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AC/DC (120V) Input Module
(Cat. No. 1771-IAD Series D)

Contents

Use this document as a guide when installing the catalog number 1771-IAD series D input module.

To	See page
Important User Information	1
Prevent Electrostatic Discharge	3
Important Preinstallation Considerations	4
Calculate Power Requirements	4
Setting the Delay Time Jumper	5
Key the Backplane Connector	5
Install the Module and Field Wiring Arm	6
Connect Wiring to the Field Wiring Arm	7

For this reference information	See page
Interpret the Status Indicators	9
Troubleshooting	9
Hazardous Location	10
Specifications	11

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.

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.

Publication 1771-IN023B–EN–P – August 2002

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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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Prevent Electrostatic Damage

The ac/dc input module is shipped in static-shielded packaging to guard against electrostatic discharge damage. Observe the following precautions when handling the module.

Electrostatic Discharge Damage



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

Important Pre-installation Considerations

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

Calculate Power Requirements

Your module receives its power through the 1771 I/O chassis backplane from the chassis power supply. The module requires 195mA 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.

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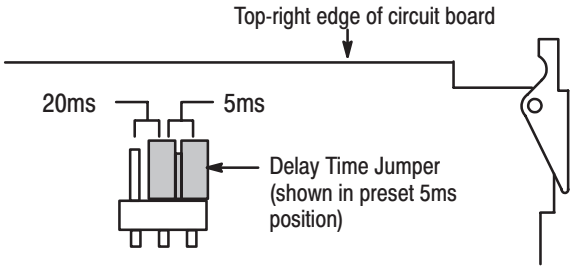
Setting the Delay Time Jumper

Your module is equipped with an adjustable delay time jumper. Use the jumper to select between two input channel delay times. The delay time you choose applies to all sixteen of the module's channels.

Use this delay time:	If you want:
5ms	to detect typical input readings
20ms	to prevent detection of false inputs in high-noise environments

The module is shipped with the delay time jumper preset to 5ms. To change the delay time jumper to 20ms, do the following:

1. Locate the delay time jumper selection plug at the top-right edge of the module circuit board, as shown in the following figure.



2. Use your finger to slide the jumper off the 5ms position (the middle post and the right post).
3. Carefully reposition the jumper by sliding it onto the 20ms position (the middle post and the left post).

Key the Backplane Connector

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

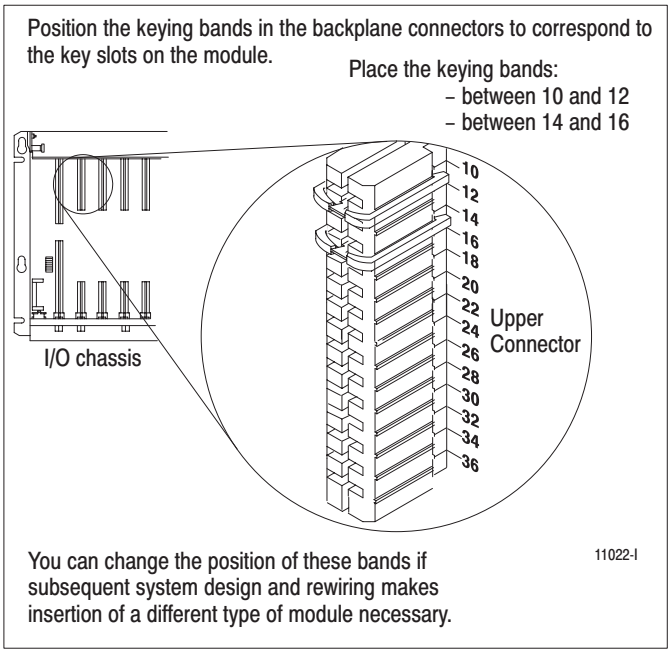
ATTENTION



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.



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Install the Module and Field Wiring Arm

ATTENTION



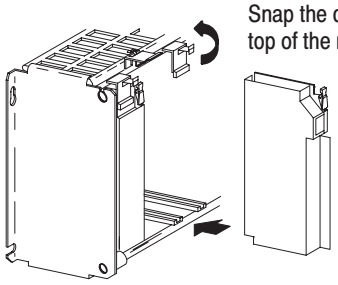
Remove power from the 1771 I/O chassis backplane before you install the module. Failure to remove power from the backplane could cause:

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

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

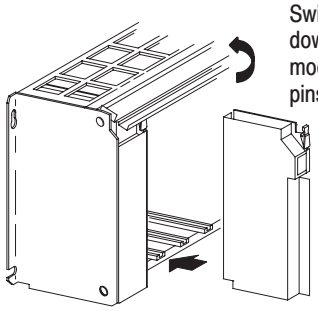
Important: Apply firm even pressure on the module to seat it into its backplane connector.

