NX-□

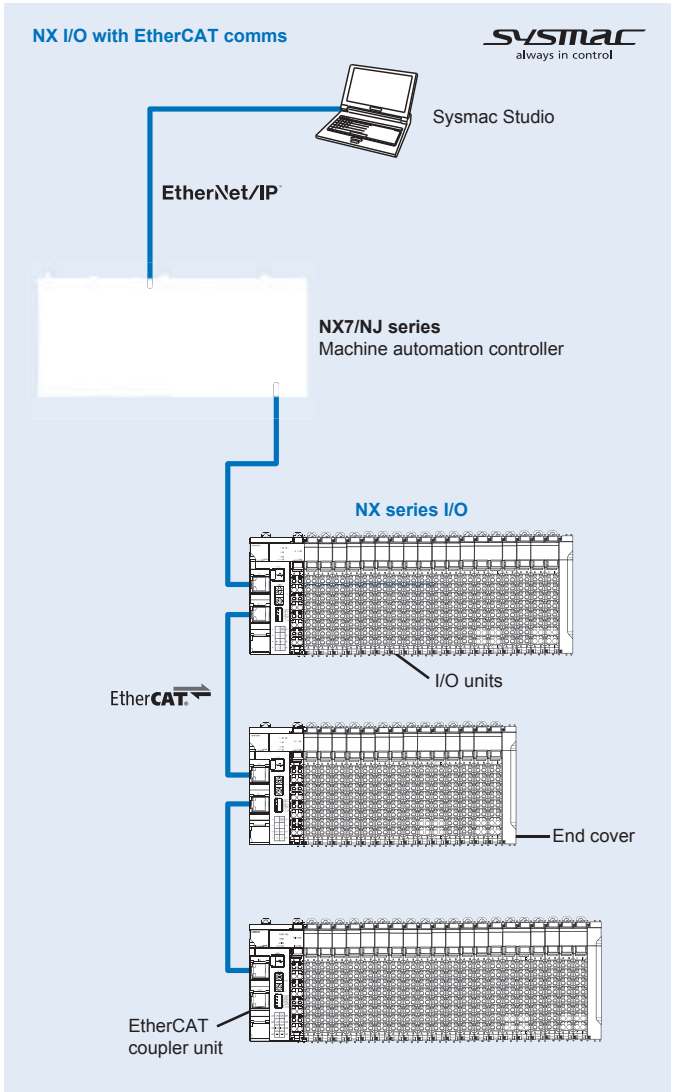
NX series I/O

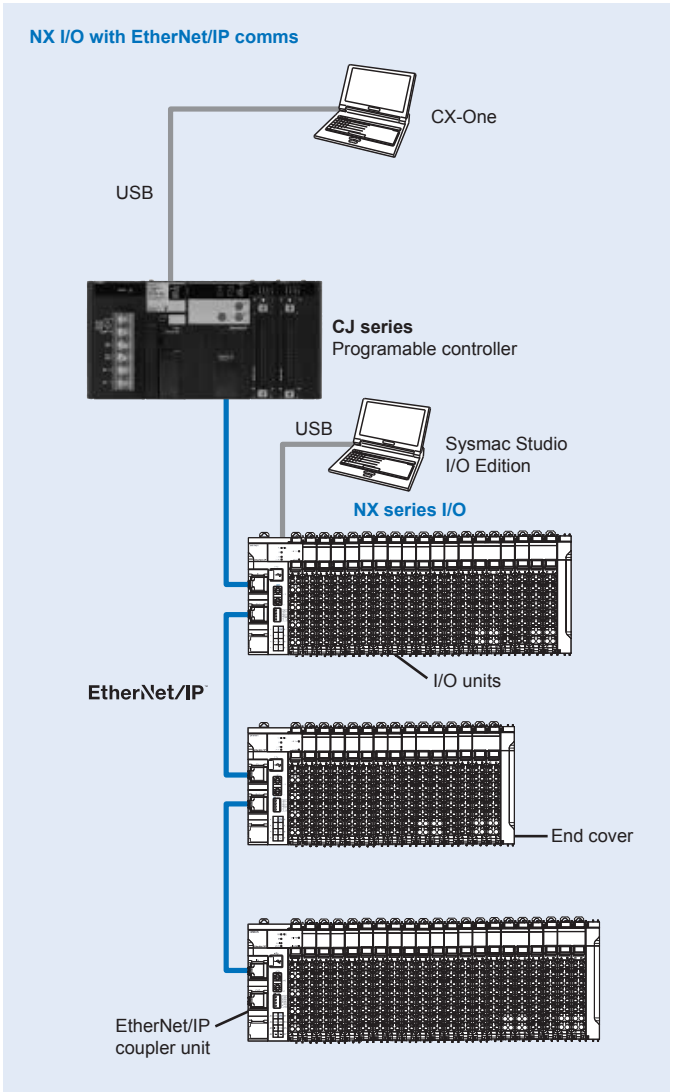
Speed and accuracy for machine performance

NX series I/O covers a full range of units, including standard and high-speed digital I/O's, analog I/O's, encoder inputs, pulse outputs and safety control.

- Standard, high-speed and Time Stamp I/O units
- Safety controller and safety I/O units can be integrated
- EtherCAT and EtherNet/IP communication options
- Detachable front connector with screwless push-in terminals for direct field wiring
- Digital I/O models with 20/40 pin "flatcable" connectors for fast connection to custom wiring looms
- High signal density: Up to 16 digital or 8 analog signals in 12 mm width

System configuration





Specifications

General specifications

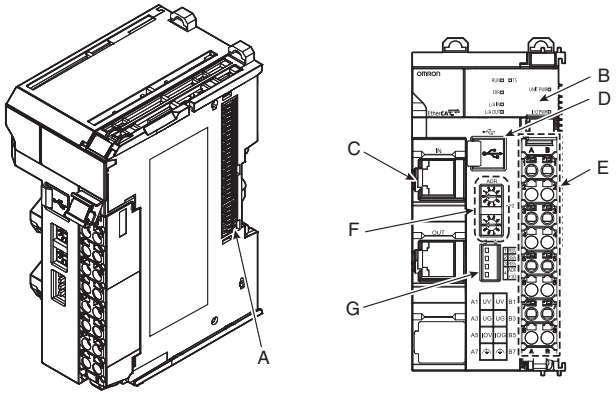
Item		Specifications
Enclosure		Mounted in a panel
Operating environment	Ambient operating temperature	0 to 55°C
	Ambient operating humidity	10% to 95% (with no condensation or icing)
	Atmosphere	Must be free from corrosive gases
	Ambient storage temperature	–25 to 70°C (with no condensation or icing)
	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 IEC 61000-4-4.
	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 and ANSI/ISA 12.12.01 EC: EN 61131-2 and C-Tick, KC registration, NK, LR

EtherCAT / EtherNet/IP communication specifications

Item	EtherCAT	EtherNet/IP
Physical layer	100BASE-TX (IEEE 802.3)	
Modulation	Baseband	
Link speed	100 Mbps	
Topology	Depends on the specifications of the EtherCAT master	Line, Tree, Star
Transmission media	Category 5 or higher twisted-pair cable (recommended cable: double-shielded cable with foil and braiding, SF/UTP or S/FTP)	
Transmission distance	Distance between nodes: 100 m or less	

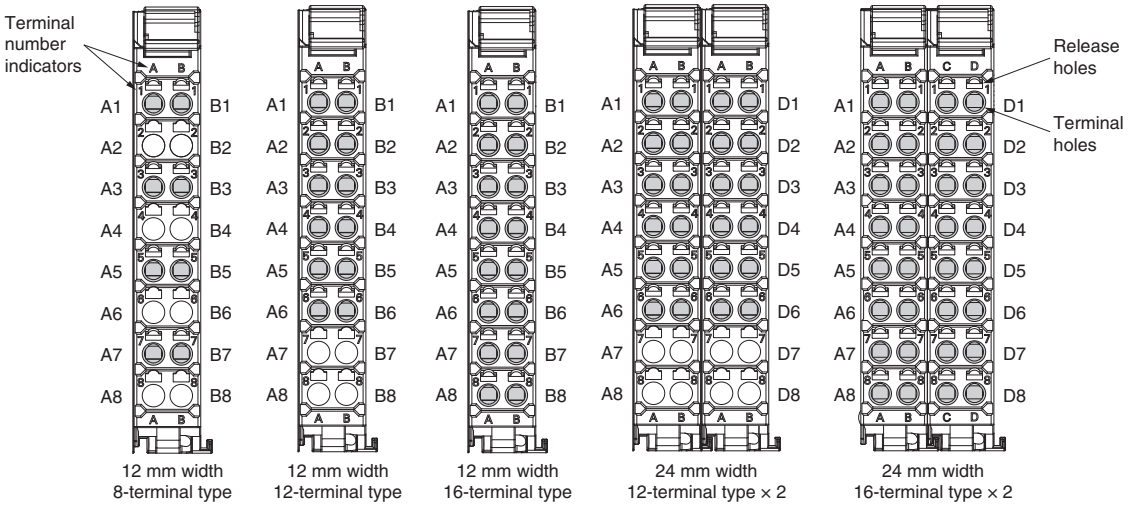
Nomenclature

Communication coupler unit (EtherCAT and EtherNet/IP)



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	Communication ports	These ports are connected to the communication cables of the network. There are two connectors, allowing daisy-chaining of communication units.
D	Peripheral USB port	This port is used to connect to the Sysmac Studio software.
E	Terminal block	The terminal block is used to connect external devices. The number of terminals depends on the type of unit.
F	Rotary switches	These rotary switches are used to set the node address. The address is set in decimal for EtherCAT and in hexadecimal for EtherNet/IP.
G	DIP switch	The DIP switch is used to set the 100s digit of the node address of the coupler unit.

Terminal block types



Communication coupler unit

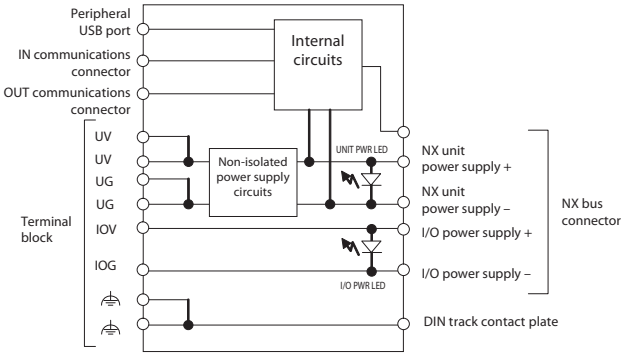
EtherCAT communication coupler unit

Item		Specifications
Model		**NX-ECC203**
Number of connectable NX units		63 units max.*1
Communications protocol		EtherCAT protocol
Send/receive PDO data sizes		Input: 1024 bytes max. (including input data, status and unused areas) Output: 1024 bytes max. (including output data and unused areas)
Mailbox data size		Input: 256 bytes / Output: 256 bytes
Mailbox		Emergency messages and SDO requests
Refreshing methods*2		• Free-run refreshing • Synchronous I/O refreshing • Time Stamp refreshing • Task period prioritized refreshing
Node address setting range		When is connected to the built-in EtherCAT port on an NX7-series CPU unit: • Set on switches: 1 to 199 • Set with Sysmac Studio: 1 to 512
		When is connected to the built-in EtherCAT port on an NJ-series CPU unit: • Set on switches: 1 to 192 • Set with Sysmac Studio: 1 to 192
I/O jitter performance		Inputs: 1 μs max. / Outputs: 1 μs max.
Communications cycle in DC mode		125 to 10,000 μs*3*4
Unit power supply	**Voltage**	24 VDC (20.4 to 28.8 VDC)
	Capacity	10 W max.
	Efficiency	70%
	Isolation method	No isolation between NX unit power supply and unit power supply terminals
	Unwired terminal current capacity	4 A max.
I/O power supply	**Voltage**	5 to 24 VDC (4.5 to 28.8 VDC)*5
	Maximum I/O current	10 A
	Terminal current capacity	10 A max.
Unit power consumption		1.25 W max.
Current consumption from I/O power supply		10 mA max. (for 24 VDC)
Dielectric strength		510 VAC for 1 min, leakage current: 5 mA max. (between isolated circuits)
Insulation resistance		100 VDC, 20 MΩ min. (between isolated circuits)
External connection terminals		Connector for EtherCAT communications: • RJ45 × 2 (shielded) • IN/OUT: EtherCAT input/output data
		Screwless push-in terminal (8 terminals) For power supply unit, I/O power supply and grounding. Removable.
		Peripheral USB port for Sysmac Studio connection: • Physical layer: USB 2.0-compliant, B-type connector • Transmission distance: 5 m max.
Terminal block type		Screwless push-in terminal 8 terminals (A + B with FG)
Dimensions (W x H x D)		46 × 100 × 71 mm
Weight		170 g max.

*1. Refer to the NX-safety control units user's manual (Cat.No. Z930) for the number of safety control units that can be connected.
*2. This function was added or improved for a version upgrade. Refer to the NX-series EtherCAT coupler unit user's manual (Cat.No. W519) for information on version upgrades.
*3. This depends on the specifications of the EtherCAT master. The values are as follows when you are connected to the built-in EtherCAT port on an NJ5-series CPU unit: 500 μs, 1,000 μs, 2,000 μs and 4,000 μs. Refer to the NX/NJ-series CPU unit built-in EtherCAT port user's manual (Cat.No. W505) for the specifications of the built-in EtherCAT ports on NX7/NJ-series CPU units.
*4. This depends on the unit configuration.
*5. Use an output voltage that is appropriate for the I/O circuits of the NX units and the connected external devices.

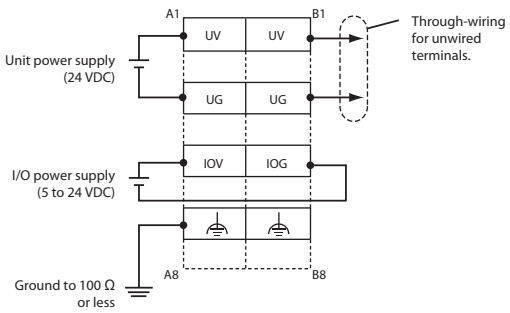
Circuit layout

NX-ECC203



Terminal wiring

NX-ECC203



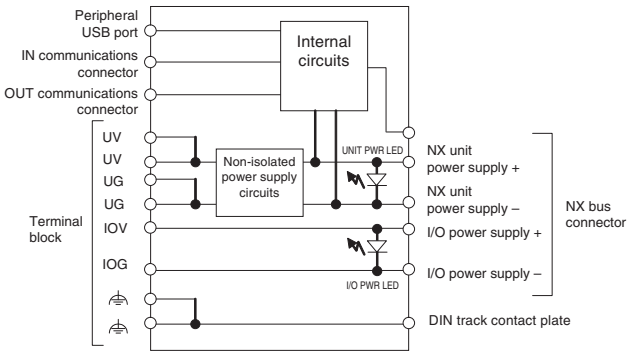
EtherNet/IP communication coupler unit

Item		Specifications
Model		**NX-EIC202**
Number of connectable NX units		63 units max.*1
Communications protocol		EtherNet/IP protocol
Number of connections		8
Received packet interval (RPI, refresh cycle)		4 to 1,000 ms
Allowed communications bandwidth per unit		1,000 pps
NX bus I/O data size		Input: 512 bytes max. (including input data, status and unused areas) Output: 512 bytes max. (including output data and unused areas)
EtherNet/IP I/O connection size		Input: 504 bytes max. (including input data, status and unused areas) Output: 504 bytes max. (including output data and unused areas)
Refreshing methods		Free-run refreshing
Unit power supply	**Voltage**	24 VDC (20.4 to 28.8 VDC)
	Capacity	10 W max.
	Efficiency	70%
	Isolation method	No isolation between NX unit power supply and unit power supply terminals
	Unwired terminal current capacity	4 A max.
I/O power supply	**Voltage**	5 to 24 VDC (4.5 to 28.8 VDC)*2
	Maximum I/O current	10 A
	Terminal current capacity	10 A max.
Unit power consumption		1.60 W max.
Current consumption from I/O power supply		10 mA max. (for 24 VDC)
Dielectric strength		510 VAC for 1 min, leakage current: 5 mA max. (between isolated circuits)
Insulation resistance		100 VDC, 20 MΩ min. (between isolated circuits)
External connection terminals		Connector for EtherNet/IP communications: • RJ45 × 2 (shielded)
		Screwless push-in terminal (8 terminals) For power supply unit, I/O power supply and grounding. Removable.
		Peripheral USB port for Sysmac Studio connection: • Physical layer: USB 2.0-compliant, B-type connector • Transmission distance: 5 m max.
Terminal block type		Screwless push-in terminal 8 terminals (A + B with FG)
Dimensions (W x H x D)		46 × 100 × 71 mm
Weight		150 g max.

*1. Refer to the NX-safety control units user's manual (Cat.No. Z930) for the number of safety control units that can be connected.
*2. Use an output voltage that is appropriate for the I/O circuits of the NX units and the connected external devices.

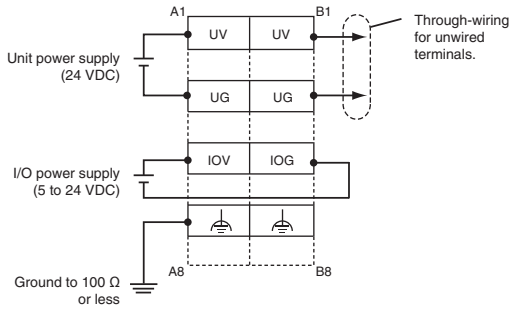
Circuit layout

NX-EIC202



Terminal wiring

NX-EIC202



Digital I/O unit

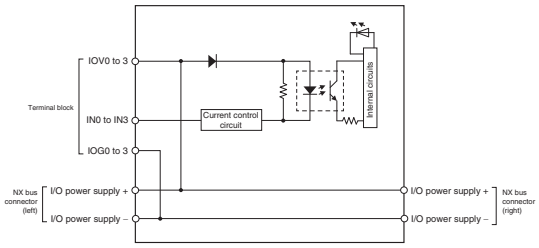
Digital input unit (24 VDC)

Item	Specifications							
Model	**NX-ID3317**	**NX-ID4342**	**NX-ID5342**	**NX-ID3343**	**NX-ID3417**	**NX-ID4442**	**NX-ID5442**	**NX-ID3443**
Name	DC input unit							
Internal I/O common	NPN				PNP			
Capacity	4 points	8 points	16 points	4 points	4 points	8 points	16 points	4 points
Rated input voltage	12 to 24 VDC (9 to 28.8 VDC)	24 VDC (15 to 28.8 VDC)			12 to 24 VDC (9 to 28.8 VDC)	24 VDC (15 to 28.8 VDC)		
Input current[*1]	6 mA	3.5 mA	2.5 mA	3.5 mA	6 mA	3.5 mA	2.5 mA	3.5 mA
ON voltage	9 VDC min.	15 VDC min.			9 VDC min.	15 VDC min.		
ON current	3 mA min.	3 mA min.	2 mA min.	3 mA min.	3 mA min.	3 mA min.	2 mA min.	3 mA min.
OFF voltage	2 VDC max.	5 VDC max.			2 VDC max.	5 VDC max.		
OFF current	1 mA max.		0.5 mA max.	1 mA max.	1 mA max.		0.5 mA max.	1 mA max.
ON/OFF response time	20 μs max./400 μs max.			100 ns max.	20 μs max./400 μs max.			100 ns max.
Input filter time	Default setting: 1 ms[*2]			Default setting: 8 μs[*3]	Default setting: 1 ms[*2]			Default setting: 8 μs[*3]
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.							
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)							
Isolation method	Photocoupler isolation			Digital isolator	Photocoupler isolation			Digital isolator
Unit power consumption	0.50 W max.	0.50 W max.	0.55 W max.	0.55 W max.	0.50 W max.	0.50 W max.	0.55 W max.	0.55 W max.
I/O power supply method	Supply from the NX bus							
I/O current consumption	No consumption			30 mA max.	No consumption			30 mA max.
Current capacity of I/O power supply terminal	0.1 A/terminal max.		Without I/O power supply terminals	0.1 A/terminal max.	0.1 A/terminal max.		Without I/O power supply terminals	0.1 A/terminal max.
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing							
Terminal block type	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)
Dimensions (W x H x D)	12 × 100 × 71 mm							
Weight	65 g max.							
Disconnection/ short-circuit detection	Not supported							
Protective function	Not supported							

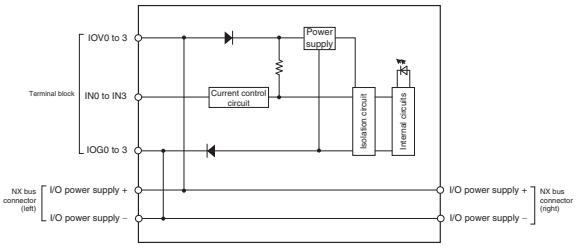
*1. Typical rated current at 24 VDC.
*2. Input filter time: No filter, 0.25, 0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 ms.
*3. Input filter time: No filter, 1, 2, 4, 8, 16, 32, 64, 128, 256 μs.

