

**in**  **RAC2-P**™

**More than Just a Racking Device**

**Instruction Manual**



## Table of Contents

Conditions of Sales and Product Warranty	3
Copyright Notice & Disclaimer	4
1.0 Technical Specifications	5
1.1 Features	6
2.0 Description	7
2.1 Components	8
3.0 Receiving, Unpacking, Lifting	10
4.0 Circuit Breaker Racking Instructions	15
4.1 Pushbutton Operation Instructions	16
4.2 User Setup Instructions	17
4.3 Breaker Profile Instructions	19
4.4 Calibrate Accessory Actuators Instructions	20
5.0 Maintenance	21
5.1 Alarms and Troubleshooting	22
6.0 Spare Parts List	25
7.0 Contact Information	27

## Conditions of Sale and Product Warranty

inoLECT, LLC (inoLECT) and the Buyer agree to the following terms and conditions of Sale and Purchase:

1. Buyer may not copy, alter, disassemble, or reverse-engineer the software. Buyer may not provide the software to a third party.
2. The inoRAC2P™ and accessories are guaranteed against defects in materials or workmanship for a period of one year from the date of shipment from inoLECT to the Buyer. Any inoRAC2P™ or accessory which is found to be defective will, at the discretion of inoLECT, be repaired or replaced.
3. inoLECT will not be responsible for the repair or replacement of any inoRAC2P™ or accessory damaged by user modification, negligence, abuse, improper application, or mishandling.
4. inoLECT is not responsible to the Buyer for any loss or claim of special or consequential damages arising from the use of the inoRAC2P™ or accessory. The product must not be used in applications where failure of the product could lead to physical harm or loss of human life. Buyer is responsible to conduct their own tests to meet the safety regulation of their respective industry.
5. inoLECT reserves the right to alter any feature or specification at any time.

**Notes to Buyer:** If you disagree with any of the above terms or conditions, you should promptly return the inoRAC2P™ and accessories to inoLECT within 30 days from the date of shipment from inoLECT.

## Copyright Notice and Disclaimer

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inoLECT, LLC (inoLECT) makes no representations or warranties with respect to the contents hereof. In addition, information contained herein are subject to change without notice. Every precaution has been taken in the preparation of this manual. Nevertheless, inoLECT assumes no responsibility for errors or omissions or any damages resulting from the use of the information contained in this publication.

### Revision

Revision No.	Date	Revision Description
P15 Rev. 0	2/20/2015	First Release

## 1.0 Technical Specifications

- Power Supply: 120 VAC (230 VAC for European models), 5A
- Dimensions (L x W x H):
  - Base: 42" x 26" x 62"
  - Portable Control Box: 20" x 16" x 9"
  - Portable Touchscreen Box: 13" x 10" x 6"
- Weight:
  - Base: 225 lbs.
  - Portable Control Box: 35 lbs.
  - Portable Touchscreen Box: 12 lbs.
- Minimum Height of Operation: 62" from top of floor
- Maximum Height of Operation: 84" from top of floor
- Minimum Working Clearance for Operation: 50"
- Maximum Breaker Travel During Racking: 11.5" without accessory

Remote operation is possible from 75' as standard. Longer lengths are available upon request.

## 1.1 Features

- Real-time feedback of entire racking process, including breaker position and racking torque in foot pounds.
- Equipment protection is optimized by limiting the level of available torque at each point in the racking process.
- Continuous breaker position monitoring insures the breaker has fully travelled the proper racking distance.
- Operation of rotary and lever driven racking in a single device.
- Operation of low and medium voltage circuit breakers in a single device.
- Customizable by the end user for racking of 100 different breaker types.

## 2.0 Description

The design of medium voltage metal clad switchgear and low voltage switchgear commonly incorporates a manual method of operating the circuit breakers while physically positioned in front of the circuit breaker including: circuit breaker racking operation, push button operation, and manual close/open operation.

The operation of switchgear circuit breakers is most often performed with the switchgear energized, due to typical operating requirements. These tasks potentially expose the operator to severe arc flash hazards. An electrical failure in the circuit breaker or switchgear during the racking process can result in serious injury or death of the operator.

The inoRAC2P™ is a device designed for the specific purpose of operating medium voltage and low voltage switchgear circuit breakers while allowing the operator to be at a safe distance from the energized switchgear and circuit breaker. The inoRAC2P™ utilizes the latest technology for position control and monitoring to protect the circuit breaker and switchgear from damage during operations.





 **2.1 inoRAC2™ Components**

<b>1</b>	Handle	<b>14</b>	Accessory Block
<b>2</b>	Control Panel Communication Port	<b>15</b>	Accessory Plug
<b>3</b>	Touch Panel Communication Port	<b>16</b>	Receptacle
<b>4</b>	Operator Portable Touch Panel		
<b>5</b>	Operator Portable Control Panel		
<b>6</b>	Brake Assembly		
<b>7</b>	Rear Wheels		
<b>8</b>	Switch		
<b>9</b>	Sliding Boom		
<b>10</b>	Fixed Boom		
<b>11</b>	Motor Carriage		
<b>12</b>	Base		
<b>13</b>	Casters		

## 3.0 Receiving

### IMPORTANT NOTICE TO CUSTOMER

The customer is responsible for informing the appropriate persons, including any third party, of these receiving instructions. The appropriate persons are those responsible for safely and correctly receiving shipments from our company.

