



AC (12-120V) Output Module

Cat. No. 1771-OAD Series C

To The Installer

This document provides information on:

- important pre-installation considerations
- power supply requirements
- installing the module
- using the indicators for troubleshooting
- replacing the fuse
- module specifications

Pre-installation Considerations

The 1771-OAD Series C module is compatible with all chassis except 1771-A1, 1771-A2 and 1771-A4 chassis. Make sure no other output module or single card block transfer module is placed in the same module group when using 2-slot addressing. Any discrete input module may be used within the same module group.

European Union Directive Compliance

If this product has the CE mark it 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 the following Allen-Bradley publications:

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

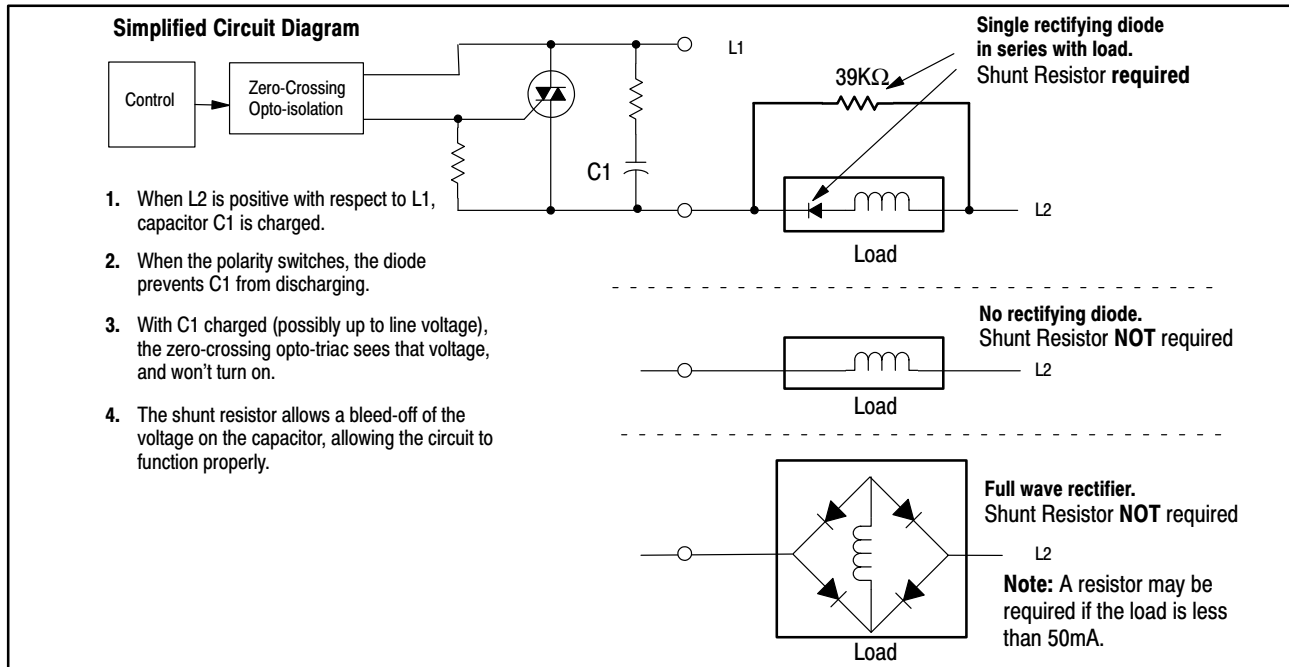
Using the 1771-OAD Series C Module with Half-wave Rectifying Load Devices (single diode) and Indicator Lights

This module uses zero-crossing technology to allow turn-on when the output voltage is less than a specified voltage (typically 40 to 50V). This greatly reduces the stress on contacts and other devices that are sensitive to current surges.

- When using this output module with a device that includes a single diode in series with the load, place a shunt resistor (39K ohm, 1W) across the load. This resistor allows proper output operation.

The shunt resistor may cause LED indicators to glow when the output is turned off. In this case, use an incandescent lamp in place of the LED.

- When using a full-wave rectified device, the device may not turn off when the output is deenergized. Add a 2.5K ohm, 10W resistor in parallel with the device to provide proper operation.
- If 24V ac incandescent indicator lights appear dim when used with the Series C module, place a 2.5K ohm, 1W resistor in parallel with the indicator. This will restore full brightness.



Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 295mA from the output of this supply. Add this to the requirements of all other modules in the I/O chassis to prevent overloading the chassis backplane and/or chassis power supply.

