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Find the *Rockwell / Allen-Bradley 1771-OVN* at our website: ***Click HERE***

# DC (10-30V) Output Module

## Cat. No. 1771–OVN Series B

## To The Installer

This document provides information on:


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## Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Rockwell Automation be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Publication 1771–IN036C–EN–P – July 2002

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Allen–Bradley publication SGI–1.1, Safety Guidelines for Application, Installation, and Maintenance of Solid–State Control (available from your local Rockwell Automation office), describes some important differences between solid–state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard.

**WARNING**



Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

**ATTENTION**



Identifies information about practices or circumstances that may lead to personal injury or death, property damage, or economic loss.

**IMPORTANT**

Identifies information that is critical for successful application and understanding of the product.



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**ATTENTION**



### Environment and Enclosure

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664–1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present, and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures. Also, see the appropriate sections in this publication, as well as the Allen–Bradley publication 1770–4.1, (“Industrial Automation Wiring and Grounding Guidelines”), for additional installation requirements pertaining to this equipment.



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**ATTENTION**



**Preventing Electrostatic Discharge**
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static–safe workstation.
- When not in use, keep modules in appropriate static–safe packaging.

## Pre-installation Considerations

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

You must use this module in a 1771-A1B, -A2B, -A3B, -A3B1, -A4B or later 1771 I/O chassis. Refer to the table below for processor compatibility.

**Table A Processor Compatibility Chart**

| System Type | Use with Processors: |
|---|---|
| Local | Mini-PLC-2/02 (cat. no. 1772-LZ, -LZP)<br>Mini-PLC-2/16 (cat. no. 1772-LX, -LXP)<br>Mini-PLC-2/17 (cat. no. 1772-LW, -LWP)<br>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)<br>PLC-2/30 (cat. no. 1772-LP3)<br>PLC-3 (cat. no. 1775-L1, -L2, -L3, -L4)<br>PLC-3/10 (cat. no. 1775-LP4, -LP8)<br>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.



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## Initial Handling Procedures

**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.

## Keying the I/O Chassis

**ATTENTION**

A module inserted into a wrong slot could be damaged by improper voltages connected through the wiring arm. Use keying bands to prevent damage to the module.

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

**ATTENTION**

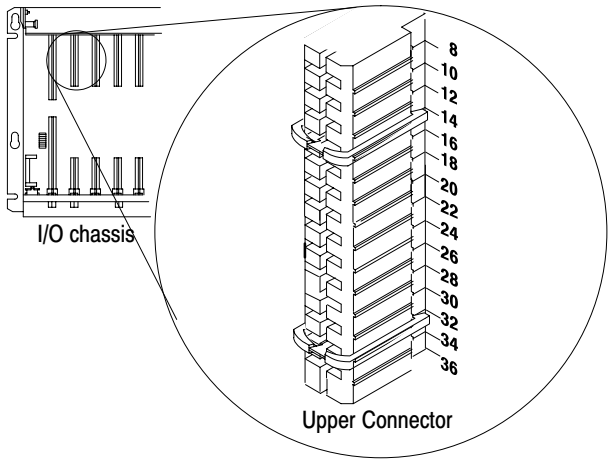
Observe the following precautions when inserting or removing keys:

- 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.

Position the keying bands in the backplane connectors to correspond to the key slots on the module.

Place the keying bands:
- between **14** and **16**
- between **32** and **34**




You can change the position of these bands if subsequent system design and rewiring makes insertion of a different type of module necessary.

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The 1771–OVN module is a modular component of the 1771 I/O system requiring a properly installed system chassis. Refer to publication 1771–IN075 for detailed information on acceptable chassis, proper installation and grounding requirements.



