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Signal Words

As stated in ANSI Z535.4-2007, the signal word is a word that calls attention to the safety sign and designates a degree or level of hazard seriousness. The signal words for product safety signs are “Danger”, “Warning”, “Caution”, and “Notice”. These words are defined as:

**DANGER**

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING**

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION, used without the safety alert symbol, is used to address practices not related to personal injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

Qualified Person

For the purposes of this manual, a qualified person, as stated in NFPA 70E®, is one who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved. In addition to the above qualifications, one must also be:

1. trained and authorized to energize, de-energize, clear, ground, and tag circuits and equipment in accordance with established safety practices.
2. trained in the proper care and use of personal protective equipment (PPE) such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.
3. trained in rendering first aid if necessary.
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Ch 1 General Information

**WARNING**

The equipment described in this document may contain high voltages and currents which can cause death or serious injury.

The equipment is designed for use, installation, and maintenance by knowledgeable users of such equipment having experience and training in the field of high voltage electricity. This document and all other documentation shall be fully read, understood, and all warnings and cautions shall be abided by. If there are any discrepancies or questions, the user shall contact Powell immediately at 1.800.480.7273.

**WARNING**

Prior to adjustments, servicing, maintenance, or any act requiring the operator to make physical contact with the equipment, the power source must be disconnected and the equipment grounded. Failure to do so may result in death or serious injury.

**NOTICE**

The information in this instruction bulletin is not intended to explain all details or variations of the Powell equipment, nor to provide for every possible contingency or hazard to be met in connection with installation, testing, operation, and maintenance of the equipment. For additional information and instructions for particular problems, which are not presented sufficiently for the user’s purposes, contact Powell at 1.800.480.7273.

**NOTICE**

Powell reserves the right to discontinue and to change specifications at any time without incurring any obligation to incorporate new features in products previously sold.
A. **Scope**

The information in this instruction bulletin describes the basic lifting, installation, reassembly, maintenance, and inspection concepts for a Powell Power Control Room (PCR®).

B. **Purpose**

The information in this instruction bulletin is intended to provide information required to properly install, operate, and maintain the Power Control Room.

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions of the operation and maintenance of the Power Control Room.
3. Instructions for installation and placing the Power Control Room into service
4. Instructions for part replacement
5. Information for ordering renewal parts
6. Procedure for critical adjustments
7. Illustrations, photographs, and description of the Power Control Room

The illustrations contained in this document may not represent the exact construction details of each Power Control Room. The illustrations in this document are provided as general information to aid in showing component locations only. See the “As Built” drawings for specific construction details.

*All illustrations and photos are shown using deenergized equipment.*

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**WARNING**

Follow the appropriate safety precaution while handling any of the equipment. Failure to do so may result in serious injury or death.

To the extent required, the products described herein meet the applicable ANSI, IEEE, and NEMA Standards; however, no such assurance is given with respect to local codes and ordinances which may vary greatly.

C. **Instruction Bulletins Available Electronically**

For more information visit powellind.com.
To contact the Powell Service Division call 1.800.480.7273 or 713.944.6900, or email info@powellservice.com.

For specific questions or comments pertaining to this instruction bulletin, email documents@powellind.com with the IB number in the subject line.
Ch 2 Safety

A. Safe Work Condition

The information in Section A is quoted from NFPA 70E 2012 - Article 120, 120.1 Establishing an Electrically Safe Work Condition.

120.1 Process of Achieving an Electrically Safe Work Condition

1. Determine all possible sources of electrical supply to the specific equipment. Check applicable up-to-date drawings, diagrams, and identification tags.

2. After properly interrupting the load current, OPEN the disconnecting device(s) for each source.

3. Wherever possible, visually verify that all blades of the disconnecting devices are fully OPEN or that drawout type circuit breakers are withdrawn to the fully disconnected position.

4. Apply lockout/tagout devices in accordance with a documented and established policy.

5. Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are deenergized. Test each phase conductor or circuit part both phase-to-phase, and phase-to-ground. Before and after each test, determine that the voltage detector is operating satisfactorily.

Informational Note: See ANSI/ISA-61010-1 (82.02.01)/UL 61010-1, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 V and below.

6. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being deenergized could contact other exposed energized conductors or circuit parts, apply ground connecting devices rated for the available fault duty.

B. Safety Guidelines

Study this instruction bulletin and all other associated documentation before installing the PCR®.

Each user has the responsibility to instruct and supervise all personnel associated with usage, installation, operation, and maintenance of this equipment on all safety procedures. Furthermore, each user has the responsibility of establishing a safety program for each type of equipment encountered.

