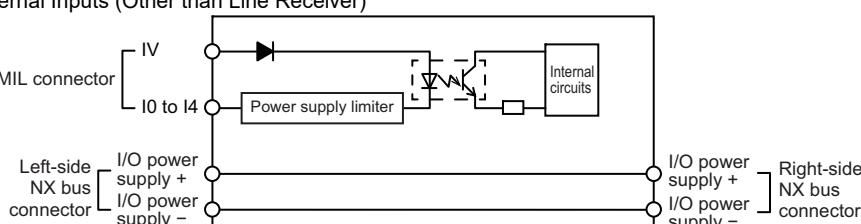
*2. You can use the external input 0 as a latch input.

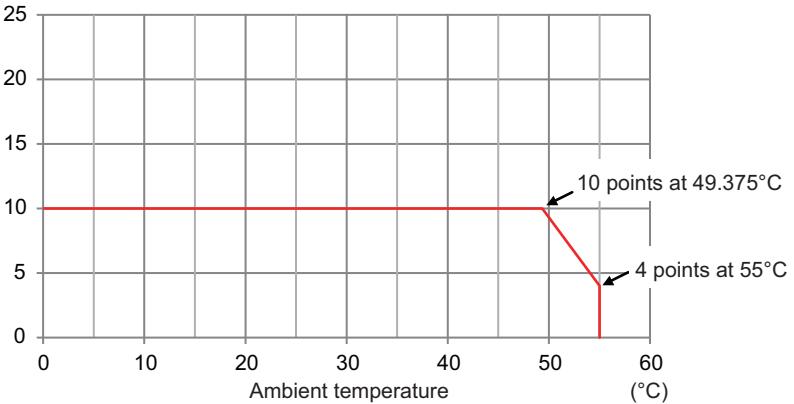
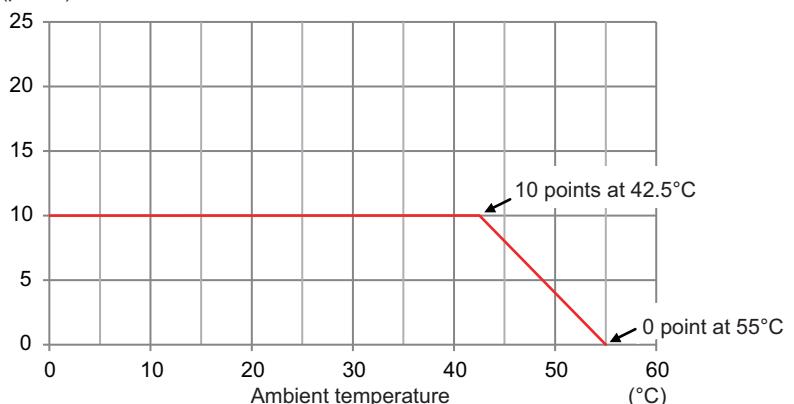
*3. You can use the external output 0 as an error counter reset output.

*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

Dimensions	30 x 100 x 71 mm (W x H x D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	Without I/O power supply terminals
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.55 W max. Connected to a Communications Coupler Unit 1.20 W max. 	Current consumption from I/O power supply	50 mA max.
Weight	110 g max.	Cable length	Line driver outputs: 10 m max. Other I/O: 3 m max.
Circuit layout	<p>Pulse Output</p>  <p>External Output</p> 		
	<p>External Inputs (Line Receiver)</p> 		
	<p>External Inputs (Other than Line Receiver)</p> 		

Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: The number of external inputs that can be always ON is restricted as shown below.</p> <ul style="list-style-type: none"> For upright installation <p>Number of input points that are always ON (points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 50</td><td>10</td></tr> <tr><td>50 - 55</td><td>4</td></tr> <tr><td>55 - 55.5</td><td>0</td></tr> </tbody> </table> <ul style="list-style-type: none"> For any installation other than upright <p>Number of input points that are always ON (points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 42.5</td><td>10</td></tr> <tr><td>42.5 - 55</td><td>0</td></tr> </tbody> </table>	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 50	10	50 - 55	4	55 - 55.5	0	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 42.5	10	42.5 - 55	0
Ambient temperature (°C)	Number of input points that are always ON (points)														
0 - 50	10														
50 - 55	4														
55 - 55.5	0														
Ambient temperature (°C)	Number of input points that are always ON (points)														
0 - 42.5	10														
42.5 - 55	0														