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



Snap the chassis latch over the top of the module to secure it.

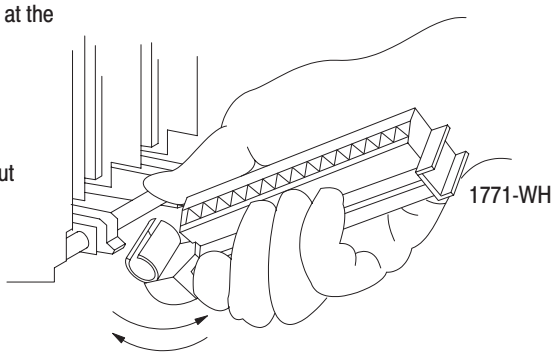
1771-A1B, -A2B, -A4B Series B I/O chassis



Swing the chassis locking bar down into place to secure the modules. Make sure the locking pins engage.

2 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.



WARNING



When 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.

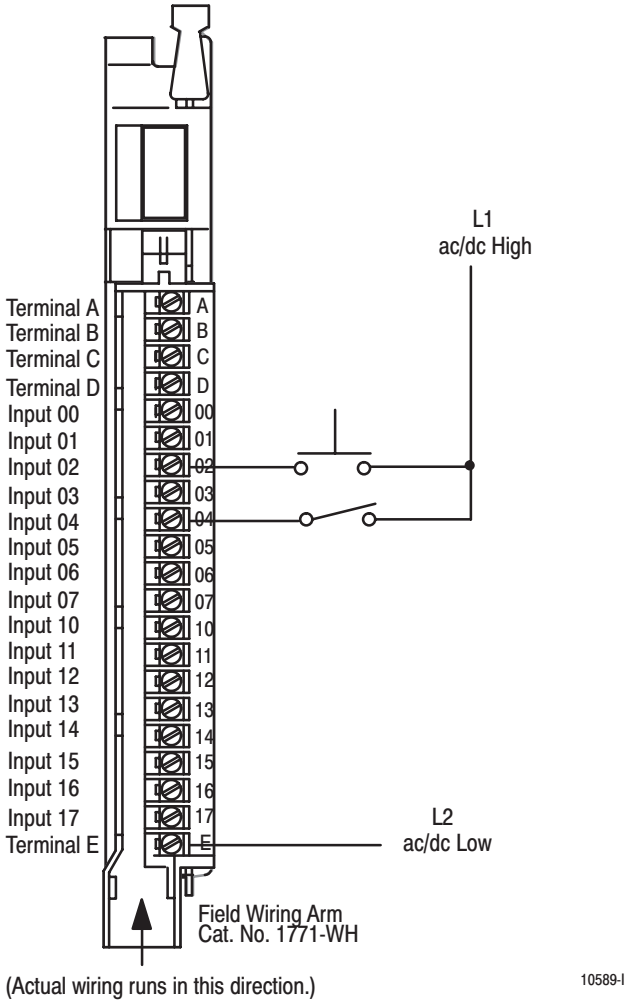
The 1771–IAD module is a modular component of the 1771 I/O system requiring a properly installed system chassis. Refer to publication 1771–IN075 for detailed information on acceptable chassis, proper installation and grounding requirements. Limit the maximum adjacent slot power dissipation to 17W maximum.

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Connect Wiring to the Field Wiring Arm

Connect your I/O devices to the field wiring arm (cat. no. 1771-WH) shipped with the module.

1. Connect one terminal of your 2-wire input device to terminals 00 thru 17. Connect L1 (high) ac/dc line to the other terminal of your input devices.
2. Connect terminal E to the L2 (low) ac/dc return. Terminals A thru D are not used. Use stranded 14 gauge wire to minimize the voltage drop over long cable distances.



IMPORTANT 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.

