NX-series Analog Input Unit

NX-AD

CSM_NX-AD_DS_E_3_1

Analog Inputs to meet all machine control needs; from general-purpose inputs to high-speed synchronous, high-resolution units

- Analog Input 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 inputs.

Features

- Up to eight analog inputs per unit.
- Free-Run refreshing or Synchronous I/O refreshing can be selected for refreshing with the NX-series NX1P2 CPU Unit or EtherCAT Coupler.
- Input update cycles of 10µs per channel, and a resolution of 1/30000, ideal for high-speed measurement and, high-precision control.
- All basic models are available as single-ended and differential-input types.
- 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.
- Connection to the CJ-series is possible by connecting with the EtherNet/IP™ Coupler.

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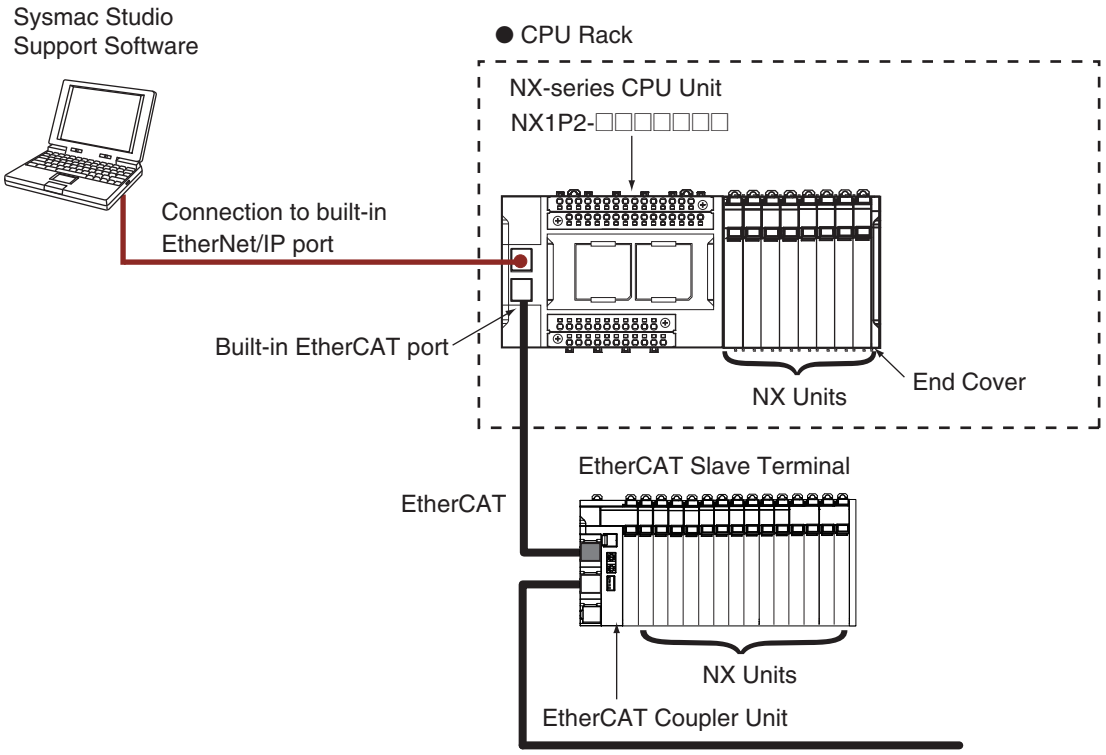
System Configuration

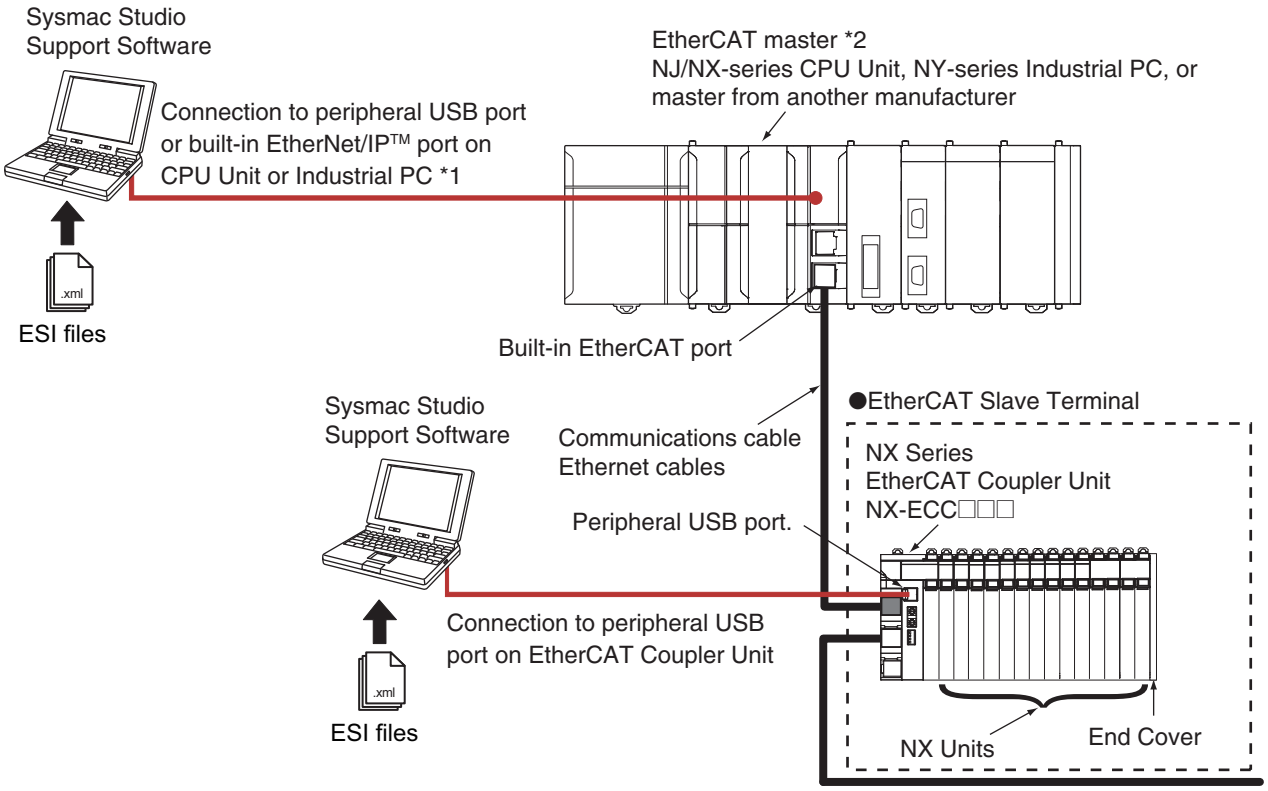
System Configuration in the Case of a CPU Unit

The following figure shows a system configuration when a group of NX Units is connected to an NX-series CPU Unit.



System Configuration of Slave Terminals

The following figure shows an example of the system configuration when an EtherCAT Coupler Unit is used as a Communications Coupler Unit.



*1. The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.
*2. An EtherCAT Slave Terminal cannot be connected to any of the OMRON CJ1W-NC□81/□82 Position Control Units even though they can operate as EtherCAT masters.

Note: For whether NX Units can be connected to the CPU Unit or Communications Coupler Unit to be used, refer to the user's manual for the CPU Unit or Communications Coupler Unit to be used.

