NX-series System Unit

NX-PD/PF/PC/TBX

CSM_NX-PD_PF_PC_TBX_DS_E_4_2

Power Supply Unit, Power Connection Unit, and FG Terminal Expansion Unit for NX-series

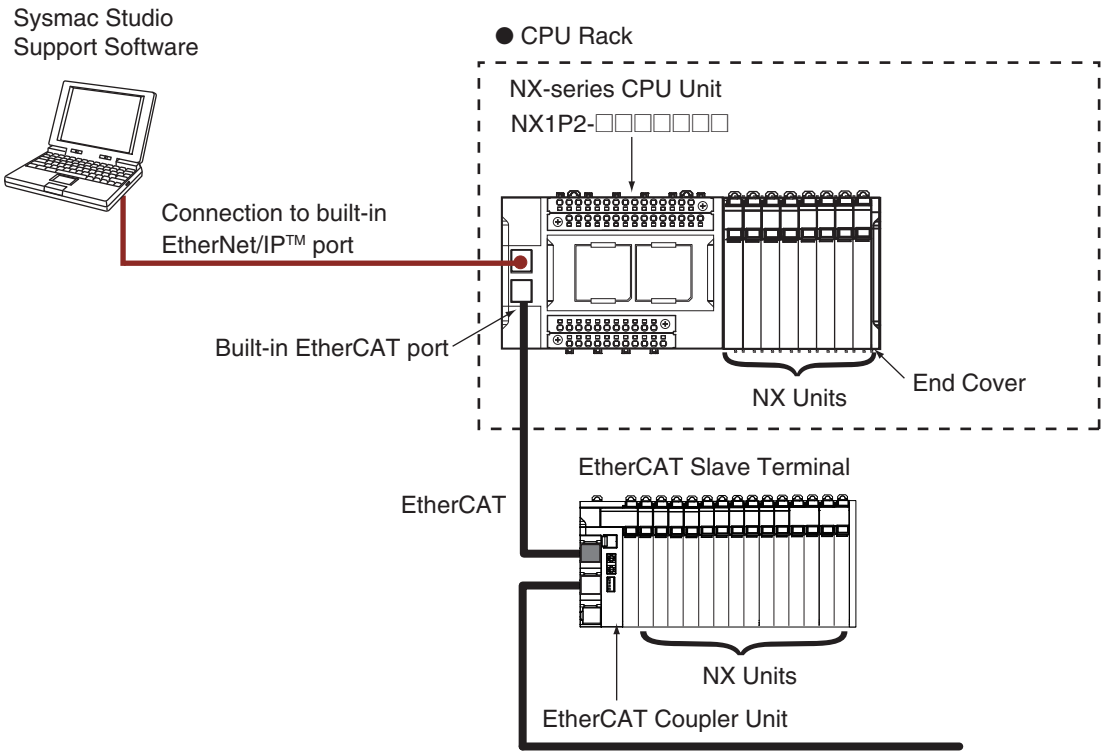
Features

- Units to feed in additional Unit power and I/O power to an NX-series remote I/O terminal.
- Screwless clamp terminal block significantly reduces wiring work.
- Space-saving 12 mm wide units.
- The NX Unit Power Supply Unit allows expansion of the I/O configuration beyond the maximum power supply capacity of the EtherCAT Coupler
- The I/O Power Supply Unit is used when the total allowed I/O current per feed terminal is exceeded, or to split I/O power into groups.
- The I/O Power Connection Unit can be used as an additional power supply terminal for connected sensors and actuators.
- The FG Terminal Expansion Unit can be used as ground terminal for wire shields.
- The screwless terminal block is detachable for easy commissioning and maintenance.

System Configuration

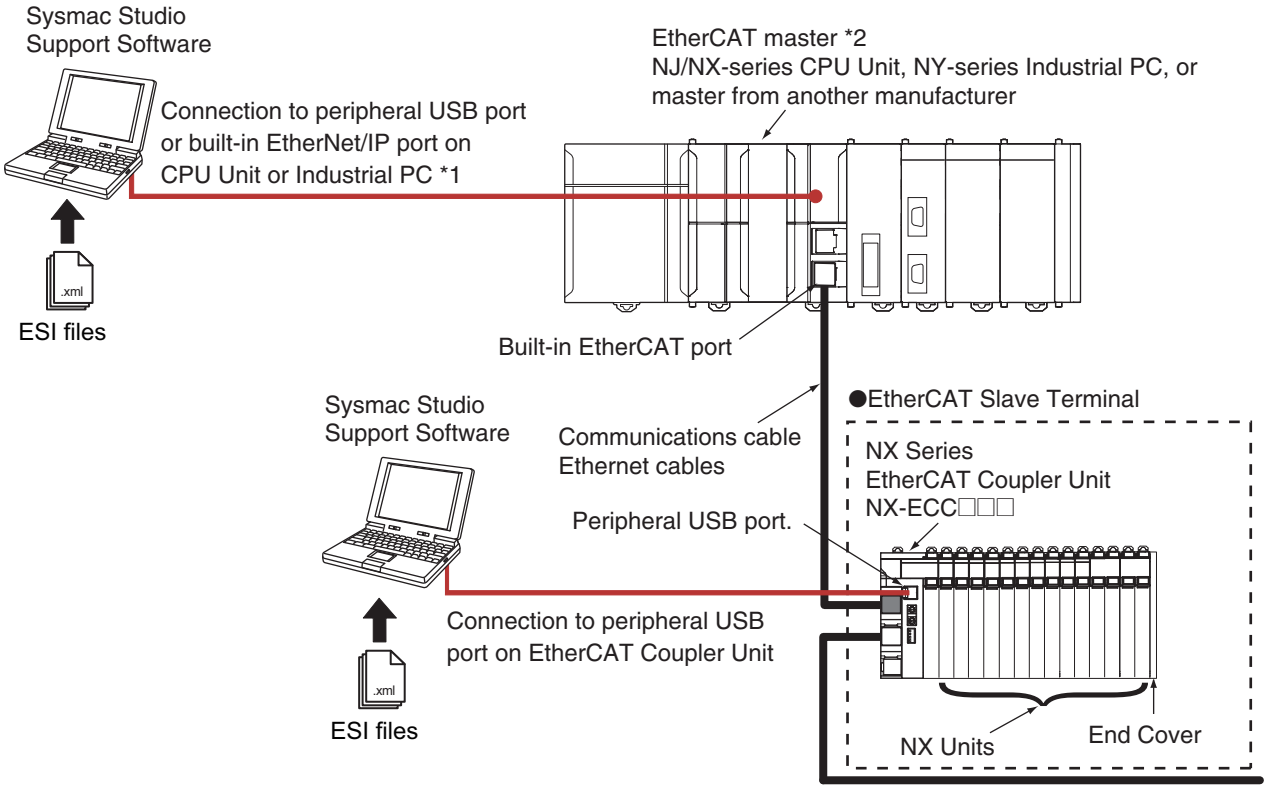
System Configuration in the Case of a CPU Unit

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



System Configuration of Slave Terminals

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: For whether NX Units can be connected to the CPU Unit or Communications Coupler Unit to be used, refer to the user's manual for the CPU Unit or Communications Coupler Unit to be used.

