

# PACSystems\* RX7i

## 17-slot Rear Mount Rack with Rear I/O Access

GFK-2360A  
June 2011

IC698CHS217

The PACSystems\* RX7i rack can be used for all RX7i CPU and I/O configurations, Series 90\*-70 I/O, and VME modules.

Backplane connectors are spaced on 0.8" (20.3mm) centers to accommodate single-width RX7i modules, VME modules, and single-width Series 90-70 modules. Double-width modules use two slots each.

Seventeen I/O connectors, also spaced on 0.8" (20.3mm) centers, are provided on the rear of the rack. An offset bracket allows access to the rear I/O pins.

The rack accepts a power supply in slot 0 and a CPU in slot 1. The RX7i CPUs with Ethernet daughter card are double-width modules and use slots 1 and 2. The remaining slots can be used for one of the following I/O combinations:

- fifteen single-width modules (with no double-width modules installed),
- eight double-width modules, or
- a combination of double-width and single-width modules.

For a list of supported modules, see the *PACSystems RX7i Installation Manual*, GFK-2223. The power supply capacity may limit the number of modules in a rack.

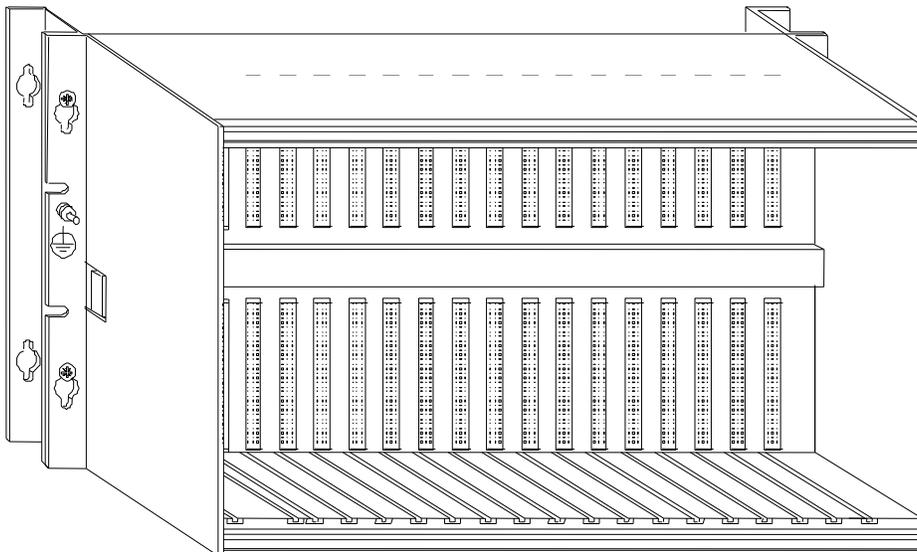
**Integration of VME modules must be in accordance with the guidelines described in the *RX7i User's Guide to Integration of VME Modules*, GFK-2235.**

**RX7i racks are considered *open equipment*, and therefore must be installed in a protective enclosure rated IP54 or greater.**

### Features

- Provides rear access to the VME64 J2 backplane connectors.
- Provides slot sensing for rack-type I/O modules. No jumpers or DIP switches on the I/O modules are required for addressing of these modules.
- Provides automatic daisy chaining of interrupt acknowledge and bus grant signals so no blank slot jumpers are required.
- Provides J2 backplane connectors to allow high-speed VME transfers of up to 64 data bits per cycle.
- Accepts plug-in RX7i AC power supplies
- Supports higher wattage power supply for high-current configurations.
- Supports an optional cooling fan assembly (required for IC698CPE020 or IC698CRE020).

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## Rack Installation

**RX7i racks are considered *open equipment*, and therefore must be installed in a protective enclosure rated IP54 or greater.**

Overall rack dimensions are 11.15"H x 19"W x 8.875"D (283 x 483 x 225mm). Rack dimensions with the optional rear cover installed are 11.15"H x 19"W x 8.97"D (283 x 483 x 228mm).

