

NX-series Digital Output Units

NX-OD/OC

CSM_NX-OD_OC_DS_E_1_1

A Wide Range of Basic Output Units for High-speed Synchronous Control and General Purpose

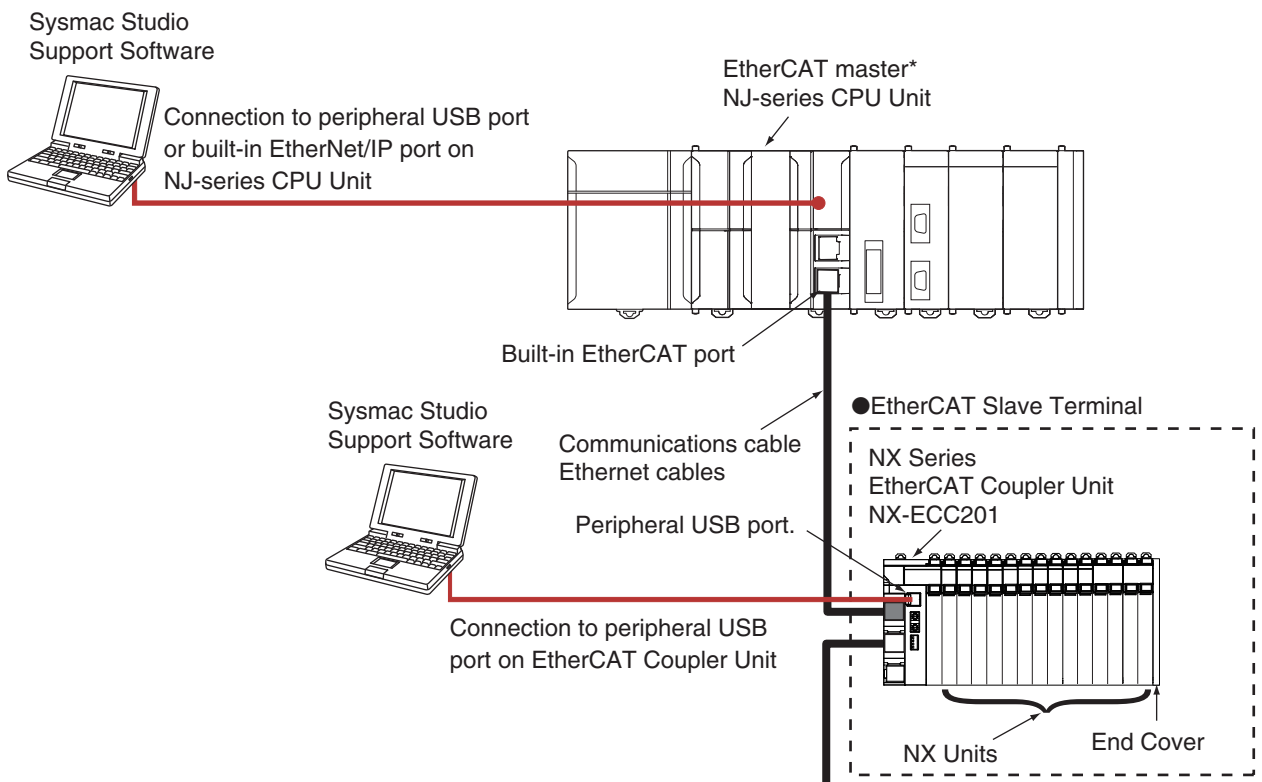
- The Slice I/O Unit that is used by connecting to the NJ-series Machine Automation Controller with the EtherCAT Coupler.
- Outputs to external devices are performed according to output instructions from the Controller.



Features

- High-speed I/O refreshing is possible by connecting with the EtherCAT Coupler.
- I/O refreshing can be synchronized with the control cycle of the Controller. (Synchronous refreshing)
- ON/OFF response time of the high-speed model is 100 μ s max, which enables high-speed, high-precision control.
- The removable screwless terminal block improves maintenance.
- Screw-less clamp terminal block significantly reduces wiring work.
- 12-mm-wide unit can save space.
- The lineup including 2-point, 4-point, 8-point, and 16-point types enables ideal system configuration for your system.

System Configuration



* OMRON CJ1W-NC□81/□82 Position Control Units cannot be connected to the EtherCAT Slave Terminal even though they support EtherCAT.


Sysmac® is a trademark or registered trademark of OMRON Corporation in Japan and other countries for OMRON factory automation products. EtherCAT® is a registered trademark of Beckhoff Automation GmbH for their patented technology. Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

Ordering Information


International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Transistor Output Unit

Unit type	Product Name	Specification					I/O refreshing method	NX Unit power consumption	Model	Standards
		Capacity	Internal I/O common	Rated voltage	Maximum value of load current	ON/OFF response time				
NX Series Digital output Units	 Transistor Output Unit	4 points	NPN	DC12 to 24V	0.5 A/point, 2 A/NX Unit	0.1ms max./0.8ms max.	Switching Synchronous I/O refreshing and Free-Run refreshing	0.55W max.	NX-OD3121	UC1,CE,KC
				300ns max./300ns max.		0.50W max.		NX-OD3153		
			DC24V	0.5ms max./1.0ms max.		0.55W max.		NX-OD3256		
				300ns max./300ns max.		0.50W max.		NX-OD3257		
		8 points	NPN	DC12 to 24V	0.5 A/point, 4 A/NX Unit	0.1ms max./0.8ms max.		0.55W max.	NX-OD4121	
			PNP	DC24V		0.5ms max./1.0ms max.		0.65W max.	NX-OD4256	
		16 points	NPN	DC12 to 24V	0.5 A/point, 4 A/NX Unit	0.1ms max./0.8ms max.		0.65W max.	NX-OD5121	
			PNP	DC24V		0.5ms max./1.0ms max.		0.70W max.	NX-OD5256	

Relay Output Unit

Unit type	Product Name	Specification				I/O refreshing method	NX Unit power consumption	Model	Standards
		Capacity	Relay type	Maximum switching capacity	ON/OFF response time				
NX Series Digital output Units	 Relay Output Unit	2 points	N.O.	AC250V/2A (cosφ=1) AC250V/2A (cosφ=0.4) DC24V/2A 4A/NX Unit	15ms max./15ms max.	Free-Run refreshing	0.80W max.	NX-OC2633	UC1,CE,KC

Option

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

Accessories

Not included.

