# NX-series Analog I/O Unit NX-AD/DA

CSM NX-AD DA DS F 3 1

# Analog inputs and outputs to meet all machine control needs, from general purpose to high-speed synchronous control

- Connect to other NX I/O Units and EtherCAT® Coupler Units using the high-speed NX-bus
- Separate modules for voltage and current



### **Features**

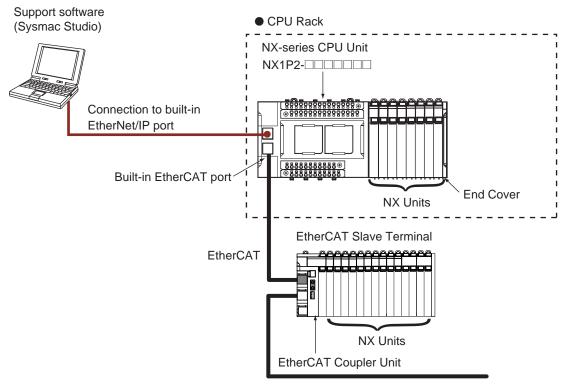
- Up to eight analog inputs per unit (NX-AD)
- Up to four analog outputs per unit (NX-DA)
- Free-run refreshing or synchronous I/O refreshing with the NX1P2 CPU Unit or EtherCAT Coupler Unit
- Sampling times down to 10 μs per channel and high resolution of 1/30,000
- Single-ended or differential input (NX-AD)
- Selecting channel to use, moving average, input disconnection detection, over range/under range detection, and user calibration
- Detachable front connector with screwless Push-In Plus terminals for easy installation and maintenance
- Compact with a width of 12 mm per unit
- Connect to the CJ PLC using the EtherNet/IP<sup>™</sup> bus coupler

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 and patented technology, licensed by Beckhoff Automation GmbH, Germany. EtherNet/IP<sup>TM</sup> is a trademark of ODVA.

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### Connected to a CPU Unit or Communication Control Unit

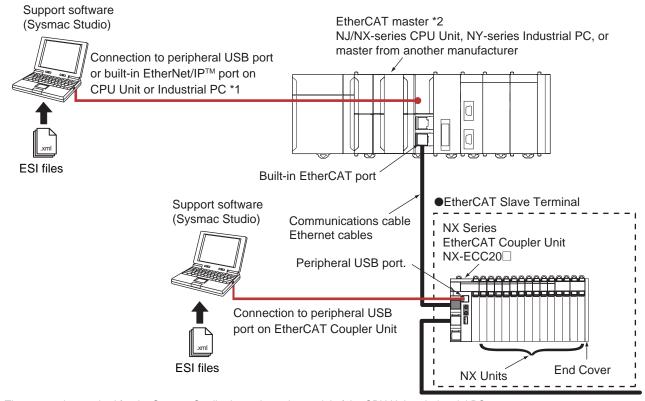
The following figure shows a system configuration when NX Units are connected to an NX-series CPU Unit.



Note: For whether an NX Unit can be connected to the CPU Unit, refer to the version information.

### Connected to an EtherCAT Coupler Unit

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



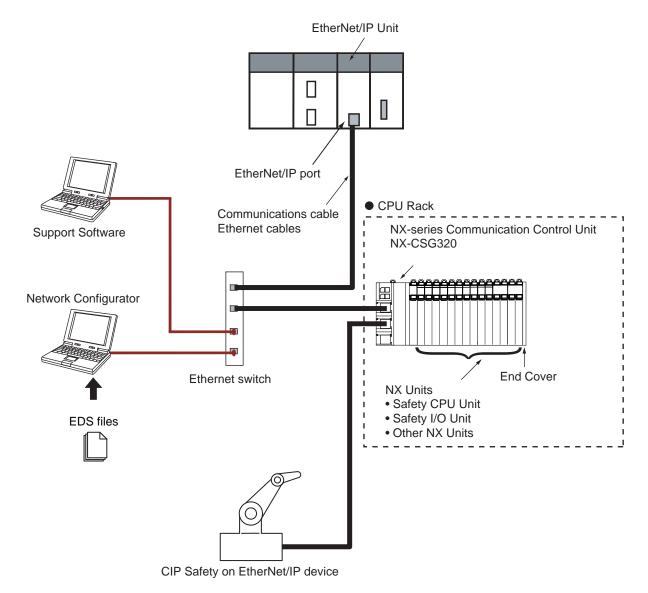
<sup>\*1.</sup> The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.

Note: For whether an NX Unit can be connected to the Communications Coupler Unit, refer to the version information.

<sup>\*2.</sup> 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.

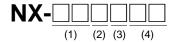
### System Configuration in the Case of a Communication Control Unit

The following figure shows a system configuration when a group of NX Units is connected to an NX-series Communication Control Unit. To configure a Safety Network Controller, mount the Safety CPU Unit, which is one of the NX Units, to the CPU Rack of the Communication Control Unit.



Note: For whether an NX Unit can be connected to the Communication Control Unit, refer to the version information.

### **Model Number Structure**



### (1) Unit type

No.	Specification	
AD	Analog input	
DA	Analog output	

### (2) Number of points

No.	Specification
2	2 points
3	4 points
4	8 points

### (3) I/O range

No.	Specification		
1			
2	4 to 20 mA		
6	-10 to +10 V		

### (4) Other specifications **Analog Input Units**

				I/O refreshing method		
No.	Resolution	Conversion time	Input method	Free-Run refreshing *1 only	Switching synchronous I/O refreshing *2 and Free-Run refreshing	
03	1/8000	250 μs/point	Single-ended	Yes		
04	1/8000	250 μs/point	Differential	Yes		
08	1/30000	10 μs/point	Differential		Yes	

<sup>\*1</sup> Free-Run refreshing

### **Analog Output Units**

			I/O refreshing method		
No.	Resolution	Conversion time	Free-Run refreshing *1 only	Switching synchronous I/O refreshing *2 and Free-Run refreshing	
03	1/8000	250 μs/point	Yes		
05	1/30000	10 μs/point		Yes	

<sup>\*2</sup> Synchronous I/O refreshing

<sup>\*1</sup> Free-Run refreshing
\*2 Synchronous I/O refreshing

# **Ordering Information**

### **Applicable standards**

Refer to the OMRON website or ask your OMRON representative for the most recent applicable standards for each model.