To mount the rack with the rack spacers, you will need eight M6 machine screws.

**Note:** If your installation includes a fan assembly, a minimum clearance of 23cm (9 inches) between RX7i racks is recommended so that an individual fan can be removed and replaced.

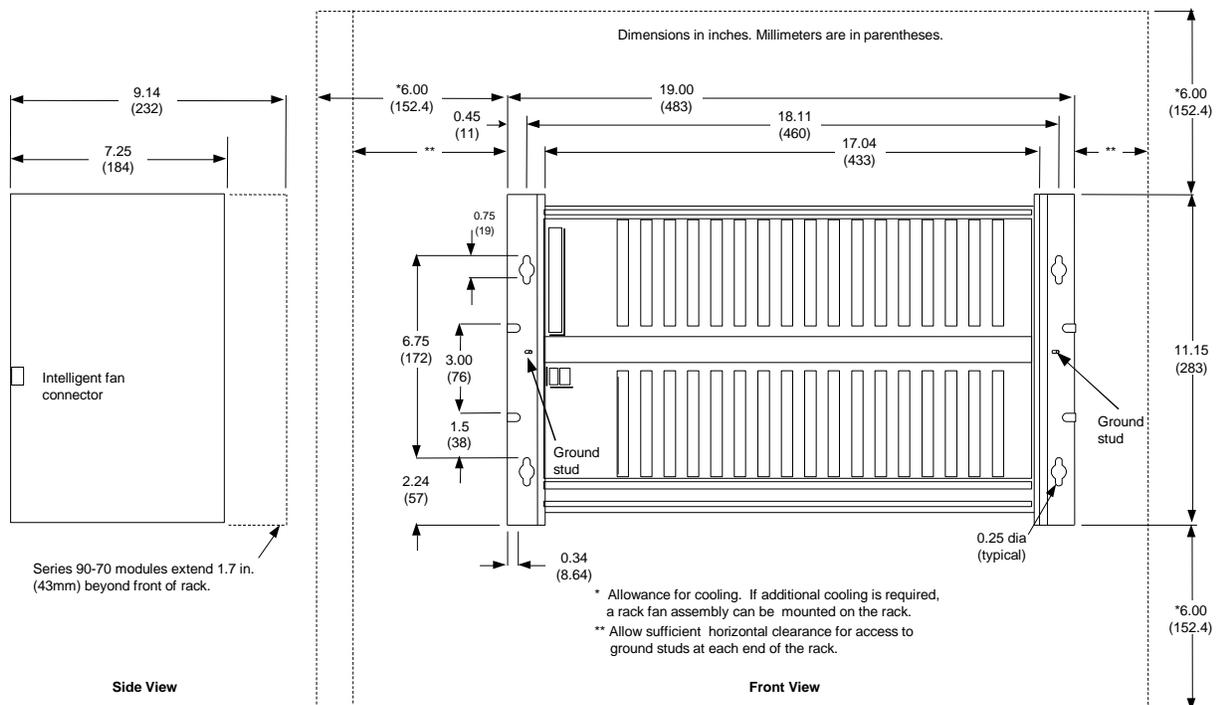
The rack must be mounted in the orientation shown in "Rack Mounting Dimensions." Sufficient space must be left around the rack to allow air flow for module cooling. Mounting requirements must be determined according to the application. Mounting flanges are an integral part of rack side panels.

To meet U.S., Canadian, Australian, and European regulations for Class A digital devices and maintain CE Mark compliance, RX7i installations that include an IC698CHS217 rack must be installed in a metal enclosure with external wiring routed in metal conduit as described in Appendix A of the *PACSystems RX7i Installation Manual, GFK-2223*.

These racks accommodate two module types:

- Rack-type RX7i and Series 90-70 I/O modules. I/O wiring is routed out the bottom of the front cover which uses a detachable field wiring terminal board. Each I/O module accepts up to forty AWG #14 (2.10 mm<sup>2</sup>) wires. With the IC698CHS217, the VME64 J2 connector user-defined I/O pins are accessible through a rear 96-pin DIN connector. I/O wiring may be connected to these rear access connectors. If the optional rear cover is used, I/O wiring is routed out the bottom of the cover.
- VME modules, which have varying methods of connecting to field devices.