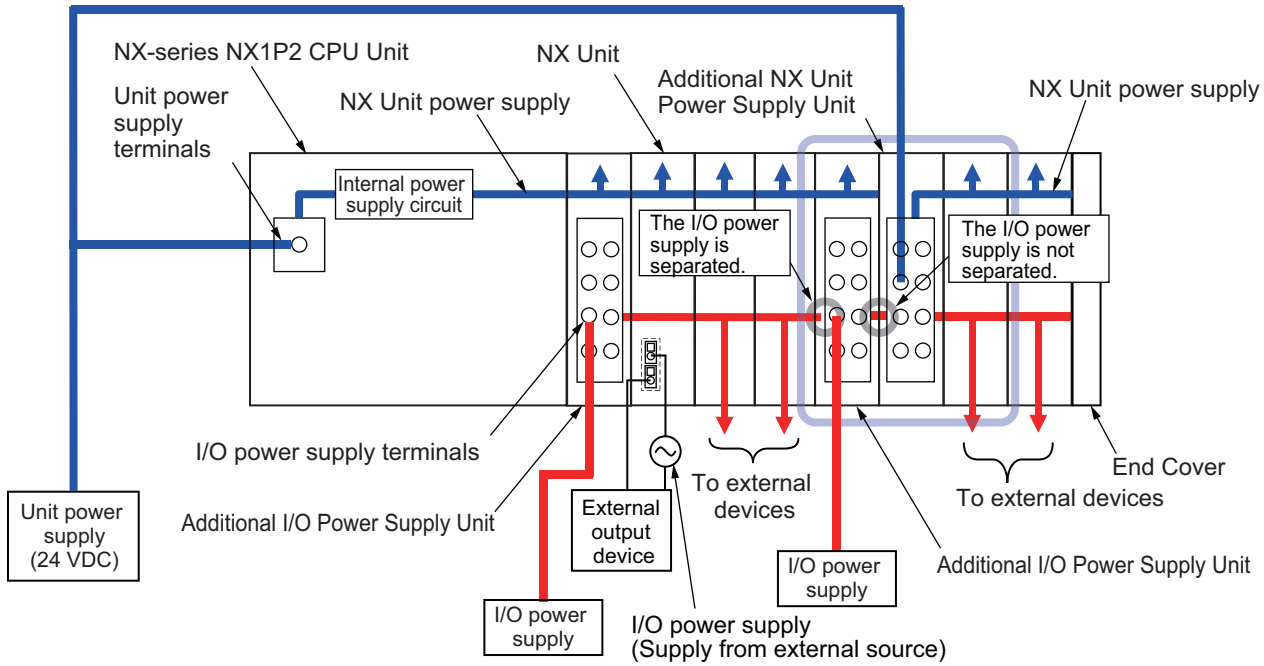
Power Supply Systems

Wiring the Power Supply to the CPU Unit

There are the following two types of power supplies that supply power to the CPU Rack of the NX1P2 CPU Units.
I/O power supply is also required to drive the built-in I/O output circuit. However, only the supply to the NX Unit is described in this section.
For the I/O power supply to the built-in I/O, refer to the hardware user's manual for the CPU Unit to which NX Units are connected.

Power supply name	Description
Unit power supply	This is the power supply for generating the internal power supply required for the CPU Rack to operate. This power supply is connected to the Unit power supply terminals on the CPU Unit. From the Unit power supply, the internal power supply circuit in the CPU Unit generates the internal circuit power supply, Option Board power supply and NX Unit power supply. The internal circuits of the NX Unit operates on the NX Unit power supply. The NX Unit power supply is supplied to the NX Units in the CPU Rack through the NX bus connectors.
I/O power supply	This power supply is used for driving the I/O circuits of the NX Units and for the connected external devices. There are the following two I/O power supply methods. Either supply method used depends on each model of NX Unit. • Supply from the NX bus • Supply from external source Refer to the *Installation and Wiring* in the *NX-series System Units User's Manual* (Cat. No. W523) for the details on the power supply methods.

The following are wiring diagrams (examples) for each power supply.



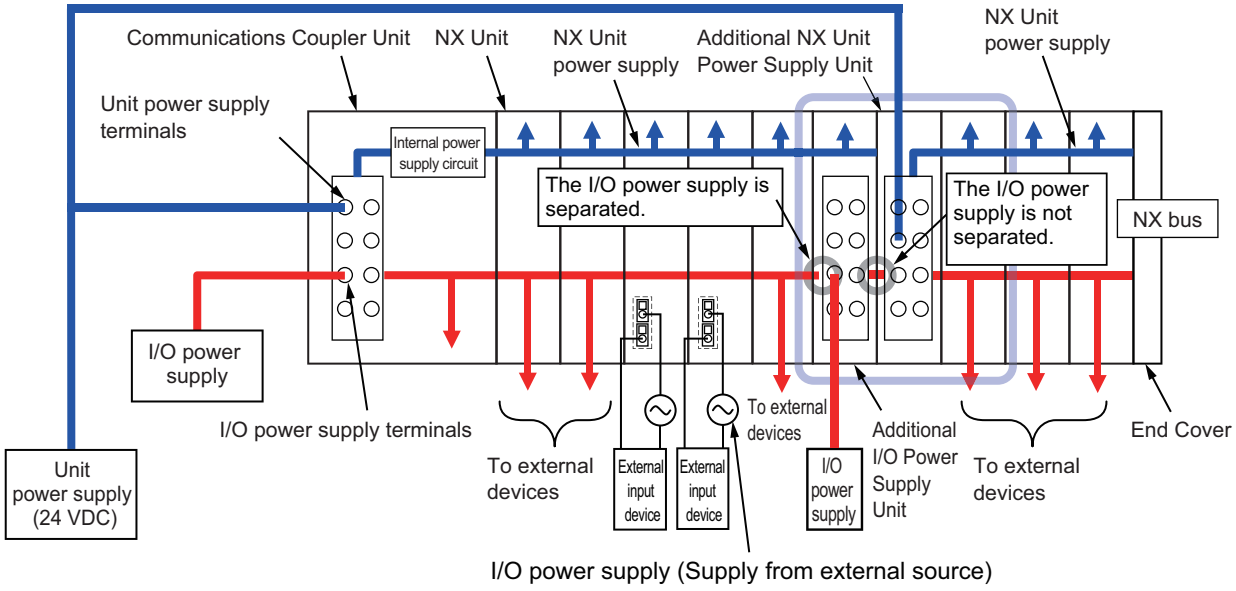
Note: Supply the Unit power and the I/O power from different power supplies. If you supply power from the same power supply the galvanic separation between the bus system and the I/O circuits is no longer effective. Noise generated in the I/O circuits may cause malfunctions in the internal circuits of the units.

