NX-PD/PF/PC/TBX

CSM_NX-PD_PF_PC_TBX_DS_F_5_1

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



Features

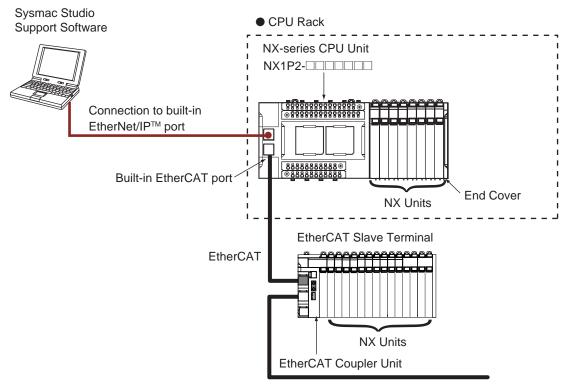
- Units to feed in additional Unit power and I/O power to an NX-series remote I/O terminal.
- Screwless clamp terminal block significantly reduces wiring work.
- · Space-saving 12 mm wide units.
- The NX Unit Power Supply Unit allows expansion of the I/O configuration beyond the maximum power supply 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.

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System Configuration

System Configuration in the Case of a CPU Unit

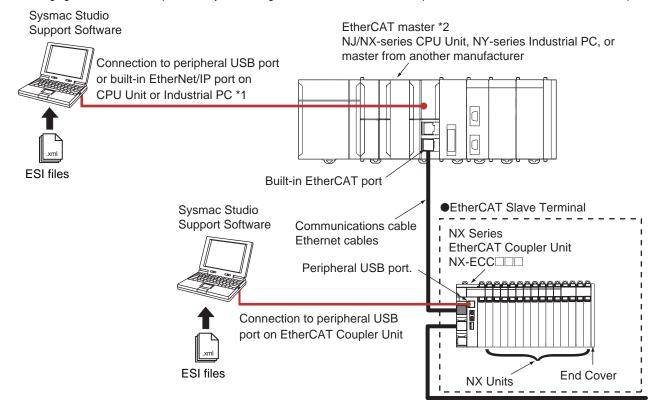
The following figure shows a system configuration when a group of NX Units is connected to an NX-series CPU Unit.



Note: For whether an NX Unit can be connected to the CPU Unit, refer to the version information.

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.



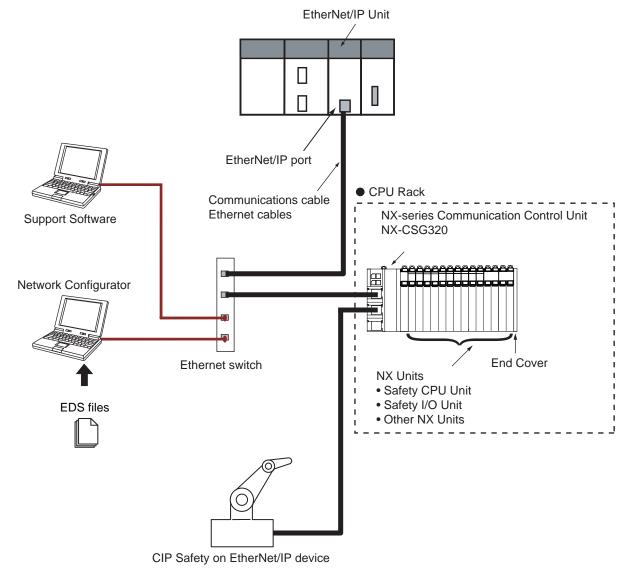
^{*1.} The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.

Note: For whether an NX Unit can be connected to the Communications Coupler Unit, refer to the version information.

^{*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.

System Configuration in the Case of a Communication Control Unit

The following figure shows a system configuration when a group of NX Units is connected to an NX-series Communication Control Unit. To configure a Safety Network Controller, mount the Safety CPU Unit, which is one of the NX Units, to the CPU Rack of the Communication Control Unit.



Note: For whether an NX Unit can be connected to the Communication Control Unit, refer to the version information.

