Instruction Bulletin - 01.4IB.65032
PowlVac 27® and PowlVac 38® CDS
Manually Operated Ground and Test Device

27kV and 38kV, 1200A and 2000A
40” wide design
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 PowlVac 27® and PowlVac 38® CDS Manually Operated Ground and Test devices:

- 38PV40MGT - 38kV, 1200A or 2000A
- 27PV40MGT - 27kV, 1200A or 2000A
- both the 27kV & 38kV are 40” wide designs

B. Purpose

The information in this instruction bulletin is intended to provide information required to properly operate and maintain the PowlVac 27 and PowlVac 38 CDS manually operated ground and test devices 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 PowlVac 27 and PowlVac 38 CDS manually operated ground and test devices
3. Instructions for installation and placing the ground and test device 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 ground and test device

The illustrations contained in this document may not represent the exact construction details of each particular type of ground and test device. 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.

\[
\text{WARNING}
\]

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.

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 the Powell equipment.

For more information visit powellind.com. To contact the Powell Service Division call 1.800.480.7273 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 uncrating the PowlVac 27® and PowlVac 38® CDS Manually Operated Ground and Test devices.

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, and maintenance of these ground and test devices.

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 PowlVac 27 and the PowlVac 38 CDS manually operated ground and test devices.
C. **General**

1. Only supervised and qualified personnel trained in the usage, installation, operation, and maintenance of the PowIVac 27® and the PowIVac 38® CDS manually operated ground and test devices 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 circuit breaker’s reliability and safety.

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

D. **Specific**

When operating the ground and test device safety precautions must be observed. **Improper use can result in death, serious personal injury, or damage to the equipment.** It is important for the user to develop specific and safe operating procedures to be observed when using the ground and test device.

The following specific safety precautions must be observed:

1. Do not attempt to ground an energized circuit. The circuit to be grounded should always be treated as energized until proven otherwise.

2. Do not attempt to service the device while it is installed in a switchgear compartment or on a lift truck. For service, the device must be located either on the floor or on a sturdy, level work bench, and blocked from rolling.

3. Store the manually operated ground and test device in a clean, dry area free from dust, dirt, moisture, caustic atmosphere, and vermin.

4. Keep all insulating surfaces, which include primary support insulation and insulation barriers, clean and dry.

5. Check all primary circuit connections to make certain that they are clean and tight.

6. Take extreme care while using this device to avoid contacting “live” or “hot” energized terminals.

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 in and on the switchgear and on the circuit breaker removable element. Always observe these warnings and caution labels. Do NOT remove or deface any of these warning/caution labels.**
Ch 3 Equipment Description

A. General

The PowlVac 27® and PowlVac 38™ CDS ground and test devices, exterior frame and dimensions are similar to the PowlVac 38 CDS circuit breaker and can be temporarily inserted in place of a circuit breaker in a metal-clad switchgear compartment for the purpose of grounding and testing. The manual ground and test device is supplied with two terminal sets. The primary disconnecting devices of each terminal set are compatible with compartments rated 1200A or 2000A as applicable.

The two terminal set ground and test device consists of a wheeled frame on which are mounted two terminal sets arranged in an upper and lower configuration. Each terminal set consists of three primary disconnect devices. The front of the ground and test device has four lockable access doors; two (2) upper doors, and two (2) lower doors. One terminal set is mounted behind the upper access doors, and one terminal set is mounted behind the lower access doors. Each of the ground and test device primary disconnect devices are designed to connect to one of the six primary disconnect devices in the switchgear compartment. The upper ground and test device primary disconnect devices are connected to the upper primary disconnect devices of the switchgear compartment. The lower ground and test device primary disconnect devices are connected to the lower primary disconnect devices of the switchgear compartment. In each terminal set of ground and test device the left, center, and right ground and test device primary disconnect devices are connected to the switchgear’s equivalent. Isolation barriers between the primary disconnect devices are provided where required.

The ground and test device is equipped with a sliding ground connector which engages the ground bus in the switchgear compartment. A ground bar extends from the ground connector to the lower front part of the ground and test device (Figure 1, g). Flexible grounding cables are supplied. Refer to Ch 5 Operation, B. Grounding for proper use of the grounding cables.

The ground and test device is equipped with a racking guide which engages and disengages with the racking roller located in the circuit breaker compartment. The racking mechanism is operated by the hand crank as described in instruction bulletin 01.4IB.65202. The ground and test device is equipped with an anti-rollout latch to prevent inadvertent removal from the compartment.