Circuit layout

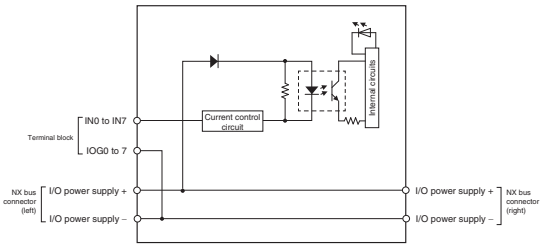
NX-ID3317



NX-ID3343

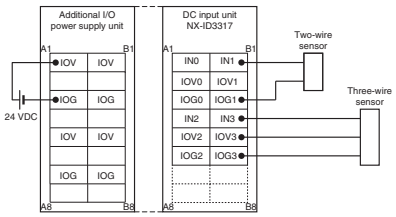


NX-ID4342



Terminal wiring

NX-ID3317



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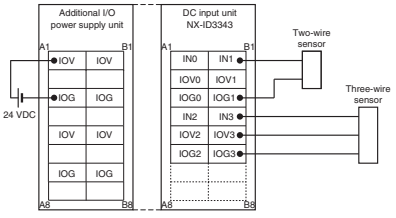

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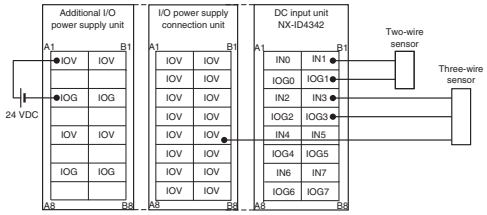
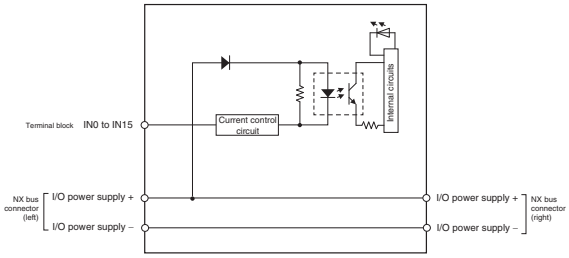
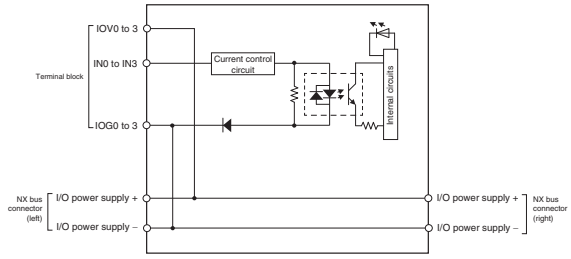


Circuit layout

NX-ID5342



NX-ID3417



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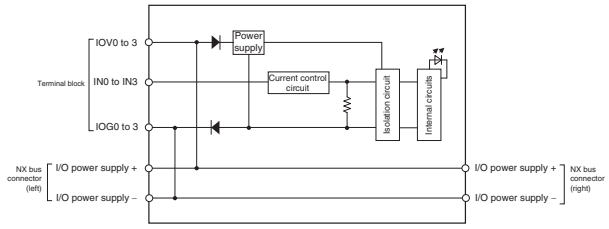

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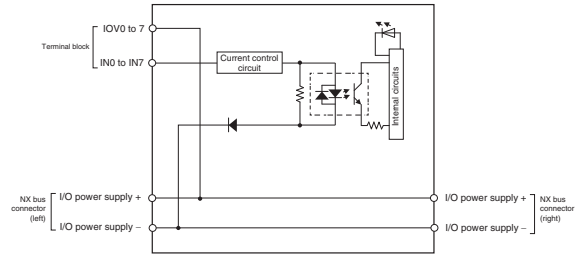

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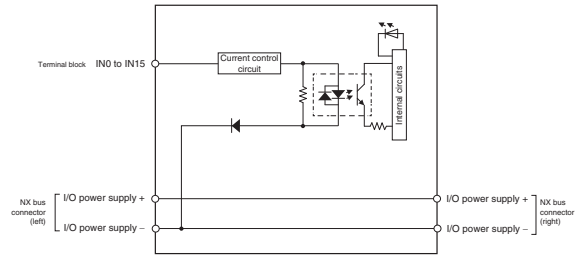
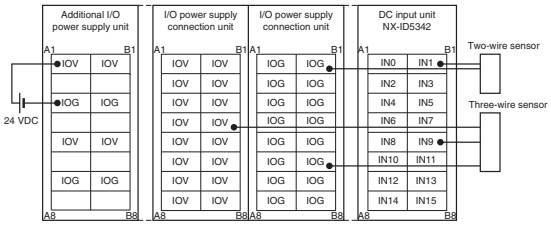


Terminal wiring

NX-ID5342



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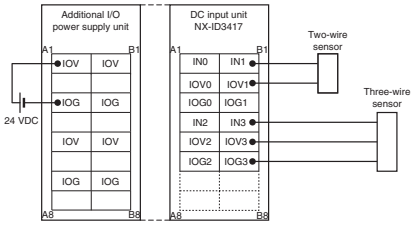

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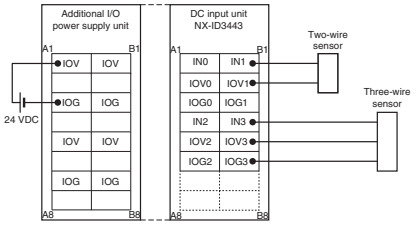

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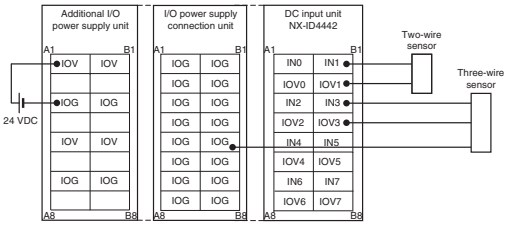

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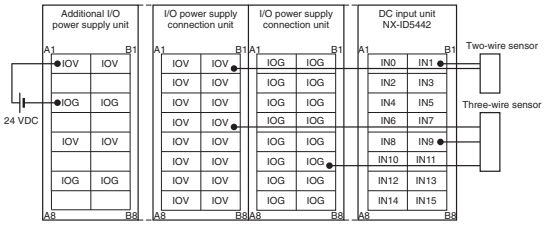


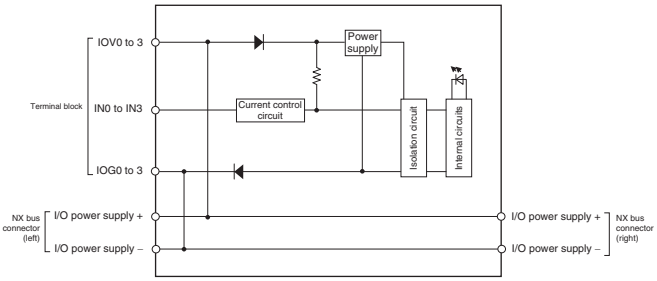
Digital input unit (with time stamp function) (24 VDC)

Item	Specifications	
Model	**NX-ID3344**	**NX-ID3444**
Name	DC input unit	
Internal I/O common	NPN	PNP
Capacity	4 points	4 points
Rated input voltage	24 VDC (15 to 28.8 VDC)	
Input current[*1]	3.5 mA	
ON voltage	15 VDC min.	
ON current	3 mA min.	
OFF voltage	5 VDC max.	
OFF current	1 mA max.	
ON/OFF response time	100 ns max.	
Input filter time	No filter	
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	Digital isolator	
Unit power consumption	0.55 W max.	
I/O power supply method	Supply from the NX bus	
I/O current consumption	30 mA max.	
Current capacity of I/O power supply terminal	0.1 A/terminal max.	
I/O refreshing method	Time stamp	
Terminal block type	Screwless push-in terminal 12 terminals (A + B)	
Dimensions (W x H x D)	12 × 100 × 71 mm	
Weight	65 g max.	
Disconnection/ short-circuit detection	Not supported	
Protective function	Not supported	

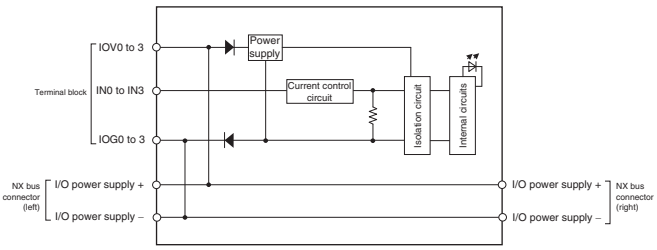
*1. Typical rated current at 24 VDC.

Circuit layout

NX-ID3344

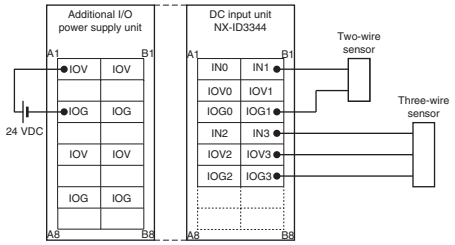


NX-ID3444

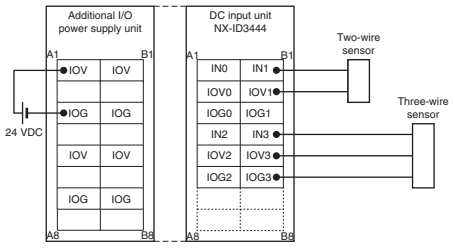


Terminal wiring

NX-ID3344



NX-ID3444



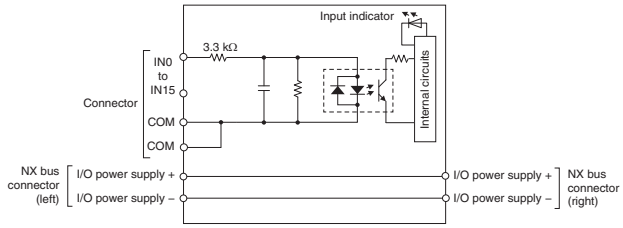
Digital input unit (with MIL connector) (24 VDC)

Item	Specifications	
Model	**NX-ID5142-5**	**NX-ID6142-5**
Name	DC input unit	
Internal I/O common	For both NPN/PNP	
Capacity	16 points	32 points
Rated input voltage	24 VDC (15 to 28.8 VDC)	24 VDC (19 to 28.8 VDC)
Input current[*1]	7 mA	4.1 mA
ON voltage	15 VDC min.	19 VDC min.
ON current	3 mA min.	
OFF voltage	5 VDC max.	
OFF current	1 mA max.	
ON/OFF response time	20 μs max./400 μs max	
Input filter time	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms	
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	Photocoupler isolation	
Unit power consumption	0.55 W max.	0.60 W max.
I/O power supply method	Supply from external source	
I/O current consumption	No consumption	
Current capacity of I/O power supply terminal	Without I/O power supply terminals	
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing	
Terminal block type	MIL connector 20 terminals	MIL connector 40 terminals
Dimensions (W x H x D)	30 × 100 × 71 mm	
Weight	85 g max.	90 g max.
Disconnection/ short-circuit detection	Not supported	
Protective function	Not supported	

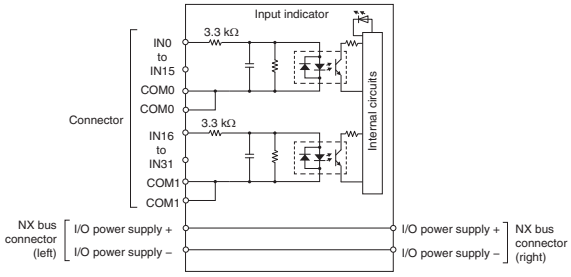
*1. Typical rated current at 24 VDC.

Circuit layout

NX-ID5142-5

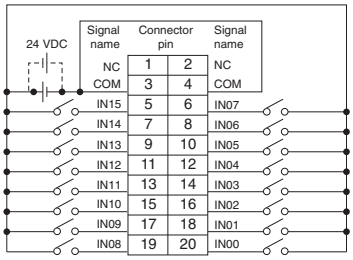


NX-ID6142-5



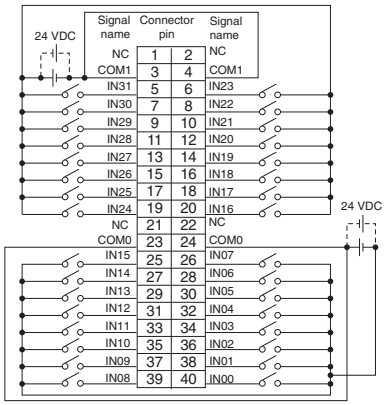
Terminal wiring

NX-ID5142-5



- The polarity of the input power supply can be connected in either direction.
- Be sure to wire both pins 3 and 4 (COM), and set the same polarity for both pins.

NX-ID6142-5



- The polarity of the input power supply can be connected in either direction.
- Be sure to wire both pins 23 and 24 (COM0), and set the same polarity for both pins.
- Be sure to wire both pins 3 and 4 (COM1), and set the same polarity for both pins.

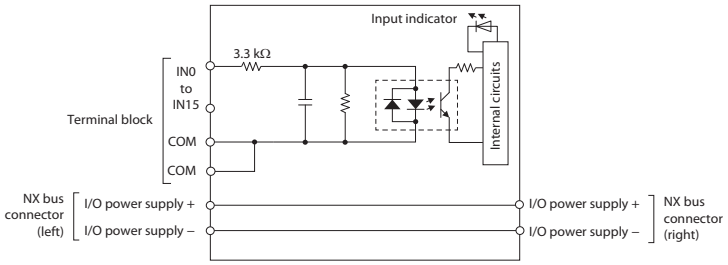
Digital input unit (with M3 screw terminal block) (24 VDC)

Item	Specifications
Model	**NX-ID5142-1**
Name	DC input unit
Internal I/O common	For both NPN/PNP
Capacity	16 points
Rated input voltage	24 VDC (15 to 28.8 VDC)
Input current[*1]	7 mA
ON voltage	15 VDC min.
ON current	3 mA min.
OFF voltage	5 VDC max.
OFF current	1 mA max.
ON/OFF response time	20 μs max./400 μs max
Input filter time	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method	Photocoupler isolation
Unit power consumption	0.55 W max.
I/O power supply method	Supply from external source
I/O current consumption	No consumption
Current capacity of I/O power supply terminal	Without I/O power supply terminals
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing
Terminal block type	M3 screw terminal block 18 terminals
Dimensions (W x H x D)	30 × 100 × 71 mm
Weight	125 g max.
Disconnection/ short-circuit detection	Not supported
Protective function	Not supported

*1. Typical rated current at 24 VDC.

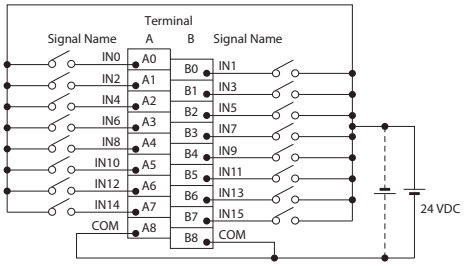
Circuit layout

NX-ID5142-1



Terminal wiring

NX-ID5142-1



• The polarity of the input power supply can be connected in either direction.

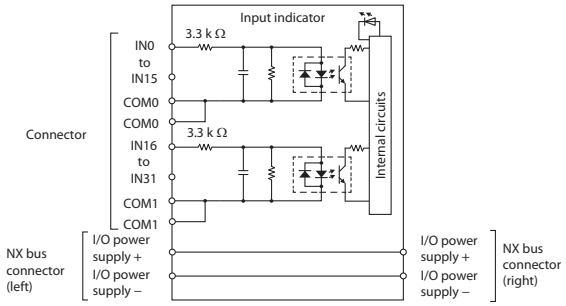
Digital input unit (with Fujitsu connector) (24 VDC)

Item	Specifications
Model	**NX-ID6142-6**
Name	DC input unit
Internal I/O common	For both NPN/PNP
Capacity	32 points
Rated input voltage	24 VDC (19 to 28.8 VDC)
Input current[*1]	4.1 mA
ON voltage	19 VDC min.
ON current	3 mA min.
OFF voltage	5 VDC max.
OFF current	1 mA max.
ON/OFF response time	20 μs max./400 μs max
Input filter time	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method	Photocoupler isolation
Unit power consumption	0.55 W max.
I/O power supply method	Supply from external source
I/O current consumption	No consumption
Current capacity of I/O power supply terminal	Without I/O power supply terminals
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing
Terminal block type	Fujitsu connector 40 terminals
Dimensions (W x H x D)	30 × 100 × 71 mm
Weight	90 g max.
Disconnection/ short-circuit detection	Not supported
Protective function	Not supported

*1. Typical rated current at 24 VDC.

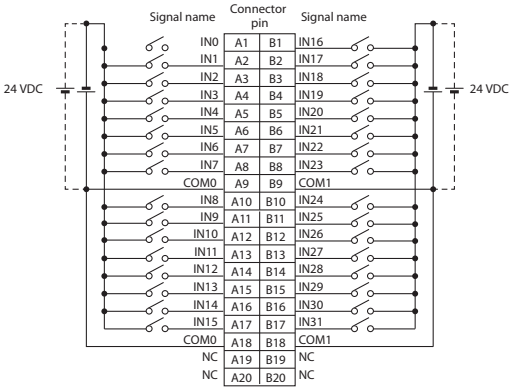
Circuit layout

NX-ID6142-6



Terminal wiring

NX-ID6142-6



- The polarity of the input power supply can be connected in either direction.
- Be sure to wire both pins A9 and A18 (COM0), and set the same polarity for both pins.
- Be sure to wire both pins B9 and B18 (COM1), and set the same polarity for both pins.

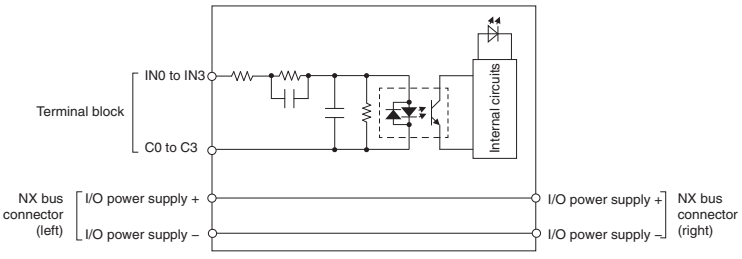
Digital input unit (230 VAC)

Item	Specifications
Model	**NX-IA3117**
Name	AC input unit
Internal I/O common	No polarity
Capacity	4 points, independent contacts
Rated input voltage	200 to 240 VAC, 50/60 Hz (170 to 264 VAC, ±3 Hz)
Input current	9 mA (at 200 VAC, 50 Hz) 11 mA (at 200 VAC, 60 Hz)
ON voltage	120 VAC min.
ON current	4 mA min.
OFF voltage	40 VAC max.
OFF current	2 mA max.
ON/OFF response time	10 ms max./40 ms max.
Input filter time	Default setting: 1 ms *1
Dielectric strength	Between each AC input circuit: AC3700V VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and functional ground terminal: 2300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and internal circuits: 2300 VAC for 1 min at a leakage current of 5 mA max. Between the internal circuit and the functional ground terminal: 510 VAC for 1 min at a leakage current of 5 mA max.
Insulation resistance	Between each AC input circuit: 20 MΩ min. (at 500 VDC) Between the external terminals and functional ground terminal: 20 MΩ min. (at 500 VDC) Between the external terminals and internal circuits: 20 MΩ min. (at 500 VDC) Between the internal circuit and the functional ground terminal: 20 MΩ min. (at 100 VDC)
Isolation method	Photocoupler isolation
Unit power consumption	0.5 W max.
I/O power supply method	Supply from external source
I/O current consumption	No consumption
Current capacity of I/O power supply terminal	Without I/O power supply terminals
I/O refreshing method	Free-run refreshing
Terminal block type	Screwless push-in terminal 8 terminals (A + B)
Dimensions (W x H x D)	12 × 100 × 71 mm
Weight	60 g max.
Disconnection/ short-circuit detection	Not supported
Protective function	Not supported

*1. Input filter time: No filter, 0.25, 0.5, 1, 2, 4, 8, 16, 32, 64, 128, 256 ms.