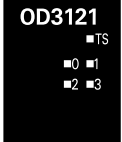
General Specification

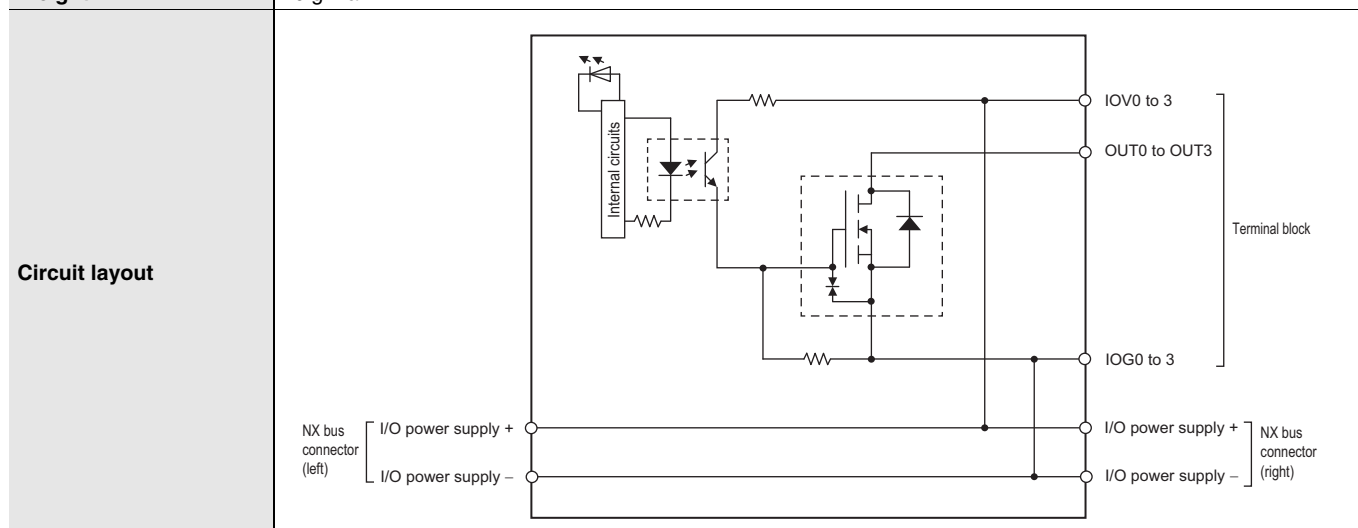
Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to 100 Ω or less
Operating environment	Ambient operating temperature	0 to 55°C
	Ambient operating humidity	10% to 95% (with no condensation or icing)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70°C (with no condensation or icing)
	Altitude	2,000 m max.
	Pollution degree	2 or less: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)
	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.
	EMC immunity level	Zone B
	Vibration resistance*	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz, acceleration of 9.8 m/s ² , 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
Shock resistance*	Conforms to IEC 60068-2-27. 147 m/s ² , 3 times each in X, Y, and Z directions	
Applicable standards		cULus: Listed UL508 and ANSI/ISA 12.12.01 EC: EN 61131-2 and C-Tick, KC Registration

* For the Relay Output Unit, refer to the Digital Input Unit Specifications.

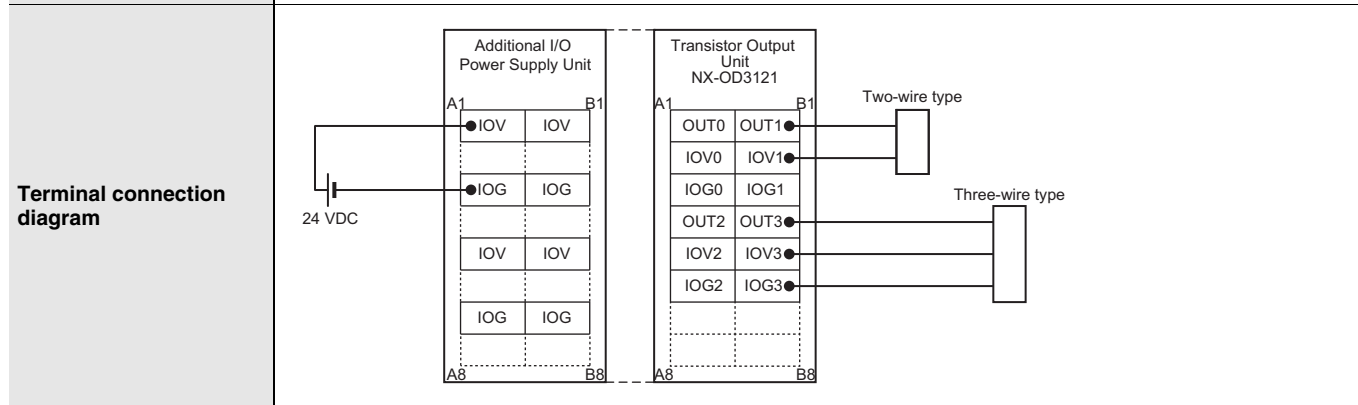
Digital Input Unit Specifications

Transistor Output Unit 4 points NX-OD3121

Unit name	Transistor Output Unit	Model	NX-OD3121
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	NPN
		Rated voltage	12 to 24 VDC
		Operating load voltage range	10.2 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 2 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	0.1 ms max./0.8 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.5 A/terminal max., IOG: 0.5 A/terminal max.
NX Unit power consumption	0.55 W max.	I/O current consumption	10 mA max.
Weight	70 g max.		




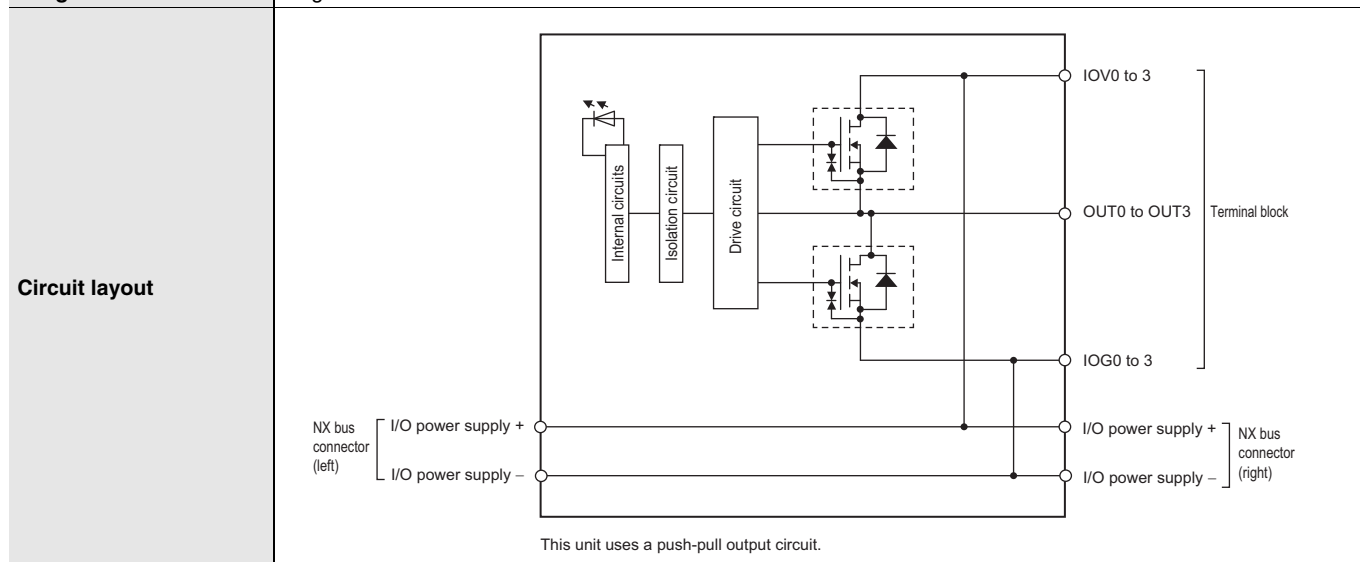
Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



