Honeywell

Experion

Redundant Power Supply

Installation Guide

EP-DCx204

R300.1

5/06

Notices and Trademarks

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About This Document

This document provides information for installing a redundant power supply for your C200 Controller and/or I/O chassis.

Release Information

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Redundant Power Supply Installation Guide - rpsg	EP-DCx204	300.1	5/06

References

The following list identifies all documents that may be sources of reference for material discussed in this publication.

Document Title

Contacts

World Wide Web

The following Honeywell web sites may be of interest to Process Solutions customers.

Honeywell Organization	WWW Address (URL)
Corporate	*http://www.honeywell.com*
Honeywell Process Solutions	*http://hpsweb.honeywell.com*

Telephone

Contact us by telephone at the numbers listed below.

Location	Organization	Phone
United States and Canada	Honeywell IAC Solution Support Center	1-800-822-7673
Europe	Honeywell TAC-EMEA	+32-2-728-2704
Pacific	Honeywell Global TAC - Pacific	1300-300-4822 (toll free within Australia) +61-8-9362-9559 (outside Australia)
India	Honeywell Global TAC - India	+91-20-2682-2458
Korea	Honeywell Global TAC - Korea	+82-2-799-6317
People's Republic of China	Honeywell Global TAC - China	+86-10-8458-3280 ext. 361
Singapore	Honeywell Global TAC - South East Asia	+65-6580-3500
Taiwan	Honeywell Global TAC - Taiwan	+886-7-323-5900
Japan	Honeywell Global TAC - Japan	+81-3-5440-1303
Elsewhere	Call your nearest Honeywell office.	

Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	**ATTENTION:** Identifies information that requires special consideration.
	**TIP:** Identifies advice or hints for the user, often in terms of performing a task.
	**REFERENCE -EXTERNAL:** Identifies an additional source of information outside of the bookset.
	**REFERENCE - INTERNAL:** Identifies an additional source of information within the bookset.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	**CAUTION**: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. **CAUTION** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	**WARNING**: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death. **WARNING** symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.

Symbol	Definition
	**WARNING, Risk of electrical shock**: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 VDC may be accessible.
	**ESD HAZARD:** Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	**Protective Earth (PE) terminal**: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	**Functional earth terminal**: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	**Earth Ground**: **Functional earth connection.** NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	**Chassis Ground**: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.

Contents

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Preparing for Installation

Before you begin

Be sure you have reviewed the *Preinstallation Considerations* in the *Control Hardware Installation Guide* and confirmed that you have taken steps to minimize Electrostatic Discharge (ESD). The *Control Hardware Installation Guide* is provided with the Knowledge Builder on-line documentation that is provided with the Experion system.

CAUTION

Since power output ratings vary for given approval bodies, be sure the specified load capacity and temperature rating for the power supply will not be exceeded in your application.

For applicable power output rating specifications, refer to the Experion specifications. The Experion specifications can be found on the Honeywell website: http://www.acs.honeywell.com/. Just follow the Experion product links.

Installation declaration

ATTENTION

This equipment shall be installed in accordance with the requirements of the National Electrical Code (NEC), ANSI/NFPA 70, or the Canadian Electrical Code (CEC), C22.1. It is supplied as “open equipment” that is intended to be mounted on a sub-panel within an enclosure. The suitability of the enclosure and installed system shall be acceptable to the local “authority having jurisdiction,” as defined in the NEC, or “authorized person” as defined in the CEC.

Check Components

Verify that you have the correct redundant power supply components to meet your particular installation requirements. The following table lists the available components for reference and the following figure shows a typical installation configuration.

Note that model numbers beginning with the prefix "TK" are for a coated version of the component.

Model Number	Component	Quantity per Chassis
TC-RPCXX1 or TK-RPCXX1	120/240Vac Redundant Power Supply	2[1]
TC-RPDXX1 or TK-RPDXX1	24Vdc Redundant Power Supply	2[1]
TC-RPSCA2 or TK-RPSCA2	Redundant Power Supply Chassis Adapter	1
TC-RPSC04	Redundant Power Supply Cables [Length is 914mm (3ft)]	2
User Supplied[2]	12-14 AWG Annunciator Wiring [Maximum Length is 10m (32.8ft)]	2

[1] The redundant power supply models can be mixed or matched, so the quantity would be 1 per chassis if they were mixed.

[2] Optional user-supplied annunciator wiring can be connected to a solid-state relay for status and troubleshooting purposes.

