



## **01.4IB.51810 Electric Remote Racking Device (51897G32)**

for use with Powell Low Voltage Switchgear  
Equipped with Magnum DS Circuit Breakers  
800-4000A

## 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**”, and “**Caution**”. 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 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.*

### **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 Electric Remote Racking Device for Powell version Magnum DS circuit breakers:

- 51897G32 - 800A - 4000A

**B. PURPOSE**

The information in this instruction bulletin is intended to provide information required to properly operate and maintain the Powell version Magnum DS Electric Racking Device described in **Ch 1 General Information, A. SCOPE.**

This instruction bulletin provides:

1. Safety guidelines
2. General descriptions on the operation of the Magnum DS Electric 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 in this document are provided as general information to aid in showing component locations only.

*All photos and 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****NOTICE**

***Changes to the instruction bulletin may be implemented at any time and without notice. Goto [www.powellind.com](http://www.powellind.com) to ensure use of the current instruction bulletin for the Powell equipment.***

To contact the Powell Service Division call 1.800.480.7273 or 713.944.6900, or email [info@powellservice.com](mailto:info@powellservice.com).

For specific questions or comments pertaining to this instruction bulletin email [documents@powellind.com](mailto:documents@powellind.com) with the Instruction Bulletin number in the subject line.



## 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

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 Magnum DS Electric Racking Device.*

### C. GENERAL

1. Only supervised and qualified personnel trained in the usage, installation, operation, and maintenance of the metal-clad switchgear 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; and any adverse local conditions including excessive dust, ash, corrosive atmosphere, vermin and insect infestations.

**D. SAFETY LABELS**

**NOTICE**

*Warning and Caution labels are located in various places in and on the switchgear and on the circuit breaker. 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 Magnum DS Electric Remote 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 box (Figure 1, d) and electric racking device assembly (Figure 1, c, e, g, & h).