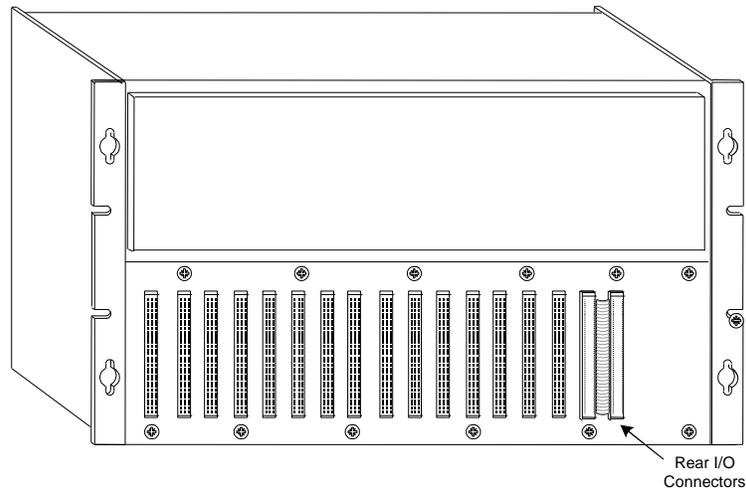
## Rack Mounting Dimensions



GFK-2360A

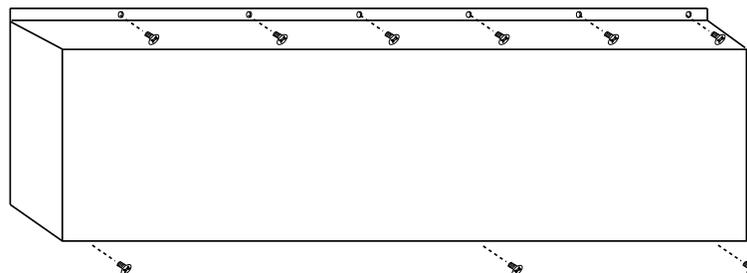
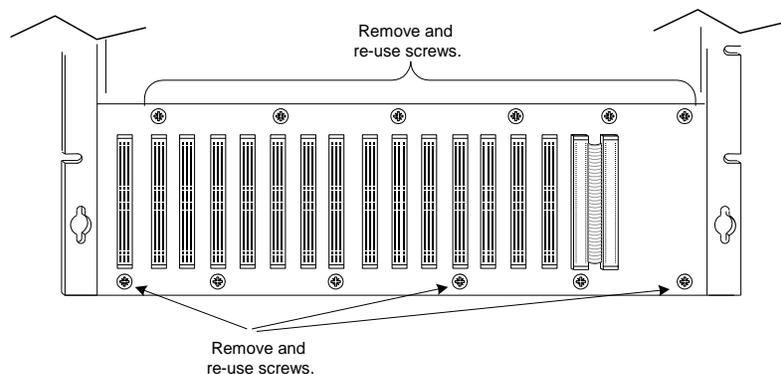
**Rack Installation Procedure**

1. Fasten two rack spacers on the equipment panel, one for each side of the rack, using four M6 screws.
2. Insert four M6 screws in either the top or bottom sets of holes on the spacers. Because these will be used for mounting the rack, do not tighten them all the way down. Leave enough space between the screws and the spacer to install the rack.
3. Install any rack rear I/O wiring required for the application. Refer to the PACSystems RX7i Installation Manual, GFK-2223 for recommendations related to wiring.