Terminal connection diagram		
	Failure detection	None
	Protection	None

Pulse Output Unit (Line driver output, PNP type) 2 channels NX-PG0242-5

Unit name	Pulse Output Unit	Model	NX-PG0242-5
Number of channels	2 channels	Type of external connections	MIL connector (34 terminals ×1)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		I/O signals	Inputs: 5 per channel. External inputs *2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) *3
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Phase + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	-2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning*4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, -10%)	ON voltage/ON current	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 µs max./2 µs max. External inputs 2 to 4: 20 µs max./400 µs max.		
Internal I/O common processing	PNP		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V _{IT+} : 0.1 V min.
Input impedance	120 Ω ± 5%	Low level input voltage	V _{IT-} : -0.1 V max.
Hysteresis voltage	V _{hys} (V _{IT+} - V _{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	Residual voltage	1.0 V max.
Maximum load current	30 mA	Leakage current	0.1 mA max.
ON/OFF response time	External output 0: 5 µs max./200 µs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	PNP		

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.

*2. You can use the external input 0 as a latch input.

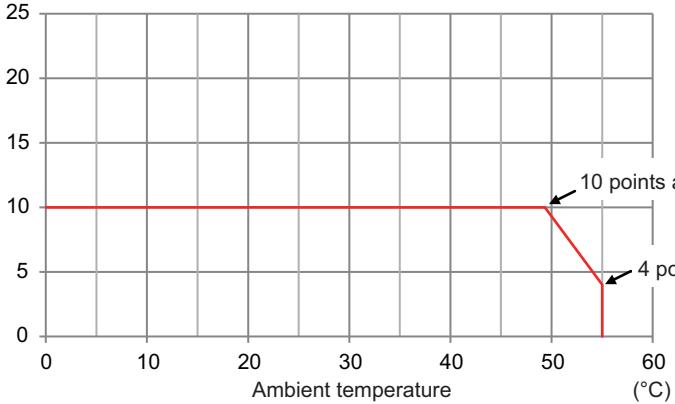
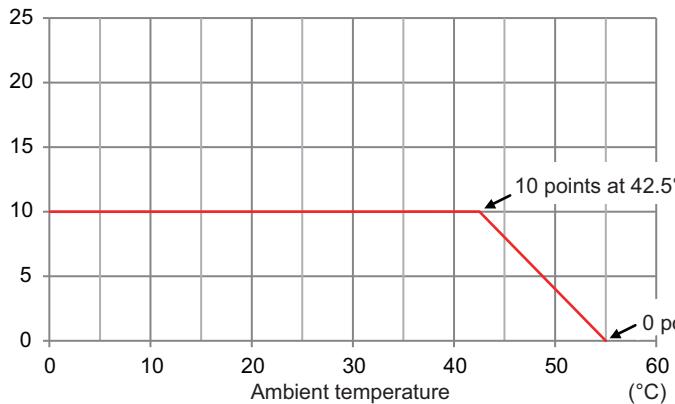
*3. You can use the external output 0 as an error counter reset output.

*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

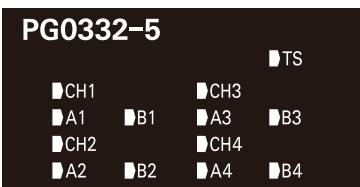
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

Dimensions	30 x 100 x 71 mm (W x H x D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	Without I/O power supply terminals
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.55 W max. Connected to a Communications Coupler Unit 1.20 W max. 	Current consumption from I/O power supply	50 mA max.
Weight	110 g max.	Cable length	Line driver outputs: 10 m max. Other I/O: 3 m max.
Circuit layout	Pulse Output		
	External Output		
	External Inputs (Line Receiver)		
	External Inputs (Other than Line Receiver)		

Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: The number of external inputs that can be always ON is restricted as shown below.</p> <ul style="list-style-type: none"> For upright installation <p>(points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 50</td><td>10</td></tr> <tr><td>50 - 55</td><td>4</td></tr> <tr><td>55.375</td><td>0</td></tr> </tbody> </table> <ul style="list-style-type: none"> For any installation other than upright <p>(points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 42.5</td><td>10</td></tr> <tr><td>42.5 - 55</td><td>0</td></tr> </tbody> </table>	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 50	10	50 - 55	4	55.375	0	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 42.5	10	42.5 - 55	0
Ambient temperature (°C)	Number of input points that are always ON (points)														
0 - 50	10														
50 - 55	4														
55.375	0														
Ambient temperature (°C)	Number of input points that are always ON (points)														
0 - 42.5	10														
42.5 - 55	0														

Terminal connection diagram		
	Failure detection	None
	Protection	None

Pulse Output Unit (Line driver output, NPN type) 4 channels NX-PG0332-5

Unit name	Pulse Output Unit		Model	NX-PG0332-5		
Number of channels	4 channels		Type of external connections	MIL connector (34 terminals ×2)		
I/O refreshing method ^{*1}	Synchronous I/O refreshing or task period prioritized refreshing					
Indicators			I/O signals	Inputs: 5 per channel. External inputs ^{*2} Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) ^{*3}		
Control method	Open-loop control through pulse string output					
Controlled drive	Servo drive with a pulse string input or a stepper motor drive					
Pulse output form	Line driver output					
Unit of control	Pulses					
Maximum pulse output speed	4 Mpps					
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4					
Position control range	-2,147,483,648 to 2,147,483,647 pulses					
Velocity control range	1 to 4,000,000 pps					
Positioning ^{*4}						
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding					
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)					
Single-axis synchronized control	Cam operation and gear operation					
Single-axis manual operation	Jogging					
Auxiliary function for single-axis control	Homing, stopping, and override changes					
External input specifications (except for line receiver inputs)						
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, -10%)	ON voltage/ON current	15 VDC min./3 mA min.			
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.			
ON/OFF response time	External inputs 0 and 1: 1 µs max./2 µs max. External inputs 2 to 4: 20 µs max./400 µs max.					
Internal I/O common processing	NPN					
External input specifications (line receiver inputs)						
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V _{IT+} : 0.1 V min.			
Input impedance	120 Ω ± 5%	Low level input voltage	V _{IT-} : -0.1 V max.			
Hysteresis voltage	V _{phys} (V _{IT+} - V _{IT-}): 60 mV					
Line driver output specifications						
Output voltage	RS-422-A line driver level (equivalent to AM26C31)					
Maximum load current	20 mA					
Maximum output frequency	4 Mpps					
External output specifications						
Rated voltage	24 VDC					
Load voltage range	15 to 28.8 VDC	Residual voltage	1.0 V max.			
Maximum load current	30 mA	Leakage current	0.1 mA max.			
ON/OFF response time	External output 0: 5 µs max./5 µs max. External outputs 1 and 2: 0.5 ms max./1 ms max.					
Internal I/O common processing	NPN					

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.

