



Allen-Bradley Power Supply Modules

(Cat. No. 1771-P4S, -P6S, -P4S1, -P6S1)

To the Installer

This document provides you with the following information:

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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.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the 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 can 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.

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 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 enclosure. 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.

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, store the equipment in appropriate static-safe packaging.

What this Power Supply Package Contains

When you receive your power supply, you should see the following components in the box:

- one 1771-P4S, -P6S, -P4S1, or -P6S1 power supply module
- one 5-position terminal block (attached to module)

Install the Power Supply

To install the power supply, you need to know how to perform the following tasks:

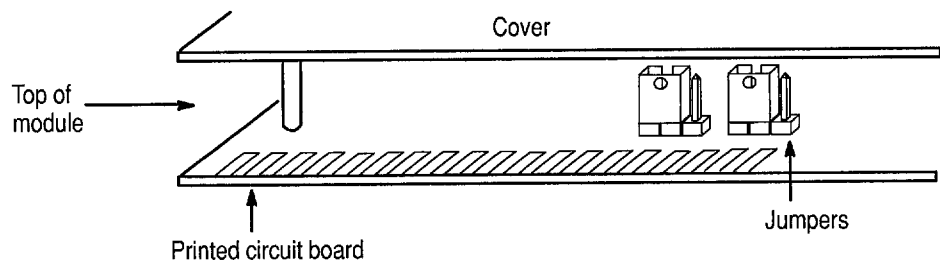
- set the jumpers
- place the power supply in a chassis
- connect a paralleling cable (if using a second supply)
- connect input power

Set the Jumpers

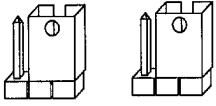
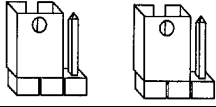
Each power supply module has two jumpers located at the back edge of the module near the gold-plated edge connectors. The jumper selection provides the proper voltage regulation for the different power supply configurations. The power supply can be configured to support local or remote sensing by setting the jumpers.

To configure the supply:

1. Position the power supply module so that the jumpers and pins are facing upward as shown below.



2. Set the jumpers as shown in the following table. Use needle-nose pliers to set the jumpers.

For this configuration	Set jumpers to:
A single power supply in a power supply chassis connected to an I/O chassis thru a power cable	right position 
All other configurations. (Power supplies are shipped with jumpers in this position.)	left position 

Place the Power Supply in a Chassis

WARNING



Turn off all power-supply modules before removing modules from or inserting modules into a chassis. Failure to observe this warning could alter processor memory, damage module circuitry, and cause unintended operation which could possibly cause injury to personnel.

WARNING



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

You can place these power-supply modules into any I/O module slot in any current chassis (1771-A1B, -A2B, -A3B, -A3B1, -A4B, -PSC).

However, to place these power-supply modules into a superseded I/O chassis (1771-A1, -A2, -A4), you must follow the restrictions in the following table.

Adapter or in-chassis processor	I/O Chassis	1st Power Supply ¹	2nd Power Supply ¹
Without an integral power supply	1771-A4	I/O slot 0	I/O slot 10
	1771-A2	I/O slot 0	I/O slot 4
	1771-A1	I/O slot 0	not applicable
With an integral power supply	1771-A4	not applicable	I/O slot 8
	1771-A2	not applicable	I/O slot 3

¹ I/O module slots are numbered 0 thru 15, left to right.

The power supply 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 and proper installation and grounding requirements. Limit the adjacent slot power dissipation to a maximum of 10W.