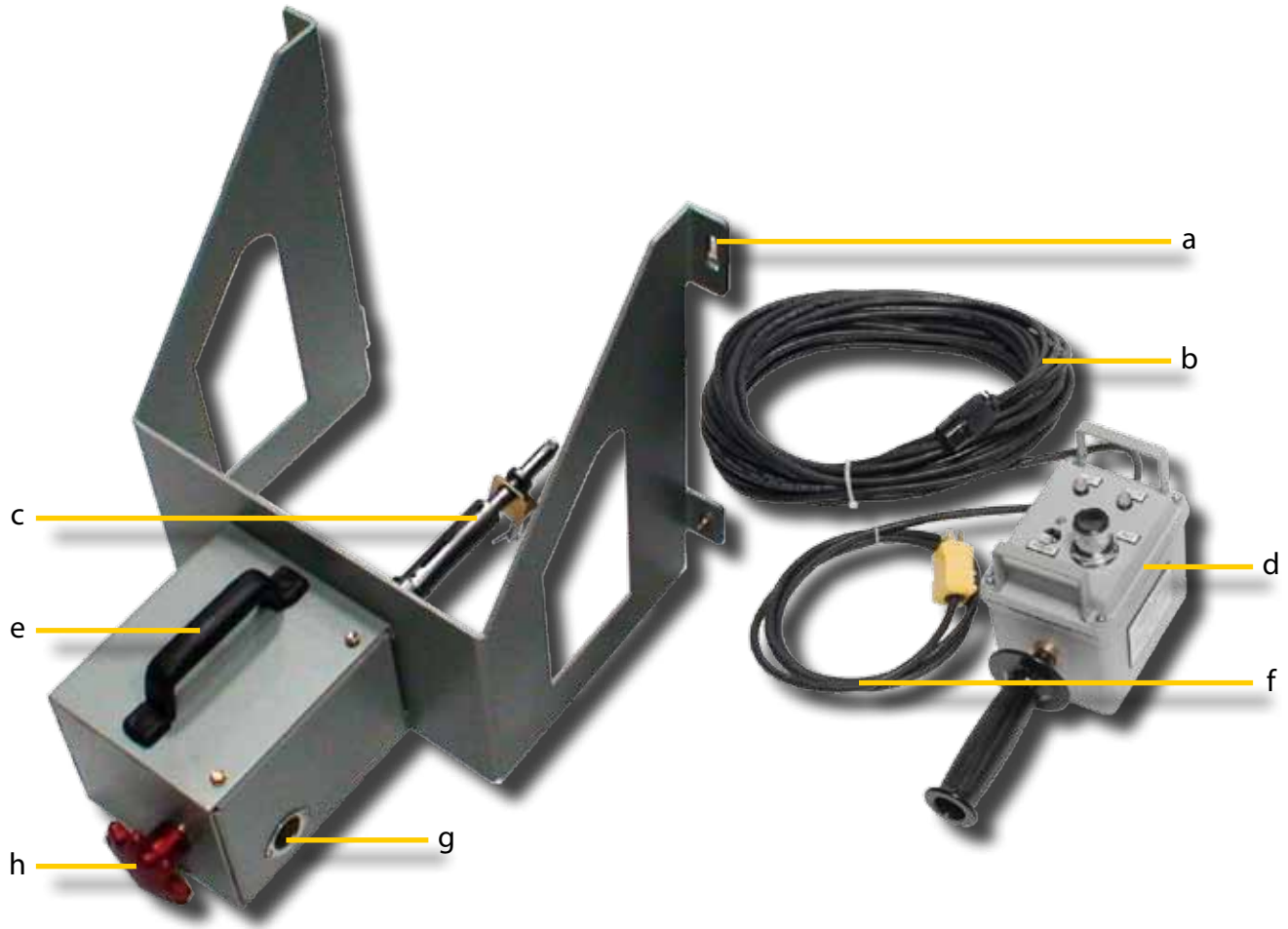
### **B. MOTOR CONTROL BOX**

The motor control box (Figure 1, d) supplies power and enables the selection of operating modes for the electric racking device. The motor control box has a 50 foot cord (Figure 1, b) with a plug that is inserted into the electric racking device twist lock power cord receptacle (Figure 1, g). The length of the cord enables the user to move to a remote location from the circuit breaker during the racking in or racking out procedures. The motor control box power supply cord (Figure 1, f) plugs into a 120VAC outlet.

### **C. ELECTRIC RACKING DEVICE**

The electric racking device uses shoulder bolts to connect to the door of the compartment. The racking shaft assembly is to engage the breaker racking shaft on the circuit breaker. The motor control box (Figure 2) is used to operate the racking device from a safe distance.

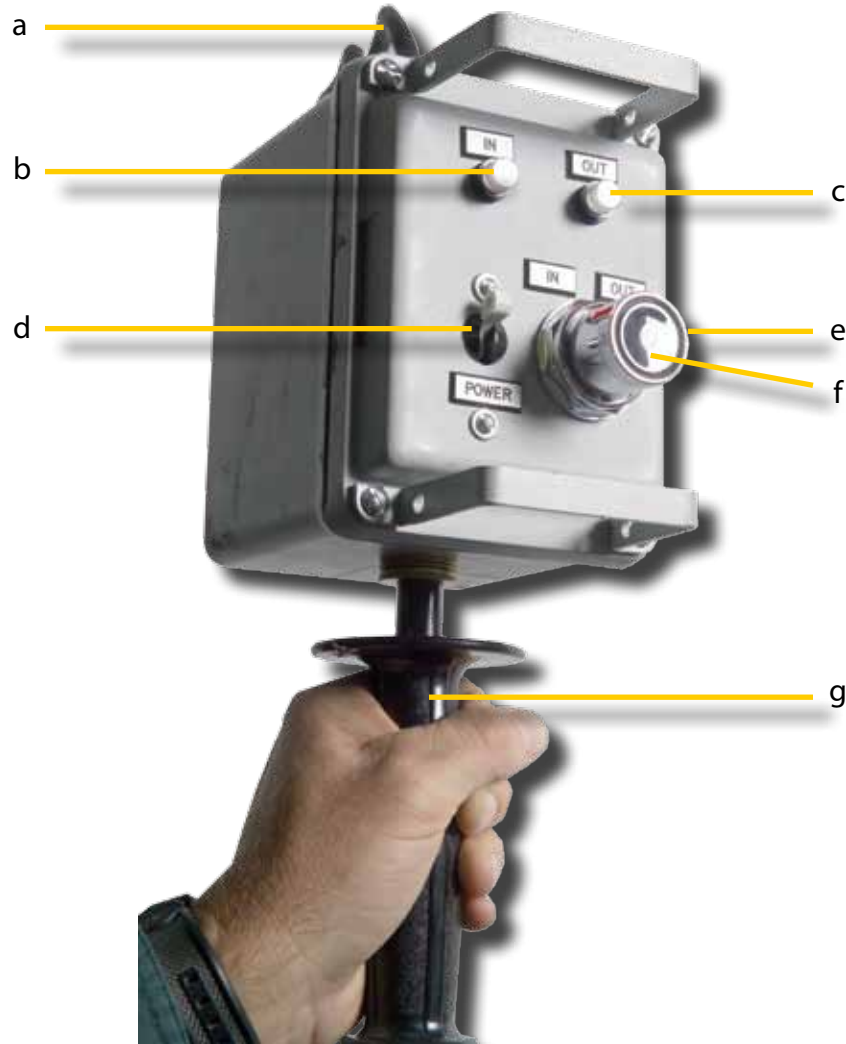
**Figure 1** *Electric Remote Racking Device for Powell LV Switchgear Equipped with Magnum DS Circuit Breakers*



