NX-series Analog Output Unit

NX-DA

CSM_NX-DA_DS_E_1_1

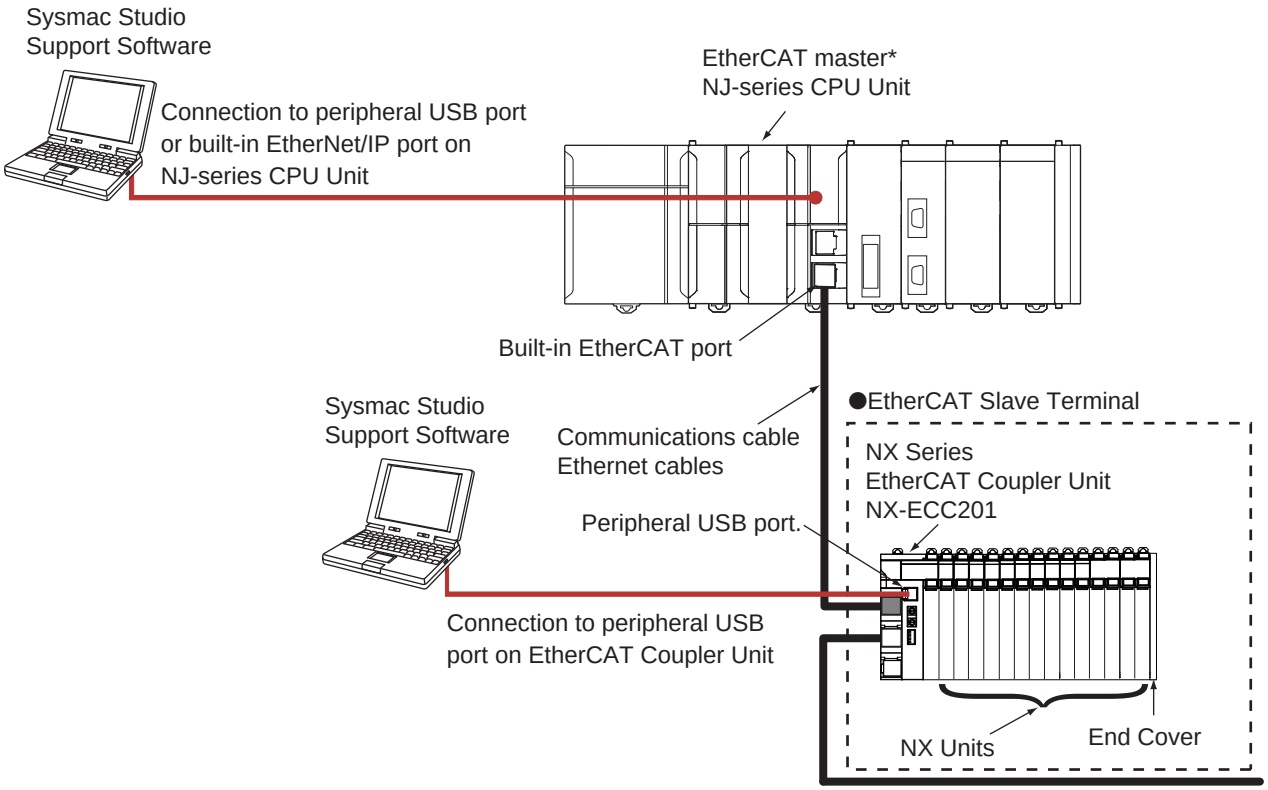
Analog Outputs to meet all machine control needs; from general-purpose outputs to high-speed synchronous, high-resolution control outputs

- Analog Output Units for the NX-series modular I/O system.
- Connect to other NX-series I/O Units and EtherCAT Coupler units using the high-speed NX-bus.
- Separate modules for voltage- and current outputs.

Features

- Up to four analog outputs per unit.
- Free-run refreshing or synchronous I/O refreshing can be selected using the NX-series EtherCAT Coupler.
- Output update cycles of 10 μs per channel, and resolution of 1/30000, ideal for high-speed, high-precision control.
- The screwless terminal block is detachable for easy commissioning and maintenance.
- Screwless push-in terminal block significantly reduces wiring work.
- All models are just 12 mm wide, saving space in your cabinet.