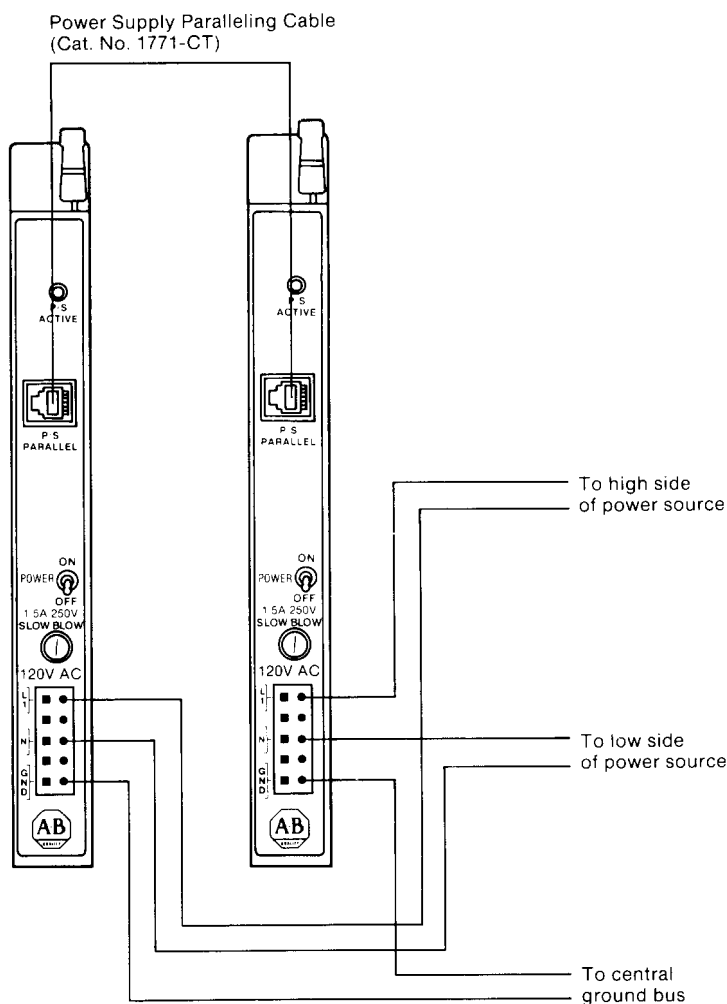
Connect a Paralleling Cable

You can use two power supplies in the same I/O chassis to provide more current by connecting them with a power-supply paralleling cable (cat. no. 1771-CT). This connection is for communication between the two supplies. If one supply has to shut down, it tells the second supply to turn off its indicator. Although the adapter or in-chassis processor is disabled, the second supply will continue trying to operate until its dc output limits are exceeded. Because the adapter or in-chassis processor is disabled, paralleling two supplies does not provide redundancy.

To connect the cable:

1. Connect the paralleling cable between the P/S PARALLEL connectors on the two supplies (see below).

Figure 1 - Power Connections and Paralleling Cable Connections



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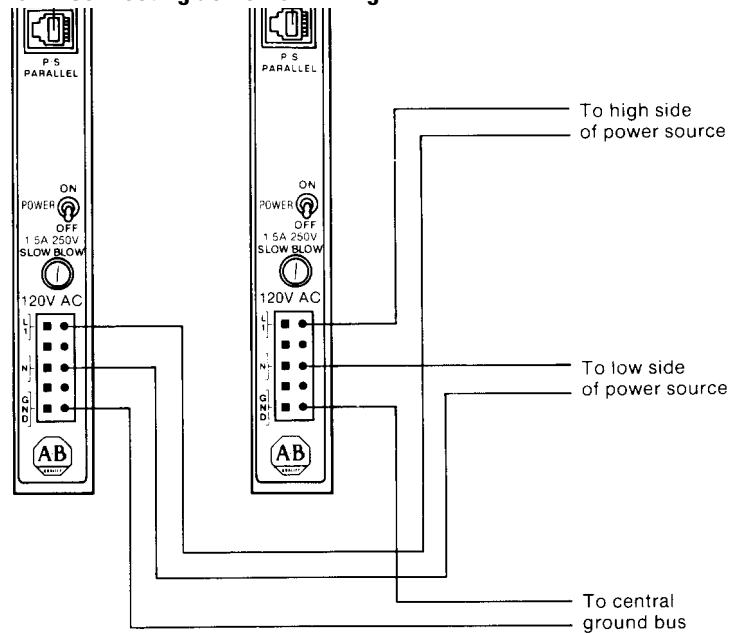
2. Loop the paralleling cable over the top of the I/O chassis to avoid picking up signals induced from I/O wiring.
3. Turn on the supplies simultaneously. If you don't, the first supply you turn on may shut down due to an overcurrent condition.

