



DC (10-30V) Output Module (Cat. No. 1771-OBN Series B)

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Use this document as a guide when installing the catalog number 1771-OBN series B output module.

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Prevent Electrostatic Discharge

This output module is sensitive to electrostatic discharge. This module is shipped in static-shielded packaging to guard against electrostatic discharge damage. Observe the following precautions when handling this module.



ATTENTION: Electrostatic discharge can damage integrated circuits or semiconductors if you touch backplane connector pins. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential
- Wear an approved wrist-strap grounding device
- Do not touch the backplane connector or connector pins
- Do not touch circuit components inside the module
- If available, use a static-safe work station
- When not in use, keep the module in its original static-shielded packaging

Understand Compliance to European Union Directives

This product has the CE mark and is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as these Allen-Bradley publications:

Publication	Publication number
Industrial Automation Wiring and Grounding Guidelines For Noise Immunity	1770-4.1
Guidelines for Handling Lithium Batteries	AG-5.4
Automation Systems Catalog	B111

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

Important Pre-installation Considerations

The 1771-OBN/B dc output module is a source output and requires a sink input. A sink input provides a path to ground and a source output provides a positive voltage path.

Use this module in all 1771 I/O chassis **except** 1771-A1, -A2 and 1771-A4 chassis. Refer to the table below for processor compatibility.

Processor Compatibility Chart

System Type	Use with Processors:
Local	Mini-PLC-2/02 [®] (cat. no. 1772-LZ, -LZP) Mini-PLC-2/16 (cat. no. 1772-LX, -LXP) Mini-PLC-2/17 (cat. no. 1772-LW, -LWP) PLC-5/15 [®] , Series B and later (cat. no. 1785-LT)
Remote (with a 1771-ASB remote I/O adapter)	PLC-2/20 [®] (cat. no. 1772-LP2) PLC-2/30 (cat. no. 1772-LP3) PLC-3 [®] (cat. no. 1775-L1, -L2, -L3, -L4) PLC-3/10 (cat. no. 1775-LP4, -LP8) PLC-5/15, Series B and later (cat. no. 1785-LT)

Do not place this module in the same I/O chassis as the 1771-IX thermocouple module. You can use this module in the same chassis as the 1771-IXE thermocouple module.

Calculate Power Supply Requirements

The controller or I/O chassis power supply, connected through the backplane of the I/O chassis, powers the logic circuitry of the output modules. The maximum current drawn from this supply is 330mA. To calculate the requirements for the backplane power supply, add 330mA to the power requirements of all other modules in the I/O chassis. Calculating the requirements will prevent an overload to the chassis backplane and/or backplane power supply.

Key the Backplane Connector

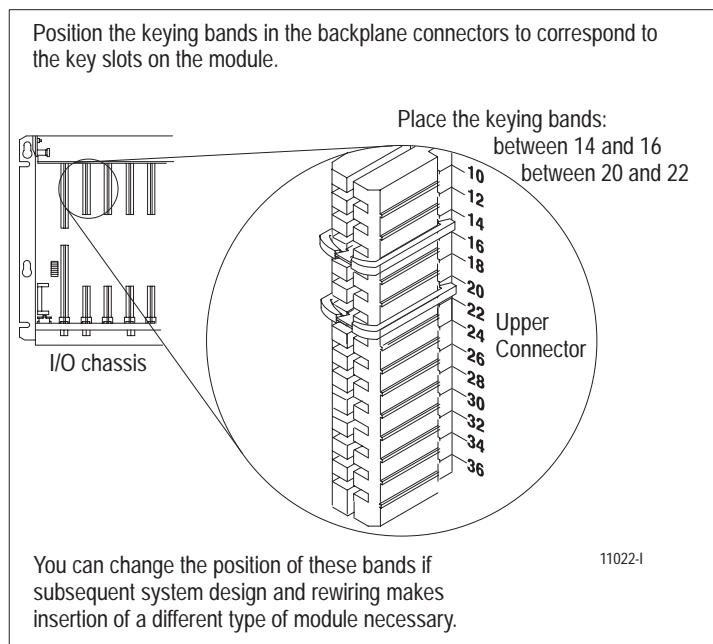
Place your module in any slot in the chassis except the leftmost slot which is reserved for processors or adapters.