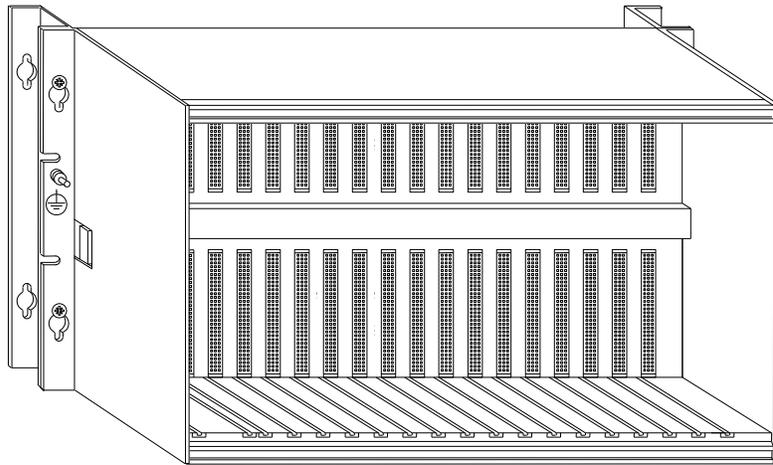


4. To use the optional rear cover, remove nine screws from the rear connector assembly, as indicated in the drawing to the right.

Install the cover over the rack rear connectors, with the opening facing downward. Fasten the cover to the rack using the nine screws.



5. Mount the rack assembly onto the spacer screws and tighten the screws to firmly hold the rack.



## Shield Ground

### RX7i Modules

The power supply, CPU, and all RX7i modules have metal faceplates that are screwed directly to the enclosure at the top and bottom to ensure the faceplate is grounded to frame ground.

### Series 90-70 Modules

Some Series 90-70 I/O modules have a ground clip that contacts the conductive bottom rail when the module is fully inserted. Shield connections in the user connectors are routed to this ground clip through conductors on the module.

## Safety Ground

The #8-32 ground studs on the sides of the rack must be connected to earth ground with not less than an AWG #12 (3.33 mm<sup>2</sup>) wire. Use of a nut and star washer for each wire on the GND stud is recommended to ensure adequate grounding. Refer to applicable electrical safety codes.

### Warning

**If the ground lug is not connected to earth ground, the rack is not grounded. The rack must be grounded to minimize electrical shock hazard, which may result in severe personal injury, and to maintain certification to standards.**

## System Noise Protection

The following steps must be taken to properly ground the PLC system to reduce the possibility of errors due to electrical noise.

1. Make sure that the power supply mounting screws are properly secured.
2. The GND terminal on the power supply must be connected to the GND terminal on either side of the rack using AWG #12 (3.33 mm<sup>2</sup>) wire. Use of a ring terminal and star washer is recommended.
3. The GND terminal on the rack must be connected to a reliable earth ground.

**Note:** RX7i modules with faceplates fitted with an EMI gasket (a metal strip along the side of the faceplate) ensure contact of the gasket with the faceplate of each adjacent module in the rack, forming a continuous EMI shield for the modules in the rack. (RX7i power supplies have the gasket on both sides of the faceplate.) This EMI shield makes the rack less susceptible to external electrical noise and minimizes the level of electrical noise radiated by the rack. If the rack is not fully populated with gasketed faceplates, it must be installed into a metal enclosure to achieve similar noise improvement. Note that gasketed filler faceplates may be ordered as needed. (IC698ACC735 – single-width; IC698ACC720 -double-width)

## Module Retention

Series 90-70 double width I/O modules have molded latches that automatically snap onto the upper and lower rails of the rack when the module is fully inserted. Some VME modules or Series 90-70 single width modules may not have these latches.

RX7i modules are mechanically tied to frame ground using screws that secure the top and bottom of the faceplates to the enclosure. For high vibration applications, other modules can be secured to the rack using M2.5x8 screws.

To remove an RX7i or Series 90-70 module, first remove the field half of the terminal board (if it is an I/O module). If screws have been used to secure modules to the rack, remove the screws. Then grasp the top and bottom of the module to depress the latch releases (CPU and Ethernet modules do not have latches) while pulling the module out. For detailed information on removing I/O terminal boards, refer to the applicable Installation Manual or individual data sheets for I/O modules.