Connect Input Power

Refer to Figure 3. To make ac power connections:

1. Connect the high side of the power source to the L1 terminal of the power supply.

Figure 2 - Connecting ac Power Wiring



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2. Connect the low side of the power source to the L2 or N (neutral) terminal of the power supply.
3. Connect the GND (ground) terminal of the power supply to central ground bus in the enclosure.

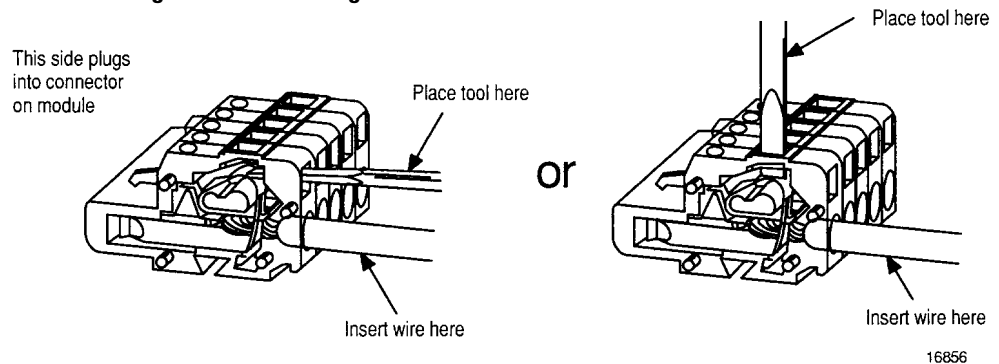
Figure 3 shows details of how to connect a wire to a terminal on the terminal block. You can connect these wires while the terminal block is plugged into the supply, or you can remove the block to lay it on a flat surface to connect these wires. To remove the block, pull it straight out from the receptacle on the module.

The two undesignated terminals do not connect to any electrical circuit on the module and are not used. Each of the three functional terminals accepts a single 14AWG copper wire (maximum).

To connect a wire to a terminal block:

1. Strip 0.35 inches of insulation off the wire.
2. Spring the clip open to insert the wire, using a wedge-tipped tool such as a small screwdriver. If you leave the terminal block plugged into the supply, insert the tool parallel to the wire (push straight in). If you remove the terminal block and lay it on a flat surface, insert the tool perpendicular to the wire (push straight down).

Figure 3 - Connecting a Wire to a Terminal



3. After making the wiring connections, reinsert the terminal block into the front plate of the module. Be sure that the plug is completely inserted and that the locking prongs are engaged.

WARNING



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

Interpreting the Indicators

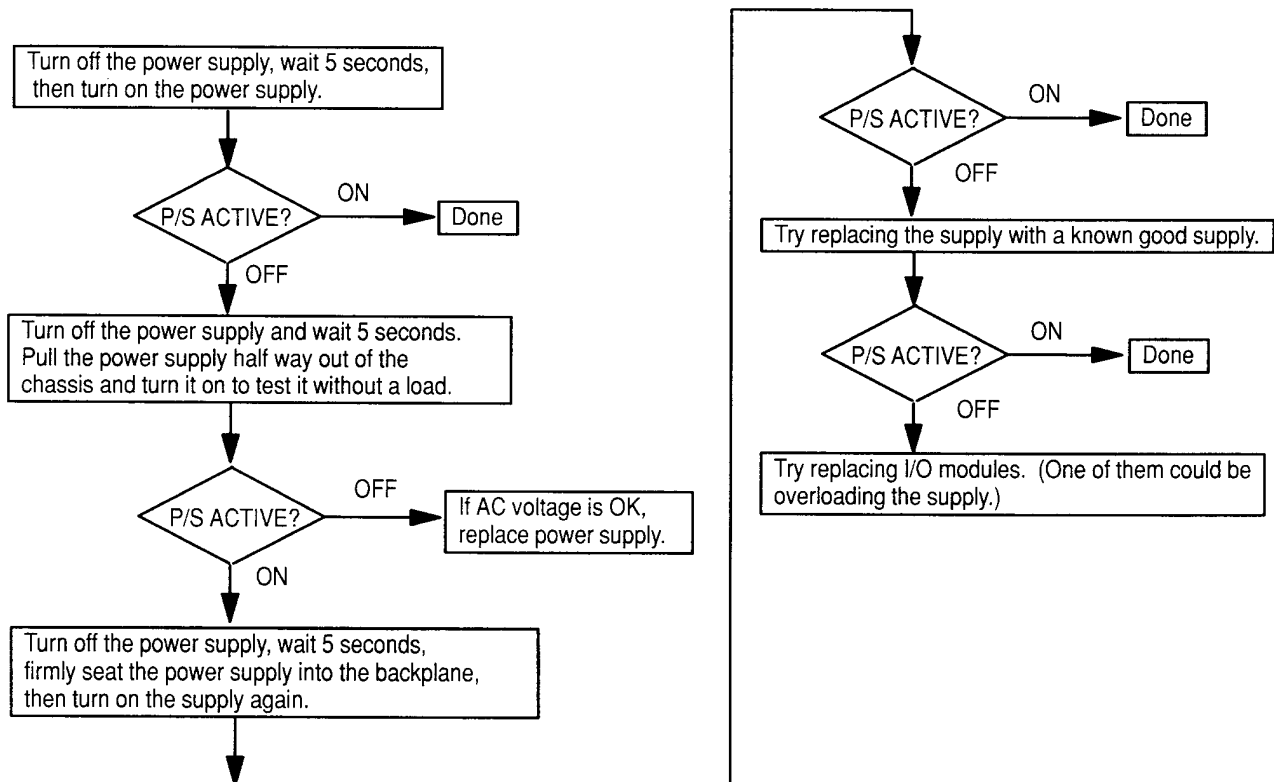
Your power supply has an indicator located in the upper half of the module front panel labeled P/S ACTIVE. Refer to the table below for descriptions of possible conditions.