Wiring the Power Supply to the Slave Terminal

There are the following two types of power supplies that supply power to the Slave Terminal.

Power supply name	Description
Unit power supply	This is the power supply for generating the NX Unit power supply required for the Slave Terminal to operate. This is connected to the Unit power supply terminal on the Communications Coupler Unit or on the Additional NX Unit Power Supply Unit. The internal power supply circuit in the Communications Coupler Unit or the Additional NX Unit Power Supply Unit generates the NX Unit power supply from the Unit power supply. The internal circuits of the Communications Coupler Unit and NX Units operate by the NX Unit power supply. The NX Unit power supply is supplied to the NX Units in the Slave Terminal through the NX bus connectors.
I/O power supply	This power supply provides power to drive the I/O circuits of the Position Interface Units and it provides power to external devices such as external encoders and sensors. There are the following two I/O power supply methods. Either supply method used depends on each model of NX Unit. • Supply from the NX bus • Supply from external source Refer to the *Installation and Wiring* in the *NX-series System Units User's Manual* (Cat. No. W523) for the details on the power supply methods.

The following are wiring diagrams (examples) for each power supply.



Note: Supply the Unit power and the I/O power from different power supplies. If you supply power from the same power supply the galvanic separation between the bus system and the I/O circuits is no longer effective. Noise generated in the I/O circuits may cause malfunctions in the internal circuits of the units.

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: EU Directives, RCM: Regulatory Compliance Mark, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Additional NX Unit Power Supply Unit

Unit type	Product name	Power supply voltage	NX Bus power supply capacity	Model	Standards
NX Series System Unit	Additional NX Unit Power Supply Unit 	24 VDC (20.4 to 28.8 VDC)	10 W max.	NX-PD1000	UC1, N, L, CE, RCM, KC

Additional I/O Power Supply Unit

Unit type	Product name	Power supply voltage	I/O power feed maximum current	Model	Standards
NX Series System Unit	Additional I/O Power Supply Unit 	5 to 24 VDC (4.5 to 28.8 VDC)	4 A	NX-PF0630	UC1, N, L, CE, RCM, KC
			10 A	NX-PF0730	

I/O Power Supply Connection Unit

Unit type	Product name	Number of I/O power terminals	Current capacity of I/O power terminal	Model	Standards
NX Series System Unit	I/O Power Supply Connection Unit 	IOG: 16 terminals	4 A/terminal max.	NX-PC0010	UC1, N, L, CE, RCM, KC
		IOV: 16 terminals	4 A/terminal max.	NX-PC0020	UC1, N, L, CE, RCM, KC
		IOV:8 terminals IOG:8 terminals	4 A/terminal max.	NX-PC0030	UC1, N, L, CE, RCM, KC

Shield Connection Unit

Unit type	Product name	Number of shield terminals	Model	Standards
NX Series System Unit	Shield Connection Unit 	14 terminals (The lower two terminals are functional ground terminals.)	NX-TBX01	UC1, N, L, CE, RCM, KC

Optional Products

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

Product Name	Specification				Model	Standards
	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity		
Terminal Block	8	A/B	None	10 A	**NX-TBA082**	---
			Provided		**NX-TBC082**	
	16		None		**NX-TBA162**	
			Provided		**NX-TBC162**	

Accessories
There are no accessories.

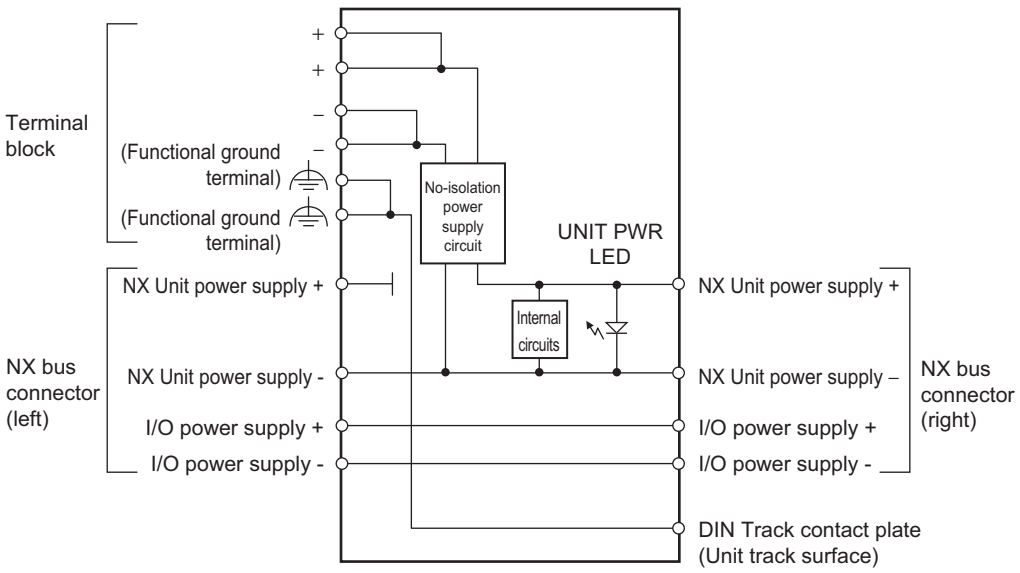
General Specification

Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to 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	2 or less: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)
	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), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, and LR