The safety rules in this instruction bulletin are not intended to be a complete safety program. The rules are intended to cover only some of the important aspects of personnel safety related to Power Control Rooms.
C. **General**

1. Only supervised and qualified personnel trained in the usage, installation, operation, and maintenance of the PCR® shall be allowed to work on this equipment. It is mandatory that this instruction bulletin, any supplements, and service advisories be studied, understood, and followed.

2. Maintenance programs must be consistent with both customer experience and manufacturer's recommendations, including service advisories and instruction bulletin(s). A well planned and executed routine maintenance program is essential for Power Control Room's reliability and safety.

D. **Specific**

1. **DO NOT WORK ON AN ENERGIZED EQUIPMENT in or on the PCR.** If work must be performed, remove the equipment from service prior to maintenance or repair.

2. **EXTREME CARE MUST BE EXERCISED TO KEEP ALL PERSONNEL, TOOLS, AND OTHER OBJECTS CLEAR OF MECHANISMS WHICH ARE TO BE OPERATED, DISCHARGED, OR RELEASED.** Many types of equipment found inside the PCR may utilize stored energy mechanisms. These mechanisms must be serviced only by skilled and knowledgeable personnel capable of releasing each spring load in a controlled manner. Detailed information regarding these mechanisms is found in the appropriate equipment instruction bulletin.

3. **ALL COMPONENTS SHALL BE DISCONNECTED BY MEANS OF A VISIBLE BREAK AND SECURELY GROUNDED FOR SAFETY OF PERSONNEL PERFORMING MAINTENANCE OPERATIONS ON THE EQUIPMENT.**

E. **Safety Labels**

The equipment described in this document has **DANGER, WARNING, CAUTION**, and instruction labels attached to various locations. All equipment **DANGER, WARNING, CAUTION**, and instruction labels shall be observed.

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**NOTICE**

Warning and Caution labels are located in various places in and around the equipment. Always observe these warnings and caution labels. Do NOT remove or deface any of these warning/caution labels.
Ch 3 Equipment Description

A. General

**NOTICE**

Powell is committed to continuous product improvement.

*It is possible that improvements occurred between revisions to this document and therefore, may not be described in these instructions. If the equipment does not resemble the photographs and descriptions contained herein, contact Powell before attempting to perform any actions.*

A Power control Room (PCR®) is designed as a complete solution that is custom engineered to order to facilitate the exact needs of each customer.

B. Design Concept

Each PCR is custom engineered based on project specific equipment arrangement, transportation, lifting, and environmental criteria. The PCR is built with interlocking wall, roof, and ceiling panels to maximize structural strength and minimize weight. Exterior panels are constructed of galvanized steel and finished with a powdercoat finish. See Figure 1 for a typical assembly configuration.

1) Dimensions

The exterior dimensions of a PCR are determined by a combination of customer needs and shipping considerations. The minimum length and width is six feet. All dimensions are affected by the equipment installed within the enclosure and the mandated code clearances that are required. Interior height is typically between 10 feet and 14 feet. PCR enclosures too large to ship as one piece may be designed to split for shipment and reassembly at the jobsite. See Ch 4 Installation, G. Field Assembly Instructions for details on PCR splits.

2) Normal Service Conditions

Normal service temperature falls between -30°C (-22°F) and +40°C (104°F). Normal environmental conditions are free from highly corrosive elements or explosive gas and dust. Special design considerations can be implemented if any of these conditions will be present. See the appropriate instruction bulletins for the equipment inside the PCR for their normal service conditions.
3) **Base and Floor Standard Construction**

Powell uses a base design with structural steel channels which allows either permanent or portable installations. All structural members are sized by design structural calculations and reinforced to meet or exceed specified static and dynamic loads. Structural members are located to coordinate with the enclosed equipment to allow both proper support and maximum access for cable penetrations from below. Each base has a minimum of 4 lifting lugs. A ¼ inch steel plate floor is stitch welded to the structural base assembly. Cutouts with surface-mounted aluminum covers for bottom access can be provided. Maximum allowed designed deflection under lift will not exceed L/240 (length in inches between supports divided by 240). The floor is finished with a non-skid enamel.

4) **Roof and Ceiling Standard Construction**

The roof and ceiling system consist of separate interlocking panels that run across the width of the PCR®. The interlocking flanges of the roof system prevent collection of water and aid in runoff. A trim assembly is installed along the entire perimeter. Roof panels are a maximum of 16 inches wide and constructed using 18 gauge galvanized steel at a minimum. Material gauge and panel depth may increase with an increased width PCR and/or roof live load design requirements. The roof is sloped 3 inches across the width. The standard ceiling load is 2 psf which is adequate to support conduit, wireway, and interior lighting.

