# 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, various performance levels in analog I/O, 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 <sup>2</sup> , 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 <sup>2</sup> , 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-Tick3, KC: KC registration				

#### EtherCAT / EtherNet/IP communication specifications

Item	EtherCAT	EtherNet/IP					
Physical layer	100BASE-TX (IEEE 802.3)						
Modulation	Baseband						
Link speed	100 Mbps						
Topology	Topology Depends on the specifications of the EtherCAT Line, Tree, Star master						
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						
А	NX bus connector	This connector is used to connect each unit.						
В	Indicators	The indicators show the current operating status of the unit.						
С	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 ad- dress. 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-ECC202						
Number of connectable	NX units	63 units max.*1						
Communications proto	col	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/Output: 256 bytes						
Mailbox		Emergency messages, SDO requests and SDO information						
Node address setting ra	ange	1 to 192 <sup>*2</sup>						
I/O jitter performance		Inputs/Outputs: 1 µs max.						
Communications cycle		250 to 4,000 μs <sup>*3*4</sup>						
Refreshing methods		Free-run refreshing / I/O-synchronized refreshing / Time Stamp 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) <sup>*5</sup>						
	Maximum I/O current	10 A						
	Terminal current capacity	10 A max.						
Unit power consumptio	n	1.45 W max.						
Current consumption fr	om 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 M $\Omega$ min. (between isolated circuits)						
External connection ter	minals	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: <ul> <li>Physical layer: USB 2.0-compliant, B-type connector</li> <li>Transmission distance: 5 m max.</li> </ul>						
Terminal block type		Screwless push-in terminal 8 terminals (A + B with FG)						
Dimensions (W x H x D)		46 × 100 × 71						
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. This specification applies to a connection to the built-in EtherCAT port on an NJ-series CPU unit.
\*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 NJ-series CPU unit: 500 µs, 1,000 µs, 2,000 µs and 4,000 µs. Refer to the NJ-series CPU unit built-in EtherCAT port user's manual (Cat.No. W505) for the most recent specifications.

\*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.



**Terminal wiring** 

Through-wiring

for unwired terminals.

#### EtherNet/IP communication coupler unit

Item		Specifications						
Model		NX-EIC202						
Number of connectable	NX units	63 units max."						
Communications proto	col	EtherNet/IP protocol						
Number of connections		8						
Received packet interva	al (RPI, refresh cycle)	4 to 1,000 ms						
Allowed communication	ns 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 connect	ion 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) <sup>*2</sup>						
	Maximum I/O current	10 A						
	Terminal current capacity	10 A max.						
Unit power consumptio	n	1.60 W max.						
Current consumption fr	om 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 M $\Omega$ min. (between isolated circuits)						
External connection ter	minals	Connector for EtherNet/IP communications: <ul> <li>RJ45 × 2 (shielded)</li> </ul>						
		Screwless push-in terminal (8 terminals) For power supply unit, I/O power supply and grounding. Removable.						
		<ul> <li>Peripheral USB port for Sysmac Studio connection:</li> <li>Physical layer: USB 2.0-compliant, B-type connector</li> <li>Transmission distance: 5 m max.</li> </ul>						
Terminal block type		Screwless push-in terminal 8 terminals (A + B with FG)						
Dimensions (W x H x D)	· · · · · · · · · · · · · · · · · · ·	46 × 100 × 71						
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.



#### Terminal wiring



### 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	input voltage 12 to 24 VDC 24 VDC (9 to 28.8 VDC) (15 to 28.8 VDC)				12 to 24 VDC (9 to 28.8 VDC)			
Input current <sup>*1</sup>	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	us max.		100 ns max.	20 µs max./400 µ	us max.		100 ns max.
Input filter time	Default setting: 1	ms <sup>*2</sup>		Default setting: 8 μs <sup>*3</sup>	Default setting: 1	ms <sup>*2</sup>		Default setting: 8 μs <sup>*3</sup>
Dielectric strength	510 VAC betwee	en isolated circuits	s for 1 minute at a	leakage current	of 5 mA max.			
Insulation resistance	20 MΩ min. betv	veen isolated circ	uits (at 100 VDC)					
Isolation method	Photocoupler iso	lation		Digital isolator	Photocoupler iso		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	0.1 A/terminal m	ax.	Without I/O	0.1 A/terminal	0.1 A/terminal m	ax.	Without I/O	0.1 A/terminal
power supply terminal			power supply terminals	max.			power supply terminals	max.
I/O refreshing method	Switching synch	ronous I/O refrest	ning 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)	ScrewlessScrewlesspush-in terminalpush-in terminal12 terminals16 terminals(A + B)(A + B)		Screwless push-in terminal 16 terminals (A + B)	Screwless push-in terminal 12 terminals (A + B)
Dimensions (W x H x D)	$12 \times 100 \times 71$							
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.



#### Terminal wiring











#### Terminal wiring

NX-ID5342

	Additio power su	nal I/O upply unit	Τ	I/O pow connec	er supply tion unit	1	I/O powe connect	er supply tion unit	Τ	Γ	DC inp NX-IE	ut unit 05342		
	A1	В	1	A1	B1	A1		B	31	A	1	E	31	Two-wire sensor
	●IOV	IOV		IOV	IOV	١ſ	IOG	IOG 🖕			INO	IN1 🖝	⊨	
				IOV	IOV	١٢	IOG	IOG			IN2	IN3		
- Чн	●IOG	IOG		IOV	IOV	١ſ	IOG	IOG			IN4	IN5		Three-wire sensor
24 VDC				IOV	IOV 🖕	Ш	IOG	IOG			IN6	IN7	Ц	
	IOV	IOV		IOV	IOV	۱ŀ	IOG	IOG			IN8	IN9 🖝	H	
				IOV	IOV	11	IOG	IOG 🖕	Ц.	1	IN10	IN11	Ц	
	IOG	IOG		IOV	IOV	١٢	IOG	IOG			IN12	IN13		
				IOV	IOV	11	IOG	IOG			IN14	IN15		
	AB	B	8	A8	B8	BAB		E	88	A	ŝ	E	38	





NX-ID4442

								_						
	Additional I/O power supply unit		I I/O power supply connection unit					DC input unit NX-ID4442			Two-wire			
Α	1	в	B1	A	1	F	31	k	41			B1	sensor	
	●IOV	IOV	v	ſ	IOG	IOG	11		Ĩ	IN0	IN1 🖝	ŀ		Three
					IOG	IOG	11		ſ	IOV0	IOV1 •	+		sens
	•IOG	IOG	G		IOG	IOG	11		ſ	IN2	IN3 🖝	+		
					IOG	IOG	11		ſ	IOV2	IOV3 🗣	╞		-
	IOV	IOV	v		IOG	IOG	1	4	1	IN4	IN5			
					IOG	IOG	11		ſ	IOV4	IOV5	1		
	IOG	IOG	G		IOG	IOG	11		ſ	IN6	IN7	1		
					IOG	IOG	11		ľ	IOV6	IOV7	1		
A	8	E	B8	A	8	E	38	ł	48			<b>B</b> 8		

	NX-II	05442	2											
	Additional I/O power supply unit			I/O power supply connection unit			I/O power supply connection unit			T	DC input unit NX-ID5442			
	A1 IOV	B1		A1 IOV	B IOV	14	1 IOG	IOG	31	A	1 IN0	IN1 🖝	31	Two-wire sensor
				IOV	IOV	l	IOG	IOG			IN2	IN3		
- Чн	●10G	IOG		IOV	IOV	l	IOG	IOG			IN4	IN5		Three-wire sensor
24 VDC				IOV	IOV 🖕	+	IOG	IOG	4	+	IN6	IN7	_	$-\Box$
	IOV	IOV		IOV	IOV		IOG	IOG			IN8	IN9 🗣	-	
				IOV	IOV		IOG	IOG 🖕	$\parallel$	+	IN10	IN11		
	IOG	IOG		IOV	IOV		IOG	IOG			IN12	IN13		
				IOV	IOV		IOG	IOG			IN14	IN15		
	A8	B8		A8	B	3/4	18	E	88	_ A	8		38	

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

Item	Specifications							
Model	NX-ID3344	NX-ID3444						
Name	DC input unit							
Internal I/O common	PN PNP							
Capacity	4 points	4 points						
Rated input voltage	24 VDC (15 to 28.8 VDC)							
Input current <sup>*1</sup>	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	0.1 A/terminal max.							
power supply terminal								
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 × /1							
Weight	65 g max.							
Disconnection/ short-circuit detection	Not supported							
Protective function	Not supported							

\*1. Typical rated current at 24 VDC.