Table 4 Interpreting the P/S ACTIVE Indicator

If the indicator is:	Then:
ON	The power supply (and any supply connected thru a paralleling cable) is operating normally. However, it could still have a poor connection to the backplane.
OFF	<p>The power supply has detected one of the following:</p> <ul style="list-style-type: none"> • dc overvoltage (the supply shuts down) • dc undervoltage (the supply shuts down) • dc overcurrent (the supply shuts down) • power switch is turned off (the supply is turned off) • ac undervoltage • the paralleled supply is shut down <p>With ac undervoltage or a paralleled supply shut down, the supply will attempt to generate the output. When dc limits are exceeded, the supply shuts down until you turn power off (for 5s minimum) and then turn it back on.</p>

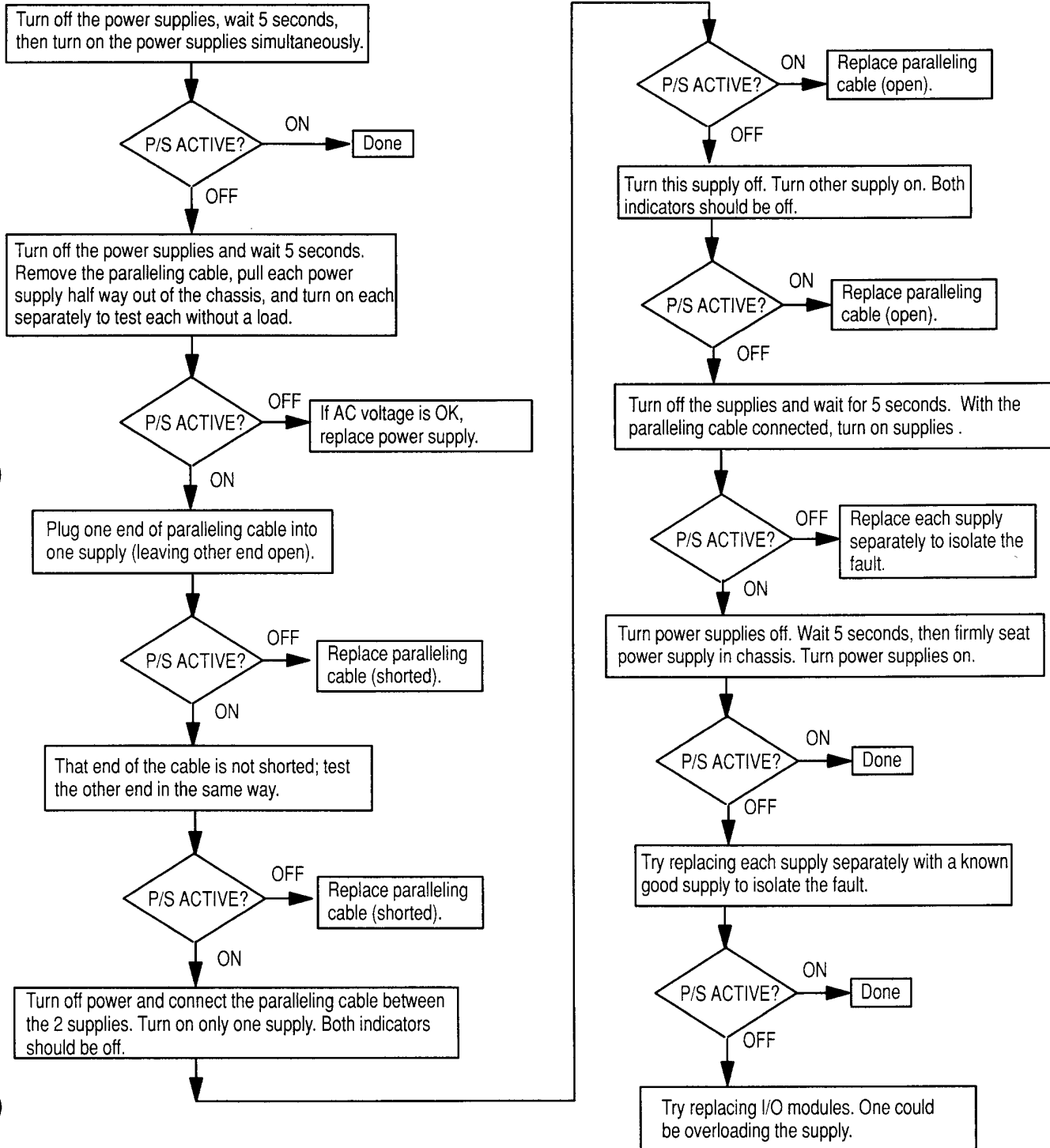
Troubleshooting a Single Power Supply



If you have a single power supply installed in the I/O chassis and its P/S ACTIVE indicator is off, verify the ground connection to the supply; then follow the flow chart below.



Troubleshooting Parallel Power Supplies

If you have a pair of power supplies installed in parallel in the I/O chassis and the P/S ACTIVE indicators are off, verify the ground connection to the supply; then follow the flow chart below.



<p>The following information applies when operating this equipment in hazardous locations:</p>	<p>Informations sur l'utilisation de cet équipement en environnements dangereux :</p>
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, 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.</p>	<p>Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à 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 système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>
<p>WARNING</p> 	<p>EXPLOSION HAZARD</p> <ul style="list-style-type: none"> • 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.
<p>AVERTISSEMENT</p> 	<p>RISQUE D'EXPLOSION</p> <ul style="list-style-type: none"> • 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 I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