**Figure 1   PCR® Exploded View**
5) **Wall Standard Construction**

The wall system consists of an interlocking exterior wall panel and interior wall liner. The exterior walls are generally 16 inches wide and attached to one another by the interlocking construction and #14 TEK® screws. The wall assembly is 3” thick with an interior space for insulation. Cutouts in the wall system are made to facilitate entry of cable, bus duct, bulkhead fittings, or HVAC systems as required. Additional interior support may be added to specific wall sections to assure the integrity of heavy interior wall mounted equipment. The wall material is at a minimum 18 gauge galvanized steel for the exterior panels and 16 gauge galvanized steel for the interior liners.

6) **Personnel and Equipment Door Standards**

- Hollow core construction
- Insulation rating of R11
- Exterior stainless steel thumb-actuated entry handle
- Rim cylinder lock
- Aluminum interior panic exit device
- Stainless steel 4 inch ball bearing hinges
- Magnetic gasketed assembly for weather resistance and A/C
- Door sweep and threshold
- Typical Dimensions:
  - (1) Personnel Door 3’ x 7’
  - (1) Equipment Door 4’ x 8’
  - (1) Double Equipment Door 6’ x 8’
- Double pane laminated safety glass window (12” x 12” x ¼”)
- Door closers with stop

7) **Equipment Rear Access Doors Standards**

- Equipment rear access doors may be provided when a piece of equipment is mounted flush against a PCR wall and there is a need for rear access. Rear access may be required for installation or maintenance.

8) **Grounding System**

Every light panel, HVAC unit, panelboard, switchgear and motor control center and their associated loads will be supplied with an equipment grounding conductor. The conductor is sized by the allowable current carrying capability by a series of rules in the NEC.

The most common equipment grounding conductors are:

- Copper conductors (see NEC Table 250.122 for ampacity)
- Cable Tray (if listed for grounding) (see NEC Table 392.7 (B) for ampacity)
- Rigid galvanized steel conduit
- Electrical metallic tubing
- Liquid tight flex
- Greenfield flex under certain conditions
- Cable armor of armor clad and metal-clad cables
- Metallic sheaths of shielded cables

In accordance with NEC Section 250.68(B), the metal frame of the PCR® can serve as an equal potential plane, and thus a part of the grounding electrode system. Powell supplies a minimum of two ground pads bolted to the steel base for connection to the customer’s ground grid to ensure that the PCR is effectively grounded. See the “As Built” drawings for specific location of the grounding pads.
Figure 2    Exterior Ground Pad

The ground bus of all the equipment in the PCR will be bonded to the enclosure steel by an equipment grounding conductor. This is accomplished through a ¼” x 2” copper bus for switchgear and motor control centers.

Figure 3    Equipment Grounding Through Bus

The ground bus for all other equipment installed in the PCR is grounded with an equipment grounding conductor sized per NEC Table 240.122.
Figure 4  Equipment Grounding Through Cable and Neutrals

The neutrals of any separately derived systems such as 480-208/120V or 480-120/240V transformer secondaries will be grounded to the PCR steel as near as possible to its transformer.
Ch 4 Installation

A. Foundation

The foundation and under base cable trays should be completed and verified level before the arrival of the PCR® to the jobsite to minimize any excessive handling or crane use during the installation.

Typically the foundations are constructed of concrete piers or concrete slabs. Check the PCR floor plate and base drawings for support locations.

B. Shipping Procedures

Prior to shipment some external items along the long walls are removed from the PCR including: HVAC, door canopies, lights, stairs, walkways, and landings. Switchgear may be shipped with the circuit breakers installed and blocked to prevent movement and damage during transport. Ship loose items may be shipped inside the PCR and are blocked or tied to prevent shipping damage. Doors are shut, locked, and secured with nylon wire ties and may be anchored for shipment. Lift lugs may be removed for shipment depending on the width of the PCR. Openings in the PCR wall, floor, or roof are temporarily sealed to prevent water and/or dust from entering during transit. In the case of shipping splits, temporary supports are installed and wall openings are crated with plywood and sealed for weather resistance.

C. Receiving

When the PCR is received, check for signs of damage. If damage is found or suspected, file claims as soon as possible with the transportation company and notify the nearest Powell representative.

D. Storage Procedures

Storage of all electrical distribution equipment requires special handling and storage measures to prevent deterioration.