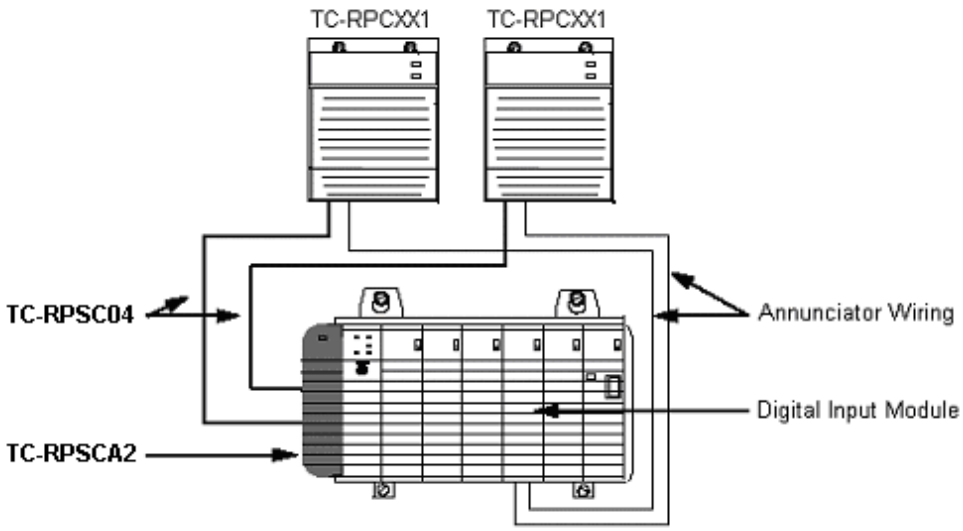
ATTENTION

If you have a Series A chassis with any of the following model numbers, contact your Honeywell Service representative for redundant power supply options.

- TC-FXXnn1
- TK-FXXnn1

Note: nn = the number of slots available in the chassis, (04, 07, 10, 13, 17).

Typical Redundant Power Supply Application



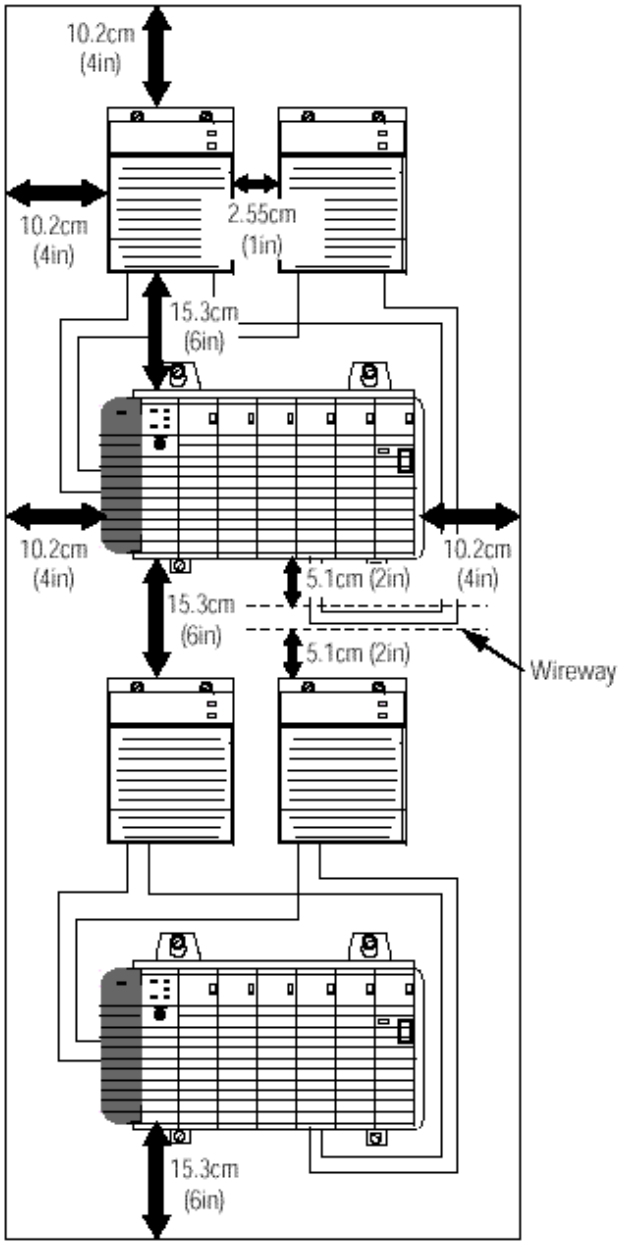
The redundant power supplies (TC-RPCxx1 or TC-RPDxx1) are surface mounted within 3 feet of the controller or I/O chassis. A redundant power supply adapter, (TC-RPSCA2) is installed on one end of the chassis. Three-foot cables, (TC-RPSC04) are installed connecting the redundant power supplies to the adapter.

Verify mounting space requirements

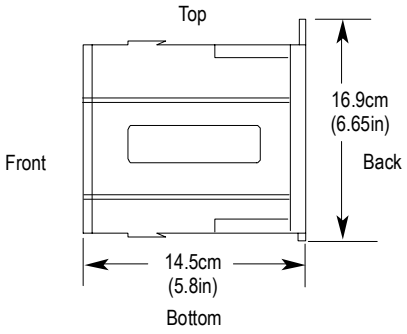
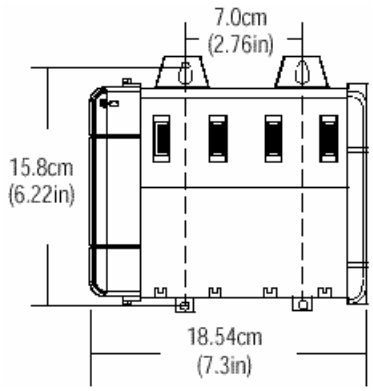
ATTENTION