Power Supply Systems

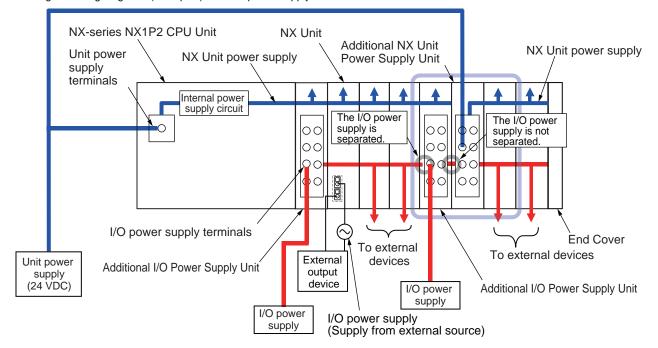
Wiring the Power Supply to the CPU Unit

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.



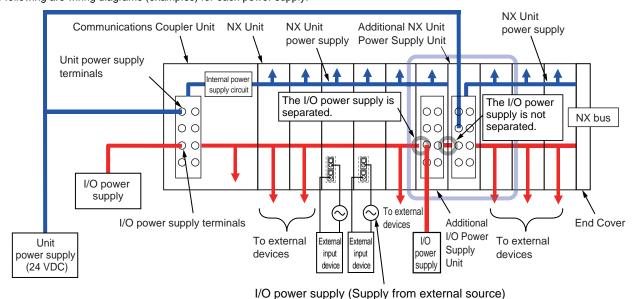
Note: Supply the Unit power and the I/O power from different power supplies. If you supply power from the same power supply the galvanic separation between the bus system and the I/O circuits is no longer effective. Noise generated in the I/O circuits may cause malfunctions in the internal circuits of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



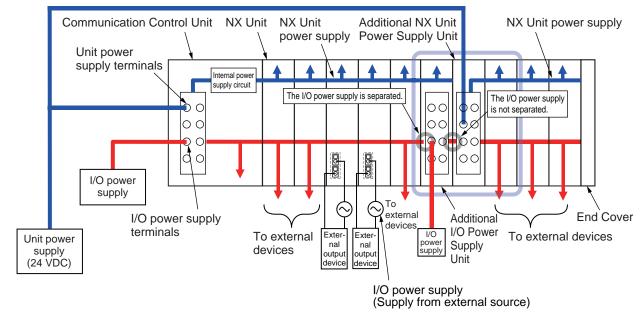
Note: Supply the Unit power and the I/O power from different power supplies. If you supply power from the same power supply the galvanic separation between the bus system and the I/O circuits is no longer effective. Noise generated in the I/O circuits may cause malfunctions in the internal circuits of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

Wiring the Power Supply to the Communication Control Unit

There are the following two types of power supplies that supply power to the Communication Control Unit.

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 Communication Control Unit or Additional NX Unit Power Supply Unit. From the Unit power supply, the internal power supply circuit in the Communication Control Unit generates the power supply to the internal circuit of the Communication Control Unit and NX Unit power supply. The internal power supply circuit in the Additional NX Unit Power Supply Unit generates the NX Unit power supply from the 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 Supplying Each Power Supply and Wiring in the User's Manual 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

SYSTEM Units

Product Name	Specifications	Model
Additional NX Unit Power Supply Unit	Power supply voltage: 24 VDC (20.4 to 28.8 VDC) NX Bus power supply capacity: 10 W max.	NX-PD1000
Additional I/O Power Supply Unit	Power supply voltage: 5 to 24 VDC (4.5 to 28.8 VDC) I/O power feed maximum current: 4 A	NX-PF0630
	Power supply voltage: 5 to 24 VDC (4.5 to 28.8 VDC) I/O power feed maximum current: 10 A	NX-PF0730
I/O Power Supply Connection Unit	Number of I/O power terminals: IOG: 16 terminals Current capacity of I/O power terminal: 4 A/terminal max.	NX-PC0010
	Number of I/O power terminals: IOV: 16 terminals Current capacity of I/O power terminal: 4 A/terminal max.	NX-PC0020
	Number of I/O power terminals: IOV: 8 terminals, IOG: 8 terminals Current capacity of I/O power terminal: 4 A/terminal max	NX-PC0030
Shield Connection Unit	Number of shield terminals: 14 terminals (The lower two terminals are functional ground terminals.)	NX-TBX01

Optional Products

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

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

Accessories

There are no accessories.