- a. Key Slot
- b. Motor Control Box Cord
- c. Racking Shaft
- d. Motor Control Box
- e. Handle
- f. Power Cord
- g. Power Cord Receptacle
- h. Adjustment Knob



**Figure 2** Close-up of Motor Control Box



- a. Electrical Cord
- b. "In" Indicator Light
- c. "Out" Indicator Light
- d. Power Switch
- e. In/Out Selector Switch
- f. Push Button
- g. 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 box assembly weighs 5 lbs. The preferred method for moving the electric racking device and motor control box is to place them securely on a hand operated shop cart. When handling the electric racking device, personnel should securely grasp the device by its handle during movement and installation to avoid possible personal injury or damage to the electric racking device. Avoid dropping or hitting the electric racking device with hard objects.

 **CAUTION**

***Protect the motor control box 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 cause an electrical short. The power cords should be inspected for any signs of damage prior to each use.***

### 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

#### D. 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.***

Attaching and operating the electric racking device can be accomplished by one person. When circuit breaker racking is required, the electric racking device engages the racking shaft of the breaker. The racking device is operated by the motor control box.

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

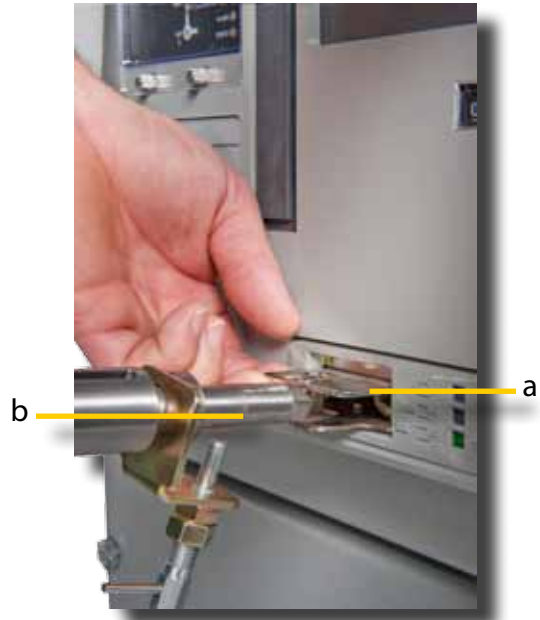
For more information on the circuit breaker handling, see the instruction bulletin for the circuit breaker in use.

