Instruction Bulletin - 01.4IB.49001
PowlVac® Series 4 Test Cabinet
Contact Information

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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 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 following test cabinets:

- 0237C4219G501 - Single Shunt Trip
- 0237C4219G502 - Dual Shunt Trip
- 0237C4219G503 - Single Shunt Trip with UV Device
- 0237C4219G504 - Dual Shunt Trip with Separate Control Voltages

B. **Purpose**

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

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions of the operation and maintenance of the test cabinets
3. Instructions for installation and placing the test cabinet into service
4. Instructions for part replacement
5. Information for ordering renewal parts
6. Illustrations, photographs, and description of the test cabinet

The illustrations contained in this document may not represent the exact construction details of each particular type of test cabinet. 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.*

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**WARNING**

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

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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**

Changes to the instruction bulletin may be implemented at any time and without notice. Go to powellind.com to ensure use of the current instruction bulletin for Powell equipment.

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.

D. **Associated Instruction Bulletins**

- 01.4IB.60305 PowlVac® CDR & GCB Series 4 Vacuum Circuit Breakers
- 01.4IB.60306 PowlVac® ARG & ARM Series 4 Vacuum Circuit Breakers
- 01.4IB.77020 PowlVac-NDA™ Series 4 Automatic Racking Vacuum Circuit Breaker
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 operating the test cabinet.

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 test cabinets.

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 circuit breaker 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 test cabinet reliability and safety.

3. Service conditions shall also be considered in the development of safety programs. Variables include ambient temperature; humidity; actual continuous current; thermal cycling; number of operations; interrupting duty; 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. **ALL CONDUCTORS MUST BE ASSUMED TO BE ENERGIZED UNLESS THEIR POTENTIAL HAS BEEN MEASURED AS GROUND AND SUITABLE GROUNDING CONDUCTORS HAVE BEEN APPLIED TO PREVENT ENERGIZING.** Many accidents have been caused by back feeds from a wide variety of sources.

3. **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.

**NOTICE**

*Warning and Caution labels are located in various places. Do not remove or deface any of these warning/caution labels.*
Ch 3  Equipment Description

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. General

The test cabinet (Figure 1) is designed to operate PowlVac® Series 4 circuit breakers that have been removed from the metal-clad switchgear. It provides a safe means for operating the electrical “CLOSE” and “TRIP” circuits of the circuit breaker during maintenance and inspection.

B. Single Shunt Trip

The single shunt trip test cabinet is designed to be wall or cabinet mounted. Each test cabinet comes equipped with an 8’ (2.4 meter) cable (Figure 1, d), a storage bracket, control power selector switch (Figure 3, c), UV Trip push button (Figure 3, a), close push button (Figure 3, d) for closing the circuit breaker, and an open push button (Figure 3, b) for opening the circuit breaker.

C. Single Shunt Trip with UV Device

The single shunt trip with UV device is designed to be wall or cabinet mounted. Each test cabinet comes equipped with an 8’ (2.4 meter) cable (Figure 1, d), a storage bracket, control power selector switch (Figure 3, c), UV Trip push button (Figure 3, a), close push button (Figure 3, d) for closing the circuit breaker, and an open push button (Figure 3, b) for opening the circuit breaker.

D. Dual Shunt Trip

The dual shunt trip test cabinet is designed to be wall or cabinet mounted. Each test cabinet comes equipped with an 8’ (2.4 meter) cable (Figure 1, d), a storage bracket, control power selector switch (Figure 4, c), close push button (Figure 4, d) for closing the circuit breaker, and dual open push buttons (Figure 4, a & b) for opening the circuit breaker.

E. Dual Shunt Trip with Separate Control Voltages

The dual shunt trip with separate control voltages test cabinet is designed to be wall or cabinet mounted. Each test cabinet comes equipped with an 8’ (2.4 meter) cable (Figure 1, d), a storage bracket, control power selector switch (Figure 5, c), close push button (Figure 5, d) for closing the circuit breaker, and dual open push buttons (Figure 5, a & b) for opening the circuit breaker.
Figure 1  Typical PowIVac® Series 4 Test Cabinet

a. Nameplate  
b. Control Circuit Power Indicator Light  
c. Close Push Button  
d. 8 Foot Cable  
e. Test Cabinet Control Power Selector Switch  
f. Open Push Button  
g. Secondary Disconnect Plug
Ch 4 Installation

A. Receiving

When the test cabinet 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.