### **Analog Input Units**

					Specificat	ion						
Product name	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	Model		
					±0.2%	Single-ended input	250 μs/		Free-Run	NX-AD2603		
			1/8000	-4000 to 4000	(full scale)	Differential input	point		refreshing	NX-AD2604		
	2 points		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		
Voltage Input type			1/0000	4000 to 4000	±0.2%	Single-ended input	250 μs/		Free-Run	NX-AD3603		
		-10 to	1/8000	-4000 to 4000	(full scale)	Differential input	point		refreshing	NX-AD3604		
	4 points	+10 V	1/30000	-15000 to 15000	±0.1% (full scale)	Differential input	10 μs/ point	1 MΩ min.	Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD3608		
	8 points	,		-4000 to 4000	±0.2% (full scale)	Single-ended input	250 μs/	-	Free-Run refreshing	NX-AD4603		
			1/8000			Differential input	point			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		
		2 points				±0.2%	Single-ended input	250 μs/		Free-Run	NX-AD2203	
	2 points		1/8000	0 to 8000	(full scale)	Differential input	point		refreshing	NX-AD2204		
			1/30000	0 to 30000	±0.1% (full scale)	Differential input	10 μs/ point	050.0	Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD2208		
Current Input type		20 mA			1/0000		±0.2%	Single-ended input	250 μs/	250 Ω	Free-Run	NX-AD3203
			1/8000	0 to 8000	(full scale)	Differential input	point		refreshing	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		
		1			±0.2%	Single-ended input	250 μs/		Free-Run	NX-AD4203		
			1/8000 0 to 8	0 to 8000	(full scale)	Differential input	point		refreshing	NX-AD4204		
	8 points	8 points		1/30000	0 to 30000	±0.1% (full scale)	Differential input	10 μs/ point	85 Ω	Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-AD4208	

# **Analog Output Units**

				Specification	on			
Product name	Number of points	Output range	Resolution	Output setting value, decimal number (0 to 100%)	Over all accuracy (25°C)	Conversion time	I/O refreshing method	Model
Voltage Output type			1/8000	-4000 to 4000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	NX-DA2603
	2 points	-10 to +10 V	1/30000	-15000 to 15000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free- Run refreshing	NX-DA2605
	4 points		1/8000	-4000 to 4000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	NX-DA3603
			1/30000	-15000 to 15000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-DA3605
Current Output type	2 points		1/8000	0 to 8000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	NX-DA2203
		4 to	1/30000	0 to 30000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	NX-DA2205
	20 m/	20 mA	1/8000	0 to 8000	±0.3% (full scale)	250 μs/point	Free-Run refreshing	NX-DA3203
			1/30000	0 to 30000	±0.1% (full scale)	10 μs/point	Selectable Synchronous I/O refreshing or Free- Run refreshing	NX-DA3205

# **Optional Products**

Product name		Specification				
Unit/Terminal Block Coding Pins	For 10 Units (Terminal Block: 30 pins,	or 10 Units Ferminal Block: 30 pins, Unit: 30 pins)				
	Specification					
Product name	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity	Model	
	8				NX-TBA082	
Terminal Block	12	A/B	None	10 A	NX-TBA122	
	16				NX-TBA162	

### **Accessories**

Not included.

# **General Specifications**

	Item	Specification		
Enclosure		Mounted in a panel		
Grounding m	Inding method Ground to 100 $\Omega$ or less			
9		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: Meets IEC 61010-2-201.		
Operating environment	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)		
environinent	Overvoltage category	Category II: Meets IEC 61010-2-201.		
	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/s², 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/s², 3 times each in X, Y, and Z directions		
Applicable sta	andards *	cULus: Listed (UL508), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, LR		

<sup>\*</sup> Refer to the OMRON website 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				
	TS indicator	Input method	Single-ended input		
	AD2603	Input range	-10 to +10 V		
		Input conversion range	-5 to 105% (full scale)		
Indicator		Absolute maximum rating	±15 V		
iliuicatoi		Input impedance	1 MΩ min.		
		Resolution	1/8000 (full scale)		
		Overall 25°C	±0.2% (full scale)		
		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 M $\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 2+ IOG  NX bus connector (left)  I/O power supply -	AMP AG AG: Analog circuit	internal GND  I/O power supply + NX bus connector (right)		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions				
Terminal connection diagram	Additional I/O Power Supply Unit NX-AD2603  A1				
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				
	TS indicator	Input method	Differential Input		
	AD2604 ■TS	Input range	-10 to +10 V		
		Input conversion range	-5 to 105% (full scale)		
Indicator		Absolute maximum rating	±15 V		
indicator		Input impedance	1 MΩ min.		
		Resolution	1/8000 (full scale)		
		Overall 25°C	±0.2% (full scale)		
		accuracy 0 to 55°C	±0.4% (full scale)		
		Conversion time	250 μs/point  Between the input and the NX bus: Power		
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)		
Insulation resistance	20 M $\Omega$ 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 or Communication Control 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	Terminal block  Input1+ to 2+  AG  AG  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply + log power supply - log po				
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions				
Terminal connection diagram	Voltage Input Unit NX-AD2604  A1				
Input disconnection detection	Not supported.				