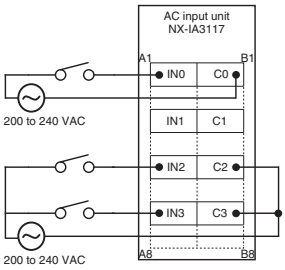
Circuit layout

NX-IA3117



Terminal wiring

NX-IA3117

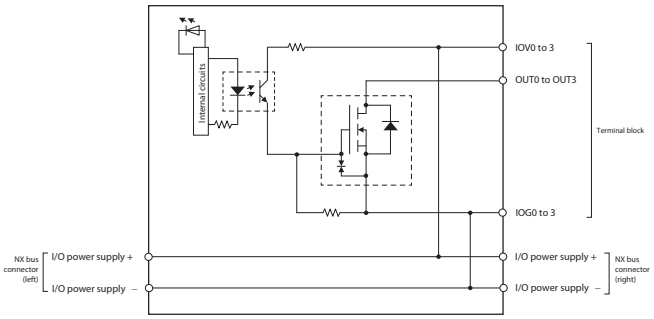


Digital output unit

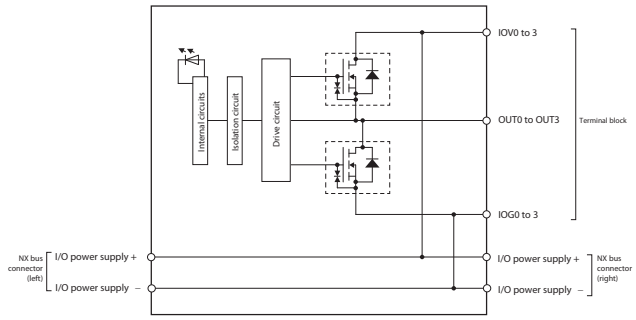
Item	Specifications								
Model	**NX-OD3121**	**NX-OD4121**	**NX-OD5121**	**NX-OD3153**	**NX-OD3256**	**NX-OD4256**	**NX-OD5256**	**NX-OD3268**	**NX-OD3257**
Name	Transistor output unit								
Internal I/O common	NPN				PNP				
Capacity	4 points	8 points	16 points	4 points	4 points	8 points	16 points	4 points	4 points
Rated voltage	12 to 24 VDC			24 VDC					
Operating load voltage	10.2 to 28.8 VDC			15 to 28.8 VDC					
Maximum value of load current	0.5 A/point, 2 A/NX unit	0.5 A/point, 4 A/NX unit		0.5 A/point, 2 A/NX unit	0.5 A/point, 2 A/NX unit	0.5 A/point, 4 A/NX unit		2 A/point, 8 A/NX unit	0.5 A/point, 2 A/NX unit
Maximum inrush current	4.0 A/point, 10 ms max.								
Leakage current	0.1 mA max.								
Residual voltage	1.5 V max.								
ON/OFF response time	0.1 ms max./0.8 ms max.			300 ns max.	0.5 ms max./1.0 ms max.				300 ns max.
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.								
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)								
Isolation method	Photocoupler isolation			Digital isolator	Photocoupler isolation				Digital isolator
Unit power consumption	0.55 W max.	0.55 W max.	0.65 W max.	0.50 W max.	0.55 W max.	0.65 W max.	0.70 W max.	0.50 W max.	0.50 W max.
I/O power supply method	Supply from the NX bus							Supply from external source	Supply from the NX bus
I/O current consumption	10 mA max.	10 mA max.	20 mA max.	30 mA max.	20 mA max.	30 mA max.	40 mA max.	20 mA max.	40 mA max.
Current capacity of I/O power supply terminal	0.5 A/terminal max.		Without I/O power supply terminals	0.5 A/terminal max.	0.5 A/terminal max.		Without I/O power supply terminals	IOV/IOG: 2 A/ terminal max. COM/0V: 4A/ terminal max.	0.5 A/terminal max.
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing								
Terminal block type	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)
Dimensions (W x H x D)	12 × 100 × 71 mm								
Weight	70 g max.								
Disconnection/ short-circuit detection	Not supported								
Protective function	Not supported				With load short-circuit protection				

Circuit layout

NX-OD3121



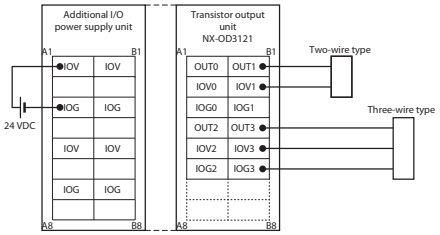
NX-OD3153



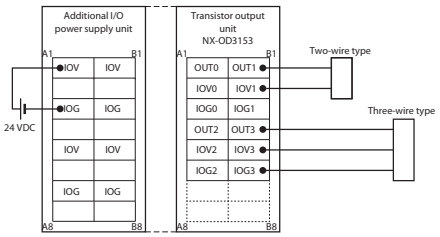
This unit uses a push-pull output circuit.

Terminal wiring

NX-OD3121

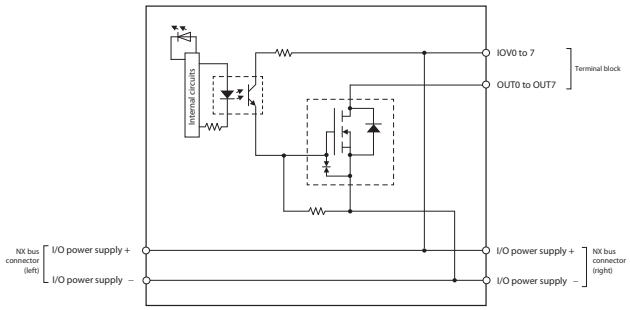


NX-OD3153

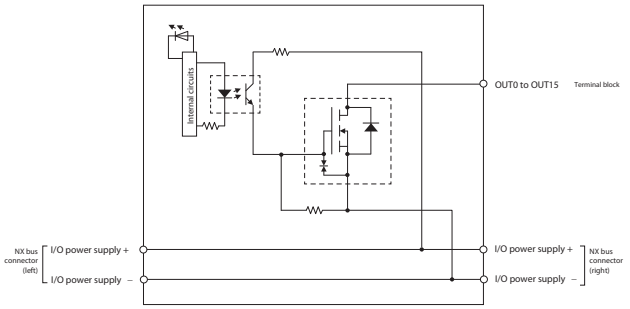


Circuit layout

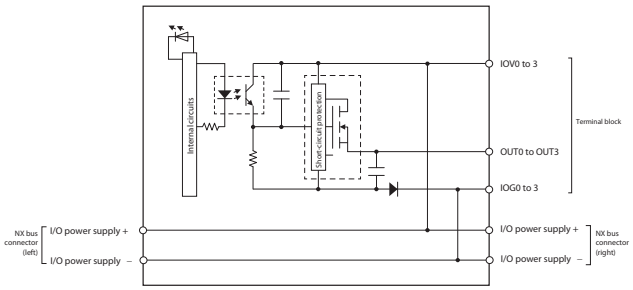
NX-OD4121



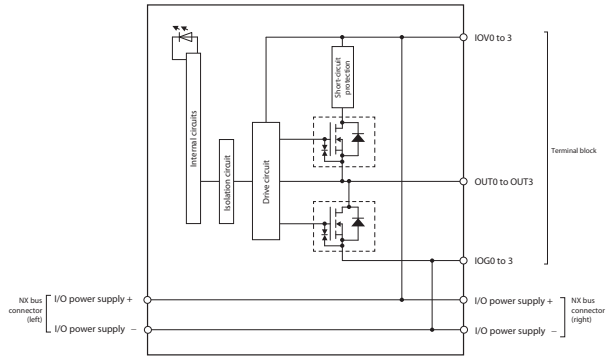
NX-OD5121



NX-OD3256

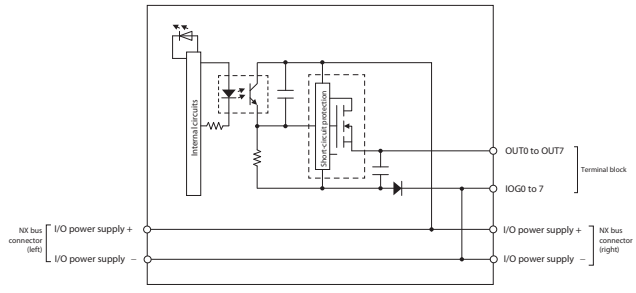


NX-OD3257



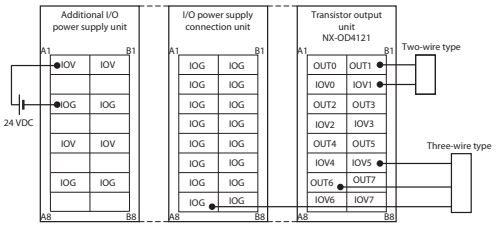
This unit uses a push-pull output circuit.

NX-OD4256

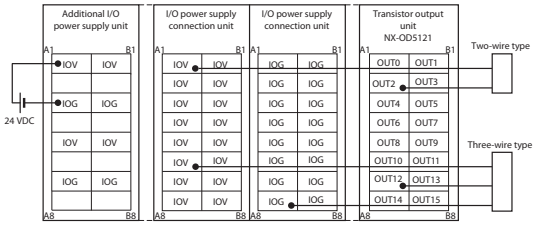


Terminal wiring

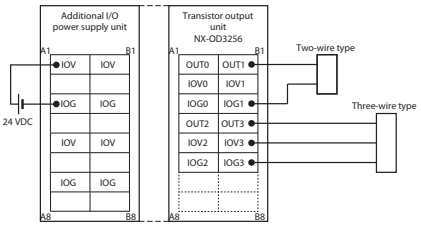
NX-OD4121



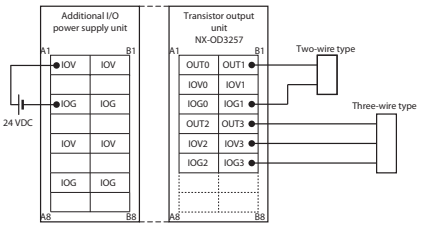
NX-OD5121



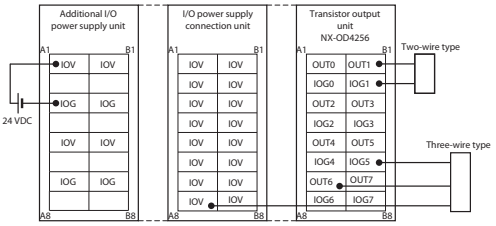
NX-OD3256



NX-OD3257

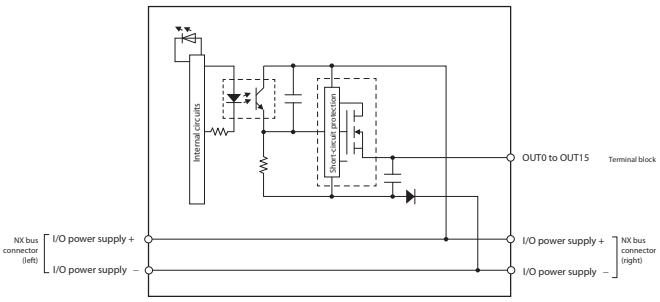


NX-OD4256

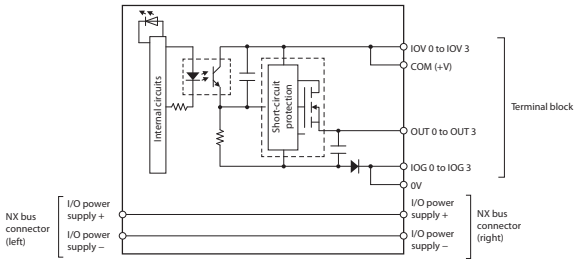


Circuit layout

NX-OD5256

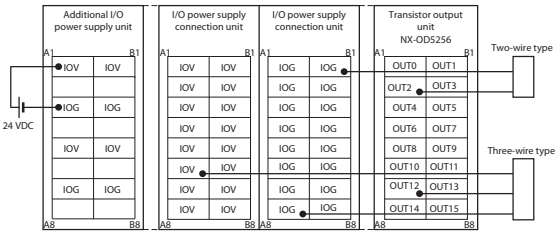


NX-OD3268

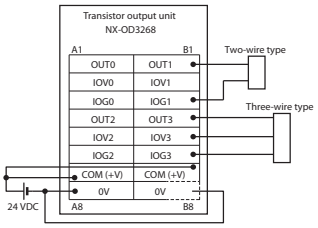


Terminal wiring

NX-OD5256



NX-OD3268



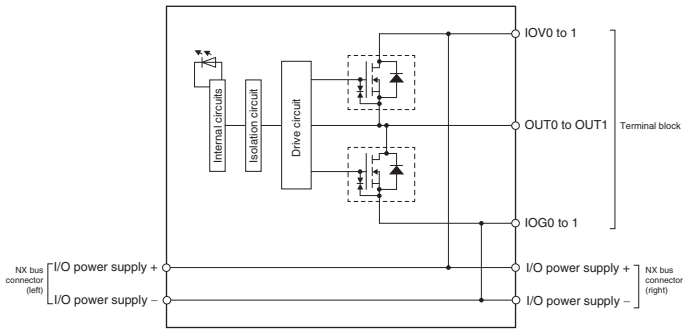
- 0V has 2 terminals, so be sure to wire both terminals.
- COM (+V) has 2 terminals, so be sure to to wire both terminals.

Digital output unit (with time stamp function)

Item	Specifications	
Model	**NX-OD2154**	**NX-OD2258**
Name	Transistor output unit	
Internal I/O common	NPN	PNP
Capacity	2 points	2 points
Rated voltage	24 VDC	
Operating load voltage	15 to 28.8 VDC	
Maximum value of load current	0.5 A/point, 1 A/NX unit	
Maximum inrush current	4.0 A/point, 10 ms max.	
Leakage current	0.1 mA max.	
Residual voltage	1.5 V max.	
ON/OFF response time	300 ns max.	
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	Digital isolator	
Unit power consumption	0.50 W max.	
I/O power supply method	Supply from the NX bus	
I/O current consumption	30 mA max.	40 mA max.
Current capacity of I/O power supply terminal	0.5 A/terminal max.	
I/O refreshing method	Time Stamp	
Terminal block type	Screwless push-in terminal 8 terminals (A + B)	
Dimensions (W x H x D)	12 × 100 × 71 mm	
Weight	70 g max.	
Disconnection/ short-circuit detection	Not supported	
Protective function	Not supported	With load short-circuit protection

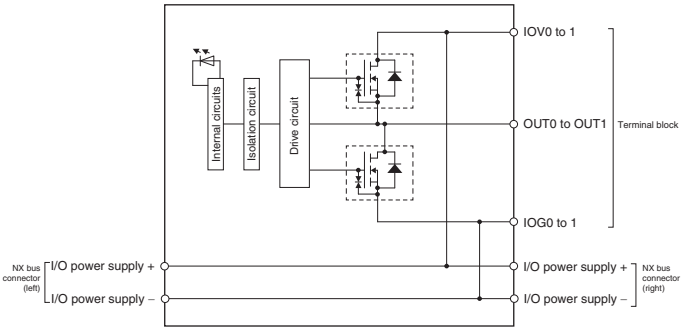
Circuit layout

NX-OD2154



This unit uses a push-pull output circuit.

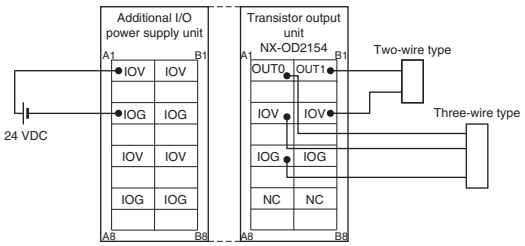
NX-OD2258



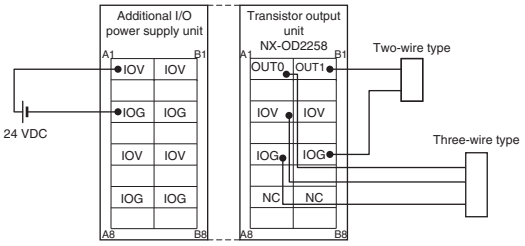
This unit uses a push-pull output circuit.

Terminal wiring

NX-OD2154



NX-OD2258

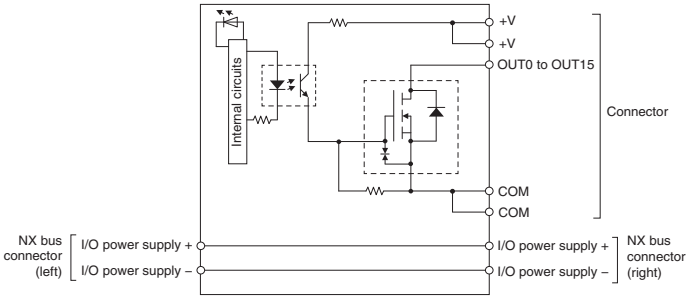


Digital output unit (with MIL connector)

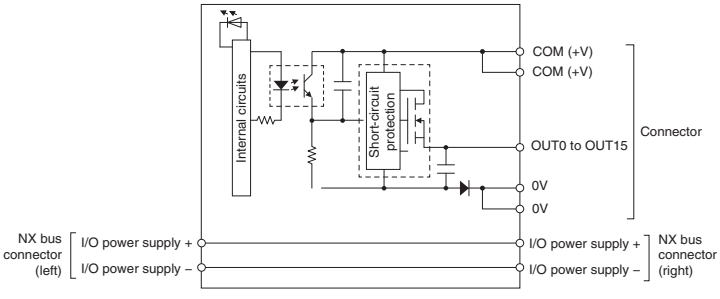
Item	Specifications			
Model	**NX-OD5121-5**	**NX-OD5256-5**	**NX-OD6121-5**	**NX-OD6256-5**
Name	Transistor output unit			
Internal I/O common	NPN	PNP	NPN	PNP
Capacity	16 points	16 points	32 points	32 points
Rated voltage	12 to 24 VDC	24 VDC	12 to 24 VDC	24 VDC
Operating load voltage	10.2 to 28.8 VDC	20.4 to 28.8 VDC	10.2 to 28.8 VDC	20.4 to 28.8 VDC
Maximum value of load current	0.5 A/point, 2 A/NX unit		0.5 A/point, 2 A/common, 4 A/NX unit	
Maximum inrush current	4.0 A/point, 10 ms max.			
Leakage current	0.1 mA max.			
Residual voltage	1.5 V max.			
ON/OFF response time	0.1 ms max./0.8 ms max.	0.5 ms max./1.0 ms max.	0.1 ms max./0.8 ms max.	0.5 ms max./1.0 ms max.
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.			
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)			
Isolation method	Photocoupler isolation			
Unit power consumption	0.60 W max.	0.70 W max.	0.80 W max.	1.0 W max.
I/O power supply method	Supply from external source			
I/O current consumption	30 mA max.	40 mA max.	50 mA max.	80 mA max.
Current capacity of I/O power supply terminal	Without I/O power supply terminals			
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing			
Terminal block type	MIL connector 20 terminals		MIL connector 40 terminals	
Dimensions (W x H x D)	30 × 100 × 71 mm			
Weight	80 g max.	85 g max.	90 g max.	95 g max.
Disconnection/ short-circuit detection	Not supported			
Protective function	Not supported	With load short-circuit protection	Not supported	With load short-circuit protection

Circuit layout

NX-OD5121-5

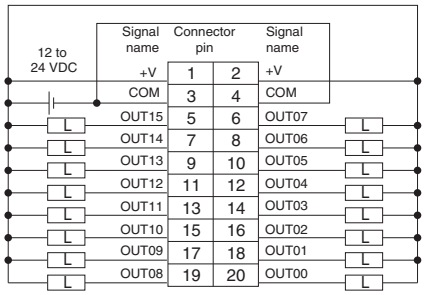


NX-OD5256-5



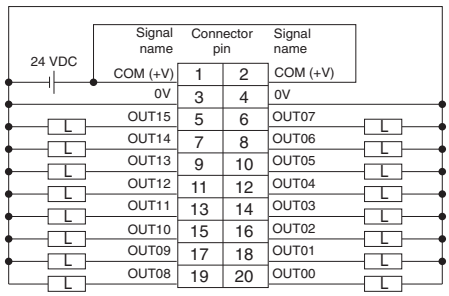
Terminal wiring

NX-OD5121-5



- Be sure to wire both pins 3 and 4 (COM).
- Be sure to wire both pins 1 and 2 (+V).

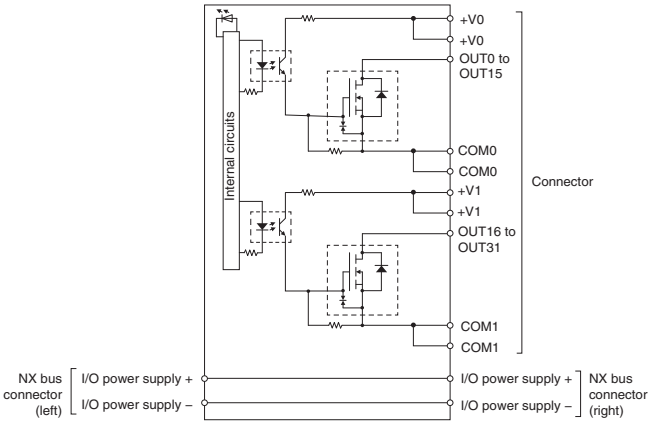
NX-OD5256-5



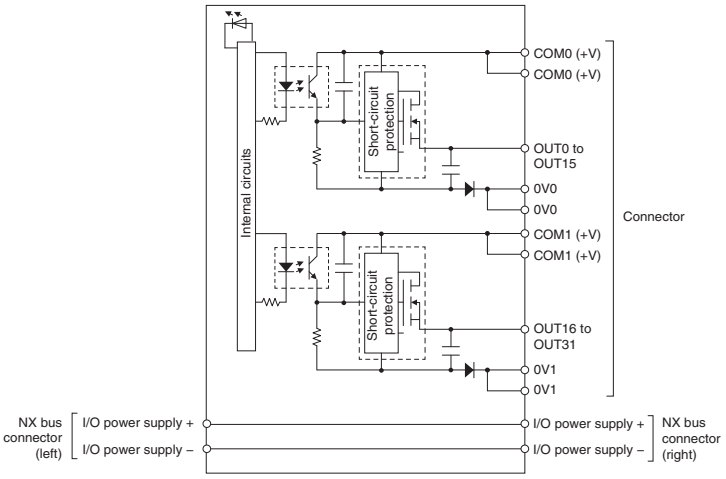
- Be sure to wire both pins 1 and 2 (COM (+V)).
- Be sure to wire both pins 3 and 4 (0V).