ATTENTION: Observe the following precautions when inserting or removing keys:

- insert or remove keys with your fingers
- make sure that key placement is correct

Incorrect keying or the use of a tool can result in damage to the backplane connector and possible system faults.



Install the Module and Field Wiring Arm



ATTENTION: Remove power from the 1771 I/O chassis backplane before you install the module. Failure to remove power from the backplane could cause:

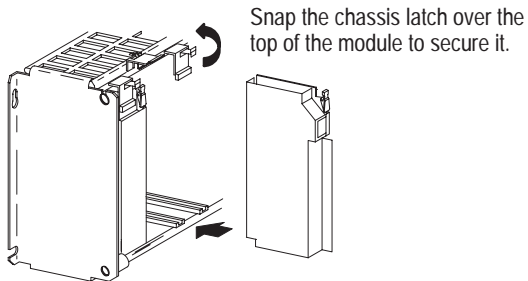
- module damage
- degradation of performance
- injury or equipment damage due to possible unexpected operation

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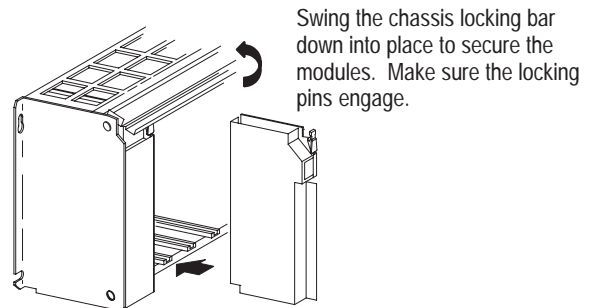
Place the module in the card guides on the top and bottom of the chassis that guide the module into position.

Important: Apply firm even pressure on the module to seat it into its backplane connector.

1771-A1B, -A2B, -A3B, -A4B I/O chassis



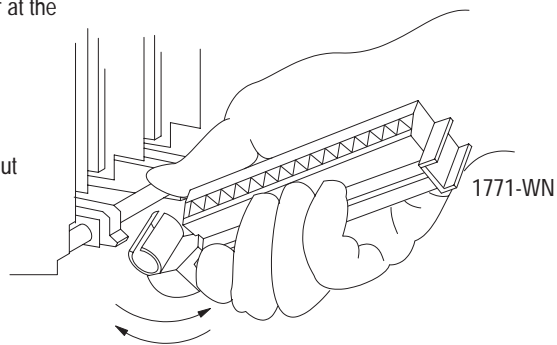
1771-A1B, -A2B, -A4B Series B I/O chassis



2

Attach the wiring arm (1771-WN) to the horizontal bar at the bottom of the I/O chassis.

The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.



Connecting Wiring to the Module

You make connections to the module through the field wiring arm cat. no. 1771-WN. The arm pivots on the I/O chassis to connect with terminals on the front of the module and acts as a terminal strip. The wiring arm allows the module to be removed from the chassis without disconnecting wiring.

1. Make certain all power is removed from the module before making wiring connections.
2. Swing the wiring arm up into position on the front of the module. The locking tab on the module will secure it into place.
3. Make your connections to the field wiring arm as shown in the connection diagram. (Use the label on the front of the wiring arm to identify your wiring.)



ATTENTION: The field wiring arm terminal identification number is not the same as the number of the bit which controls that output.