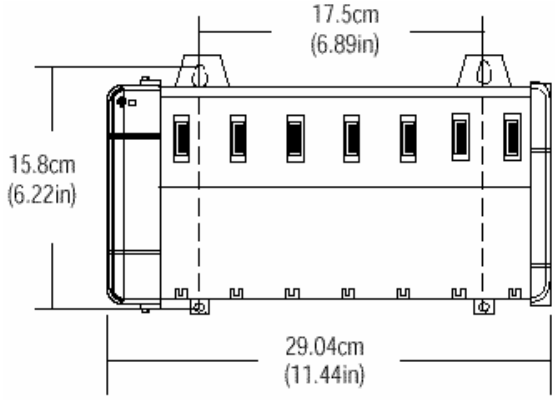
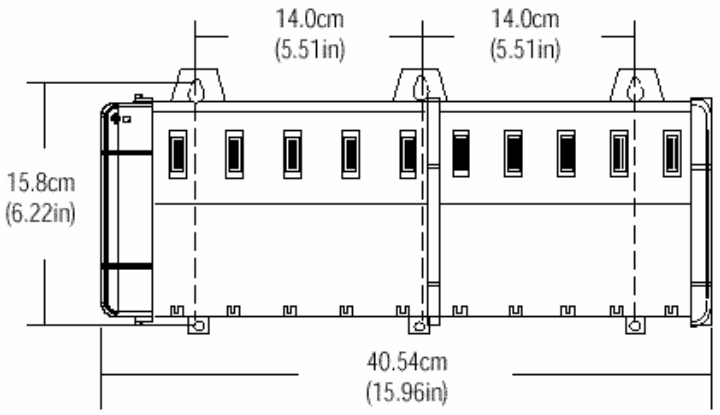
Be sure you meet these minimum spacing requirements when mounting components in an enclosure, as shown in the following Figure.

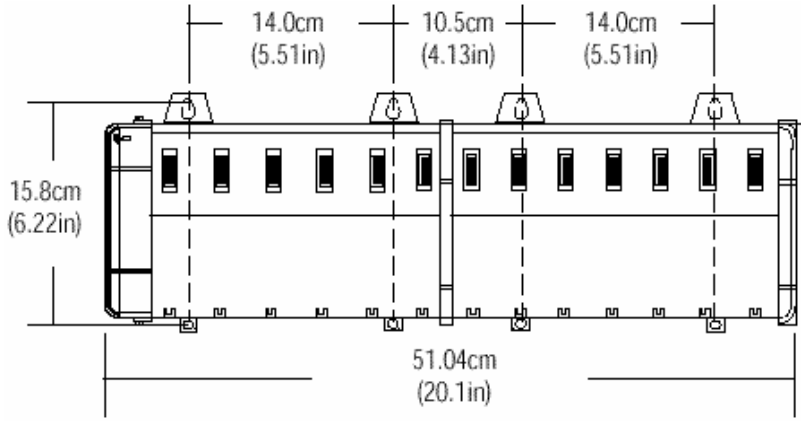
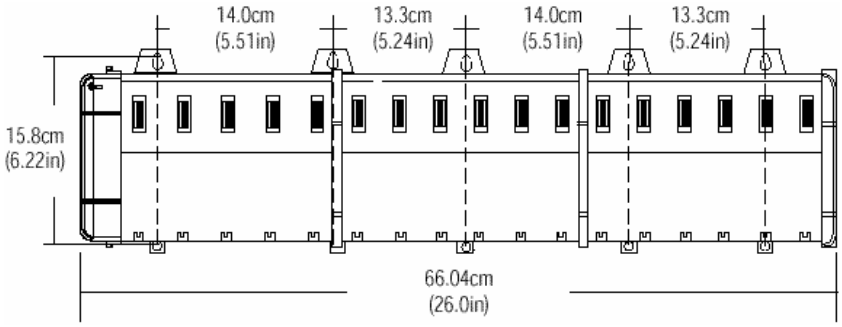
- 10.2cm (4in) between redundant power supplies and the enclosure.
- 2.55cm (1in) between redundant power supplies.
- 15.3cm (6in) between chassis and heat source.
- 5.1cm (2in) between wireway and top or bottom of chassis.
- 5.1cm (2in) between wireway and power supply.
- 7.7 to 10.2cm (3 to 4in) between chassis mounted horizontally – not shown.


10.2cm
(4in)
10.2cm
(4in)
2.55cm
(1in)
15.3cm
(6in)
10.2cm
(4in)
10.2cm
(4in)
5.1cm (2in)
15.3cm
(6in)
5.1cm (2in)
Wireway
15.3cm
(6in)

Refer to the dimensions for the appropriate chassis model in the following table to plan the panel layout for your particular installation. See the *Control Hardware Installation Guide* for more chassis mounting information.