General Specification

	Item	Specification	
Enclosure		Mounted in a panel	
Grounding m	ethod	Ground to 100 Ω or less	
	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: Meets IEC 61010-2-201.	
Operating environment	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)	
environment	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/s², 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/s², 3 times each in X, Y, and Z directions	
Applicable sta	andards *	cULus: Listed (UL508), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, and LR	

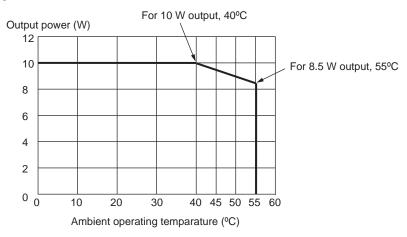
^{*} Refer to the OMRON website or ask your OMRON representative for the most recent applicable standards for each model.

Specification

Additional NX Unit Power Supply Unit NX-PD1000 Unit name Additional NX Unit Power Supply Unit Model NX-PD1000 **External connection** Screwless push-in terminal block (8 terminals) terminals 24 VDC (20.4 to 28.8 VDC) Power supply voltage NX Bus power supply 10 W max. (Refer to Installation orientation and restrictions for details.) capacity **NX Unit power supply** 70% efficiency **Unwired terminal** 4 A max. (Including the current of through-wiring) current capacity **Dimensions** 12 (W) × 100 (H) 71 × (D) Isolation method No-isolation Insulation resistance 20 M Ω 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. · Connected to a CPU Unit or Communication Control Unit **NX** Unit power 0.85 W max. consumption Connected to a Communications Coupler Unit 0.45 W max. I/O current No consumption consumption Weight 65 g max. **Terminal** block (Functional ground terminal) No-isolatio power (Functional ground 📤 supply **UNIT PWR** terminal) circuit LED Circuit layout NX Unit power supply + NX Unit power supply + Internal NX bus NX bus NX Unit power supply NX Unit power supply connector connector (left) (right) I/O power supply + I/O power supply + I/O power supply -I/O power supply -DIN Track contact plate (Unit track surface)

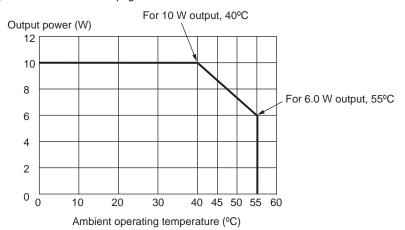
Installation orientation:

- Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.
- Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions:
- · For upright installation