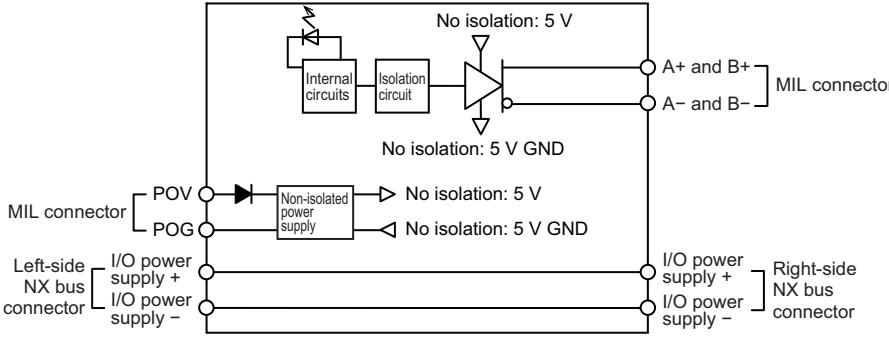
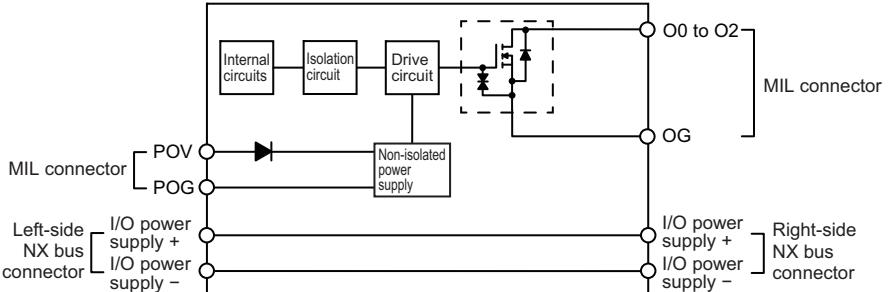
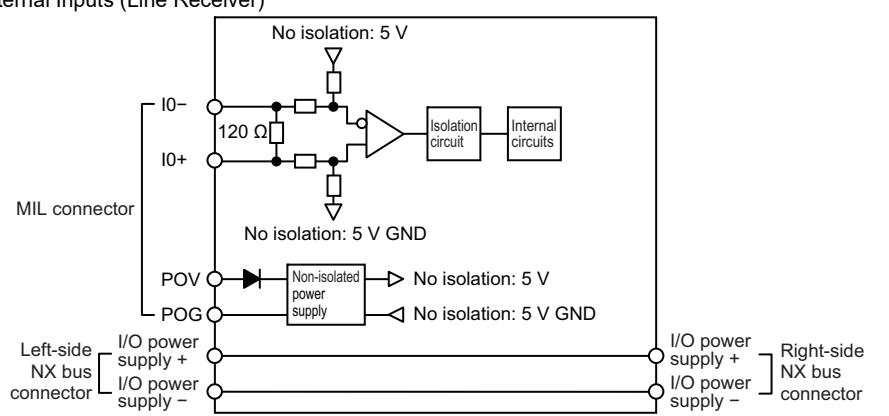
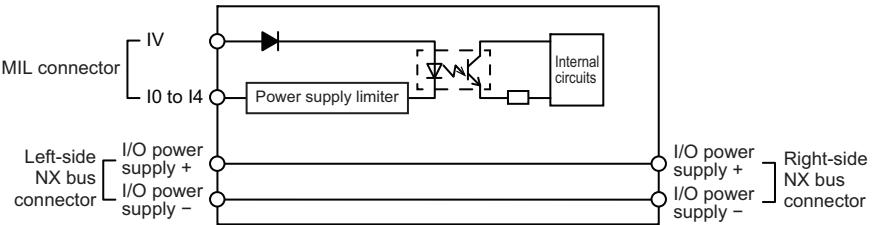
*2. You can use the external input 0 as a latch input.

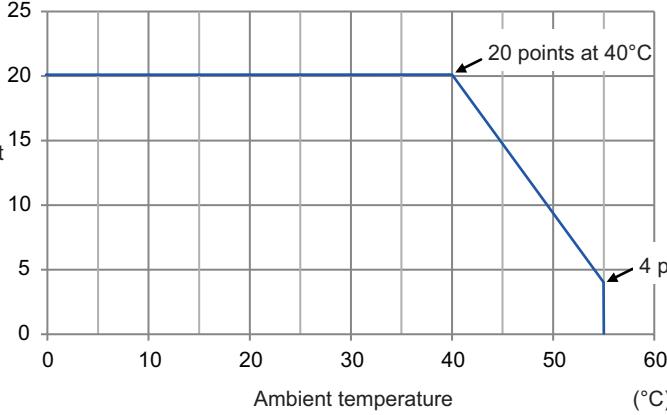
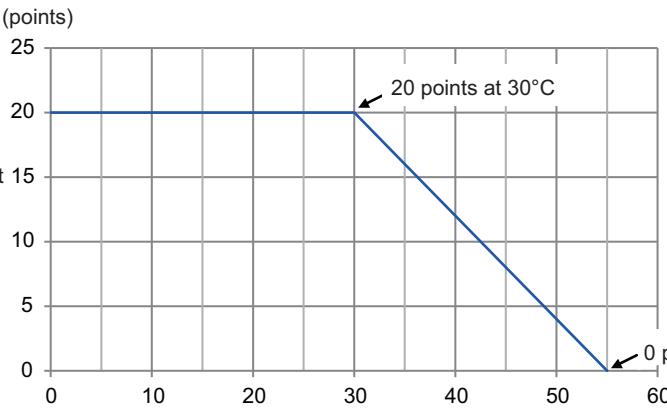
*3. You can use the external output 0 as an error counter reset output.