System Configuration



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

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.

Analog Output Unit

Unit type	Product Name	Specification							NX Unit power consumption	Model	Standards
		Capacity	Input range	Resolution	Output setting value, decimal number (0 to 100%)	Over all accuracy (25°C)	Conversion time	I/O refreshing method			
NX Series Analog Output Unit	Voltage Output Unit 	2 points	-10 to +10V	1/8000	-4000 to 4000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	1.10W max.	**NX-DA2603**	UC1,CE,KC
				1/30000	-15000 to 15000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.10W max.	**NX-DA2605**	
		4 points		1/8000	-4000 to 4000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	1.25W max.	**NX-DA3603**	
				1/30000	-15000 to 15000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.25W max.	**NX-DA3605**	
	Current Output Unit 	2 points	4 to 20mA	1/8000	0 to 8000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	1.75W max.	**NX-DA2203**	
				1/30000	0 to 30000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.75W max.	**NX-DA2205**	
		4 points		1/8000	0 to 8000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	1.80W max.	**NX-DA3203**	
				1/30000	0 to 30000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	1.80W max.	**NX-DA3205**	

Option

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

Accessories

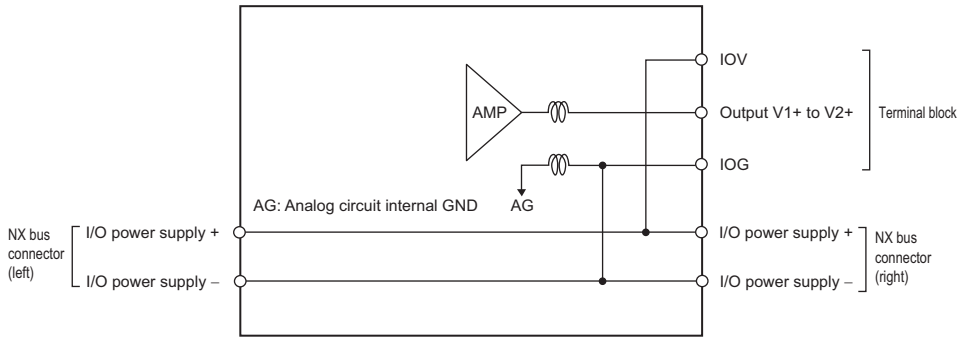
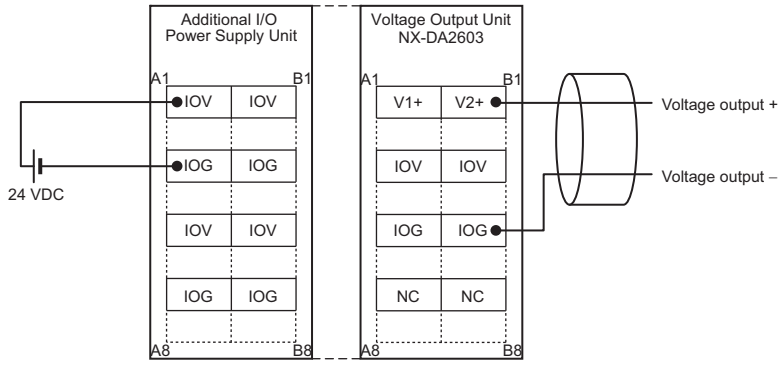
Not included.