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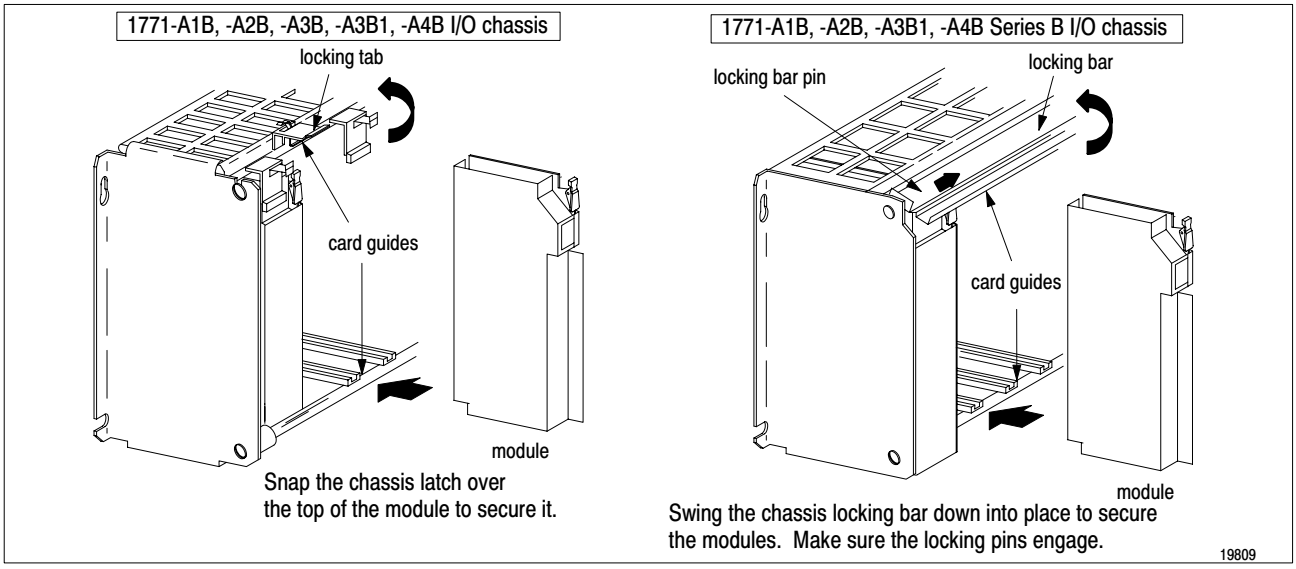
## Install the Module and Field Wiring Arm

**ATTENTION**



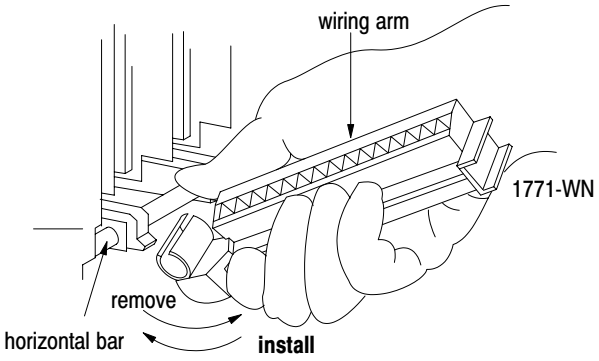
Remove power from the 1771 I/O chassis backplane and field wiring arm before removing or installing an I/O module.

- 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.




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.




**WARNING**



If you insert or remove the module while backplane power is on, or you connect or disconnect the wiring arm with field power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure power is removed or the area is nonhazardous before proceeding.



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## Connect Wiring to the Module

**WARNING**



When you connect or disconnect the wiring arm with field power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure power is removed or the area is nonhazardous before proceeding.

**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.

Make wiring 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.

**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 two full module groups (32 outputs) into each I/O chassis slot. For example:

- Module group 1 = inputs 00 through 17
- Module group 2 = inputs 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.

