IB-51802 PowlVac® ITE-HK Remote Racking Device

for use with ITE-HK 5kV & 15kV Circuit Breakers and PowlVac® ITE-HK 5kV & 15kV Replacement Circuit Breakers
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Signal Words

As stated in ANSI Z535.4-2002, § 4.13-4.13.3 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”, and “Caution”. These words are defined as:

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

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

- **CAUTION**: indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Not stated in ANSI Z535.4-2002, § 4.13-4.13.3 as a signal word but used in this manual is “IMPORTANT”. This is defined as:

- **IMPORTANT**: indicates a section of the manual covering a non hazardous situation, but one where Powell feels proper attention is warranted.

Qualified Person

For the purposes of this manual, a qualified person, as stated in NFPA 70®, is one familiar with the construction and operation of the equipment and 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 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 ⚠️

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.

⚠️ IMPORTANT ⚠️

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.

⚠️ IMPORTANT ⚠️

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 Remote Racking Devices for PowlVac® ITE-HK replacement circuit breakers:

- 51897G26

B. Purpose

The information in this instruction bulletin is intended to provide information required to properly operate and maintain the PowlVac ITE-HK Remote Racking Devices described in Ch 1 General Information, A. Scope.

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions on the operation of the PowlVac ITE-HK Remote Racking Device
3. Instructions for installation
4. Illustrations, photographs, and description of the equipment described in Ch 1 General Information, A. Scope.

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

All illustrations are shown using deenergized equipment.

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

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.
Ch 2 Safety

A. Safe Work Condition

The information in Section A is quoted from NFPA 70E 2004 - 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 uncrating the circuit breakers.

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 PowlVac® ITE-HK Remote Racking Device.
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 reliability and safety.

3. Service conditions and applications 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 AN ENERGIZED CIRCUIT BREAKER.** If work must be performed on a circuit breaker, remove it from service and remove it from the metal-clad switchgear.

2. **DO NOT WORK ON A CIRCUIT BREAKER WITH THE CONTROL CIRCUIT ENERGIZED.**

3. **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 circuit breakers 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 this instruction bulletin.

4. **DO NOT ATTEMPT TO CLOSE THE CIRCUIT BREAKER MANUALLY ON AN ENERGIZED CIRCUIT.**

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

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

7. Interlocks are provided to ensure the proper operating sequences of the circuit breakers and for the safety of the user. If for any reason an interlock does not function as described, do not make any adjustments, modification, or deform the parts. **DO NOT FORCE THE PARTS INTO POSITION. CONTACT POWELL FOR INSTRUCTIONS.**
E. X-Rays

When high voltage is applied across the contacts of a vacuum interrupter, there is the possibility of generation of X-rays. The intensity of the X-radiation is dependent on the peak voltage and the contact gap. At the normal operating voltage for this type of equipment, the radiation levels are negligible. At the voltages specified for testing, test personnel shall be in front of the circuit breaker such that the two layers of steel used in the frame and front cover construction are between the test personnel and the vacuum interrupters, and that the test personnel be no closer than one meter (3') from the front of the circuit breaker. **THE CIRCUIT BREAKER SHALL BE EITHER FULLY OPEN, OR FULLY CLOSED WHEN MAKING HIGH POTENTIAL TESTS. DO NOT TEST WITH CONTACTS PARTIALLY OPEN.**
Ch 3  *Equipment Description*

A. **GENERAL**

The ITE-HK Electrical Racking Device is an accessory which enables circuit breakers to be racked into and out of switchgear from a distance. The accessory consists of a motor control switchbox (Figure 2) and electric racking device assemblies (Figure 1).

B. **Motor Control Switchbox**

The motor control switchbox supplies power and enables the selection of operating modes for the electric racking device. The motor control switchbox has a 50 foot long cord (Figure 1, f) with a plug that is inserted into the electric racking device twist lock receptacle (Figure 1, e). The length of the cord enables the user to move to a remote location away from the circuit breaker during the racking in or racking out procedures. The motor control switchbox power supply cord (Figure 2, a) plugs into a 110VAC outlet.