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

Specification

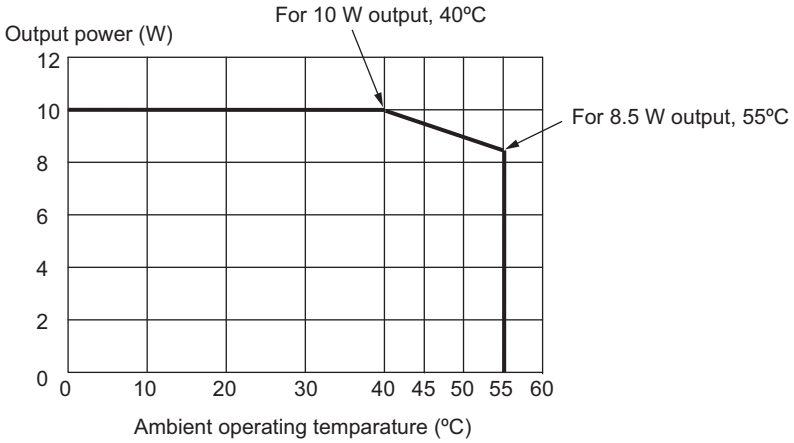
Additional NX Unit Power Supply Unit NX-PD1000

Unit name	Additional NX Unit Power Supply Unit
Model	NX-PD1000
External connection terminals	Screwless push-in terminal block (8 terminals)
Power supply voltage	24 VDC (20.4 to 28.8 VDC)
NX Bus power supply capacity	10 W max. (Refer to Installation orientation and restrictions for details.)
NX Unit power supply efficiency	70%
Unwired terminal current capacity	4 A max. (Including the current of through-wiring)
Dimensions	12 (W) × 100 (H) 71 × (D)
Isolation method	No-isolation
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.
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.
I/O current consumption	No consumption
Weight	65 g max.
Circuit layout	

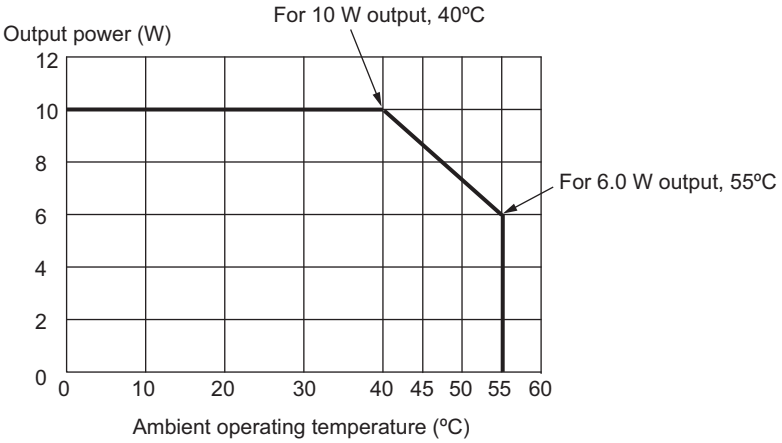
Installation orientation and restrictions

Installation orientation:
- Connected to a CPU Unit: Possible in upright installation.
- Connected to a Communications Coupler Unit: Possible in 6 orientations.

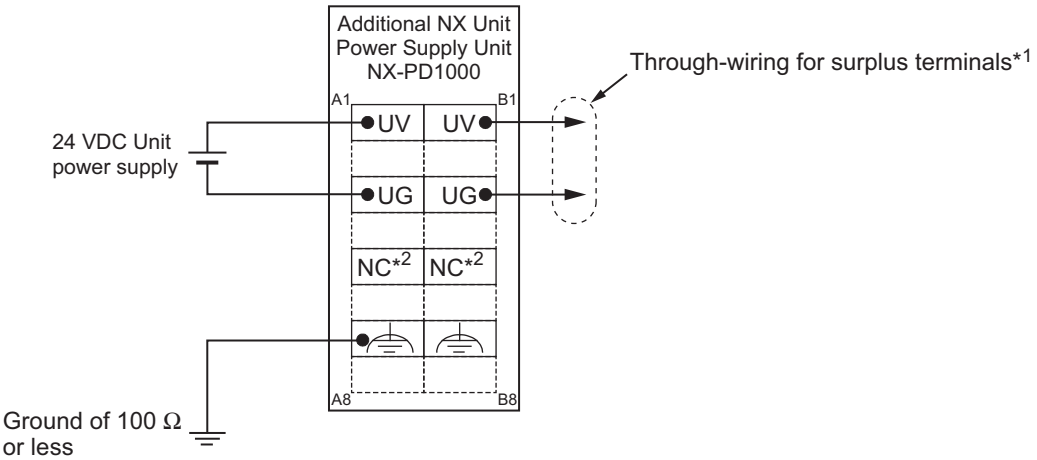
Restrictions:
- For upright installation