Circuit layout

NX-OD6121-5

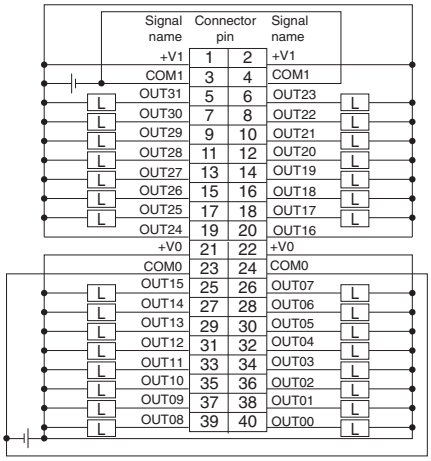


NX-OD6256-5



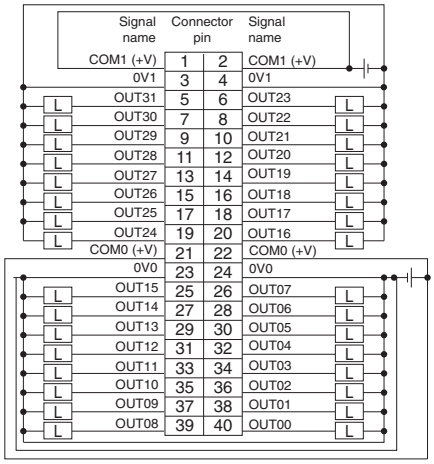
Terminal wiring

NX-OD6121-5



- Be sure to wire both pins 21 and 22 (+V0).
- Be sure to wire both pins 23 and 24 (COM0).
- Be sure to wire both pins 1 and 2 (+V1).
- Be sure to wire both pins 3 and 4 (COM1).

NX-OD6256-5



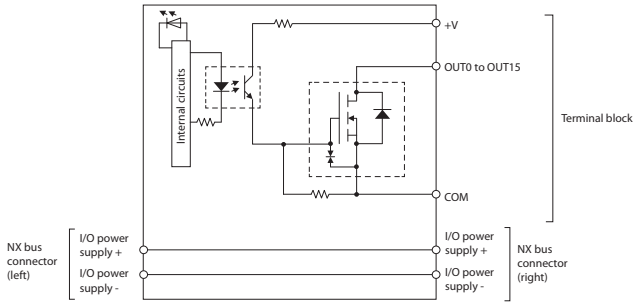
- Be sure to wire both pins 21 and 22 (COM0 (+V)).
- Be sure to wire both pins 1 and 2 (COM1 (+V)).
- Be sure to wire both pins 23 and 24 (0V0).
- Be sure to wire both pins 3 and 4 (0V1).

Digital output unit (with M3 screw terminal block)

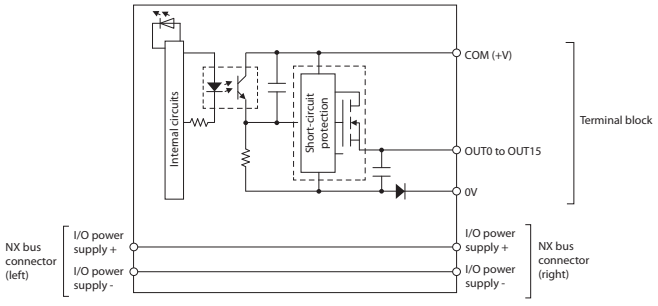
Item	Specifications	
Model	**NX-OD5121-1**	**NX-OD5256-1**
Name	Transistor output unit	
Internal I/O common	NPN	PNP
Capacity	16 points	16 points
Rated voltage	12 to 24 VDC	24 VDC
Operating load voltage	10.2 to 28.8 VDC	20.4 to 28.8 VDC
Maximum value of load current	0.5 A/point, 5 A/NX unit	
Maximum inrush current	4.0 A/point, 10 ms max.	
Leakage current	0.1 mA max.	
Residual voltage	1.5 V max.	
ON/OFF response time	0.1 ms max./0.8 ms max.	0.5 ms max./1.0 ms max.
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	Photocoupler isolation	
Unit power consumption	0.60 W max.	0.65 W max.
I/O power supply method	Supply from external source	
I/O current consumption	30 mA max.	
Current capacity of I/O power supply terminal	Without I/O power supply terminals	
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing	
Terminal block type	M3 screw terminal block 18 terminals	
Dimensions (W x H x D)	30 × 100 × 71 mm	
Weight	125 g max.	
Disconnection/ short-circuit detection	Not supported	
Protective function	Not supported	With load short-circuit protection

Circuit layout

NX-OD5121-1

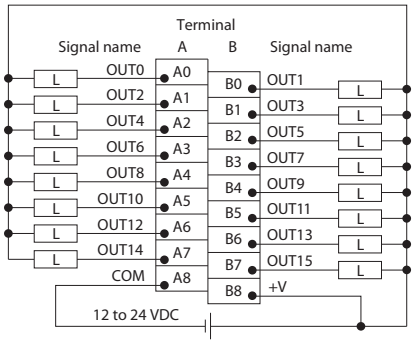


NX-OD5256-1

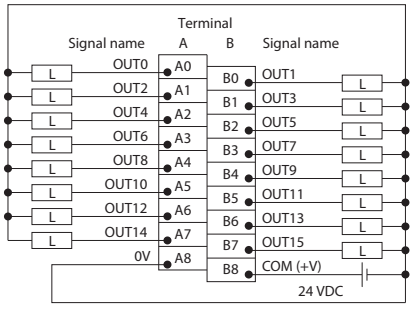


Terminal wiring

NX-OD5121-1



NX-OD5256-1

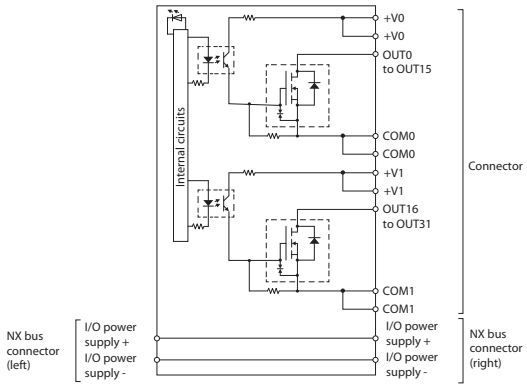


Digital output unit (with Fujitsu connector)

Item	Specifications
Model	**NX-OD6121-6**
Name	Transistor output unit
Internal I/O common	NPN
Capacity	32 points
Rated voltage	12 to 24 VDC
Operating load voltage	10.2 to 28.8 VDC
Maximum value of load current	0.5 A/point, 2 A/common, 4 A/NX unit
Maximum inrush current	4.0 A/point, 10 ms max.
Leakage current	0.1 mA max.
Residual voltage	1.5 V max.
ON/OFF response time	0.1 ms max./0.8 ms max.
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method	Photocoupler isolation
Unit power consumption	0.80 W max.
I/O power supply method	Supply from external source
I/O current consumption	50 mA max.
Current capacity of I/O power supply terminal	Without I/O power supply terminals
I/O refreshing method	Switching synchronous I/O refreshing and free-run refreshing
Terminal block type	Fujitsu connector 40 terminals
Dimensions (W x H x D)	30 × 100 × 71 mm
Weight	90 g max.
Disconnection/ short-circuit detection	Not supported
Protective function	Not supported

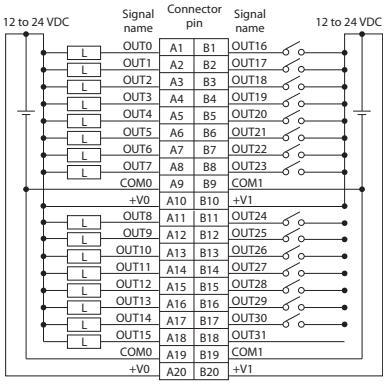
Circuit layout

NX-OD6121-6



Terminal wiring

NX-OD6121-6



- Be sure to wire both pins A9 and A19 (COM0).
- Be sure to wire both pins B9 and B19 (COM1).
- Be sure to wire both pins A10 and A20 (+V0).
- Be sure to wire both pins B10 and B20 (+V1).

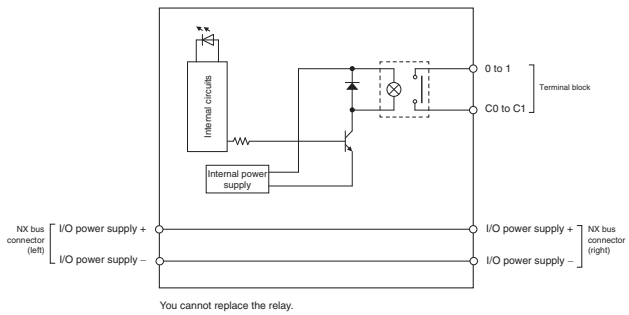
Relay output unit

Item	Specifications	
Model	**NX-OC2633**	**NX-OC2733**
Name	Relay output unit	
Relay type	N.O. contact	N.O. + N.C. contact
Capacity	2 points, independent contacts	
Max. switching capacity	250 VAC/2 A (cos Ø = 1), 250 VAC/2 A (cos Ø = 0.4), 24 VDC/2 A, 4 A/unit	
Min. switching capacity	5 VDC, 1 mA	
ON/OFF response time	15 ms max.	
Relay service life	Electrical: 100,000 operations*1 Mechanical: 20,000,000 operations	
Dielectric strength	Between A1/B1 terminals and A3/B3 terminals: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and GR terminal: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and internal circuits: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the internal circuit and GR terminal: 510 VAC for 1 min at a leakage current of 5 mA max.	Between A1/3, B1/3 terminals and A5/7, B5/7 terminals: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and functional ground terminal: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and internal circuits: 2,300 VAC for 1 min at a leakage current of 5 mA max. Between the internal circuit and functional ground terminal: 510 VAC for 1 min at a leakage current of 5 mA max.
Insulation resistance	Between A1/B1 terminals and A3/B3 terminals: 20 MΩ min. (500 VDC) Between the external terminals and internal circuits: 20 MΩ min. (500 VDC) Between the internal circuit and GR terminal: 20 MΩ min. (100 VDC) Between the external terminals and GR terminal: 20 MΩ min. (500 VDC)	Between A1/3, B1/3 terminals and A5/7, B5/7 terminals: 20 MΩ min. (500 VDC) Between the external terminals and functional ground terminal: 20 MΩ min. (500 VDC) Between the external terminals and internal circuits: 20 MΩ min. (500 VDC) Between the internal circuit and functional ground terminal: 20 MΩ min. (100 VDC)
Vibration resistance	Conforms to IEC60068-2-6. 5 to 8.4 Hz with amplitude of 3.5 mm, 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	100 m/s^2, 3 times each in X, Y and Z directions	
Isolation method	Relay isolation	
Unit power consumption	0.80 W max.	0.95 W max.
I/O power supply method	Supply from external source	
I/O current consumption	No consumption	
Current capacity of I/O power supply terminal	Without I/O power supply terminals	
I/O refreshing method	Free-run refreshing	
Terminal block type	Screwless push-in terminal 8 terminals (A + B)	
Dimensions (W x H x D)	12 × 100 × 71 mm	
Weight	65 g max.	70 g max.
Disconnection/ short-circuit detection	Not supported	
Protective function	Not supported	

*1. Electrical service life will vary depending on the current value. Refer to “NX-series digital I/O units user’s manual” for details.

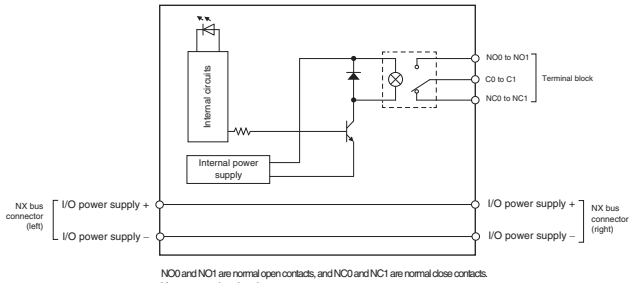
Circuit layout

NX-OC2633



You cannot replace the relay.

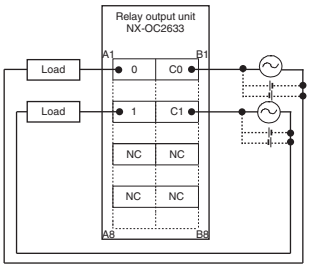
NX-OC2733



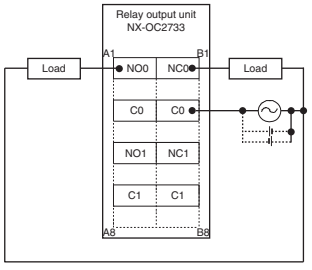
NO0 and NO1 are normal open contacts, and NC0 and NC1 are normal close contacts.
You cannot replace the relay.

Terminal wiring

NX-OC2633



NX-OC2733



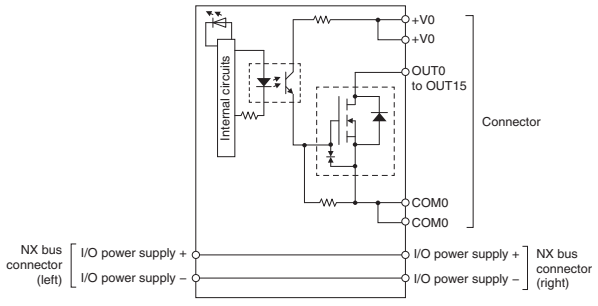
Digital I/O unit (with MIL connector)

Item		Specifications	
Model		**NX-MD6121-5**	**NX-MD6256-5**
Name		DC input/transistor output unit	
Capacity		16 inputs/16 outputs	
Output section (CN1)	**Internal I/O common**	NPN	PNP
	Rated voltage	12 to 24 VDC	24 VDC
	Operating load voltage	10.2 to 28.8 VDC	20.4 to 28.8 VDC
	Maximum value of load current	0.5 A/point, 2 A/NX unit	
	Maximum inrush current	4.0 A/point, 10 ms max.	
	Leakage current	0.1 mA max.	
	Residual voltage	1.5 V max.	
	ON/OFF response time	0.1 ms max./0.8 ms max.	0.5 ms max./1.0 ms max.
Input section (CN2)	**Internal I/O common**	For both NPN/PNP	
	Rated input voltage	24 VDC (15 to 28.8 VDC)	
	Input current[*1]	7 mA	
	ON voltage	15 VDC min.	
	ON current	3 mA min.	
	OFF voltage	5 VDC max.	
	OFF current	1 mA max.	
	ON/OFF response time	20 μs max./400 μs max	
	Input filter time	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms	
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method		Photocoupler isolation	
Unit power consumption		0.70 W max.	0.75 W max.
I/O power supply method		Supply from external source	
I/O current consumption		30 mA max.	40 mA max.
Current capacity of I/O power supply terminal		Without I/O power supply terminals	
I/O refreshing method		Switching synchronous I/O refreshing and free-run refreshing	
Terminal block type		2 MIL connectors 20 terminals	
Dimensions (W x H x D)		30 × 100 × 71 mm	
Weight		105 g max.	110 g max.
Disconnection/short-circuit detection		Not supported	
Protective function		Not supported	With load short-circuit protection

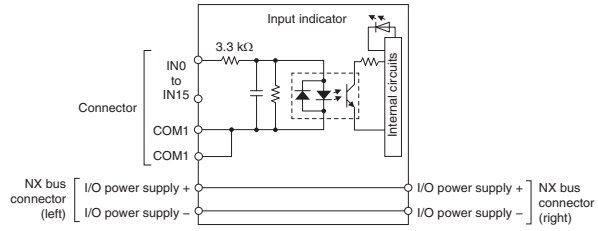
*1. Typical rated current at 24 VDC.

Circuit layout

NX-MD6121-5
CN1 (left) output circuit

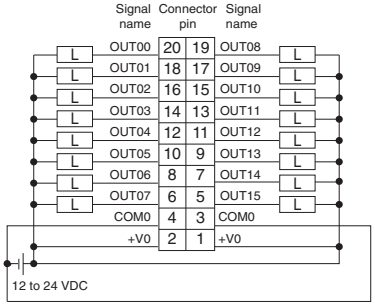


CN2 (right) input circuit



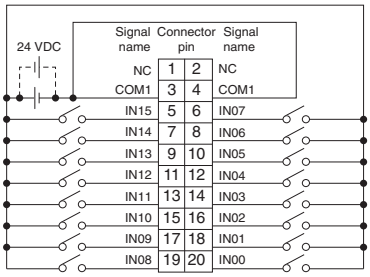
Terminal wiring

NX-MD6121-5
CN1 (left) output terminal



- Be sure to wire both pins 3 and 4 (COM0) of CN1.
- Be sure to wire both pins 1 and 2 (+V0) of CN1.

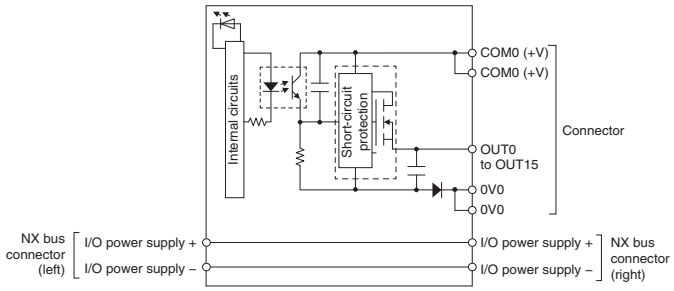
CN2 (right) input terminal



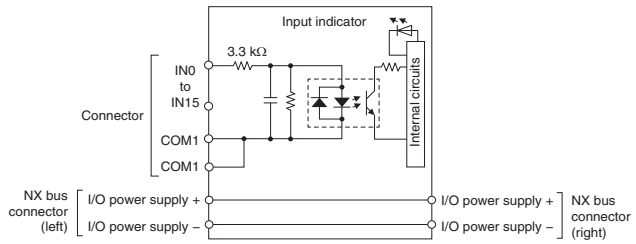
- The polarity of the input power supply of CN2 can be connected in either direction.
- Be sure to wire both pins 3 and 4 (COM1) of CN2, and set the same polarity for both pins.

Circuit layout

NX-MD6256-5
CN1 (left) output circuit

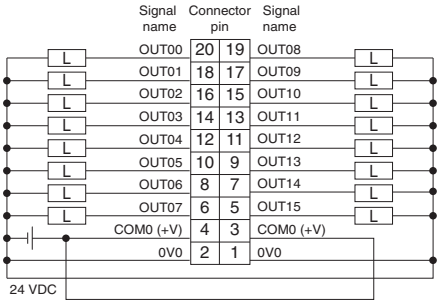


CN2 (right) input circuit



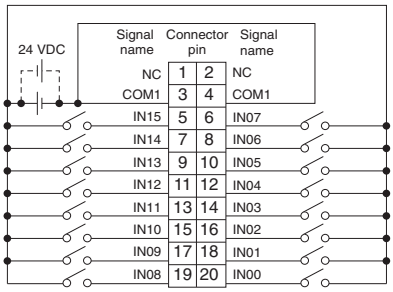
Terminal wiring

NX-MD6256-5
CN1 (left) output terminal



- Be sure to wire both pins 3 and 4 (COM0 (+V)) of CN1.
- Be sure to wire both pins 1 and 2 (0V0) of CN1.

CN2 (right) input terminal



- The polarity of the input power supply of CN2 can be connected in either direction.
- Be sure to wire both pins 3 and 4 (COM1) of CN2, and set the same polarity for both pins.