#### **Circuit layout**



NX-ID3444



#### Terminal wiring



#### 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 <sup>*1</sup>	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	·						
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**





#### **Terminal wiring**

#### NX-ID5142-5

		Signal	Conn	ector	Signal
	24 VDC	name	pi	n	name
	1-1-3	NC	1	2	NC
		COM	3	4	COM
		IN15	5	6	IN07
		IN14	7	8	
		IN13	9	10	IN05
		IN12	11	12	IN04
		IN11	13	14	
		IN10	15	16	
		IN09	17	18	
1		IN08	19	20	INOO

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

							1
	Γ	Signal	Conne	ector	Signal	1	
	24 VDC	name	pii	n	name		
	etter l	NC	1	2	NC		
		COM1	3	4	COM1		
]		IN31	5	6	IN23		
		IN30	7	8	IN22		[
		IN29	9	10	IN21		
		IN28	11	12	IN20		[
		IN27	13	14	IN19		
		IN26	15	16	IN18		
		IN25	17	18	IN17		[
		IN24	19	20	IN16		24 VDC
		NC	21	22	NC		- e4-3.
		COM0	23	24	COM0		أسألبا
		IN15	25	26	IN07	6	. T " T
		IN14	27	28	IN06	~	
		IN13	29	30	IN05	<u> </u>	
		IN12	31	32	IN04	<u> </u>	
		IN11	33	34	IN03	<u> </u>	
		IN10	35	36	IN02		
		IN09	37	38	IN01		
		IN08	39	40	IN00		
					-		

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.

8

#### 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 <sup>-1</sup>
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 M $\Omega$ min. (at 500 VDC) Between the external terminals and functional ground terminal: 20 M $\Omega$ min. (at 500 VDC) Between the external terminals and internal circuits: 20 M $\Omega$ min. (at 500 VDC) Between the internal circuit and the functional ground terminal: 20 M $\Omega$ 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
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**



#### 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-OD3257	
Name	Transistor output	t 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 voltage	12 to 24 VDC			24 VDC	24 VDC				
Operating load voltage	10.2 to 28.8 VD0			15 to 28.8 VDC					
Maximum value of load	0.5 A/point, 0.5 A/point, 4 A/NX unit 2 A/NX unit		0.5 A/point, 2 A/NX unit	0.5 A/point, 0.5 A/point, 4 A/NX unit			0.5 A/point, 2 A/NX unit		
Maximum inrush current	4.0 A/point. 10 m	is max.						_ / f / f / f / f / f / f / f / f / f /	
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 betwee	10 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 isc	lation		Digital isolator	Photocoupler iso	olation		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.	
I/O power supply method	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.	40 mA max.	
Current capacity of I/O power supply terminal	0.5 A/terminal m	ax.	Without I/O power supply terminals	0.5 A/terminal max.	0.5 A/terminal m	ax.	Without I/O power supply terminals	0.5 A/terminal max.	
I/O refreshing method	Switching synch	ronous I/O refrest	ning 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)	$12 \times 100 \times 71$								
Weight	70 g max.								
Disconnection/ short-circuit detection	Not supported								
Protective function	Not supported				With load short-o	circuit protection			

#### Circuit layout



#### NX-OD3153



This unit uses a push-pull output circuit.

#### NX-OD4121



Terminal wiring









#### **Terminal wiring**

#### NX-OD5121

	A -1 -172 -		<b>-</b>			Т	1/0		-		Transfel				
	power supply unit			connection unit			connect	ion unit			i ransisti ur				
	A1 B1			11	B1		A1 B1		A1 NX-OE		D5121 B1	Two-wire t		type	
	● IOV	IOV		IOV	IOV	1	IOG	IOG		_	OUT0	OUT1			
				IOV	IOV		IOG	IOG			OUT2	OUT3			
-Чн	●IOG	IOG		IOV	IOV		IOG	IOG			OUT4	OUT5	'		
24 VDC				IOV	IOV		IOG	IOG			OUT6	OUT7			
	IOV	IOV		IOV	IOV		IOG	IOG			OUT8	OUT9	Three	-wire	type
				IOV	IOV		IOG	IOG			OUT10	OUT11			
	IOG	IOG		IOV	IOV		IOG	IOG			OUT12	OUT13			
				IOV	IOV		IOG	IOG			OUT14	OUT15			
	A8	B8	L_lé	18	В	84	18	В	8	A	8	B8	I '		







l	NX-O	D525	56													
	Additio power si	nal I/O .pply unit	Γ		I/O powe connect	er supply tion unit		I/O pow connec	er supply	T		Transiste ur NX-OI	or output nit D5256			
	A <u>1</u>	B	1	A	1	В	1	A <u>1</u>		31	Α	1	B1	Iwo	-wire t	type
	• IOV	IOV			IOV	IOV		IOG	IOG			OUT0	OUT1			
					IOV	IOV		IOG	IOG			OUT2	OUT3			
Ч—	●IOG	IOG			IOV	IOV		IOG	IOG			OUT4	OUT5			
24 VDC					IOV	IOV		IOG	IOG			OUT6	OUT7			
	IOV	IOV			IOV	IOV		IOG	IOG			OUT8	OUT9	Three	-wire	type
					IOV	IOV		IOG	IOG			OUT10	OUT11			
	IOG	IOG			IOV	IOV	Ι	IOG	IOG	Τ	Т	OUT12	OUT13			
					IOV	IOV		IOG	IOG			OUT14	OUT15			
	A8	B	8	A	3	B	8	48	É	88	_A;	6	- És			

### 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	4 VDC								
Operating load voltage	15 to 28.8 VDC								
Maximum value of load current	.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	10 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)	$12 \times 100 \times 71$								
Weight	70 g max.								
Disconnection/ short-circuit detection	Not supported								
Protective function	Not supported	With load short-circuit protection							

#### **Circuit layout**



This unit uses a push-pull output circuit.

#### NX-OD2258



#### Terminal wiring









#### 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.	I.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 circuit	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.						
Insulation resistance	20 M $\Omega$ 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 termina	ıls						
I/O refreshing method	Switching synchronous I/O refres	hing and free-run refreshing						
Terminal block type	MIL connector 20 terminals		MIL connector 40 terminals					
Dimensions (W x H x D)	$30 \times 100 \times 71$							
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**







#### Terminal wiring

#### NX-OD5121-5

	Signal	Conne	ctor	Signal	
12 to	name	pin		name	
24 VDC	+V	1 2		+V	
	COM	3	4	COM	
	OUT15	5	6	OUT07	
	OUT14	7	8	OUT06	
	OUT13	9	10	OUT05	
	OUT12	11	12	OUT04	
	OUT11	13	14	OUT03	
	OUT10	15	16	OUT02	
	OUT09	17	18	OUT01	
	OUT08	19	20	OUT00	

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

### NX-OD5256-5

l l	Signal	Conn	ector	Signal	]
	name	pi	in	name	
24 VDC	COM (+V)	1	2	COM (+V)	
	0V	3	4	ov	
	OUT15	5	6	OUT07	
	OUT14	7	8	OUT06	
	OUT13	9	10	OUT05	
	OUT12	11	12	OUT04	
	OUT11	13	14	OUT03	
	OUT10	15	16	OUT02	
	OUT09	17	18	OUT01	
	OUT08	19	20	OUT00	

