

Positioning with Pulse Input Type Motor Drivers Such As Stepper Motor Drive

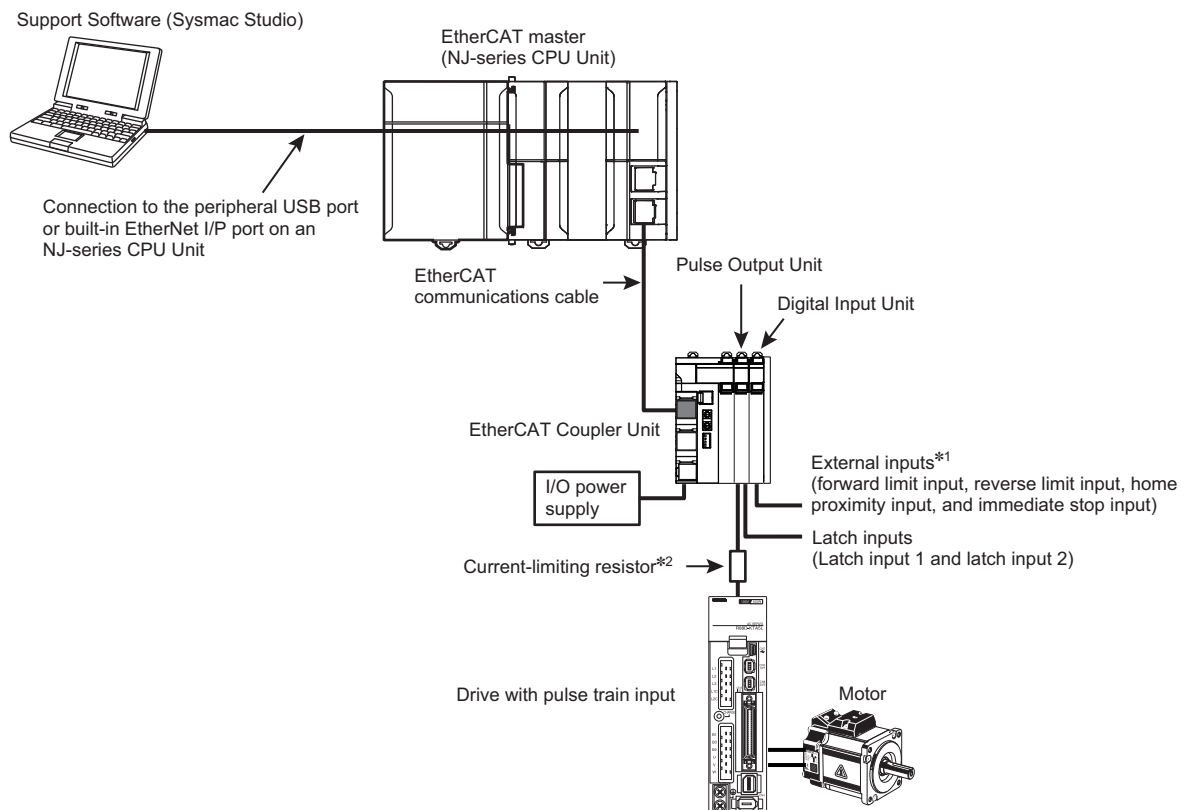
- The MC Function Modules of the NJ-series Machine Automation Controller enable pulse outputs for motor control.
- The same motion control instructions as those for Servomotor control allow you to program single-axis PTP control and interpolation.



Features

- When the motion control instructions of the MC Function Modules of the NJ-series Machine Automation Controller are used, number of usable units is the same as the maximum number of axes controlled by the NJ-series Controller.
- Synchronous I/O refreshing with the EtherCAT Coupler Unit.
- Latch function (2 external latch inputs)
- Maximum pulse output speed: 500 kpps

System Configuration



*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.


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Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL(Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Unit type	Product Name	Specification					Model	Standards
		Number of axes	Pulse Output form	Maximum pulse output speed	I/O signals	Type of external connections		
NX Series Position Interface Unit	Pulse Output Units 	1	Open collector output	500 kpps	External inputs: 2 External outputs: 3	Screwless clamping terminal block (16 terminals)	NX-PG0122	UC1, CE, KC

Option

Product Name	Specification	Model	Standards
Cording Pins	For 10 Units (Terminal Block: 30 pins, Unit: 30 pins)	NX-AUX02	–

Accessories

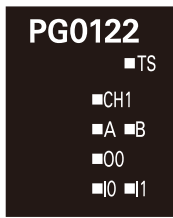
Not included.