I/O Module Groups

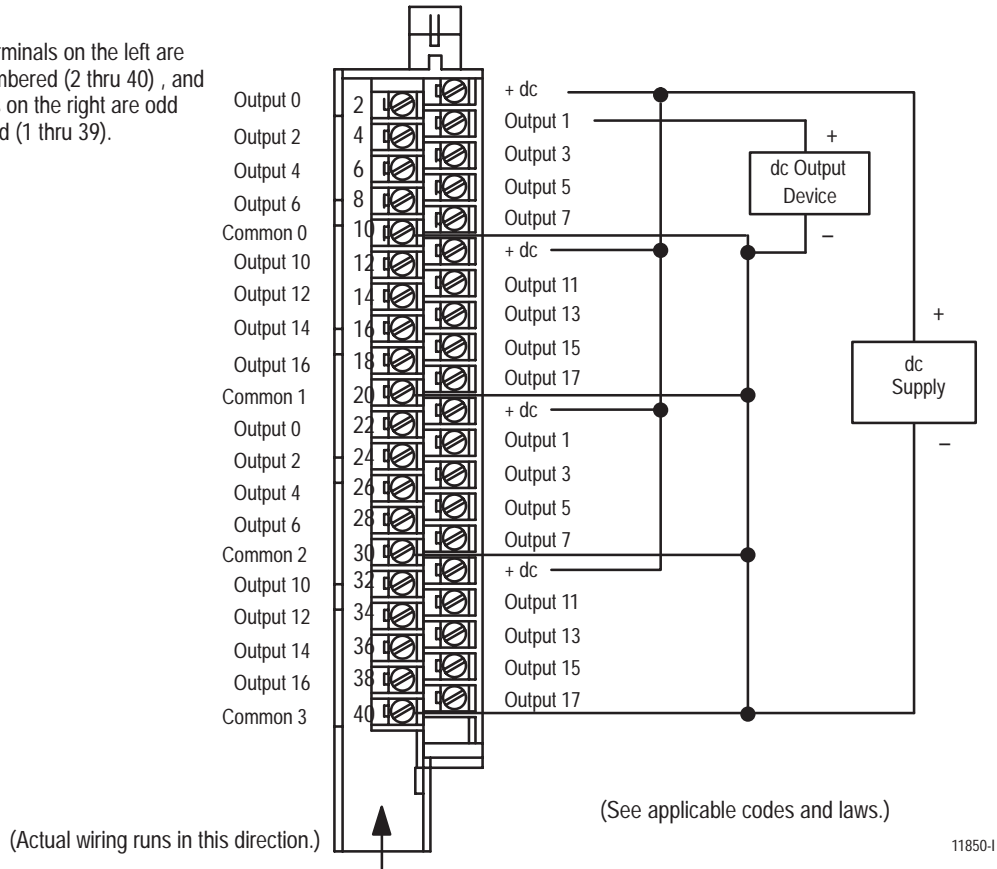
Each module condenses 2 full module groups (32 outputs) into each I/O chassis slot. For example:

- Module group 1 = outputs 00 through 17
- Module group 2 = outputs 00 through 17 (module group 2 represents the second set of outputs).

Terminals 1 through 20 represent module group 1. Terminals 21 through 40 represent module group 2. Terminals 10, 20, 30 and 40 are DC common and terminals 1, 11, 21 and 31 are DC power.

Connection Diagram for the 1771-OBN DC Output Module

Note: Terminals on the left are even numbered (2 thru 40), and terminals on the right are odd numbered (1 thru 39).



ATTENTION: Miswiring or shorting the output terminals will cause permanent damage to this module.



ATTENTION: Observe proper polarity with dc power connections. Reverse polarity, or application of ac voltage could damage the module.

Table A Module Output Terminal Assignments

Terminal Number	Output Assignment	I/O program address	Terminal Number	Output Assignment	I/O program address
01	¹ 10 to 30V dc	-	21	¹ 10 to 30V dc	-
02	Output 00	ORG00	22	Output 00	ORG00
03	Output 01	ORG01	23	Output 01	ORG01
04	Output 02	ORG02	24	Output 02	ORG02
05	Output 03	ORG03	25	Output 03	ORG03
06	Output 04	ORG04	26	Output 04	ORG04
07	Output 05	ORG05	27	Output 05	ORG05
08	Output 06	ORG06	28	Output 06	ORG06
09	Output 07	ORG07	29	Output 07	ORG07
10	Common 0	-	30	Common 2	-
11	¹ 10 to 30V dc	-	31	¹ 10 to 30V dc	-
12	Output 10	ORG10	32	Output 10	ORG10
13	Output 11	ORG11	33	Output 11	ORG11
14	Output 12	ORG12	34	Output 12	ORG12
15	Output 13	ORG13	35	Output 13	ORG13
16	Output 14	ORG14	36	Output 14	ORG14
17	Output 15	ORG15	37	Output 15	ORG15
18	Output 16	ORG16	38	Output 16	ORG16
19	Output 17	ORG17	39	Output 17	ORG17
20	Common 1	-	40	Common 3	-