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

# **Circuit layout**



#### NX-OD6256-5



#### **Terminal wiring**

#### NX-OD6121-5

	Signal	Conn	ector	Signal	
	name	pi	n	name	
	+V1	1	2	+V1	
I	COM1	3	4	COM1	T
	OUT31	5	6	OUT23	
	OUT30	7	8	OUT22	
	OUT29	9	10	OUT21	
	OUT28	11	12	OUT20	
	OUT27	13	14	OUT19	
I H	OUT26	15	16	OUT18	H I
IH	OUT25	17	18	OUT17	
	OUT24	19	20	OUT16	
	+V0	21	22	+V0	
	COM0	23	24	COM0	
	OUT15	25	26	OUT07	
I HH	OUT14	27	28	OUT06	HH I
IH	OUT13	29	30	OUT05	
I	OUT12	31	32	OUT04	
I H	OUT11	33	34	OUT03	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>
	OUT10	35	36	OUT02	
	OUT09	37	38	OUT01	
	OUT08	39	40	OUT00	
			-	1	

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

Signal Connector         Signal name pin name           OW1 (+V)         1         2         COM1 (+V)           OV1 3         4         OV1           U         3         4         OV1           U         0/13         5         6         OUT23           L         OUT30         5         6         OUT21         L           U         OUT28         11         12         OUT20         L           U         OUT28         11         12         OUT20         L           U         OUT28         11         12         OUT20         L           U         OUT28         11         12         OUT19         L           U         OUT27         13         14         OUT19         L           U         OUT24         19         20         OUT16         L           U         OUT14         27         28         OUT07         L           U         OUT13         25         26         OUT07         L           U         OUT13         33         QUT06         L         L           U         OUT13         33         QUT04         L	Г						
name         pin         name           COM1 (+V)         1         2         COM1 (+V)           0V1         3         4         0V1           0V1         3         4         0V1           0V13         5         6         OUT23         L           0U730         7         8         OUT22         L           L         OUT30         7         8         OUT21         L           L         OUT29         9         10         OUT21         L           L         OUT29         11         12         OUT20         L           L         OUT26         15         16         OUT18         L           OUT24         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)         0V         23         24         0V           0UT14         25         26         OUT07         L         OUT04         L         OUT04         L           U         OUT13         29         30         OUT05         L         OUT04         L           U         OUT13         35         6         OUT04         L <td></td> <td></td> <td>Signal</td> <td>Conn</td> <td>ector</td> <td>Signal</td> <td></td>			Signal	Conn	ector	Signal	
COM1 (+V)         1         2         COM1 (+V)           0V1         3         4         0V1           0V13         5         6         OUT23           L         OUT31         5         6         OUT23           L         OUT30         7         8         OUT22           L         OUT29         9         10         OUT21           L         OUT28         11         12         OUT20           L         OUT26         15         16         OUT19         L           L         OUT26         15         16         OUT18         L           OUT26         15         16         OUT17         L           OUT27         19         20         OUT16         L           L         OUT24         19         20         OUT16         L           L         OUT21         22         COM0 (+V)         10         23         24         0V0			name	pi	in	name	
0V1         3         4         0V1           0UT31         5         6         0UT23         L           0UT30         7         8         0UT22         L           L         0UT29         9         10         0UT21         L           L         0UT28         11         12         0UT20         L           L         0UT28         11         12         0UT20         L           L         0UT27         13         14         0UT19         L           L         0UT27         15         16         0UT18         L           L         0UT25         17         18         0UT17         L           OUT24         19         20         0UT16         L           COM0 (+V)         21         22         COM0 (+V)         U           0V115         25         26         0UT07         L           U         0UT13         29         30         0UT05         L           L         0UT13         29         30         0UT05         L           L         0UT13         33         40         0UT04         L           L			COM1 (+V)	1	2	COM1 (+V)	
OUT31         5         6         OUT23         L           OUT30         7         8         OUT22         L           L         OUT30         7         8         OUT22         L           L         OUT29         9         10         OUT21         L           L         OUT28         11         12         OUT20         L           L         OUT27         13         14         OUT19         L           L         OUT27         15         16         OUT16         L           L         OUT25         17         18         OUT17         L           OUT24         19         20         OUT16         L           OV0         23         24         0V0         U           OU015         25         26         OUT06         L           OUT13         29         00         OUT05         L           L         OUT12         31         32         OUT04         L           L         OUT10         35         36         OUT04         L           L         OUT10         37         38         OUT01         L           L </td <td></td> <td></td> <td>0V1</td> <td>3</td> <td>4</td> <td>0V1</td> <td></td>			0V1	3	4	0V1	
OUT30         7         8         OUT22         L           UOT29         9         10         OUT21         L           UOT28         11         12         OUT20         L           UOT26         15         16         OUT18         L           OUT26         15         16         OUT17         L           UOT26         15         16         OUT17         L           UOT26         15         16         OUT17         L           UOT26         15         20         OUT16         L           UOT27         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)         0           0V15         25         26         OUT07         L           UOT113         29         30         OUT06         L           UOT113         29         30         OUT04         L           UOT10         35         36         OUT02         L           UOT10         37         38         OUT01         L           UOT08         39         40         OUT00         L	I		OUT31	5	6	OUT23	
OUT29         9         10         OUT21         L           L         OUT28         11         12         OUT20         L           L         OUT27         13         14         OUT19         L           L         OUT26         15         16         OUT18         L           L         OUT25         17         18         OUT17         L           OUT24         19         20         OUT16         L           L         OUT24         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)         0         23         24         0V0           0UT15         25         26         OUT07         L         OUT14         L         OUT06         L           L         OUT13         29         30         OUT06         L         L         OUT04         L           L         OUT13         29         30         OUT04         L         OUT04         L           L         OUT13         33         40         OUT04         L         L         OUT03         L           L         OUT03         37         38 <td>I</td> <td>규는</td> <td>OUT30</td> <td>7</td> <td>8</td> <td>OUT22</td> <td></td>	I	규는	OUT30	7	8	OUT22	
OUT28         11         12         OUT20         L           L         OUT27         13         14         OUT19         L           L         OUT21         13         14         OUT19         L           L         OUT26         15         16         OUT18         L           OUT24         19         20         OUT16         L           OW0 (*V)         12         22         COM0 (*V)         COM0 (*V)           OUT15         25         26         OUT06         L           L         OUT14         27         28         OUT06         L           L         OUT13         25         26         OUT05         L           L         OUT13         31         32         OUT04         L           L         OUT11         33         34         OUT03         L           L         OUT10         53         6         OUT04         L           L         OUT08         39         40         OUT00         L	Ι		OUT29	9	10	OUT21	
OUT27         13         14         OUT19         L           QUT26         15         16         OUT18         L           QUT25         17         18         OUT17         L           QUT24         19         20         OUT16         L           QUT24         19         20         OUT16         L           QUT24         19         20         OUT6         L           QUT25         27         28         OUT07         L           QUT14         27         28         OUT06         L           QUT13         29         30         OUT05         L           QUT13         21         32         QUT04         L           QUT13         33         40         QUT03         L           QUT10         35         36         OUT02         L           QUT09         37         38         OUT01         L           QUT08         39         40         OUT00         L	I		OUT28	11	12	OUT20	
OUT26         15         16         OUT18         L           UOT25         17         18         OUT17         L           UOT24         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)           0V0         23         24         0V0           OUT16         25         26         OUT07         L           UOUT14         72         28         OUT06         L           UOUT13         29         30         OUT05         L           UOUT12         31         32         OUT04         L           UOUT10         35         36         OUT02         L           UOUT09         37         38         OUT01         L           UOT08         39         40         OUT00         L	I		OUT27	13	14	OUT19	
OUT25         77         18         OUT17         L           OUT24         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)         L           0V0         23         24         0V0           OUT15         25         26         OUT07         L           L         OUT13         29         30         OUT05         L           L         OUT12         31         32         OUT04         L           L         OUT13         33         40 UT03         L           L         OUT10         33         34         OUT02         L           L         OUT10         37         38         OUT01         L           L         OUT08         39         40         OUT00         L	Ι		OUT26	15	16	OUT18	
OUT24         19         20         OUT16         L           COM0 (+V)         21         22         COM0 (+V)           0V0         23         24         0V0           OUT15         25         26         OUT07         L           OUT14         27         28         OUT06         L           L         OUT13         29         30         OUT05         L           L         OUT11         31         32         OUT04         L           L         OUT11         33         34         OUT03         L           L         OUT10         35         36         OUT02         L           L         OUT08         39         40         OUT00         L	Ι	누는	OUT25	17	18	OUT17	
COM0 (+V)         21         22         COM0 (+V)           0V0         23         24         0V0           0UT15         25         26         0UT07           L         0UT14         27         28         0UT06           L         0UT13         29         30         0UT05         L           L         0UT13         29         30         0UT04         L           L         0UT13         33         40UT03         L           L         0UT10         35         36         0UT02         L           U         0UT08         39         40         0UT00         L	I		OUT24	19	20	OUT16	
0V0         23         24         0V0           OUT15         25         26         OUT07         L           L         OUT14         27         28         OUT06         L           L         OUT13         29         30         OUT06         L           L         OUT12         31         32         OUT04         L           L         OUT11         33         34         OUT03         L           L         OUT10         S5         36         OUT02         L           L         OUT09         37         38         OUT01         L           L         OUT08         39         40         OUT00         L			COM0 (+V)	21	22	COM0 (+V)	
OUT15         25         26         OUT07         L           U         OUT14         27         28         OUT06         L           U         OUT13         29         30         OUT05         L           U         OUT12         31         32         OUT04         L           U         OUT11         33         34         OUT03         L           U         OUT10         35         36         OUT02         L           U         OUT09         37         38         OUT01         L           U         OUT08         39         40         OUT00         L			0V0	23	24	0V0	 
OUT14         27         28         OUT06         L           L         OUT13         29         30         OUT05         L           L         OUT12         31         32         OUT04         L           L         OUT11         33         34         OUT03         L           L         OUT10         35         36         OUT02         L           L         OUT09         37         38         OUT01         L           L         OUT08         39         40         OUT00         L			OUT15	25	26	OUT07	1
OUT13         29         30         OUT05         L           L         OUT12         31         32         OUT04         L           L         OUT11         33         34         OUT03         L           L         OUT10         35         36         OUT03         L           L         OUT09         37         38         OUT01         L           L         OUT08         39         40         OUT00         L			OUT14	27	28	OUT06	
OUT12         31         32         OUT04         L           OUT11         33         34         OUT03         L           OUT10         35         36         OUT02         L           OUT09         37         38         OUT01         L           OUT08         39         40         OUT00         L			OUT13	29	30	OUT05	
OUT11         33         34         OUT03         L           OUT10         35         36         OUT02         L           OUT09         37         38         OUT01         L           OUT08         39         40         OUT00         L	I		OUT12	31	32	OUT04	
OUT10         35         36         OUT02         L           OUT09         37         38         OUT01         L           OUT08         39         40         OUT00         L	I		OUT11	33	34	OUT03	
L         OUT09         37         38         OUT01         L           U         OUT08         39         40         OUT00         L	I		OUT10	35	36	OUT02	
	I		OUT09	37	38	OUT01	
	I		OUT08	39	40	OUTOO	
	Ľ						