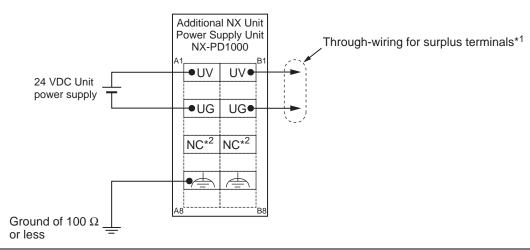


Installation orientation and restrictions

· For any installation other than upright





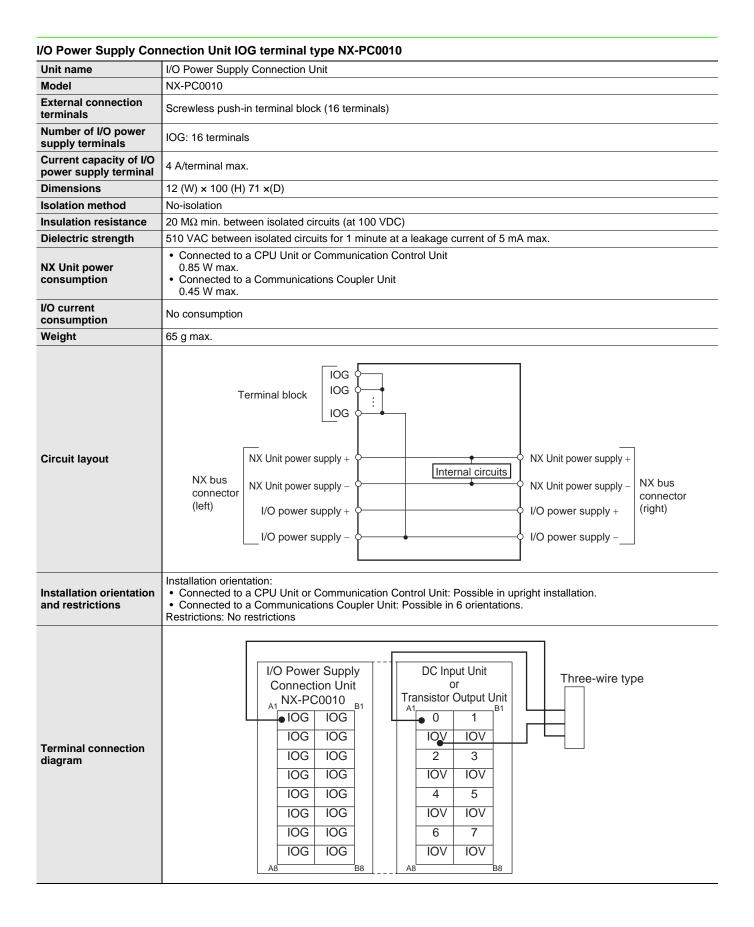


^{*1.} You can use the unwired terminals of the Unit power supply terminals (UV/UG) for through-wiring of the Additional NX Unit Power Supply Unit or the Unit power supply terminals on the EtherCAT Coupler Unit.

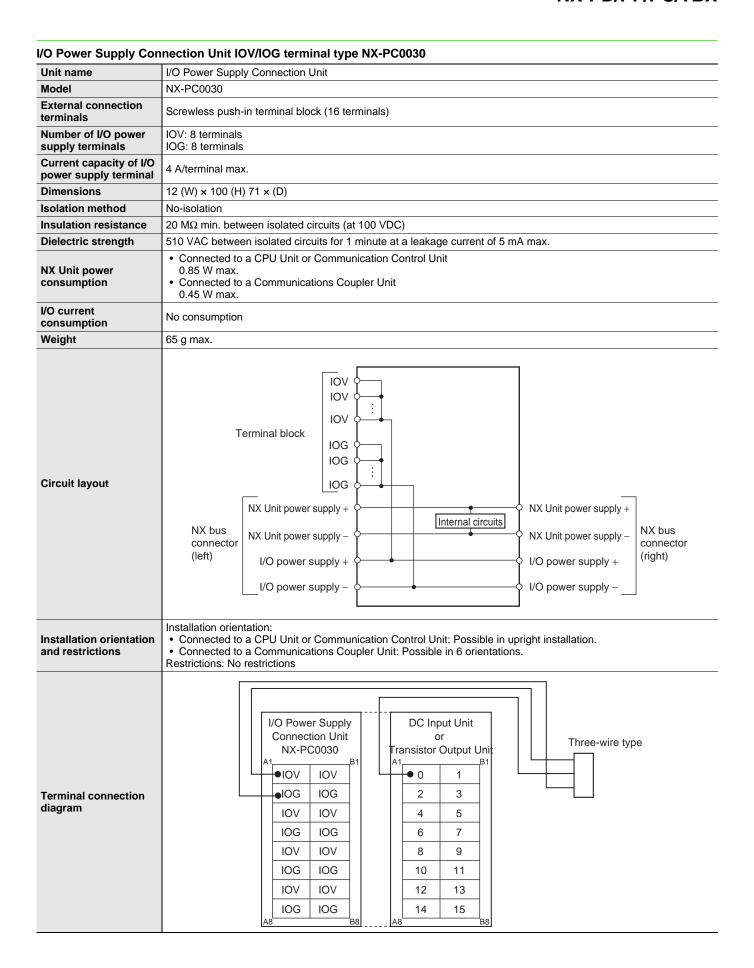
^{*2.} The NC terminal is not connected to the internal circuit.