Initial Handling

The ac output module is shipped in a static-shielded bag to guard against electrostatic discharge damage. Observe the following precautions when handling the module.

Electrostatic Discharge Damage



ATTENTION: Under some conditions, electrostatic discharge can degrade performance or damage the module. Observe the following precautions to guard against electrostatic damage.

- Wear an approved wrist strap grounding device, or touch a grounded object to discharge yourself before handling the module.
- Do not touch the backplane connector or connector pins.
- If you configure or replace internal components, do not touch other circuit components inside the module. If available, use a static-free work station.
- When not in use, keep the module in its static-shielded bag.

AB Parts

Installing Your Module

In this section we tell you how to:

- change the mode of the fuse-blown jumper
- key your I/O chassis
- install your module
- make your wiring connections

Changing the Mode of the Fuse-blown Jumper

The fuse-blown jumper has two modes:

- the preset, **standard (STD) mode** – displays the fuse status on the red fuse-blown status indicator
- the **customer side indication (CSI) mode** – displays the fuse status in the input image table **and** on the red fuse-blown status indicator.

This mode configures the module as a 16 point output module that uses **both the output and input image data tables** of your controller. When a fuse blows, all 16 bits in the associated input image table will turn on (1).

For example, if you install the module in a PLC-5 system and address the module as O:012, then the fuse status bits are in I:012.

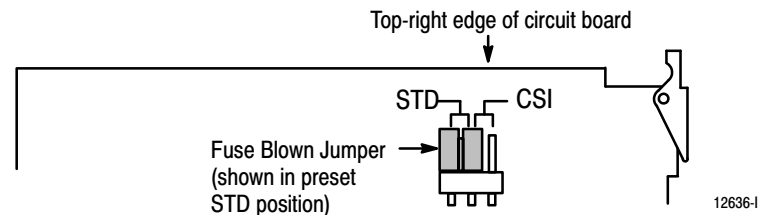
To monitor the status of the module fuse, make certain that your user program monitors the module's input image table for "on" bits.



ATTENTION: Do not put the module jumper in CSI mode when you use this module in a complementary mode. Your system will not operate properly.

To change the fuse blown jumper to the CSI mode:

1. Locate the fuse-blown jumper at the top-right edge of the module circuit board, as shown.



2. Use your finger to slide the jumper off the STD position (the middle post and the left post).
3. Carefully reposition the jumper by sliding it onto the CSI position (the middle post and the right post).

Keying Your I/O Chassis

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

Keying Band Location
Upper Connector
 Between 10 and 12
 Between 20 and 22

ATTENTION: Insert or remove keying bands with your fingers.

The keying bands can be repositioned if subsequent system design and rewiring make insertion of a different type of module necessary.

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Installing the Module and Connecting the Wiring



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

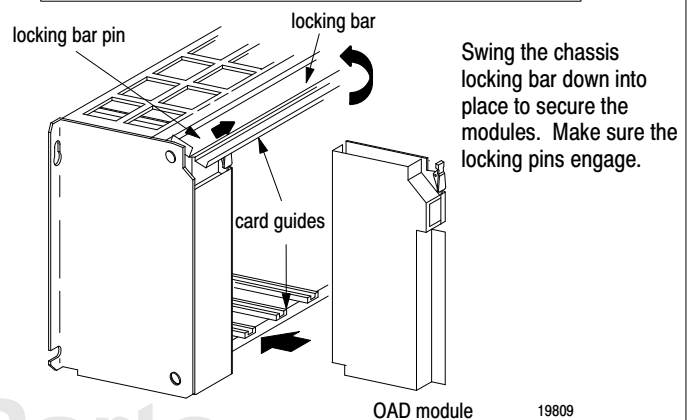
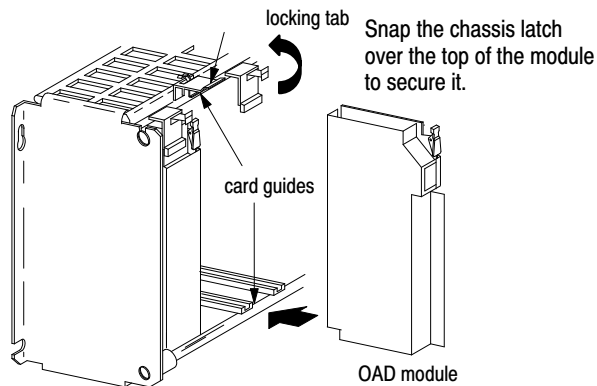
- Failure to remove power from the backplane or wiring arm could cause module damage, degradation of performance, or injury.
- Failure to remove power from the backplane could cause injury or equipment damage due to possible unexpected operation.