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**CAUTION**

The mechanical and dielectric integrity must be protected during the storage period. **Ensure that the equipment is not subjected to environments for which it is not designed. Check the applicable Instruction Bulletin for the equipment storage requirements.**

1. Equipment designed for indoor installation must be stored indoors in a climate controlled environment to prevent condensation of moisture. Exposure to rain and the elements, even for a short period, can permanently damage the equipment. Space heaters within the equipment should be energized. Humidity controlling desiccant materials should be utilized when space heaters are not provided or cannot be energized. The temperature should be kept above (>33°F/1°C) and below (<140°F/60°C). The relative humidity should be kept below 60% or a dew point of (59°F/15°C). The equipment should be stored in such a manner as to leave all doors and panels accessible for inspection. The equipment must be inspected on a routine basis to assure operational integrity.

2. Equipment designed for outdoor exposure may be stored either in indoor or outdoor storage locations. This also applies to equipment contained within a Power Control Room (PCR). The equipment must be protected from airborne external contaminates if stored outdoors. Outdoor storage will also require additional care to maintain temporary covers over the openings and shipping splits. The equipment must be provided with control...
power to facilitate the energization of space heaters, as well as other temperature and humidity controlling equipment. The temperature should be kept above freezing (>33°F/1°C) and below (<140°F/60°C). The relative humidity should be kept below 60% or a dew point of (59°F/15°C). The equipment should be stored in such a manner as to leave all doors and panels accessible for inspection. The equipment must be inspected on a routine basis to assure its integrity.

3. The auxiliary control devices, ship loose material and protective relays must also be protected. This includes items such as battery chargers, UPS systems, lighting, installation hardware and air conditioning. If prolonged storage is anticipated, humidity controlling desiccant material should be utilized. Desiccant packets should be installed in all compartment and packing containers.

Contact the Powell Service Division for site specific needs with regard to short or long term storage of the PCR® and associated equipment.

E. LIFTING RECOMMENDATIONS

1) Single Point - 4 Point Lift

The following are notes for lifting a single point - 4 point PCR® (Figure 5):

a. Attach the cables to all lifting points. The cables at each lift point need to be sized for the load on that specific lift lug.

![CAUTION]

**A factor of safety of 4 times is recommended.**

b. The spreader bar lift points need to be two (2) feet wider than the PCR.

![CAUTION]

**A factor of safety of 4 times is recommended for spreader bar lifting.**

c. The shackles at each lifting point should be sized for that lift point.

![CAUTION]

**A factor of safety of 4 times is recommended with a 1½” pin.**

![CAUTION]

**Do not lay the spreader bar on the roof.**

d. A lift plan should be devised to determine the size of the lift cables.

e. Lifting lug holes are 2” diameter and extend approximately 6” to 9” past the PCR wall, depending on the base configuration.
Figure 5  Single Point - 4 Point Lift

- Lift Point
- XX Ton Shackles
- XX Long Sling
- XX Long Sling
- XX Ton Shackles

65° or Greater

1° to 4°
2) **Single Point - 6 Point Lift**

The following are notes for lifting a single point - 6 point PCR® *(Figure 6)*:

- a. Attach cables to all lifting points. Cables at each lift point need to be sized for the load at each specific lug.

  ![CAUTION]

  A factor of safety of 4 times is recommended.

- b. The spreader bar lift points need to be two (2) feet wider than the PCR.

  ![CAUTION]

  A factor of safety of 4 times is recommended for spreader bar lifting.

- c. The shackles at each lifting point should be sized for the load at each specific lug.

  ![CAUTION]

  A factor of safety of 4 times is recommended with a 1 5/8” pin.

  ![CAUTION]

  Do not lay the spreader bar on the roof.

- d. A lift plan should be devised to determine the size of the lift cables.
- e. Lifting lug holes are 2” diameter and extends approximately 6” to 9” past the PCR wall, depending on the base configuration.

3) **Double Point - 8 Point Lift**

The following are notes for lifting a double point - 8 point PCR® *(Figure 7)*:

- a. Attach cables to all lifting points. Cables at each lift point need to be sized for the load at each specific lug.

  ![CAUTION]

  A factor of safety of 4 times is recommended.

- b. The spreader bar lift points need to be two (2) feet wider than the PCR.

  ![CAUTION]

  A factor of safety of 4 times is recommended for spreader bar lifting.

- c. The shackles at each lifting point should be sized for that lift point.

  ![CAUTION]

  A factor of safety of 4 times is recommended with a 1 5/8” pin.