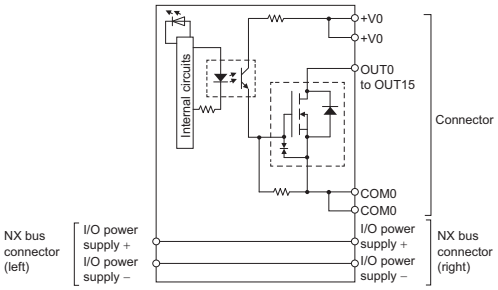
Digital I/O unit (with Fujitsu connector)

Item		Specifications
Model		**NX-MD6121-6**
Name		DC input/transistor output unit
Capacity		16 inputs/16 outputs
Output section (CN1)	**Internal I/O common**	NPN
	Rated voltage	12 to 24 VDC
	Operating load voltage	10.2 to 28.8 VDC
	Maximum value of load current	0.5 A/point, 2 A/NX unit
	Maximum inrush current	4.0 A/point, 10 ms max.
	Leakage current	0.1 mA max.
	Residual voltage	1.5 V max.
	ON/OFF response time	0.1 ms max./0.8 ms max.
Input section (CN2)	**Internal I/O common**	For both NPN/PNP
	Rated input voltage	24 VDC (15 to 28.8 VDC)
	Input current[*1]	7 mA
	ON voltage	15 VDC min.
	ON current	3 mA min.
	OFF voltage	5 VDC max.
	OFF current	1 mA max.
	ON/OFF response time	20 μs max./400 μs max
	Input filter time	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method		Photocoupler isolation
Unit power consumption		0.70 W max.
I/O power supply method		Supply from external source
I/O current consumption		30 mA max.
Current capacity of I/O power supply terminal		Without I/O power supply terminals
I/O refreshing method		Switching synchronous I/O refreshing and free-run refreshing
Terminal block type		2 Fujitsu connectors 24 terminals
Dimensions (W x H x D)		30 × 100 × 71 mm
Weight		95 g max.
Disconnection/short-circuit detection		Not supported
Protective function		Not supported

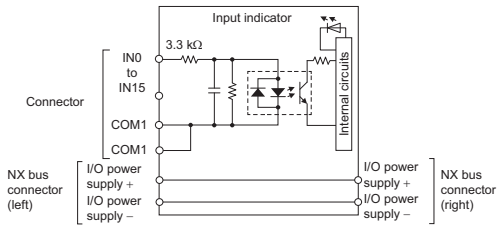
*1. Typical rated current at 24 VDC.

Circuit layout

NX-MD6121-6
CN1 (left) output circuit

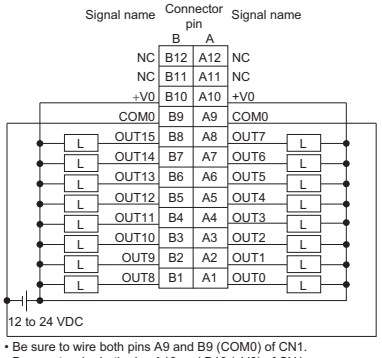


CN2 (right) input circuit



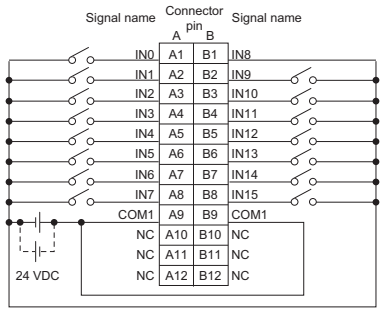
Terminal wiring

NX-MD6121-6
CN1 (left) output terminal



- Be sure to wire both pins A9 and B9 (COM0) of CN1.
- Be sure to wire both pins A10 and B10 (+V0) of CN1.

CN2 (right) input terminal



- The polarity of the input power supply of CN2 can be connected in either direction.
- Be sure to wire both pins A9 and B9 (COM1) of CN2, and set the same polarity for both pins.

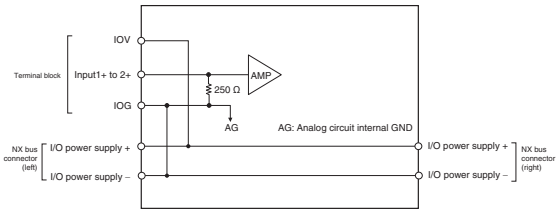
Analog I/O unit

Current input unit

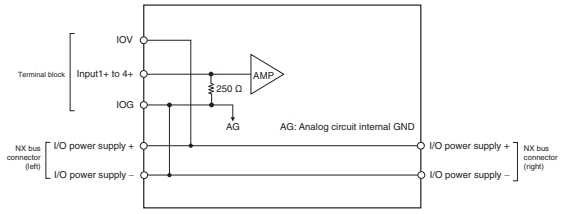
Item		Specifications								
Model		**NX-AD2203**	**NX-AD3203**	**NX-AD4203**	**NX-AD2204**	**NX-AD3204**	**NX-AD4204**	**NX-AD2208**	**NX-AD3208**	**NX-AD4208**
Name		Current input unit								
Input range		4 to 20 mA								
Input method		Single-ended input			Differential input					
Capacity		2 points	4 points	8 points	2 points	4 points	8 points	2 points	4 points	8 points
Input conversion range		–5% to 105% (full scale)								
Absolute maximum rating		±30 mA								
Input impedance		250 Ω min.	250 Ω min.	85 Ω min.	250 Ω min.	250 Ω min.	85 Ω min.	250 Ω min.	250 Ω min.	85 Ω min.
Resolution		1/8,000 (full scale)						1/30,000 (full scale)		
Overall accuracy	**25°C**	±0.2% (full scale)						±0.1% (full scale)		
	0 to 55°C	±0.4% (full scale)						±0.2% (full scale)		
Conversion time		250 μs/point						10 μs/point		
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.								
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)								
Isolation method		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)								
Unit power consumption		0.90 W max.	0.90 W max.	1.05 W max.	0.90 W max.	0.90 W max.	1.05 W max.	0.90 W max.	0.95 W max.	1.10 W max.
I/O power supply method		Supply from the NX bus			No supply					
I/O current consumption		No consumption								
Current capacity of I/O power supply terminal		0.1 A/terminal max.			Without I/O power supply terminals					
I/O refreshing method		Free-run refreshing						Switching synchronous I/O refreshing and free-run refreshing		
Terminal block type		Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)
Dimensions (W x H x D)		12 × 100 × 71 mm								
Weight		70 g max.								
Input disconnection detection		Supported								

Circuit layout

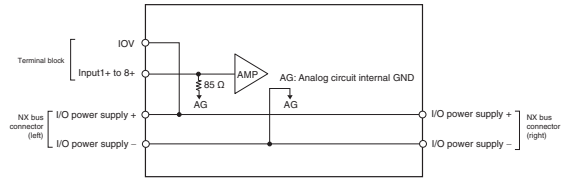
NX-AD2203



NX-AD3203

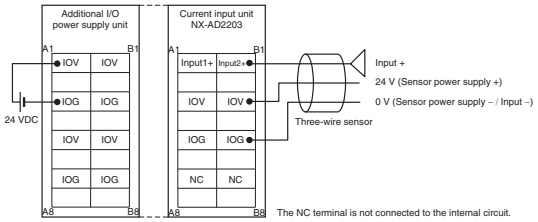


NX-AD4203

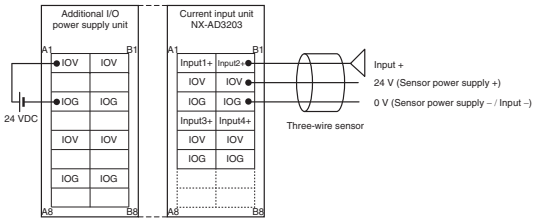


Terminal wiring

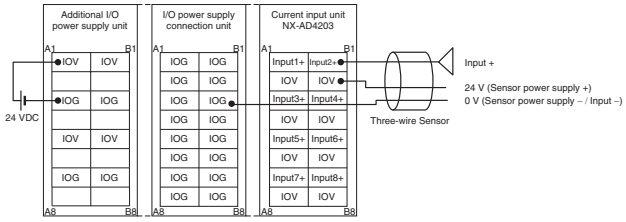
NX-AD2203



NX-AD3203

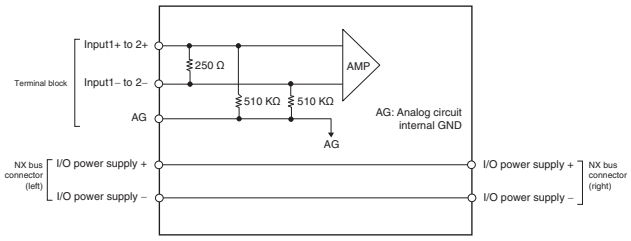


NX-AD4203

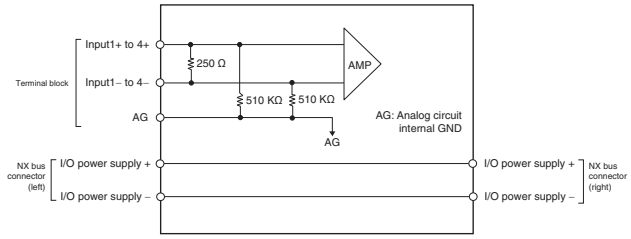


Circuit layout

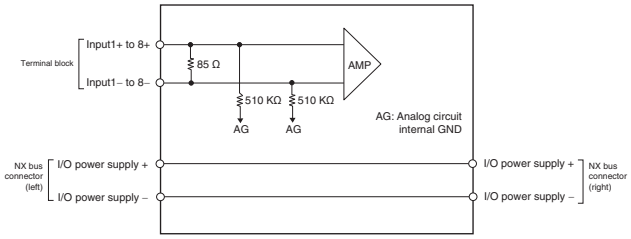
NX-AD2204/NX-AD2208



NX-AD3204/NX-AD3208

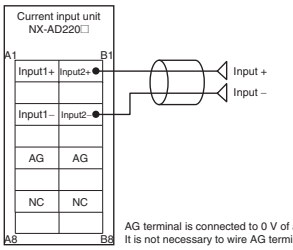


NX-AD4204/NX-AD4208



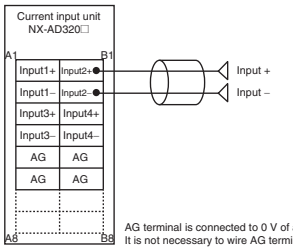
Terminal wiring

NX-AD2204/NX-AD2208



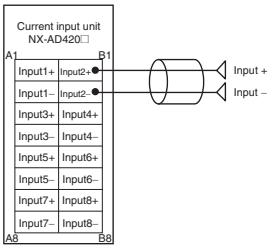
AG terminal is connected to 0 V of analog circuit inside the unit. It is not necessary to wire AG terminal normally.

NX-AD3204/NX-AD3208



AG terminal is connected to 0 V of analog circuit inside the unit. It is not necessary to wire AG terminal normally.

NX-AD4204/NX-AD4208

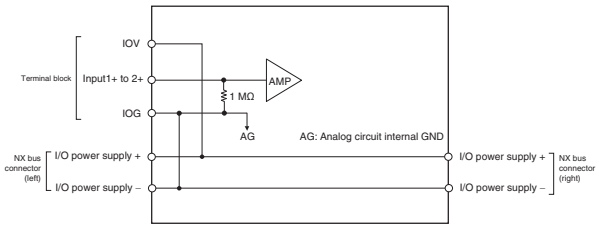


Voltage input unit

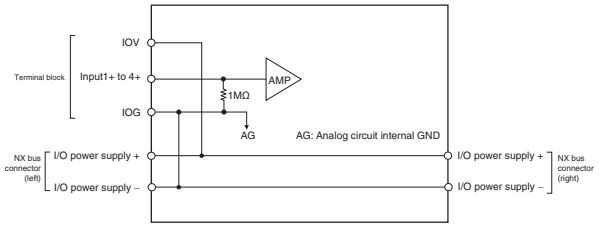
Item		Specifications								
Model		NX-AD2603	NX-AD3603	NX-AD4603	NX-AD2604	NX-AD3604	NX-AD4604	NX-AD2608	NX-AD3608	NX-AD4608
Name		Voltage input unit								
Input range		–10 to 10 V								
Input method		Single-ended input			Differential input					
Capacity		2 points	4 points	8 points	2 points	4 points	8 points	2 points	4 points	8 points
Input conversion range		–5% to 105% (full scale)								
Absolute maximum rating		±15 V								
Input impedance		1 MΩ min.								
Resolution		1/8,000 (full scale)						1/30,000 (full scale)		
Overall accuracy	25°C	±0.2% (full scale)						±0.1% (full scale)		
	0 to 55°C	±0.4% (full scale)						±0.2% (full scale)		
Conversion time		250 μs/point						10 μs/point		
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.								
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)								
Isolation method		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)								
Unit power consumption		1.05 W max.	1.10 W max.	1.15 W max.	1.05 W max.	1.10 W max.	1.15 W max.	1.05 W max.	1.10 W max.	1.15 W max.
I/O power supply method		Supply from the NX bus			No supply					
I/O current consumption		No consumption								
Current capacity of I/O power supply terminal		0.1 A/terminal max.			Without I/O power supply terminals					
I/O refreshing method		Free-run refreshing						Switching synchronous I/O refreshing and free-run refreshing		
Terminal block type		Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 16 terminals (A + B)
Dimensions (W x H x D)		12 × 100 × 71 mm								
Weight		70 g max.								
Input disconnection detection		Not supported								

Circuit layout

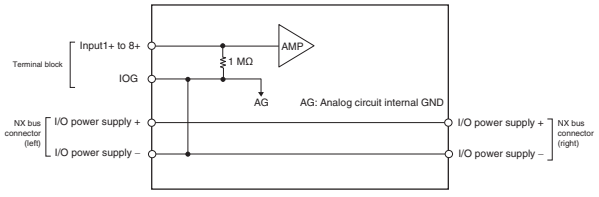
NX-AD2603



NX-AD3603

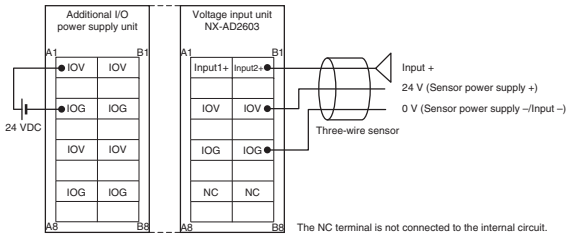


NX-AD4603

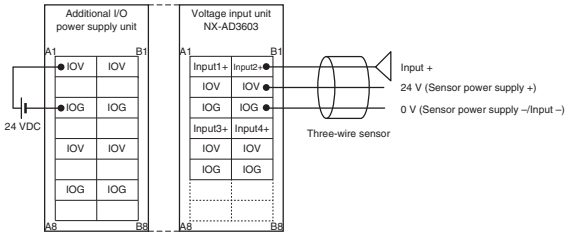


Terminal wiring

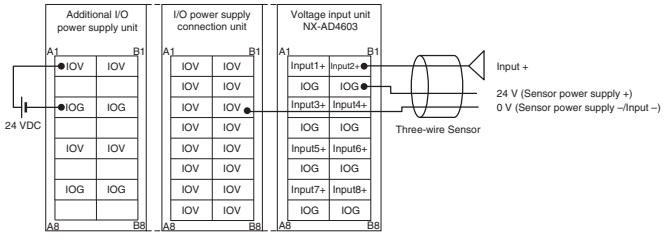
NX-AD2603



NX-AD3603

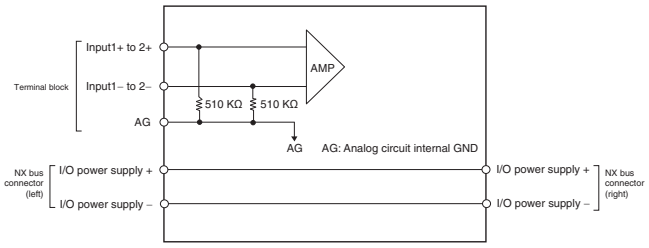


NX-AD4603

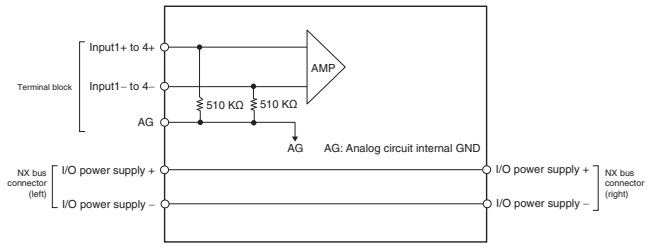


Circuit layout

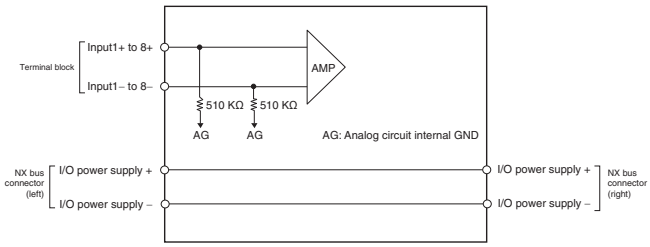
NX-AD2604/NX-AD2608



NX-AD3604/NX-AD3608

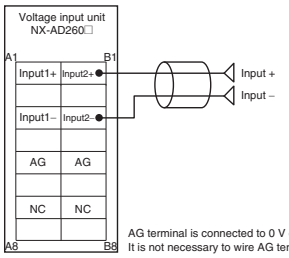


NX-AD4604/NX-AD4608



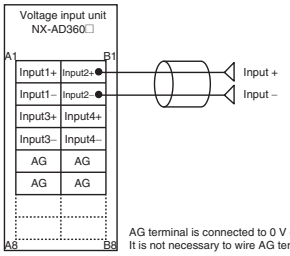
Terminal wiring

NX-AD2604/NX-AD2608



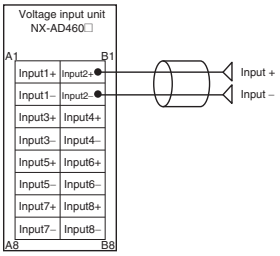
AG terminal is connected to 0 V of analog circuit inside the unit. It is not necessary to wire AG terminal normally.

NX-AD3604/NX-AD3608



AG terminal is connected to 0 V of analog circuit inside the unit. It is not necessary to wire AG terminal normally.

NX-AD4604/NX-AD4608

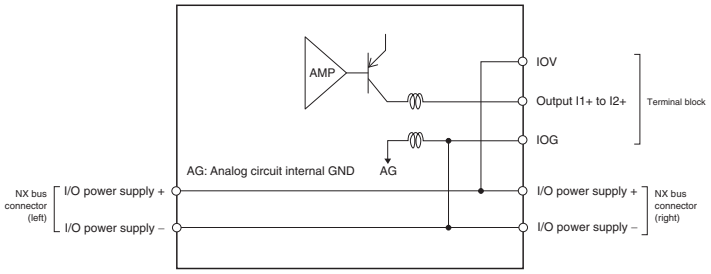


Current output unit

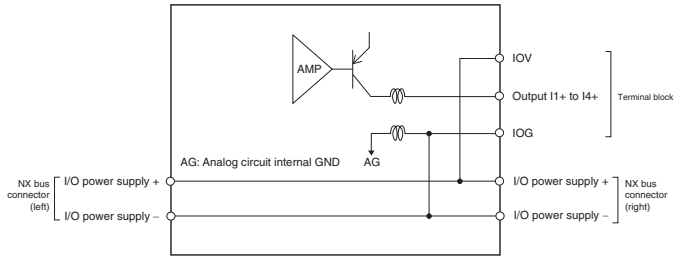
Item		Specifications			
Model		NX-DA2203	NX-DA3203	NX-DA2205	NX-DA3205
Name		Current output unit			
Output range		4 to 20 mA			
Capacity		2 points	4 points	2 points	4 points
Output conversion range		–5% to 105% (full scale)			
Allowable load resistance		600 Ω min.	350 Ω min.	600 Ω min.	350 Ω min.
Resolution		1/8,000 (full scale)		1/30,000 (full scale)	
Overall accuracy	25°C	±0.3% (full scale)		±0.1% (full scale)	
	0 to 55°C	±0.6% (full scale)		±0.3% (full scale)	
Conversion time		250 μs/point		10 μs/point	
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.			
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)			
Isolation method		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)			
Unit power consumption		1.75 W max.	1.80 W max.	1.75 W max.	1.80 W max.
I/O power supply method		Supply from the NX bus			
I/O current consumption		No consumption			
Current capacity of I/O power supply terminal		0.1 A/terminal max.			
I/O refreshing method		Free-run refreshing		Switching synchronous I/O refreshing and free-run refreshing	
Terminal block type		Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)
Dimensions (W x H x D)		12 × 100 × 71 mm			
Weight		70 g max.			