Init name	Additional I/O Power Supply Unit			
lodel	NX-PF0630	NX-PF0730		
xternal connection erminals	Screwless push-in terminal block (8 terminals)			
ower supply voltage	5 to 24 VDC (4.5 to 28.8 VDC)*			
O power supply naximum current	4 A	10 A		
current capacity of I/O ower supply terminal	4 A max.	10 A max.		
imensions	12 (W) × 100 (H) 71 × (D)			
solation method	No-isolation			
nsulation resistance	20 $\mbox{M}\Omega$ min. between isolated circuits (at 100 VDC)			
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage	ge current of 5 mA max.		
NX Unit power consumption	 Connected to a CPU Unit or Communication Control Ur 0.85 W max. Connected to a Communications Coupler Unit 0.45 W max. 	nit		
O current consumption	10 mA max.			
Veight	65 g max.			
Circuit layout	NX bus connector (left) NX Unit power supply - I/O	NX Unit power supply + NX Unit power supply - NX bus connector (right) NX bus connector (right)		
nstallation orientation and restrictions	Installation orientation: Connected to a CPU Unit or Communication Control Ur Connected to a Communications Coupler Unit: Possible Restrictions: No restrictions			
Ferminal connection liagram	Additional I/O Power Supply Unit NX-PF0630 A1 IOV IOV IOG IOG IOG A8 B8 A8	DC Input Unit Two-wire type 0 1 • IOV IOV • IOG IOG Three-wire type 2 3 • IOV IOV • IOG IOG • B8		
	NO DO NO	DO		

^{*} 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 Con	nection 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 M $Ω$ 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 or Communication Control 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	Terminal block IOV IOV IOV INX Unit power supply + NX Unit power supply - I/O po			
Installation orientation and restrictions	Installation orientation: Connected to a CPU Unit or Communication Control 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 A1 NX-PC0020 B1 IOV A8 B8 B8 B8			



Shield Connection Un	it 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 M Ω 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 or Communication Control 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	Terminal block SHLD terminal (Functional ground terminal) NX Unit power supply + NX Unit power supply - U/O power supp		
Installation orientation and restrictions	Installation orientation: Connected to a CPU Unit or Communication Control 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 A1 SHLD		
	or less		

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 uni	t versions/versions
Model	Unit Version	CPU Unit	Sysmac Studio
NX-PD1000			
NX-PF0630			
NX-PF0730			
NX-PC0020	Ver.1.0	Ver.1.13	Ver.1.17
NX-PC0010			
NX-PC0030			
NX-TBX01			

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.

Connecting with EtherCAT Coupler Units

NX Unit		Corresponding unit versions/versions			
Model	Unit Version	EtherCAT Coupler Unit	CPU Units or Industrial PCs	Sysmac Studio	
NX-PD1000				Var. 1.00	
NX-PF0630				Ver.1.06	
NX-PF0730				Ver.1.08	
NX-PC0020	Ver.1.0	Ver.1.0	Ver.1.05		
NX-PC0010				Var. 1.00	
NX-PC0030				Ver.1.06	
NX-TBX01					

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.

Connecting with EtherNet/IP Coupler Unit

NX Unit		Corresponding unit versions/versions						
	Unit version	Application with an NJ/NX/NY-series Controller *1			Application with a CS/CJ/CP-series PLC *2			
Model		EtherNet/IP Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio	EtherNet/IP Coupler Unit	Sysmac Studio	NX-IO Configurator *3	
NX-PD1000								
NX-PF0630								
NX-PF0730								
NX-PC0020	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00	
NX-PC0010								
NX-PC0030								
NX-TBX01								

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. Refer to the user's manual for the EtherNet/IP Coupler Units for information on the unit versions of EtherNet/IP Units that are compatible with EtherNet/IP Coupler Units.
- *2. Refer to the user's manual for the EtherNet/IP Coupler Units for information on the unit versions of CPU Units and EtherNet/IP Units that are compatible with EtherNet/IP Coupler Units.
- *3. For connection to an EtherNet/IP Coupler Unit with unit version 1.0, You can connect only to the peripheral USB port on the EtherNet/IP Coupler Unit. You cannot connect with any other path. If you need to connect by another path, use an EtherNet/IP Coupler Unit with unit version 1.2 or later.