  ![CAUTION]

  Do not lay the spreader bar on the roof.

- d. A lift plan should be devised to determine the size of the lift cables.
- e. Lifting lug holes are 2” diameter and extends approximately 6” to 9” past the PCR wall, depending on the base configuration.
Figure 6  Single Point - 6 Point Lift
Figure 7  Double Point - 8 Point Lift

Lift Point

XX Ton Shackles

65° or Greater

XX' Long Sling

XX' Long Sling

XX' Long Sling

1° to 4°
F. **RECOMMENDED ANCHORING**

**NOTICE**

The method of anchoring as well as the design and construction of the piers or slab are the customer’s responsibility.

The following are recommendations of anchoring the PCR®:

1. A steel plate should be embedded in the concrete pier or slab to provide an anchor location for the PCR perimeter base.
2. After installation, it is critical that the PCR be level. If necessary, shim the base of the PCR on the foundation to level. Use ¼” x 2” flat bar of appropriate size depending on the size of the gap between the foundation and the PCR base.

**CAUTION**

Improper leveling will result in personnel door, equipment door, and rear access door closure problems. Doors that close improperly will not seal and may leak.

3. PCR perimeter base should be welded to the embedded steel plate. Attach the site provided earth ground to the PCR at the provided ground pads. Once properly grounded, anchor the base to the foundation at the designated support locations. See *Figures 8 through 11* for additional details.

4. When pier mounting a PCR that was split for shipment, care must be taken on the piers located at the shipping split. A minimum of 13” must be allowed between perimeter beams of the PCR to allow for the removal of the PCR lifting lugs prior to the split sections being joined.
Figure 8  Recommended Anchoring Single Section PCR®

Interior Supports
- Base girder
- Leveling / anchor plate
- Grout after leveling
- Anchor bolts
- Foundation

Corner Supports
- C.L.
- Make sure full depth floor beams do not interfere with anchor bolts

Suggested Anchoring
- Welding
- Strap Clamps
- Suggested Anchoring
  - Typ if both sides are accessible
  - Weld from one side only if not
  - Client is responsible for weld sizing

Figure 9  Recommended Anchoring Single Section PCR® - I Beam Girders

Interior Supports
- Base girder
- Leveling / anchor plate
- Grout after leveling
- Anchor bolts
- Foundation

Corner Supports
- C.L.

Suggested Anchoring
- Welding
- Strap Clamps
- Suggested Anchoring
  - Typ if both sides are accessible
  - Weld from one side only if not
  - Client is responsible for weld sizing
**Figure 10**  Recommended Anchoring Split PCR®

### Split Floor Beam
- Design anchorage for sufficient space to allow for the next section to be placed near its final position by the crane.
- Last section placed.
- Design anchorage to allow for sufficient space to remove the lifting lugs before final assembly.
- Centering designed for temporary support during assembly.

### Split Girder
- Design anchorage for sufficient space to allow for the next section to be placed near its final position by the crane.
- Centering designed for temporary support during assembly.

### 4 Way Split Center
- Centering designed for temporary support during assembly.

### 4 Way Split Corner
Figure 11  Recommended Anchoring Split PCR® - I Beam Girders

Split Floor Beam

Design anchorage to allow for sufficient space to remove the lifting lug before final assembly.

End floor beam of section being set and slid into position.

End floor beam of previously set and anchored section.

Design anchorage for sufficient space to allow for the next section to be placed near its final position by the crane.

Base girder of section being set and slid into position.

Leveling / Assembly Beam

4 Way Split Center

2nd section placed

Last section placed

2nd or 3rd section placed

First section placed

4 Way Split Corner

2nd or 3rd section placed

First section placed
G. Field Assembly Instructions

1) Reassembly of Single Widthwise Split

**CAUTION**

Follow the appropriate lifting instructions as stated in Ch 4 Installation, E. Lifting Recommendations prior to the Field Assembly Instructions.