Specifications

	1771-P4S	1771-P6S	1771-P4S1	1771-P6S1
Input Voltage	120V ac, 0.9A	220V ac, 0.5A	100V ac, 1.06A	200V ac, 0.53A
Input Range	97-132V ac rms	194-264V ac rms	85-120V ac rms	170-240V ac rms
Frequency	47-63Hz	47-63Hz	47-63Hz	47-63Hz
Fuse	250V, 1.5A, Bussman MDL 1.5, Littelfuse 31301.5, IEC 127 Type T (Blue)			
Output Voltage (backplane)	5V dc			
Output Current (maximum)	8A (see derating curve below)			
Power Dissipation	16W			
Thermal Dissipation	47.8 BTU/hr			
Adjacent Slot Power Dissipation	10W maximum			
Branch Circuit Protection ¹	15A maximum (user supplied)			
Environmental Conditions				
Operational 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): 0 to 60°C (32 to 140°F)			
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): -25 to 80°C (-13 to 176°F)			
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5 to 95% noncondensing			
Shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock) 30g peak acceleration 50g peak acceleration			
Vibration	IEC 60068-2-6, (Test Fc, Operating) Tested 2g @ 10-500Hz			
Isolation Voltage	Tested to withstand 1000V ac for 60s			
Enclosure Type Rating	None (open style)			
Conductors	Wire Size	14AWG (2.4mm ²) maximum, solid or stranded copper wire rated at 60°C or greater		
	Category	3/64 inch (1.2mm) insulation maximum 1 ²		
5 Position Terminal Block	A-B PN 941274-55, Wago ³ PN 231-002/027-000 (1 included with each power supply)			
Certifications (when product is marked)	UL UL Listed Industrial Control Equipment, certified for US and Canada C-UL UL Listed for Class I, Division 2, Groups A, B, C and D Hazardous locations, certified for Canada CE ⁴ European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN61326; Meas./Control/Lab Industrial Requirements EN 61000-2; Industrial Emissions European Union 73/23/EEC LVD Directive, compliant with: EN 61131-2, Programmable Controllers C-Tick ⁴ Australian Radiocommunications Act compliant with: AS/NZS 2064, Industrial Emissions			