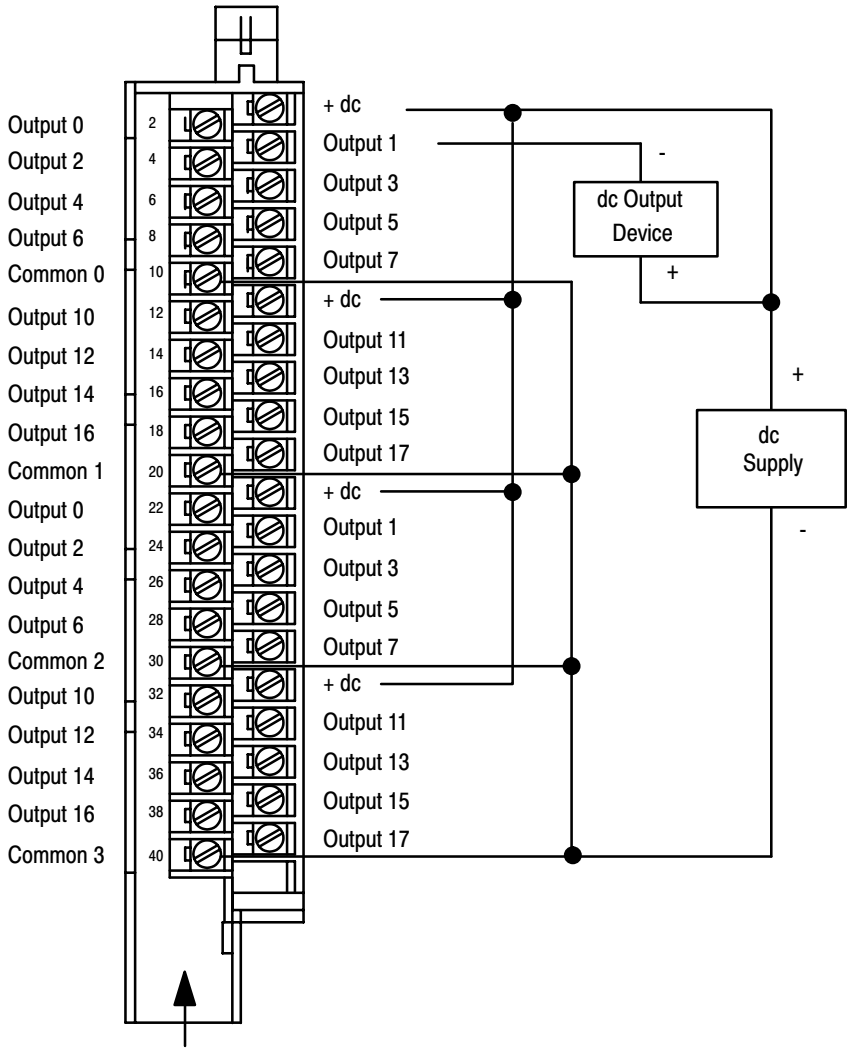


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**Connection Diagram for the 1771-OVN/B DC Output Module**

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

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.




Actual wiring runs in this direction.

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If multiple power sources are used, do not exceed the specified isolation voltage.

**ATTENTION**

Observe proper polarity, as indicated in the connection diagram with dc power connections. Reverse polarity, or application of ac voltage, could damage the module.

**ATTENTION**

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



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**Table B**
**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 | 0RG00 | 22 | Output 00 | 0RG00 |
| 03 | Output 01 | 0RG01 | 23 | Output 01 | 0RG01 |
| 04 | Output 02 | 0RG02 | 24 | Output 02 | 0RG02 |
| 05 | Output 03 | 0RG03 | 25 | Output 03 | 0RG03 |
| 06 | Output 04 | 0RG04 | 26 | Output 04 | 0RG04 |
| 07 | Output 05 | 0RG05 | 27 | Output 05 | 0RG05 |
| 08 | Output 06 | 0RG06 | 28 | Output 06 | 0RG06 |
| 09 | Output 07 | 0RG07 | 29 | Output 07 | 0RG07 |
| 10 | Common 0 | - | 30 | Common 2 | - |
| 11 | [1] 10 to 30V dc | - | 31 | [1] 10 to 30V dc | - |
| 12 | Output 10 | 0RG10 | 32 | Output 10 | 0RG10 |
| 13 | Output 11 | 0RG11 | 33 | Output 11 | 0RG11 |
| 14 | Output 12 | 0RG12 | 34 | Output 12 | 0RG12 |
| 15 | Output 13 | 0RG13 | 35 | Output 13 | 0RG13 |
| 16 | Output 14 | 0RG14 | 36 | Output 14 | 0RG14 |
| 17 | Output 15 | 0RG15 | 37 | Output 15 | 0RG15 |
| 18 | Output 16 | 0RG16 | 38 | Output 16 | 0RG16 |
| 19 | Output 17 | 0RG17 | 39 | Output 17 | 0RG17 |
| 20 | Common 1 | - | 40 | Common 3 | - |

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

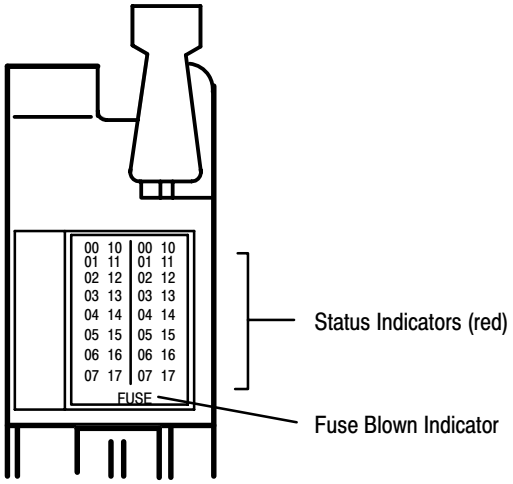
[1] You can connect a different power supply to each 10 to 30V dc terminal. They are not connected internally. Connect each common (0, 1, 2, 3) to the corresponding supply. Commons are not internally connected.



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## 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 side cover), and replace it with a 4A, 250V normal blow fuse.
4. Reinsert the module into the I/O chassis.
5. Turn on power to the chassis.



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**The following information applies when operating this equipment in hazardous locations:**

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, and D Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.

**WARNING**



**EXPLOSION HAZARD –**

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must only be changed in an area known to be nonhazardous.