Perform the following to assemble a single widthwise split Power Control Room at the jobsite (Figure 12):

a. Connect lifting lugs, shackles, and lifting cables to the first section of the PCR® so that the PCR will be as level as possible. Set the PCR on the foundation.
b. Square the PCR on the foundation.
c. Shim the base of the PCR on the foundation to level.
d. Anchor the base to the foundation at several locations so the first section of the PCR will not move when attaching the next section. See Ch 4 Installation, F. Recommended Anchoring for proper anchoring techniques.
e. Remove the lifting lugs.
f. Connect shackles and lifting cables to the next section of the PCR so that the PCR will be as level as possible.
g. Place non-flammable lubricant or pulling soap on the bottom of the base.
h. Lubricate the foundation where the base will come in contact with the foundation.
i. Set the next section of the PCR on the foundation as close as possible to the previously placed section.
j. Remove the lifting lugs.
k. Remove all crating materials from the ends of the shipping sections.
l. Make sure that the bolt hole locations are lubricated.
m. Install a continuous strip of Mobilseal (Powell #S1001) in Section A-A & B-B.
n. Reinstall the bolts from the lifting lugs in the holes in the base.
o. Attach two industrial type lever chain pullers to each side of the two sections and pull the bases together.
p. Shim PCR as required.
q. Remove shipping split support tubes.
r. Install bolts in the holes at the shipping split and tighten.
s. Apply sealant (Powell #3M730) at any external cracks and internal beams at shipping splits, including inside shipping split junction boxes.
t. Go inside the PCR with no lights on and check for any light coming into the building through cracks or holes.
u. Install shipping split channel and splice plates at facia trim.
v. See Ch 4 Installation, G. Field Assembly Instructions, 5) Termination and Control Box Reassembly for connection detail.
Figure 12  Reassembly of Single Widthwise Split
2) **Reassembly of Single Lengthwise Split**

**CAUTION**

*Follow the appropriate lifting instructions as stated in Ch 4 Installation, E. Lifting Recommendations prior to the Field Assembly Instructions.*

Perform the following to assemble a single lengthwise split Power Control Room at the jobsite *(Figure 13)*:

- **a.** Connect lifting lugs, shackles, and lifting cables to the first section of the PCR® so that the PCR will be as level as possible. Set the PCR on the foundation.
- **b.** Square the PCR on the foundation.
- **c.** Shim the base of the PCR on the foundation to level.
- **d.** Anchor the base to the foundation at several locations so the first section of the PCR will not move when attaching the next section. See *Ch 4 Installation, F. Recommended Anchoring* for proper anchoring techniques.
- **e.** Remove the lifting lugs.
- **f.** Connect shackles and lifting cables to the next section of the PCR so that the PCR will be as level as possible.
- **g.** Place grease or pulling soap on the bottom of the base.
- **h.** Grease the foundation where the base will come in contact with the foundation.
- **i.** Set the next section of the PCR on the foundation as close as possible to the previously placed section.
- **j.** Remove the lifting lugs.
- **k.** Remove all crating materials from the ends of the shipping sections.
- **l.** Make sure that the bolt hole locations are greased.
- **m.** Install a continuous strip of Mobilseal (Powell #S1001) in Section A-A & B-B.
- **n.** Apply sealant (Powell #S123) on the face of one shipping section as in View A-A.
- **o.** Reinstall the bolts from the lifting lugs in the holes in base.
- **p.** Attach two industrial type lever chain pullers to each side of the two sections and pull the bases together.
- **q.** Shim PCR as required.
- **r.** Install bolts in the holes at the shipping split and tighten. Remove the shipping split support tubes.
- **s.** Apply sealant (Powell #3M730) at any external cracks.
- **t.** Go inside the PCR with no lights on and check for any light coming into the building through cracks or holes.
- **u.** Install ridge caps and ridge cap splice plates (match up tag numbers). Caulk the self tapping hardware where the ridge cap meets the roof.
- **v.** Install end cap splice plates.
- **w.** See *Ch 4 Installation, G. Field Assembly Instructions, 5) Termination and Control Box Reassembly* for connection detail.
Figure 13  Reassembly of Single Lengthwise Split

- See Step r
- Rooftop Flashing
- Screw into Panel Rib

- See Step n
- Roof Panel at Split

- See Step s
- View A-A

- Pier Spacing
  - Determined by Size of PCR

- See Step m
- Wall Panel @ Split

- Pier Size
  - Determined by Customer

- Minimum Distance Between Sections to Remove Lifting Lugs with Crating Removed

- Pier Size
  - Minimum Surface Area to Re-Assembly PCR
3) Reassembly of 3-Way Split

**CAUTION**

*Follow the appropriate lifting instructions as stated in Ch 4 Installation, E. Lifting Recommendations prior to the Field Assembly Instructions.*

Perform the following to assemble a 3-way split Power Control Room at the jobsite *(Figure 14)*:

a. Connect lifting lugs, shackles, and lifting cables to the first section of the PCR® so that the PCR will be as level as possible. Set the PCR on the foundation.

b. Square the PCR on the foundation.

c. Shim the base of the PCR on the foundation to level.

