NX-series Analog Output Unit

NX-DA

CSM NX-DA DS F 1 1

Wide Lineup to Meet Various Analog Control Needs: from High-speed Synchronous Control to General Purpose

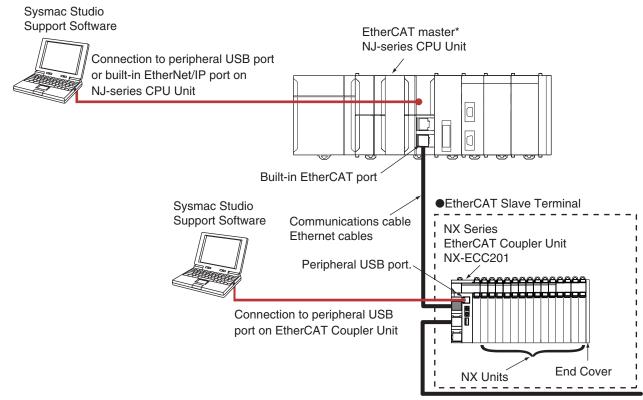
- NX-series Analog Output Unit
- This unit can be used as an ECAT slave by connecting with the ECAT Coupler.
- Voltage and current output models are available.



Features

- Output up to four analog signals with one Unit.
- Free-run refreshing or I/O synchronous refreshing can be selected for refreshing with the EtherCAT Coupler Unit.
- The lineup includes the model which achieves sampling speed of 10 μs and resolution of 1/30000, ideal for high-speed, high-precision control.
- The removable screwless terminal block improves maintenance.
- · Screw-less clamp terminal block significantly reduces wiring work.
- 12-mm-wide unit can save space.

System Configuration



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

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Ordering Information

International Standards

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

Analog Output Unit

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

Option

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

Accessories

Not included.

General Specification

Item		Specification			
Enclosure		Mounted in a panel			
Grounding method		Ground to 100 Ω or less			
	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.			
Operating environment	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)			
environment	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/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 standards		cULus: Listed UL508 and ANSI/ISA 12.12.01 EC: EN 61131-2 and C-Tick, KC Registration			

3

Analog Output Unit Specifications

Voltage Output Unit 2points NX-DA2603

Unit name	Voltage Output Unit	Model	NX-DA2603		
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)		
I/O refreshing method	Free-Run refreshing				
	TS indicator	Output range	-10 to +10 V		
	AD2603 ■TS	Output conversion range	-5 to 105% (full scale)		
		Allowable load resistance	5 k $Ω$ 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 M Ω min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.		
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.		
NX Unit power consumption	1.10 W max.	I/O current consumption	No consumption		
Weight	70 g max.				
Circuit layout	NX bus connector (left) I/O power supply + 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: Possible in 6 orientations. Restrictions: No restrictions				
Terminal connection diagram	Additional I/O Power Supply Unit NX-DA2603 A1 B1 Voltage Output Unit NX-DA2603 A1 V1+ V2+ Voltage output + Voltage output + Voltage output -				

Voltage Output Unit 2points NX-DA2605

Unit name	Voltage Output Unit	Model	NX-DA2605		
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)		
I/O refreshing method	Switching Synchronous I/O refreshing and	Free-Run refreshing			
	TS indicator	Output range	-10 to +10 V		
	DA2605 ■TS	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	1.10 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) NX bus connector (left) NX bus connector (left)	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: Possible in 6 orientations. Restrictions: No restrictions				
Terminal connection diagram	Additional I/O Power Supply Unit A1 B1 IOV IOV IOV IOV IOV IOV IOG IOG A8 B8	Voltage Output Unit NX-DA2605 A1	Voltage output + Voltage output –		