**Informations sur l'utilisation de cet équipement en environnements dangereux:**

Les produits marqués CL I, DIV 2, GP A, B, C, D ne conviennent que une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un systéme, le code de température le plus défavorable (code de température le plus faible) peut eatre utilisé pour déterminer le code de température global du systéme. Les combinaisons d'equipements dans le systéme sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

**AVERTISSEMENT**



**RISQUE D'EXPLOSION –**

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

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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, 0.5A per output, 2A per group, 8A per module |
| Maximum Output Current Rating | Maximum Output Current Rating<br>0.5A per output (not to exceed 8A per module)<br>2A per output group |
| Maximum Surge Current | 2A per output for 10ms; repeatable every 2 seconds.<br>5A per output group for 10ms; repeatable every 2 seconds.<br>20A per module for 10ms; repeatable every 2 seconds. |
| Maximum On-state Voltage Drop | 1.5V dc at rated output current |
| Maximum Off-state Leakage Current | 1.0mA @ 55°C |
| Output Signal Delay | On to off propagation delay 2.0msec<br>Off to on propagation delay 0.1msec |
| 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 | Tested to withstand 500V for 60s. |
| Conductors Wire Size<br><br>Category | 14 AWG (2.5mm$^2$) to 22 AWG (0.25mm$^2$) (max)[1] stranded copper rated at 60°C or greater<br>3/64 inch (1.2mm) insulation (max)<br>2[2] |
| Environmental Conditions | |
| Operating Temperature | IEC 60068–2–1 (Test Ad, Operating Cold)<br>IEC 60068–2–2 (Test Bd, Operating Dry Heat)<br>IEC 60068–2–14 (Test Nb, Operating Thermal Shock)<br>32 to 104°F (0° to 40°C) |
| Storage Temperature | IEC 60068–2–1 (Test Ab, Unpackaged, Nonoperating Cold)<br>IEC 60068–2–2 (Test Bb, Unpackaged, Nonoperating Dry Heat)<br>IEC 60068–2–14 (Test Na, Unpackaged, Nonoperating Thermal Shock)<br>–40 to 185°F (–40 to 185°F) |
| Relative Humidity | IEC 60068–2–30 (Test Db, Unpackaged, Nonoperating Damp Heat)<br>5 to 95%, noncondensing |
| Shock<br>Operating<br>Nonoperating | IEC 60068–2–27 (Test Ea, Unpackaged Shock)<br>30g<br>50g |
| Vibration | IEC 60068–2–6 (Test Fc, Operating)<br>2g @ 10–500Hz |
| ESD Immunity | IEC 61000–4–2<br>4kV indirect discharges |
| Radiated RF Immunity | IEC 61000–4–3<br>10V/m, 3V/M Broadcast Bands, with 1kHz sine–wave 80% AM from 30MHz to 1000MHz |
| EFT/B Immunity | IEC 61000–4–4<br>±1kV @ 5kHz on signal ports |
| Surge Transient Immunity | IEC 61000–4–5<br>±1kV line–line (DM) and ±2kV line–earth (CM) on signal ports |
| Conducted RF Immunity | IEC 61000–4–6<br>10V rms with 1kHz sine wave 80% AM from 150kHz to 30MHz |

**Specifications continued on next page.**



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## Specifications (cont.)

| | |
|---|---|
| Emissions | CISPR 11<br>Group 1, Class A (with appropriate enclosure) |
| Enclosure Type Rating | None (open–style) |
| Keying | Between 14 and 16<br>Between 32 and 34 |
| Fuse | Four 4.0A, 250V normal blow fuses (1 per group); SAN–O Corporation ST4–4.0A |
| Field Wiring Arm | Catalog Number 1771-WN |
| Wiring Arm Screw Torque | 9 pound–inches (1.0Nm) |
| Certifications<br>(when product is marked) | UL UL Listed Industrial Control Equipment<br>CSA CSA Certified Process Control Equipment<br>CSA CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations<br>CE[3] European Union 89/336/EEC EMC Directive, compliant with:<br>EN 61000–6–2, Industrial Immunity<br>EN 61000–6–4, Industrial Emissions<br>EN 50082–2, Industrial Immunity<br>EN 61326, Meas./Control/Lab., Industrial Requirements<br>C–Tick[3] Australian Radiocommunications Act, compliant with:<br>AS/NZS 2064, Industrial Emissions |

[1] 14 gauge wire connected to all terminals may not allow the cover on the field wiring arm to close. A smaller gauge wire may be used.
[2] You use this conductor category information for planning conductor routing as described in publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.
[3] See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates and other certification details



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