01.4IB.65210A Overhead Lifting Device

for use with Auxiliary Rollout in Standard 27kV-38kV Switchgear
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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**
  
  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, deenergize, 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 serious injury or death.

The equipment is designed for use, installation, and maintenance by qualified 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

Before any adjustment, servicing, part replacement, or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, the power supply must be disconnected. Failure to follow this warning may result in injury or death.

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 operation of the following overhead lifting device.

- 65494G02

The Overhead Lifting Device is an option on Standard 27kV and 38kV switchgear to place an Auxiliary device in an upper compartment.

B. **Purpose**

The information in this instruction bulletin is intended to provide information required to properly operate and maintain the overhead lifting device described in Ch 1 General Information, A. Scope.

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions of the operation for the overhead lifting device option
3. Instructions for installation and removal of the Auxiliary Rollout Device used in 27kV-38kV PowlVac Switchgear
4. Illustrations, photographs, and description of the overhead lifting device as used to install an Auxiliary Rollout Device

The illustrations contained in this document may not represent the exact construction details of each particular switchgear installation. The illustrations in this document are provided as general information to aid in showing component locations only.

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

C. **Instruction Bulletins Available Electronically**

- **WARNING**

  Be sure to 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.

D. **Associated Bulletins**

- 01.4IB.65000B PV System 38 Metal-Clad Switchgear
- 01.4IB.65080A PowlVac 38 CDR 3000A Vacuum Circuit Breaker
- 01.4IB.65110A PowlVac 38 CDS Vacuum Circuit Breaker

For more information visit www.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.

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 using the overhead lifting device.

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.

It is mandatory that the following rules be observed to ensure the safety of personnel associated with usage, installation, operation, of the overhead lifting device.

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 using the overhead lifting device.

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.
C. General

1. Only supervised and qualified personnel trained in the usage, installation, operation, and maintenance of the equipment 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 equipment reliability and safety.

3. Service conditions shall also be considered in the development of safety programs. Variables include ambient temperature; humidity; number of operations; and any adverse local conditions including excessive dust, ash, corrosive atmosphere, vermin and insect infestations.

D. Specific

1. **DO NOT WORK ON ENERGIZED EQUIPMENT.** If work must be performed, remove the equipment from service.

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.** These mechanisms must be serviced only by skilled and knowledgeable personnel capable of releasing each spring load in a controlled manner.

3. **DO NOT USE AN OPEN CIRCUIT BREAKER AS THE SOLE MEANS OF ISOLATING A HIGH VOLTAGE CIRCUIT.** For complete isolation, the equipment shall be in the disconnected position or shall be withdrawn completely.

4. **ALL COMPONENTS SHALL BE DISCONNECTED BY MEANS OF A VISIBLE BREAK AND SECURELY GROUNDED FOR SAFETY OF PERSONNEL PERFORMING OPERATIONS.**

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 when the circuit breaker is handled, operated, or maintained.

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**NOTICE**

Warning and Caution labels are located in various places in and on the switchgear and on the auxiliary device removable element. Always observe these warnings and caution labels. Do NOT remove or deface any of these warning/caution labels.

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**WARNING**

The overhead lifting device is designed to move the auxiliary rollout device to an upper compartment. It is not intended to be used for any other purpose. Using the overhead lifting device for any other purpose may result in equipment failure that could cause equipment damage or serious injury or death.
Ch 3 Operation

A. General

1. Open the upper compartment door in the vertical section the auxiliary device will be placed into.
2. Open the instrument compartment door directly beneath the auxiliary compartment to gain access to the mounting holes for the support rails. Note this may be the same door in some designs.

⚠️ WARNING

If the equipment is energized, opening the door will expose the operator to high voltage.

Figure 1  Auxiliary Device in Front of open Vertical Section

a. Overhead Lifting Device
b. Auxiliary Compartment
c. Support Rail Slots
d. Auxiliary Device
B. ATTACH THE LIFTING YOKE TO THE AUXILIARY DEVICE

1. Spread the arms of the lifting yoke and place it on the auxiliary device.

*Figure 2  Lifting Yoke Installation*

2. Align the holes in the lifting yoke arms closest to the vertical section of the yoke with the matching tapped holes in the bottom of the auxiliary device base pan.