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: EU Directives, RCM: Regulatory Compliance Mark, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Analog Input Units

Unit type	Product name	Specification									Model	Standards
		Number of points	Input range	Resolution	Conversion value, decimal number (0 to 100%)	Over all accuracy (25°C)	Input method	Conversion time	Input impedance	I/O refreshing method		
NX-series Analog Input Unit	Voltage Input type 	2 points	-10 to +10 V	1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point	1 MΩ min.	Free-Run refreshing	NX-AD2603	UC1, N, L, CE, RCM, KC
							Differential input				NX-AD2604	
				1/30000	-15000 to 15000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD2608	
		4 points		1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	NX-AD3603	
							Differential input				NX-AD3604	
				1/30000	-15000 to 15000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD3608	
		8 points		1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	NX-AD4603	
							Differential input				NX-AD4604	
				1/30000	-15000 to 15000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD4608	
	Current Input type 	2 points	4 to 20 mA	1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point	250 Ω	Free-Run refreshing	NX-AD2203	
							Differential input				NX-AD2204	
				1/30000	0 to 30000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD2208	
		4 points		1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	NX-AD3203	
							Differential input				NX-AD3204	
				1/30000	0 to 30000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD3208	
		8 points		1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point	85 Ω	Free-Run refreshing	NX-AD4203	
							Differential input				NX-AD4204	
				1/30000	0 to 30000	±0.1% (full scale)	Differential input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD4208	

Optional Products

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

Product name	Specification				Model	Standards
	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity		
Terminal Block	8	A/B	None	10 A	**NX-TBA082**	---
	12				**NX-TBA122**	
	16				**NX-TBA162**	

Accessories

Not included.

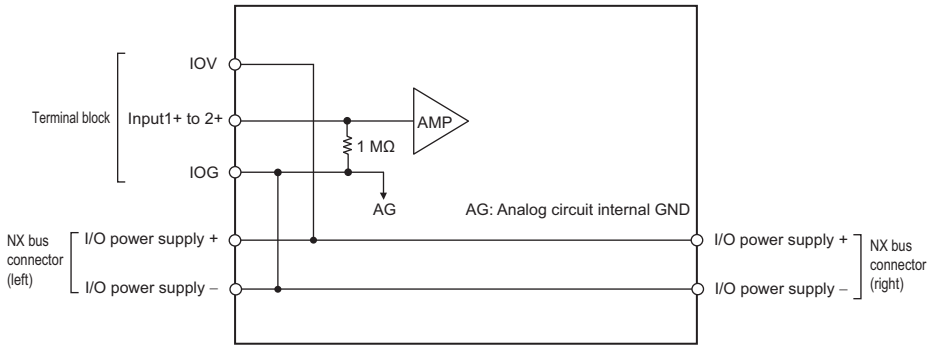
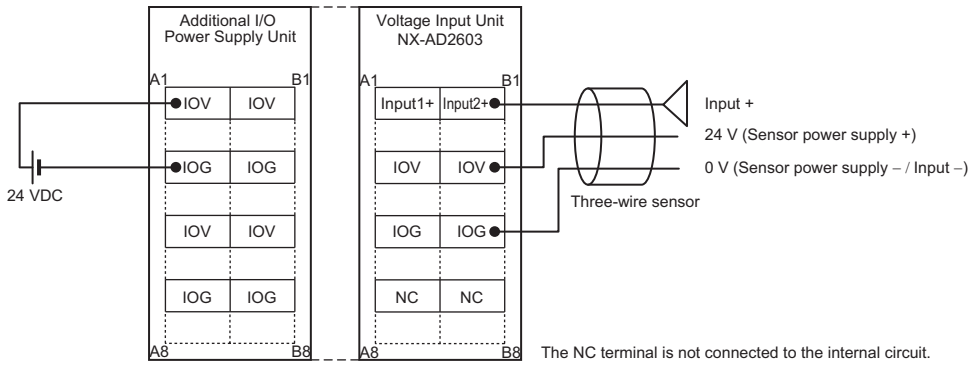
General Specification

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), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, LR

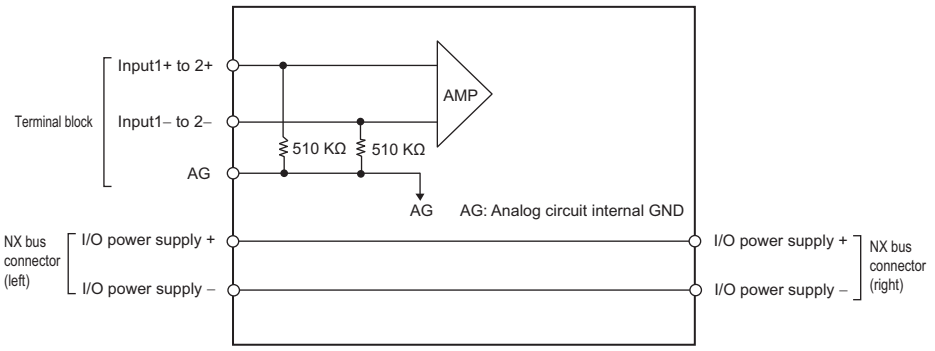
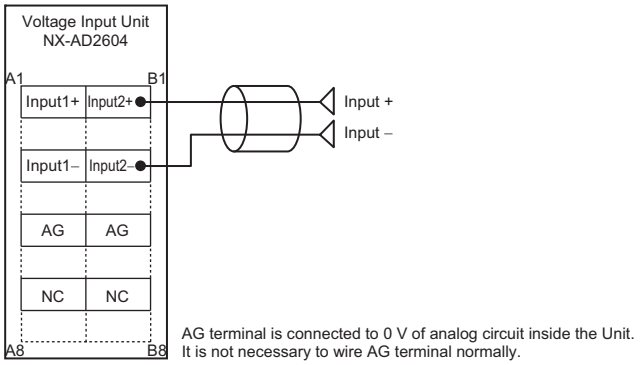
* Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

Analog Input Unit Specifications

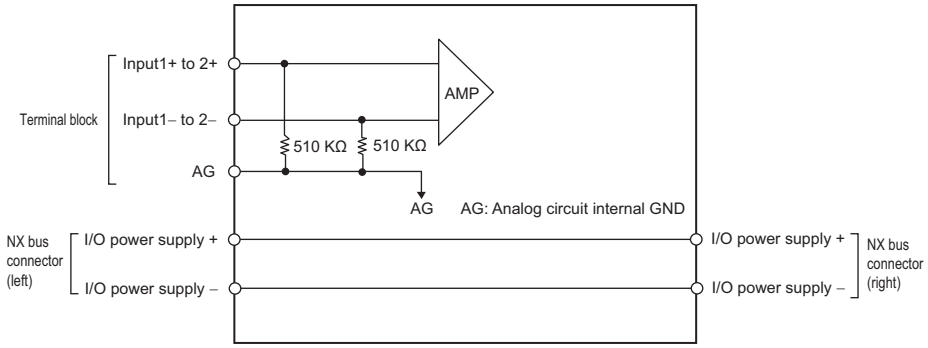
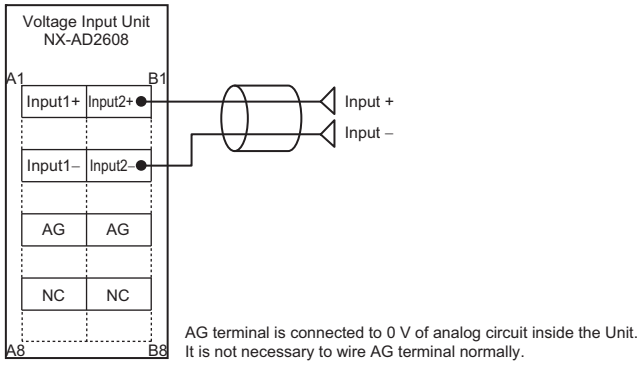
Analog Input Unit (voltage input type) 2 points NX-AD2603

Unit name	Analog Input Unit (voltage input type)	**Model**		NX-AD2603
Number of points	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Single-ended input
		Input range		-10 to +10 V
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±15 V
		Input impedance		1 MΩ min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	• Connected to a CPU Unit 1.35 W max. • Connected to a Communications Coupler Unit 1.05 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Not supported.			