- For any installation other than upright

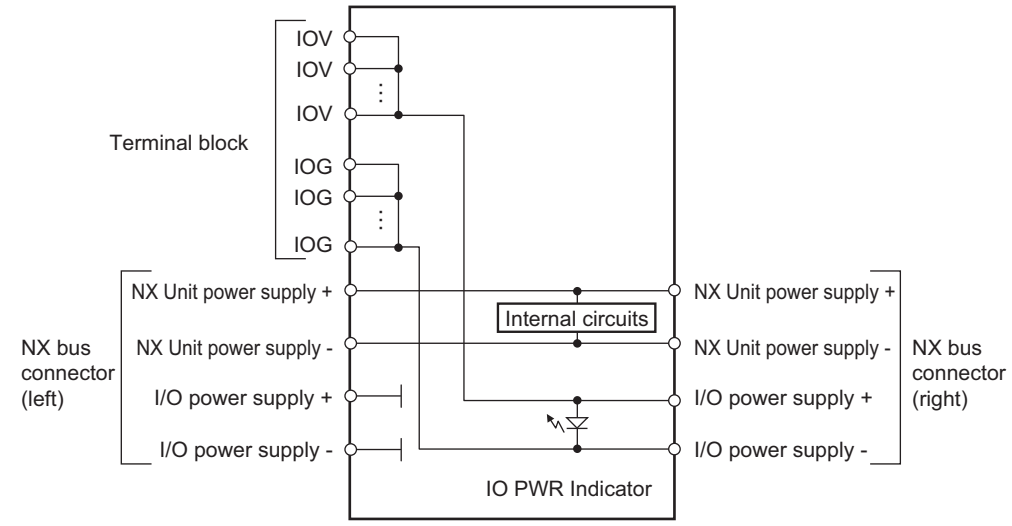
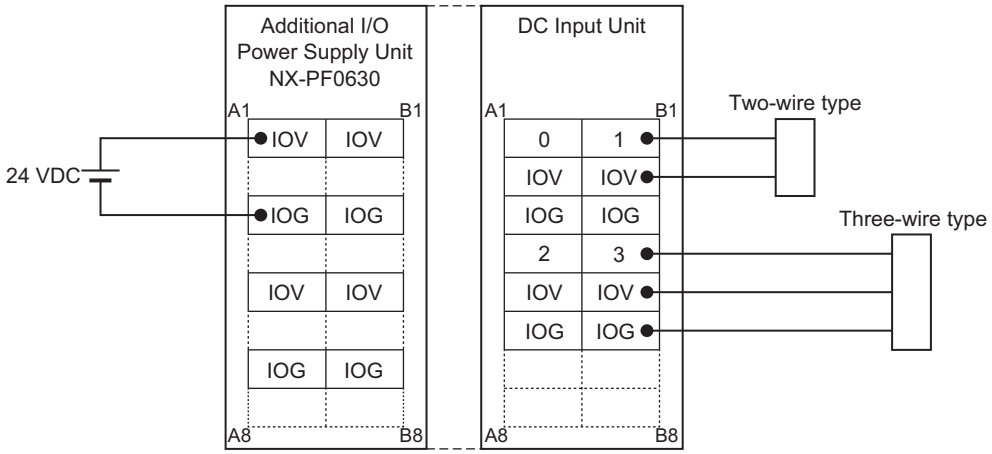


Terminal connection diagram



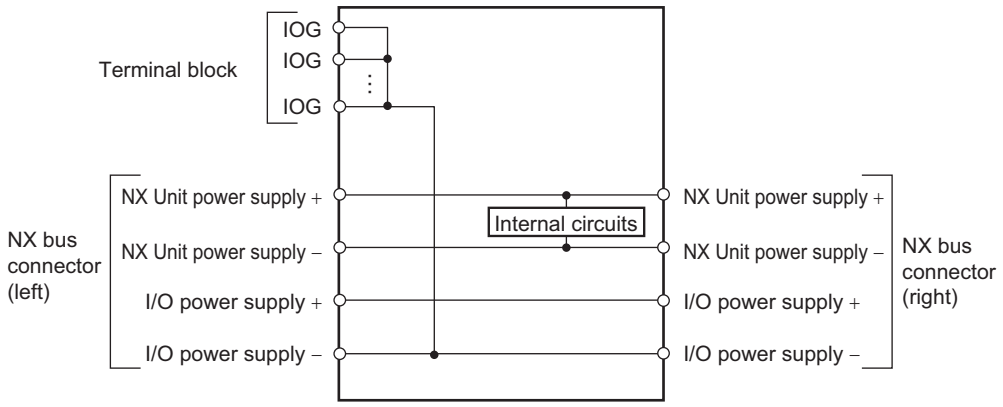
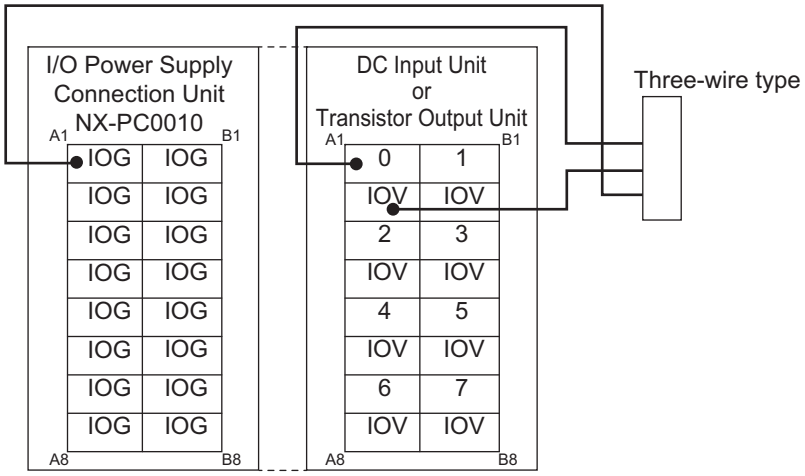
*1. You can use the unwired terminals of the Unit power supply terminals (UV/UG) for through-wiring of the Additional NX Unit Power Supply Unit or the Unit power supply terminals on the EtherCAT Coupler Unit.
*2. The NC terminal is not connected to the internal circuit.