General Specification

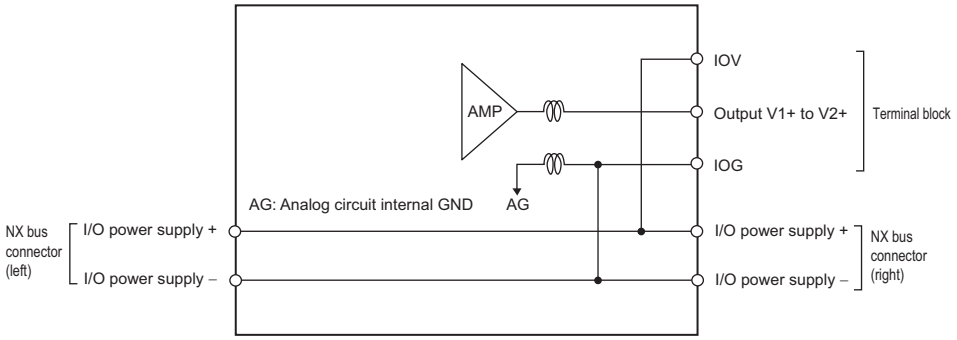
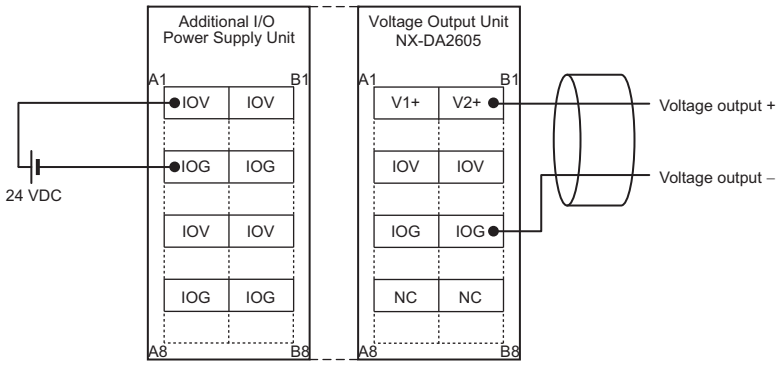
Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to 100 Ω or less
Operating environment	Ambient operating temperature	0 to 55°C
	Ambient operating humidity	10% to 95% (with no condensation or icing)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	−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	IConforms 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

Analog Output Unit Specifications

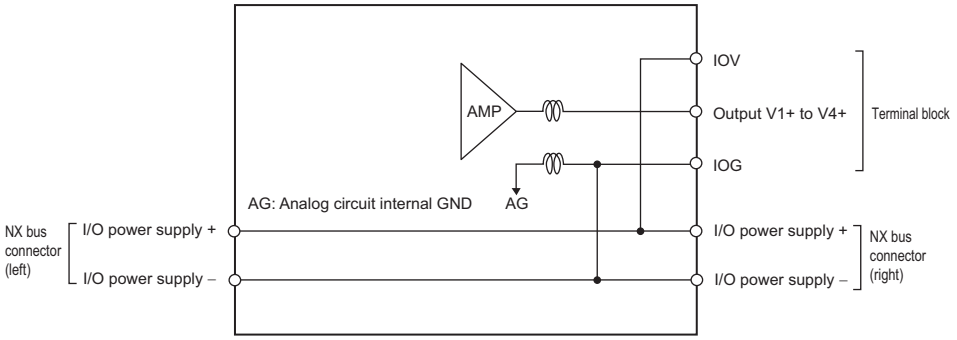
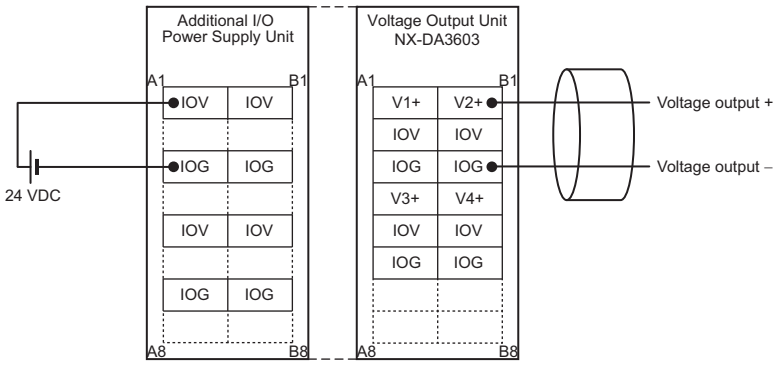
Analog Output Unit (voltage output type) 2points NX-DA2603

Unit name	Analog Output Unit (voltage output type)	**Model**		NX-DA2603
Capacity	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Output range**		-10 to +10 V
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		5 kΩ min.
		Output impedance		0.5 Ω max.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.3% (full scale)
			0 to 55°C	±0.5% (full scale)
		Conversion time		250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.10 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				