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).

#### **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.	5 ms max.							
Relay service life	Electrical: 100,000 operations <sup>11</sup> 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 M $\Omega$ min. (500 VDC) Between the external terminals and internal circuits: 20 M $\Omega$ min. (500 VDC) Between the internal circuit and GR terminal: 20 M $\Omega$ min. (100 VDC) Between the external terminals and GR terminal: 20 M $\Omega$ min. (500 VDC)	Between A1/3, B1/3 terminals and A5/7, B5/7 terminals: 20 M $\Omega$ min. (500 VDC) Between the external terminals and functional ground terminal: 20 M $\Omega$ min. (500 VDC) Between the external terminals and internal circuits: 20 M $\Omega$ min. (500 VDC) Between the internal circuit and functional ground terminal: 20 M $\Omega$ 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 each =100 min total)	9.8 m/s <sup>2</sup> , 100 min each in X, Y and Z directions (10 sweeps of 10 min							
Shock resistance	100 m/s <sup>2</sup> , 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								
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



### NX-OC2733



#### Terminal wiring

#### NX-OC2633



#### NX-OC2733



#### Digital I/O unit (with MIL connector)

Item	l	Specifications						
Moc	lel	NX-MD6121-5	NX-MD6256-5					
Nam	ne	DC input/transistor output unit						
Сар	acity	16 inputs/16 outputs						
(	Internal I/O common	NPN	PNP					
۲.	Rated voltage	12 to 24 VDC	24 VDC					
0	Operating load voltage	10.2 to 28.8 VDC	20.4 to 28.8 VDC					
ection	Maximum value of load current	0.5 A/point, 2 A/NX unit						
tse	Maximum inrush current	4.0 A/point, 10 ms max.						
nd	Leakage current	0.1 mA max.						
Dut	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.					
	Internal I/O common	For both NPN/PNP						
12)	Rated input voltage	24 VDC (15 to 28.8 VDC)						
ð	Input current <sup>*1</sup>	7 mA						
S	ON voltage	15 VDC min.						
ctic	ON current	3 mA min.						
se	OFF voltage	5 VDC max.						
out	OFF current	1 mA max.						
In p	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 m	s, 32 ms, 64 ms, 128 ms, 256 ms					
Diel	ectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.						
Insu	llation resistance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)						
Isola	ation method	Photocoupler isolation						
Unit	power consumption	0.70 W max.	0.75 W max.					
1/O p	power supply method	Supply from external source						
I/O (	current consumption	30 mA max.	40 mA max.					
Cur sup	rent capacity of I/O power ply terminal	Without I/O power supply terminals						
I/O 1	efreshing method	Switching synchronous I/O refreshing and free-run refreshing						
Terr	ninal block type	2 MIL connectors 20 terminals						
Dim	ensions (W x H x D)	30 × 100 × 71						
Wei	ght	105 g max.	110 g max.					
Disc dete	connection/short-circuit	Not supported						
Prot	tective function	Not supported	With load short-circuit protection					

\*1. Typical rated current at 24 VDC.

#### **Circuit layout**



#### CN2 (right) input circuit



#### **Terminal wiring**

#### NX-MD6121-5 CN1 (left) output terminal

- (					
	Signal name	Conr p	necto in	r Signal name	
	OUT00	20	19	OUT08	
	OUT01	18	17	OUT09	
	OUT02	16	15	OUT10	
	OUT03	14	13	OUT11	
	OUT04	12	11	OUT12	
	OUT05	10	9	OUT13	
	OUT06	8	7	OUT14	
	OUT07	6	5	OUT15	
	COM0	4	3	COM0	
	+V0	2	1	+V0	
┫					]
2 to 24 VDC					

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

	Signal	Conr	necto	r Signal	
24 VDC	name	р	in	name	
1-1-1	NC	1	2	NC	
	COM1	3	4	COM1	
	IN15	5	6	IN07	
	IN14	7	8	IN06	
	IN13	9	10	IN05	
	IN12	11	12	IN04	
	IN11	13	14	IN03	
	IN10	15	16	IN02	
	IN09	17	18	IN01	
	IN08	19	20	IN00	

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**



CN2 (right) input circuit



#### **Terminal wiring**

#### NX-MD6256-5 CN1 (left) output terminal

		Signal name	Conr p	iector in	Signal name		
		OUT00	20	19	OUT08	_	L
		OUT01	18	17	OUT09		
		OUT02	16	15	OUT10		<u> </u>
		OUT03	14	13	OUT11		
		OUT04	12	11	OUT12		<u> </u>
		OUT05	10	9	OUT13		
		OUT06	8	7	OUT14		
		OUT07	6	5	OUT15		
	cc	0M0 (+V)	4	3	COM0 (+V)		1
Ι "		0V0	2	1	0V0		
L			·				
24 VDC							

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

	Signal	Conr	ecto	r Signal			
24 VDC	name	name pin name					
r-1	NC	1	2	NC			
	COM1	3	4	COM1			
	IN15	5	6	IN07	_6	<u></u>	
	IN14	7	8	IN06		~	I
	IN13	9	10	IN05		~	J
	IN12	11	12	IN04		~	
	IN11	13	14	IN03			J
	IN10	15	16	IN02			J
	IN09	17	18	IN01	_6	~	J
	IN08	19	20	IN00	_6	~	

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.