Additional I/O Power Supply Units NX-PF0□30

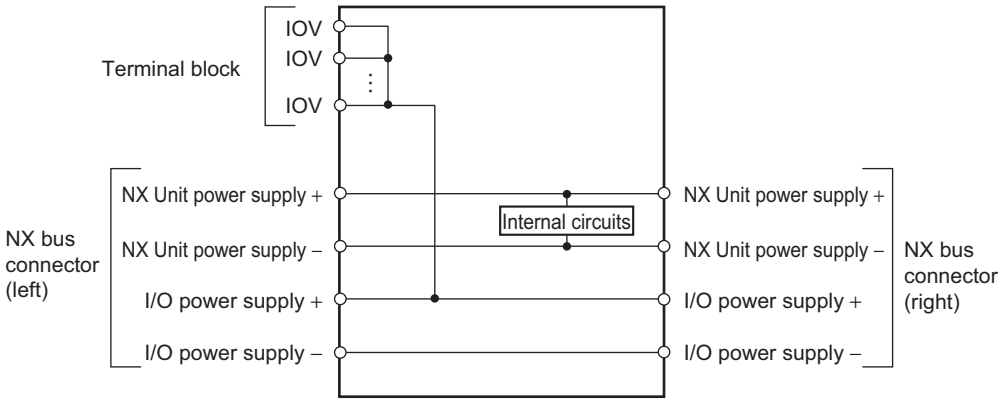
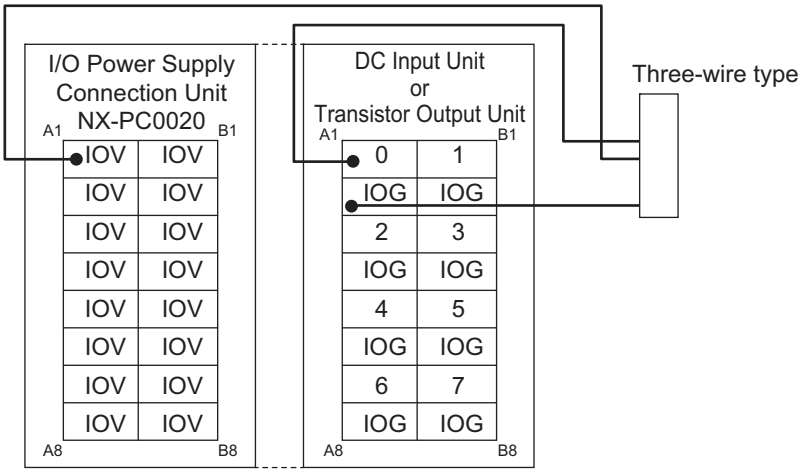
Unit name	Additional I/O Power Supply Unit	
Model	NX-PF0630	NX-PF0730
External connection terminals	Screwless push-in terminal block (8 terminals)	
Power supply voltage	5 to 24 VDC (4.5 to 28.8 VDC)*	
I/O power supply maximum current	4 A	10 A
Current capacity of I/O power supply terminal	4 A max.	10 A max.
Dimensions	12 (W) × 100 (H) 71 × (D)	
Isolation method	No-isolation	
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.	
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.	
I/O current consumption	10 mA max.	
Weight	65 g max.	
Circuit layout		
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: No restrictions	
Terminal connection diagram		
Overload/low voltage detection	Not supported	
Protective function	Not supported.	

* Use an output voltage that is appropriate for the I/O circuits of the NX Units and the connected external devices.

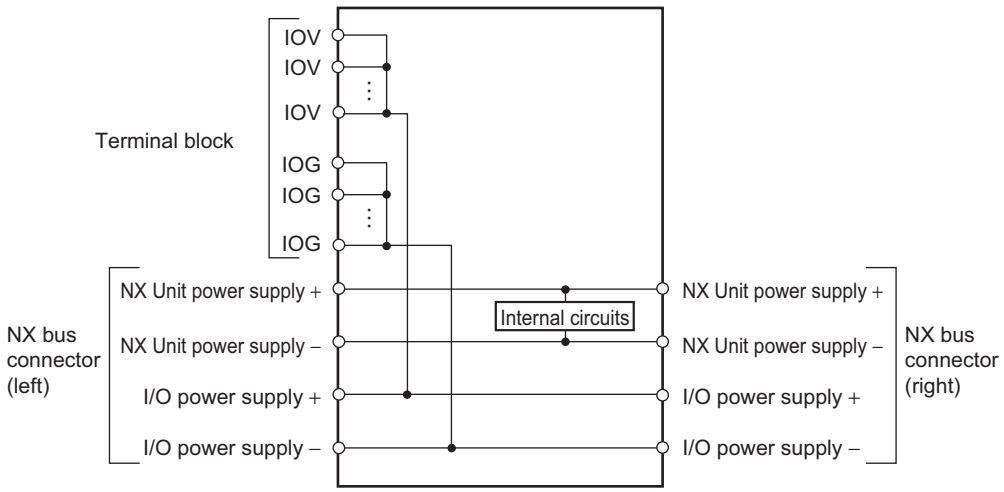
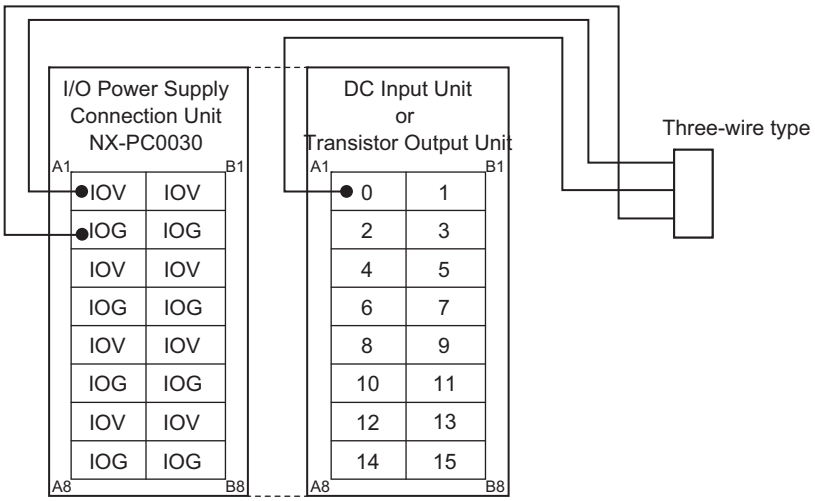
I/O Power Supply Connection Unit IOG terminal type NX-PC0010

Unit name	I/O Power Supply Connection Unit
Model	NX-PC0010
External connection terminals	Screwless push-in terminal block (16 terminals)
Number of I/O power supply terminals	IOG: 16 terminals
Current capacity of I/O power supply terminal	4 A/terminal max.
Dimensions	12 (W) × 100 (H) 71 ×(D)
Isolation method	No-isolation
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.
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.
I/O current consumption	No consumption
Weight	65 g max.
Circuit layout	
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: No restrictions
Terminal connection diagram	