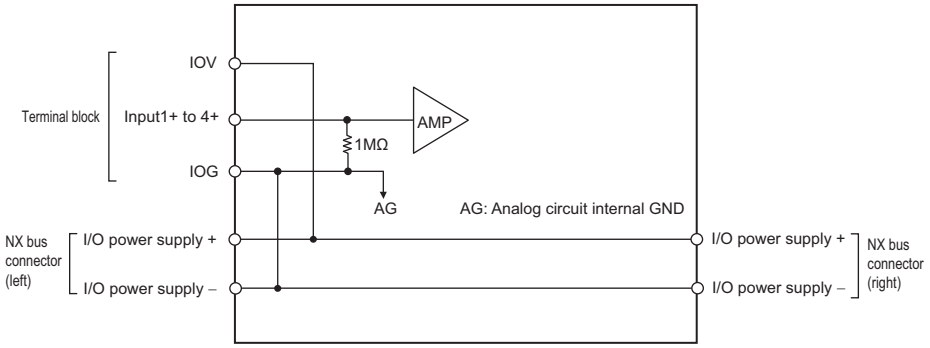
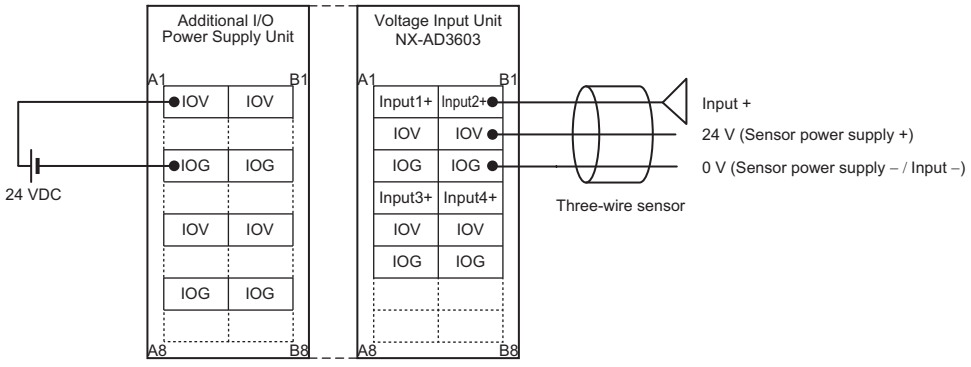
Analog Input Unit (voltage input type) 2 points NX-AD2604

Unit name	Analog Input Unit (voltage input type)	**Model**	NX-AD2604
Number of points	2 points	**External connection terminals**	Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing		
Indicator	TS indicator 	**Input method**	Differential Input
		Input range	-10 to +10 V
		Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±15 V
		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall accuracy 25°C	±0.2% (full scale)
		Overall accuracy 0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.35 W max. • Connected to a Communications Coupler Unit 1.05 W max.	**I/O current consumption**	No consumption
Weight	70 g max.		
Circuit layout			
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions		
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.		
Input disconnection detection	Not supported.		

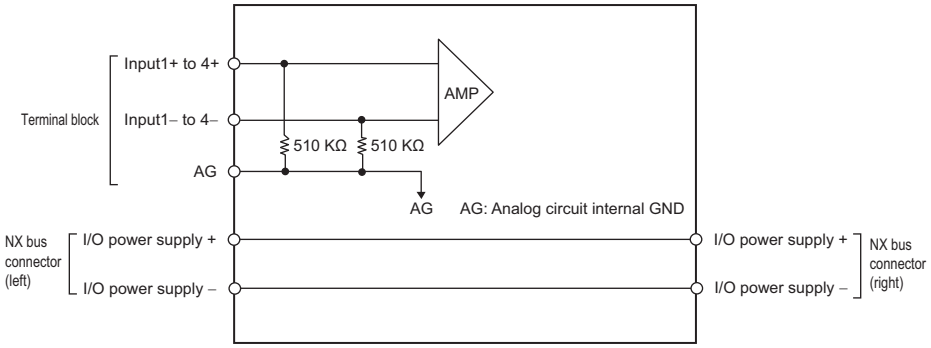
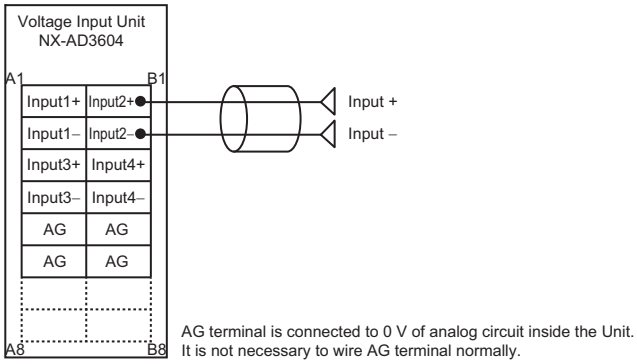
Analog Input Unit (voltage input type) 2 points NX-AD2608

<table>
<tr><td>Unit name</td><td>Analog Input Unit (voltage input type)</td><td>Model</td><td colspan="2">NX-AD2608</td></tr>
<tr><td>Number of points</td><td>2 points</td><td>External connection terminals</td><td colspan="2">Screwless clamping terminal block (8 terminals)</td></tr>
<tr><td>I/O refreshing method</td><td colspan="4">Selectable Synchronous I/O refreshing or Free-Run refreshing</td></tr>
<tr><td rowspan="8">Indicator</td><td rowspan="8">TS indicator
  </td><td>Input method</td><td colspan="2">Differential Input</td></tr>
<tr><td>Input range</td><td colspan="2">-10 to +10 V</td></tr>
<tr><td>Input conversion range</td><td colspan="2">-5 to 105% (full scale)</td></tr>
<tr><td>Absolute maximum rating</td><td colspan="2">±15 V</td></tr>
<tr><td>Input impedance</td><td colspan="2">1 MΩ min.</td></tr>
<tr><td>Resolution</td><td colspan="2">1/30000 (full scale)</td></tr>
<tr><td rowspan="2">Overall accuracy</td><td>25°C</td><td>±0.1% (full scale)</td></tr>
<tr><td>0 to 55°C</td><td>±0.2% (full scale)</td></tr>
<tr><td>Conversion time</td><td colspan="2">10 μs/point</td></tr>
<tr><td>Dimensions</td><td>12 (W) x 100 (H) x 71 (D)</td><td>Isolation method</td><td colspan="2">Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)</td></tr>
<tr><td>Insulation resistance</td><td>20 MΩ min. between isolated circuits (at 100 VDC)</td><td>Dielectric strength</td><td colspan="2">510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.</td></tr>
<tr><td>I/O power supply method</td><td>No supply</td><td>Current capacity of I/O power supply terminal</td><td colspan="2">Without I/O power supply terminals</td></tr>
<tr><td>NX Unit power consumption</td><td>• Connected to a CPU Unit
1.35 W max.
• Connected to a Communications Coupler Unit
1.05 W max.</td><td>I/O current consumption</td><td colspan="2">No consumption</td></tr>
<tr><td>Weight</td><td colspan="4">70 g max.</td></tr>
<tr><td>Circuit layout</td><td colspan="4">  </td></tr>
<tr><td>Installation orientation and restrictions</td><td colspan="4">Installation orientation:
• Connected to a CPU Unit: Possible in upright installation.
• Connected to a Communications Coupler Unit: Possible in 6 orientations.
Restrictions: No restrictions</td></tr>
<tr><td>Terminal connection diagram</td><td colspan="4"> 
AG terminal is connected to 0 V of analog circuit inside the Unit.
It is not necessary to wire AG terminal normally.</td></tr>
<tr><td>Input disconnection detection</td><td colspan="4">Not supported.</td></tr>
</table>