Voltage Output Unit 4points NX-DA3603

Unit name	Voltage Output Unit	Model	NX-DA3603
Capacity	4 points	External connection terminals	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing		
	TS indicator AD3603 ■TS	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	1.25 W max.	I/O current consumption	No consumption
Weight	70 g max.		
Circuit layout	NX bus connector (left) NX bus connector (left) N/O power supply +	AMP W	Output V1+ to V4+ IOG I/O power supply + I/O power supply - I/O power supply -
Installation orientation and restrictions	Installation orientation: Possible in 6 orient Restrictions: No restrictions	ations.	
Terminal connection diagram	Additional I/O Power Supply Unit A1 IOV IOV IOV IOV IOG IOG IOG IOG A8 B8	Voltage Output Unit NX-DA3603 A1	Voltage output + Voltage output -

Voltage Output Unit 4points NX-DA3605

Unit name	Voltage Output Unit	Model	NX-DA3605	
		External connection	Screwless clamping terminal block (12	
Capacity	4 points	terminals terminals)		
I/O refreshing method	Switching Synchronous I/O refreshing and	Free-Run refreshing		
	TS indicator	Output range	-10 to +10 V	
	DA3605 ■TS	Output conversion range	-5 to 105% (full scale)	
		Allowable load resistance	5 kΩ min.	
Indicator		Output impedance	$0.5~\Omega$ 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	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 W	Output V1+ to V4+ IOG I/O power supply + I/O power supply - I/O power supply - I/O power supply -	
Installation orientation and restrictions	Installation orientation: Possible in 6 oriental Restrictions: No restrictions	ations.		
Terminal connection diagram	A1 B1 Olov IOV IOV IOV IOG IOG IOG IOG	Voltage Output Unit NX-DA3605 1	Voltage output + Voltage output –	

Current Output Unit 2points NX-DA2203

Unit name	Current Output Unit	Model	NX-DA2203		
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)		
I/O refreshing method	Free-Run refreshing	1-			
	TS indicator DA2203	Output conversion	-5 to 105% (full scale)		
	-13	range Allowable load resistance	$600~\Omega$ min.		
Indicator		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 Ω min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.		
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.		
NX Unit power consumption	1.75 W max.	I/O current consumption	No consumption		
Weight	70 g max.				
Circuit layout	NX bus connector (left) NX bus connector (left) NX bus connector (left)	auit 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: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below.				
Terminal connection diagram	Additional I/O Power Supply Unit A1 IOU IOV IOV IOU IOG	IOV IOV	Current output + Current output –		

Current Output Unit 2points NX-DA2205

Unit name	Current Output Unit	Model	NX-DA2205	
Capacity	2 points	External connection terminals	Screwless clamping terminal block (8 terminals)	
I/O refreshing method	Switching Synchronous I/O refreshing and	_		
	TS indicator	Output range	4 to 20 mA	
	DA2205 ■TS	Output conversion range	-5 to 105% (full scale)	
Indicator		Allowable load resistance	600 $Ω$ 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 M Ω min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.	
NX Unit power consumption	1.75 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	NX bus connector (left) NX bus connector (left) NX bus connector (left)	ait internal GND AG	Output I1+ to I2+ I/O power supply + I/O power supply - I/O power supply -	
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below.			
	Ambient operating tem			
Terminal connection diagram	Additional I/O Power Supply Unit A1 B1 A1 B1 A1 B1 A1 IOG IOG IOG IOG IOG IOG A8 B8 B8 A8	101/	current output +	

Current Output Unit 4points NX-DA3203

Unit name	Current Output Unit	Model	NX-DA3203	
Capacity	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 ■TS	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 Ω min. between isolated circuits (at 100 VDC)	Dielectric strength	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.	
I/O power supply method	Supply from the NX bus	Current capacity of I/O power supply terminal	IOV: 0.1 A/terminal max., IOG: 0.1 A/terminal max.	
NX Unit power consumption	1.80 W max.	I/O current consumption	No consumption	
Weight	70 g max.			
Circuit layout	NX bus connector (left) I/O power supply +	internal GND AG	Output I1+ to I4+ IOG I/O power supply + I/O power supply - I/O power supply -	
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below.			
Terminal connection diagram	Additional I/O Power Supply Unit A1 B1 A1 IOG IOG IOV IOV IOG IOG A8 B8 A8	IOV IOV	Current output + Current output –	