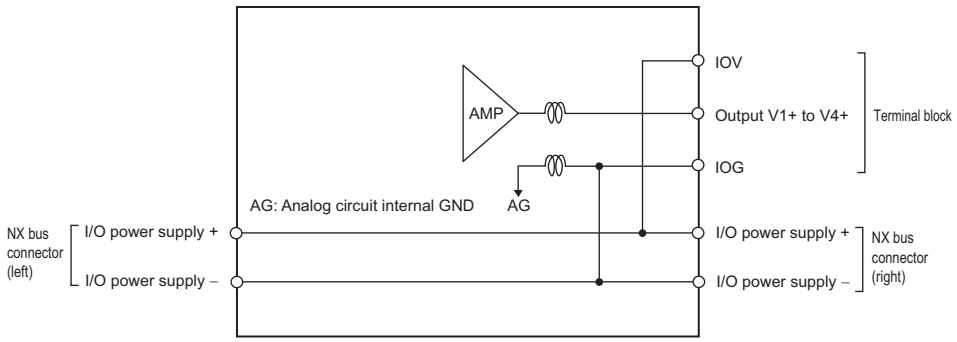
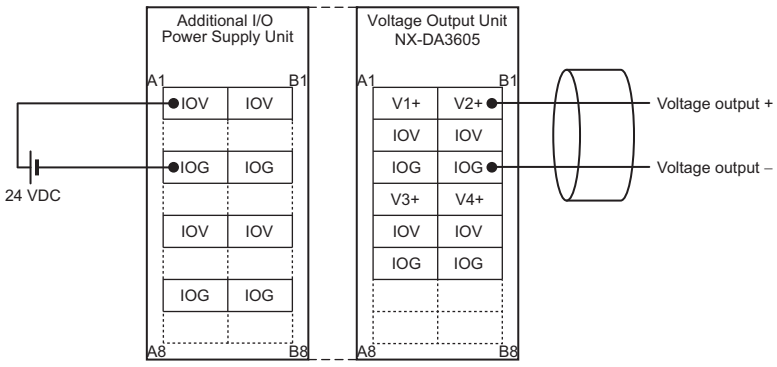
Analog Output Unit (voltage output type) 2points NX-DA2605

Unit name	Analog Output Unit (voltage output type)	**Model**		NX-DA2605
Capacity	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing			
Indicator	TS indicator 	**Output range**		-10 to +10 V
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		5 kΩ min.
		Output impedance		0.5 Ω max.
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.3% (full scale)
		Conversion time		10 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.10 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				

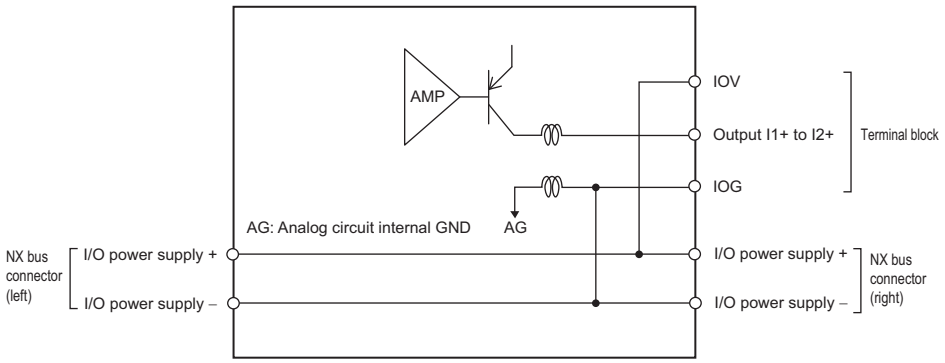
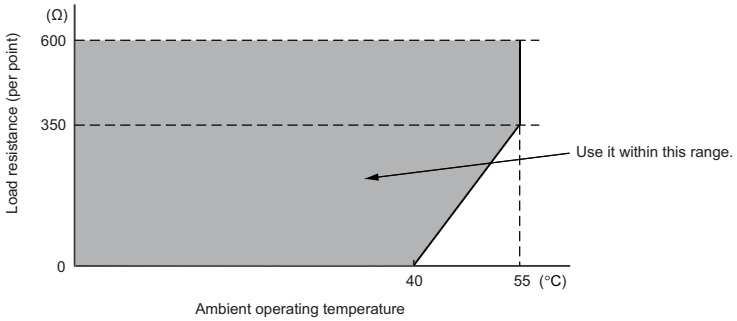
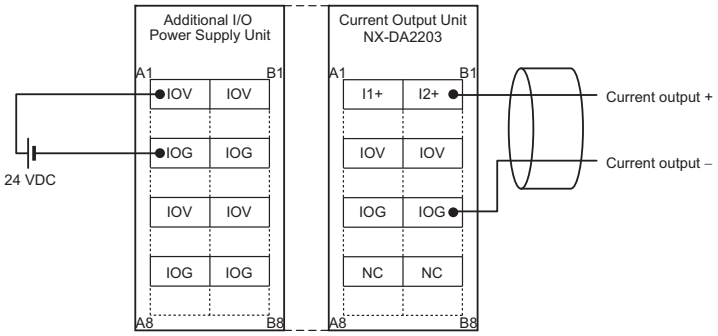
Analog Output Unit (voltage output type) 4points NX-DA3603