B. Storage

Shipping and storage of electrical equipment requires measures to prevent the deterioration of the apparatus over a long unused period. The mechanical and dielectric integrity must be protected. Electrical equipment is designed for use in a variety of environments. When the equipment is in transit and storage, these design considerations are not fully functional. In general, the following measures must be considered.

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, if so equipped. 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 15°C/59°F. 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. 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 15°C/59°F. 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 materials should be utilized. Desiccant packets should be installed in all compartments and packing containers.

C. Installing Test Cabinet

The test cabinet must be installed so that the secondary disconnect cannot reach a circuit breaker in the connected position. If more assistance is needed, contact Powell Service at info@powellservice.com or call 1.800.480.7273.
A. General

Perform the following to test the circuit breaker outside the switchgear:

**CAUTION**

The test cabinet should be located at least 8 feet away from the switchgear.

**CAUTION**

Prior to connecting the test cabinet with the circuit breaker make sure the power switch is in the "off" position. Failure to do so may result in personal injury.

1) Single Shunt Trip Test Cabinet

a. Connect the test cabinet umbilical cord to the circuit breaker secondary disconnect receptacle.

b. Turn the test cabinet power switch (Figure 2, b) to the ON position. This will charge the circuit breaker.

c. After the circuit breaker is fully charged, push the “Close” push button (Figure 2, c) on the test cabinet and ensure the circuit breaker is in the closed position by viewing CLOSED in the circuit breaker position indicator located on the front cover of the circuit breaker.

d. Push the “Open” push button (Figure 2, a) on the test cabinet to trip the circuit breaker.

**Note:** If the circuit breaker does not trip refer to the Adjustment of Primary and Secondary Trip Prop section of the circuit breaker instruction bulletin. Once these adjustments have been made repeat steps a-d of this section.

2) Single Shunt Trip with UV Device Test Cabinet

a. Connect the test cabinet umbilical cord to the circuit breaker secondary disconnect receptacle.

b. Turn the test cabinet power switch (Figure 3, c) to the ON position. This will charge the circuit breaker.

c. After the circuit breaker is fully charged, push the “Close” push button (Figure 3, d) on the test cabinet and ensure the circuit breaker is in the closed position by viewing CLOSED in the circuit breaker position indicator located on the front cover of the circuit breaker.

d. Push the Trip “Open” push button (Figure 3, b) on the test cabinet to trip the circuit breaker.

e. After the circuit breaker is fully charged, push the “Close” push button (Figure 3, d) on the test cabinet and ensure the circuit breaker is in the closed position by viewing CLOSED in the circuit breaker position indicator located on the front cover of the circuit breaker.

f. Push the UV Trip “Open” push button (Figure 3, a) on the test cabinet to trip the circuit breaker.

**Note:** If the circuit breaker does not trip refer to the Adjustment of Primary and Secondary Trip Prop section of the circuit breaker instruction bulletin. Once these adjustments have been made repeat steps a-d of this section.
3) **Dual Shunt Trip Test Cabinet**

   a. Connect the test cabinet umbilical cord to the circuit breaker secondary disconnect receptacle.
   b. Turn the test cabinet power switch (Figure 4, c) to the ON position. This will charge the circuit breaker.
   c. After the circuit breaker is fully charged, push the “Close” push button (Figure 4, d) on the test cabinet and ensure the circuit breaker is in the closed position by viewing CLOSED in the circuit breaker position indicator located on the front cover of the circuit breaker.
   d. Push the Trip 1 “Open” push button (Figure 4, b) to trip the primary trip coil or push the Trip 2 “Open” push button (Figure 4, a) to trip the secondary trip coil.

   **Note:** If the circuit breaker does not trip refer to the Adjustment of Primary and Secondary Trip Prop section of the circuit breaker instruction bulletin. Once these adjustments have been made repeat steps a-d of this section.