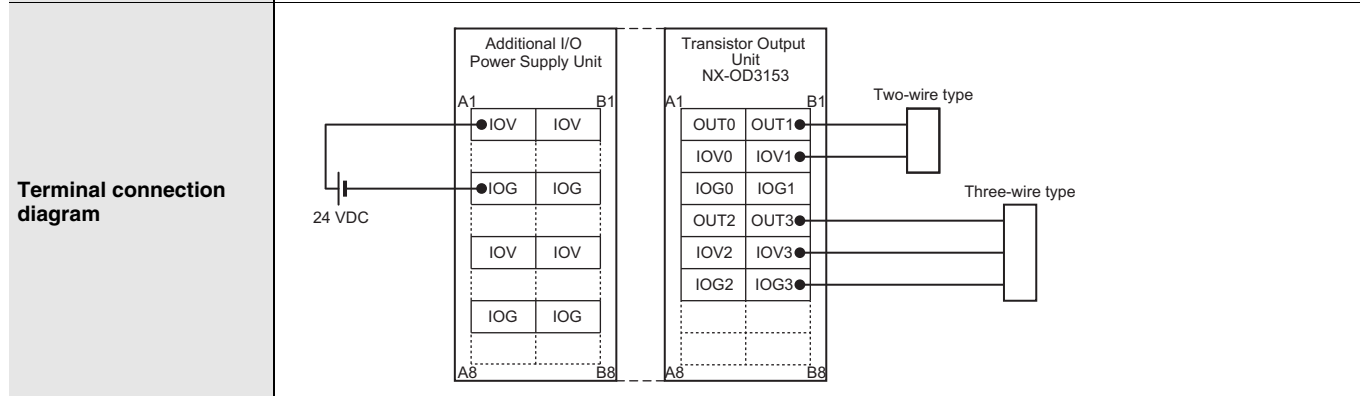
Disconnection/Short-circuit detection	Not supported.	Protective function	Not supported.
--	----------------	----------------------------	----------------

Transistor Output Unit 4 points NX-OD3153

Unit name	Transistor Output Unit	Model	NX-OD3153
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	NPN
		Rated voltage	24 VDC
		Operating load voltage range	15 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 2 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	300 ns max./300 ns max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Digital isolator isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.5 A/terminal max., IOG: 0.5 A/terminal max.
NX Unit power consumption	0.50 W max.	I/O current consumption	30 mA max.
Weight	70 g max.		




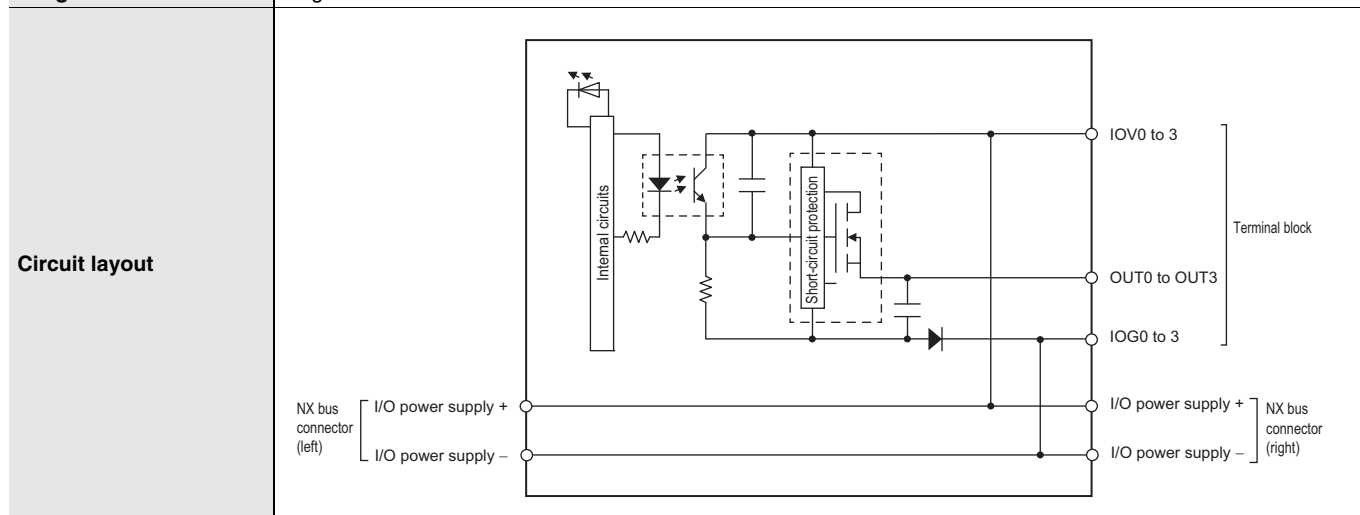
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions
--	--



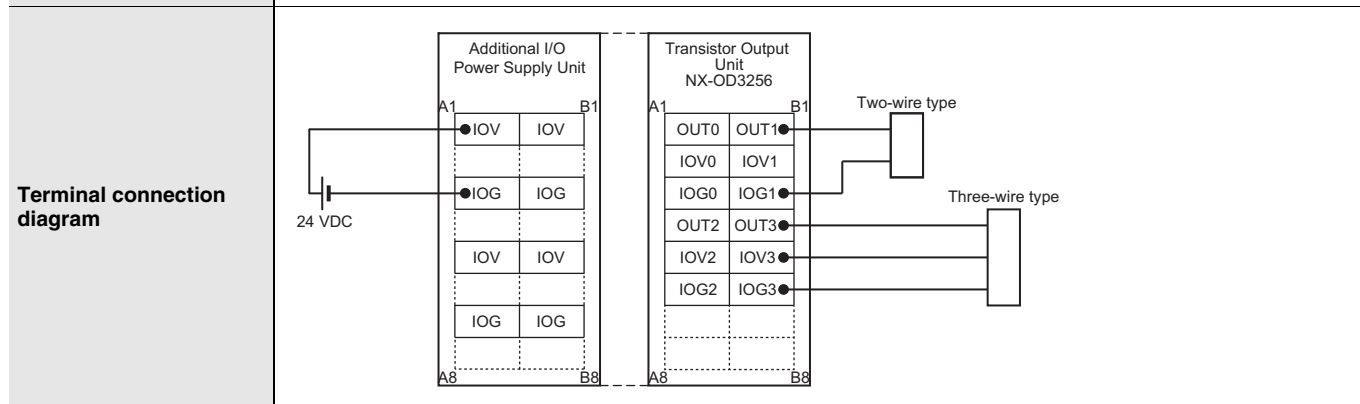
Disconnection/Short-circuit detection	Not supported.	Protective function	Not supported.
--	----------------	----------------------------	----------------

Transistor Output Unit 4 points NX-OD3256

Unit name	Transistor Output Unit	Model	NX-OD3256
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	PNP
		Rated voltage	24 VDC
		Operating load voltage range	15 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 2 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	0.5 ms max./1.0 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.5 A/terminal max., IOG: 0.5 A/terminal max.
NX Unit power consumption	0.55 W max.	I/O current consumption	20 mA max.
Weight	70 g max.		