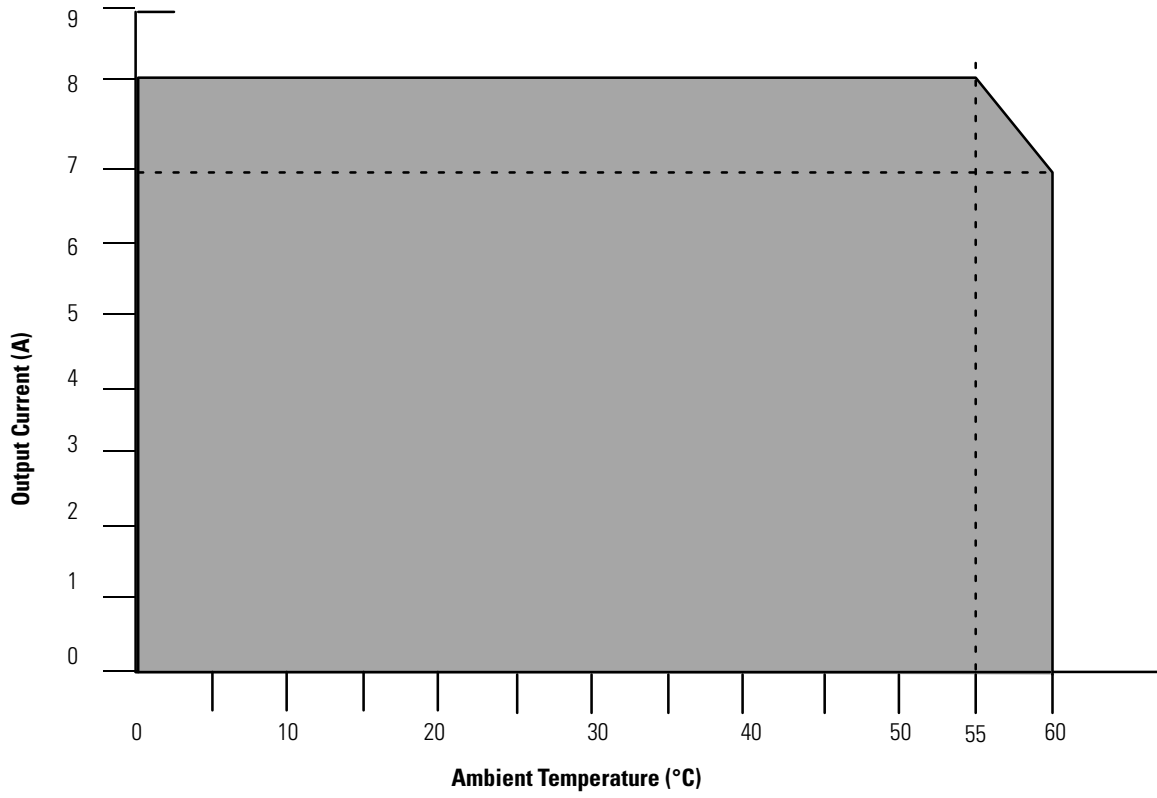
¹ Provided in all ungrounded mains connections.

² Use this conductor category information for planning conductor routing as described in publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines"

³ Wago Corporation, 9085 N. Deerbrook Trail, Brown Deer WI 53223

⁴ See the Product Certification link at www.ab.com for Declaration of Conformity, Certificates, and other certification details

Derating Curve



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