**Figure 3** Positioning RRD onto LV Switchgear



- a. Shoulder Bolt
- b. Key Slot

**Figure 5** Lifting the Racking Access Door



- a. Racking Access Door
- b. Racking Shaft

**Figure 4** Close-Up Racking Shaft Position



- a. Racking Shaft Socket

**Figure 6** Engaging Racking Shaft





**Figure 7** *Aligning Racking Shaft*



- a. Racking Shaft
- b. Adjustment Knob

**Figure 9** *Connecting the RRD Motor to the Motor Control Box*



**Figure 10** *Activate Remote Racking Device*

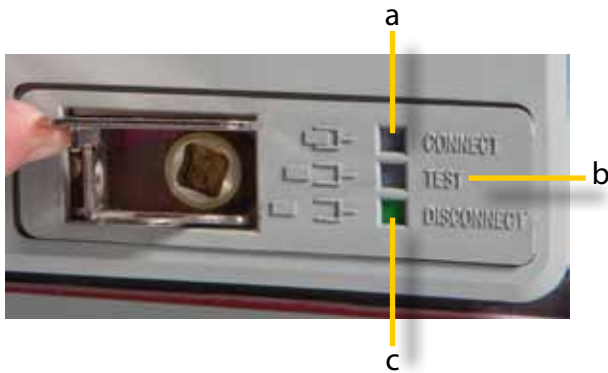


**Figure 8** *Positioning Locking Pin in Place*



- a. Locking Pin
- b. Racking Shaft

**Figure 11 Breaker Position Indicator**



- a. "CONNECT" Position
- b. "TEST" Position
- c. "DISCONNECT" Position

**Figure 12 Racking Device Installed**



**E. INSERTING THE CIRCUIT BREAKER INTO SWITCHGEAR COMPARTMENT**

**⚠ CAUTION**

**Before installing any circuit breaker into a compartment, the user *MUST* verify that the circuit breaker rating meets or exceeds 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.**

**⚠ CAUTION**

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

Before using the electric racking device verify compliance with the Magnum DS circuit breaker instruction bulletin.

1) *Racking Mechanism*

The racking mechanism is an integral part of the breaker and provides a means of moving the breaker from "DISCONNECT" to "TEST" to "CONNECT". The breaker is equipped with interlocks and visual indicators for safety.



## 2) Inserting the Circuit Breaker Into the Compartment

Refer to the specific circuit breaker instruction bulletin for instructions to insert the circuit breaker into the compartment.

## 3) Racking the Circuit Breaker Into the Compartment

- a. Verify the breaker door is closed and latched.
- b. Verify the breaker is discharged (tripped).
- c. Lift the racking device by the handle (Figure 1, e). Position the device in place on the breaker door by the shoulder bolts and key slots (Figure 3, a & b).
- d. With the racking device secured to the door, lift the racking access door (Figure 5, a) and slide the racking shaft in place (Figure 6). If the racking shaft is not aligned use the red adjustment knob (Figure 7, b) located on the back of the racking device to achieve alignment.
- e. With the racking shaft engaged, swivel the spring loaded locking pin up and release the pin through the locking holes on the racking shaft access door (Figure 8, a). This will hold the racking shaft in place during the operation.
- f. Verify the breaker door is closed and latched and the breaker is tripped.
- g. Insert the cylindrical plug into the remote racking device motor (Figure 9). Lock the plug by turning it clockwise.
- h. Ensure the motor control box power switch is in the "OFF" position (Figure 2, d).
- i. Physically move the motor control box to a remote area and connect the power cord (Figure 1, b) to a 120VAC power source.

- j. When racking "IN" turn the IN/OUT selector switch (Figure 2, e) on the motor control box to the "IN" position.

**Note:** *The housing on the push button is a switch, and can be rotated to either the "IN" or "OUT" positions.*

- k. Move the power switch to the "ON" position (Figure 2, d).
- l. To begin racking the circuit breaker into the compartment, depress the push button on the motor control box (Figure 10).

**Note:** *If the push button is released during operation the motor will stop.*

- m. When the push button is depressed, the "IN" indicator light (Figure 2, b) will be energized and illuminated.
- n. When the breaker is fully racked "IN" the remote racking device torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the push button. The breaker position indicator will read "CONNECT" (Figure 11, a).

**Note:** *Excessive operation of this device beyond the travel required to rack "In" or rack "Out" the circuit breaker may damage the assembly. If the remote location that was selected is in a location where the breaker can not be seen and the torque limiter can not be heard it is suggested to perform a racking operation on dead bus and time the operation. Document the time and rack the breaker in and out using the documented time.*

- o. Disconnect the 120VAC power source and reverse Steps c thru h to remove the racking device from the breaker door.