Circuit layout

NX-DA2203/DA2205

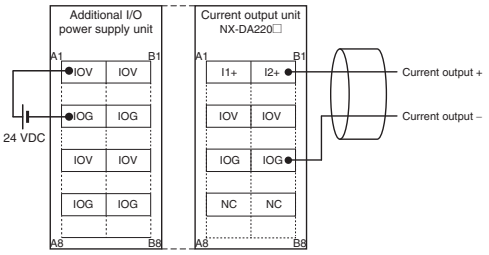


NX-DA3203/DA3205

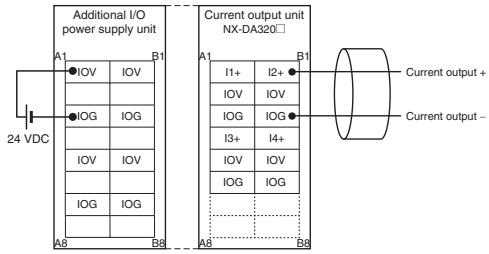


Terminal wiring

NX-DA2203/DA2205



NX-DA3203/DA3205

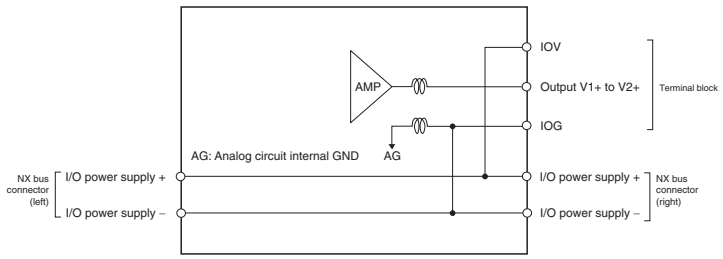


Voltage output unit

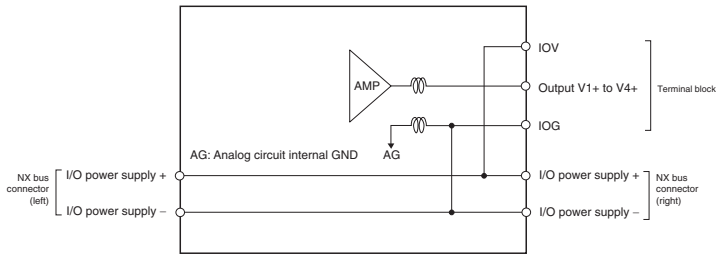
Item		Specifications			
Model		NX-DA2603	NX-DA3603	NX-DA2605	NX-DA3605
Name		Voltage output unit			
Output range		–10 to 10 V			
Capacity		2 points	4 points	2 points	4 points
Output conversion range		–5% to 105% (full scale)			
Allowable load resistance		5 kΩ min.			
Output impedance		0.5 Ω max.			
Resolution		1/8,000 (full scale)		1/30,000 (full scale)	
Overall accuracy	25°C	±0.3% (full scale)		±0.1% (full scale)	
	0 to 55°C	±0.5% (full scale)		±0.3% (full scale)	
Conversion time		250 μs/point		10 μs/point	
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.			
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)			
Isolation method		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)			
Unit power consumption		1.10 W max.	1.25 W max.	1.10 W max.	1.25 W max.
I/O power supply method		Supply from the NX bus			
I/O current consumption		No consumption			
Current capacity of I/O power supply terminal		0.1 A/terminal max.			
I/O refreshing method		Free-run refreshing		Switching synchronous I/O refreshing and free-run refreshing	
Terminal block type		Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)	Screwless push-in terminal 8 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)
Dimensions (W x H x D)		12 × 100 × 71 mm			
Weight		70 g max.			

Circuit layout

NX-DA2603/DA2605

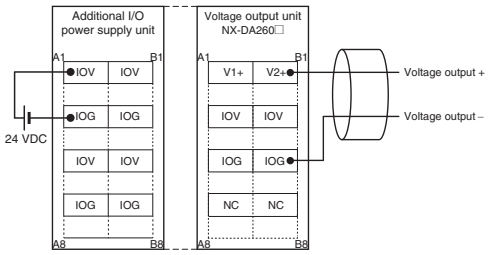


NX-DA3603/DA3605

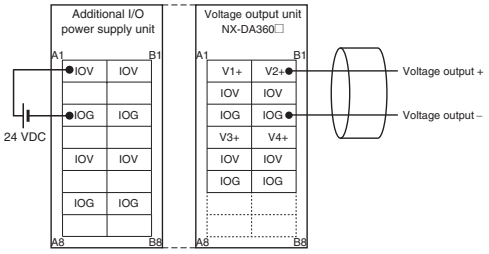


Terminal wiring

NX-DA2603/DA2605



NX-DA3603/DA3605



Temperature input unit

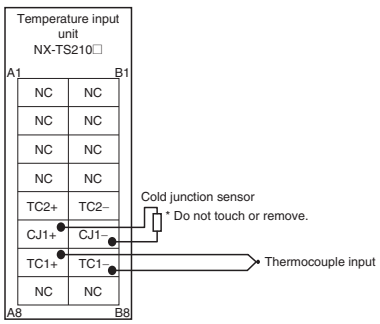
Thermocouple input unit

Item		Specifications					
Model		**NX-TS2101**	**NX-TS3101**	**NX-TS2102**	**NX-TS3102**	**NX-TS2104**	**NX-TS3104**
Name		Thermocouple type					
Capacity		2 points	4 points	2 points	4 points	2 points	4 points
Temperature sensor		K, J, T, E, L, U, N, R, S, B, WRe5-26, PLII		K, J, T, E, L, U, N, R, S, WRe5-26, PLII			
Input conversion range		±20°C of the input range					
Input detection current		Approx. 0.1 μA					
Input impedance		20 KΩ min.					
Absolute maximum rating		±130 mV					
Resolution		0.1°C max.*1		0.01ºC max.		0.001ºC max.	
Warm-up period		30 minutes		45 minutes			
Reference accuracy and temperature coefficient	**Conversion time**	250 ms		10 ms		60 ms	
	Temperature range	K, N (–200 to 1,300°C) J (–200 to 1,200°C) T (–200 to 400°C) E (–200 to 1,000°C) L (–200 to 900°C) U (–200 to 600°C) R, S (–50 to 1,700°C) B (0 to 1,800°C) WRe5-26 (0 to 2,300°C) PLII (0 to 1,300°C)		K, N (–200 to 1,300°C) K (-20 to 600ºC, high resolution) J (–200 to 1,200°C) J (–20 to 600°C, high resolution) T (–200 to 400°C) E (–200 to 1,000°C) L (–200 to 900°C) U (–200 to 600°C) R, S (–50 to 1,700°C) WRe5-26 (0 to 2,300°C) PLII (0 to 1,300°C)			
	Accuracy*2	K/J/E/L/N/R/S/PLII (±0.1%) T (±0.2%) U (±0.15%) WRe5-26 (±0.05%)		T (±0.22%) R/S (±0.19%) N (±0.11%) U (±0.09%) K/J/E/L/WRe5-26/PLII (±0.05%)			
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.					
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)					
Isolation method		Between the input and the NX bus: Power = Transformer Signal = Photocoupler Between inputs: Power = Transformer, Signal = Photocoupler		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator Between inputs: Power = Transformer Signal = Digital isolator			
Unit power consumption		0.90 W max.	1.30 W max.	0.80 W max.	1.10 W max.	0.80 W max.	1.10 W max.
I/O power supply method		No supply					
I/O current consumption		No consumption					
Current capacity of I/O power supply terminal		Without I/O power supply terminals					
I/O refreshing method		Free-run refreshing					
Terminal block type		Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]
Dimensions (W x H x D)		12 × 100 × 71 mm	24 × 100 × 71 mm	12 × 100 × 71 mm	24 × 100 × 71 mm	12 × 100 × 71 mm	24 × 100 × 71 mm
Weight		70 g max.	140 g max.	70 g max.	140 g max.	70 g max.	140 g max.

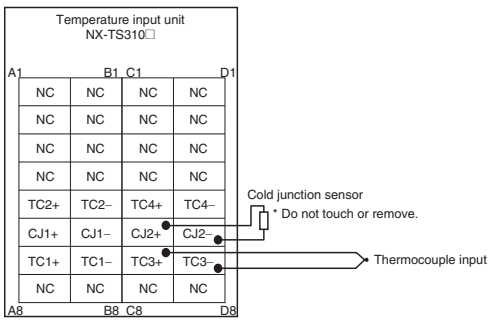
*1. The resolution is 0.2ºC max. when the input type is R, S or W.
*2. Accuracy for temperature inputs as percentage of process value and typical value 25ºC ambient temperature (refer to the user's manual for detailed information).

Terminal wiring

NX-TS2101/TS2102/TS2104



NX-TS3101/TS3102/TS3104



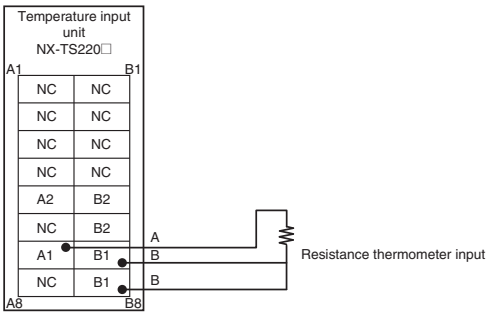
Resistance thermometer input unit

Item		Specifications					
Model		**NX-TS2201**	**NX-TS3201**	**NX-TS2202**	**NX-TS3202**	**NX-TS2204**	**NX-TS3204**
Name		Resistance thermometer type					
Capacity		2 points	4 points	2 points	4 points	2 points	4 points
Temperature sensor		Pt100 (three-wire)/Pt1000 (three-wire)		Pt100 (three-wire)		Pt100 (three-wire)/Pt1000 (three-wire)	
Input conversion range		±20°C of the input range					
Input detection current		Approx. 0.25 mA					
Resolution		0.1°C max.		0.01ºC max.		0.001ºC max.	
Effect of conductor resistance		0.06°C/Ω max. (also 20 Ω max.)					
Warm-up period		10 minutes		30 minutes			
Reference accuracy and temperature coefficient	**Conversion time**	250 ms		10 ms		60 ms	
	Temperature range	–200 to 850°C					
	Accuracy[*1]	±0.1%		±0.05%			
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.					
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)					
Isolation method		Between the input and the NX bus: Power = Transformer Signal = Photocoupler Between inputs: Power = Transformer Signal = Photocoupler		Between the input and the NX bus: Power = Transformer Signal = Digital isolator Between inputs: Power = Transformer Signal = Digital isolator			
Unit power consumption		0.90 W max.	1.30 W max.	0.75 W max.	1.05 W max.	0.75 W max.	1.05 W max.
I/O power supply method		No supply					
I/O current consumption		No consumption					
Current capacity of I/O power supply terminal		Without I/O power supply terminals					
I/O refreshing method		Free-run refreshing					
Terminal block type		Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]	Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 16 terminals x 2 [(A + B) & (C + D)]
Dimensions (W x H x D)		12 × 100 × 71 mm	24 × 100 × 71 mm	12 × 100 × 71 mm	24 × 100 × 71 mm	12 × 100 × 71 mm	24 × 100 × 71 mm
Weight		70 g max.	140 g max.	70 g max.	130 g max.	70 g max.	130 g max.

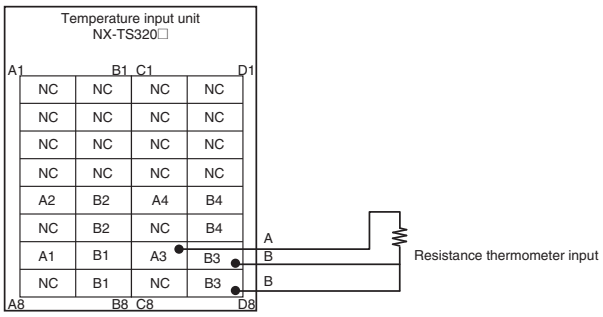
*1. Accuracy for temperature inputs as percentage of process value and typical value 25ºC ambient temperature (refer to the user's manual for detailed information).

Terminal wiring

NX-TS2201/TS2202/TS2204



NX-TS3201/TS3202/TS3204



Position interface unit

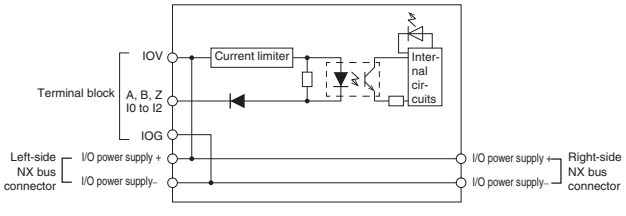
Incremental encoder input unit

Item			Specifications					
Model			**NX-EC0112**	**NX-EC0122**	**NX-EC0212**	**NX-EC0222**	**NX-EC0132**	**NX-EC0142**
Name			Incremental encoder input unit					
Number of channels			1 channel		2 channels		1 channel	
Input signals			Counter: Phases A, B and Z External inputs: 3		Counter: Phases A, B and Z External inputs: None		Counter: Phases A, B and Z External inputs: 3	
Input form	**Type**		NPN type 500 kHz	PNP type 500 kHz	NPN type 500 kHz	PNP type 500 kHz	Line driver, 4 MHz	
	Specifications	**Voltage**	20.4 to 28.8 VDC (24 VDC +20%/–15%) ON voltage: 19.6 VDC min./3 mA min. OFF voltage: 4.0 VDC max./1 mA max.				EIA standard RS-422-A line driver levels Impedance: 120 Ω ±5% Level input voltage: V_{IT+}: 0.1 V min. V_{IT-}: 0.1 V min. Hysteresis voltage: Vhys (V_{IT+} - V_{IT-}): 60 Mv	
		Current	4.2 mA (24 VDC)					
		5 V power supply for encoder	–				Output voltage: 5 VDC ±5% Output current: 500 mA max.	
		Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase difference pulse input × 4: 125 kHz), Phase Z: 125 kHz				Phases A and B: Single-phase 4 MHz (phase differential pulse input × 4: 1 MHz), Phase Z: 1 MHz	
Counting units			Pulses					
Pulse input method			Phase difference pulse (multiplication × 2/4), pulse + direction inputs or up and down pulse inputs					
Counter range			–2,147,483,648 to 2,147,483,647 pulses					
Counter functions	**Type**		Ring counter or linear 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					
External input specifications	**Input voltage**		20.4 to 28.8 VDC (24 VDC +20%/–15%)		–		20.4 to 28.8 VDC (24 VDC +20%/–15%)	
	Input current		4.6 mA (24 VDC)		–		3.5 mA (24 VDC)	
	ON voltage/ON current		15 VDC min./3 mA min.		–		15 VDC min./3 mA min.	
	OFF voltage/OFF current		4.0 VDC max./1 mA max.		–		5.0 VDC max./1 mA max.	
	ON/OFF response time		1 μs max./2 μs max.		–		1 μs max./1 μs max.	
	Internal I/O common		NPN	PNP	–		NPN	PNP
Dielectric strength			510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.					
Insulation resistance			20 MΩ min. between isolated circuits (at 100 VDC)					
Isolation method			Photocoupler isolation				Digital isolator	
Unit power consumption			0.85 W max.	0.95 W max.	0.85 W max.	0.95 W max.	0.95 W max.	1.05 W max.
I/O power supply source			Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)					
Current consumption from I/O power supply			None				30 mA	
Current capacity of I/O power supply terminal			0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections		0.3 A max. per terminal		0.1 A max. per terminal	
I/O refreshing method			Free-run refreshing or synchronous I/O refreshing*1					
Terminal block type			Screwless push-in terminal 16 terminals (A + B)		Screwless push-in terminal 12 terminals (A + B)		Screwless push-in terminal 12 terminals x 2 [(A + B) x 2]	
Dimensions (W x H x D)			12 × 100 × 71 mm				24 × 100 × 71 mm	
Weight			70 g				130 g	
Failure detection			None					
Protection			None					

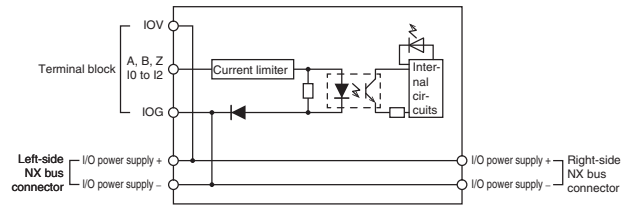
*1. The I/O refreshing method is automatically set according to the connected communication unit and CPU unit.

Circuit layout

NX-EC0112

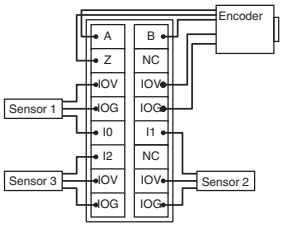


NX-EC0122

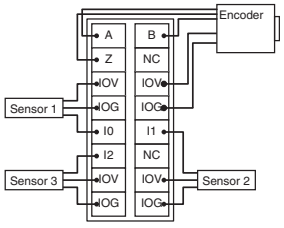


Terminal wiring

NX-EC0112

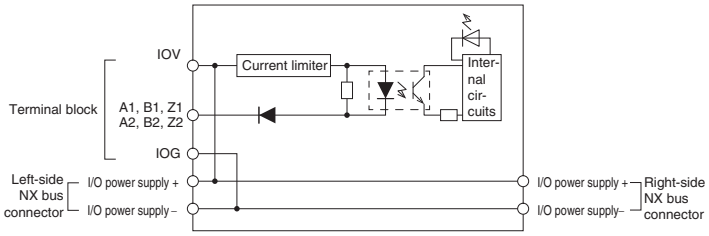


NX-EC0122

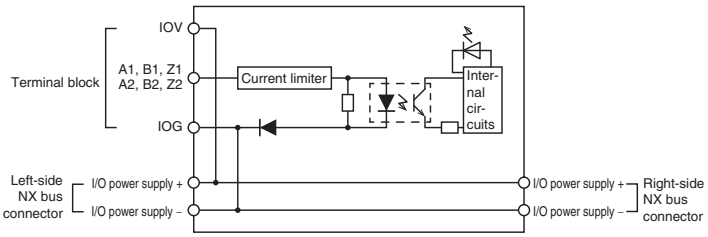


Circuit layout

NX-EC0212

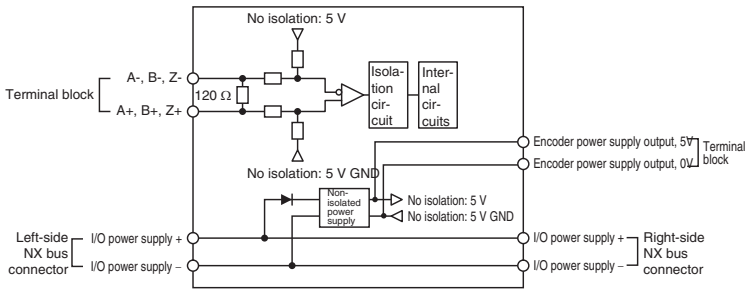


NX-EC0222

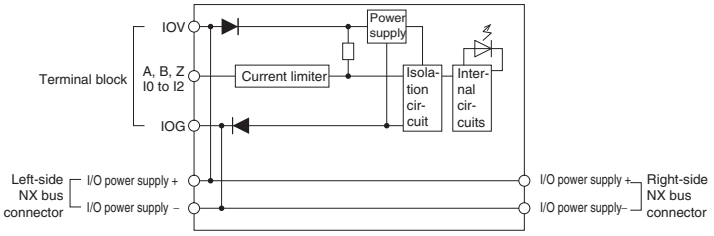


NX-EC0132/EC0142

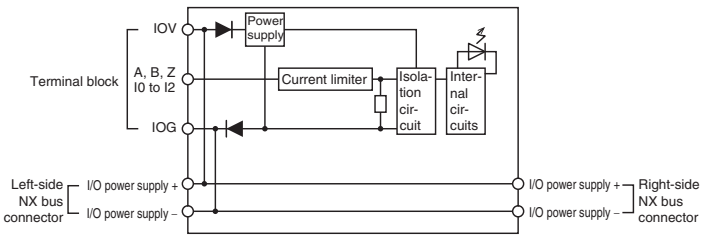
Encoder Input (NX-EC0132/EC0142)



External Inputs (NX-EC0132)

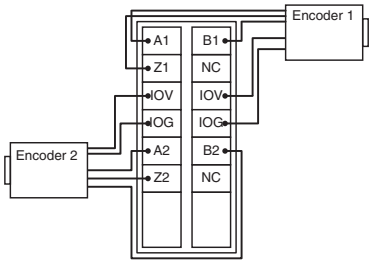


External Inputs (NX-EC0142)

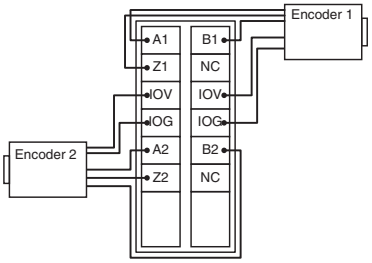


Terminal wiring

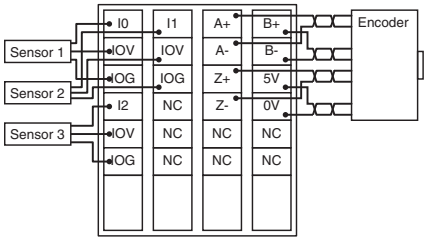
NX-EC0212



NX-EC0222



NX-EC0132/EC0142



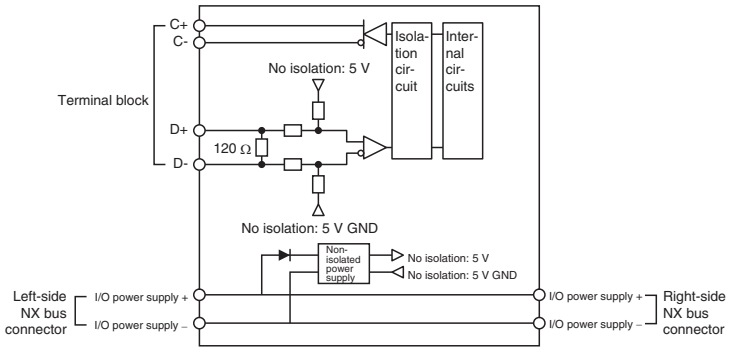
SSI input unit

Item	Specifications	
Model	**NX-ECS112**	**NX-ECS212**
Name	SSI input unit	
Number of channels	1 channel	2 channels
Input signals	External inputs: 2 data input (D+, D–) External outputs: 2 clock output (C+, C–)	
I/O interface	Synchronous serial interface (SSI), 2 MHz	
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	
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	Digital isolator	
Unit power consumption	0.85 W max.	0.90 W max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	
Current consumption from I/O power supply	20 mA	30 mA
Current capacity of I/O power supply terminal	0.3 A max. per terminal	
I/O refreshing method	Free-run refreshing or synchronous I/O refreshing*1	
Terminal block type	Screwless push-in terminal 12 terminals (C + D)	Screwless push-in terminal 12 terminals (C + D)
Dimensions (W x H x D)	12 x 100 x 71 mm	
Weight	65 g	
Maximum transmission distance*2	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) or 2.0 MHz (5 m)	
Failure detection	None	
Protection	None	

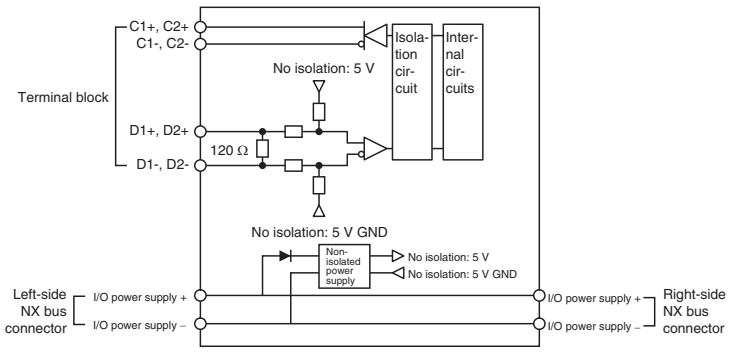
*1. The I/O refreshing method is automatically set according to the connected communication unit and CPU unit.
*2. The maximum transmission distance for an SSI input unit depends on the baud rate due to the delay that can result from the responsiveness of the connected encoder and cable impedance. The 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.