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

Unit name	Analog Input Unit (voltage input type)	Model	NX-AD2608		
Number of points	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)		
I/O refreshing method	Selectable Synchronous I/O refreshing or F	ree-Run refreshing			
	TS indicator	Input method	Differential Input		
	AD2608 • TS	Input range	-10 to +10 V		
		Input conversion range	-5 to 105% (full scale)		
Indicator		Absolute maximum rating	±15 V		
maicator		Input impedance	1 MΩ min.		
		Resolution	1/30000 (full scale)		
		Overall 25°C	±0.1% (full scale)		
		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 M $\Omega$ 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 or Communication Control Unit 1.35 W max. Connected to a Communications Coupler Unit 1.05 W max.	No consumption			
Weight	70 g max.				
Circuit layout	Terminal block  Input1+ to 2+  AMP  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O powe				
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communica Connected to a Communications Couple Restrictions: No restrictions				
Terminal connection diagram	Voltage Input Unit NX-AD2608  A1 Input1+ Input2+  Input + Input Input2-  Input -  AG AG  NC NC  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-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	T	
	TS indicator	Input method	Single-ended input
	AD3603	Input range	-10 to +10 V
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±15 V
maioato.		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall accuracy 0 to 55°C	±0.2% (full scale) ±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 $M\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 4+ IOG AG AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply + I/O power supply - I/O power sup		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions		
Terminal connection diagram	Additional I/O Power Supply Unit  A1  B1  OIOV IOV  IOV IOV  IOG IOG  A8  B8	Voltage Input Unit NX-AD3603  A1	Input + 24 V (Sensor power supply +) 0 V (Sensor power supply -/ Input -) re sensor
Input disconnection detection	Not supported.		

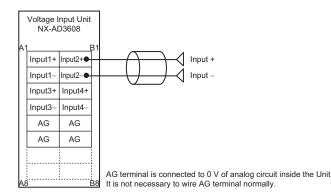
# Analog Input Unit (voltage input type) 4 points NX-AD3604

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	1	
	TS indicator	Input method	Differential Input
	AD3604	Input range	-10 to +10 V
	■TS	Input conversion range	-5 to 105% (full scale)
lo di satar		Absolute maximum rating	±15 V
Indicator		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		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	$20~\text{M}\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 4+  AG  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions		
Terminal connection diagram	Voltage Input Unit NX-AD3604  A1		
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 **External connection** Screwless clamping terminal block (12 **Number of points** 4 points terminals terminals) I/O refreshing method Selectable Synchronous I/O refreshing or Free-Run refreshing TS indicator Input method **Differential Input** AD3608 Input range -10 to +10 V Input conversion range -5 to 105% (full scale) Absolute maximum ±15 V rating Indicator Input impedance 1 M $\Omega$ min. 1/30000 (full scale) Resolution 25°C ±0.1% (full scale) Overall accuracy 0 to 55°C ±0.2% (full scale) Conversion time 10 μs/point Between the input and the NX bus: Power 12 (W) x 100 (H) x 71 (D) **Dimensions** Isolation method = Transformer, Signal = Digital isolator (no isolation between inputs) $20 \text{ M}\Omega$ min. between isolated circuits (at 510 VAC between isolated circuits for 1 Insulation resistance Dielectric strength 100 VDC) minute at a leakage current of 5 mA max. I/O power supply Current capacity of I/O No supply Without I/O power supply terminals method power supply terminal · Connected to a CPU Unit or Communication Control Unit **NX Unit power** 1.45 W max. I/O current consumption No consumption Connected to a Communications consumption Coupler Unit 1.10 W max. Weight 70 g max. Input1+ to 4+ Terminal block Input1- to 4-**≩**510 ΚΩ **⋛**510 ΚΩ Circuit layout AG ΑĞ AG: Analog circuit internal GND I/O power supply I/O power supply NX bus NX hus connector connector (left) (right) I/O power supply -I/O power supply Installation orientation: Installation orientation Connected to a CPU Unit or Communication Control Unit: Possible in upright installation. and restrictions • 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-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		
	TS indicator	Input method	Single-ended input
	AD4603	Input range	-10 to +10 V
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±15 V
maioatoi		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall 25°C accuracy 0 to 55°C	±0.2% (full scale)
		7   7   7   7	±0.4% (full scale)
		Conversion time	250 μs/point  Between the input and the NX bus: Power
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	$20~\text{M}\Omega$ 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	<ul> <li>Connected to a CPU Unit or Communication Control Unit 1.45 W max.</li> <li>Connected to a Communications Coupler Unit 1.15 W max.</li> </ul>	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 8+ IOG AG: Analog circuit internal GND  NX bus connector (left) I/O power supply + I/O power supply - I/O power supply		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions		
Terminal connection diagram	IOV IC   I		Input +  24 V (Sensor power supply +) 0 V (Sensor power supply – / I  Three-wire sensor
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		
	TS indicator	Input method	Differential Input
	AD4604 • • • • • • • • • • • • • • • • • • •	Input range	-10 to +10 V
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±15 V
maroator		Input impedance	1 MΩ min.
		Resolution	1/8000 (full scale)
		Overall 25°C 0 to 55°C	±0.2% (full scale) ±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 $\text{M}\Omega$ 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 or Communication Control 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	] ]	AMP \$510 KΩ  AG: Analog circuit into	ernal GND  I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Couple Restrictions: No restrictions		
Terminal connection diagram		nput + nput –	
Input disconnection detection	Not supported.		