1

Position the module in the card guides.
 Apply firm, even pressure to seat the module in the chassis.

1771-A1B, -A2B, -A3B, -A3B1, -A4B I/O chassis

1771-A1B, -A2B, -A3B1, -A4B Series B I/O chassis

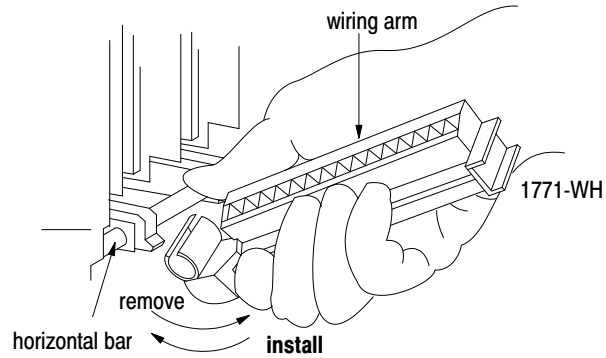


AB Parts

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

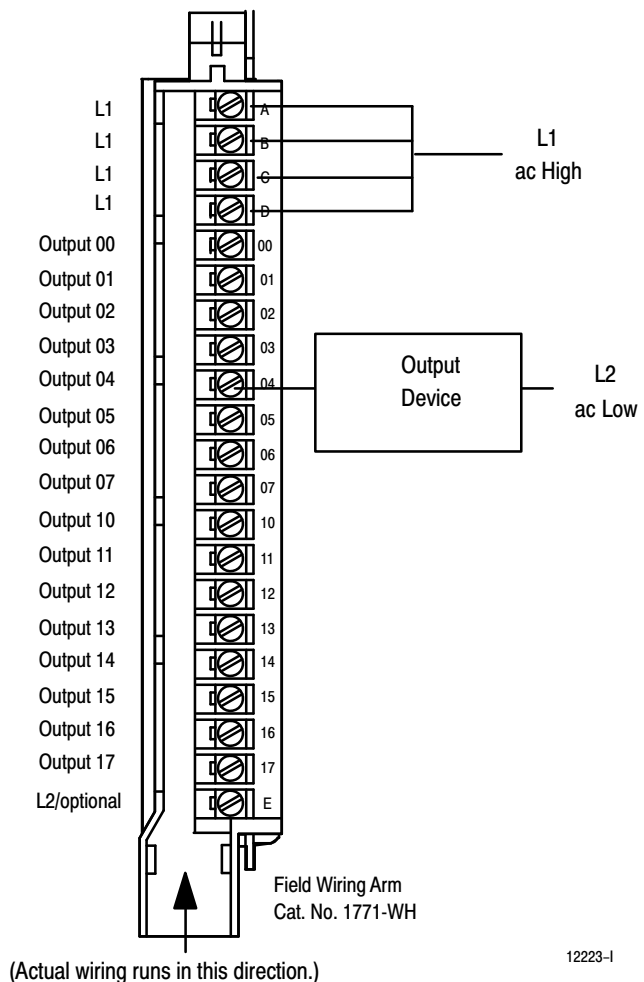
The wiring arm pivots upward and connects with the module so you can install or remove the module without disconnecting the wires.



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3

You must supply ac (L1) at terminals A through D on the field wiring arm, as shown. You need four ac connections to accommodate the total required surge rating on the module without overstressing any single connection on the field wiring arm. Jumper all ac (L1) connections together to prevent module damage.



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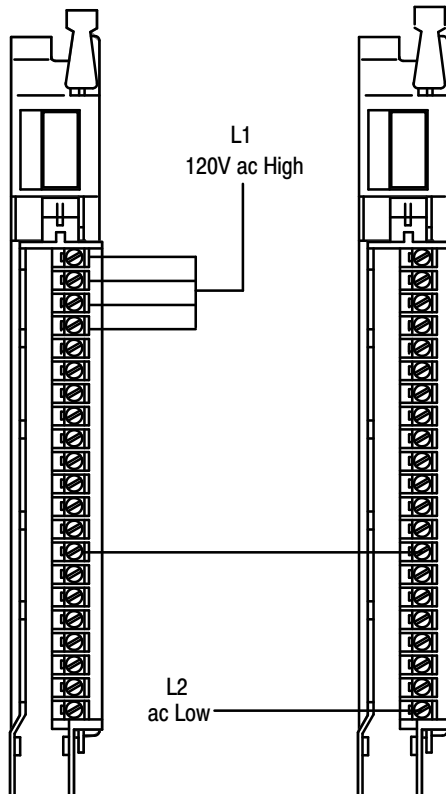
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Driving an Input Module with an Output Module