Chassis Model	Dimensions
All models – Right-Side View	
TC-FXX042 (With Adapter installed)	

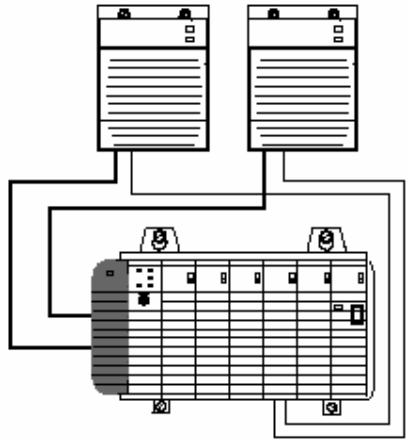
Chassis Model	Dimensions
TC-FXX072 **(With Adapter installed)**	
TC-FXX102 **TK-FXX102** **(With Adapter installed)**	

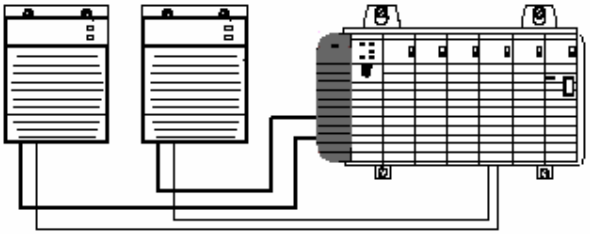
Chassis Model	Dimensions
TC-FXX132 **TK-FXX132** **(With Adapter installed)**	
TC-FXX172 **(With Adapter installed)**	

Component layout recommendations

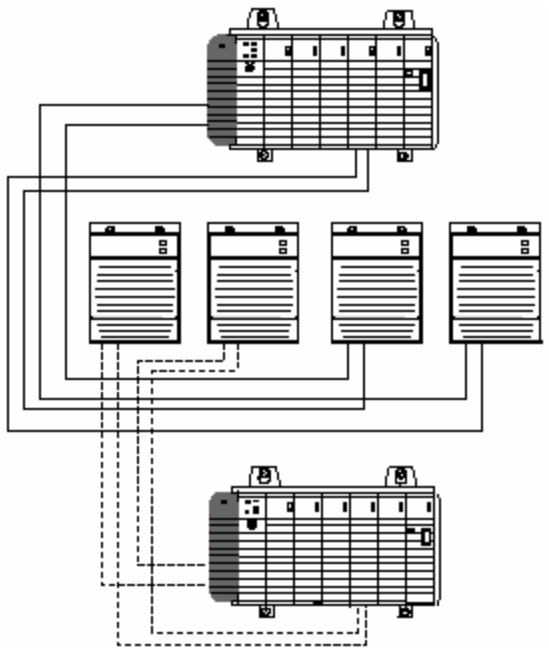
We recommend that you use one of the following recommended layouts for installing redundant power supply components with one or two chassis.

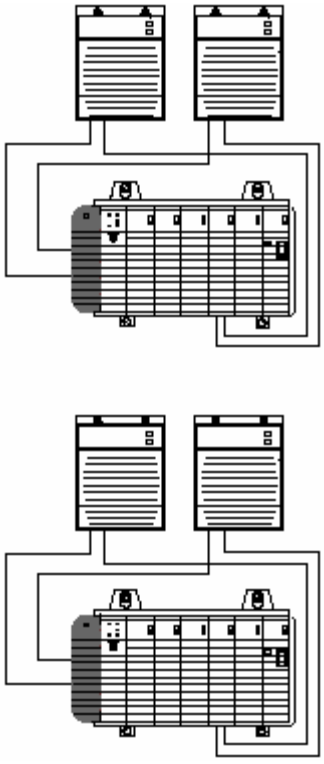
Recommended Layouts With One Chassis





Recommended Layouts With Two Chassis





Tools needed

- 1/8-inch flat-blade screwdriver
- 1/4-inch flat-blade (#2) or Phillips screwdriver
- Needle-nose pliers
- Wire stripper
- Electric drill

Installing Components

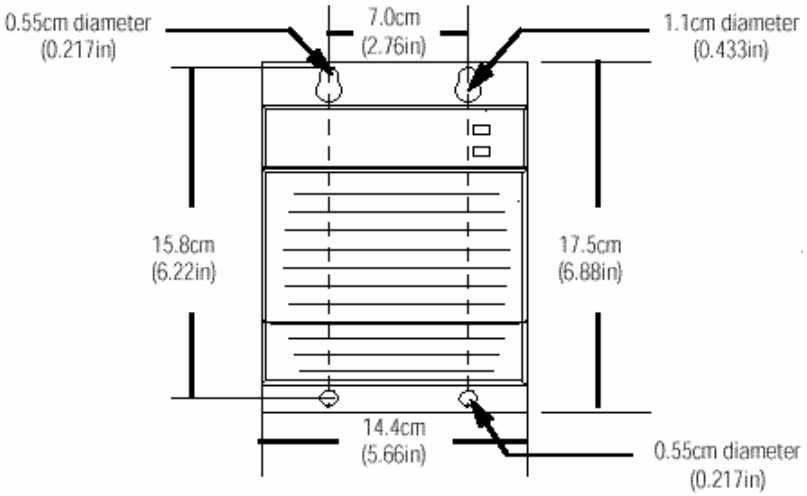
Installing redundant power supply

Use the following procedure to install a redundant power supply on the back panel of an enclosure.

CAUTION

Do **not** drill holes for a redundant power supply above an already installed chassis. Metal chips from drilling can damage the backplane and cause intermittent operation.

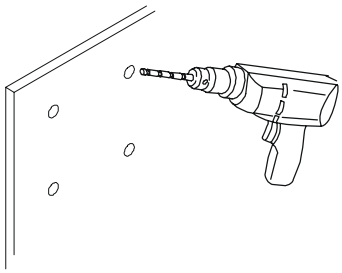
Step	Action
1	Reference the following mounting dimensions and measure and mark the location of the mounting tab holes for the power supply on the back panel. Or, if you have help, position the power supply in the desired location on the back panel and use a center punch to mark the location of the mounting tab holes.