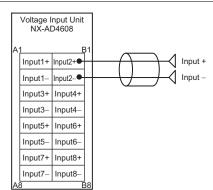
#### Analog Input Unit (voltage input type) 8 points NX-AD4608 **Unit name** Analog Input Unit (voltage input type) Model NX-AD4608 **External connection** Screwless clamping terminal block (16 **Number of points** 8 points terminals terminals) I/O refreshing method Selectable Synchronous I/O refreshing or Free-Run refreshing TS indicator Input method **Differential Input AD4608** Input range -10 to +10 V Input conversion range -5 to 105% (full scale) Absolute maximum ±15 V rating Indicator Input impedance 1 M $\Omega$ min. 1/30000 (full scale) Resolution 25°C ±0.1% (full scale) Overall accuracy 0 to 55°C ±0.2% (full scale) Conversion time 10 μs/point Between the input and the NX bus: Power 12 (W) x 100 (H) x 71 (D) **Dimensions** Isolation method = Transformer, Signal = Digital isolator (no isolation between inputs) $20 \text{ M}\Omega$ min. between isolated circuits (at 510 VAC between isolated circuits for 1 Insulation resistance Dielectric strength 100 VDC) minute at a leakage current of 5 mA max. I/O power supply Current capacity of I/O No supply Without I/O power supply terminals method power supply terminal · Connected to a CPU Unit or Communication Control Unit **NX Unit power** 1.45 W max. I/O current consumption No consumption Connected to a Communications consumption Coupler Unit 1.15 W max. Weight 70 g max. Input1+ to 8+ Terminal block AME Input1- to 8-**\$**510 KΩ **\$**510 KΩ Circuit layout ĀĠ ĀĠ AG: Analog circuit internal GND I/O power supply + I/O power supply NX bus NX hus connector connector (left) (right) I/O power supply -I/O power supply Installation orientation: Installation orientation Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.

# and restrictions

• Connected to a Communications Coupler Unit: Possible in 6 orientations.

Restrictions: No restrictions

# **Terminal connection** diagram



Input disconnection detection

Not supported.

# 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			
	TS indicator	Input method	Single-ended input	
	AD2203 • TS	Input range	4 to 20 mA	
		Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±30 mA	
		Input impedance	250 Ω min.	
		Resolution	1/8000 (full scale)	
		Overall accuracy 0 to 55°C	±0.2% (full scale)	
			±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	$20~\text{M}\Omega$ 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	<ul> <li>Connected to a CPU Unit or Communication Control Unit 1.25 W max.</li> <li>Connected to a Communications Coupler Unit 0.90 W max.</li> </ul>	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	Terminal block Input1+ to 2+  IOG  AG  AG: Analog circuit internal GND  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -			
Installation orientation and restrictions		<ul> <li>Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.</li> <li>Connected to a Communications Coupler Unit: Possible in 6 orientations.</li> </ul>		
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1  IOG IOG  IOV IOV  IOG IOG  A8 B8	IOG IOG NC	Input + 24 V (Sensor power supply +) 0 V (Sensor power supply -/ Input -) wire sensor	
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			
	TS indicator	Input method	Differential Input	
	AD2204 DTS	Input range	4 to 20 mA	
		Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±30 mA	
maioatoi		Input impedance	250 Ω min.	
		Resolution	1/8000 (full scale)	
		Overall 25°C accuracy 0 to 55°C	±0.2% (full scale) ±0.4% (full scale)	
		Conversion time	±0.4% (full scale) 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	
Insulation resistance	$20~\text{M}\Omega$ min. between isolated circuits (at 100 VDC)	Dielectric strength	isolation between inputs)  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 or Communication Control 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	Terminal block Input1+ to 2+  Input1- to 2-  AG  NX bus connector (left)  I/O power supply +  I/O power supply -		og circuit nal GND  I/O power supply +  I/O power supply -  I/O power supply -	
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions			
Terminal connection diagram	Current Input Unit NX-AD2204  A1 Input1+ Input2+ Input1- Input2- Input1- Input2-  AG AG  NC NC  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 F	ree-Run refreshing	
	TS indicator	Input method	Differential Input
	AD2208 ■TS	Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
inuicator		Input impedance	250 Ω
		Resolution	1/30000 (full scale)
		Overall 25°C	±0.1% (full scale)
		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	$20~\text{M}\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 2+  Input1- to 2-  AG  NX bus connector (left)  I/O power supply +  I/O power supply -	AMP AG: Analinten	og circuit nal GND  I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions		
Terminal connection diagram	Input1- Input2-  AG AG  NC NC	nput + nput – d to 0 V of analog circuit inside the Ur re AG terminal normally.	nit.
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		
	TS indicator	Input method	Single-ended input
	AD3203	Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
ilidicator		Input impedance	250 Ω min.
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		accuracy 0 to 55°C	±0.4% (full scale)
		Conversion time	250 μs/point  Between the input and the NX bus: Power
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	$20~\text{M}\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 4+ IOG  NX bus connector (left) I/O power supply + I/O power supply -	AMP 250 Ω  AG: Analog circuit into	ernal GND  I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions		
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1  OIOV IOV  IOV IOV  IOG IOG  A8 B8	Current Input Unit NX-AD3203  A1 Input1+ Input2+ IOV IOV IOG IOG Input3+ Input4+ IOV IOV IOG IOG  A8 B8	Input +  24 V (Sensor power supply +)  0 V (Sensor power supply – / Input –)  vire sensor
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			