C. **Electric Racking Device**

The electric racking device uses a mechanism keeper arm (Figure 1, a) to connect to the circuit breaker. The racking assembly (Figure 1, c) engages the circuit breaker racking shaft located on the circuit breaker. After the racking device is installed, the motor shaft knob (Figure 1, d) can be turned to align the drive shaft drive socket with the circuit breaker racking mechanism. When the racking device is connected to the motor control switchbox and energized the drive socket operates the circuit breaker racking mechanism during the racking in or racking out procedures.
Figure 1  ITE-HK Remote Racking Device

a. Mechanism Keeper Arm  
b. Keeper Arm Adjustment Knob  
c. Racking Assembly  
d. Motor Shaft Knob  
e. Twist Lock Receptacle  
f. 50' Power Cord  
g. Control Box  
h. Handle
Figure 2  Closeup of Control Box

- a. Electrical Cord
- b. In Indicator Light
- c. Out Indicator Light
- d. Power Switch
- e. In/Out Selector Switch
- f. Handle
Ch 4  Installation & Operation

A. RECEIVING

Upon receipt, remove any shipping material and inspect the electric racking device for damage that may have occurred during shipment. Check the equipment received against the shipping documents to ensure receipt of the complete shipment.

B. HANDLING

The electric racking device weighs 20 lbs. and the motor control switchbox assembly weighs 5 lbs. The preferred method for moving the electric racking device and motor control switchbox is to place them securely on a hand operated shop cart.

CAUTION
When handling the electric racking device, personnel should use caution during movement and installation. Failure to do so may cause personal injury or damage to the equipment.

CAUTION
Protect the motor control switchbox and the racking device from moisture. Failure to do so may cause damage to the equipment.

CAUTION
Do NOT handle or carry the racking device by the power cords. Damage to the power connections may result and cause an electrical short. The power cords should be inspected for any signs of damage before each use.

C. OPERATION

WARNING
Do NOT work on an energized circuit breaker. Follow circuit breaker safety guidelines and operating instruction provided in the specific circuit breaker instruction bulletin.

When racking in a circuit breaker, move the circuit breaker to the required switchgear location.

For more information on the circuit breaker handling, see the instruction bulletin for the circuit breaker in use.
Figure 3 Aligning the Remote Racking Device to the Circuit Breaker

- a. Circuit Breaker Racking Coupler
- b. Remote Racking Device Racking Assembly
Figure 4  Connecting the Remote Racking Device to the Circuit Breaker

a. Keeper Arm behind Interlock Tab
b. Circuit Breaker Interlock Tab
c. Racking Assembly Engaged with Coupler
d. Keeper Arm Adjustment Knob
**Figure 5**  
Circuit Breaker Interlock to the Trip-Free Position

**Figure 6**  
Inserting Cylindrical Plug into the Remote Racking Device
Figure 7  Moving Selector Switch on the Control Box
D. **Inserting the Circuit Breaker into the Switchgear Equipment**

**CAUTION**

*Before installing any circuit breaker into a compartment, the user MUST verify that the circuit breaker rating meets the metal-clad switchgear rating.*

Follow the steps below to insert the circuit breaker into the switchgear compartment:

**CAUTION**

*Prior to inserting the circuit breaker into the circuit breaker compartment, make sure that the control circuits are deenergized.*

**IMPORTANT**

*Powell recommends using the original manual racking handle to move the circuit breaker from the “Disconnected” to “Test” positions.*

2) “Test” to “Connected”

**CAUTION**

*Prior to inserting the circuit breaker into the circuit breaker compartment, ensure that the circuit breaker is OPEN and the mechanism is discharged.*

a. Place the remote racking device directly in front of the circuit breaker so the racking assembly (Figure 3, b) on the remote device is aligned with the racking coupler (Figure 3, a) on the circuit breaker.

b. Engage the remote racking assembly with the racking coupler on the circuit breaker.

c. Place the keeper arm (Figure 4, a) behind the circuit breaker racking unlocking lever (Figure 4, b). This locks the remote racking device in place to prevent disengagement between the remote racking device and the circuit breaker.

d. If necessary, adjust the height of the keeper arm by turning the keeper arm adjustment knob (Figure 4, d) on the top of the remote racking device.

e. Move the racking unlocking lever (Figure 5) to the left or trip free position.