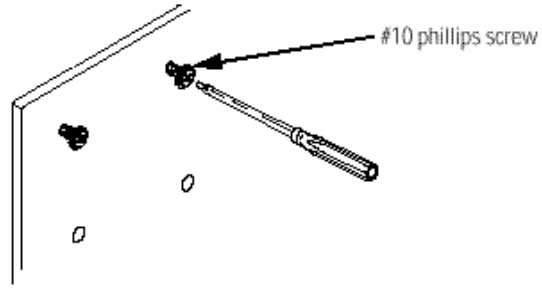
TIP

The mounting hole dimensions for a redundant power supply are identical to the ones for a 4-slot chassis.

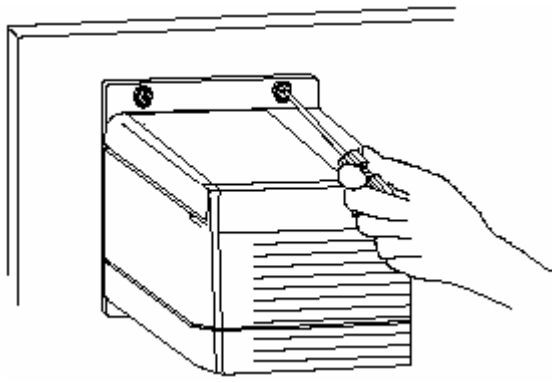
Step	Action
2	Using the marks made in Step 1, drill tap holes in the back panel of the enclosure for #10 (M4) or #12 (M5) mounting screws.



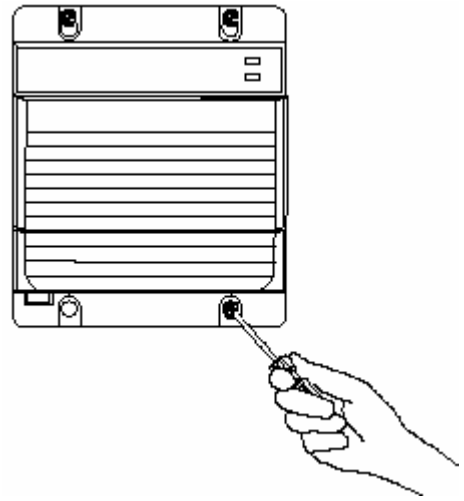
3	Put a split lock-washer and flat washer on a #10 (M4) or #12 (M5) screw and screw it into a top mounting hole so it is secure, but not tight against the panel. Repeat for the other top mounting hole.



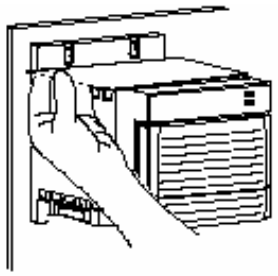
Step	Action
4	Align the top mounting tab holes in the redundant power supply with the installed screws, slip the tabs over the screws, and slide the power supply behind the washers, so it rests on the screws. Tighten the screws.



5	Install screws and washers in the bottom mounting tabs and tighten.

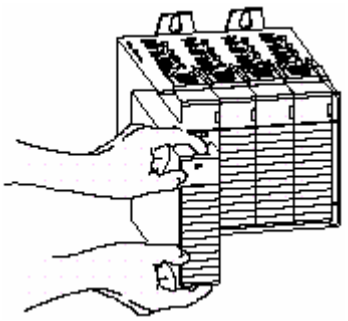
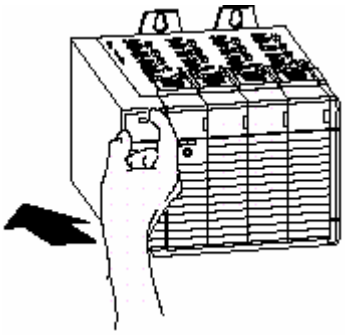


6	Observing spacing and layout recommendations, repeat this procedure to install the other redundant power supply (ies).

Step	Action
	ATTENTION Be sure the power supply is mounted and all panel fabrication is completed before you remove the protective label. The label protects the power supply from metal shavings falling inside it.
7	Peel the protective label off the top of each redundant power supply. 
8	Go to the next section *Installing redundant power supply chassis adapter*.

Installing redundant power supply chassis adapter

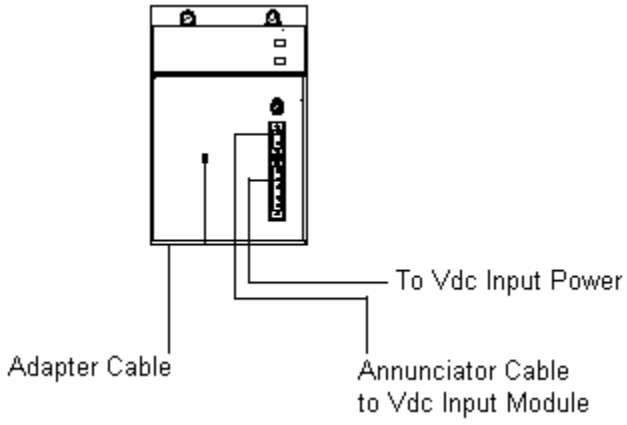
Use the following procedure to install a chassis adapter on the leftmost side of a chassis.

