

Temperature input

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

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

Heater burnout detection

Type	Channels, signal type	Control output	I/O refresh method	Connection type ¹	Width	Model
Heater burnout detection	4 CT inputs 4 control outputs	NPN, 12 to 24 VDC 0.1 A/point, 0.4 A/unit	Free run	Screwless push-in (NX-TBA162)	12 mm	NX-HB3101
		PNP, 24 VDC 0.1 A/point, 0.4 A/unit		Screwless push-in (NX-TBA162)		NX-HB3201

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

Position interface

Type	Channels, signal type	I/O refresh method	Connection type ¹	Width	Model	NPN type ²
Encoder input	1 SSI encoder, 2 MHz	Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS112	-
	2 SSI encoders, 2 MHz		Screwless push-in (NX-TBA122)	12 mm	NX-ECS212	-
	1 incremental encoder line driver 4 MHz + 3 digital inputs (1 µs)		Screwless push-in (NX-TBA122 + NX-TBB122)	24 mm	NX-EC0142	NX-EC0132
	1 incremental encoder open collector 500 kHz + 3 digital inputs (1 µs)		Screwless push-in (NX-TBA162)	12 mm	NX-EC0122	NX-EC0112
	2 incremental encoders open collector 500 kHz		Screwless push-in (NX-TBA122)	12 mm	NX-EC0222	NX-EC0212
Pulse output	1 pulse open collector 500 kHz + 2 digital inputs + 1 digital output	Synchronous	Screwless push-in (NX-TBA162)	12 mm	NX-PG0122	NX-PG0112
	2 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital out- puts per channel		1 x 34-pin MIL connector	30 mm	NX-PG0242-5	NX-PG0232-5
	4 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital out- puts per channel		2 x 34-pin MIL connector	30 mm	NX-PG0342-5	NX-PG0332-5

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.

Load cell input

Type	Specifications	I/O refresh method	Excitation voltage/Input range	Connection type ¹	Width	Model
Load cell input	1 load cell input, 125 µs conversion cycle	Synchronous/free run	5 VDC ±10%/-5 to 5 mV/V	Screwless push-in (NX-TBC162)	12 mm	NX-RS1201

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

Safety (the NX-Safety units must be used in combination with the EtherCAT communication coupler)

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

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

Communication interface

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

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

Position interface unit

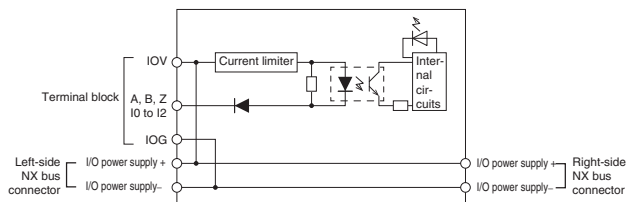
Incremental encoder input unit

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

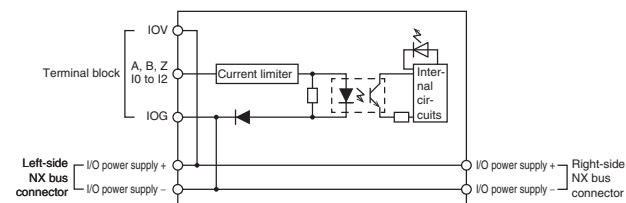
*1. The I/O refreshing method is automatically set according to the connected communication unit and CPU unit.

Circuit layout

NX-EC0112

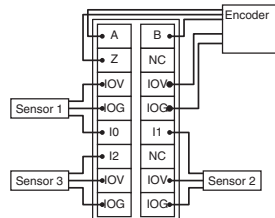


NX-EC0122

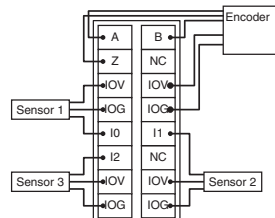


Terminal wiring

NX-EC0112



NX-EC0122



Position interface

Type	Channels, signal type	I/O refresh method	Connection type ¹	Width	Model	NPN type ²
Encoder input	1 SSI encoder, 2 MHz	Synchronous/free run	Screwless push-in (NX-TBA122)	12 mm	NX-ECS112	-
	2 SSI encoders, 2 MHz		Screwless push-in (NX-TBA122)	12 mm	NX-ECS212	-
	1 incremental encoder line driver 4 MHz + 3 digital inputs (1 μs)		Screwless push-in (NX-TBA122 + NX-TBB122)	24 mm	NX-EC0142	NX-EC0132
	1 incremental encoder open collector 500 kHz + 3 digital inputs (1 μs)		Screwless push-in (NX-TBA162)	12 mm	NX-EC0122	NX-EC0112
	2 incremental encoders open collector 500 kHz		Screwless push-in (NX-TBA122)	12 mm	NX-EC0222	NX-EC0212
Pulse output	1 pulse open collector 500 kHz + 2 digital inputs + 1 digital output	Synchronous	Screwless push-in (NX-TBA162)	12 mm	NX-PG0122	NX-PG0112
	2 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital out- puts per channel		1 x 34-pin MIL connector	30 mm	NX-PG0242-5	NX-PG0232-5
	4 pulse line driver 4 MHz + 5 digital inputs per channel + 3 digital out- puts per channel		2 x 34-pin MIL connector	30 mm	NX-PG0342-5	NX-PG0332-5

*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.

Load cell input

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

Safety

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

*1. Units with Screwless push-in connections are supplied with the appropriate terminal connector.
Note: For more detailed information about safety units, refer to "NX integrated safety datasheet (I183E-EN)" and "NX safety standalone datasheet (I185E-EN)".

Communication interface unit

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

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

Power/System unit

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

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

Accessories

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