Where: R = rack number (1, 2, 3, etc.)
G = I/O group (0 - 7)

¹ You can connect a different power supply to each 10 to 30V dc terminal. They are not connected internally. Connect each common (0, 1, 2, 3) to the corresponding supply. Commons are not internally connected.

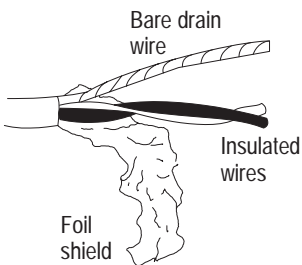
Ground the Chassis and Module

Use the following diagrams to ground your I/O chassis and isolated analog input module. Follow these steps to prepare the cable:

- 1 Remove a length of cable jacket from the Belden 8761 cable.



- 2 Pull the foil shield and bare drain wire from the insulated wires.



- 3 Twist the foil shield and drain wire together to form a single strand.



- 4 Attach a ground lug.

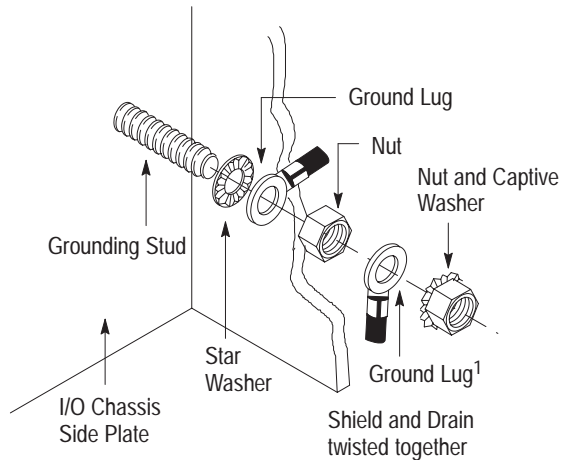


When using shielded cable wire, ground the foil shield and drain wire only at one end of the cable. We recommend that you wrap the foil shield and drain wire together and connect them to a chassis mounting bolt. At the opposite end of the cable, tape exposed shield and drain wire with electrical tape to insulate it from electrical contact.

Refer to Wiring and Grounding Guidelines, publication 1770-4.1 for additional information.

Chassis Ground

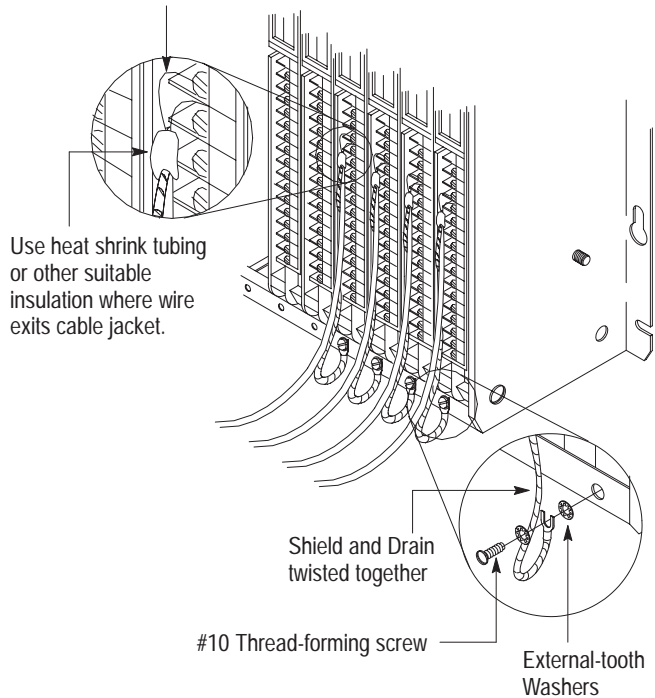
When you connect grounding conductors to the I/O chassis grounding stud, place a star washer under the first lug, then place a nut with captive lock washer on top of each ground lug.