General Specification

Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to less than 100 Ω or less
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: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	Conforms to IEC61000-4-4, 2 kV (power supply line)
	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.
	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 and ANSI/ISA 12.12.01 EC: EN 61131-2 and C-Tick, KC Registration

Specification

Pulse Output Units NX-PG0122

Unit name	Pulse Output Units		Model	NX-PG0122
Number of axes	1	Type of external connections	Screwless clamping terminal block (16 terminals)	
I/O refreshing method	Synchronous I/O refreshing *1			
Indicators			I/O signals	External inputs: 2 These are general-purpose inputs. External outputs: 3 These are the forward direction pulse output, reverse direction pulse output, and a general-purpose 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 *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	PNP			
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	
Maximum load current	30 mA	ON/OFF response time		
ON/OFF response time	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	
NX Unit power consumption	0.9 W	Current consumption from I/O power supply	20 mA	
Weight	70 g	Cable length	3 m max.	

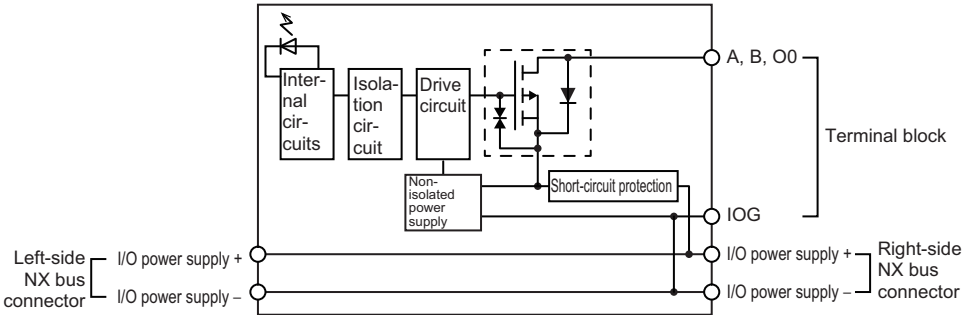
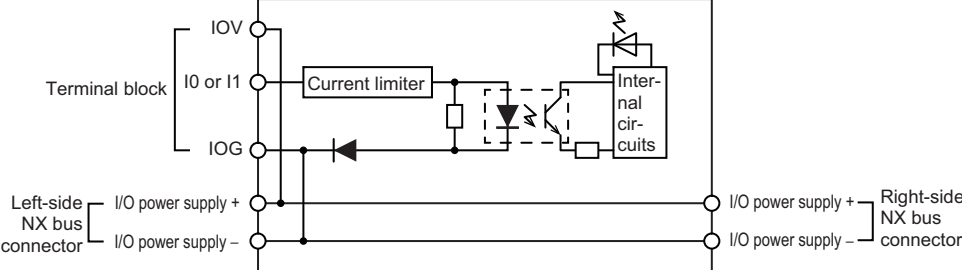
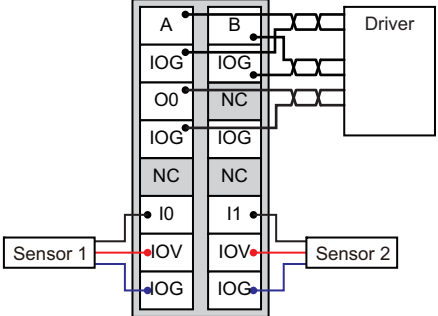
*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

*2. These functions are supported when you also use the MC Function Module in the NJ-series CPU Unit.

Refer to the NJ-series CPU Unit Motion Control User's Manual (Cat. No. W507) for details.

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 that is connected as the host

<p>Circuit layout</p>	<p>Pulse Output and External Output</p>  <p>External Inputs</p> 
<p>Installation orientation and restrictions</p>	<p>Installation orientation: 6 possible orientations Restrictions: There are no restrictions.</p>
<p>Terminal connection diagram</p>	
<p>Failure detection</p>	<p>None</p>
	<p>Protection</p>
	<p>None</p>