	TS indicator	Input method	Differential Input	
	AD3204 DTS	Input range	4 to 20 mA	
		Input conversion range	-5 to 105% (full scale)	
Indicator		Absolute maximum rating	±30 mA	
		Input impedance	250 Ω min.	
		Resolution Overall 25°C	1/8000 (full scale)	
		Overall 25°C accuracy 0 to 55°C	±0.2% (full scale) ±0.4% (full scale)	
		Conversion time	250 μs/point	
Dimensions	40 (14) 400 (11) 74 (17)		Between the input and the NX bus: Power	
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)	
Insulation resistance	20 $\text{M}\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 4+  AG  NX bus connector (left)  I/O power supply +  I/O power supply -  I/O po			
Installation orientation and restrictions		<ul> <li>Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.</li> <li>Connected to a Communications Coupler Unit: Possible in 6 orientations.</li> </ul>		
Terminal connection diagram	Input1- Input2- Input3+ Input4+ Input3- Input4- AG AG AG AG AG AG AG AG AG terminal is connected.	Input + Input – ed to 0 V of analog circuit inside the U ire AG terminal normally.	nit.	
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 F	ree-Run refreshing	
	TS indicator	Input method	Differential Input
	AD3208 ■TS	Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
indicator		Input impedance	250 $\Omega$ min.
		Resolution	1/30000 (full scale)
		Overall 25°C	±0.1% (full scale)
		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	$20~\text{M}\Omega$ 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 or Communication Control 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	Terminal block Input1+ to 4+  AG  NX bus connector (left)  I/O power supply +  I/O power supply -		I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation:		
Terminal connection diagram	Input1- Input2- Input3+ Input4+ Input3- Input4- AG AG AG AG	nput + nput – d to 0 V of analog circuit inside the Ur re AG terminal normally.	nit.
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	terminais	terrimas)
3 · · · · · · · · · · · · · · · · · · ·	TS indicator	Input method	Single-ended input
	AD4203	Input range	4 to 20 mA
	■TS	Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
indicator		Input impedance	85 Ω
		Resolution	1/8000 (full scale)
		Overall 25°C accuracy 0 to 55°C	±0.2% (full scale)
		Conversion time	±0.4% (full scale) 250 μs/point
		Conversion time	Between the input and the NX bus: Power
Dimensions	12 (W) x 100 (H) x 71 (D)	Isolation method	= Transformer, Signal = Digital isolator (no isolation between inputs)
Insulation resistance	20 M $\Omega$ 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	<ul> <li>Connected to a CPU Unit or Communication Control Unit 1.40 W max.</li> <li>Connected to a Communications Coupler Unit 1.05 W max.</li> </ul>	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	Terminal block Input1+ to 8+  NX bus connector (left)  I/O power supply + I/O power supply - I/O power supp		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communica Connected to a Communications Couple Restrictions: No restrictions		
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1 IOG	B1 A1 B1 Input1+ Input2+ Input3+ Input4+ Input4+	Input +  24 V (Sensor power supply +) 0 V (Sensor power supply – / Input –) ree-wire Sensor
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		
	TS indicator	Input method	Differential Input
	AD4204 DTS	Input range	4 to 20 mA
		Input conversion range	-5 to 105% (full scale)
Indicator		Absolute maximum rating	±30 mA
indicator		Input impedance	85 Ω
		Resolution	1/8000 (full scale)
		Overall 25°C	±0.2% (full scale)
		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	$20~\text{M}\Omega$ 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 or Communication Control Unit 1.40 W max. Connected to a Communications Coupler Unit 1.05 W max.	I/O current consumption	n No consumption
Weight	70 g max.		
Circuit layout			I/O power supply + NX bus connector (right)
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communications Couple Restrictions: No restrictions		
Terminal connection diagram		Input + Input –	
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 **External connection** Screwless clamping terminal block (16 Number of points 8 points terminals terminals) I/O refreshing method Selectable Synchronous I/O refreshing or Free-Run refreshing Input method Differential Input TS indicator **AD4208** Input range 4 to 20 mA -5 to 105% (full scale) Input conversion range Absolute maximum ±30 mA rating Indicator Input impedance $85 \Omega$ Resolution 1/30000 (full scale) ±0.1% (full scale) Overall accuracy 0 to 55°C ±0.2% (full scale) Conversion time 10 μs/point Between the input and the NX bus: Power **Dimensions** 12 (W) x 100 (H) x 71 (D) Isolation method = Transformer, Signal = Digital isolator (no isolation between inputs) 510 VAC between isolated circuits for 1 20 M $\Omega$ min. between isolated circuits (at Insulation resistance Dielectric strength 100 VDC) minute at a leakage current of 5 mA max. I/O power supply Current capacity of I/O No supply Without I/O power supply terminals method power supply terminal · Connected to a CPU Unit or Communication Control Unit **NX Unit power** 1.45 W max. I/O current consumption No consumption consumption Connected to a Communications Coupler Unit 1.10 W max. Weight 70 g max. Input1+ to 8+ Terminal block \$ 85 O AME Input1- to 8-≩ 510 ΚΩ ≩ 510 ΚΩ Circuit layout AG: Analog circuit ΑĞ ĀĠ I/O power supply I/O power supply NX bus NX bus connector connector (left) I/O power supply -I/O power supply Installation orientation: Installation orientation • Connected to a CPU Unit or Communication Control Unit: Possible in upright installation. and restrictions • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions Current Input Unit NX-AD4208 Input1+ Input2+ Input + Input2-Input1-Input3+ Terminal connection Input4+ diagram Input3-Input4-Input5+ Input6+