4) **Dual Shunt Trip with Separate Control Voltages Test Cabinet**

   a. Connect the test cabinet umbilical cord to the circuit breaker secondary disconnect receptacle.
   b. Turn the test cabinet power switch (Figure 5, c) to the ON position. This will charge the circuit breaker.
   c. After the circuit breaker is fully charged, push the “Close” push button (Figure 5, d) on the test cabinet and ensure the circuit breaker is in the closed position by viewing CLOSED in the circuit breaker position indicator located on the front cover of the circuit breaker.
   d. Push the Trip 1 “Open” push button (Figure 5, b) to trip the primary trip coil or push the Trip 2 “Open” push button (Figure 5, a) to trip the secondary trip coil.

   **Note:** If the circuit breaker does not trip refer to the Adjustment of Primary and Secondary Trip Prop section of the circuit breaker instruction bulletin. Once these adjustments have been made repeat steps a-d of this section.
**Figure 2  Single Shunt Trip Test Cabinet**

- **a. Open Push Button**
- **b. Test Cabinet Power Switch**
- **c. Close Push Button**

Customer Note
For 120VAC, ground this leg at source and install dummy fuses.

**NOTES:**
1. TO BE USED WITH CABINET 0237C4219G501 FOR 1 TRIP COIL.
2. TEST CABINET SOURCE VOLTAGE MUST BE SAME AS EQUIPMENT CONTROL VOLTAGE.
Figure 3  Single Shunt Trip with UV Device Test Cabinet

- UV Trip Open Push Button
- Trip Open Push Button
- Test Cabinet Power Switch
- Close Push Button

Customer Note:
For 120VAC, Ground this leg at source and install dummy fuses.

NOTES: 1. TO BE USED WITH CABINET 0237C4219G503 FOR 1 TRIP COIL AND UNDERVOLTAGE DEVICE.
2. TEST CABINET SOURCE VOLTAGE MUST BE SAME AS EQUIPMENT CONTROL VOLTAGE.
Figure 4  Dual Shunt Trip Test Cabinet

Customer Note:
For 120VAC, Groung this leg at source and install dummy fuses.

NOTES:  
1. TO BE USED WITH CABINET 0237C4219GS02  
   FOR 2 TRIP COIL. 
2. TEST CABINET SOURCE VOLTAGE MUST 
   BE SAME AS EQUIPMENT CONTROL VOLTAGE.
Figure 5  Dual Shunt Trip with Separate Control Voltages Test Cabinet

- Trip 2 Open Push Button
- Trip 1 Open Push Button
- Test Cabinet Power Switch
- Close Push Button

Customer Note:
For 120VAC, Groung this leg at source and install dummy fuses.

NOTES:
1. TO BE USED WITH CABINET 0237C4219G504 FOR 2 TRIP COIL WITH SEPARATE CONTROL SOURCES.
2. TEST CABINET SOURCE VOLTAGE MUST BE SAME AS EQUIPMENT CONTROL VOLTAGE.
Ch 6  Recommended Renewal Parts and Replacement Procedures

A. ORDERING INSTRUCTIONS

1. Order Renewal Parts from Powell at powellind.com or call 1.800.480.7273.

2. Specify the quantity and description of the part and the instruction bulletin number. If the part is in any of the recommended renewal parts tables, specify the catalog number. If the part is not in any of the tables, a description should be accompanied by a marked illustration from this instruction bulletin, a photo or simply submit a sketch showing the part needed.

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<th>Fuse Type</th>
<th>Part Number</th>
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<td>Buss Fuse 30A 250V</td>
<td>N0N30</td>
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<tr>
<td>0237C4219G503 Shunt Trip with UV Device</td>
<td>Buss Fuse 30A 250V</td>
<td>N0N30</td>
</tr>
<tr>
<td>0237C4219G502 Dual Shunt Trip</td>
<td>Buss Fuse 30A 250V</td>
<td>N0N30</td>
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<tr>
<td>0237C4219G504 Dual Shunt Trip with Separate Control Voltages</td>
<td>Buss Fuse 30A 250V</td>
<td>N0N30</td>
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