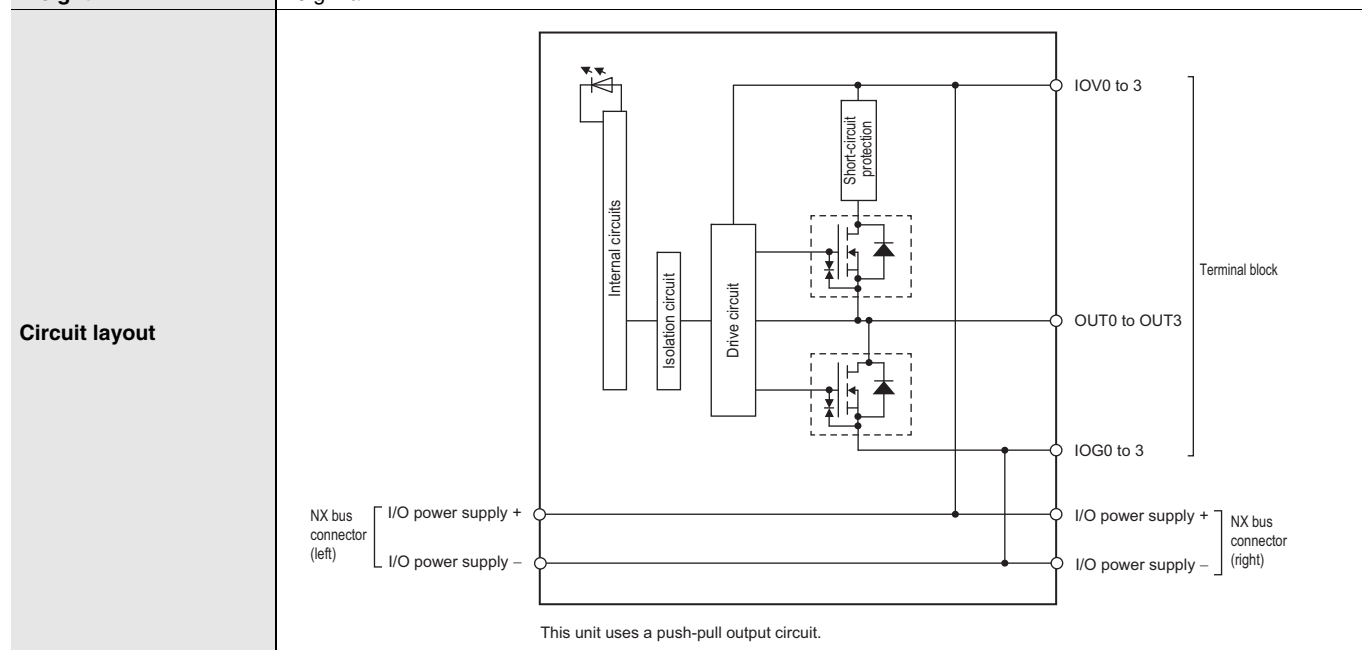
Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



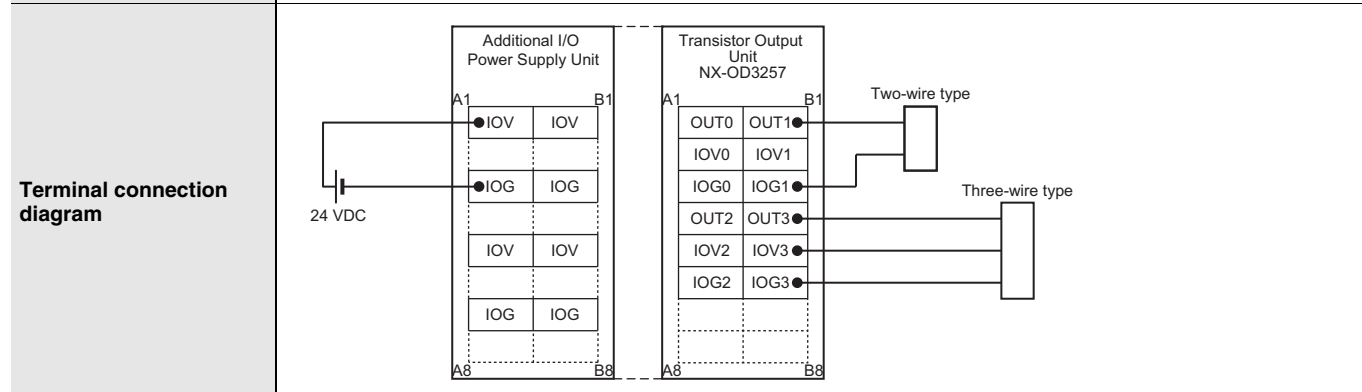
Disconnection/Short-circuit detection	Not supported.	Protective function	With load short-circuit protection.
--	----------------	----------------------------	-------------------------------------

Transistor Output Unit 4 points NX-OD3257

Unit name	Transistor Output Unit	Model	NX-OD3257
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	PNP
		Rated voltage	24 VDC
		Operating load voltage range	15 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 2 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	300 ns max./300 ns max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Digital isolator isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.5 A/terminal max., IOG: 0.5 A/terminal max.
NX Unit power consumption	0.50 W max.	I/O current consumption	40 mA max.
Weight	70 g max.		

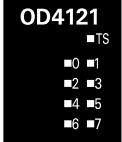


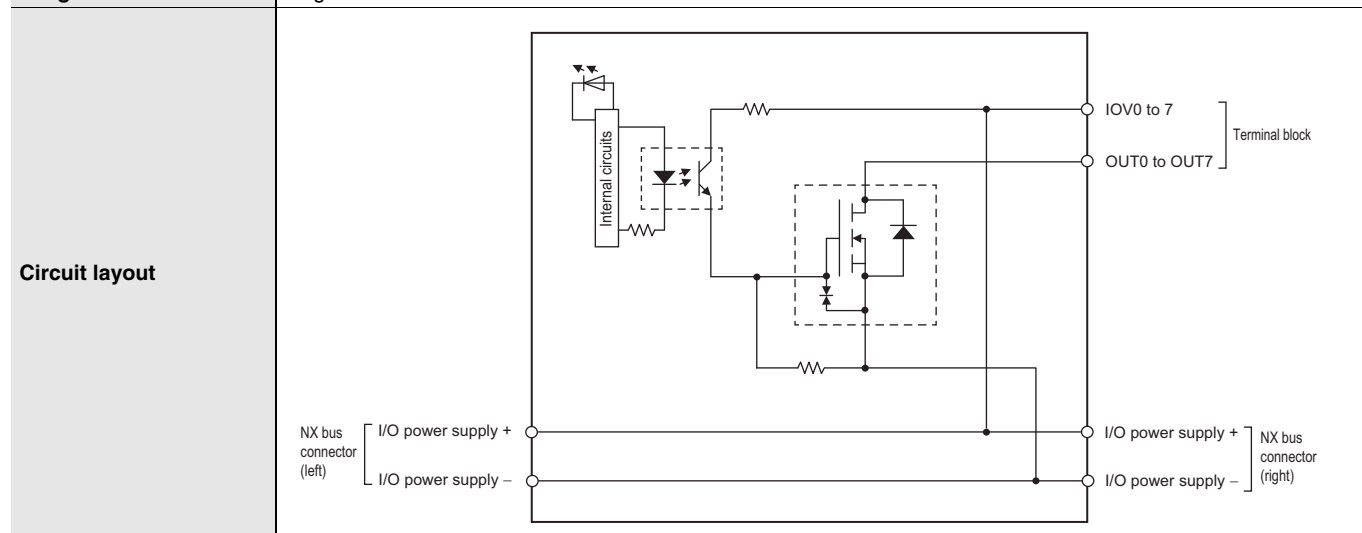
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions
--	--