### Warning

**Do not remove (or insert) modules when the power supply or any externally-connected power sources are on. Hazardous voltages may exist. Personal injury, damage to the module, or unpredictable operation of the device or process being controlled may result.**

A blank faceplate is available to cover two consecutive unused slots in the rack or a single unused slot (IC698ACC735 – single-width; IC698ACC720 -double-width).

## Insulating Strips for High Voltage Modules

The RX7i rack is shipped with an Insulator Kit that includes enough parts to update three Series 90-70 I/O modules.

An insulator strip is required on a high voltage module that is installed to the immediate right of a module with a metal faceplate. Insulating strips should be installed on the following modules that have versions earlier than:

IC697MDL240D  
IC697MDL241D  
IC697MDL250G  
IC697MDL251E  
IC697MDL640E  
IC697MDL340G  
IC697MDL341E  
IC697MDL350F  
IC697BEM731W  
IC697BEM713H

**Note:** Current versions of these modules are shipped with the insulators installed. The strip is visible on the back of the printed wiring assembly.

### To install the insulating strip:

The plastic insulating strip is installed on the back side of the printed wiring assembly, along the edge of the I/O connector to prevent the possibility of high voltage I/O cards short-circuiting to the metal faceplates of VME cards. (Follow the installation instructions included with the kit). Use part number 44A752213-G01 to order additional kits as necessary.

## Rack Fan Assembly

Rack Fan Assemblies are available in several versions for forced air cooling when heat build-up could be a problem.

**Note:** A Rack Fan is **required** if the IC698CPE020, IC698CRE020 or IC698PSA350 is installed in the rack.

Three rack fan assemblies are available:

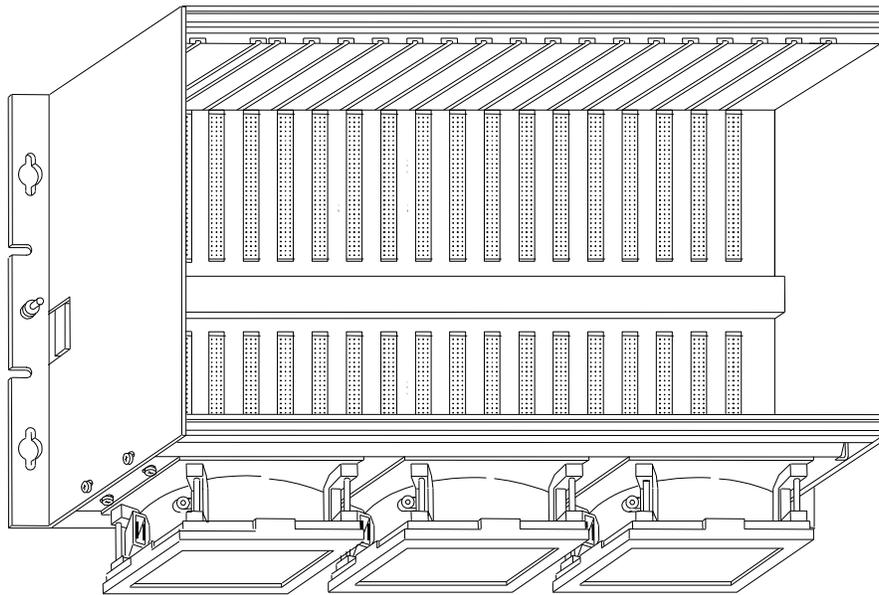
- IC697ACC721 for 120VAC power source
- IC697ACC724 for 240VAC power source
- IC697ACC744 for 24VDC power source

It is recommended that the fans be wired to the same source of power as the PLC to ensure that the fans are running when the PLC is active.

The following illustration shows the position of the fan assembly mounted on a rack. Note that it is mounted on the bottom of the rack with air flow from the bottom towards the top of the rack. When using the fan assembly, filler faceplates are required to block unused openings so that the normal bottom-to-top airflow is maintained.

For detailed specifications and installation instructions, refer to the documentation for the Rack Fan Assembly.