Input5-

Input7+

Input7-

Supported.

Input disconnection

detection

Input6-

Input8-

Input8-

# **Analog Output Unit Specifications**

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

Unit name	Analog Output Unit (voltage output type)	Model	NX-DA2603			
Number of points	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)			
I/O refreshing method	Free-Run refreshing	· ·				
	TS indicator DA2603	Output range Output conversion range	-10 to +10 V -5 to 105% (full scale)			
		Allowable load resistance	5 kΩ min.			
Indicator		Output impedance	0.5 Ω max.			
		Resolution	1/8000 (full scale)			
		Overall 25°C	±0.3% (full scale)			
		accuracy 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	$20~\text{M}\Omega$ 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 or Communication Control Unit 1.40 W max. Connected to a Communications Coupler Unit 1.10 W max.	I/O current consumption	No consumption			
Weight	70 g max.					
Circuit layout	NX bus connector (left)  NX bus connector (left)  I/O power supply -	AMP W	Output V1+ to V2+  IOG  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -			
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions					
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1 Voltage Output Unit NX-DA2603  A1 V1+ V2+   IOV IOV IOV Voltage output + Voltage output - IOG					

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

Unit name	Analog Output Unit (voltage output type)	Model	NX-DA2605			
Number of points	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)			
/O refreshing method	Selectable Synchronous I/O refreshing or Free-Run refreshing					
	TS indicator	Output range	-10 to +10 V			
	DA2605 DTS	Output conversion range	-5 to 105% (full scale)			
		Allowable load resistance	5 kΩ min.			
Indicator		Output impedance	0.5 Ω max.			
		Resolution	1/30000 (full scale)			
		Overall 25°C	±0.1% (full scale)			
		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	$20~\text{M}\Omega$ 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	<ul> <li>Connected to a CPU Unit or Communication Control Unit 1.40 W max.</li> <li>Connected to a Communications Coupler Unit 1.10 W max.</li> </ul>	No consumption				
Weight	70 g max.					
Circuit layout	NX bus connector (left)  I/O power supply +	AMP W	Output V1+ to V2+  IOG  I/O power supply +  I/O power supply -  I/O power supply -			
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions: No restrictions					
Terminal connection diagram	●IOV IOV  ■IOG IOG  IOV IOV  IOG IOG	Voltage Output Unit NX-DA2605  A1	Voltage output +  Voltage output -			

#### Analog Output Unit (voltage output type) 4 points NX-DA3603 **Unit name** Analog Output Unit (voltage output type) Model NX-DA3603 **External connection** Screwless clamping terminal block (12 **Number of points** 4 points terminals terminals) I/O refreshing method Free-Run refreshing TS indicator **Output range** -10 to +10 V **DA3603 Output conversion** -5 to 105% (full scale) range Allowable load $5 \text{ k}\Omega \text{ min.}$ resistance Indicator **Output impedance** $0.5~\Omega$ max. Resolution 1/8000 (full scale) 25°C ±0.3% (full scale) Overall accuracy 0 to 55°C ±0.5% (full scale) Conversion time 250 μs/point Between the input and the NX bus: Power 12 (W) x 100 (H) x 71 (D) Dimensions Isolation method = Transformer, Signal = Digital isolator (no isolation between inputs) 20 $M\Omega$ min. between isolated circuits (at 510 VAC between isolated circuits for 1 Insulation resistance Dielectric strength 100 VDC) minute at a leakage current of 5 mA max. I/O power supply Current capacity of I/O IOV: 0.1 A/terminal max., Supply from the NX bus method power supply terminal IOG: 0.1 A/terminal max. · Connected to a CPU Unit or Communication Control Unit **NX Unit power** 1.35 W max. I/O current consumption No consumption consumption · Connected to a Communications Coupler Unit 1.25 W max. Weight 70 g max. IOV Output V1+ to V4+ Terminal block Circuit layout IOG AG: Analog circuit internal GND I/O power supply I/O power supply NX bus NX bus connecto (left) (right) I/O power supply I/O power supply Installation orientation: Installation orientation • Connected to a CPU Unit or Communication Control Unit: Possible in upright installation. and restrictions • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions Additional I/O Voltage Output Unit Power Supply Unit NX-DA3603

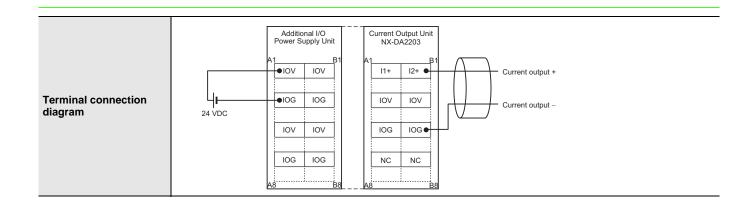
#### IOV •IOV V1+ V2+ € Voltage output + IOV IOV ●IOG IOG IOG IOG ( Voltage output -Terminal connection 24 VDC diagram V3+ V4+ IOV IOV IOV/ IOV IOG IOG IOG IOG

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

Unit name	Analog Output Unit (voltage output type)	Model	NX-DA3605		
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				
	TS indicator	Output range	-10 to +10 V		
	DA3605	Output conversion range	-5 to 105% (full scale)		
		Allowable load resistance	5 k $Ω$ min.		
Indicator		Output impedance	0.5 Ω max.		
		Resolution	1/30000 (full scale)		
		Overall 25°C	±0.1% (full scale)		
		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	$20~\text{M}\Omega$ 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 or Communication Control Unit 1.60 W max. Connected to a Communications Coupler Unit 1.25 W max.	I/O current consumption No consumption			
Weight	70 g max.				
Circuit layout	NX bus connector (left)  NX bus connector (left)  NX bus connector (left)	AMP (0)	Output V1+ to V4+  IOG  I/O power supply +  I/O power supply -  I/O power supply -		
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communic Connected to a Communications Couple Restrictions: No restrictions				
Terminal connection diagram	Additional I/O Power Supply Unit  A1 B1  OIOV IOV  IOV IOV  IOV IOV  IOG IOG  A8 B8	Voltage Output Unit NX-DA3605  A1	Voltage output + Voltage output –		

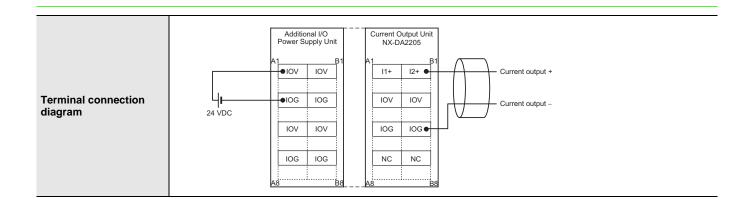
# Analog Output Unit (current output type) 2 points NX-DA2203

Unit name	Analog Output Unit (current output type)	NX-DA2203				
Number of points	2 points	External connection terminals  Screwless clamping terminal block terminals)				
I/O refreshing method	Free-Run refreshing	Free-Run refreshing				
	TS indicator	Output range	4 to 20 mA			
	DA2203	Output conversion range	-5 to 105% (full scale)			
Indicator		Allowable load resistance	600 $Ω$ min.			
		Resolution	1/8000 (full scale)			
		Overall 25°C	±0.3% (full scale)			
		accuracy 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	$20~\text{M}\Omega$ 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 or Communication Control Unit 2.10 W max.     Connected to a Communications Coupler Unit 1.75 W max.  I/O current consumption  No consumption					
Weight	70 g max.					
Circuit layout	NX bus connector (left)  NX bus connector (left)  NX bus connector (left)	amp (m)	Output I1+ to I2+  IOG  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -			
Installation orientation and restrictions	Installation orientation:  Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions:  For upright installation: No restrictions  For any installation other than upright: Restricted as shown in the graph below.  ((1)  (1)  (1)  (1)  (2)  (2)  (3)  (4)  (4)  (5)  (5)  (*C)  Ambient operating temperature					