# Analog I/O unit

# **Current input unit**

Item		Specification	S									
Model		NX-AD2203	NX-AD3203	NX-AD4203	NX-AD2204	NX-AD3204	NX-AD4204	NX-AD2208	NX-AD3208	NX-AD4208		
Name		Current input u	init									
Input range		4 to 20 mA										
Input metho	d	Single-ended i	nput		Differential inp	ut						
Capacity		2 points	4 points	8 points	2 points	4 points	8 points	2 points	4 points	8 points		
Input conver	sion range	–5% to 105% (	-5% to 105% (full scale)									
Absolute ma rating	ximum	±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 sc	ale)					1/30,000 (full	scale)			
Overall	25°C	±0.2% (full sca	ale)					±0.1% (full sc	ale)			
accuracy	0 to 55°C	±0.4% (full scale) ±0.2% (full scale)										
Conversion time		250 μs/point 10 μs/point										
Dielectric strength		510 VAC betw	een isolated cir	cuits for 1 minu	te at a leakage	current of 5 mA	A max.					
Insulation resistance		20 M $\Omega$ min. between isolated circuits (at 100 VDC)										
Isolation me	thod	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)										
Unit power of	onsumption	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 su	pply method	Supply from th	e NX bus		No supply							
I/O current c	onsumption	No consumption										
Current capa	acity of I/O	0.1 A/terminal	max.		Without I/O po	wer supply tern	ninals					
power suppl	y terminal	-										
I/O refreshin	g method	Free-run refree	shing					Switching syn free-run refres	chronous I/O re shing	freshing and		
Terminal block type		Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)	Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)	Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)		
Dimensions	(W x H x D)	$12 \times 100 \times 71$										
Weight		70 g max.										
Input discon detection	nection	Supported										

#### **Circuit layout**



NX-AD3203



#### NX-AD4203



#### Terminal wiring



IOV IOV Input5+ Input6+ IOV IOV

Input7+ Input8-IOV IOV

IOG IOG IOG IOG IOG IOG IOG IOG IOG IOG

IOV IOV

IOG IOG

18

#### **Circuit layout**



#### NX-AD3204/NX-AD3208



#### NX-AD4204/NX-AD4208



#### **Terminal wiring**

#### NX-AD2204/NX-AD2208



#### NX-AD3204/NX-AD3208



#### NX-AD4204/NX-AD4208



#### Voltage input unit

Item		Specification	s									
Model		NX-AD2603	NX-AD3603	NX-AD4603	NX-AD2604	NX-AD3604	NX-AD4604	NX-AD2608	NX-AD3608	NX-AD4608		
Name		Voltage input u	/oltage input unit									
Input range		-10 to 10 V										
Input metho	d	Single-ended i	nput		Differential inp	ut						
Capacity		2 points	4 points	8 points	2 points	4 points	8 points	2 points	4 points	8 points		
Input conver	sion range	–5% to 105% (	-5% to 105% (full scale)									
Absolute maximum rating		±15 V										
Input impeda	ance	1 MΩ min.	1 MΩ min.									
Resolution		1/8,000 (full sc	ale)					1/30,000 (full	scale)			
Overall	25°C	±0.2% (full sca	ale)					±0.1% (full sc	ale)			
accuracy	0 to 55°C	±0.4% (full scale)						±0.2% (full sc	ale)			
Conversion	time	250 µs/point 10 µs/point										
Dielectric st	rength	510 VAC betw	een isolated cir	cuits for 1 minu	te at a leakage	current of 5 mA	max.					
Insulation re	sistance	20 MΩ min. be	tween isolated	circuits (at 100	VDC)							
Isolation me	thod	Between the ir	nput and the NX	bus: Power = 7	Transformer, Si	gnal = Digital is	olator (no isolat	ion between in	puts)			
Unit power of	onsumption	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 su	pply method	Supply from the NX bus No supply										
I/O current c	onsumption	No consumption										
Current capa power suppl	acity of I/O y terminal	0.1 A/terminal	max.		Without I/O po	wer supply tern	ninals					
I/O refreshin	g method	Free-run refree	shing					Switching syn free-run refres	chronous I/O re shing	freshing and		
Terminal block type		Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)	Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)	Screwless push-in termi- nal 8 terminals (A + B)	Screwless push-in termi- nal 12 terminals (A + B)	Screwless push-in termi- nal 16 terminals (A + B)		
Dimensions	(W x H x D)	$12 \times 100 \times 71$	•	•	•	•	-	•	*			
Weight		70 g max.										
Input discon detection	nection	Not supported										