Unit name	Analog Output Unit (voltage output type)	**Model**		NX-DA3603
Capacity	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Output range**		-10 to +10 V
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		5 kΩ min.
		Output impedance		0.5 Ω max.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.3% (full scale)
			0 to 55°C	±0.5% (full scale)
		Conversion time		250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.25 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				

Analog Output Unit (voltage output type) 4points NX-DA3605

Unit name	Analog Output Unit (voltage output type)	**Model**		NX-DA3605
Capacity	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing			
Indicator	TS indicator 	**Output range**		-10 to +10 V
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		5 kΩ min.
		Output impedance		0.5 Ω max.
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.3% (full scale)
		Conversion time		10 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.25 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				

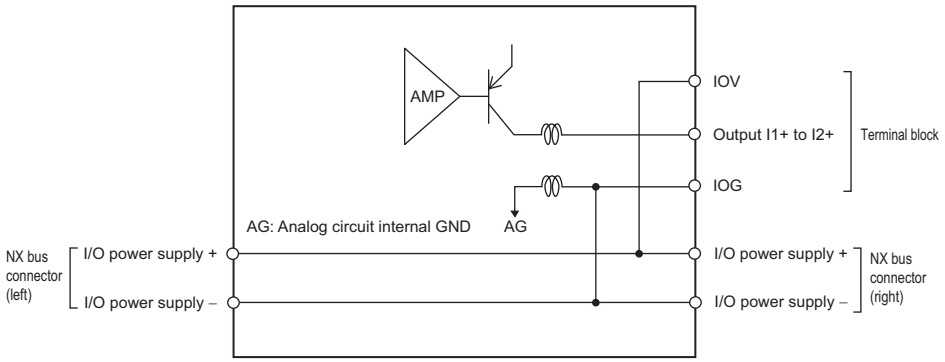
Analog Output Unit (current output type) 2points NX-DA2203

Unit name	Analog Output Unit (current output type)	**Model**		NX-DA2203
Capacity	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Output range**		4 to 20 mA
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		600 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.3% (full scale)
			0 to 55°C	±0.6% (full scale)
		Conversion time		250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.75 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below. 			
Terminal connection diagram				

Analog Output Unit (current output type) 2points NX-DA2205

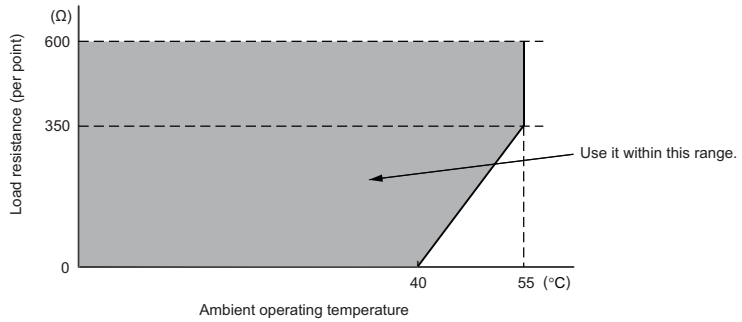
Unit name	Analog Output Unit (current output type)	**Model**	NX-DA2205
Capacity	2 points	**External connection terminals**	Screwless clamping terminal block (8 terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing		
Indicator	TS indicator 	**Output range**	4 to 20 mA
		Output conversion range	-5 to 105% (full scale)
		Allowable load resistance	600 Ω min.
		Resolution	1/30000 (full scale)
		Overall accuracy 25°C	±0.1% (full scale)
		Overall accuracy 0 to 55°C	±0.3% (full scale)
		Conversion time	10 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**	Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.75 W max.	**I/O current consumption**	No consumption
Weight	70 g max.		