*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

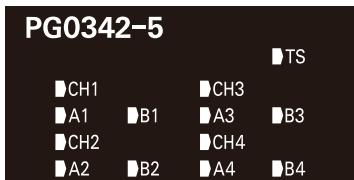
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

Dimensions	30 × 100 × 71 mm (W×H×D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	Without I/O power supply terminals
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.65 W max. Connected to a Communications Coupler Unit 1.30 W max. 	Current consumption from I/O power supply	50 mA/CN max.
Weight	150 g max.	Cable length	Line driver outputs: 10 m max. Other I/O: 3 m max.
Circuit layout	<p>Pulse Output</p>  <p>External Output</p> 		
	<p>External Inputs (Line Receiver)</p> 		
	<p>External Inputs (Other than Line Receiver)</p> 		

Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: The number of external inputs that can be always ON is restricted as shown below.</p> <ul style="list-style-type: none"> For upright installation <p>(points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 to 40</td><td>20</td></tr> <tr><td>40 to 55</td><td>20 to 4 (linear)</td></tr> <tr><td>55 to 60</td><td>4</td></tr> </tbody> </table> <p>Number of input points that are always ON</p> <p>Ambient temperature (°C)</p> <ul style="list-style-type: none"> For any installation other than upright <p>(points)</p>  <table border="1"> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 to 30</td><td>20</td></tr> <tr><td>30 to 55</td><td>20 to 0 (linear)</td></tr> <tr><td>55 to 60</td><td>0</td></tr> </tbody> </table> <p>Number of input points that are always ON</p> <p>Ambient temperature (°C)</p>	Ambient temperature (°C)	Number of input points that are always ON (points)	0 to 40	20	40 to 55	20 to 4 (linear)	55 to 60	4	Ambient temperature (°C)	Number of input points that are always ON (points)	0 to 30	20	30 to 55	20 to 0 (linear)	55 to 60	0
Ambient temperature (°C)	Number of input points that are always ON (points)																
0 to 40	20																
40 to 55	20 to 4 (linear)																
55 to 60	4																
Ambient temperature (°C)	Number of input points that are always ON (points)																
0 to 30	20																
30 to 55	20 to 0 (linear)																
55 to 60	0																

Terminal connection diagram	<p>• The connection diagram for CN2 is the same as the one for CN1.</p>	
Failure detection	None	Protection