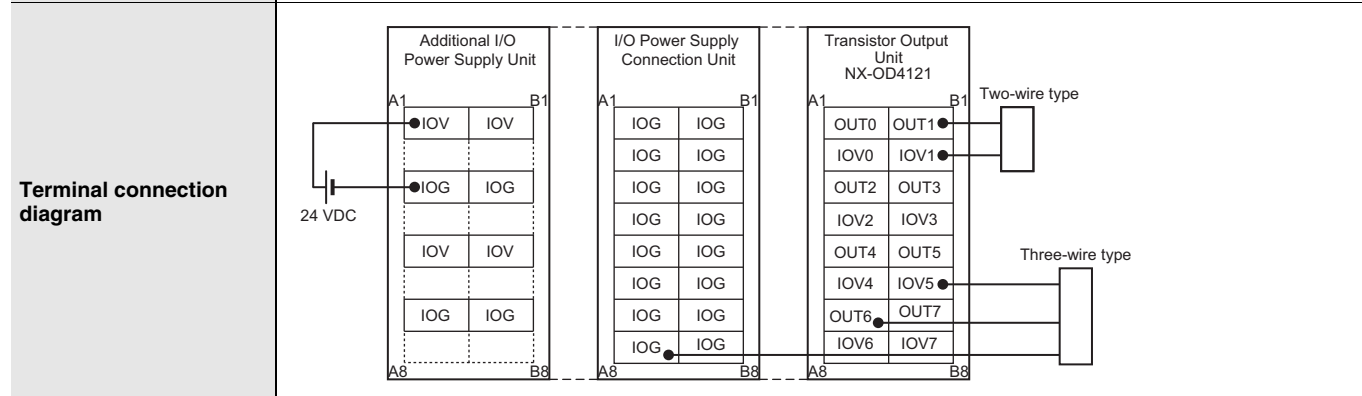
Disconnection/Short-circuit detection	Not supported.	Protective function	With load short-circuit protection.
--	----------------	----------------------------	-------------------------------------

Transistor Output Unit 8 points NX-OD4121

Unit name	Transistor Output Unit	Model	NX-OD4121
Capacity	8 points	External connection terminals	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	NPN
		Rated voltage	12 to 24 VDC
		Operating load voltage range	10.2 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 4 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA
		Residual voltage	1.5 V max.
		ON/OFF response time	0.1 ms max./0.8 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.5 A/terminal max.
NX Unit power consumption	0.55 W max.	I/O current consumption	10 mA max.
Weight	70 g max.		

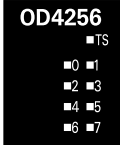


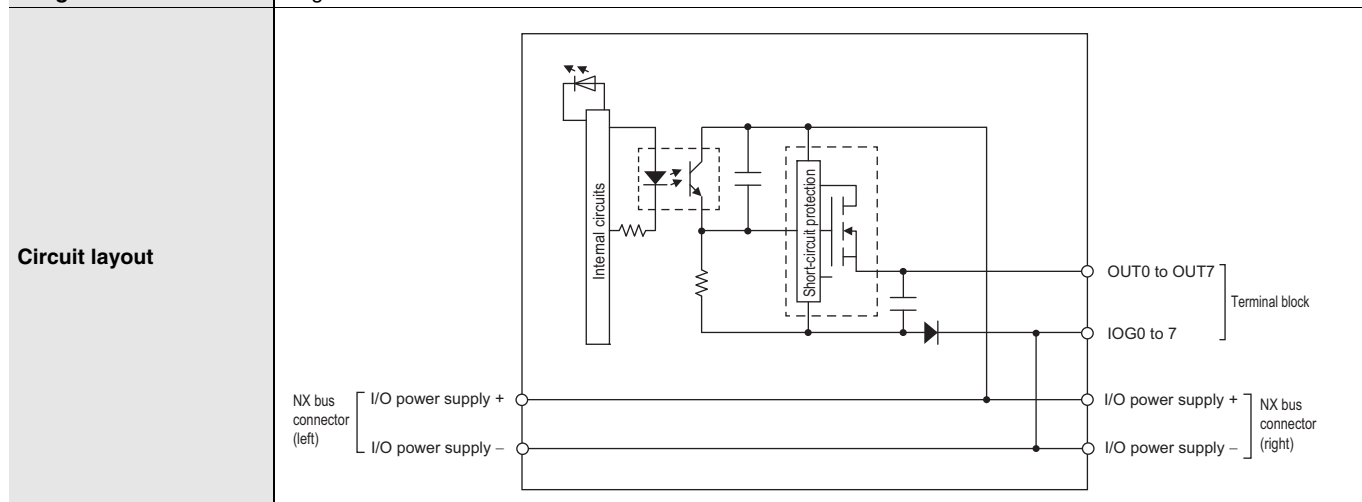
Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



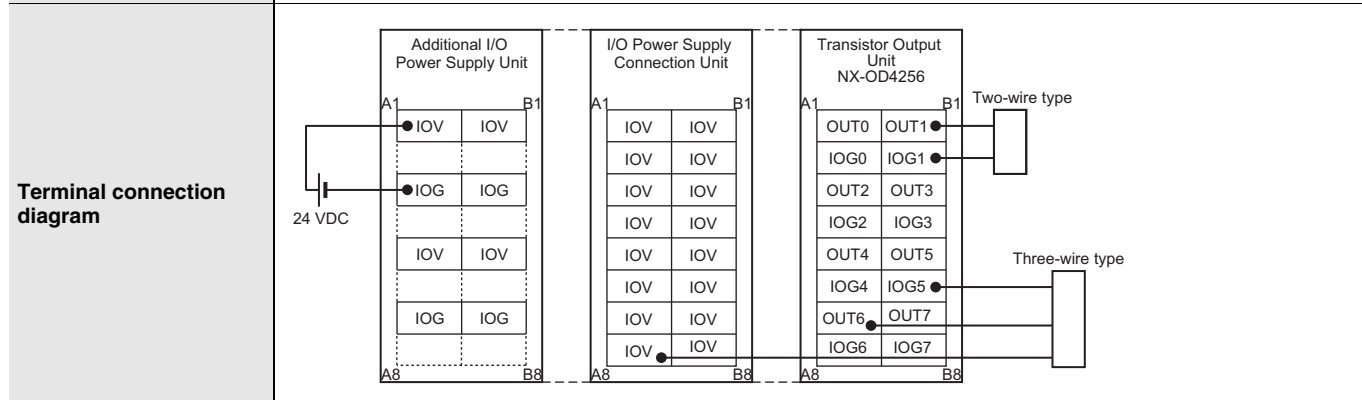
Disconnection/Short-circuit detection	Not supported.	Protective function	Not supported.
--	----------------	----------------------------	----------------

Transistor Output Unit 8 points NX-OD4256

Unit name	Transistor Output Unit	Model	NX-OD4256
Capacity	8 points	External connection terminals	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	PNP
		Rated voltage	24 VDC
		Operating load voltage range	15 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 4 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA
		Residual voltage	1.5 V max.
		ON/OFF response time	0.5 ms max./1.0 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOG: 0.5 A/terminal max.
NX Unit power consumption	0.65 W max.	I/O current consumption	30 mA max.
Weight	70 g max.		