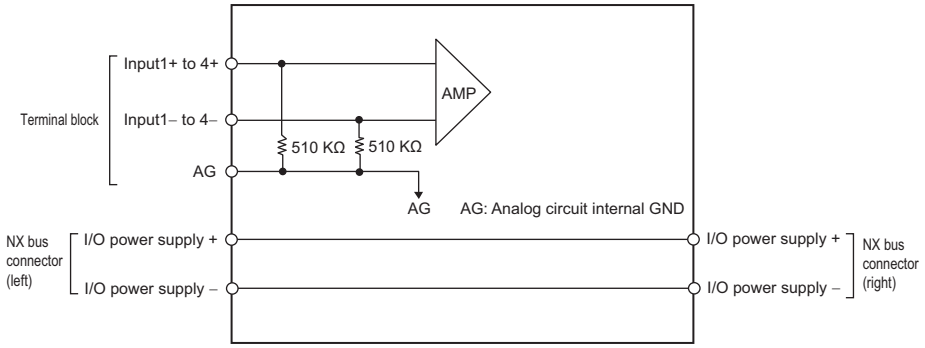
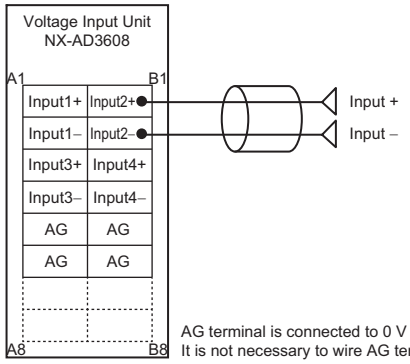
Analog Input Unit (voltage input type) 4 points NX-AD3603

Unit name	Analog Input Unit (voltage input type)	**Model**		NX-AD3603
Number of points	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Single-ended input
		Input range		-10 to +10 V
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±15 V
		Input impedance		1 MΩ min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	• Connected to a CPU Unit 1.35 W max. • Connected to a Communications Coupler Unit 1.10 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Not supported.			

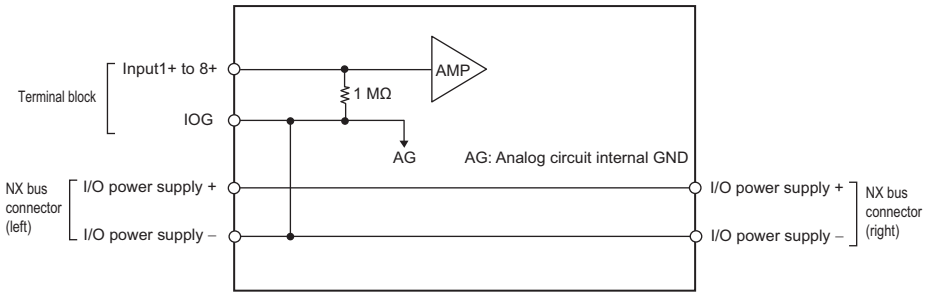
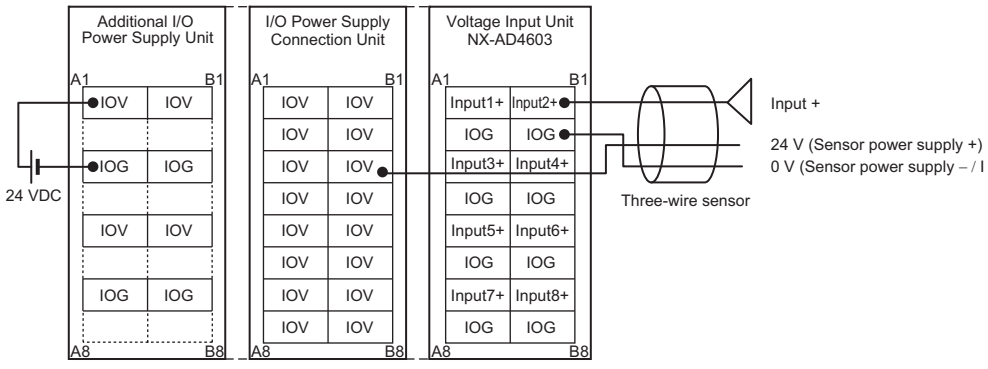
Analog Input Unit (voltage input type) 4 points NX-AD3604

Unit name	Analog Input Unit (voltage input type)	**Model**		NX-AD3604
Number of points	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Differential Input
		Input range		-10 to +10 V
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±15 V
		Input impedance		1 MΩ min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.35 W max. • Connected to a Communications Coupler Unit 1.10 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Not supported.			

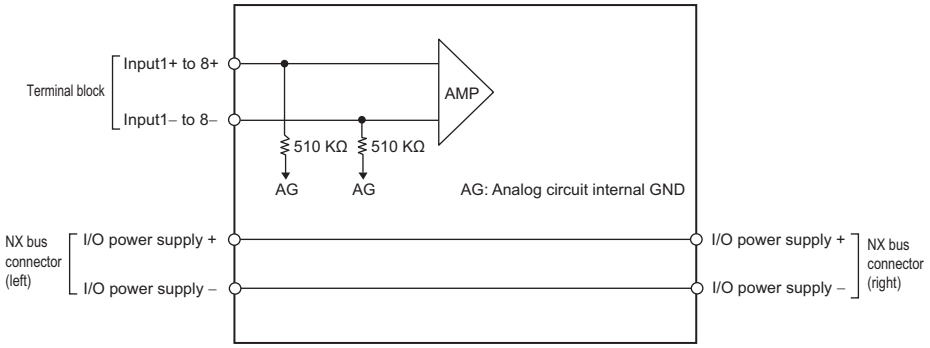
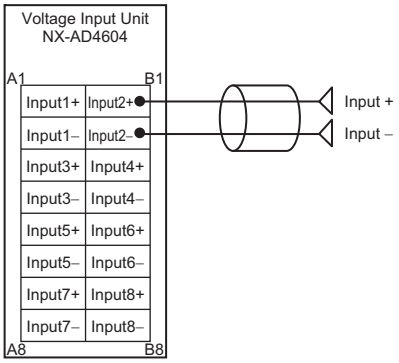
Analog Input Unit (voltage input type) 4 points NX-AD3608

Unit name	Analog Input Unit (voltage input type)	**Model**		NX-AD3608
Number of points	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 	**Input method**		Differential Input
		Input range		-10 to +10 V
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±15 V
		Input impedance		1 MΩ min.
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.2% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.45 W max. • Connected to a Communications Coupler Unit 1.10 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Not supported.			

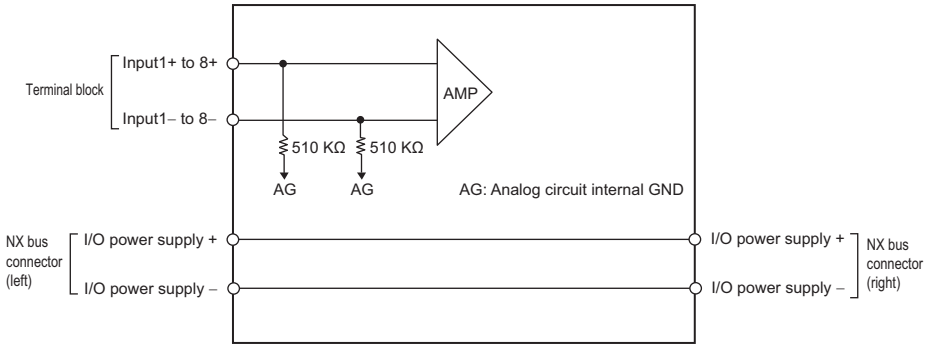
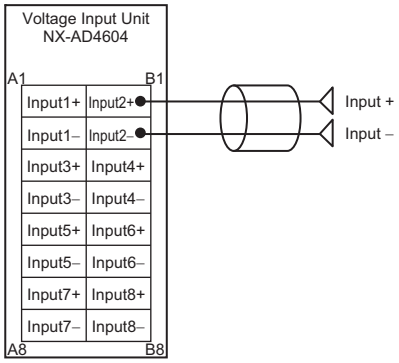
Analog Input Unit (voltage input type) 8 points NX-AD4603

Unit name	Analog Input Unit (voltage input type)	**Model**	NX-AD4603
Number of points	8 points	**External connection terminals**	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing		
Indicator	TS indicator 	**Input method**	Single-ended input
		Input range	-10 to +10 V
		Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±15 V
		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall accuracy 25°C	±0.2% (full scale)
		Overall accuracy 0 to 55°C	±0.4% (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**	IOG: 0.1 A/terminal max.
NX Unit power consumption	• Connected to a CPU Unit 1.45 W max. • Connected to a Communications Coupler Unit 1.15 W max.	**I/O current consumption**	No consumption
Weight	70 g max.		
Circuit layout			
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions		
Terminal connection diagram			
Input disconnection detection	Not supported.		