Circuit layout

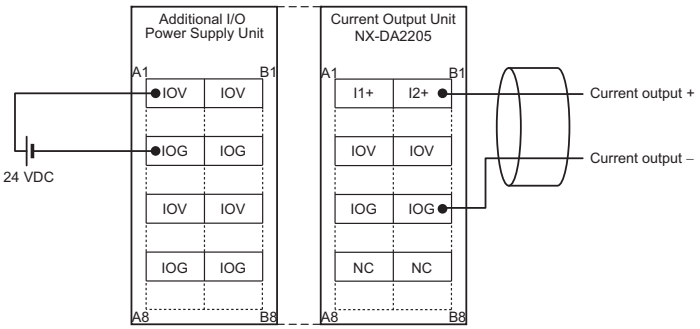


Installation orientation and restrictions

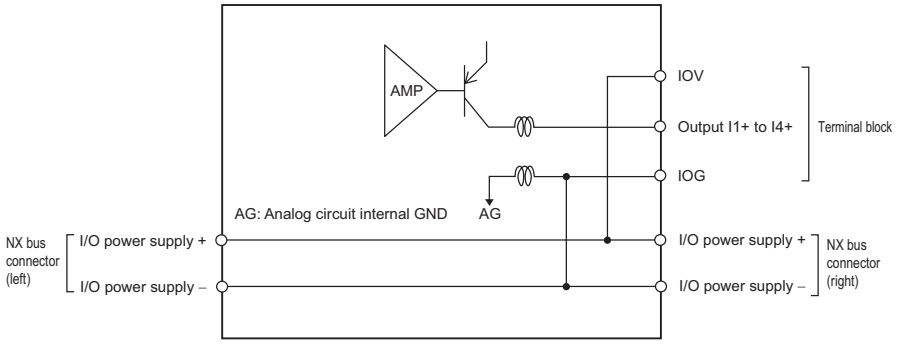
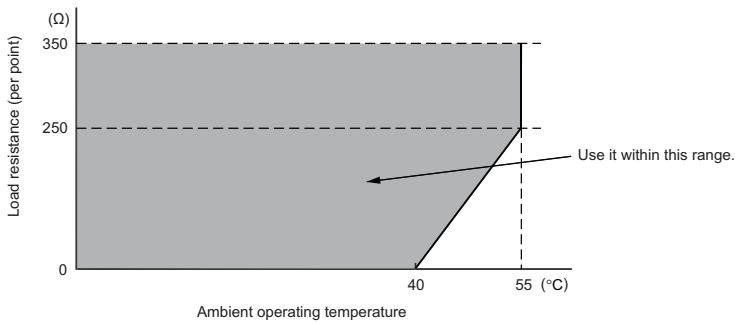
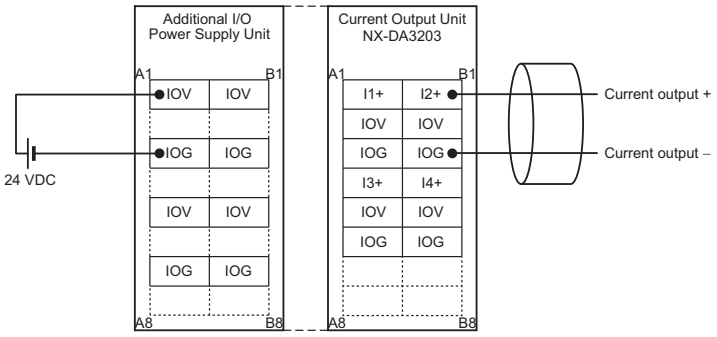
Installation orientation: Possible in 6 orientations.
Restrictions:
For upright installation: No restrictions
For any installation other than upright: Restricted as shown in the graph below.