**F. REMOVING THE CIRCUIT BREAKER FROM THE SWITCHGEAR COMPARTMENT**

**CAUTION**

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


**CAUTION**

***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 compartment:

- a. Verify the breaker door is closed and latched.
- b. Depress the push-to-trip button.
- c. Verify the breaker is discharged (tripped).
- d. Lift the racking device by the handle (Figure 1, e). Position the device in place on the breaker door by the shoulder bolts and key slots (Figure 3, a & b).
- e. With the racking device secured to the door, lift the racking access door (Figure 5, a) and slide the racking shaft in place (Figure 6). If the racking shaft is not aligned use the red adjustment knob (Figure 7, b) located on the back of the racking device to achieve alignment
- f. With the racking shaft engaged, swivel the spring loaded locking pin up and release the pin through the locking holes on the racking shaft access door (Figure 8, a). This will hold the racking shaft in place during the operation.
- g. Verify the breaker door is closed and latched and the breaker is tripped.
- h. Insert the cylindrical plug into the remote racking device motor (Figure 9). Lock the plug by turning it clockwise.

- i. Ensure the motor control box power switch is in the "OFF" position (Figure 2, d).
- j. Physically move the motor control box to a remote area and connect the power cord (Figure 1, b) to a 120VAC power source.
- k. When racking "OUT" turn the IN/OUT selector switch (Figure 2, e) on the motor control box to the "OUT" position.

**Note:** *The housing on the push button is a switch, and can be rotated to either the "IN" or "OUT" positions.*

- l. Move the power switch to the "ON" position (Figure 2, d).
- m. To begin racking the circuit breaker out of the compartment, depress the push button on the motor control box (Figure 10).

**Note:** *If the push button is released during operation the motor will stop.*

- n. When the push button is depressed, the "OUT" indicator light (Figure 2, c) will be energized and illuminated.
- o. When the breaker is fully racked "OUT" the remote racking device torque limiter will begin to slip and there will be a clear clicking sound along with a vibration of the racking device. At this point, release the push button. The breaker position indicator will read "DISCONNECT" (Figure 11, c).

**Note:** *Excessive operation of this device beyond the travel required to rack "In" or rack "Out" the circuit breaker may damage the assembly. If the remote location that was selected is in a location where the breaker can not be seen and the torque limiter can not be heard it is suggested to perform a racking operation on dead bus and time the operation. Document the time and rack the breaker in and out using the documented time.*



- p. Disconnect the 120VAC power source and reverse *Steps d thru i* to remove the racking device from the breaker door.

## **Ch 5 Maintenance**

### **A. GENERAL**

A regular maintenance schedule should be established to obtain the best service and reliability from the electric racking device.

Actual inspection and maintenance will depend on individual application conditions such as number of racking operations, time between uses, and storage conditions. When the electric racking device has been in storage for an extended period of time, it must be inspected and cleaned before being used. See **Ch 4 Installation, C. STORAGE.**

A permanent record of maintenance work and inspections should be kept. The degree of record detail depends on the operating conditions. The record should include the dates and results starting from the date the device is first put into service. Dates and results of inspections and routine maintenance activities should be recorded.

### **B. INSPECTION AND CLEANING**

Inspect the electric racking device for loose or damaged hardware or parts. Tighten any loose hardware, and replace missing or damaged hardware or parts.

When necessary, remove loose dust and dirt from the electric racking device with a vacuum cleaner, a clean, dry cloth, or an industrial type wiper. **DO NOT** use an air hose to clean the electric racking device. Dirt or grit may be blown into critical parts, including bearings, which will cause excessive wear of the parts.



## **Ch 6 Recommended Renewal Parts**

### **A. ORDERING INSTRUCTIONS**

1. Order Renewal Parts from Powell at [www.powellind.com](http://www.powellind.com) or call 1.800.480.7273.
2. Always specify the complete nameplate information including:
  - Device Type
  - Serial Number
  - Rated Voltage
  - Rated Amps
3. Specify the quantity and description of the part and the instruction bulletin number. 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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