Pulse Output Unit (Line driver output, PNP type) 4 channels NX-PG0342-5

Unit name	Pulse Output Unit		Model	NX-PG0342-5		
Number of channels	4 channels		External connection terminals	MIL connector (34 terminals ×2)		
I/O refreshing method*1	Synchronous I/O refreshing or task period prioritized refreshing					
Indicators			I/O signals	Inputs: 5 per channel. External inputs*2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel)*3		
Control method	Open-loop control through pulse string output					
Controlled drive	Servo drive with a pulse string input or a stepper motor drive					
Pulse output form	Line driver output					
Unit of control	Pulses					
Maximum pulse output speed	4 Mpps					
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4					
Position control range	-2,147,483,648 to 2,147,483,647 pulses					
Velocity control range	1 to 4,000,000 pps					
Positioning*4						
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding					
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)					
Single-axis synchronized control	Cam operation and gear operation					
Single-axis manual operation	Jogging					
Auxiliary function for single-axis control	Homing, stopping, and override changes					
External input specifications (except for line receiver inputs)						
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, -10%)	ON voltage/ON current	15 VDC min./3 mA min.			
Input current	4.6 mA typical (24 VDC)	OFF voltage/OFF current	4.0 VDC max./1 mA max.			
ON/OFF response time	External inputs 0 and 1: 1 µs max./2 µs max. External inputs 2 to 4: 20 µs max./400 µs max.					
Internal I/O common processing	PNP					
External input specifications (line receiver inputs)						
Input voltage	EIA standard RS-422-A line driver levels	High level input voltage	V _{IT+} : 0.1 V min.			
Input impedance	120 Ω ± 5%	Low level input voltage	V _{IT-} : -0.1 V max.			
Hysteresis voltage	V _{hys} (V _{IT+} - V _{IT-}): 60 mV					
Line driver output specifications						
Output voltage	RS-422-A line driver level (equivalent to AM26C31)					
Maximum load current	20 mA					
Maximum output frequency	4 Mpps					
External output specifications						
Rated voltage	24 VDC					
Load voltage range	15 to 28.8 VDC	Residual voltage	1.0 V max.			
Maximum load current	30 mA	Leakage current	0.1 mA max.			
ON/OFF response time	External output 0: 5 µs max./200 µs max. External outputs 1 and 2: 0.5 ms max./1 ms max.					
Internal I/O common processing	PNP					

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.

*2. You can use the external input 0 as a latch input.

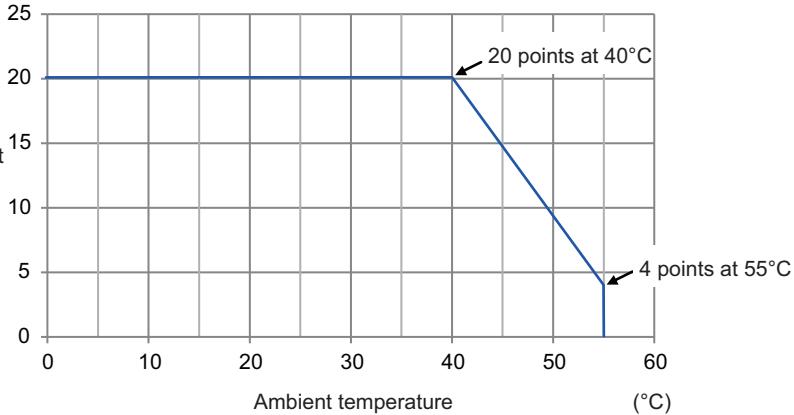
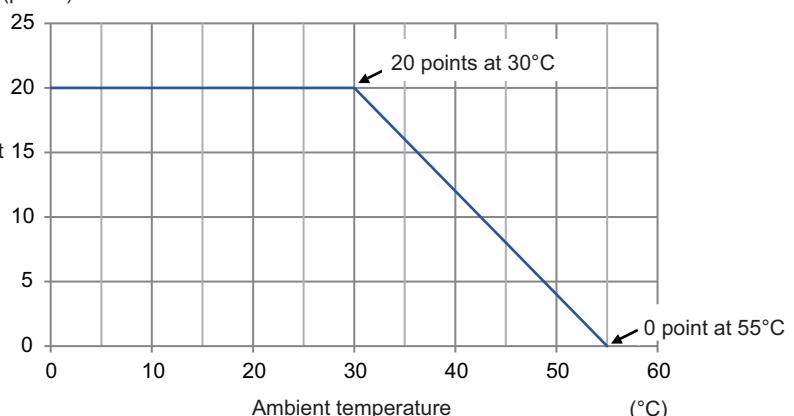
*3. You can use the external output 0 as an error counter reset output.

*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.

A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.

Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

Dimensions	30 × 100 × 71 mm (W×H×D)	Isolation method	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	Current capacity of I/O power supply terminals	Without I/O power supply terminals
NX Unit power consumption	<ul style="list-style-type: none"> Connected to a CPU Unit 1.65 W max. Connected to a Communications Coupler Unit 1.30 W max. 	Current consumption from I/O power supply	50 mA/CN max.
Weight	150 g max.	Cable length	Line driver outputs: 10 m max. Other I/O: 3 m max.
Circuit layout	<p>Pulse Output</p> <p>MIL connector</p> <p>POV</p> <p>POG</p> <p>Left-side NX bus power supply +</p> <p>Left-side NX bus power supply -</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>A+ and B+</p> <p>A- and B-</p> <p>I/O power supply +</p> <p>I/O power supply -</p> <p>Right-side NX bus power supply +</p> <p>Right-side NX bus power supply -</p>		
	<p>External Output</p> <p>MIL connector</p> <p>POV</p> <p>POG</p> <p>Left-side NX bus power supply +</p> <p>Left-side NX bus power supply -</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>O0 to O2</p> <p>OV</p> <p>I/O power supply +</p> <p>I/O power supply -</p> <p>Right-side NX bus power supply +</p> <p>Right-side NX bus power supply -</p>		
	<p>External Inputs (Line Receiver)</p> <p>MIL connector</p> <p>I0-</p> <p>I0+</p> <p>120 Ω</p> <p>POV</p> <p>POG</p> <p>Left-side NX bus power supply +</p> <p>Left-side NX bus power supply -</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>I0-</p> <p>I0+</p> <p>Isolation circuit</p> <p>Internal circuits</p> <p>I/O power supply +</p> <p>I/O power supply -</p> <p>Right-side NX bus power supply +</p> <p>Right-side NX bus power supply -</p>		
	<p>External Inputs (Other than Line Receiver)</p> <p>MIL connector</p> <p>I0 to I4</p> <p>IG</p> <p>Left-side NX bus power supply +</p> <p>Left-side NX bus power supply -</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>No isolation: 5 V</p> <p>No isolation: 5 V GND</p> <p>Power supply limiter</p> <p>Internal circuits</p> <p>I0 to I4</p> <p>IG</p> <p>Internal circuits</p> <p>I/O power supply +</p> <p>I/O power supply -</p> <p>Right-side NX bus power supply +</p> <p>Right-side NX bus power supply -</p>		

Installation orientation and restrictions	<p>Installation orientation:</p> <ul style="list-style-type: none"> Connected to a CPU Unit: Possible in upright installation. Connected to a Communications Coupler Unit: Possible in 6 orientations. <p>Restrictions: The number of external inputs that can be always ON is restricted as shown below.</p> <ul style="list-style-type: none"> For upright installation 													
	<p>(points)</p>  <table border="1"> <caption>Data for Upright Installation</caption> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 40</td><td>20</td></tr> <tr><td>40 - 55</td><td>4</td></tr> <tr><td>55</td><td>0</td></tr> </tbody> </table> <p>Number of input points that are always ON</p> <p>Ambient temperature (°C)</p> <ul style="list-style-type: none"> For any installation other than upright <p>(points)</p>  <table border="1"> <caption>Data for Non-Upright Installation</caption> <thead> <tr> <th>Ambient temperature (°C)</th> <th>Number of input points that are always ON (points)</th> </tr> </thead> <tbody> <tr><td>0 - 30</td><td>20</td></tr> <tr><td>30 - 55</td><td>0</td></tr> </tbody> </table> <p>Number of input points that are always ON</p> <p>Ambient temperature (°C)</p>	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 40	20	40 - 55	4	55	0	Ambient temperature (°C)	Number of input points that are always ON (points)	0 - 30	20	30 - 55
Ambient temperature (°C)	Number of input points that are always ON (points)													
0 - 40	20													
40 - 55	4													
55	0													
Ambient temperature (°C)	Number of input points that are always ON (points)													
0 - 30	20													
30 - 55	0													

Terminal connection diagram		
	<ul style="list-style-type: none"> The connection diagram for CN2 is the same as the one for CN1. 	
Failure detection	None	Protection

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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In the interest of product improvement, specifications are subject to change without notice.

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Industrial Automation Company

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