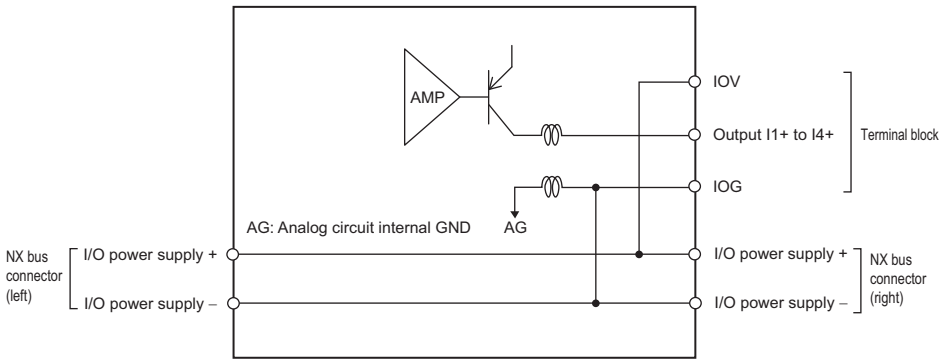
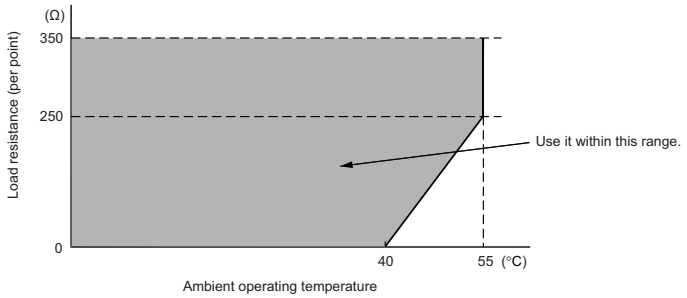
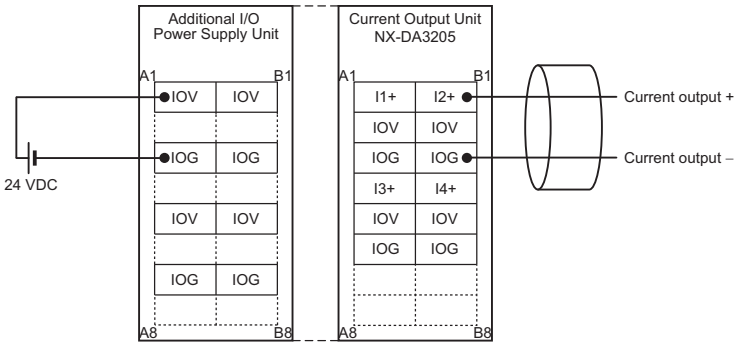
Terminal connection diagram



Analog Output Unit (current output type) 4points NX-DA3203

Unit name	Analog Output Unit (current output type)	**Model**		NX-DA3203
Capacity	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Output range**		4 to 20 mA
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		350 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.3% (full scale)
			0 to 55°C	±0.6% (full scale)
		Conversion time		250 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.80 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below. 			
Terminal connection diagram				

Analog Output Unit (current output type) 4points NX-DA3205

Unit name	Analog Output Unit (current output type)	**Model**		NX-DA3205
Capacity	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing			
Indicator	TS indicator 	**Output range**		4 to 20 mA
		Output conversion range		-5 to 105% (full scale)
		Allowable load resistance		350 Ω min.
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.3% (full scale)
		Conversion time		10 μs/point
Dimensions	12 (W) x 100 (H) x 71 (D)	**Isolation method**		Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)
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: 0.1 A/terminal max., IOG: 0.1 A/terminal max.
NX Unit power consumption	1.80 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below. 			
Terminal connection diagram				

Version Information

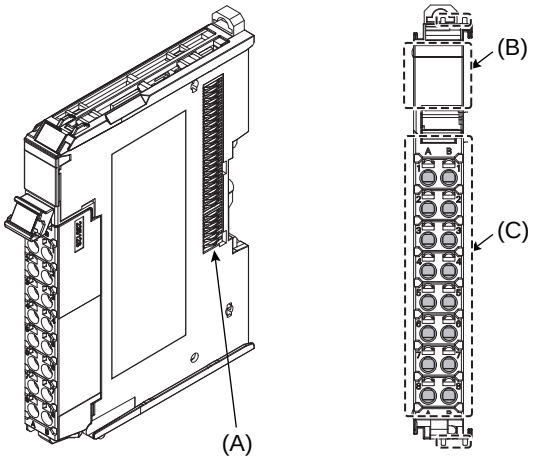
NX Series Analog Output Unit and Sysmac Studio