Circuit layout

NX-ECS112

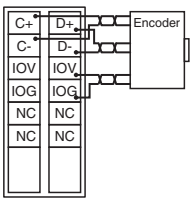


NX-ECS212

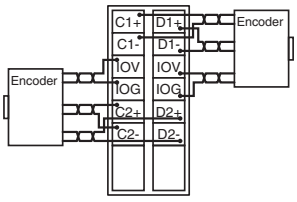


Terminal wiring

NX-ECS112



NX-ECS212



Pulse output unit

Item		Specifications	
Model		NX-PG0112	NX-PG0122
Name		Pulse output unit	
Number of axes		1 axis	
I/O signals		External inputs: 2 general-purpose inputs External outputs: 3 (forward direction pulse, reverse direction pulse and a general-purpose outputs)	
Control method		Open-loop control through pulse train 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*1	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%)	
	Input current	4.6 mA (24 VDC)	
	ON voltage/ON current	15 VDC min./3 mA min.	
	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	PNP
External output specifications	Rated voltage	24 VDC (15 to 28.8 VDC)	
	Maximum load current	30 mA	
	ON/OFF response time	5 μs max./5 μs max.	
	Internal I/O common processing	NPN	PNP
	Residual voltage	1.0 V max.	
	Leakage current	0.1 mA	
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method		External inputs: Photocoupler isolation External outputs: Digital isolator	
Unit power consumption		0.8 W max.	0.9 W max.
I/O power supply source		Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	
Current consumption from I/O power supply		20 mA	
Current capacity of I/O power supply terminal		0.1 A max. per terminal	
Cable length		3 m max.	
I/O refreshing method		Synchronous I/O refreshing*2	
Terminal block type		Screwless push-in terminal 16 terminals (A + B)	
Dimensions (W x H x D)		12 × 100 × 71 mm	
Weight		70 g	
Failure detection		None	
Protection		None	

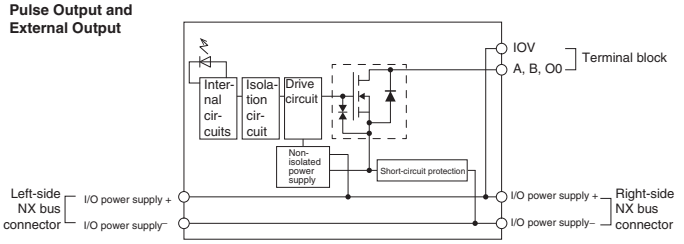
*1. These functions are supported when you also use the MC function module in the NJ-series CPU unit. Refer to the NJ-series CPU unit motion control user's manual (Cat.No. W507) for details. A pulse output unit only outputs pulses during the control period based on commands received at a fixed period. 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.

*2. The I/O refreshing method is automatically set according to the connected communication unit and CPU unit.

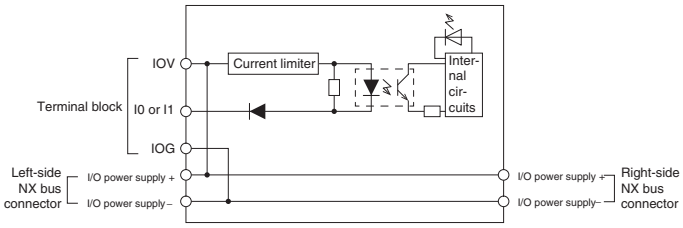
Circuit layout

NX-PG0112

Pulse Output and External Output

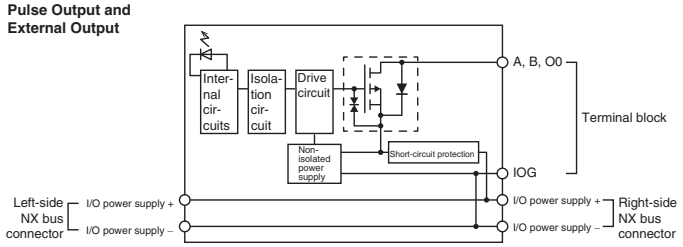


External Inputs

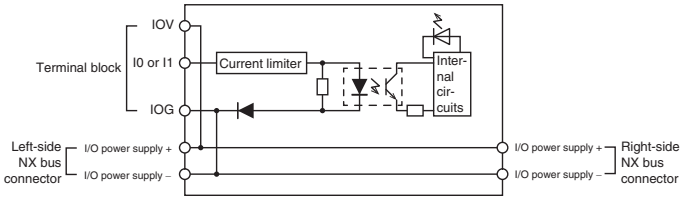


NX-PG0122

Pulse Output and External Output

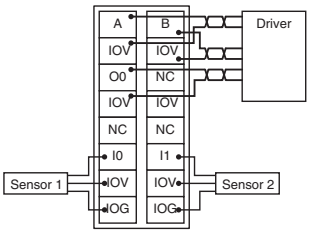


External Inputs

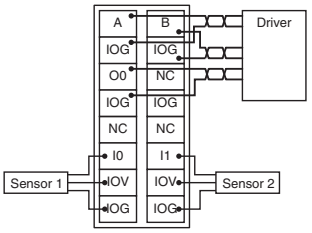


Terminal wiring

NX-PG0112



NX-PG0122



Communication interface unit

Item		Specifications		
Model		**NX-CIF101**	**NX-CIF210**	**NX-CIF105**
Name		Communication interface unit		
Communication ports		RS-232C		RS-422A/485
Number of ports		1	2	1
Communication specifications	**Communication method**	Full duplex		Half duplex for two-wire connection Full duplex for four-wire connection
	Signal lines[*1]	-		Two lines or four lines
	Baud rate [bps][*1]	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 or 230400		
	Data length [bits][*1]	7 or 8		
	Parity[*1]	Even, odd or none		
	Start bits [bits]	Always 1		
	Stop bits [bits][*1]	1 or 2		
	Flow control[*1]	None, RS/CS flow control or Xon/Xoff control		None or Xon/Xoff control
	Flow control target[*1]	Send/receive, send only or receive only		
	Initial RS signal value[*1*2]	ON or OFF		
	Number of characters to determine the end[*1*3]	0 to 10,000 (in increments of 0.1 character) 0: The end is not detected		
	Max. communication distance	15 m[*4]		1200 m[*5]
	Connection configuration	1:1		1:N (max. value of N is 32) You can change between two-wire and four-wire connections
PDO data size [bytes][*1]		Inputs or outputs: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76 or 80		
Transmission buffering enable/disable setting[*1]		Enabled or disabled		
Functions to back up data		Provided[*6]		
Terminating resistance setting		-		Possible
Isolation method		No-isolation		Power supply: Transformer and photocoupler Signals: Digital isolators
Unit power consumption		0.9 W max.		1.45 W max.
I/O refreshing method		Free-run refreshing		
Terminal block type		Screwless push-in terminal 16 terminals (A + B with FG)	D-Sub 9pin connector	Screwless push-in terminal 16 terminals (A + B with FG)
Dimensions (W x H x D)		12 × 100 × 71 mm	30 × 100 × 71 mm	12 × 100 × 71 mm
Weight		66 g max.	91 g max.	69 g max.

*1. Setting is possible in the unit operation settings of the Sysmac Studio software.
*2. This is the value of the RS signal when the port enters the operational state or immediately after the port is restarted. The initial value is disabled when RS/CS flow control is set. It is also disable for the NX-CIF105.
*3. This setting is provided for communication protocols that assume the end of the data if data is not received for a specific period of time. For example, if the number of characters to determine the end is set to 35, the end of the data will be assumed if data is not received for the time required to receive 3.5 characters.
*4. If the baud rate is set to higher than 19,200 bps, refer to the manual for the remote communications device.
*5. The maximum total cable length for multidrop connections is 1200 m.
*6. The settings that are backed up are saved in memory in the communication coupler unit, not in the communication interface unit.

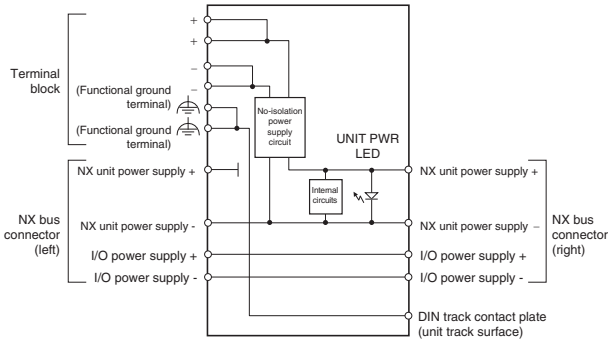
Power unit

NX bus power supply unit

Item	Specifications
Model	**NX-PD1000**
Name	NX bus power supply unit
Power supply voltage	24 VDC (20.4 to 28.8 VDC)
NX unit 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)
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method	No-isolation
Unit power consumption	0.45 W max.
I/O current consumption	No consumption
Terminal block type	Screwless push-in terminal 8 terminals (A + B with FG)
Dimensions (W x H x D)	12 × 100 × 71 mm
Weight	65 g max.

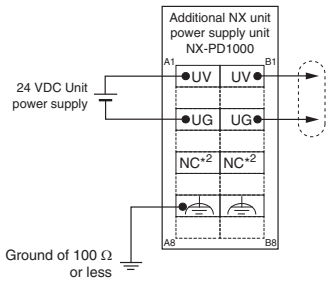
Circuit layout

NX-PD1000



Terminal wiring

NX-PD1000



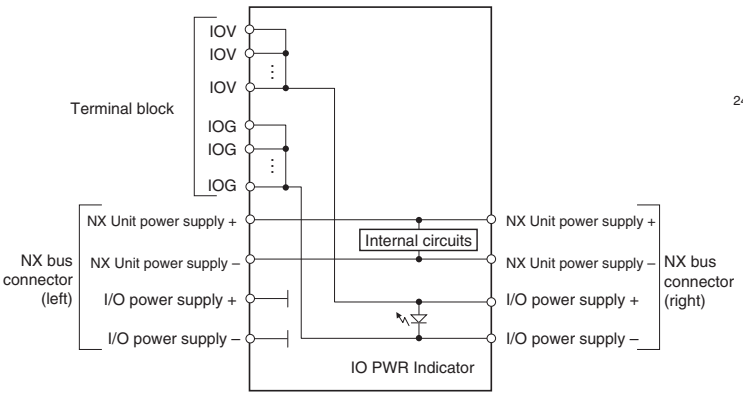
I/O power feed unit

Item	Specifications	
Model	**NX-PF0630**	**NX-PF0730**
Name	Additional I/O power supply unit	
Power supply voltage	5 to 24 VDC (4.5 to 28.8 VDC)*1	
I/O power supply maximum current	4 A	10 A
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	
Isolation method	No-isolation	
Unit power consumption	0.45 W max.	
I/O current consumption	10 mA max.	
Current capacity of I/O power supply terminal	4 A max.	10 A max.
Terminal block type	Screwless push-in terminal 8 terminals (A + B)	
Dimensions (W x H x D)	12 × 100 × 71 mm	
Weight	65 g max.	

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

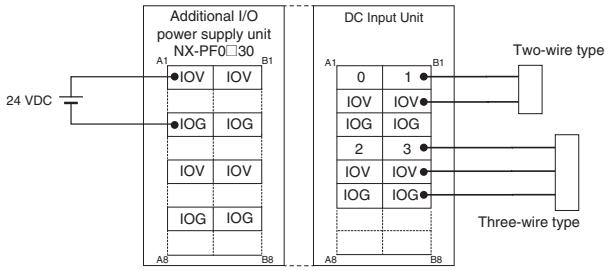
Circuit layout

NX-PF0630/PF0730



Terminal wiring

NX-PF0630/PF0730

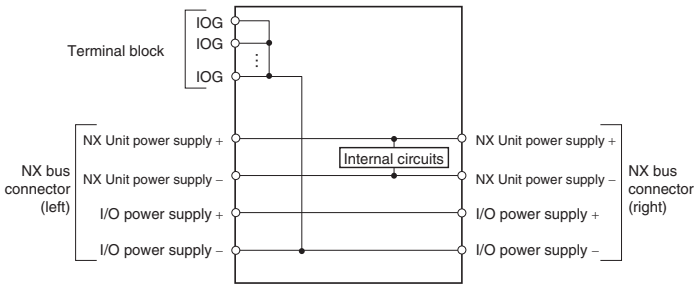


I/O power supply connection unit

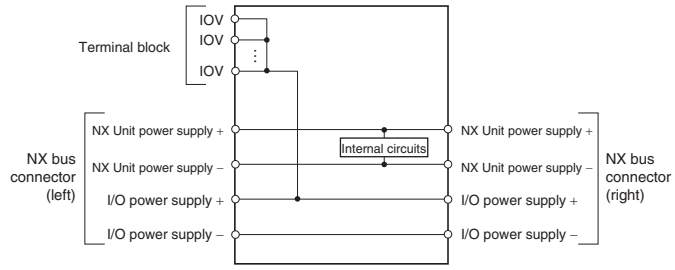
Item	Specifications		
Model	**NX-PC0010**	**NX-PC0020**	**NX-PC0030**
Name	I/O power supply connection unit		
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.		
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)		
Isolation method	No-isolation		
Unit power consumption	0.45 W max.		
I/O current consumption	No consumption		
Current capacity of I/O power supply terminal	4 A/terminal max.		
Terminal block type	Screwless push-in terminal 16 terminals (A + B)		
Number of I/O power supply terminals	IOG: 16 terminals	IOV: 16 terminals	IOG: 8 terminals IOV: 8 terminals
Dimensions (W x H x D)	12 × 100 × 71 mm		
Weight	65 g max.		

Circuit layout

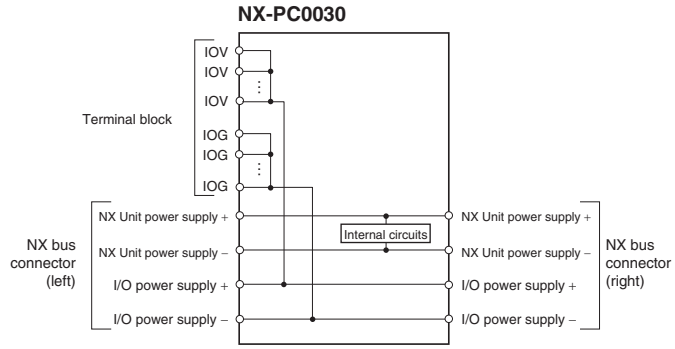
NX-PC0010



NX-PC0020

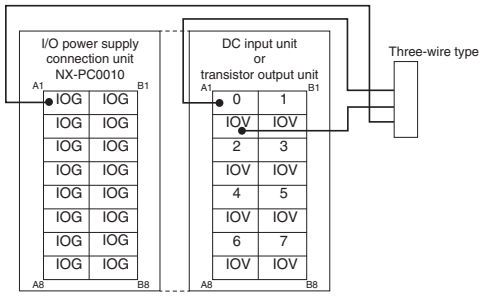


NX-PC0030

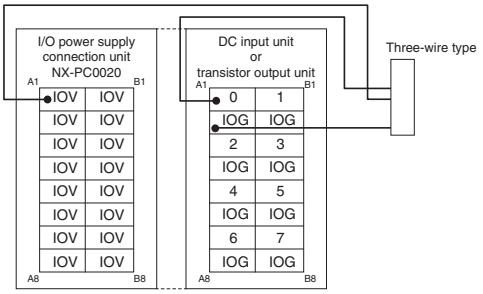


Terminal wiring

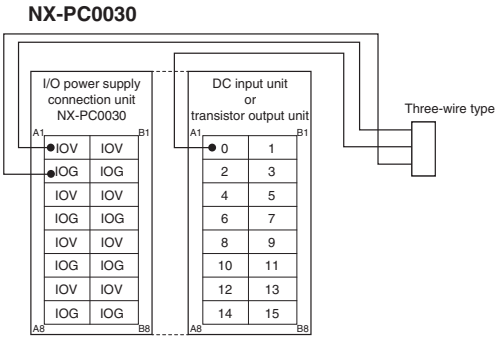
NX-PC0010



NX-PC0020



NX-PC0030



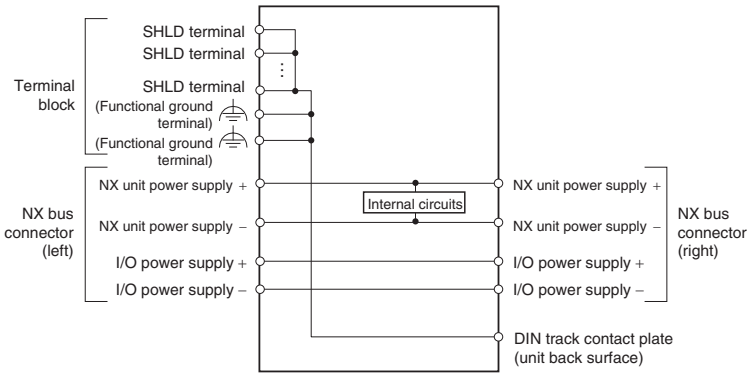
System unit

Shield connection unit (grounding terminal)

Item	Specifications
Model	**NX-TBX01**
Name	Shield connection unit
Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
Isolation method	Isolation between the SHLD functional ground terminal and internal circuit: no-isolation
Unit power consumption	0.45 W max.
I/O current consumption	No consumption
Terminal block type	Screwless push-in terminal 16 terminals (A + B with FG)
Number of shield terminals	14 terminals (the following two terminals are Functional Ground terminals)
Dimensions (W x H x D)	12 × 100 × 71 mm
Weight	65 g max.