Connecting with Communication Control Units

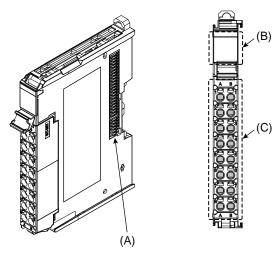
	NX Unit	Corresponding unit versions/versions			
Model	Unit version	Communication Control Unit	Sysmac Studio		
NX-PD1000					
NX-PF0630					
NX-PF0730					
NX-PC0020	Ver. 1.0	Ver.1.00	Ver.1.24		
NX-PC0010					
NX-PC0030					
NX-TBX01					

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.

External Interface

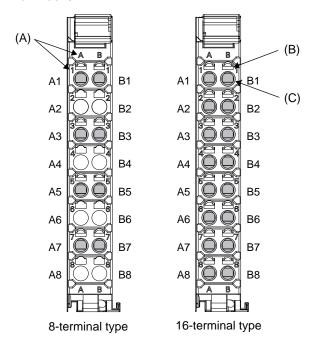
Additional NX Unit Power Supply Unit, Additional I/O Power Supply Unit, I/O Power Supply Connection Unit, and Shield Connection Unit

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



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

	Terminal Blocks							
Unit model	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.

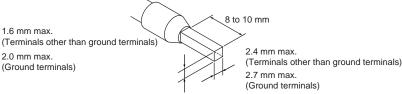
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

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

Terminal types	Manufacturer	Ferrule model	Applicable wire (mm² (AWG))	Crimping tool	
	Phoenix Contact	AI0,34-8	0.34 (#22)	Phoenix Contact (The figure in parentheses is the applicable wire	
than ground terminals		AI0,5-8	0.5 (#20)	size.) CRIMPFOX 6 (0.25 to 6 mm², AWG 24 to 10)	
terriiriais		AI0,5-10		OKTIVIT 1 OX 0 (0.23 to 0 Hill) , AVVO 24 to 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	Weidmuller	H0.14/12	0.14 (#26)	Weidmueller (The figure in parentheses is the applicable wire size.)	
than ground terminals		H0.25/12	0.25 (#24)	PZ6 Roto (0.14 to 6 mm², AWG 26 to 10)	
terriiriais		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	1		
		H1.5/14	1.5 (#16)		
		H1.5/16	1		

^{*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.

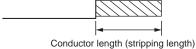


Using Twisted Wires/Solid Wires

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		(Surpping length)
All terminals except ground terminals	2 A max.		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	Possible	Not Possible	Possible *1	Not Possible		
	Greater than 4 A	Possible *1	FOSSIDIE	Not Possible	FUSSIDIE		
Ground terminals		Possible	Possible	Possible *2	Possible *2	2.0 mm ²	9 to 10 mm

Secure wires to the screwless clamping terminal block. Refer to the Securing Wires in the USER'S MANUAL for how to secure wires. With the NX-TB — 1 Terminal Block, use twisted wires to connect the ground terminal. Do not use a solid wire.



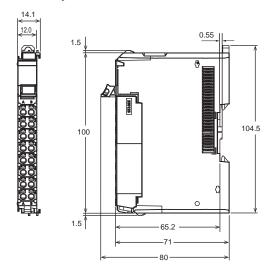
< Additional Information > If more than 2 A will flow on the wires, use plated wires or use ferrules.

Dimensions (Unit: mm)

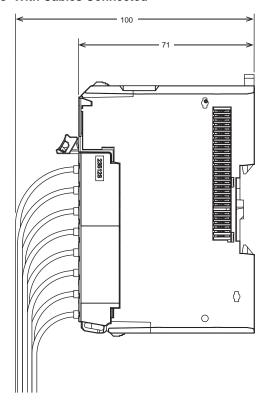
Additional NX Unit Power Supply Unit, Additional I/O Power Supply Unit, I/O Power Supply Connection Unit, and Shield Connection Unit

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-TBX01	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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