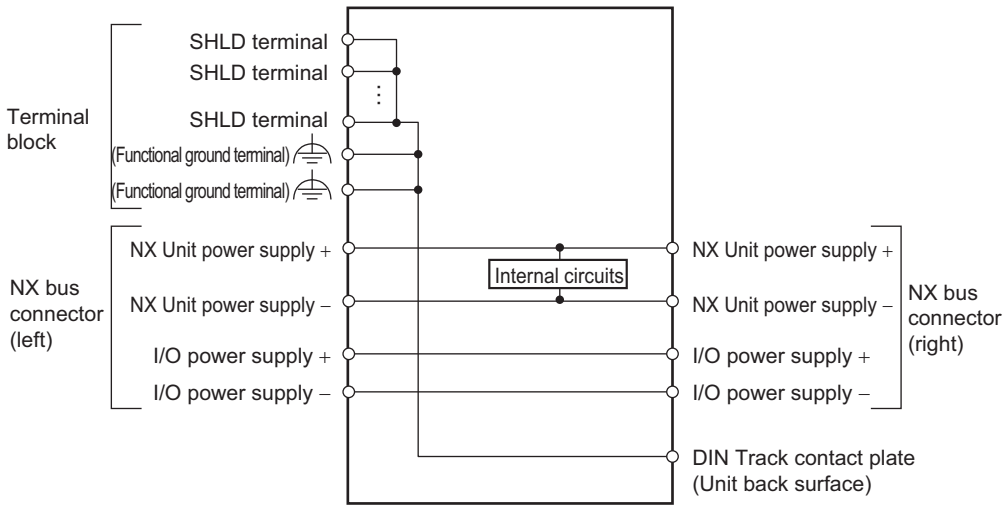
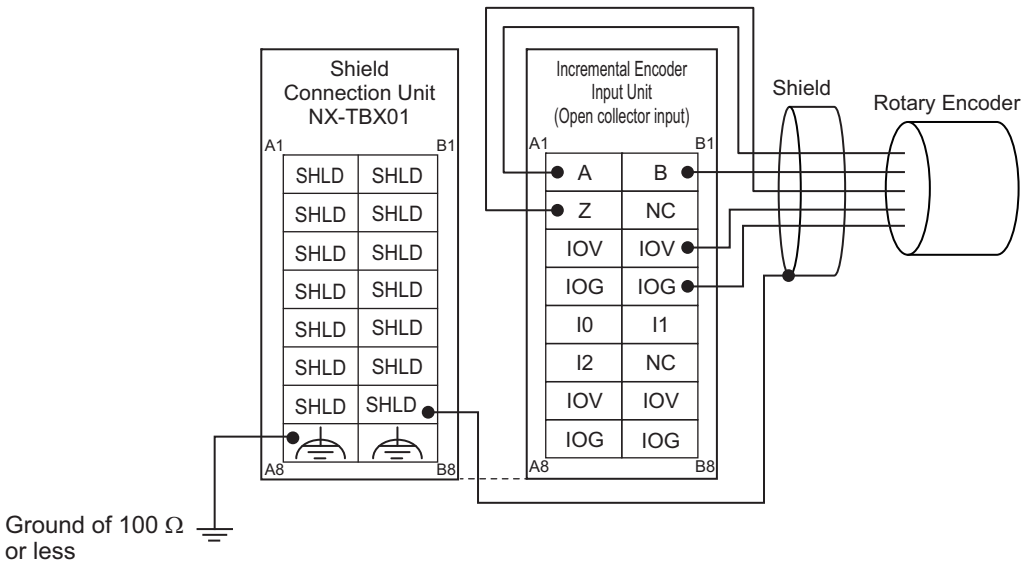
I/O Power Supply Connection Unit IOV terminal type NX-PC0020

Unit name	I/O Power Supply Connection Unit
Model	NX-PC0020
External connection terminals	Screwless push-in terminal block (16 terminals)
Number of I/O power supply terminals	IOV: 16 terminals
Current capacity of I/O power supply terminal	4 A/terminal max.
Dimensions	12 (W) × 100 (H) 71 × (D)
Isolation method	No-isolation
Isolation 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.
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.
I/O current consumption	No consumption
Weight	65 g max.
Circuit layout	
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: No restrictions
Terminal connection diagram	

I/O Power Supply Connection Unit IOV/IOG terminal type NX-PC00300

Unit name	I/O Power Supply Connection Unit
Model	NX-PC0030
External connection terminals	Screwless push-in terminal block (16 terminals)
Number of I/O power supply terminals	IOV: 8 terminals IOG: 8 terminals
Current capacity of I/O power supply terminal	4 A/terminal max.
Dimensions	12 (W) × 100 (H) 71 × (D)
Isolation method	No-isolation
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.
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.
I/O current consumption	No consumption
Weight	65 g max.
Circuit layout	
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: No restrictions
Terminal connection diagram	

Shield Connection Unit NX-TBX01

Unit name	Shield Connection Unit
Model	NX-TBX01
External connection terminals	Screwless push-in terminal block (16 terminals)
Number of shield terminals	14 terminals (The following two terminals are functional ground terminals.)
Dimensions	12 (W) × 100 (H) 71 × (D)
Isolation method	Isolation between the SHLD functional ground terminal, and internal circuit: No-isolation
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.
NX Unit power consumption	• Connected to a CPU Unit 0.85 W max. • Connected to a Communications Coupler Unit 0.45 W max.
I/O current consumption	No consumption
Weight	65 g max.
Circuit layout	
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: No restrictions
Terminal connection diagram	

Version Information

Connecting with CPU Units

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

NX Unit		Corresponding versions *	
Model	Unit Version	CPU Unit	Sysmac Studio
NX-PD1000	Ver.1.0	Ver.1.13 or later	Ver.1.17 or higher
NX-PF0630			
NX-PF0730			
NX-PC0020			
NX-PC0010			
NX-PC0030			
NX-TBX01			

* 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.

Connecting with Coupler Units

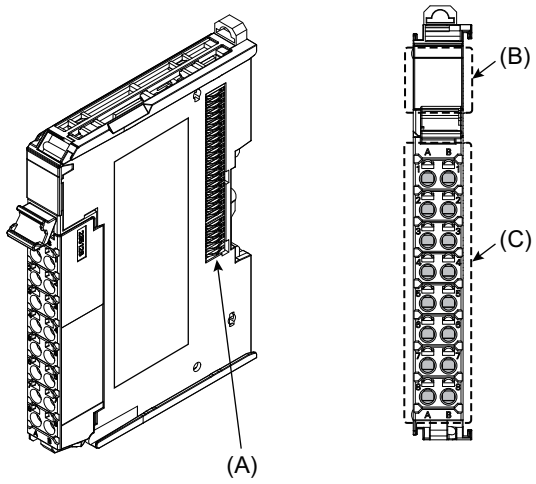
NX Unit		Corresponding versions *				
		EtherCAT			Ethernet/IP	
Model	Unit Version	Communications Coupler Unit	NJ/NX-series CPU Units or NY-series Industrial PCs	Sysmac Studio	Communications Coupler Unit	Sysmac Studio
NX-PD1000	Ver.1.0	Ver.1.0 or later	Ver.1.05 or later	Ver.1.06 or higher	Ver.1.0 or later	Ver.1.10 or higher
NX-PF0630						
NX-PF0730				Ver.1.08 or higher		
NX-PC0020				Ver.1.06 or higher		
NX-PC0010						
NX-PC0030						
NX-TBX01						

* 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.