The PowlVac 38 CDS Manually Operated Ground and Test Device can be supplied with the following compatibility options:

- 1200A
- 2000A

<table>
<thead>
<tr>
<th>Table A Equipment Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Device Type</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>27PV40MGT</td>
</tr>
<tr>
<td>38PV40MGT</td>
</tr>
</tbody>
</table>
Figure 1  PowlVac 38® Manually Operated Ground and Test Device - Front View

Figure 2  PowlVac 38® Manually Operated Ground and Test Device - Rear View

- a. Lifting Point
- b. Nameplate
- c. Warning Label
- d. Racking Crank Arm
- e. Caution Label
- f. Racking Shaft Access
- g. Ground Bus
- h. Anti-Rollout Latch
- i. Wheel

- a. Upper Primary Disconnecting Devices
- b. Lower Primary Disconnecting Devices
- c. Interference Plate
Figure 3  PowiVac 38® Manually Operated Ground and Test Device - Grounding Cables Connected

a. Ground Cable Connection Terminal  
b. Upper Access Doors Location  
c. Grounding Cable  
d. Lower Access Doors

Note: Upper access doors are removed for clarification.
Ch 4 Installation

A. RECEIVING

When the ground and test device is received check for any sign of damage. If damage is found or suspected, file all claims immediately with the transportation company and notify the nearest Powell representative.

Estimated size and weight for shipping a PowlVac 27® and PowlVac 38® CDS Manually Operated Ground and Test Devices on a pallet:

- **Size:** 42” width x 42” depth x 47” height
- **Weight:** 625 lbs.

Figure 5 shows the ground and test device enclosed in the carton used for shipment. The carton is attached to the shipping pallet by two metal bands. Remove these bands and lift the carton from the pallet so that the ground and test device is visible. The ground and test device is attached to the pallet by two metal bands. When these are removed the ground and test device may be removed from the shipping pallet. Refer to Ch 4 Installation, B. Handling, for more information.

B. HANDLING

After the ground and test device has been removed from its shipping pallet it may be rolled on its own wheels on a level surface. This is the preferred method of handling the ground and test device. When rolling the ground and test device it should be pushed and steered by the steel frame or the front cover.

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**CAUTION**

Do not handle or move the ground and test device by the primary disconnecting devices, as damage may occur.

If necessary, the ground and test device can be moved by a lift truck or an overhead crane. When using a lift truck load the ground and test device front first onto the lift and ensure that it is secured to the lift truck. The device can also be lifted by an overhead crane using the two lifting points which have been provided for hooks at the top of the frame side sheets (Figure 1, a). The ground and test device will tilt backward when it is lifted by a crane. Therefore, when setting down the device, it is necessary to guide the device to ensure that all four wheels are placed on a level surface.
C. **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 contaminants 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.
Ch 5  Operation

As stated in *IEEE C37.20.6-2007, §9.5*, “Ground and test devices are used infrequently and therefore are stored for long periods of time. They should be stored in a clean, dry area, free from dust, dirt, moisture, and the like.” However, even though it is assumed that the ground and test device was stored properly, it should be carefully inspected and maintained before each use.

The following procedure is recommended before each use of the ground and test device. The manufacturers’ instruction manual must be followed for specific guidance.

1. All insulating surfaces, including but not limited to the primary support insulation, voltage probes, and isolation barriers, should be clean and dry.
2. All primary circuits, including cables and connections, should be clean and tight.
3. All primary and ground disconnect contacts should be clean, with the correct contacts in place and properly lubricated.
4. A 1 minute power frequency voltage withstand test should be conducted on the complete ground and test device in accordance with *Table B Field Dielectric Test Values*.

### Table B  Field Dielectric Test Values

<table>
<thead>
<tr>
<th>Rated Maximum Voltages (kV rms)</th>
<th>Power Frequency Withstand (kV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td>38</td>
<td>60</td>
</tr>
</tbody>
</table>

The ground and test device may be used with both grounding and testing functions. The procedures for these two types of operations differ, and are described separately below.