Step	Action
1	Align the right side of the chassis adapter with the leftmost edge of the chassis. 
2	Push the module onto the chassis until the locking tabs click. 
3	Go to the next section *Connecting Components*.

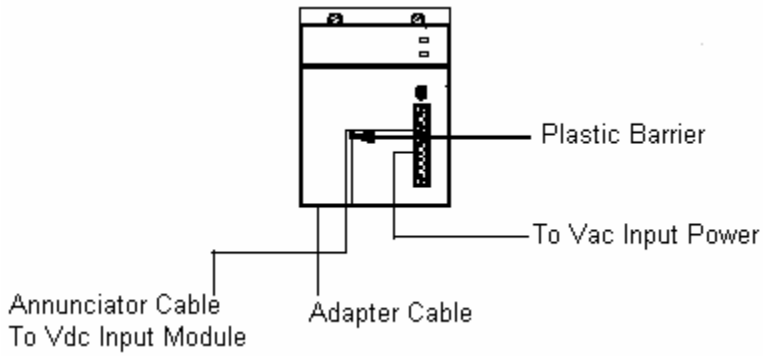
Connecting Components

General wiring guidelines

- Never run all three lines together in any application. For example, do not run input power, adapter cable, and annunciator cable together in the same raceway.
- If the redundant power supply and the annunciator cable use the same input power source, you can route the power line and annunciator cable together. For example, if your application uses a Vdc redundant power supply and the annunciator cable is connected to a Vdc input module, you can route the power source line and the annunciator cable together, as shown below.



- If the redundant power supply and the annunciator cable use different input power sources, you must route the power line and annunciator cable separately. For example, if your application uses a Vac redundant power supply and the annunciator is connected to a Vdc input module, you must route the power source line and annunciator cable separately. In this case, be sure to route the annunciator cable under the tab at the top of the plastic barrier, as shown below.



- Be sure the length of the annunciator cable does not exceed 10m (32.8ft).

WARNING

When components are located in a Division 2 hazardous location, do **not** attempt to connect or disconnect cables unless power has been removed, or the area is known to be nonhazardous.

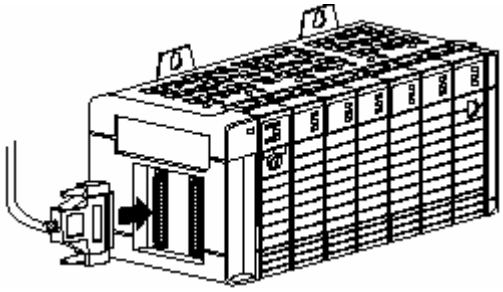
Connecting adapter cable

Use the following procedure to connect the cable TC-RPSC04 to the chassis adapter and the redundant power supply. This procedure assumes that there is a minimum space of 4 inches (10.2cm) between the adapter and the enclosure per previous spacing recommendations. You will not be able to connect the cable to the adapter, if the space is less than 4 inches (10.2cm).

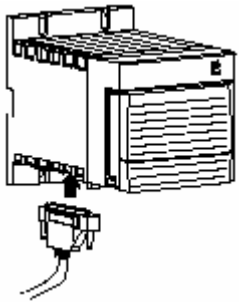
ATTENTION

Be sure the redundant power supply is turned off before making any cable connections.

Step	Action
1	Connect a plug on one end of the adapter cable to one of the ports on the left side of the chassis adapter. Be sure the plug is fully seated and tighten the plug screws to secure it.



2	Connect the plug on the other end of the adapter cable to the port under the left side of the redundant power supply. Be sure the plug is fully seated and tighten the plug screws to secure it.



3	Repeat this procedure to connect the other adapter cable to the remaining port on the adapter and to the second redundant power supply.
4	Go to the next section *Connecting optional annunciator cable*.

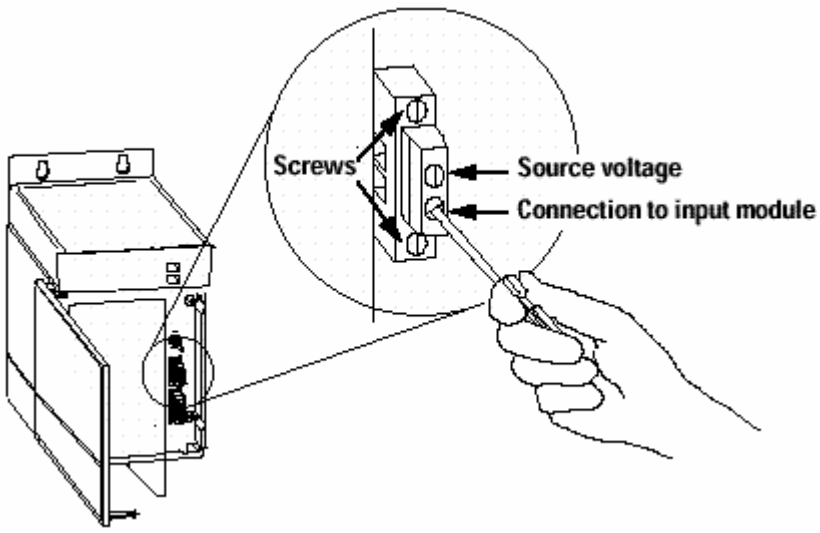
Connecting optional annunciator cable

Use the following procedure to connect a user-supplied cable between the solid-state relay on a redundant power supply to an input module in the chassis. The normally open relay is held closed during normal operation and opens when the power supply fails or is turned off.