**Note:** Powell’s ITE-HK remote racking device is intended to move the circuit breaker from the “Disconnected” position to the “Connected” position; however, due to the original circuit breaker design this must be accomplished in two steps: “Disconnected” to “Test” and “Test” to “Connected”.
f. While holding the circuit breaker racking unlocking lever to the left, turn the motor shaft knob (Figure 1, d) on the back of the remote racking device $\frac{1}{4}$ turn clockwise as shown in Figure 5. The circuit breaker racking unlocking lever will stay in the trip free position once the motor shaft knob has been turn $\frac{1}{4}$ turn. The circuit breaker is now ready to be racked in.

g. Insert the cylindrical plug into the remote racking device outlet (Figure 6). Turn the plug to lock it in place.

h. Make sure the control box power switch (Figure 2, d) is in the “OFF” position.

i. Plug the device into a 120VAC power source.

j. Turn the power switch to the “ON” position.

k. Move to a remote location and turn the selector switch (Figure 7) on the push button to the IN position.

l. Press and hold the push button to begin racking the circuit breaker in. The motor will stop if the push button is released.

m. When the push button is pressed the IN indicating light (Figure 2, b) will be energized and illuminated.

n. When the circuit breaker is fully racked in, (the locking device on the racking shaft will stop the circuit breaker from racking in any further) the circuit breaker’s racking shaft will begin to “clutch-out”. The clutching action will cause the device to shake and make an audible clicking noise. At this point the operator can release the racking push button. The circuit breaker is now in the connected position.

o. Unplug the racking device from the 120VAC power source.

p. Loosen the keeper arm using the adjustment knob on the top of the remote racking device. Lift up to clear the locking lever on the circuit breaker.

q. Move the racking unlocking lever (Figure 5) to the left or trip free position and pull the racking device away from the circuit breaker.

E. Removing the Circuit Breaker from the Switchgear Equipment

Prior to removing the remote racking motor from the circuit breaker compartment, make sure that the control circuits are deenergized.

Prior to removing the circuit breaker from the circuit breaker compartment, ensure that the circuit breaker is OPEN.

Follow the steps below to remove the circuit breaker from the switchgear equipment:

1) “Connected” to “Test”

a. Place the remote racking device directly in front of the circuit breaker so the racking assembly (Figure 3, b) on the remote device is aligned with the racking coupler (Figure 3, a) on the circuit breaker.

b. Engage the remote racking assembly with the racking coupler on the circuit breaker.
c. Place the keeper arm (Figure 4, a) behind the circuit breaker racking unlocking lever (Figure 4, b). This locks the remote racking device in place to prevent disengagement between the remote racking device and the circuit breaker.

d. If necessary, adjust the height of the keeper arm by turning the keeper arm adjustment knob (Figure 4, d) on the top of the remote racking device.

e. Move the racking unlocking lever (Figure 5) to the left or trip free position.

f. While holding the circuit breaker interlock tab to the left, turn the motor shaft knob (Figure 1, d) on the back of the remote racking device ¼ turn counterclockwise as shown in Figure 5. The circuit breaker unlocking lever will stay in the trip free position once the motor shaft knob has been turn ¼ turn. The circuit breaker is now ready to be racked out.

g. Insert the cylindrical plug into the remote racking device outlet (Figure 6). Turn the plug to lock it in place.

h. Make sure the control box power switch (Figure 2, d) is in the “OFF” position.

i. Plug the device into a 120VAC power source.

j. Turn the power switch to the “ON” position.

k. Move to a remote location and turn the selector switch (Figure 7) on the push button to the OUT position.

l. Press and hold the push button to begin racking the circuit breaker out. The motor will stop if the push button is released.

m. When the push button is pressed the OUT indicating light (Figure 2, c) will be energized and illuminated.

n. When the circuit breaker is fully racked out, (the locking device on the racking shaft will stop the circuit breaker from racking out any further) the circuit breaker’s racking shaft will begin to “clutch-out”. The clutching action will cause the device to shake and make an audible clicking noise. At this point the operator can release the racking push button. The circuit breaker is now in the test position.

o. Unplug the racking device from the 120VAC power source.

p. Loosen the keeper arm using the adjustment knob on the top of the remote racking device. Lift up to clear the locking lever on the circuit breaker.

q. Move the racking unlocking lever (Figure 5) to the left or trip free position and pull the racking device away from the circuit breaker.

2) “Test” to “Disconnected”

**Important**

Powell recommends using the original manual racking handle to move the circuit breaker from the “Test” to “Disconnected” position.

Note: The chrome housing on the push button is a switch and can be moved to either the IN or OUT positions.
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