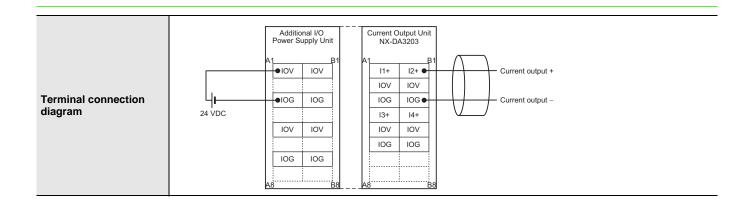
# Analog Output Unit (current output type) 2 points NX-DA2205

Unit name	Analog Output Unit (current output type)	Model	NX-DA2205	
		External connection	Screwless clamping terminal block (8	
Number of points	2 points	terminals)		
I/O refreshing method	Selectable Synchronous I/O refreshing or	-	Transaction of the control of the co	
	TS indicator DA2205	Output range Output conversion	4 to 20 mA -5 to 105% (full scale)	
	<b>■</b> TS	Allowable load	600 Ω min.	
Indicator		resistance		
		Resolution	1/30000 (full scale)	
		Overall 25°C accuracy 0 to 55°C	±0.1% (full scale)	
		Conversion time	±0.3% (full scale) 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	$20~\text{M}\Omega$ 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 or Communication Control Unit 2.10 W max.     Connected to a Communications Coupler Unit 1.75 W max.  //O current consumption  No consumption			
Weight	70 g max.			
Circuit layout	NX bus connector (left)  NX bus connector (left)  NX bus connector (left)	AMP With internal GND AG	Output I1+ to I2+  IOG  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -	
Installation orientation and restrictions	Installation orientation:  • Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  • Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions:  For upright installation: No restrictions  For any installation other than upright: Restricted as shown in the graph below.   (2)  (3)  (60)  (9)  (10)			



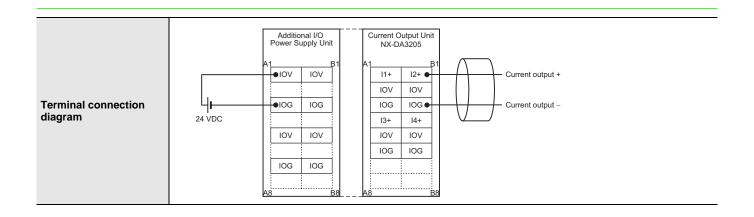
# Analog Output Unit (current output type) 4 points NX-DA3203

Unit name	Analog Output Unit (current output type)	Model	NX-DA3203		
Number of points	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)		
I/O refreshing method	Free-Run refreshing				
	TS indicator	Output range	4 to 20 mA		
	DA3203	Output conversion range	-5 to 105% (full scale)		
Indicator		Allowable load resistance	350 Ω min.		
		Resolution	1/8000 (full scale)		
		Overall 25°C	±0.3% (full scale)		
		accuracy 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 M $\Omega$ 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 or Communication Control Unit 2.10 W max.     Connected to a Communications Coupler Unit 1.80 W max.  //O current consumption		No consumption		
Weight	70 g max.				
Circuit layout	NX bus connector (left)  NX bus connector (left)  NX bus connector (left)	AMP 00 1 internal GND AG	Output I1+ to I4+  IOG  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -		
Installation orientation and restrictions	Installation orientation:  • Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  • Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions:  For upright installation: No restrictions  For any installation other than upright: Restricted as shown in the graph below.  (\text{Q})  \[ \text{350} \]  \[ \text{Q} \]  \[ \text{350} \]  \[ \text{Q} \]  \[ \text{350} \]  \[ \text{Q} \]  \[ \text{40} \]  Ambient operating temperature}  (\text{Total Ambient operating temperature})				



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

Unit name	Analog Output Unit (current output type)	Model	NX-DA3205		
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				
	TS indicator	Output range	4 to 20 mA		
	DA3205	Output conversion range	-5 to 105% (full scale)		
Indicator		Allowable load resistance	$350~\Omega$ min.		
		Resolution	1/30000 (full scale)		
		Overall 25°C	±0.1% (full scale)		
		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	$20~\text{M}\Omega$ 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 or Communication Control Unit 2.10 W max.     Connected to a Communications Coupler Unit 1.80 W max.  I/O current consumption  No consumption				
Weight	70 g max.				
Circuit layout	NX bus connector (left)  NX bus connector l/O power supply +	AMP Witinternal GND AG	Output I1+ to I4+  IOG  I/O power supply +  I/O power supply -  I/O power supply -  I/O power supply -		
Installation orientation and restrictions	Installation orientation:  • Connected to a CPU Unit or Communication Control Unit: Possible in upright installation.  • Connected to a Communications Coupler Unit: Possible in 6 orientations.  Restrictions:  For upright installation: No restrictions  For any installation other than upright: Restricted as shown in the graph below.   (10)  (				



### **Version Information**

### Connected to a CPU Unit

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

NX Unit		Corresponding unit versions/versions	
Model	Unit version	CPU Unit	Sysmac Studio
NX-AD	Ver.1.0	Ver.1.13	Ver.1.17

Note: 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.

### **Connected to an EtherCAT Coupler Unit**

N	NX Unit	Corre	esponding unit versions/vers	sions
Model	Unit version	EtherCAT Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio
NX-AD	Ver.1.0	Ver.1.0	Ver.1.05	Ver.1.06

Note: 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.