¹Use the cup washer if crimp-on lugs are not used.

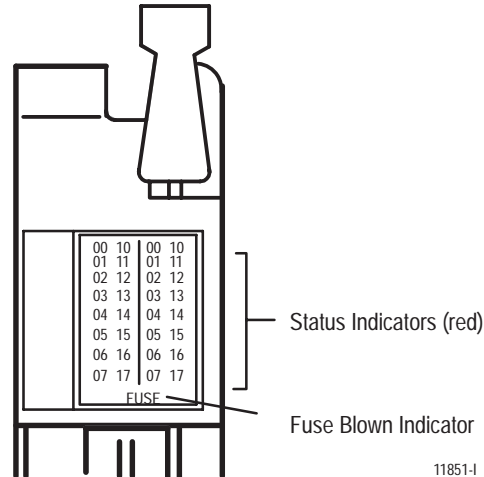
Single-point Grounding

Extend shield to termination point. Expose just enough cable to adequately terminate inner conductors.



Interpreting the Status Indicators

The module has 32 status indicators on the module front plate. These represent the control status of the outputs. Each indicator is lit when its corresponding output is energized. An additional indicator is provided to indicate a blown fuse condition.



Replacing the Fuses



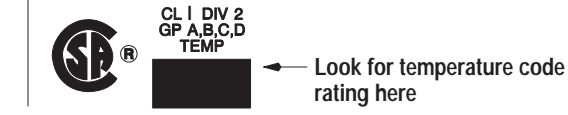
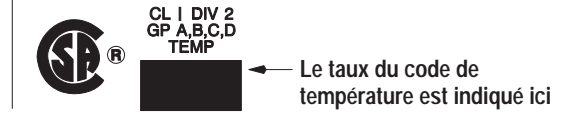


To replace a blown fuse, proceed as follows:



ATTENTION: Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing an I/O module.

- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

1. Turn off power to the chassis.
2. Remove the module from the I/O chassis.
3. Remove the blown fuse from the fuse holder (accessible through the side cover), and replace with a 4A, 250V normal blow fuse.
4. Reinsert the module into chassis I/O chassis.
5. Turn on power to the chassis.