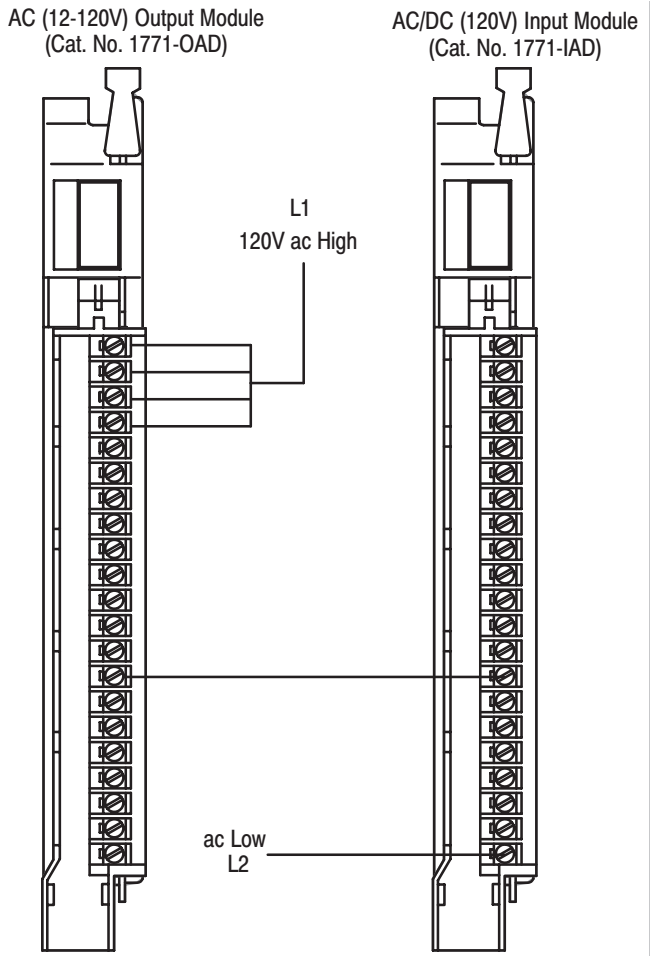
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You can also use a 1771-OA output module to drive an AC/DC (120V) input module (cat. no. 1771-IAD) but you must connect one of the following between the output terminal and L2 (common).

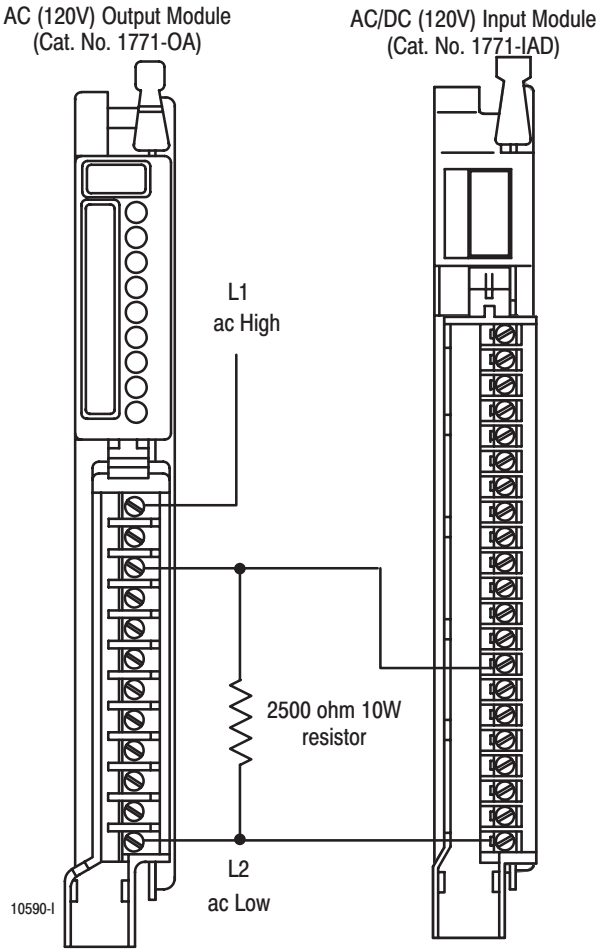
- 2500 ohm, 10W resistor
- RG-1676-1 Electrocube (San Gabriel, California)

Use the same ac power source to power both modules to ensure proper phasing and prevent module damage. All inputs to the 1771–IAD module must be powered by the same phase of the ac source.

An Output Module Driving an Input Module



Note: 1771-OAD output voltage range is 12-138V ac. However, the on-state voltage range of the 1771-IAD is 79-138V ac.

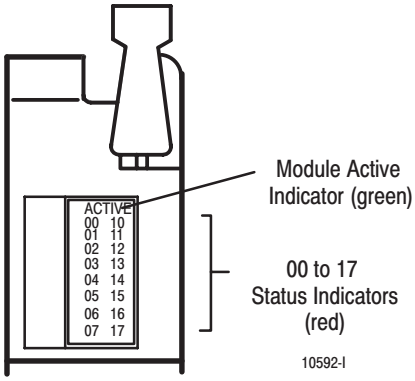


Note: 1771-OA output voltage range is 92-138V ac. However, the on-state voltage range of the 1771-IAD is 79-138V ac.

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Interpreting the Status Indicators

The front panel of your module contains one green module active indicator, and 16 red status indicators as shown below.