*Note:* The larger holes in the lifting yoke are clearance for the hardware used by certain transformer configurations. The smaller set of holes is used to secure the lifting yoke to the base of the auxiliary device.
Figure 3  Lifting Yoke Installation Bottom View Showing Hardware

3. Use 3/8” Hex Head Bolts (3/4” minimum length, 1” maximum length - Grade 5) to secure the yoke. The hardware only needs to be finger tight.

Note:  For Auxiliary with three PT configurations: The PT base may not allow the lifting yoke hardware to fully penetrate the base pan. This is an acceptable condition. The head of the 3/8” bolt does not need to be tight against the lifting yoke to serve its function of securing the yoke to the base.
Figure 4  Lifting Yoke Installed on Hardware

Figure 5  Lifting Yoke Fully Assembled.
C. **LIFTING AND INSTALLING THE AUXILIARY DEVICE**

1. Insert operating handle into the universal joint connector
2. Rotate operating handle counter-clockwise to lower cable

*Figure 6  Lowering Overhead Lifting Device*

3. Attach cable to the lifting yoke on the auxiliary device at the top center hole using the clevis on the end of the cable and securing it with the retainer pin. Insert until the spring detent on the pin latches on the opposite side of the clevis.
**Figure 7** Attaching Overhead Lifting Device Operator

- a. Retainer Pin
- b. Clevis

**Figure 8** Overhead Lifting Device secured to Lifting Yoke
The auxiliary device may move depending on where it is located relative to the plumb line of the lifting device cable. Apply only enough tension to the cable to aid in locating the auxiliary device directly under the overhead lift. This will prevent excessive motion as the auxiliary device is lifted.

4. Rotate the operating handle clockwise to remove any slack in the lifting cable.
5. Move the auxiliary device as necessary to align it with the centerline of the vertical section and the plumb line of the lifting cable.

**Figure 9  Auxiliary Device aligned and ready for lift**

6. Raising the auxiliary device into position.
   a. Remove the anti-rollout safety stop from the auxiliary compartment
   b. Rotate the lifting handle clockwise to lift the auxiliary device. Stop when the wheels are approximately 6" above the bottom pan of the upper auxiliary compartment or the lifting device reaches its lifting limit; whichever occurs first.
Figure 10  Auxiliary Device in raised position for Rail Installation

7. Installing the Support Rails
   a. Place the support rails into the slots provided on the front of the switchgear, directly beneath the upper auxiliary compartment. Insert the rectangular end, with the wheel track facing up, until the wheel track bottoms out on the face of the switchgear.
Figure 11  Rail Insertion Detail

a. Rails
b. Rail Mounting Holes
Figure 12  Rail Insertion Detail Cont.

Note: Latch moves up as rail is inserted
b. There is a latch to the inside of the rail that will momentarily lift and reset during rail insertion to latch the rail in place. Verify the rail is latched by pulling on it. It must not pull out of the slot.

**Figure 13 Rail Latch Detail**

![Rail Latch Detail](image)

**Note:** Latch drops to the original down position when rail is fully inserted.

c. Repeat this process for the second rail.
d. Place the safety stop in the two holes provided at the end of the rails.

**WARNING**

Failure to install the anti-rollout safety stop at the end of the rails may result in the auxiliary device falling off the rails. Such an event will cause damage to the equipment and can cause serious injury to nearby personnel.

**Figure 14 Safety Stop Installation**

![Safety Stop Installation](image)

b. Align the wheels of the auxiliary device with the tracks on the top of the rails and continue to lower until the auxiliary device is completely supported by the rails.

**Figure 15 Detail of Auxiliary Device Wheel and Rail Alignment**

8. Lower the Auxiliary Device onto the rails
   a. Turn the lifting device operating handle counter-clockwise to lower the auxiliary device.

   **WARNING**

   The auxiliary device wheels must drop into the channels provided on the support rails or the unit could become unstable and fall.

9. Remove the Lifting Yoke from the Auxiliary Device.
   a. Remove the attaching hardware.
   b. Lower the lifting yoke a few more inches to clear the hardware extending below the auxiliary device base pan.
   c. Spread the lifting yoke arms so they clear the auxiliary device.
   d. Raise the lifting yoke several inches to prevent inadvertent movement of the arms that could cause them to reattach to the auxiliary device base pan.
DO NOT store the 3/8” hardware by placing the bolts back in the holes as they may cause interference with the secondary disconnecting device on the bottom left side.