**CAUTION**

*Because of the construction of bus sectionalizing units and other special types of construction, it is NOT possible to make a general statement about which set of primary disconnects is connected to the switchgear main bus and which is connected to the outgoing conductors. Before using the ground and test device, the operator must determine the physical location of the primary disconnects to be grounded or tested. This can be determined by referencing the equipment drawings or by examining the equipment.*
A. **General**

The ground and test device can apply grounding to one three phase circuit through either the upper or lower primary disconnect assemblies. The device can also provide circuit contact points for voltage presence or phasing between upper and lower disconnect assemblies. It is also used as a convenient termination point for conducting electrical testing on deenergized conductors.

**NOTICE**

*Prior to conducting any task, develop a test plan to achieve the desired results. A written electrical test plan is strongly advised.*

B. **Voltage Presence Testing and Phasing**

The ground and test device may be used to gain access to switchgear connections for high voltage testing.

**NOTICE**

*Prior to inserting or removing the circuit breaker, refer to the latest version of the appropriate circuit breaker and switchgear bulletins and any site specific work instructions.*

**WARNING**

*PPE compliant with NFPA70E HRC, as determined by incident energy calculations for the switchgear, must be worn when inserting or removing the circuit breaker or the ground and test device. Failure to do so may result in serious injury or death.*

1. Refer to the test plan as stated in *Ch 5 Operation, A. General*.
2. If the circuit breaker is in the compartment, remove it from the compartment to be tested using the instructions found in the applicable circuit breaker instruction bulletin.
3. Verify that the ground and test device nameplate compartment compatibility rating match that of the continuous current rating of the circuit breaker removed in Step 2.
4. Ensure the ground cables are disconnected and stored.
5. After determining the voltage test requirement, remove the appropriate access doors over the upper or lower test ports which were selected for testing.
6. Ensure the floor pan channel is free of debris.
7. Align the wheels of the test device with the floor pan channels.
8. Roll the test device into the breaker compartment until the racking crank arms (*Figure 1, d*) make contact with the vertical slots in the compartment. The anti-rollout latch (*Figure 1, h*) on the lower right side of the device will engage the block in the compartment, preventing accidental removal of the test device.

*This is the disconnected position.*

9. Insert the racking handle onto the racking shaft (*Figure 1, f*).
10. Turn the racking handle clockwise to begin racking in the device. Refer to the applicable circuit breaker instruction bulletin for detailed racking instructions.
11. Once the device is racked into the connected position, use a properly rated high voltage “hot stick” or “high voltage voltmeter probe”, not furnished, observing all safety rules associated with the specific device. Orient the probe contact points to the desired contact points within the
ground and test device and acquire the voltage information desired.

12. When testing is complete, insert the racking handle onto the racking shaft.

13. Turn the racking handle counterclockwise to rack out the device. Once the test device has reached the disconnected position press the anti-rollout latch to release the test device and pull the device out of the circuit breaker compartment.

14. Reattach the access doors on the test device and move to its storage location.

C. CONNECTING TO A TEST SOURCE (HIPOT)

NOTICE

Prior to inserting or removing the circuit breaker, refer to the latest version of the appropriate circuit breaker and switchgear bulletins and any site specific work instructions.

WARNING

PPE compliant with NFPA70E HRC, as determined by incident energy calculations for the switchgear, must be worn when inserting or removing the circuit breaker or the ground and test device. Failure to do so may result in serious injury or death.

1. Repeat Ch 5 Operation, B. Voltage Presence Testing and Phasing in its entirety.
2. Remove the appropriate access doors over the test ports.
3. Attach the test equipment to the appropriate test ports of the ground and test device.
4. Ensure the floor pan channel is free of debris.
5. Align the wheels of the test device with the floor pan channels.
6. Roll the test device into the breaker compartment until the racking crank arms (Figure 1, d) make contact with the vertical slots in the compartment. The anti-rollout latch (Figure 1, h) on the lower right side of the device will engage the block in the compartment, preventing accidental removal of the test device.

This is the disconnected position.

7. Insert the racking handle onto the racking shaft (Figure 1, f).
8. Turn the racking handle clockwise to begin racking in the device taking care not to damage the test cables while racking to the connected position.
9. Once in the connected position, conduct the tests in accordance with the test plan recommended in Ch 5 Operation, A. General.
10. When testing is complete, insert the racking handle onto the racking shaft (Figure 1, f).
11. Turn the handle counterclockwise to rack out the device, taking care not to damage the test cables while removing the device. Once the test device has reached the disconnected position press the anti-rollout latch to release the test device and pull the device out of the circuit breaker compartment.
12. Reattach the access doors on the test device and move to its storage location.
D. Grounding

**WARNING**

Do NOT attempt to use the PowlVac 27 or the PowlVac 38™ CDS Ground and Test Device to ground an energized circuit. An attempt to do so will result in severe damage to the device and the switchgear in which it is being used, and may result in serious injury or death to operating personnel.