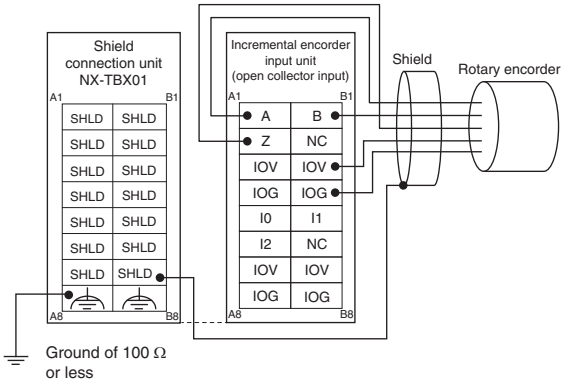
Circuit layout

NX-TBX01



Terminal wiring

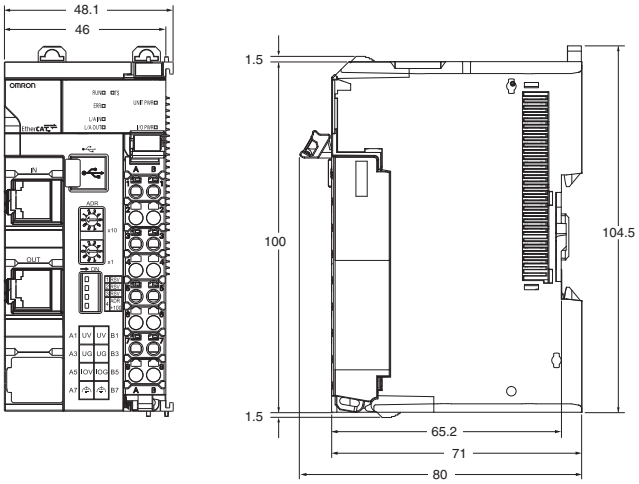
NX-TBX01



Dimensions

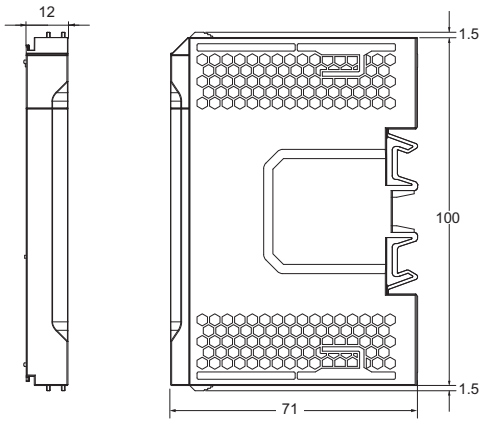
Communication coupler unit (EtherCAT / EtherNet/IP)

NX-ECC20□/EIC202



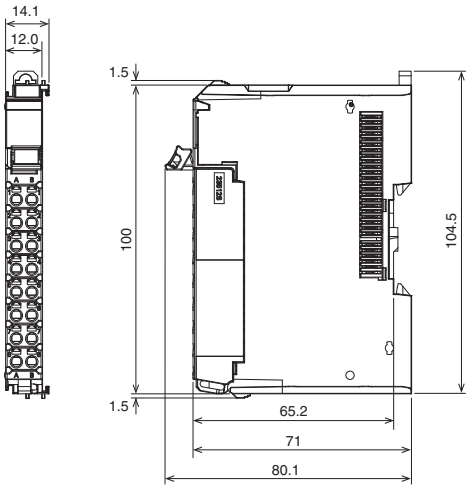
End cover unit

NX-END01

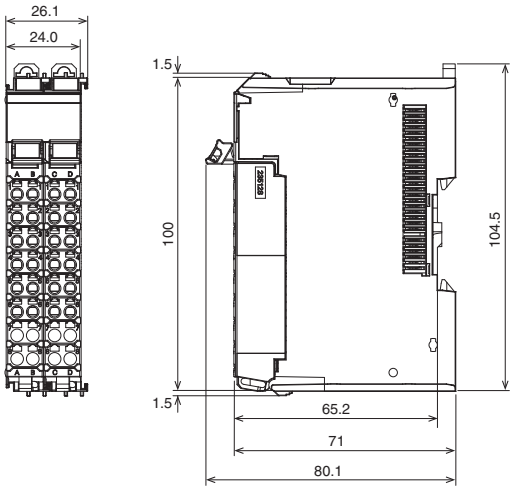


I/O unit with screwless push-in terminal

12 mm width

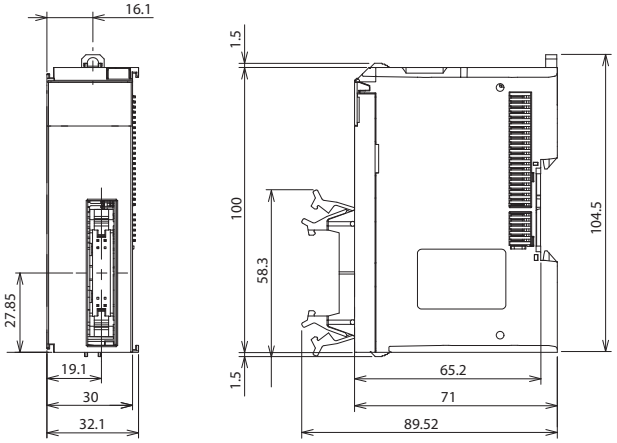


24 mm width

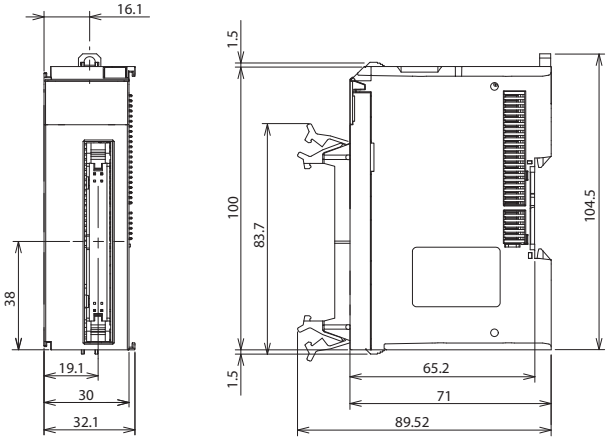


I/O unit with MIL connector

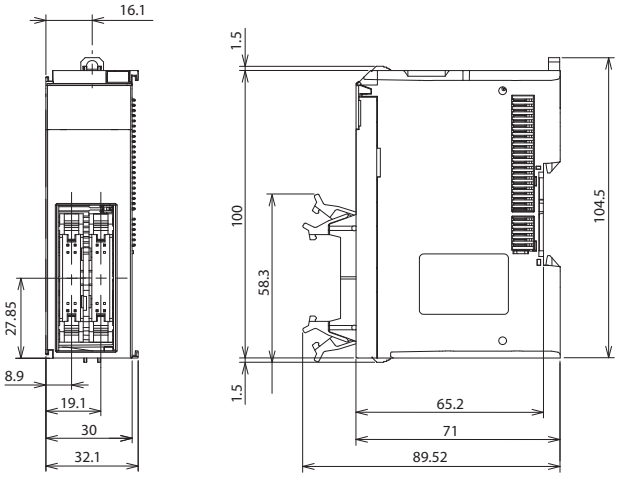
1 connector with 20 terminals



1 connector with 40 terminals

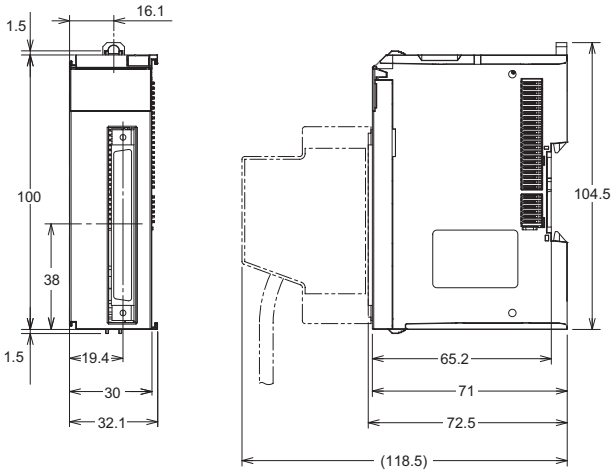


2 connectors with 20 terminals

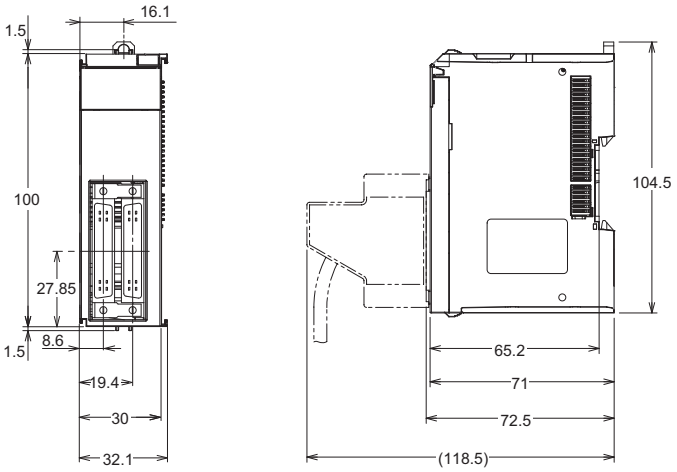


I/O unit with Fujitsu connector

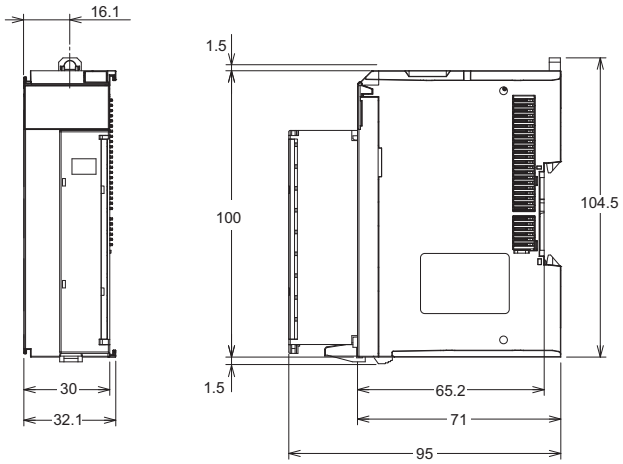
1 connector with 40 terminals



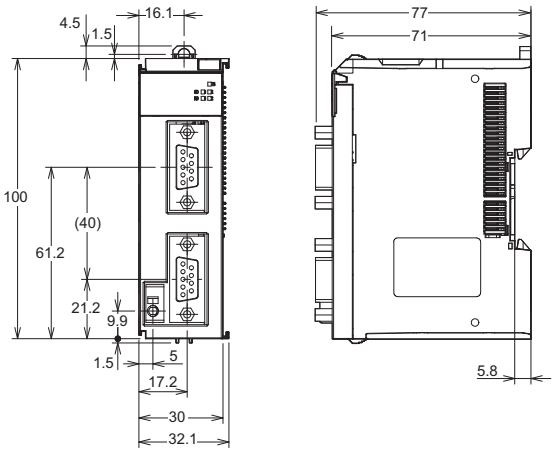
2 connectors with 24 terminals



I/O unit with M3 screw terminal block



I/O unit with D-Sub connector



Ordering information

Communication coupler unit

Type	Protocol	Communications cycle in DC mode*1	Specifications	Connection	I/O power supply	Width	Model
Communication coupler	EtherCAT slave	125 to 10,000 μs	Up to 63 I/O units Max. 1024 bytes in + 1024 bytes out Supports distributed clock	2 RJ45 ports (in + out)	10.0 A max.	46 mm	NX-ECC203
	EtherNet/IP slave		Up to 63 I/O units Max. 512 bytes in + 512 bytes out Supports local safety communication Free run I/O refresh mode only	2 RJ45 ports with built-in switch			NX-EIC202*2

*1. This depends on the specifications of the EtherCAT master and the unit configuration.
*2. The NX-EIC202 communication coupler unit does not support the NX-SL3500 safety controller unit.

I/O unit

Digital I/O

Type	Channels, signal type	Performance*1, I/O refresh method	Connection type*2	Width	Model	NPN type*3
DC digital input	4 inputs, 3-wire connection	High-speed synchronous time stamp	Screwless push-in (NX-TBA122)	12 mm	NX-ID3344	NX-ID3344
		High-speed synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ID3443	NX-ID3343
		Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ID3417	NX-ID3317
	8 inputs, 2-wire connection		Screwless push-in (NX-TBA162)	12 mm	NX-ID4442	NX-ID4342
	16 inputs, 1-wire connection		Screwless push-in (NX-TBA162)	12 mm	NX-ID5442	NX-ID5342
			M3 screw terminal block	30 mm	NX-ID5142-1	NX-ID5142-1
			1 x 20-pin MIL connector	30 mm	NX-ID5142-5	NX-ID5142-5
	32 inputs, 1-wire connection		1 x 40-pin MIL connector	30 mm	NX-ID6142-5	NX-ID6142-5
			1 x 40-pin Fujitsu connector	30 mm	NX-ID6142-6	NX-ID6142-6
AC digital input	4 inputs, 200-240 VAC, 50/60 Hz	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-IA3117	-
DC digital output	2 outputs 0.5 A, 3-wire connection	High-speed synchronous time stamp	Screwless push-in (NX-TBA082)	12 mm	NX-OD2258	NX-OD2154
	4 outputs 0.5 A, 3-wire connection	High-speed synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-OD3257	NX-OD3153
		Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-OD3256	NX-OD3121
	4 outputs 2 A, 3-wire connection		Screwless push-in (NX-TBA162)	12 mm	NX-OD3268	-
	8 outputs 0.5 A, 2-wire connection		Screwless push-in (NX-TBA162)	12 mm	NX-OD4256	NX-OD4121
	16 outputs 0.5 A, 1-wire connection		Screwless push-in (NX-TBA162)	12 mm	NX-OD5256	NX-OD5121
			M3 screw terminal block	30 mm	NX-OD5256-1	NX-OD5121-1
			1 x 20-pin MIL connector	30 mm	NX-OD5256-5	NX-OD5121-5
	32 outputs 0.5 A, 1-wire connection		1 x 40-pin MIL connector	30 mm	NX-OD6256-5	NX-OD6121-5
			1 x 40-pin Fujitsu connector	30 mm	-	NX-OD6121-6
Relay digital output	2 outputs, N.O., 2.0 A	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-OC2633	-
	2 outputs, N.O. + N.C., 2.0 A		Screwless push-in (NX-TBA082)	12 mm	NX-OC2733	-
DC Digital I/O	16 inputs + 16 outputs, 1-wire connection + common	Synchronous/free run	2 x 20-pin MIL connector	30 mm	NX-MD6256-5	NX-MD6121-5
			2 x 24-pin Fujitsu connector	30 mm	-	NX-MD6121-6

*1. Digital I/O performance, ON/OFF delay:
High speed PNP/NPN input: 100 ns/100 ns
Standard PNP/NPN input: 0.02 ms/0.4 ms
AC input: 10 ms/40 ms
High speed PNP/NPN output: 300 ns/300 ns
Standard PNP output: 0.5 ms/1.0 ms
Standard NPN output: 0.1 ms/0.8 ms
Relay output: 15 ms/15 ms
*2. Units with Screwless push-in connections are supplied with the appropriate terminal connector. Units with MIL connectors are supplied without matching plugs.
*3. Model codes are for PNP type signals (positive switching, 0 V common). Most models are also available as NPN type (negative switching, 24 V common). Inputs of MIL connector versions can be used as NPN or PNP.

Analog I/O

Type	Signal type	Performance, I/O refresh method	Channels	Connection type*1	Width	Model
Analog input	4 to 20 mA single ended	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2203
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3203
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4203
	4 to 20 mA differential	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2204
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3204
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4204
		1/30,000 resolution, 10 μs/channel Synchronous/free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2208
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3208
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4208
	±10 V single ended	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2603
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3603
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4603
	±10 V differential	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2604
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3604
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4604
		1/30,000 resolution, 10 μs/channel Synchronous/free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2608
			4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3608
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4608

Type	Signal type	Performance, I/O refresh method	Channels	Connection type*1	Width	Model
Analog output	4 to 20 mA	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2203
			4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3203
		1/30,000 resolution, 10 μs/channel Synchronous/free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2205
			4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3205
	±10 V	1/8,000 resolution, 250 μs/channel Free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2603
			4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3603
		1/30,000 resolution, 10 μs/channel Synchronous/free run	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2605
			4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3605

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector.

Temperature input

Type	Signal type	Performance, I/O refresh method	Channels	Connection type*1	Width	Model
Temperature sensor input	Thermocouple type B/E/J/K/L/N/R/S/T/U/ WRe5-26/PLII	0.1°C resolution, 200 ms/unit Free run	2	Screwless push-in terminal block(s), with cold junction sensor, calibrated individually at the factory	12 mm	NX-TS2101
			4		24 mm	NX-TS3101
		0.01°C resolution, 10 ms/unit Free run	2		12 mm	NX-TS2102
			4		24 mm	NX-TS3102
		0.001°C resolution, 60 ms/unit Free run	2		12 mm	NX-TS2104
			4		24 mm	NX-TS3104
	RTD type Pt100 (3wire)/Pt1000/ Ni508.4	0.1°C resolution, 200 ms/unit Free run	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2201
			4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3201
		0.01°C resolution, 10 ms/unit Free run	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2202
			4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3202
		0.001°C resolution, 60 ms/unit Free run	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2204
			4	Screwless push-in (NX-TBA162 + NX-TBB162)	24 mm	NX-TS3204

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector. Units with MIL connectors are supplied without matching plugs.

Position interface

Type	Channels, signal type	Performance, I/O refresh method	Connection type*1	Width	Model	NPN type*2
Encoder input	1 SSI encoder, 2 MHz	Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS112	-
	2 SSI encoders, 2 MHz		Screwless push-in (NX-TBA122)	12 mm	NX-ECS212	-
	1 incremental encoder line driver 4 MHz + 3 digital inputs (1 μs)		Screwless push-in (NX-TBA122 + NX-TBB122)	24 mm	NX-EC0142	NX-EC0132
	1 incremental encoder open collector 500 kHz + 3 digital inputs (1 μs)		Screwless push-in (NX-TBA162)	12 mm	NX-EC0122	NX-EC0112
	2 incremental encoders open collector 500 kHz		Screwless push-in (NX-TBA122)	12 mm	NX-EC0222	NX-EC0212
Pulse output	1 Pulse up/down or pulse/direction open collector 500 kHz + 2 digital inputs + 1 digital output (1 μs)	Synchronous	Screwless push-in (NX-TBA162)	12 mm	NX-PG0122	NX-PG0112

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector. Units with MIL connectors are supplied without matching plugs.
*2. Model codes are for PNP type signals (positive switching, 0 V common). Most models are also available as NPN type (negative switching, 24 V common). Inputs of MIL connector versions can be used as NPN or PNP.

Safety unit

Type	Specifications	Performance, I/O refresh method	Connection type*1	Width	Model
Safety controller	FSoE protocol	For up to 1,024 safety I/O points	128 safety connections	30 mm	NX-SL3500
		For up to 256 safety I/O points	32 safety connections	30 mm	NX-SL3300
Safety input	4 inputs + 2 test outputs	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-SIH400
	8 inputs + 2 test outputs		Screwless push-in (NX-TBA162)	12 mm	NX-SID800
Safety output	2 outputs, 2.0 A		Screwless push-in (NX-TBA082)	12 mm	NX-SOH200
	4 outputs, 0.5 A		Screwless push-in (NX-TBA082)	12 mm	NX-SOD400

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector.

Note: For more detailed information about safety units, refer to “NX integrated safety datasheet (I183E-EN)” and “NX safety standalone datasheet (I185E-EN)”.

Communication interface unit

Type	Serial interface	No. of serial ports	Connection type*1	Width	Model
Communication interface	RS-232C	1	Screwless push-in (NX-TBC162)	12 mm	NX-CIF101
		2	D-Sub 9pin connector	30 mm	NX-CIF210
	RS-422A/485	1	Screwless push-in (NX-TBC162)	12 mm	NX-CIF105

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector.

Power/System unit

Type	Description	Connection type[*1]	Width	Model
NX bus power supply unit	24 VDC input, non-isolated	Screwless push-in (NX-TBC082)	12 mm	NX-PD1000
I/O power feed unit	For separation of groups, up to 4 A	Screwless push-in (NX-TBA082)	12 mm	NX-PF0630
	For separation of groups, up to 10 A	Screwless push-in (NX-TBA082)	12 mm	NX-PF0730
I/O power supply connection unit	16 × IOV	Screwless push-in (NX-TBA162)	12 mm	NX-PC0020
	16 × IOG	Screwless push-in (NX-TBA162)	12 mm	NX-PC0010
	8 × IOV + 8 × IOG	Screwless push-in (NX-TBA162)	12 mm	NX-PC0030
Shield connection unit	Grounding terminal, 16 points	Screwless push-in (NX-TBC162)	12 mm	NX-TBX01

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector.

Accessories

Type	Description	Connection type	Width	Model
End cover	Included with communication coupler	-	12 mm	NX-END01
Terminal block (replacement front connector)	With 8 wiring terminals (A + B)	Screwless push-in	12 mm	NX-TBA082
	With 8 wiring terminals (A + B with FG)		12 mm	NX-TBC082
	With 12 wiring terminals (A + B)		12 mm	NX-TBA122
	With 12 wiring terminals (C + D)		12 mm	NX-TBB122
	With 16 wiring terminals (A + B)		12 mm	NX-TBA162
	With 16 wiring terminals (C + D)		12 mm	NX-TBB162
	With 16 wiring terminals (A + B with FG)		12 mm	NX-TBC162
DIN rail insulation spacers	Set of 3 pcs	-	-	NX-AUX01
Terminal block coding pins	For 10 units (Terminal block: 30 pins, unit: 30 pins)	-	-	NX-AUX02
End plate	To secure the units on the DIN track	-	-	PFP-M

Machine controller

Name		Model
NX7 series (firmware version 1.10 or higher)	CPU unit	NX701-□
	Power supply unit	NX-PA9001 (220 VDC)
		NX-PD7001 (24 VDC)
NJ series (firmware version 1.07 or higher[*1])	CPU unit	NJ501-□
		NJ301-□
		NJ101-□
	Power supply unit	NJ-PA3001 (220 VDC)
		NJ-PD3001 (24 VDC)

*1. Please contact your OMRON representative for compatibility between the NJ-series firmware version 1.06 or lower and NX I/O units.

Computer software

Specifications	Model
Sysmac Studio version 1.13 or higher[*1]	SYSMAC-SE2□□□

*1. Please contact your OMRON representative for compatibility between the Sysmac Studio version 1.12 or lower and NX I/O units.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat.No. I182E-EN-02

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