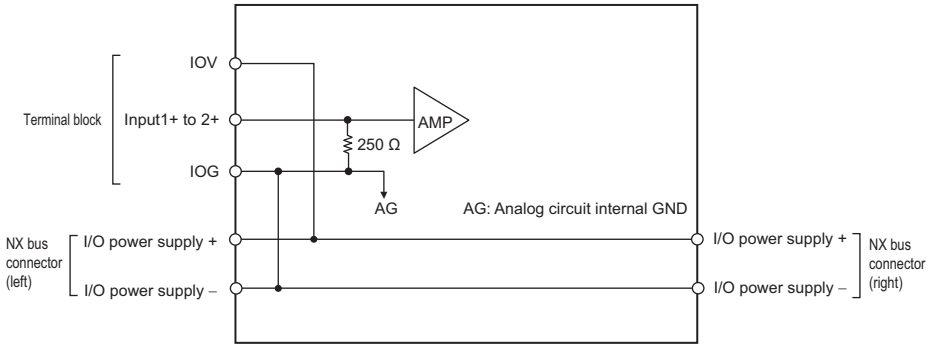
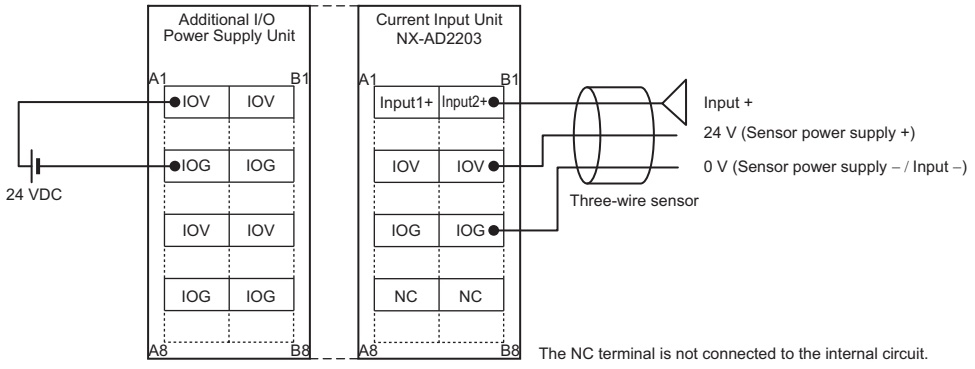
Analog Input Unit (voltage input type) 8 points NX-AD4604

Unit name	Analog Input Unit (voltage input type)	**Model**		NX-AD4604
Number of points	8 points	**External connection terminals**		Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Differential Input
		Input range		-10 to +10 V
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±15 V
		Input impedance		1 MΩ min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.45 W max. • Connected to a Communications Coupler Unit 1.15 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Not supported.			

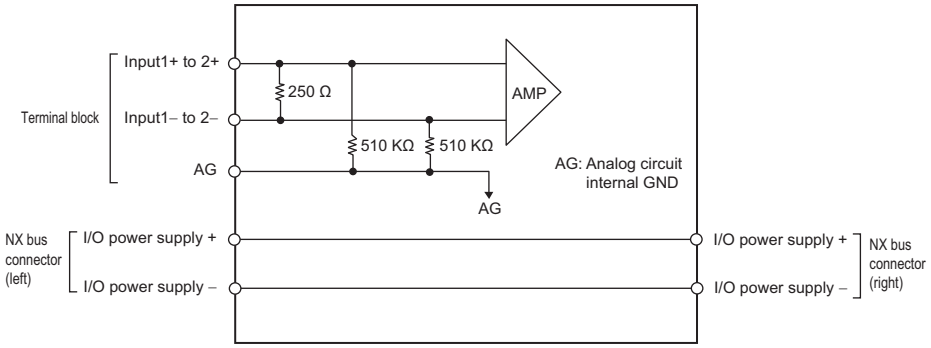
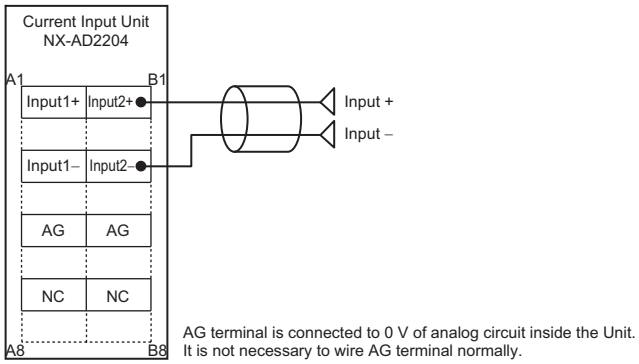
Analog Input Unit (voltage input type) 8 points NX-AD4608

<table>
<tr><td>Unit name</td><td>Analog Input Unit (voltage input type)</td><td>Model</td><td colspan="2">NX-AD4608</td></tr>
<tr><td>Number of points</td><td>8 points</td><td>External connection terminals</td><td colspan="2">Screwless clamping terminal block (16 terminals)</td></tr>
<tr><td>I/O refreshing method</td><td colspan="4">Selectable Synchronous I/O refreshing or Free-Run refreshing</td></tr>
<tr><td rowspan="8">Indicator</td><td rowspan="8">TS indicator
  </td><td>Input method</td><td colspan="2">Differential Input</td></tr>
<tr><td>Input range</td><td colspan="2">-10 to +10 V</td></tr>
<tr><td>Input conversion range</td><td colspan="2">-5 to 105% (full scale)</td></tr>
<tr><td>Absolute maximum rating</td><td colspan="2">±15 V</td></tr>
<tr><td>Input impedance</td><td colspan="2">1 MΩ min.</td></tr>
<tr><td>Resolution</td><td colspan="2">1/30000 (full scale)</td></tr>
<tr><td rowspan="2">Overall accuracy</td><td>25°C</td><td>±0.1% (full scale)</td></tr>
<tr><td>0 to 55°C</td><td>±0.2% (full scale)</td></tr>
<tr><td>Conversion time</td><td colspan="2">10 μs/point</td></tr>
<tr><td>Dimensions</td><td>12 (W) x 100 (H) x 71 (D)</td><td>Isolation method</td><td colspan="2">Between the input and the NX bus: Power = Transformer, Signal = Digital isolator (no isolation between inputs)</td></tr>
<tr><td>Insulation resistance</td><td>20 MΩ min. between isolated circuits (at 100 VDC)</td><td>Dielectric strength</td><td colspan="2">510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.</td></tr>
<tr><td>I/O power supply method</td><td>No supply</td><td>Current capacity of I/O power supply terminal</td><td colspan="2">Without I/O power supply terminals</td></tr>
<tr><td>NX Unit power consumption</td><td>• Connected to a CPU Unit
1.45 W max.
• Connected to a Communications Coupler Unit
1.15 W max.</td><td>I/O current consumption</td><td colspan="2">No consumption</td></tr>
<tr><td>Weight</td><td colspan="4">70 g max.</td></tr>
<tr><td>Circuit layout</td><td colspan="4">  </td></tr>
<tr><td>Installation orientation and restrictions</td><td colspan="4">Installation orientation:
• Connected to a CPU Unit: Possible in upright installation.
• Connected to a Communications Coupler Unit: Possible in 6 orientations.
Restrictions: No restrictions</td></tr>
<tr><td>Terminal connection diagram</td><td colspan="4">  </td></tr>
<tr><td>Input disconnection detection</td><td colspan="4">Not supported.</td></tr>
</table>