### Connected to an EtherNet/IP Coupler Unit

NX Uni	t	Corresponding unit			nit versions/versions		
		Application with a	Application with an NJ/NX/NY-series Controller *1 A		Application wi	Application with a CS/CJ/CP-series PLC *2	
Model	Unit version	EtherNet/IP Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio	EtherNet/IP Coupler Unit	Sysmac Studio	NX-IO Configurator *3
NX-AD	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00

**Note:** 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.

- \*1 Refer to the user's manual for the EtherNet/IP Coupler Units for information on the unit versions of EtherNet/IP Units that are compatible with EtherNet/IP Coupler Units.
- \*2 Refer to the user's manual for the EtherNet/IP Coupler Units for information on the unit versions of CPU Units and EtherNet/IP Units that are compatible with EtherNet/IP Coupler Units.
- \*3 For connection to an EtherNet/IP Coupler Unit with unit version 1.0, connection is supported only for a connection to the peripheral USB port on the EtherNet/IP Coupler Unit. You cannot connect by any other path. If you need to connect by another path, use an EtherNet/IP Coupler Unit with unit version 1.2 or later.

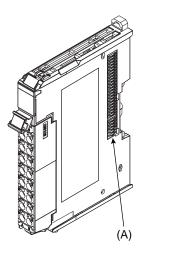
### **Connected to Communication Control Units**

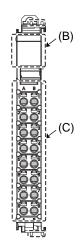
	NX Unit	Corresponding uni	t versions/versions
Model	Unit version	Communication Control Unit	Sysmac Studio
NX-AD	Ver.1.0	Ver.1.00	Ver.1.24

Note: 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**

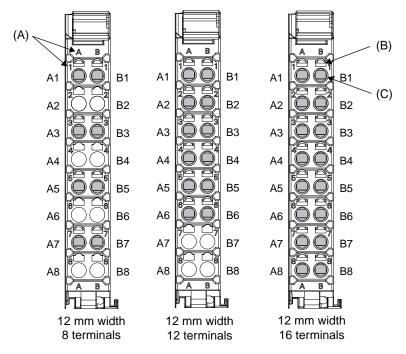
# Screwless Clamping Terminal Block Type 12 mm Width





Letter	Item Specification	
(A)	NX bus connector	This connector is used to connect to another Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The terminal block is used to connect to external devices. The number of terminals depends on the Unit.

### **Terminal Blocks**



Letter	Item	Specification
(A)	Terminal number indication	The terminal number is identified by a column (A through D) and a row (1 through 8).  Therefore, terminal numbers are written as a combination of columns and rows, A1 through A8 and B1 through B8.  The terminal number indication is the same regardless of the number of terminals on the terminal block.
(B)	Release hole	A flat-blade screwdriver is inserted here to attach and remove the wiring.
(C)	Terminal hole	The wires are inserted into these holes.

### **Applicable Terminal Blocks for Each Unit Model**

	Terminal Blocks							
Unit model	Model	Model No. of terminals		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			
NX-DA2□□□	NX-TBA082	8	A/B	None	10 A			
NX-DA3□□□	NX-TBA122	12	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.

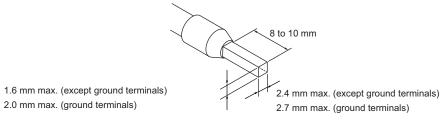
The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal type	Manufacturer	Ferrule model	Applicable wire (mm² (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.)		
		AI0,5-8	0.5 (#20)	CRIMPFOX 6 (0.25 to 6 mm <sup>2</sup> , AWG24 to 10)		
		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	1			
Ground terminals		Al2,5-10	2.0 *			
Terminals other	Weidmuller	H0.14/12	0.14 (#26)	Weidmuller (The figure in parentheses is the applicable wire size.)		
than ground terminals		H0.25/12	0.25 (#24)	PZ6 Roto (0.14 to 6 mm², AWG 26 to 10)		
		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				

<sup>\*</sup> Some AWG 14 wires exceed 2.0 mm<sup>2</sup> 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



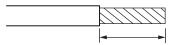
### **Using Twisted Wires/Solid Wires**

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

Termi	Wire type				On the standard		
i eriiii	Twisted wires		Solid wire		Wire size	Conductor length (stripping length)	
Classification	Current capacity	Plated	Unplated	Plated	Unplated		(ourpping longur)
	2 A or less		Possible	Possible	Possible	0.08 to 1.5 mm <sup>2</sup> AWG28 to 16	8 to 10 mm
All terminals except ground terminals	Greater than 2 A and 4 A or less	Possible	Not Possible	Possible *1	Not Possible		
ground terrimale	Greater than 4 A	Possible *1		Not Possible			
Ground terminals		Possible	Possible	Possible *2	Possible *2	2.0 mm <sup>2</sup>	9 to 10 mm

<sup>\*1.</sup> Secure wires to the screwless clamping terminal block. Refer to the Securing Wires in the USER'S MANUAL for how to secure wires.

<sup>\*2.</sup> With the NX-TB□□□1 Terminal Block, use twisted wires to connect the ground terminal. Do not use a solid wire.



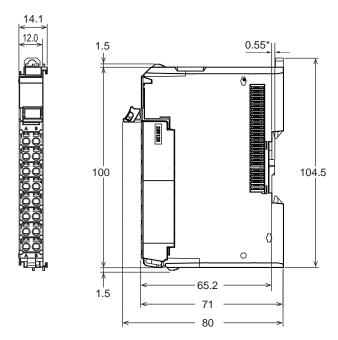
Conductor length (stripping length)

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

**Dimensions** (Unit/mm)

# **Screwless Clamping Terminal Block Type**

12 mm Width



<sup>\*</sup> The dimension is 1.35 mm for Units with lot numbers through December 2014.

### **Related Manual**

Cat. No.	Model number	Manual name	Application	Description
W522	NX-AD	NX-series Analog I/O Units User's Manual for 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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