ATTENTION

The annunciator output is rated for resistive loads. Do **not** use it to drive the coil of an electromagnetic relay.

Step	Action
1	Open the redundant power supply door.
2	Connect the source voltage lead to one of the terminals on the solid-state relay connector, as shown below. The source voltage must be compatible with the input module.



3	Connect the input point lead to the other terminal on the solid state relay; connector.

Step	Action
4	Connect the other end of the cable to the appropriate terminals on the input module. Be sure the length of the annunciator cable does not exceed 10m (32.8ft).
5	Make sure the solid-state relay connector is fully seated on the power supply and tighten the screws to secure it.
6	Close the power supply door.
7	Repeat this procedure for the second redundant power supply, if applicable.
8	Go to the next section *Connecting power*.

Connecting power

Use the appropriate portion of the following procedure to connect the power wiring to the redundant power supply.

WARNING

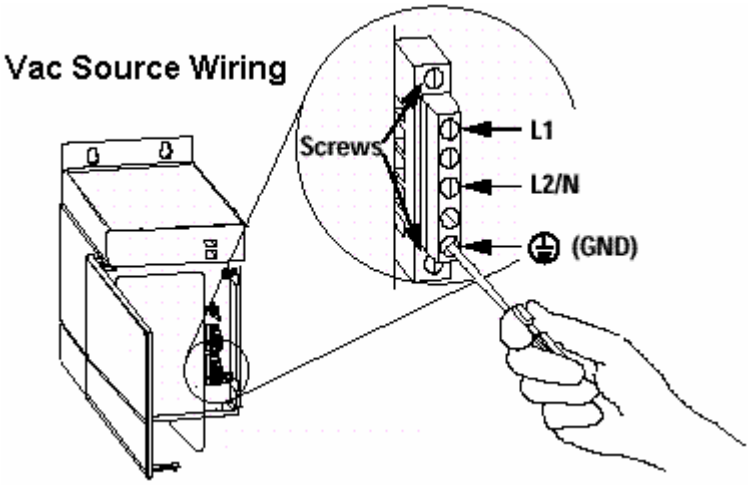
Turn off power at the source of the supply before connecting to the power supply terminals. Failure to do so could cause injury to personnel and/or equipment. This equipment must be provided with a disconnect on each ungrounded conductor.

ATTENTION

- We recommend 14 AWG, 75°C, copper wire for power connections.
- Torque screw terminals to 7 inch-pound (0.8 Newton-meter).

Step	Action
120/240 Vac Power	
1	Open the door on the front of the redundant power supply.
2	Connect the high side of the Vac power line (black) to the L1 terminal on the power connector.
3	Connect the low side of the Vac power line (white) to the L2/N terminal.

Step	Action



4 Connect the PE ground (green with yellow stripe) to the ground terminal. Please refer to the *Protective Earth (PE) ground guidelines* and *Ground bus connection guidelines* in the *Control Hardware Installation Guide* for general grounding recommendations.

5 Be sure the power connector is fully seated on the power supply and tighten the screws to secure it.

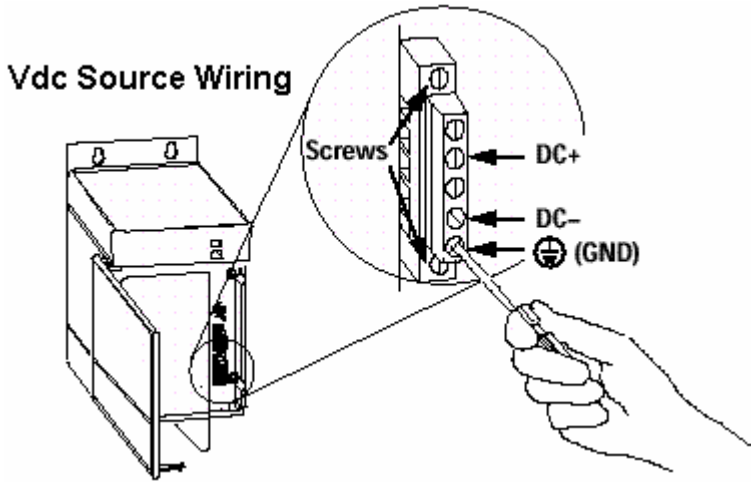
6 Close the power supply door.