External Interface

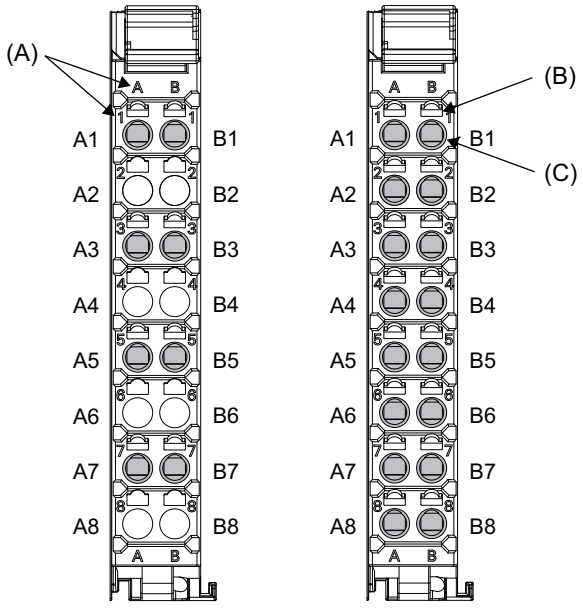
Additional NX Unit Power Supply Unit, Additional I/O Power Supply Unit, I/O Power Supply Connection Unit, and Shield Connection Unit

NX-PD1000/NX-PF0□30/NX-PC00□0/NX-TBX01



Symbol	Name	Function
(A)	NX bus connector	This connector is used to connect each Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The terminal block is used to connect external devices. The number of terminals depends on the type of Unit.

Terminal Blocks



8-terminal type　　16-terminal type

Symbol	Name	Function
{A)	Terminal number indications	Terminal numbers for which A and B indicate the column, and 1 to 8 indicate the line are displayed. The terminal number is a combination of column and line, so A1 to A8 and B1 to B8 are displayed. The terminal number indications are the same regardless of the number of terminals on the terminal block.
(B)	Release holes	Insert a flat-blade screwdriver into these holes to connect and remove the wires.
(C)	Terminal holes	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-PD1000	NX-TBC082	8	A/B	Provided	10 A
NX-PF0630	NX-TBA082	8	A/B	None	10 A
NX-PF0730	NX-TBA082	8	A/B	None	10 A
NX-PC□□□□	NX-TBA162	16	A/B	None	10 A
NX-TBX01	NX-TBC162	16	A/B	Provided	10 A

Applicable Wires

Using Ferrules

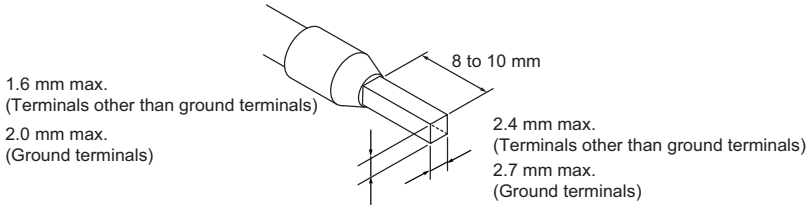
If you use ferrules, attach the twisted wires to them.
Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

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

Terminal 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)	
		AI1,5-10		
Ground terminals		AI2,5-10	2.0 *1	
Terminals other than ground terminals	Weidmuller	H0.14/12	0.14 (#26)	Weidmueller (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 mm^2 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.

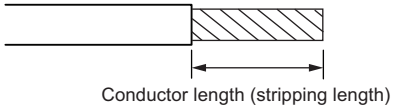


Using Twisted Wires/Solid Wires

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 max.	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			
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.



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

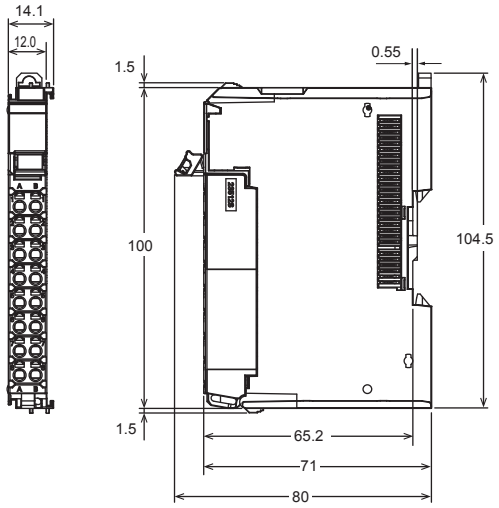
Dimensions

(Unit: mm)

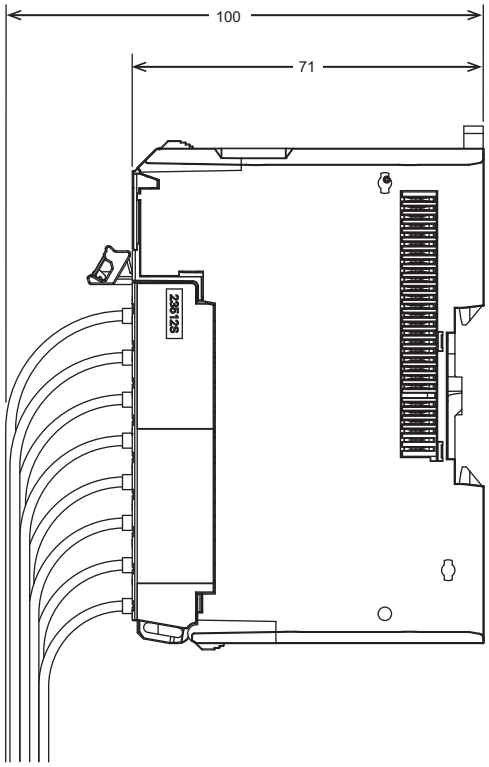
Additional NX Unit Power Supply Unit, Additional I/O Power Supply Unit, I/O Power Supply Connection Unit, and Shield Connection Unit

NX-PD1000/NX-PF0□30/NX-PC00□0/NX-TBX01

● **Unit Only**



● **With Cables Connected**



Related Manuals

Man. No	Model	Manual	Application	Description
W523	NX-PD1 □□□ NX-PF0 □□□ NX-PC0 □□□ NX-TBX □□□	NX-series System Unit User's Manual	Learning how to use NX-series System Units	The hardware and functions of the NX-series System Units are described.

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