Version Information

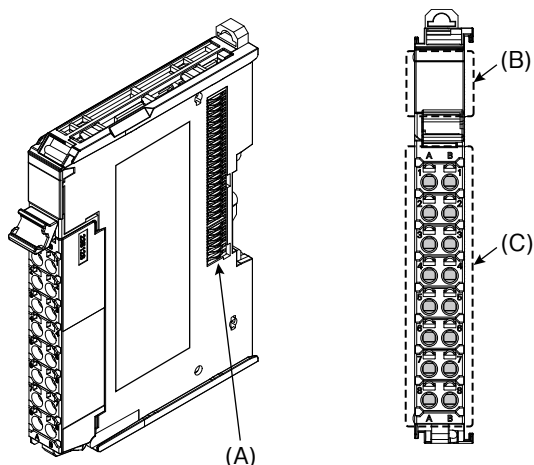
Pulse Output Unit NX Series and Sysmac Studio

Unit NX Series	Sysmac Studio	
	Version 1.05 or lower	Version 1.06 or higher
NX-PG0122	Not supported	Supported

External Interface

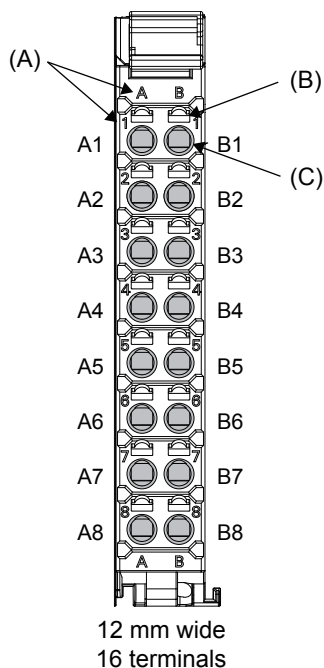
Pulse Output Unit

NX-PG0122



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 and B) 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. 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 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.

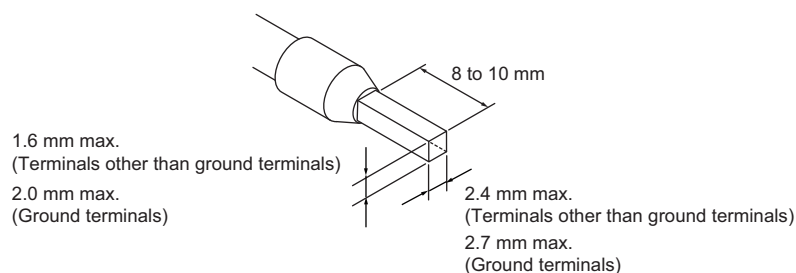
Always use one-pin ferrules. Do not use two-pin ferrules.

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

Terminal types	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)	
Ground terminals	Phoenix Contact	AI1,5-10		
		AI2,5-10	2.0 *1	
Terminals other than 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)
		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.

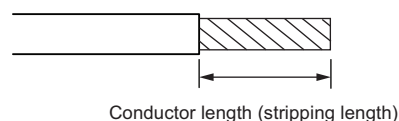


Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, the applicable wire range and conductor length (stripping length) are as follows.

Use the twisted wires to connect the ground wire to a ground of 100 Ω or less. Do not use the solid wires.

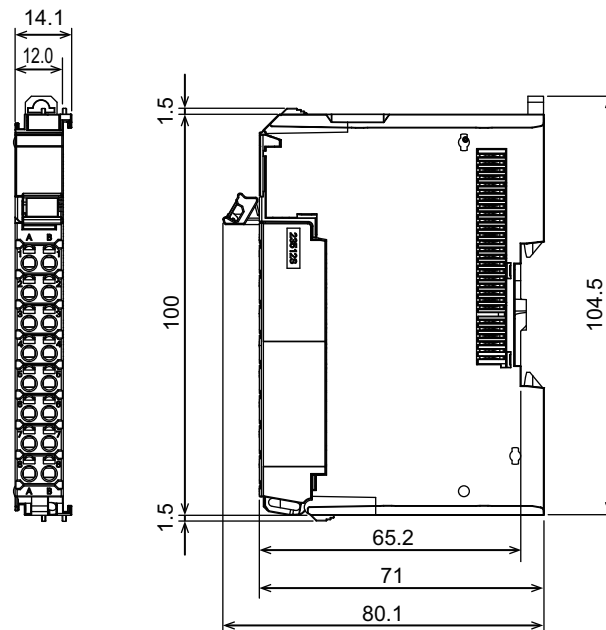
Terminal types	Applicable wires range	Conductor length (stripping length)
Ground terminals	2.0 mm ²	9 to 10 mm
Terminals other than ground terminals	0.08 to 1.5 mm ² AWG28 to 16	8 to 10 mm



Dimensions

(Unit: mm)

Pulse Output Unit NX-PG0122



Related Manuals

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.