When the green module active indicator lights, the rack power supply has properly established 5Vdc. ,The module active indicator must be lit to properly interpret the red status indicators.

The red status indicators are provided for system logic side indication of individual inputs. When a red indicator lights, voltage is present on the terminal. The module transfers this information to the backplane for the processor to read. See ‘‘Troubleshooting” for a description, probable cause, and recommended action to take for common faults based on indicator responses.

Troubleshooting

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

Indicator Status (color)	Description of Fault or System Status	Action to Take
Module active ON (green)	Normal Indication	None
Module active ON (green) and Input status ON (red)	Check for voltage on terminal.	If voltage is present, take no action. If no voltage is present, replace the module.
Module active ON (green) and Input status OFF	Input devices not functioning properly or faulty input circuitry on module.	1. Check input devices. 2. If input devices are OK, replace module.
	No voltage on terminal.	None
Module active OFF and Input status ON (red) or OFF	Not valid unless module active indicator is on; when active is off, indicators do not represent processor status.	1. Check chassis power supply and module input power. 2. If power supplies are OK, replace module.

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Hazardous Locations

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

Inputs per Module	16
Module Location	1771 Series B or later I/O chassis, 1771-AM1, -AM2 chassis
Nominal Input Voltage	120V ac @ 50/60Hz; 125V dc
Nominal Input Current	9.9mA @ 120V ac 60Hz; 8.7mA @ 120V ac 50Hz; 2.56mA @ 125V dc
On-state Voltage Range	79V to 138V ac or dc
Minimum On-state Current	5.95mA @ 79V ac 60Hz; 1.5mA @ 79V dc
Maximum Off-state Voltage	43V ac or dc
Maximum Off-state Current	3.0mA @ 43V ac 60Hz; 0.8mA @ 43V dc
Input Impedance	11.2K ohms @ 60Hz (0.18 microfarad in parallel with 47K ohms, in series with 820 ohms)
Peak Inrush Current	Inrush = V_{PS}/820 ohm, where V_{PS} = customer supply peak voltage
Input Signal Delay Off to On	5ms (+3ms) or 20ms (+5ms) @ 120V ac 60Hz selectable 3ms (±.1ms) or 10ms (±1ms) @ 120V dc selectable
On to Off	25ms (±5ms) @ 120V ac or dc
Power Dissipation	8.8 Watts (max.), 1.0 Watts (min.)
Thermal Dissipation	30.1 BTU/hr (max.), 3.42 BTU/hr (min.)
Maximum Adjacent Slot Power Dissipation	17W
Backplane Current	195mA @ 5V
Isolation Voltage	Tested to 2500V dc for 1s
Environmental Conditions	
Operating Temperature	IEC 60068–2–1 (Test Ad, Operating Cold) IEC 60068–2–2 (Test Bd, Operating Dry Heat) IEC 60068–2–14 (Test Nb, Operating Thermal Shock) 32 to 131°F (0° to 60°C)
Storage Temperature	IEC 60068–2–1 (Test Ab, Unpackaged, Nonoperating Cold) IEC 60068–2–2 (Test Bb, Unpackaged, Nonoperating Dry Heat) IEC 60068–2–14 (Test Na, Unpackaged, Nonoperating Thermal Shock) –40 to 185°F (–40 to 85°C)
Relative Humidity	IEC 60068–2–30 (Test Db, Unpackaged, Nonoperating Damp Heat) 5 to 95%, noncondensing
Enclosure Type Rating	None (open–style)
Keying	Between 10 and 12 Between 14 and 16
Field Wiring Arm	1771-WH
Wiring Arm Screw Torque	9 pound–inches (1.0Nm)

Specifications continued on next page.

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Conductors	Wire Size	14 AWG (2.5[2]) stranded copper rated at 60°C or greater 3/64 inch (1.2mm) insulation (max)
	Category	2[1]
Certifications (when product is marked)	UL	UL Listed Industrial Control Equipment
	CSA	CSA Certified Process Control Equipment
	CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations
	CE[2]	European Union 89/336/EEC EMC Directive, compliant with: EN 61000–6–4, Industrial Emissions EN 50082–2, Industrial Immunity EN 61326, Meas./Control/Lab., Industrial Requirements EN 61000–6–2, Industrial Immunity European Union 73/23/EEC LVD Directive, compliant with: EN 61131–2, Programmable Controllers
	C–Tick[2]	Australian Radiocommunications Act, compliant with: AS/NZS 2064, Industrial Emissions

[1] You use this conductor category information for planning conductor routing as described in publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.
[2] See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates and other certification details

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