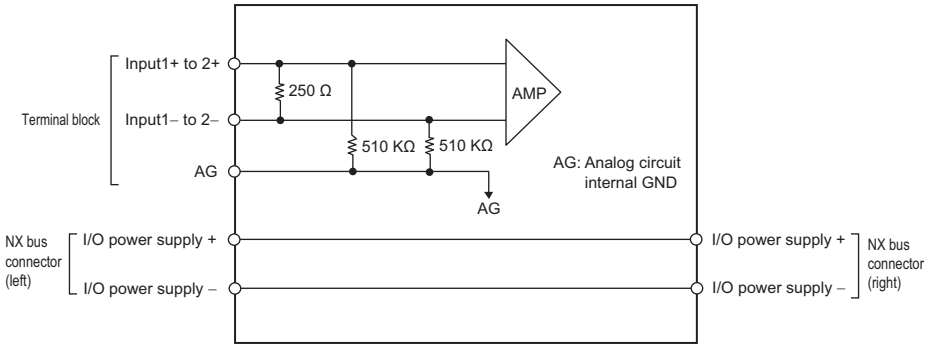
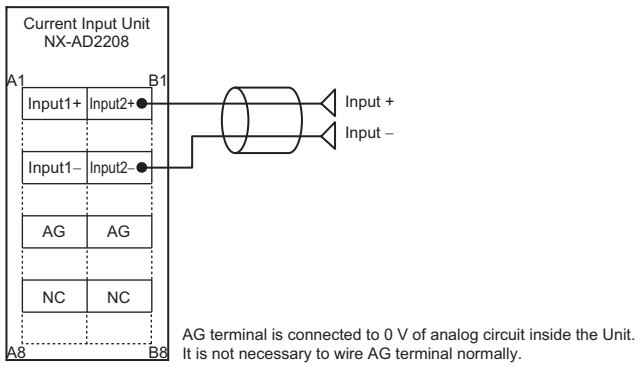
Analog Input Unit (current input type) 2 points NX-AD2203

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD2203
Number of points	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Single-ended input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Supported.			

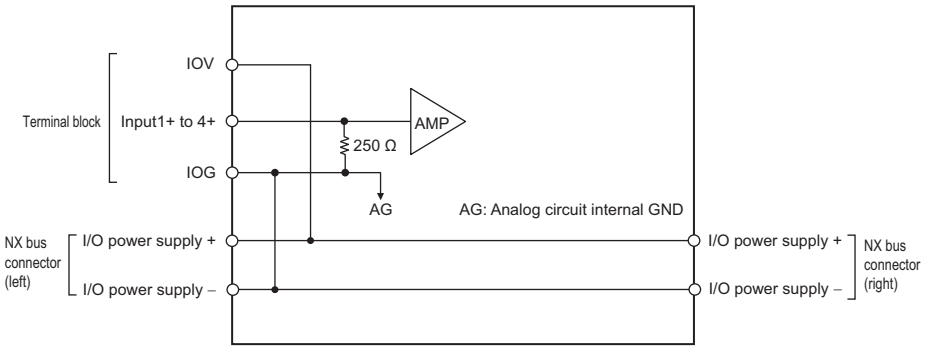
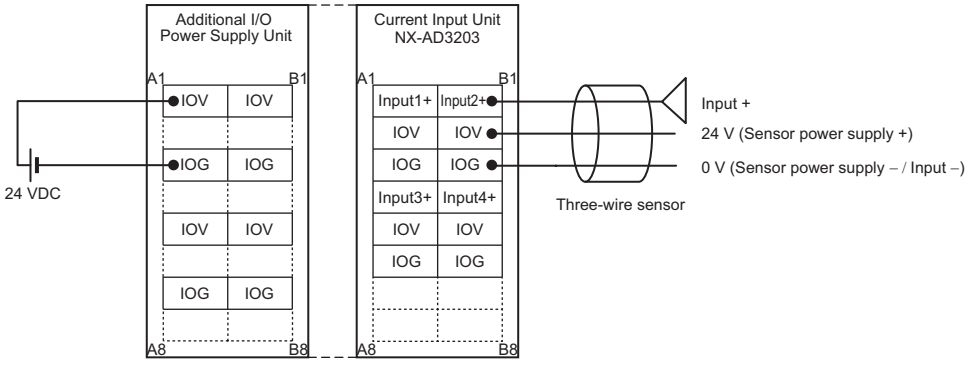
Analog Input Unit (current input type) 2 points NX-AD2204

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD2204
Number of points	2 points	**External connection terminals**		Screwless clamping terminal block (8 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Differential Input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

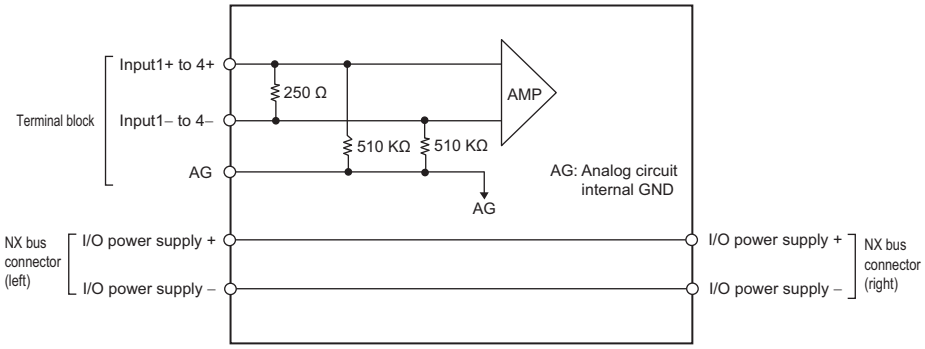
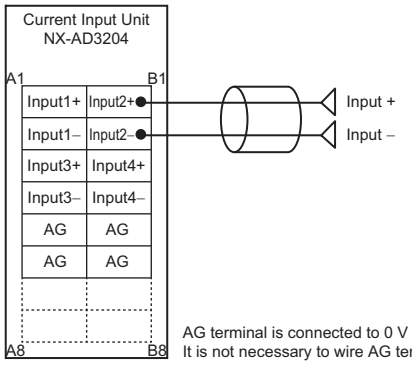
Analog Input Unit (current input type) 2 points NX-AD2208

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD2208
Number of points	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 	**Input method**		Differential Input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.2% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

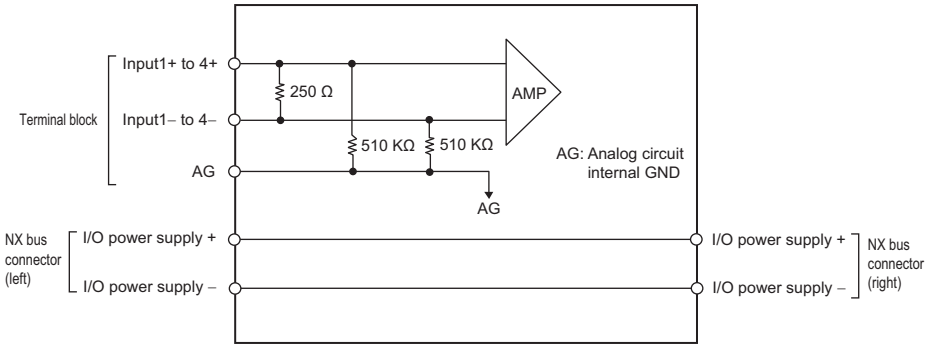
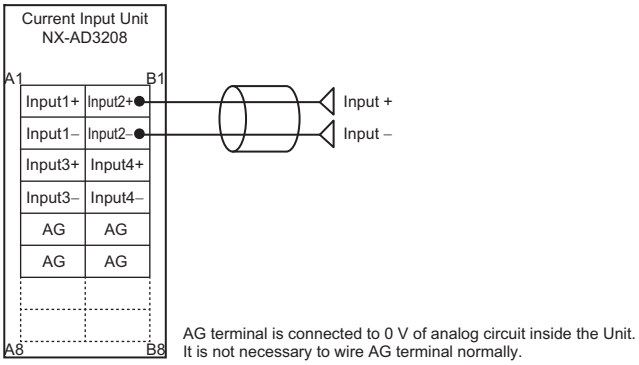
Analog Input Unit (current input type) 4 points NX-AD3203

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD3203
Number of points	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Single-ended input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Supported.			