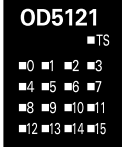


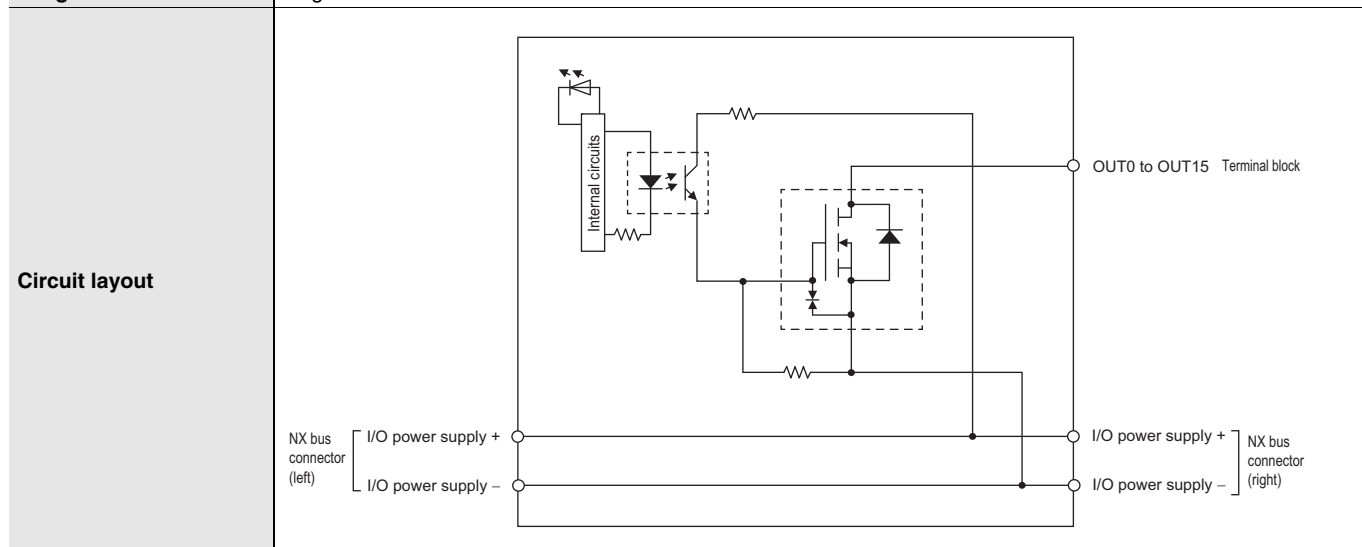
Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



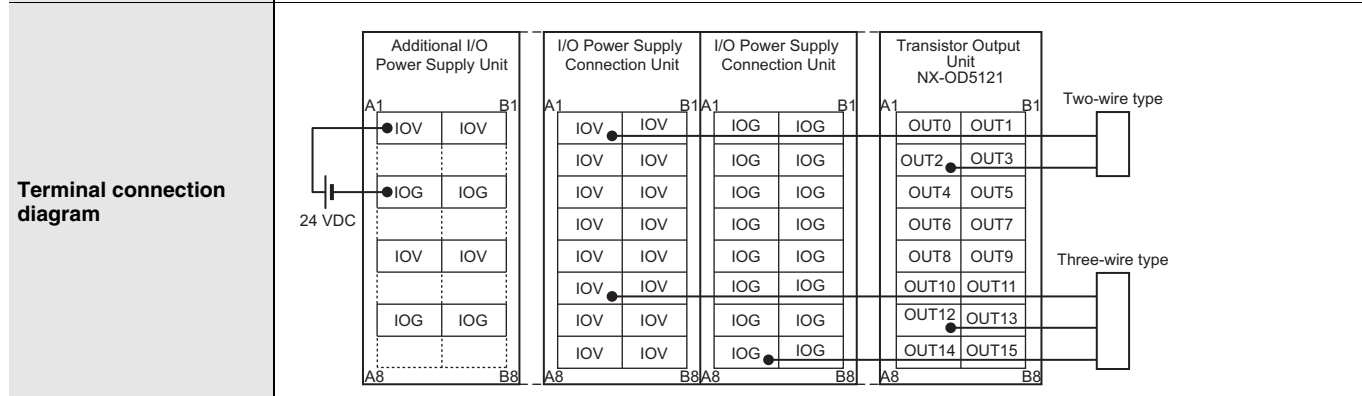
Disconnection/Short-circuit detection	Not supported.	Protective function	With load short-circuit protection.
--	----------------	----------------------------	-------------------------------------

Transistor Output Unit 16 points NX-OD5121

Unit name	Transistor Output Unit	Model	NX-OD5121
Capacity	16 points	External connection terminals	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing		
Indicators		Internal I/O common	NPN
		Rated voltage	12 to 24 VDC
		Operating load voltage range	10.2 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 4 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	0.1 ms max./0.8 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	Without I/O power supply terminals
NX Unit power consumption	0.65 W max.	I/O current consumption	20 mA max.
Weight	70 g max.		

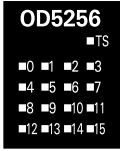


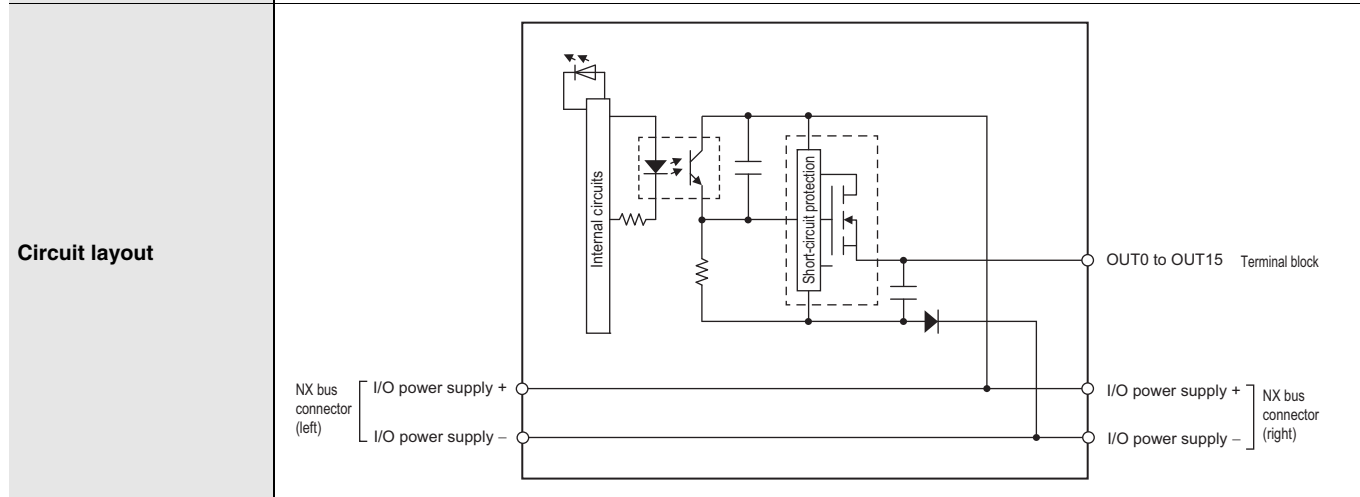
Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



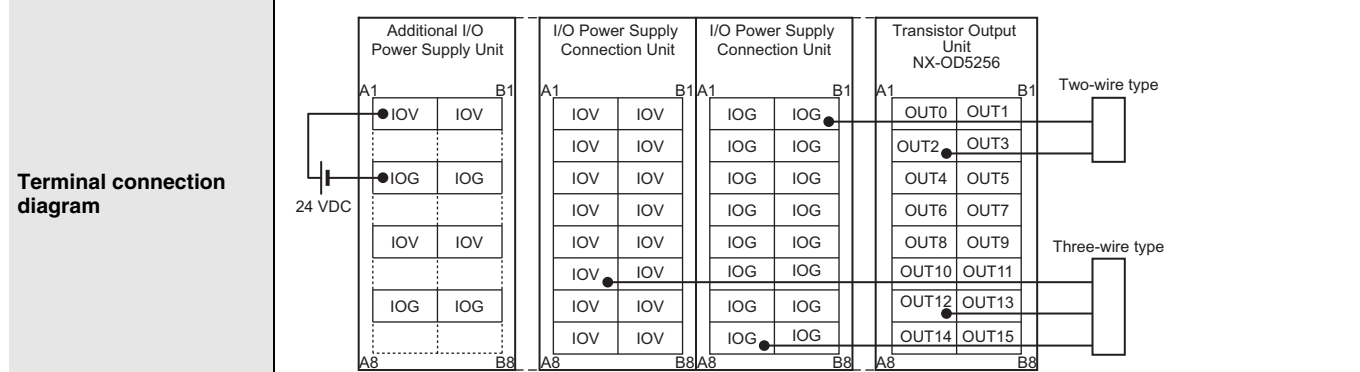
Disconnection/Short-circuit detection	Not supported.	Protective function	Not supported.
--	----------------	----------------------------	----------------

Transistor Output Unit 16 points NX-OD5256

Unit name	Transistor Output Unit	Model	NX-OD5256
Capacity	16 points	External connection terminals	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Switching Synchronous I/O refreshing and Free-Run refreshing NX		
Indicators		Internal I/O common	PNP
		Rated voltage	24 VDC
		Operating load voltage range	15 to 28.8 VDC
		Maximum value of load current	0.5 A/point, 4 A/NX Unit
		Maximum inrush current	4.0 A/point, 10 ms max.
		Leakage current	0.1 mA max.
		Residual voltage	1.5 V max.
		ON/OFF response time	0.5 ms max./1.0 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	Without I/O power supply terminals
NX Unit power consumption	0.70 W max.	I/O current consumption	40 mA max.
Weight	70 g max.		