**Note:** A minimum of 23cm (9 inches) between RX7i racks is required to remove and replace an individual fan.



**Figure 5. Typical Fan Assembly Mounted on Rack (AC Type Fan Assembly Shown)**

**Rack Specifications\***

<b>Number of Slots:</b>	Slots 1 through 17 are 0.8" (20.3mm) wide. (The CPU is installed in slot 1.) Slot 0 (power supply slot) is 2.4" (61.0mm) wide.			
<b>Maximum Current (from RX7i power supplies)</b>	100 watt supply: +5V +12V -12V 350 watt supply: +5V +12V -12V			
	20 amps	Total output power –100W		
	2 amps			
	1 amps			
	60 amps	Total output power – 350W		
	12 amps			
	4 amps			
<b>I/O References</b>	User configurable with programming/configuration software			
<b>Dimensions without rear cover</b>	<u>Height</u> 11.15" mm)	<u>Width</u> 19.00" 483mm	<u>Depth</u> 8.875" 225mm	(Note that all Series 90-70 modules extend 1.7" (43 mm) beyond front of rack.)
<b>Dimensions with rear cover</b>	<u>Height</u> 11.15" 283mm	<u>Width</u> 19.00" 483mm	<u>Depth</u> 8.97" 228mm	(Note that all Series 90-70 modules extend 1.7" (43 mm) beyond front of rack.)
<b>VME</b>	System designed to support VME64			
* For environmental specifications and compliance to standards (for example, FCC or European Union Directives), refer to Appendix A of the <i>PACSystems RX7i Installation Manual</i> , GFK-2223.				

**Ordering Information**

<b>Description</b>	<b>Catalog Number</b>
Rack - 18 slots, rear mount with rear I/O access	IC698CHS217
Rack Fan Assembly (required for CPE020/CRE020, PSA350), 120 VAC	IC697ACC721
Rack Fan Assembly (required for CPE020/CRE020, PSA350), 240 VAC	IC697ACC724
Rack Fan Assembly (required for CPE020/CRE020, PSA350), 24 VDC	IC697ACC744
Gasketed filler faceplate, single-width	IC698ACC735
Gasketed filler faceplate, double-width	IC698ACC720
<b>Note:</b> For Conformal Coat option, or Low Temperature Testing option please consult the factory for price and availability.	