#### **Circuit layout**



#### NX-AD3603



#### NX-AD4603



#### **Terminal wiring**



#### NX-AD3603



#### NX-AD4603



20

#### **Circuit layout**



NX-AD3604/NX-AD3608



NX-AD4604/NX-AD4608



#### **Terminal wiring**

#### NX-AD2604/NX-AD2608



#### NX-AD3604/NX-AD3608



#### NX-AD4604/NX-AD4608



#### **Current output unit**

Item		Specifications									
Model		NX-DA2203	NX-DA3203	NX-DA2205	NX-DA3205						
Name		Current output unit	Current output unit								
Output range	е	4 to 20 mA									
Capacity		2 points	4 points	2 points	4 points						
Output conv	ersion range	-5% to 105% (full scale)									
Allowable load		600 Ω min.	350 Ω min.	600 Ω min.	350 Ω min.						
resistance											
Resolution		1/8,000 (full scale)		1/30,000 (full scale)							
Overall	25°C	±0.3% (full scale)		±0.1% (full scale)							
accuracy	0 to 55°C	±0.6% (full scale)		±0.3% (full scale)							
Conversion	time	250 μs/point 10 μs/point									
Dielectric st	rength	510 VAC between isolated circuit	s for 1 minute at a leakage currer	nt of 5 mA max.							
Insulation re	sistance	20 MΩ min. between isolated circuits (at 100 VDC)									
Isolation me	thod	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)									
Unit power of	onsumption	1.75 W max.	1.80 W max.	1.75 W max.	1.80 W max.						
I/O power su	pply method	Supply from the NX bus									
I/O current c	onsumption	No consumption									
Current capa	acity of I/O	0.1 A/terminal max.									
power suppl	y terminal										
I/O refreshin	g method	Free-run refreshing		Switching synchronous I/O refre	shing and free-run refreshing						
Terminal blo	ck type	Screwless push-in terminal	Screwless push-in terminal	Screwless push-in terminal	Screwless push-in terminal						
		8 terminals (A + B)	12 terminals (A + B)	8 terminals (A + B)	12 terminals (A + B)						
Dimensions	(W x H x D)	$12 \times 100 \times 71$									
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	е	–10 to 10 V								
Capacity		2 points	4 points	2 points	4 points					
Output conv	ersion range	-5% to 105% (full scale)								
Allowable lo	ad	5 kΩ min.								
resistance										
Output impe	dance	0.5 Ω max.		1						
Resolution	-	1/8,000 (full scale)		1/30,000 (full scale)						
Overall	25°C	±0.3% (full scale)		±0.1% (full scale)						
accuracy	0 to 55°C	±0.5% (full scale)		±0.3% (full scale)						
Conversion	time	250 μs/point		10 μs/point						
Dielectric st	rength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.								
Insulation re	sistance	20 MΩ min. between isolated circuits (at 100 VDC)								
Isolation me	thod	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)								
Unit power of	consumption	1.10 W max.	1.25 W max.	1.10 W max.	1.25 W max.					
I/O power su	pply method	Supply from the NX bus								
I/O current c	onsumption	No consumption								
Current capa	acity of I/O	0.1 A/terminal max.								
power suppl	y terminal									
I/O refreshin	g method	Free-run refreshing		Switching synchronous I/O refres	shing and free-run refreshing					
Terminal block type		Screwless push-in terminal	Screwless push-in terminal	Screwless push-in terminal	Screwless push-in terminal					
		8 terminals (A + B)	12 terminals (A + B)	8 terminals (A + B)	12 terminals (A + B)					
Dimensions	(W x H x D)	12 × 100 × 71								
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	e								
Capacity		2 points	4 points	2 points	4 points	2 points	4 points				
Temperature sense	or	K, J, T, E, L, U, N, PLII	R, S, B, WRe5-26,	K, J, T, E, L, U, N	, R, S, WRe5-26, Pl	_11	•				
Input conversion ra	ange	±20°C of the input range									
Input detection cur	rent	Approx. 0.1 µA									
Input impedance		20 KΩ min.									
Absolute maximum	n rating	±130 mV									
Resolution		0.1°C max. <sup>*1</sup>		0.01ºC max.		0.001ºC max.					
Warm-up period		30 minutes		45 minutes							
Reference	Conversion time	250 ms		10 ms		60 ms					
accuracy and temperature coefficient	Temperature range Accuracy <sup>*2</sup>	$\begin{array}{l} {\sf K},{\sf N}\;(-200\;to\;1,30)\\ {\sf J}\;(-200\;to\;1,200{}^\circ{\rm C})\\ {\sf E}\;(-220\;to\;1,000{}^\circ{\rm C})\\ {\sf E}\;(-220\;to\;1,000{}^\circ{\rm C})\\ {\sf U}\;(-200\;to\;600{}^\circ{\rm C})\\ {\sf U}\;(-200\;to\;600{}^\circ{\rm C})\\ {\sf W}\;{\sf R}\!,{\sf S}\;(-50\;to\;1,700)\\ {\sf B}\;(0\;to\;1,800{}^\circ{\rm C})\\ {\sf W}\;{\sf R}\!,{\sf S}\!=\!6\;(0\;to\;2,3)\\ {\sf PLII}\;(0\;to\;1,300{}^\circ{\rm C})\\ {\sf W}\;{\sf R}\!,{\sf S}\!=\!26\;(0\;to\;2,3)\\ {\sf PLII}\;(0\;to\;1,300{}^\circ{\rm C})\\ {\sf W}\;{\sf R}\!,{\sf S}\!=\!26\;(0\;to\;2,3)\\ {\sf V}\;{\sf H}\!,{\sf S}\!=\!26\;(0\;to\;2,3)\\ {\sf V}\;{\sf H}\!,{\sf S}\!=\!26\;(0\;to\;2,3)\\ {\sf V}\;{\sf W}\!,{\sf R}\!=\!5\cdot\!26\;(0\;to\;2,3)\\ {\sf W}\;{\sf W}\!,{\sf S}\!=\!5\cdot\!26\;(\pm0.05{}^\circ{\rm S})\\ {\sf W}\;{\sf W}\!,{\sf S}\!=\!5\cdot\!26\;(\pm0.05{}^\circ{\rm S})\\ {\sf W}\;{\sf R}\!,{\sf S}\!=\!26\;(\pm0.05{}^\circ{\rm S})\\ {\sf S}\!,{\sf S}\!,{\sf S}\!=\!26\;{}^\circ{\rm S}\!,{\sf S}\!,{\sf$	0°C) )) °C) 00°C) (±0.1%)	K, N (-200 to 1,300°C)         K (-20 to 600°C, high resolution)         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)         T (±0.22%)         R/S (±0.19%)         N (±0.11%)         U (±0.09%)							
Dielectric strength		NJ/E/L/WR05-20/FLII (±0.05%)									
Insulation resistant	<b>CO</b>	20 MO min between	en isolated circuits	(at 100 VDC)	age current of 5 mA	IIIdA.					
Insulation method	Ce	Between the input	and the NY bus	Between the input	t and the NX bus						
		Power = Transform Signal = Photocou Between inputs: Power = Transform Signal = Photocou	ner pler pler	Power = Transforn Signal = Digital iso Between inputs: Power = Transforn Signal = Digital iso	mer plator blator						
Unit power consun	nption	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 m	nethod	No supply									
I/O current consum	ption	No consumption									
Current capacity of	I/O power supply terminal	Without I/O power	supply terminals								
I/O refreshing meth	od	Free-run refreshing	g								
Terminal block typ	e	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	24 × 100 × 71	$12 \times 100 \times 71$	24 × 100 × 71	$12 \times 100 \times 71$	24 × 100 × 71				
Weight		70 g max.	140 g max.	70 g max.	140 g max.	70 g max.	140 g max.				

\*1. The resolution is 0.2°C max. when the input type is R, S or W.
 \*2. Accuracy for temperature inputs as percentage of process value and typical value 25°C 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 thermo	meter type			•				
Capacity		2 points	4 points	2 points	4 points	2 points	4 points			
Temperature senso	r	Pt100 (three-wire)/	Pt1000 (three-wire)	Pt100 (three-wire)		Pt100 (three-wire)/	Pt1000 (three-wire)			
Input conversion ra	inge	±20°C of the input	range			•				
Input detection cur	rent	Approx. 0.25 mA								
Resolution		0.1°C max.		0.001ºC max.						
Effect of conductor	resistance	0.06°C/Ω max. (als	0.06°C/Ω max. (also 20 Ω max.)							
Warm-up period		10 minutes		30 minutes						
Reference	Conversion time	250 ms		10 ms		60 ms				
accuracy and	Temperature range	–200 to 850°C		_						
coefficient	Accuracy <sup>*1</sup>	±0.1%		±0.05%						
Dielectric strength		510 VAC between	isolated circuits for	1 minute at a leaka	ge current of 5 mA	max.				
Insulation resistance	e	20 MΩ min. betwee	en isolated circuits (	(at 100 VDC)						
Isolation method		Between the input	and the NX bus:	Between the input	and the NX bus:					
		Power = Transform	her	Power = Transform	ner					
		Signal = Photocou	oler	Signal = Digital iso	lator					
		Between Inputs: Bower – Transform	or	Between Inputs: Rewar – Transformer						
		Signal = Photocou	oler	Signal = Digital isolator						
Unit power consum	ption	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 m	ethod	No supply				•	•			
I/O current consum	ption	No consumption								
Current capacity of	I/O power supply terminal	Without I/O power	supply terminals							
I/O refreshing meth	od	Free-run refreshing	]							
Terminal block type	)	Screwless push-in	Screwless push-in	Screwless push-in	Screwless push-in	Screwless push-in	Screwless push-in			
		terminal	terminal	terminal	terminal	terminal	terminal			
		16 terminals	16 terminals x 2	16 terminals	16 terminals x 2	16 terminals	16 terminals x 2			
		(A + B)	[(A + B) & (C + D)]	(A + B)	[(A + B) & (C + D)]	(A + B)	[(A + B) & (C + D)]			
Dimensions (W x H	x D)	$12 \times 100 \times 71$	$24 \times 100 \times 71$	$12 \times 100 \times 71$	$24 \times 100 \times 71$	12 × 100 × 71	24 × 100 × 71			
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 25°C 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