NX Series Analog Output Unit	Sysmac Studio	
	Version 1.05 or lower	Version 1.06 or higher
NX-DA□□□□	Not supported	Supported

External Interface

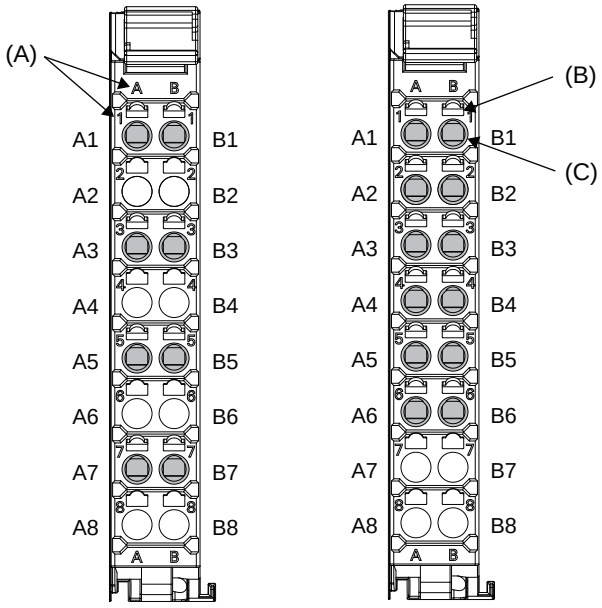
Analog Output Unit

NX-DA□□□□
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



12 mm width
8-terminal type

12 mm width
12-terminal type

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.

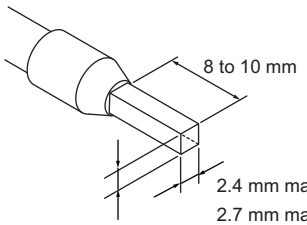
The applicable ferrules, wires, and crimping tool are given in the following table.

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)	
		AI1,5-10		
Ground terminals		AI2,5-10	2.0 *	
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 mm^2 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



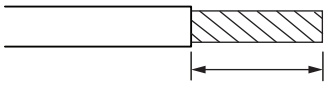
1.6 mm max. (except ground terminals)
2.0 mm max. (ground terminals)

2.4 mm max. (except ground terminals)
2.7 mm max. (ground terminals)

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)

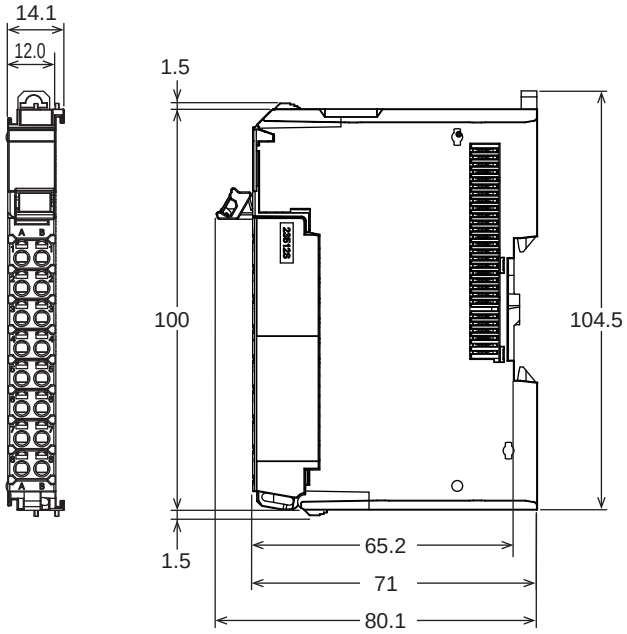
Dimensions

(Unit/mm)

Analog Output Unit

NX-DA□□□□

12 mm Width



Related Manuals

Cat. No.	Model number	Manual name	Application	Description
W522	NX-AD□□□□ NX-DA□□□□ NX-TS□□□□	NX-series Analog I/O Units User's Manual	Learning how to use NX-series Analog I/O Units and Temperature Input Units	The hardware, setup methods, and functions of the NX-series Analog I/O Units and Temperature Input Units are described.

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