Avoid pushing the auxiliary device during this process. The auxiliary device is free to move on the rails between the stops. Do not lean into or use the device itself to gain leverage during these actions as it may move unexpectedly.

e. Using a ladder to access the top of the auxiliary device, remove the lifting yoke.
f. Using the lifting device operator, elevate the lifting cable to its maximum position to allow clearance for the upper door to be closed.

10. Moving the Auxiliary Device into the Auxiliary Compartment
a. With all tools and the lifting yoke clear from the auxiliary device, slowly push the device into the upper auxiliary compartment until the anti-rollout latch on the front of the auxiliary device seats in its latch point inside the compartment.

b. Move the safety stop from the end of the rails to the holes provided in the front of the auxiliary compartment.

11. Removing the Support Rails
a. Lift the rail latch on the front of the vertical section and remove each support rail.

Figure 16  Detail on Latch Release to remove Rails

a. Latch (lift up and pull out rail)
Figure 17  *Front View of the Auxiliary Device in upper Compartment ready for use*

- Raise overhead lifting device to clear door closing.
- Move auxiliary device to desired position using the instructions in the switchgear instruction bulletin.
- Anti-Rollout Stop shown installed

b. Follow the procedure in the switchgear instruction bulletin to complete the installation of the auxiliary device and operate it as required.

c. Close the compartment door when complete.
D. REMOVAL OF AUXILIARY DEVICE

1. Move the auxiliary device into the disconnected position in accordance with the instructions found in the switchgear instruction bulletin.

2. Open the upper compartment door in the vertical section the auxiliary device will be removed from.

3. Insert the support rails as described in Ch 3 Operation, C. LIFTING AND INSTALLING THE AUXILIARY DEVICE, 7-11 of this Instruction Bulletin.

4. Remove the safety stop from the auxiliary compartment and place it at the end of the Support Rails.

5. Release the floor latch on the auxiliary device and roll it onto the support rails.

6. Attach the lifting yoke as described in Ch 3 Operation, B. ATTACHING THE LIFTING YOKE TO THE AUXILIARY DEVICE of this instruction bulletin.

7. Attach the overhead lifting device to the lifting yoke as described in Ch 3 Operation, C. LIFTING AND INSTALLING THE AUXILIARY DEVICE, 1-3 of this Instruction Bulletin.

8. Using the overhead lifting device operating handle, raise the auxiliary device off the support rails.

9. Remove the support rails as described in Ch 3 Operation, C. LIFTING AND INSTALLING THE AUXILIARY DEVICE, 11. REMOVING THE SUPPORT RAILS of this instruction bulletin.

10. Lower the auxiliary device to the floor.

11. Remove the lifting yoke from the auxiliary device
   a. Remove the attaching hardware
   b. Lower the overhead lifting device a few more inches to clear the hardware extending below the auxiliary device base pan.
   c. Spread the lifting yoke arms to they clear the auxiliary device.
   d. Roll the auxiliary device away from the lifting yoke and switchgear.
   e. Lower the lifting yoke to the floor and remove the clevis pin.
   f. Using the lifting device operator, elevate the lifting cable to its maximum position to allow clearance for the upper door to be closed.

12. Place the safety stop back in the auxiliary compartment and close the compartment door. Store the lifting yoke.
E. SPECIAL INSTRUCTIONS

Because the overhead lifting feature is an optional feature, the modification necessary to secure the lifting yoke is not typically made. Field modification for the hardware is a simple process.

To perform modification the modification, first remove the glass polyester side sheets from the auxiliary device.

Locate the holes shown in Figure 18. If these are already tapped, the unit is ready. If they are not tapped, use a 3/8” – 16 NC tap to create the threads. Repeat the process for the opposite side and replace the side sheets. Be sure to remove any shavings from the tapping process.

Figure 18 Hole Locations

a. Hardware locations for Lifting Yoke attachment
01.4IB.65210A
Overhead Lifting Device

for use of Auxiliary Rollout in Standard 27kV-38kV Switchgear

April 2014