		Specifications									
		NX-EC0112	NX-EC0122	NX-EC0212	NX-EC0222	NX-EC0132	NX-EC0142				
		Incremental enco	der input unit	•		•					
s		1 channel		2 channels		1 channel					
		Counter: Phases	A, B and Z	Counter: Phase	es A, B and Z	Counter: Phases A, B and Z					
		External inputs: 3	•	External inputs	None	External inputs:	: 3				
Ту	be	NPN type 500 kHz	PNP type 500 kHz	NPN type 500 kHz	PNP type 500 kHz	Line driver, 4 MHz					
fications	Voltage Current	20.4 to 28.8 VDC ON voltage: 19.6 OFF voltage: 4.0 4.2 mA (24 VDC)	(24 VDC +20%/-1: VDC min./3 mA mir VDC max./1 mA mir	$\label{eq:linear} \begin{array}{l} \text{Era statistical PS-422-A line driver} \\ \text{Ievels} \\ \text{Impedance: } 120 \ \Omega \ \pm 5\% \\ \text{Level input voltage: } V_{\text{IT}+}\text{: } 0.1 \ \text{V min.} \\ \text{V}_{\text{IT}-}\text{: } 0.1 \ \text{V min.} \\ \text{Hysteresis voltage: } \text{Vhys} \\ \text{(V}_{\text{IT}+} \ \text{V}_{\text{IT}-}\text{): } 60 \ \text{Mv} \end{array}$							
Spec	5 V power supply for encoder	-				Output voltage: Output current:	5 VDC ±5% 500 mA max.				
	Maximum response frequency	Phases A and B: 125 kHz), Phase 2	Single-phase 500 k Z: 125 kHz	Phases A and E (phase differen 1 MHz), Phase	8: Single-phase 4 MHz tial pulse input × 4: Z: 1 MHz						
		Pulses									
Pulse input method			Phase difference pulse (multiplication × 2/4), pulse + direction inputs or up and down pulse inputs								
		-2,147,483,648 to 2,147,483,647 pulses									
Counter functions Type		Ring counter or lin	near counter								
Controls		Gate control, cour	nter reset and coun	ter preset							
Latch function		Two external input	It latches and one in	nternal latch							
Me	asurements	Pulse rate measu	rement and pulse p	eriod measurem	ent						
Input voltage		20.4 to 28.8 VDC – (24 VDC +20%/–15%)				20.4 to 28.8 VD (24 VDC +20%)	)C /–15%)				
Inp	ut current	4.6 mA (24 VDC)		-		3.5 mA (24 VD)	C)				
ON	voltage/ON current	15 VDC min./3 m/	A min.	-		15 VDC min./3 mA min.					
OF	F voltage/OFF current	4.0 VDC max./1 n	nA max.	-		5.0 VDC max./1	I mA max.				
ON	/OFF response time	1 μs max./2 μs max	ax.	-		1 μs max./1 μs	max.				
Inte	ernal I/O common	NPN	PNP	-		NPN	PNP				
		510 VAC between	n isolated circuits fo	or 1 minute at a le	eakage current of 5 m	A max.					
се		20 MΩ min. betwe	een isolated circuits	s (at 100 VDC)							
		Photocoupler isol	ation			Digital isolator					
nptio	n	0.85 W max.	0.95 W max.	0.85 W max.	0.95 W max.	0.95 W max.	1.05 W max.				
ourc	e	Supplied from the	NX bus. 20.4 to 28	3.8 VDC (24 VDC	; +20%/–15%)						
on fi	om I/O power supply	None				30 mA					
I/O	power supply terminal	0.3 A max. per ter supply section an terminal for other	rminal for encoder d 0.1 A max. per sections	0.3 A max. per	terminal	0.1 A max. per	terminal				
od		Free-run refreshir	ng or synchronous l	/O refreshing*1							
e		Screwless push-ir 16 terminals (A +	n terminal B)	Screwless push 12 terminals (A	n-in terminal + B)	Screwless push-in terminal 12 terminals x 2 [(A + B) x 2]					
хD	)	12 × 100 × 71		$12 \times 100 \times 71$		24 × 100 × 71					
		70 g 70 g 130 g									
		None		·		·					
		None									
	s Typ Typ C Lat Me Inp O O F N Int C e iticatious Typ C Int C e itications Typ C Int C e itications Typ C Int C o d e itication C C C C C C C C C C C C C C C C C C C	S Type Voltage Voltage Current S Current S Voltage S Voltage Current S S Voltage Voltage S Volta	Specifications           NX-EC0112           Incremental enco           s         1 channel           Counter: Phases External inputs: 3           Type         NPN type 500 kHz           Voltage         20.4 to 28.8 VDC ON voltage: 19.6 OFF voltage: 4.0           Current         4.2 mA (24 VDC)           Stype         5 V power supply for encoder         -           Maximum response frequency         Phases A and B: 125 kHz), Phase           J         Phase difference           -2,147,483,648 tt         Phase difference           -2,147,483,648 tt         Type           Ring counter or lii         Gate control, cou           Latch function         Two external input Measurements           Pulse rate measu         Input voltage           Q0/ ON voltage/ON current         15 VDC min./3 m           OFF voltage/OFF current         4.0 VDC max./1 r           ON/OFF response time         1 μs max./2 μs m           Internal I/O common         NPN           Sto VAC betweet ce         20 MΩ min. betweet supply section an terminal for other           fi/O power supply terminal         0.3 A max. per te supply section an terminal for other           supply section an terminal for other         16 terminals (A + x D)	Specifications           NX-EC012         NX-EC0122           Incremental encoder input unit         incremental encoder input unit           s         1 channel           Counter: Phases A, B and Z External inputs: 3           Type         NPN type         PNP type           500 kHz         500 kHz           Voitage         20.4 to 28.8 VDC (24 VDC +20%/-1: ON voltage: 19.6 VDC min./3 mA min OFF voltage: 4.0 VDC max./1 mA min           OFF voltage: 4.0 VDC         -           Encoder         -           Maximum response frequency         Phases A and B: Single-phase 500 k1           25 kHz), Phase Z: 125 kHz         -           Pulses         -           125 kHz), Phase Z: 125 kHz         -           Pulses         -           125 kHz), Phase Z: 125 kHz         -           Pulses         -           125 kHz), Phase Z: 125 kHz         -           125 kHz), Phase Z: 125 kHz         -           126 kHz         -           127 kH3,864 to 2,147,483,647 pu           Type         Ring counter or linear counter           Controls         Gate control, counter reset and count           Latch function         Two external input latches and one in           Measurements         Puls	Specifications           NX-EC0112         NX-EC0212         NX-EC0212           Incremental encoder input unit         Incremental encoder input unit           s         1 channel         2 channels           Counter: Phases A, B and Z         Counter: Phases         External inputs:           Type         NPN type         PNP type         NPN type           S00 kHz         500 kHz         500 kHz         500 kHz           Voltage         20.4 to 28.8 VDC (24 VDC +20%-15%)         ON voltage: 4.0 VDC max./1 mA max.           Current         4.2 mA (24 VDC)         -           Maximum response frequency         Phases A and B: Single-phase 500 kHz (phase difference pulse (multiplication × 2/4), pulse + -2,147,483,648 to 2,147,483,647 pulses           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           Input current         4.6 mA (24 VDC)         -           ON/OFF response time         1 µs max./2 µs max.         -           Input current         4.6 mA (24 VDC)         -           ON/OFF response time         1 µs max./2 µs max.         -<	Specifications           NX-EC012         NX-EC022         NX-EC0222           Incremental encoder input unit         2         channels         2           Counter: Phases A, B and Z           External inputs: 3         2         Counter: Phases A, B and Z           External inputs: 3         NPN type         PNP type         S00 kHz         S	Specifications           NX-EC012         NX-EC012         NX-EC022         NX-EC033           Incremental encoder input unit           s         1 channel         2 channels         1 channel           Counter: Phases A, B and Z         Counter: Phases           External inputs: 3         External inputs: None         External inputs				

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



NX-EC0122

**Circuit layout** 



#### **Terminal wiring**

NX-EC0112



NX-EC0122



26

# Circuit layout

#### **Terminal wiring**

B1 •

IOV

IOG

B2 •

NX-EC0222



•A1

•Z1 NC

NOV

IOG

• A2

•Z2 NC



NX-EC0222





### NX-EC0132/EC0142



#### NX-EC0132/EC0142



# External Inputs (NX-EC0132)



External Inputs (NX-EC0142)



# ......g

Encoder 1

Encoder 1

#### 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	/nchronous serial interface (SSI), 2 MHz				
Clock output	IA 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	e 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 M $\Omega$ 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	20 mA	30 mA				
I/O power supply						
Current capacity of	0.3 A max. per terminal					
I/O power supply terminal						
I/O refreshing method	Free-run refreshing or synchronous I/O refreshing	1				
Terminal block type	Screwless push-in terminal	Screwless push-in terminal				
Dimensions (W x H x D)	12  terminals (C + D)	12 terminals $(C + D)$				
Dimensions (W X H X D)	12 X 100 X / 1					
weight	65 g					
Maximum transmission distance <sup>2</sup>	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					

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







**Terminal wiring** 



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 for	n	Open collector output			
Control unit		Pulses			
Maximum pulse	output speed	500 kpps			
Pulse output me	thod	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 <sup>*1</sup> 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 Input voltage		20.4 to 28.8 VDC (24 VDC +20%/-15%)			
specifications	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	Rated voltage	24 VDC (15 to 28.8 VDC)			
specifications	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 streng	th	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.			
Insulation resista	ance	20 M $\Omega$ min. between isolated circuits (at 100 VDC)			
Isolation method	I	External inputs: Photocoupler isolation External outputs: Digital isolator			
Unit power cons	umption	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 consum	ption 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 <sup>*2</sup>			
Terminal block type		Screwless push-in terminal			
Dimensions (M)		10 utilinais (A + B)			
Dimensions (W x	( H X U)	12 X 100 X / 1 70 -			
weight					
Failure detection		None			
Protection		INone			

\*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 will be used using 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



#### External Inputs



#### NX-PG0122

Pulse Output and External Output



#### External Inputs



#### Terminal wiring

#### NX-PG0112



NX-PG0122



#### 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 M $\Omega$ 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
Weight	65 g max.