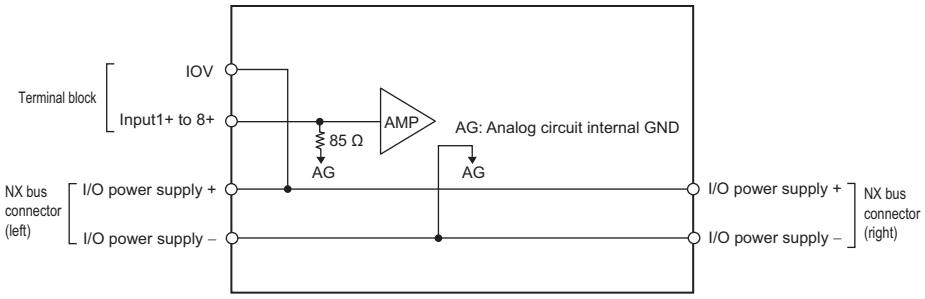
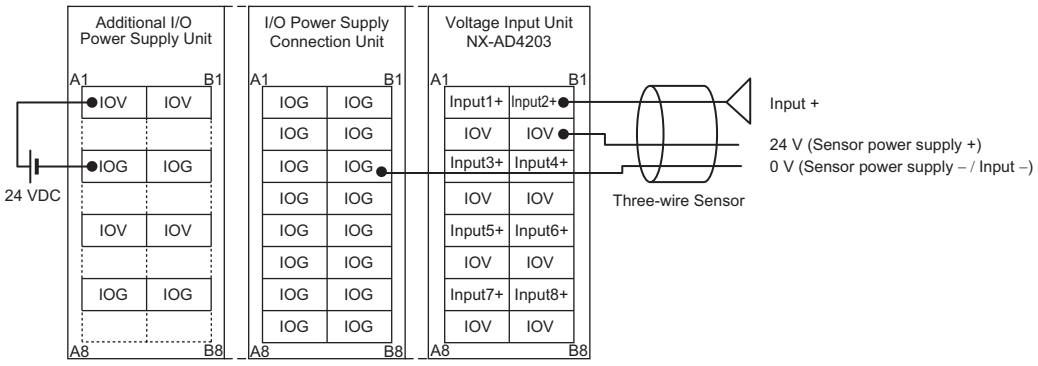
Analog Input Unit (current input type) 4 points NX-AD3204

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD3204
Number of points	4 points	**External connection terminals**		Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Differential Input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω min.
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

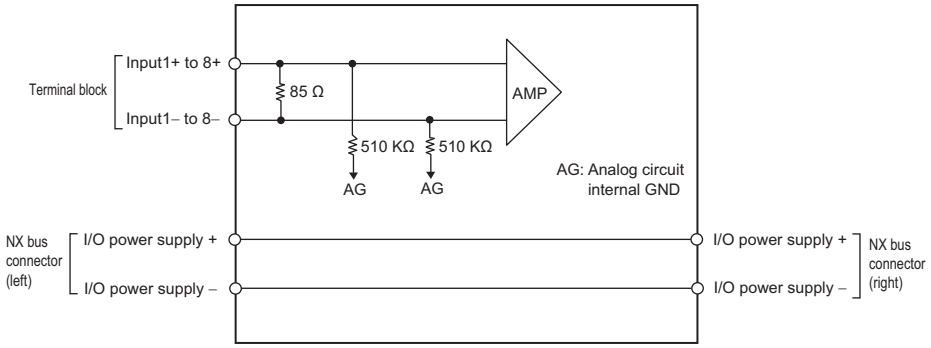
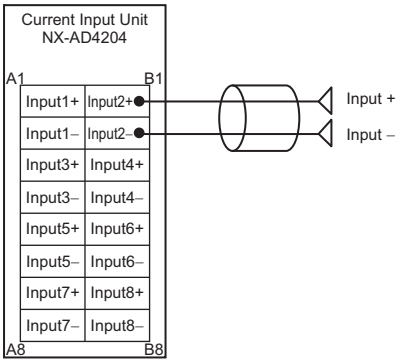
Analog Input Unit (current input type) 4 points NX-AD3208

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD3208
Number of points	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 	**Input method**		Differential Input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		250 Ω min.
		Resolution		1/30000 (full scale)
		Overall accuracy	**25°C**	±0.1% (full scale)
			0 to 55°C	±0.2% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.30 W max. • Connected to a Communications Coupler Unit 0.95 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram	 AG terminal is connected to 0 V of analog circuit inside the Unit. It is not necessary to wire AG terminal normally.			
Input disconnection detection	Supported.			

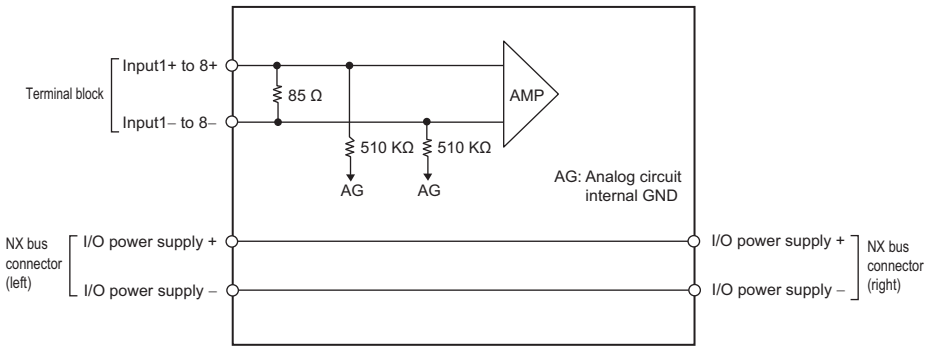
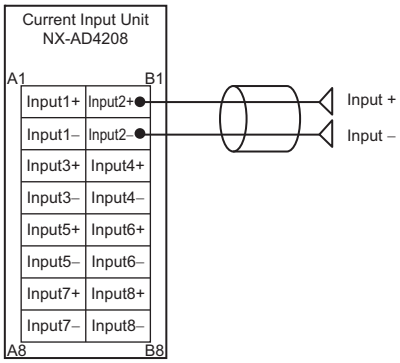
Analog Input Unit (current input type) 8 points NX-AD4203

Unit name	Analog Input Unit (current input type)	**Model**	NX-AD4203
Number of points	8 points	**External connection terminals**	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing		
Indicator	TS indicator 	**Input method**	Single-ended input
		Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±30 mA
		Input impedance	85 Ω
		Resolution	1/8000 (full scale)
		Overall accuracy 25°C	±0.2% (full scale)
		Overall accuracy 0 to 55°C	±0.4% (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.
NX Unit power consumption	• Connected to a CPU Unit 1.40 W max. • Connected to a Communications Coupler Unit 1.05 W max.	**I/O current consumption**	No consumption
Weight	70 g max.		
Circuit layout			
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions		
Terminal connection diagram			
Input disconnection detection	Supported.		