**NOTICE**

Prior to inserting or removing the circuit breaker, refer to the latest version of the appropriate circuit breaker and switchgear bulletins and any site specific work instructions.

**WARNING**

PPE compliant with NFPA70E HRC, as determined by incident energy calculations for the switchgear, must be worn when inserting or removing the circuit breaker or the ground and test device. Failure to do so may result in serious injury or death.

1. Repeat Ch 5 Operation, B. Voltage Presence Testing and Phasing in its entirety.
2. Remove the access doors over the test ports to be grounded.
3. After verification is complete, rack out the device to the disconnected position.
4. Bolt the ground cables to the ground cable connection terminals (Figure 3, a) and to the ground bus (Figure 1, g).
5. Insert the racking handle onto the racking shaft (Figure 1, f). Turn the handle clockwise until the device is in the connected position. Once in the connected position the circuit is now grounded.
6. To remove the ground, rack the device to the disconnected position and remove it from the compartment.
7. Remove the grounding cables and reattach the access doors and move the ground and test device to its storage location.
Ch 6 Maintenance

A. General

The test device requires little routine maintenance. Proper storage when the device is not in use is essential. See Ch 4 Installation, C. Storage for storage procedures.

1) Lubrication

Powell offers a complete lubrication kit (Powlube-104) which contains all the lubricants required for maintaining the test device. Powlube-104 consists of (1) A-grease, (1) B-grease, and (1) C-oil. Prior to March 2014, Powell provided Powlube-101 and Powlube-102 which contained (1) tube of Anderol 757 or Rheolube 368A, (1) tube of Mobilgrease 28 and (1) bottle of Anderol A456 oil.

A-grease should be lightly applied to those bearing surfaces that are accessible. Inaccessible surfaces such as bearings may be lubricated with a light synthetic machine oil such as C-oil. B-grease should be applied to the electrical contact surfaces.

The contact surfaces of the primary disconnect devices and the fingers of the ground shoe should be lubricated with a thin film of B-grease. Before use, particularly if the device has been in storage for a long period of time, wipe these surfaces clean and apply fresh lubricant.

The racking device and wheels require the same lubrication as on the circuit breakers. Refer to the latest version of instruction bulletin 01.4IB.65110 for details.

2) Inspection and Cleaning

Visually check the test device for loose or damaged parts. Tighten or replace loose or missing hardware. Any damaged parts that will interfere with the normal operation of the test device should be replaced.

Clean the test device by removing any loose dust and dirt. Use a vacuum cleaner or wipe with a dry lint-free cloth or an industrial-type wiper to clean the test device.
Ch 7  Recommended Renewal Parts and Replacement Procedures

A. Ordering Instructions

1. Order Renewal Parts from the Powell Service Division at powellind.com or call 1.800.480.7273.
2. Always specify complete nameplate information, including:
   a. Ground and Test Device Type
   b. Serial Number
   c. Rated Voltage
   d. Rated Amps
   e. Impulse Withstand
3. 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 or photo.

B. Recommended Renewal Parts

A sufficient amount of renewal parts should be stored to enable the prompt replacement of any worn, broken, or damaged part. A sufficient amount of stocked parts minimizes service interruptions caused by breakdowns and saves time and expense. When continuous operation is a primary consideration, a greater amount of renewal parts should be stocked, the quantity depending on the severity of the service and the time required to secure replacements.

Since parts may be improved periodically, renewal parts may not be identical to the original parts. Table C lists the recommended spare parts to be carried in stock by the user. The recommended quantity is not specified. This must be determined by the user based on the application. It is recommended that one set of parts be stocked at all times.

<table>
<thead>
<tr>
<th>Table C Recommended Renewal Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

Powell recommends that only qualified technicians perform maintenance on these units. Refer to the Qualified Person section in the front of this instruction bulletin.
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PowlVac 27® and PowlVac 38® CDS
Manually Operated Ground and Test Device

27kV and 38kV, 1200A and 2000A
40” Wide Design

June 2019