7 Repeat this procedure for other Vac powered redundant power supplies, as required.

24Vdc Power

1 Open the door on the front of the redundant power supply.

2 Connect the positive Vdc lead to the DC+ terminal on the power connector.

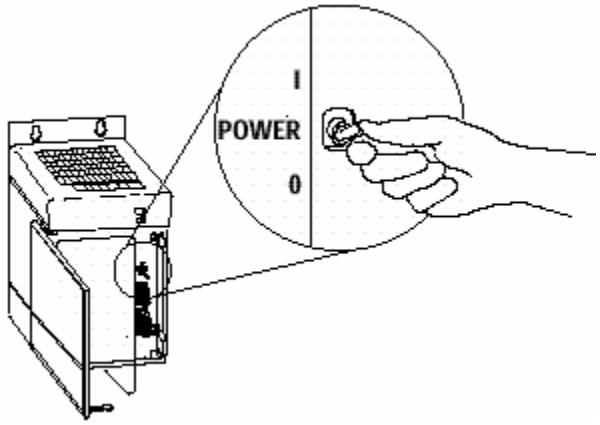
Step	Action
	
3	Connect the negative Vdc lead to the DC- terminal on the power connector.
4	Connect the PE ground (green with yellow stripe) to the ground terminal. Please refer to the *Protective Earth (PE) ground guidelines* and *Ground bus connection guidelines* in the *Control Hardware Installation Guide* for general grounding recommendations.
5	Be sure the power connector is fully seated on the power supply and tighten the screws to secure it.
6	Close the power supply door.
7	Repeat this procedure for other Vdc powered redundant power supplies, as required.

Operation

Activate Redundant Power Supply System

Turn on power

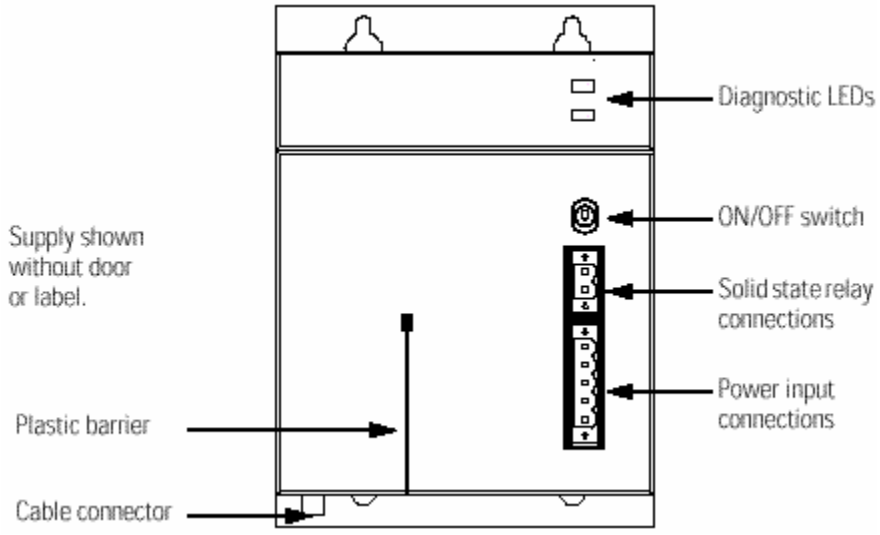
Open the door on the front of each redundant power supply and flip the power switch to the ON position. Close the power supply door.



Interpreting LED indications

Each redundant power supply includes the following two diagnostic LEDs, as shown in the following Figure.

- Power - Green
- Non-Red (non-redundancy) - Amber

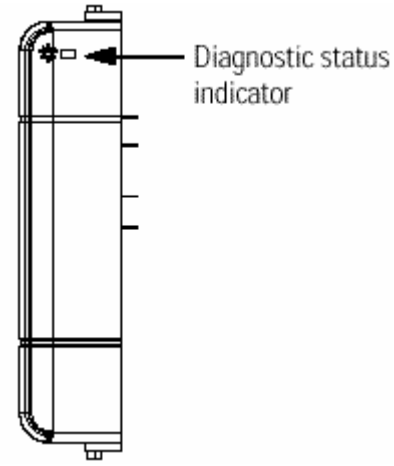


Use the following table to interpret the meaning of some typical status indications.

If LED indications are. . .	Then, it means . . .	And, the possible corrective action is . . .
Power – Solid Green Non-red - Off	Both supplies are operating properly. (You should see this status on both supplies, if it appears on either.)	None
Power – Solid Green Non-red – Solid Amber	This supply is operating properly but is the only supply providing power to the chassis adapter.	Check the other supply.
Power – Off Non-red – Solid Amber	All possible connections are made, but the redundant power supply is turned Off.	Turn the supply ON. If the supply does not turn ON, follow these steps: a) Remove input power to supply. b) Wait 15 minutes. c) Reconnect input power. d) Turn supply ON. If the supply still does not turn ON, replace it.

If LED indications are. . .	Then, it means . . .	And, the possible corrective action is . . .
Power – Off Non-red – Off	Any of the following conditions may apply: a) The supply is turned Off. b) Line voltage is not within the specified range. c) All connections are made, but input power is not supplied. d) All connections are made, including input power, but adapter cable is not connected. e) The supply is ON but defective.	Take the appropriately lettered action for each condition. a) Turn the supply ON. b) Verify that the line power is in the specified range. If the LEDs remain Off, cycle power. c) Verify that input power is supplied and turn ON the supply. d) Connect adapter cable and turn the supply ON. e) Replace the supply.

The redundant power supply chassis adapter has only one status LED, as shown in the following Figure. It is ON when the chassis is receiving power and OFF when the chassis is not receiving power.



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