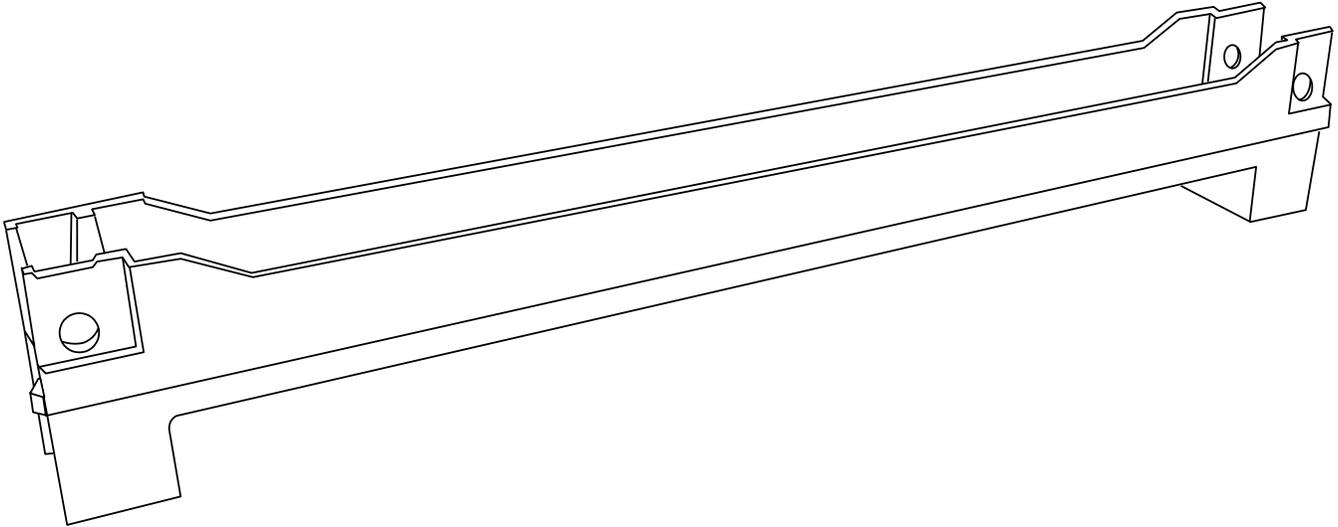
**Revision History**

<b>Part Number</b>	<b>Date</b>	<b>Description</b>
IC698CHS217-C	June 2011	Changed part for obsolete rear access connector. For details, see "Important Product Information for this Release" on page 8.
IC698CHS217-A	January 2005	Initial release.

## Important Product Information for this Release

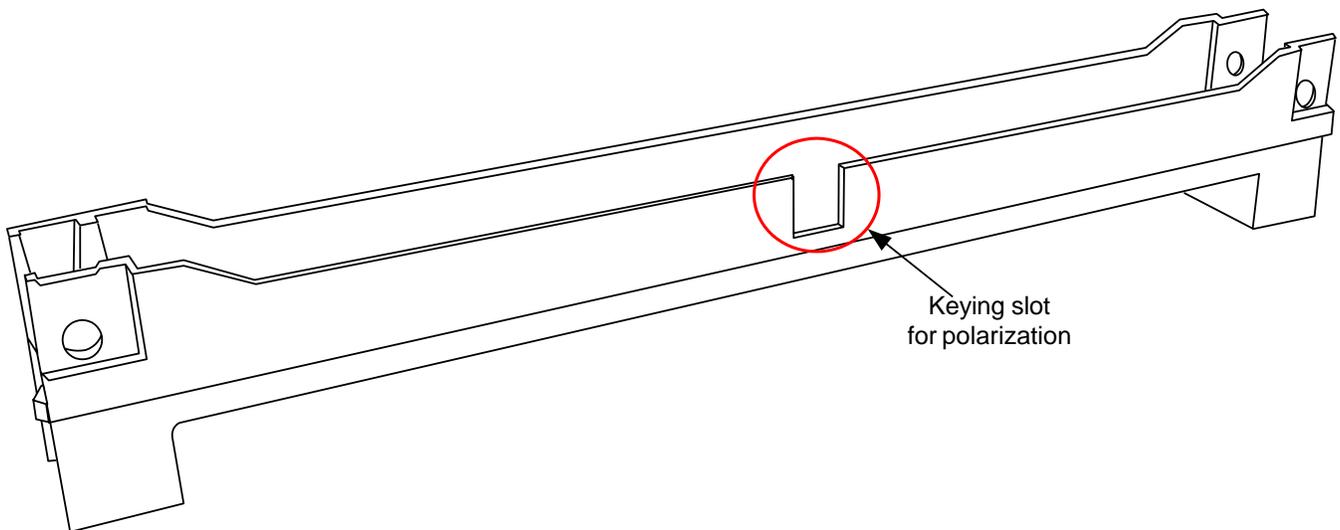
### Versions –C and Later (Current)

On versions –C and later of the CHS217 rack, the rear access connectors do not have a keying slot. Field side connectors that have a polarization notch cannot be used with this type of connector. If you are replacing an earlier version of the CHS217 rack with this version, you will also need to replace mating connectors that have a polarization notch with ones that do not.



### Versions –B and Earlier (Obsolete)

In versions –B and earlier of the CHS217 rack, the rear access connector has a keying slot to assure that a field side connector that has a matching notch is inserted with the correct polarization.



***Installation in Hazardous Locations***

The following statements are required to appear for Class I Div 2 Hazardous Locations.

1. EQUIPMENT LABELED WITH REFERENCE TO CLASS I, GROUPS A, B, C, and D, DIV. 2 HAZARDOUS LOCATIONS IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, D OR NON-HAZARDOUS LOCATIONS ONLY.
2. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
3. WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.