You can use an AC (120V) Output Module (cat. no. 1771-OAD) to directly drive terminals on an AC/DC (120V) Input Module (cat. no. 1771-IAD) as shown below.

ac (12-120V)
Output Module
(Cat. No. 1771-OAD)

ac/dc (120V)
Input Module
(Cat. No. 1771-IAD)

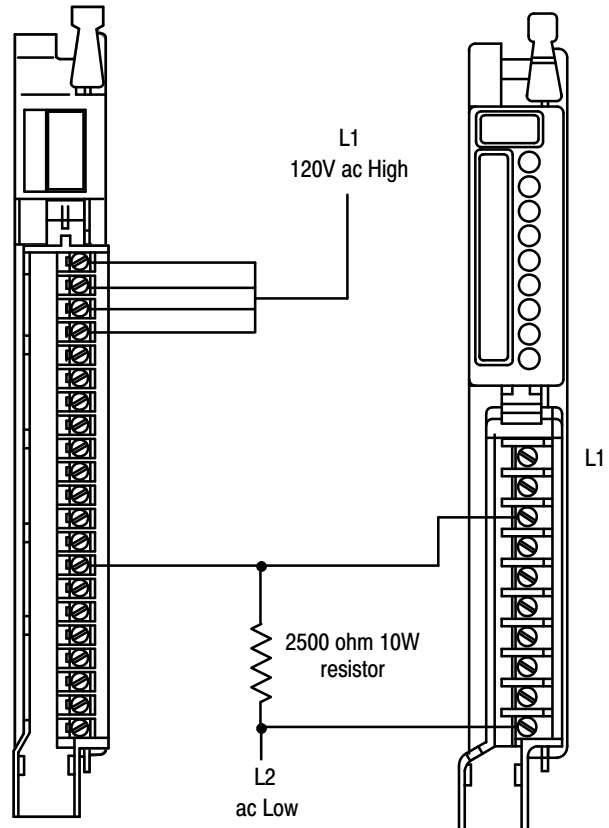


You can also use a 1771-OAD Output module to drive an AC/DC (120V) Input Module (cat. no. 1771-IA) but you must connect one of the following between the output terminal and L2 (common) as shown below.

- 2500 ohm, 10W resistor
- RG-1676-1 Electrocube (San Gabriel, California)

ac (12-120V)
Output Module
(Cat. No. 1771-OAD)

ac/dc (120V)
Input Module
(Cat. No. 1771-IA)

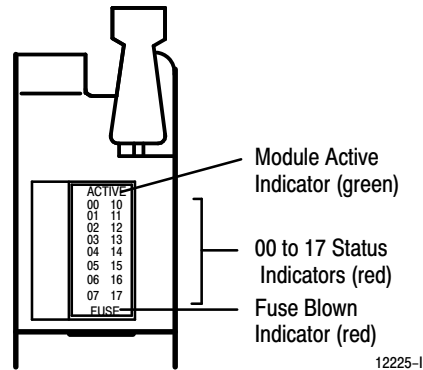


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Use the same ac power source to power both modules to ensure proper phasing and prevent module damage.

Interpreting the Status Indicators

The front panel has one green module active indicator, 16 red status indicators, and one red fuse-blown indicator.



Indicator	Mode	Description
Active	Standard Mode (STD)	The active indicator lights when the rack power supply has properly established 5V dc and the processor is in RUN mode.
	Customer Side Indication (CSI)	The active indicator lights when the rack power supply has properly established 5V dc.
Status	STD or CSI	The status indicators light when voltage is present at the respective output terminal.
Fuse		The fuse indicator lights when the fuse has blown or been cleared.

Troubleshooting

Use this table to help you interpret the 1771-OAD status indicators and to troubleshoot module and system faults.

Indicator Status	Description of Fault or System Status	Action to Take
Module active ON (green)	Normal Indication.	None.
Module active ON (green) and Output status ON (red)	Check voltage at output point on the swing arm.	If voltage is present, take no action. If no voltage is present, check the fuse. If the fuse is OK, replace the module.
Module active ON (green) and Output status OFF	No voltage.	None.
	Voltage on the terminal.	Replace the module.
Module active OFF and Output status ON (red) or OFF	1. The processor is in program mode. 2. Module not functioning properly.	1. If module is in normal mode, take no action. If module is in CSI mode replace module. 2. Check the chassis power supply and processor. If they are OK, replace the module.
Fuse blown (red)	Outputs will not turn on.	Replace the fuse. If fuse replacement does not correct the problem, replace the module.