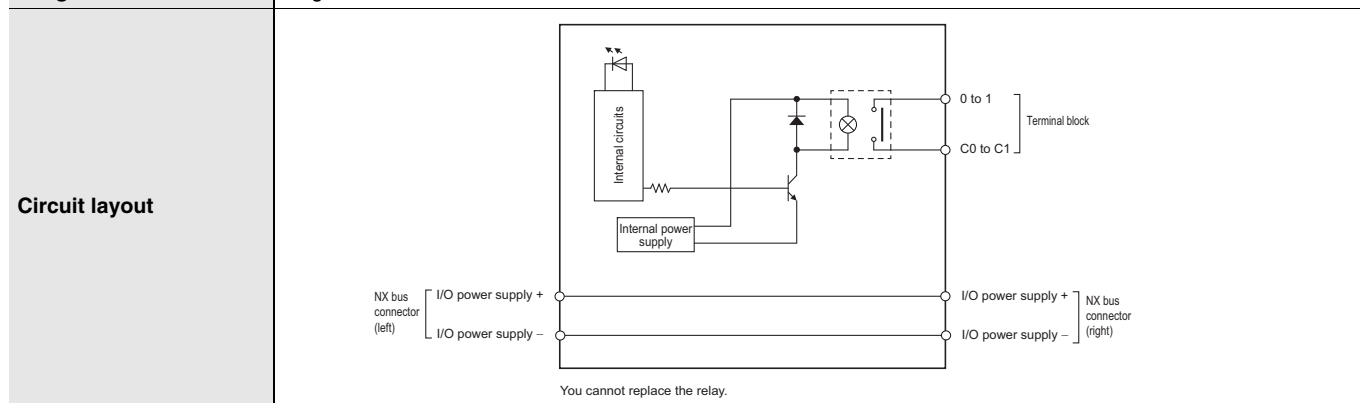
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions
--	--



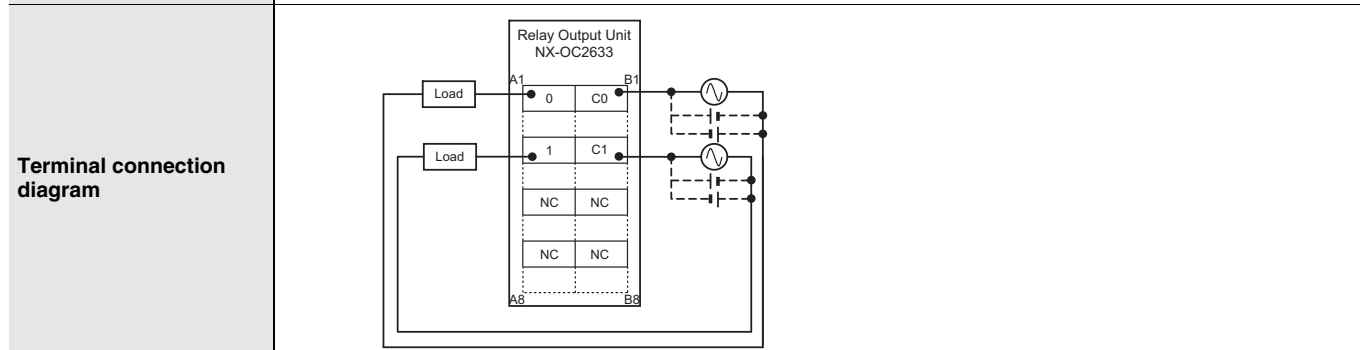
Disconnection/Short-circuit detection	Not supported.	Protective function	With load short-circuit protection.
--	----------------	----------------------------	-------------------------------------

Relay Output Unit 2 points, independent contacts NX-OC2633

Unit name	Relay Output Units	Model	NX-OC2633
Capacity	2 points, independent contacts	External connection terminals	Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing		
Indicators		Relay type	N.O. contact
		Maximum switching capacity	250 VAC/2 A ($\cos\phi = 1$), 250 VAC/2 A ($\cos\phi = 0.4$), 24 VDC/2 A, 4 A/Unit
		Minimum switching capacity	5 VDC, 1 mA
Relay service life	Electrical: 100,000 operations* Mechanical: 20,000,000 operations	ON/OFF response time	15 ms max./15 ms max.
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	Relay isolation
Insulation resistance	Between A1/B1 terminals and A3/B3 terminals: 20 M Ω min. (500 VDC) Between the external terminals and internal circuits: 20 M Ω min. (500 VDC) Between the internal circuit and GR terminal: 20 M Ω min. (100 VDC) Between the external terminals and GR terminal: 20 M Ω min. (500 VDC)	Dielectric strength	Between A1/B1 terminals and A3/B3 terminals: 2300 VAC for 1 min at a leakage current of 5 mA max. Between the external terminals and GR 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 GR terminal: 510 VAC for 1 min at a leakage current of 5 mA max.
Vibration resistance	Conforms to IEC60068-2-6. 5 to 8.4 Hz with amplitude of 3.5 mm, 8.4 to 150 Hz, acceleration of 9.8 m/s ² 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)	Shock resistance	100 m/s ² , 3 times each in X, Y, and Z directions
I/O power supply method	Supply from external source	Current capacity of I/O power supply terminal	Without I/O power supply terminals
NX Unit power consumption	0.80 W max.	I/O current consumption	No consumption
Weight	65 g max.		



Installation orientation and restrictions
 Installation orientation: Possible in 6 orientations.
 Restrictions: No restrictions



Disconnection/Short-circuit detection	Not supported.	Protective function	Not supported.
--	----------------	----------------------------	----------------

* Electrical service life will vary depending on the current value. Refer to "NX-series Digital I/O Units User's Manual" for details.