d. Anchor the base to the foundation at several locations so the first section of the PCR will not move when attaching the next section. See *Ch 4 Installation, F. Recommended Anchoring* for proper anchoring techniques.

e. Remove the lifting lugs.

f. Connect lifting lugs, shackles, and lifting cables to the next section of the PCR so that the PCR will be as level as possible.

g. Place grease or pulling soap on the bottom of the base.

h. Grease the foundation where the base will come in contact with the foundation.

i. Set the next section of the PCR on the foundation as close as possible to the previously placed section.

j. Remove the lifting lugs.

k. Remove all crating materials from the ends of the shipping sections.

l. Make sure that the bolt hole locations are greased.

m. Install a continuous strip of Mobilseal (Powell #S1001) at the shipping split above the bolt holes.

n. Apply sealant (Powell #3M730) on the face of one shipping section as in Section A-A.

o. Reinstall the bolts from the lifting lugs in the holes in the base.

p. Attach two industrial type lever chain pullers to each side of the two sections and pull the bases together.

q. Shim PCR as needed.

r. Install bolts in the holes at the shipping split and tighten. Remove the shipping split support tubes.

s. Apply sealant (Powell #3M730) at any external cracks.

t. Go inside the PCR with no lights on and check for any light coming into the building through cracks or holes.

u. Install any roof and fascia trim and splice plates. Caulk the self tapping hardware where the ridge cap meets the roof.

v. See *Ch 4 Installation, G. Field Assembly Instructions, 5) Termination and Control Box Reassembly* for connection detail.
Figure 14  Reassembly of 3-Way Split
4) **Reassembly of 4-Way Split**

**CAUTION**

*Follow the appropriate lifting instructions as stated in Ch 4 Installation, E. Lifting Recommendations prior to the Field Assembly Instructions.*

Perform the following to assemble a 4-way split Power Control Room at the jobsite (*Figure 15)*:

- **a.** Connect lifting lugs, shackles, and lifting cables to the first section of the PCR® so that the PCR will be as level as possible. Set the PCR on the foundation.
- **b.** Square the PCR on the foundation.
- **c.** Shim the base of the PCR on the foundation to level.
- **d.** Anchor the base to the foundation at several locations so the first section of the PCR will not move when attaching the next section. See *Ch 4 Installation, F. Recommended Anchoring* for proper anchoring techniques.
- **e.** Remove the lifting lugs and reinstall bolts on the outer perimeter of the base.
- **f.** Connect shackles and lifting cables to the next section of the PCR so that the PCR will be level as possible.
- **g.** Place grease or pulling soap on the bottom of the base.
- **h.** Grease the foundation where the base will come in contact with the foundation.
- **i.** Set the next section of the PCR on the foundation as close as possible to the previously placed section.
- **j.** Remove the lifting lugs.
- **k.** Remove all crating materials from the ends of the shipping sections.
- **l.** Make sure that the bolt hole locations are greased.
- **m.** Install a continuous strip of Mobilseal (Powell #S1001) at the Section B-B, C-C and View A-A.
- **n.** Apply sealant (Powell #3M730) on the face of one shipping section as in View A-A.
- **o.** Reinstall the bolts from the lifting lugs in the holes in the base.
- **p.** Attach two industrial type lever chain pullers to each side of the two sections and pull the bases together.
- **q.** Shim the PCR as required.
- **r.** Install bolts in the holes at the shipping split and tighten. Remove the shipping split support tubes.
- **s.** Apply sealant (Powell #3M730) at any external cracks.
- **t.** Go inside the PCR with no lights on and check for any light coming into the building through cracks or holes.
- **u.** Install ridge caps and ridge cap splice plates. Caulk the self tapping hardware where the ridge cap meets the roof.
- **v.** Install end cap splice plates and seal cracks.
- **w.** See *Ch 4 Installation, G. Field Assembly Instructions, 5) Termination and Control Box Reassembly* for connection detail.
**Figure 15  Reassembly of 4-Way Split**
5) **Termination and Control Box Reassembly**

When a PCR® has shipping splits, at least one shipping split terminal box will be required. The total number of terminal boxes depends on the number of voltages that are to be separated and the available space.

**NOTICE**

*No medium voltage cables shall terminate at the shipping split.*

Several types of circuits must be isolated in a separate terminal box. The circuits to be segregated include smoke detector, fire alarm, and any emergency shut down circuits. Reference *NEC Article 760* for the definition and installation of Fire Alarm Systems. If the PCR has any Optical Fiber Cable, reference *NEC Article 770* for the definition and proper installation of this type of cable.

a. **Standard Shipping Split (Length) Terminal Box**

As a standard, Powell fabricates its own shipping split terminal boxes. These boxes use a 7-point (30 amp) pull apart terminal block. The standard box can hold up to 7 of these blocks, giving a maximum of 49 points per box that can be terminated. *Figure 16* shows the standard terminal box.