Analog Input Unit (current input type) 8 points NX-AD4204

Unit name	Analog Input Unit (current input type)	**Model**		NX-AD4204
Number of points	8 points	**External connection terminals**		Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing			
Indicator	TS indicator 	**Input method**		Differential Input
		Input range		4 to 20 mA
		Input conversion range		-5 to 105% (full scale)
		Absolute maximum rating		±30 mA
		Input impedance		85 Ω
		Resolution		1/8000 (full scale)
		Overall accuracy	**25°C**	±0.2% (full scale)
			0 to 55°C	±0.4% (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	No supply	**Current capacity of I/O power supply terminal**		Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.40 W max. • Connected to a Communications Coupler Unit 1.05 W max.	**I/O current consumption**		No consumption
Weight	70 g max.			
Circuit layout				
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions			
Terminal connection diagram				
Input disconnection detection	Supported.			

Analog Input Unit (current input type) 8 points NX-AD4208

Unit name	Analog Input Unit (current input type)	**Model**	NX-AD4208
Number of points	8 points	**External connection terminals**	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing		
Indicator	TS indicator 	**Input method**	Differential Input
		Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
		Absolute maximum rating	±30 mA
		Input impedance	85 Ω
		Resolution	1/30000 (full scale)
		Overall accuracy 25°C	±0.1% (full scale)
		Overall accuracy 0 to 55°C	±0.2% (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	No supply	**Current capacity of I/O power supply terminal**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.45 W max. • Connected to a Communications Coupler Unit 1.10 W max.	**I/O current consumption**	No consumption
Weight	70 g max.		
Circuit layout			
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions		
Terminal connection diagram			
Input disconnection detection	Supported.		

Version Information

Connecting with CPU Units

Refer to the user's manual for the CPU Unit for the CPU Unit to which NX Units can be connected.

NX Unit		Corresponding versions *	
Model	Unit version	CPU Unit	Sysmac Studio
NX-AD□□□□	Ver.1.0	Ver.1.13 or later	Ver.1.17 or higher

* Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

Connecting with Coupler Units

NX Unit		Corresponding versions *				
		EtherCAT			EtherNet/IP	
Model	Unit version	Communications Coupler Unit	NJ/NX-series CPU Units or NY-series Industrial PCs	Sysmac Studio	Communications Coupler Unit	Sysmac Studio
NX-AD□□□□	Ver.1.0	Ver.1.0 or later	Ver.1.05 or later	Ver.1.06 or higher	Ver.1.0 or later	Ver.1.10 or higher

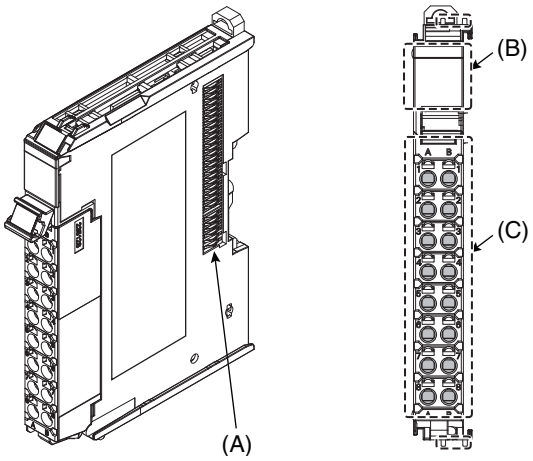
* Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

External Interface

Analog Input Unit

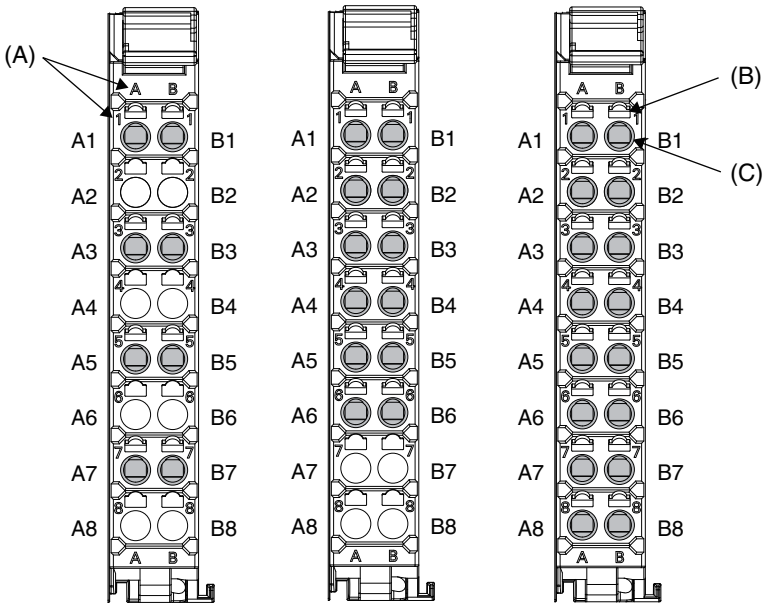
NX-AD□□□□

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 | 12 mm width 16-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 Terminal Blocks for Each Unit Model

Unit model	Terminal Blocks				
	Model	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity
NX-AD2□□□	NX-TBA082	8	A/B	None	10 A
NX-AD3□□□	NX-TBA122	12	A/B	None	10 A
NX-AD4□□□	NX-TBA162	16	A/B	None	10 A

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 plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

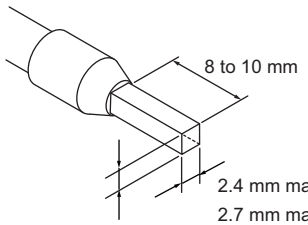
The applicable ferrules, wires, and crimping tool are given in the following table.

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)

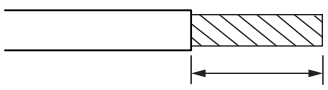
2.4 mm max. (except ground terminals)
2.7 mm max. (ground terminals)

Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, use the following table to determine the correct wire specifications.

Terminals		Wire type				Wire size	Conductor length (stripping length)
		Twisted wires		Solid wire			
Classification	Current capacity	Plated	Unplated	Plated	Unplated		
All terminals except ground terminals	2 A max.	Possible	Possible	Possible	Possible	0.08 to 1.5 mm^2 AWG28 to 16	8 to 10 mm
	Greater than 2 A and 4 A or less		Not Possible	Possible *1	Not Possible		
	Greater than 4 A	Possible *1		Not Possible			
Ground terminals	---	Possible	Possible	Possible *2	Possible *2	2.0 mm^2	9 to 10 mm

*1. Secure wires to the screwless clamping terminal block. Refer to the Securing Wires in the USER'S MANUAL for how to secure wires.
*2. With the NX-TB□□□1 Terminal Block, use twisted wires to connect the ground terminal. Do not use a solid wire.



Conductor length (stripping length)

<Additional Information> If more than 2 A will flow on the wires, use plated wires or use ferrules.

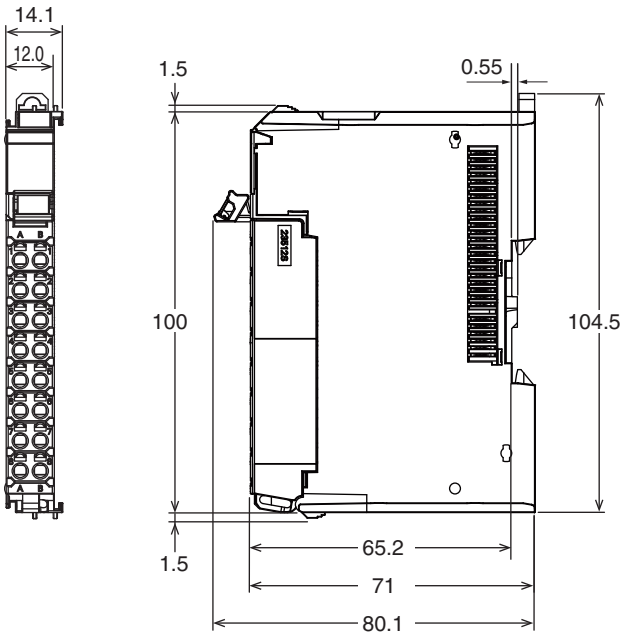
Dimensions

(Unit/mm)

Analog Input Unit

NX-AD□□□□

12 mm Width



Related Manuals

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

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