Version Information

NX Series Digital Output Unit and Sysmac Studio

NX Series Digital Output Unit	Sysmac Studio	
	Version 1.05 or lower	Version 1.06 or higher
NX-OD□□□□	Not supported	Supported
NX-OC□□□□		

External Interface

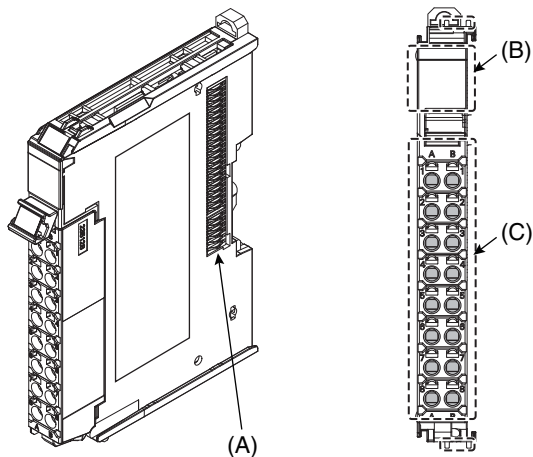
Transistor Output Unit

NX-OD□□□□

Relay Output Unit

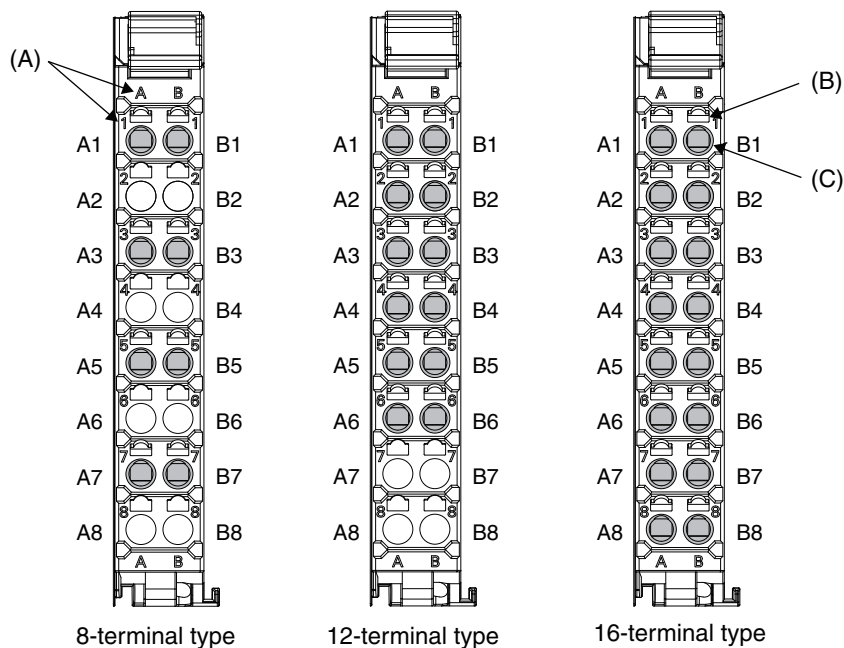
NX-OC2633

12mm Width



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

Terminal Blocks



Symbol	Name	Function
(A)	Terminal number indications	Terminal numbers for which A to D indicate the column, and 1 to 8 indicate the line are displayed. The terminal number is a combination of column and line, so A1 to A8 and B1 to B8 are displayed. The terminal number indications are the same regardless of the number of terminals on the terminal block.
(B)	Release holes	Insert a flat-blade screwdriver into these holes to connect and remove the wires.
(C)	Terminal holes	The wires are inserted into these holes.

Applicable Wires

Using Ferrules

If you use ferrules, attach the twisted wires to them.

Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.

Always use one-pin ferrules. Do not use two-pin ferrules.

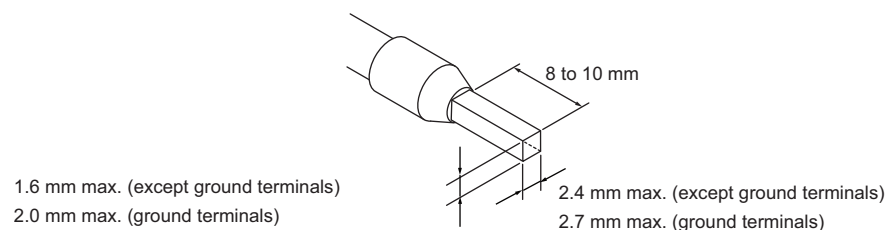
The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal types	Manufacturer	Ferrule model number	Applicable wire (mm ² (AWG))	Crimping tool
Terminals other than ground terminals	Phoenix Contact	AI0,34-8	0.34 (#22)	Phoenix Contact (The figure in parentheses is the applicable wire size.) CRIMPFOX 6 (0.25 to 6 mm ² , AWG24 to 10)
		AI0,5-8	0.5 (#20)	
		AI0,5-10		
		AI0,75-8	0.75 (#18)	
		AI0,75-10		
		AI1,0-8	1.0 (#18)	
		AI1,0-10		
		AI1,5-8	1.5 (#16)	
Ground terminals		AI1,5-10		
Terminals other than ground terminals	Weidmuller	H0.14/12	0.14 (#26)	Weidmuller (The figure in parentheses is the applicable wire size.) PZ6 Roto (0.14 to 6 mm ² , AWG 26 to 10)
		H0.25/12	0.25 (#24)	
		H0.34/12	0.34 (#22)	
		H0.5/14	0.5 (#20)	
		H0.5/16		
		H0.75/14	0.75 (#18)	
		H0.75/16		
		H1.0/14	1.0 (#18)	
		H1.0/16		
		H1.5/14	1.5 (#16)	
		H1.5/16		

* Some AWG 14 wires exceed 2.0 mm² and cannot be used in the screwless clamping terminal block.

When you use any ferrules other than those in the above table, crimp them to the twisted wires so that the following processed dimensions are achieved.

Finished Dimensions of Ferrules

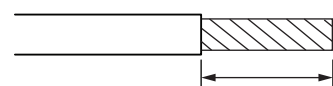


Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, the applicable wire range and conductor length (stripping length) are as follows.

Use the twisted wires to connect the ground wire to a ground of 100 Ω or less. Do not use the solid wires.

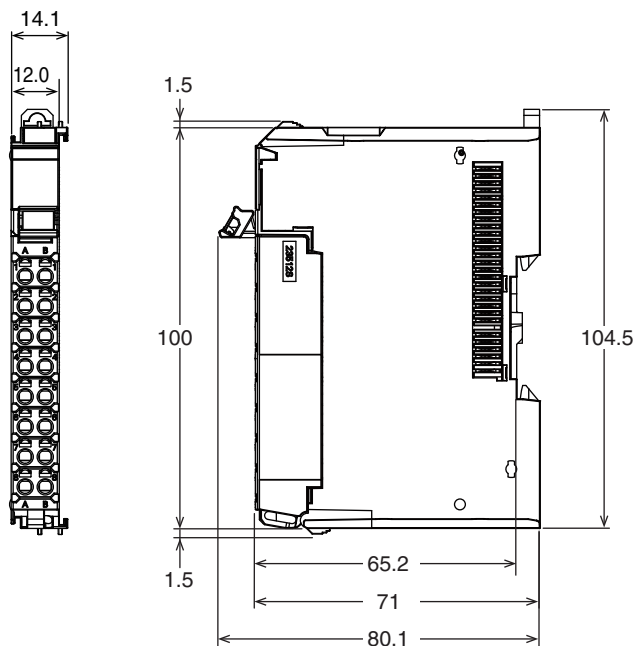
Terminal types	Applicable wires	Conductor length (stripping length)
Ground terminals	2.0 mm ²	9 to 10 mm
Terminals other than ground terminals	0.08 to 1.5 mm ² AWG28 to 16	8 to 10 mm



Conductor length (stripping length)

Dimensions

Digital Output Unit
 NX-OD□□□□
 12 mm Width



Related Manuals

Cat. No.	Model number	Manual name	Application	Description
W521	NX-ID□□□□ NX-OD□□□□ NX-OC□□□□	NX-series Digital I/O Units User's Manual	Learning how to use NX-series Digital I/O Units	The hardware, setup methods, and functions of the NX-series Digital I/O Units are described.

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.