#### **Circuit layout**



#### Terminal wiring



#### I/O power feed unit

Item	Specifications			
Model	NX-PF0630	NX-PF0730		
Name	Additional I/O power supply unit	Additional I/O power supply unit		
Power supply voltage	5 to 24 VDC (4.5 to 28.8 VDC) <sup>*1</sup>			
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 M $\Omega$ 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			
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**

### 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 m	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.				
Insulation resistance	20 M $\Omega$ min. between isolated circuits (at 1	00 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					
Weight	65 g max.					





**Terminal wiring** 



NX-PC0020













#### 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	$20 \text{ M}\Omega$ 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
Weight	65 g max.



NX-TBX01



#### Terminal wiring





# Dimensions

Communication coupler unit (EtherCAT and EtherNet/IP)

F

ΠŢ

C

104.5

### NX-ECC202/EIC202



I/O unit with screwless push-in terminal

#### 12 mm width



# I/O unit with MIL connector

# 1 connector with 20 terminals



# 24 mm width



### 1 connector with 40 terminals

A

١ï.

19.1

30

32.1

38



#### 2 connectors with 20 terminals





#### End cover unit

# NX-END01



# **Ordering information**

#### Communication coupler unit

Туре	Protocol	Specifications	Connection	Max. I/O power supply	Width	Model
Communication coupler	EtherCAT slave	Up to 63 I/O units Max. 1024 bytes in + 1024 bytes out Supports distributed clock	2 RJ45 ports (in + out)	10.0 A	46 mm	NX-ECC202
	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	10.0 A	46 mm	NX-EIC202 <sup>-1</sup>

\*1. The NX-EIC202 communication coupler unit does not support the NX-SL3500 safety controller unit.

#### I/O unit

#### **Digital I/O**

Туре	Channels, signal type	Performance <sup>*1</sup> , I/O refresh method	Connection type <sup>*2</sup>	Width	Model	NPN type <sup>*3</sup>
DC digital input	4 inputs, 3-wire connection	High-speed synchronous time stamp	Screwless push-in (NX-TBA122)	12 mm	NX-ID3444	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	Synchronous/free run	Screwless push-in (NX-TBA162)	12 mm	NX-ID4442	NX-ID4342
	16 inputs, 1-wire connection	Synchronous/free run	Screwless push-in (NX-TBA162)	12 mm	NX-ID5442	NX-ID5342
		Synchronous/free run	1 x 20-pin MIL connector	30 mm	NX-ID5142-5	NX-ID5142-5
	32 inputs, 1-wire connection	Synchronous/free run	1 x 40-pin MIL connector	30 mm	NX-ID6142-5	NX-ID6142-5
AC digital input	4 inputs, 200-240 VAC, 50/60 Hz	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-IA3117	-
DC digital	2 outputs 0.5 A, 3-wire connection	High-speed synchronous time stamp	Screwless push-in (NX-TBA082)	12 mm	NX-OD2258	NX-OD2154
output	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
	8 outputs 0.5 A, 2-wire connection	Synchronous/free run	Screwless push-in (NX-TBA162)	12 mm	NX-OD4256	NX-OD4121
	16 outputs 0.5 A, 1-wire connection	Synchronous/free run	Screwless push-in (NX-TBA162)	12 mm	NX-OD5256	NX-OD5121
		Synchronous/free run	1 x 20-pin MIL connector	30 mm	NX-OD5256-5	NX-OD5121-5
	32 outputs 0.5 A, 1-wire connection	Synchronous/free run	1 x 40-pin MIL connector	30 mm	NX-OD6256-5	NX-OD6121-5
Relay digital	2 outputs, N.O., 2.0 A	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-OC2633	-
output	2 outputs, N.O. + N.C., 2.0 A	Free run	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

\*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

Туре	Signal type	Performance, I/O refresh method	Channels	Connection type <sup>*1</sup>	Width	Model
Analog input	4 to 20 mA	1/8,000 resolution, 250 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2203
	single ended	Free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3203
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4203
	4 to 20 mA	1/8,000 resolution, 250 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2204
	differential	Free run	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	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2208
		Synchronous/free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3208
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4208
	±10 V 1/8,000 single ended Free run	1/8,000 resolution, 250 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2603
		Free run	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	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2604
		Free run	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	2	Screwless push-in (NX-TBA082)	12 mm	NX-AD2608
		Synchronous/free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-AD3608
			8	Screwless push-in (NX-TBA162)	12 mm	NX-AD4608
Analog output	4 to 20 mA	1/8,000 resolution, 250 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2203
		Free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3203
		1/30,000 resolution, 10 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2205
		Synchronous/free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3205
	±10 V	1/8,000 resolution, 250 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2603
		Free run	4	Screwless push-in (NX-TBA122)	12 mm	NX-DA3603
		1/30,000 resolution, 10 µs/channel	2	Screwless push-in (NX-TBA082)	12 mm	NX-DA2605
		Synchronous/free run	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**

Туре	Signal type	Performance, I/O refresh method	Channels	Connection type <sup>*1</sup>	Width	Model
Temperature	Thermocouple type	0.1°C resolution, 200 ms/unit Free run 0.01°C resolution, 10 ms/unit	2	Screwless push-in terminal	12 mm	NX-TS2101
sensor input	B/E/J/K/L/N/R/S/T/U/		4	block(s), with cold junction sen-	24 mm	NX-TS3101
	WRe5-26/PLII		2	sor, calibrated individually at the	12 mm	NX-TS2102
		Free run	4	lacioly	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	2	Screwless push-in (NX-TBA162)	12 mm	NX-TS2204
		Free run	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**

Туре	Channels, signal type	Performance, I/O refresh method	Connection type <sup>*1</sup>	Width	Model	NPN type <sup>*2</sup>
Encoder input	1 SSI encoder, 2 MHz	Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS112	-
	2 SSI encoders, 2 MHz	Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS212	-
	1 incremental encoder line driver 4 MHz + 3 digital inputs (1 μs)	Synchronous/free run	Screwless push-in (NX-TBA122 + NX-TBB122)	24 mm	NX-EC0142	NX-EC0132
	1 incremental encoder open collec- tor 500 kHz + 3 digital inputs (1 μs)	Synchronous/free run	Screwless push-in (NX-TBA162)	12 mm	NX-EC0122	NX-EC0112
	2 incremental encoders open col- lector 500 kHz	Synchronous/free run	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 in- puts + 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

Туре	Specifications	Performance, I/O refresh method	Connection type <sup>1</sup>	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	Free run	Screwless push-in (NX-TBA162)	12 mm	NX-SID800
Safety output	2 outputs, 2.0 A	Free run	Screwless push-in (NX-TBA082)	12 mm	NX-SOH200
	4 outputs, 0.5 A	Free run	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)".

#### Power/System unit

Туре	Description	Connection type <sup>*1</sup>	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	$16 \times IOV$	Screwless push-in (NX-TBA162)	12 mm	NX-PC0020
	16 × IOG	Screwless push-in (NX-TBA162)	12 mm	NX-PC0010
	$8 \times IOV + 8 \times IOG$	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

Туре	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)	Screwless push-in	12 mm	NX-TBC082
	With 12 wiring terminals (A + B)	Screwless push-in	12 mm	NX-TBA122
	With 12 wiring terminals (C + D)	Screwless push-in	12 mm	NX-TBB122
	With 16 wiring terminals (A + B)	Screwless push-in	12 mm	NX-TBA162
	With 16 wiring terminals (C + D)	Screwless push-in	12 mm	NX-TBB162
	With 16 wiring terminals (A + B with FG)	Screwless push-in	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
NJ-series	CPU unit	NJ501-🗆
(firmware version 1.09 or higher")		NJ301-🗆
	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 1.08 or lower and NX I/O units.

#### **Computer software**

Specifications	Model
Sysmac Studio version 1.10 or higher 1	SYSMAC-SE2

\*1. Please contact your OMRON representative for compatibility between the Sysmac Studio version 1.09 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-01

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