*Figure 16   Standard Terminal Box*

The terminal box is made out of unpainted aluminum. It comes complete with the terminal box and four end plates. The “L” bracket and the 7-point pull apart terminal blocks are separate from the terminal box.
b. Standard Shipping Split (Width) Terminal Box

Unlike the standard lengthwise split terminal box, the shipping split width terminal box will change the height based on the shipping split width beam size. A C-15 shipping split beam will hang 12” below the ceiling. The terminal box is made out of unpainted aluminum. It comes complete with the terminal box and four end plates. The “L” bracket and the 7-point pull apart terminal blocks are separate from the terminal box.

6) Equipment Reassembly

Reference the appropriate equipment instruction bulletin for installation procedures.

7) HVAC Mounting

NOTICE
Read the reassembly instructions from the drawing packet attached to the PCR®.

Perform the following to mount the HVAC unit:

a. Remove packing from unit.
b. Clean all surfaces with a dry, clean cloth before installing Mobilseal.
c. Unroll the Mobilseal starting at the top corner, applying a small amount of pressure to hold the Mobilseal in place.
d. Cut the roll at opposite corner.
e. Unroll the Mobilseal down the side applying a small amount of pressure to hold the Mobilseal in place.
f. Remove the paper from the Mobilseal when ready to mount the HVAC unit.
g. Set the unit at the wall connection location.
h. Install ¼” x 20 hardware in flange of HVAC unit and flange attached to the PCR wall.
i. Slide 2” rain collar over flange of HVAC unit and flange attached to PCR wall, then install hardware.
j. Connect the electrical wiring to the control point of the air conditioning unit.
HVAC MOUNTING INSTRUCTIONS

After Applying MobilSeal to All HVAC Flanges:
1. Align mounting holes in HVAC mounting flange with holes in PCR wall
2. Replace #14 TEK screws
3. Seal crack where flange and PCR wall meet with extreme seal tape (Powell #3MXTAPE) at top and side of unit.

Figure 17  HVAC Mounting

If AC Supplied
With Removable Flanges
Seal With Sealant
(Powell #3M730)

SUPPLY AIR

HVAC UNIT

RETURN AIR

#14 TEK Screw
(Part #W2409)

Drip Shield
(Part #27122P04)

Sealed At PCR Wall
With Extreme Seal Tape
(Powell #3MXTAPE)

MOUNTING FLANG

Nameplate

Do Not Install A/C Unit Until Mounting Instructions Have Been Reviewed
(On Units Shipped Loose)
Part #D254
8) Door Canopy Mounting

NOTICE

Read the reassembly instructions from the drawing packet attached to the PCR®.

Perform the following to mount the door canopy:

a. Remove packing from unit.
b. Clean all surfaces with a dry, clean cloth before installing Mobilseal.
c. Unroll the Mobilseal starting in the corner, applying a small amount of pressure to hold the Mobilseal in place.
d. Cut the roll at opposite corner.
e. Remove the paper from the Mobilseal when ready to mount the canopy.
f. The canopies are marked for specific doors.
g. Reattach the canopy above the door with #14 TEK® screws.
9) **Rain Gutter Mounting**

a. Locate downspouts with the ship loose items.

b. Lineup downspouts with locations marked on the PCR®.

c. Attach top of downspouts to the rain gutter with one ¾” long #14 TEK® screw.

d. Locate tape on back side of the downspout.

e. Make sure that area on the PCR that the tape will contact is clean and dry. If necessary, wipe area with denatured alcohol.

f. Peel the clear cover on the tape off.

g. Lineup downspout vertically and press against the PCR. Apply pressure for about 15 seconds to insure a good seal between the tape and the PCR.
Ch 5  Operation

**NOTICE**

Refer to the appropriate equipment instruction bulletin for operating procedures.
Ch 6  Maintenance

**NOTICE**

*Refer to the appropriate equipment instruction bulletin for maintenance requirements.*

a. Regularly check external and internal caulk (minimum once per year) for shrinkage and cracks. Reapply caulk as necessary.

b. Regularly check door gaskets (minimum once per year) for damage. Replace as necessary.

c. Check the paint once a year. Reapply as necessary.
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Power Control Room (PCR®)

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