<p>CSA Hazardous Location Approval</p>	<p>Approbation d'utilisation dans des emplacements dangereux par la CSA</p>
<p>CSA® certifies products for general use as well as for use in hazardous locations. Actual CSA certification is indicated by the product label as shown below, and not by statements in any user documentation.</p>	<p>La CSA® certifie les produits d'utilisation générale aussi bien que ceux qui s'utilisent dans des emplacements dangereux. La certification CSA en vigueur est indiquée par l'étiquette du produit et non par des affirmations dans la documentation à l'usage des utilisateurs.</p>
<p>Example of the CSA certification product label</p> 	<p>Exemple d'étiquette de certification d'un produit par la CSA</p> 
<p>To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for CSA-certified Allen-Bradley industrial control products.</p> <ul style="list-style-type: none"> • This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, or non-hazardous locations only. • The products having the appropriate CSA markings (that is, Class I Division 2, Groups A, B, C, D), are certified for use in other equipment where the suitability of combination (that is, application or use) is determined by the CSA or the local inspection office having jurisdiction. 	<p>Pour satisfaire à la certification de la CSA dans des endroits dangereux, les informations suivantes font partie intégrante de la documentation des produits industriels de contrôle Allen-Bradley certifiés par la CSA.</p> <ul style="list-style-type: none"> • Cet équipement convient à l'utilisation dans des emplacements de Classe 1, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux. • Les produits portant le marquage approprié de la CSA (c'est à dire, Classe 1, Division 2, Groupes A, B, C, D) sont certifiés à l'utilisation pour d'autres équipements où la convenance de combinaison (application ou utilisation) est déterminée par la CSA ou le bureau local d'inspection qualifié.
<p>Important: Due to the modular nature of a PLC® control system, the product with the highest temperature rating determines the overall temperature code rating of a PLC control system in a Class I, Division 2 location. The temperature code rating is marked on the product label as shown.</p>	<p>Important: Par suite de la nature modulaire du système de contrôle PLC®, le produit ayant le taux le plus élevé de température détermine le taux d'ensemble du code de température du système de contrôle d'un PLC dans un emplacement de Classe 1, Division 2. Le taux du code de température est indiqué sur l'étiquette du produit.</p>
<p>Temperature code rating</p>  <p>← Look for temperature code rating here</p>	<p>Taux du code de température</p>  <p>← Le taux du code de température est indiqué ici</p>
<p>The following warnings apply to products having CSA certification for use in hazardous locations.</p>	<p>Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.</p>
 <p>ATTENTION: Explosion hazard —</p> <ul style="list-style-type: none"> • Substitution of components may impair suitability for Class I, Division 2. • Do not replace components unless power has been switched off or the area is known to be non-hazardous. • Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous. • Do not disconnect connectors unless power has been switched off or the area is known to be non-hazardous. Secure any user-supplied connectors that mate to external circuits on an Allen-Bradley product using screws, sliding latches, threaded connectors, or other means such that any connection can withstand a 15 Newton (3.4 lb.) separating force applied for a minimum of one minute. 	 <p>AVERTISSEMENT: Risque d'explosion —</p> <ul style="list-style-type: none"> • La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 2. • Couper le courant ou s'assurer que l'emplacement est désigné non dangereux avant de remplacer les composants. • Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux. • Avant de débrancher les connecteurs, couper le courant ou s'assurer que l'emplacement est reconnu non dangereux. Attacher tous connecteurs fournis par l'utilisateur et reliés aux circuits externes d'un appareil Allen-Bradley à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens permettant aux connexions de résister à une force de séparation de 15 newtons (3,4 lb. - 1,5 kg) appliquée pendant au moins une minute.

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Specifications

Outputs per module	32 (4 groups of 8)	
Module Location	1771-A1B thru -A4B or later I/O Chassis	
Voltage Rating	10 to 30V dc	
Maximum Output Current	0.5A per output (not to exceed 8A per module) 2A per output group	
Maximum Surge Current	2A per output for 10ms; repeatable every 2s. 5A per output group for 10ms.; repeatable every 2s. 20A per module for 10ms.; repeatable every 2s.	
Maximum On-state Voltage Drop	1.5V dc at 0.5A	
Maximum Off-state Leakage Current	1.0mA @ 55°C	
Maximum Power Rating	0.75W per output	
Output Signal Delay	On to Off Off to On	2.0ms 0.1ms
Power Dissipation	13.7W (max); 1.7W (min)	
Thermal Dissipation	46.7 BTU/hr (max); 5.7 BTU/hr (min)	
Backplane Current	330mA @ 5V dc maximum	
Isolation Voltage	Isolation meets or exceeds UL Standard 508, and CSA Standard C22.2 No. 142.	
Conductors	Wire Size Category	14 gauge (2mm ²) stranded (max) 3/64 inch (1.2mm) insulation (max) Category 1 ¹
Environmental Conditions	Operational Temperature Storage Temperature Relative Humidity	0° to 60°C (32° to 140°F) -40° to 85°C (-40° to 185°F) 5 to 95% (without condensation)
Keying	Between 14 and 16 Between 20 and 22	
Field Wiring Arm	Cat. No. 1771-WN	
Field Wiring Arm Screw Torque	7-9 inch-pounds	
Fuses	Four 4.0A, 250V normal blow fuses (1 per group)	
Agency Certification (when product is marked)	<ul style="list-style-type: none"> • CSA certified • CSA Class I, Division 2, Groups A, B, C, D certified • UL listed • CE marked for all applicable directives 	

¹ Refer to publication 1770-4.1, Programmable Controller Wiring and Grounding Guidelines



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