Replacing the Fuse

The module's output circuitry is protected from overload or shorts by a fuse. You can replace the fuse as outlined below.

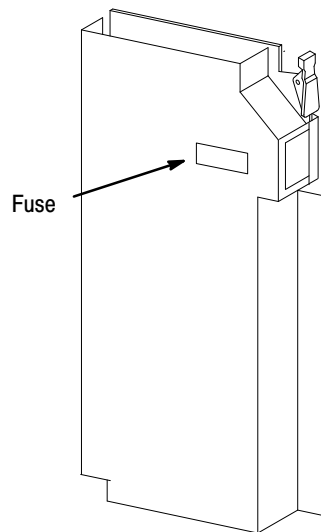
1. Turn off all power to the I/O chassis and all output device power to the field wiring arm.



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

- Failure to remove power from the backplane or field 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.

2. Remove the module from the chassis. Replace the blown fuse with a 10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse pt. no. 322010.



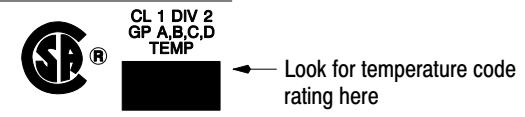
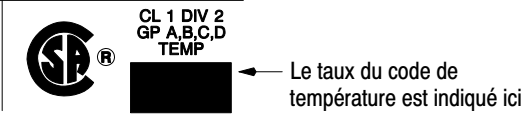




3. Replace the module in the chassis and attach the field wiring arm.
4. Turn OFF all outputs to the module.
5. Turn ON power to the I/O chassis only.
6. Check that the red status indicators on the front of the module are off (no outputs on).
7. Turn on output device power to the field wiring arm.
8. Start with bit 00 and turn on individual outputs one at a time. Turn off the previous output before turning on the next output.

AB Parts

9. If the red fuse blown indicator turns on, note which output is faulty and trace the output wiring to the faulty device.

After correcting the fault problem, return to step 1 and begin again. If you cannot locate a faulty output, return to step 8 and turn on 2 or more outputs at the same time. Total output current should not exceed 2A per output, or 8A total per module.

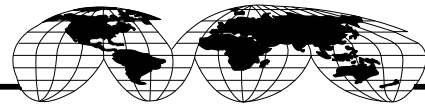
CSA Hazardous Location Approval	Approbation d'utilisation dans des emplacements dangereux par la CSA
<p>CSA certifies products for general use as well as for use in hazardous locations. Actual CSA certification is indicated by the product label as shown below, and not by statements in any user documentation.</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>Taux du code de température</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.

Specifications

Outputs per Module	16
Module Location	1771-A1B through -A4B or later I/O chassis, 1771-AM1, -AM2 chassis
Output Voltage Range	10 to 138V ac @ 47 - 63Hz
Output Current Rating	2A per output – not to exceed 8A per module
Surge Current (maximum)	25A per output for 100ms, repeatable every 1 second 25A per module for 100ms, repeatable every 1 second
Minimum Load Current	5mA per output
On State Voltage Drop (max.)	1.5V at load current > 50mA 5.8V at load current < 50mA
Off State Leakage Current (max.)	3.0mA per output @ 138V ac
Signal Delay (max.) Off to On On to Off	Zero crossing 8.3ms @ 60Hz, 10.0ms @ 50Hz Zero crossing 8.3ms @ 60Hz, 10.0ms @ 50Hz
Power Dissipation	13 Watts (max.), 1.5 Watts (min.)
Thermal Dissipation	48.0 BTU/hr (max.), 5.13 BTU/hr (min.)
Backplane Current	295mA
Isolation Voltage	Tested at 2500V dc for 1 second per UL508 & CSA C22.2 #142
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)
Conductors Wire Size Category	14 gauge (2mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum ¹
Keying	Between 10 and 12 Between 20 and 22
Fuse	10A, 250V rectifier fuse (1/4 x 1-1/4 inch), Littelfuse PN 322010
Field Wiring Arm Standard Optional	Catalog Number 1771-WH Catalog Number 1771-WHF (fused)
Wiring Arm Screw Torque	7-9 inch-pounds
Relay Compatibility	700-HC14A1 700-HC14A1-4 700-HT12AA1 700-HF32A1 700-HB32A1 700-CL110A1 100-A09 100-A30 100-A18
Agency Certification (when product or packaging 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 You use this conductor-category information for planning conductor routing as described in the system-level installation manual.	



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