Current Output Unit 4points NX-DA3205

Unit name	Current Output Unit	Model	NX-DA3205	
Capacity	4 points	External connection	Screwless clamping terminal block (12	
I/O refreshing method	Switching Synchronous I/O refreshing and	terminals	terminals)	
70 refreshing method	TS indicator	Output range	4 to 20 mA	
	DA3205 ■TS	Output conversion range	-5 to 105% (full scale)	
Indicator		Allowable load resistance	350 Ω min.	
mulcator		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	1.80 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)	uit internal GND AG	Output I1+ to I4+ Terminal block I/O power supply + I/O power supply - I/O power supply - I/O power supply -	
Installation orientation and restrictions	Installation orientation: Possible in 6 orientations. Restrictions: For upright installation: No restrictions For any installation other than upright: Restricted as shown in the graph below.			
Terminal connection diagram	Additional I/O Power Supply Unit A1	IOV IOV	Current output + Current output –	

Version Information

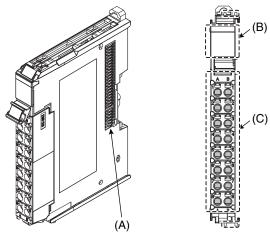
NX Series Analog Output Unit and Sysmac Studio

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

External Interface

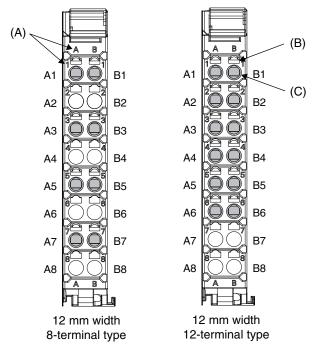
Analog Output Unit

NX-DA□□□□ 12mm Width



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

Terminal Blocks



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

Applicable Wires

Using Ferrules

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

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

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

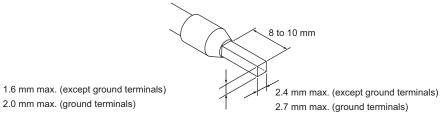
The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal types	Manufacturer	Ferrule model number	Applicable wire (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 ² , 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		
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 mm ² , AWG 26 to 10)
terminais		H0.34/12	0.34 (#22)	
		H0.5/14	0.5 (#20)	
		H0.5/16		
		H0.75/14	0.75 (#18)	
		H0.75/16		
		H1.0/14	1.0 (#18)	
		H1.0/16		
		H1.5/14	1.5 (#16)	
		H1.5/16		

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

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

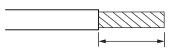
Finished Dimensions of Ferrules



Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, the applicable wire range and conductor length (stripping length) are as follows. Use the twisted wires to connect the ground wire to a ground of 100Ω or less. Do not use the solid wires.

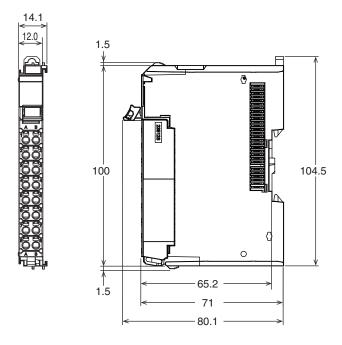
Terminal types	Applicable wires	Conductor length (stripping length)
Ground terminals	2.0 mm ²	9 to 10 mm
Terminals other than ground terminals	0.08 to 1.5 mm ² AWG28 to 16	8 to 10 mm



Conductor length (stripping length)

Dimensions (Unit/mm)

Analog Output Unit NX-DA□□□□ 12 mm Width



Related Manuals

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

Terms and Conditions Agreement

Read and understand this catalog.

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2013 4

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