### IMPORTANT NOTICE TO THE RECEIVER

The receiver is responsible for safely and correctly receiving shipments. Shipments are carefully packed and released in perfect condition. If the receiver signs the receiving paperwork (carrier's delivery receipt) to accept a shipment without correctly following our receiving instructions, they do so at their own risk.

All claims for loss, shortage, or damage on shipments sent FOB origin must be made against the carrier directly by the receiver or customer. Contact inoLECT, LLC regarding claims against a carrier for loss, damage, or shortage on shipments sent FOB destination. Delivery charges on shipments sent FOB destination include shipping, insurance, and logistics. However, an insurance claim for damage or shortage filed against a carrier on an incorrectly received shipment is rarely successful. Under no circumstances will inoLECT, LLC accept responsibility for any shortage or damage on incorrectly received shipments.

Complete the steps for PROPER INSPECTION and make any required notations BEFORE ACCEPTING this shipment. To be considered valid, any and all notations must appear on every copy of the receiving paperwork (carrier's delivery receipt) and be signed by the releasing agent (carrier's driver) and initialed by the receiver. If the shipment is refused, do NOT sign the receiving paperwork (carrier's delivery receipt). The shipment is considered ACCEPTED IN PERFECT CONDITION, except for any valid notations resulting from a proper inspection, when the receiver signs the receiving paperwork (carrier's delivery receipt).

### **STEPS FOR PROPER RECEIVING:**

- 1) Inspect the pallet and inoRAC2P™ for mishandling. Make notations of any damage to the packaging. Examples of damage include punctures, crushes, scrapes, broken boards, & other visible damage.
- 2) In rare cases of total loss, the receiver may refuse the entire shipment. In such a case, do not unpack the equipment and conclude the inspection with a notation of the date and the specific reason for refusal.

### **STEPS FOR PROPER UNPACKING AND INSPECTION:**

The inoRAC2P™ shall arrive as shown in the picture above, and consist of a Portable Touchscreen Panel box, a Portable Control Panel box and a Portable Base (this varies based on what was purchased).

- 1) Remove overall shrink wrap.
- 2) Cut (3) banding straps holding inoRAC2P™ on pallet.
- 3) Remove shrink wrap and shipping bracket from inoRAC2P™ motor carriage.
- 4) Slowly stand inoRAC2P™ upright to allow motor carriage to slide forward and remove from pallet.
- 5) Remove bubble wrap from inoRAC2P™ handle.
- 6) Remove shrink wrap from inoRAC2P™ boom.
- 7) Inspect the contents of every box in the shipment. Make notations of any shortage (the absence of content listed on the shipment packing list) or damage including breakage, chipped edges, deep scratches or scuffs. To be considered valid, these notations must reference the quantity, identity and damage or shortage specifics of all affected content. inoLECT must be notified within 48 hours of receipt of any damaged or missing accessories.

8) Move the inoRAC2P™ Portable Base, Control box and Touch Panel box to the intended location for use.

**STEPS FOR MOVING AND LIFTING THE BASE:**

**Method of Lifting 1:**

Optional Lifting Eyes for moving with crank or hoist.

Optional Lifting Eyes



**Method of Lifting 2:**  
Manual lifting using specific Lift Points.



#### 4.0 Circuit Breaker Racking Instructions

1. Connect 120 VAC (230 VAC for European models) to the inoRAC2P™ via the receptacle on the side of the Portable Control box. **DO NOT POWER ON THE UNIT AT THIS TIME.**
2. Connect one end of the YELLOW and BLACK connection cables to the Control box communication ports (see diagram, #2) and the other end of each to the YELLOW receptacles on the Portable Base.

3. Connect one end of the BLACK Ethernet cable to the Touchscreen Panel communication port (see diagram, #4) and the other end to the BLACK Ethernet port on the Control box.
4. Turn on the inoRAC2P™ by placing the ON/OFF switch, located on the front of the Control box, into the “ON” position.
5. Start the inoRAC2P™ by pressing the “Racking Unit Control” button on the Touchscreen Panel.
6. Ensure the inoRAC2P™ is not connected to a circuit breaker. Ensure the inoRAC2™ is free to operate all accessories. Follow the Operator Panel instructions for calibrating the inoRAC2P™.
7. Select the operation to be performed, “Rack Breaker” on the Operator Panel.
8. Follow the Operator Panel instructions for selecting the breaker to be racked.
9. Confirm the object circuit breaker is open position via a visual inspection.
10. Adjust the inoRAC2P™ height to the level of the circuit breaker racking mechanism via the “Raise” and “Lower” buttons on the Operator Panel.
11. Align the inoRAC2P™ breaker connection accessory to the circuit breaker racking mechanism via the “Jog CW” and “Jog CCW” buttons on the Operator Panel.
12. Connect the inoRAC2P™ to the circuit breaker racking mechanism & set the brakes (see diagram, #6).
13. Move to a safe location outside the arc flash hazard boundary with the Touchscreen Panel box.
14. Follow the Operator Panel instructions for racking the circuit breaker.
15. Disconnect the inoRAC2P™ from the circuit breaker.



16. Turn off the inoRAC2P™ by placing the ON/OFF switch on the side of the control enclosure into the “OFF” position.

#### **4.1 Pushbutton Operation Instructions**

1. Connect 120 VAC (230 VAC for European models) to the inoRAC2P™ via the receptacle on the side of the Portable Control box. DO NOT POWER ON THE UNIT AT THIS TIME.
2. Connect one end of the YELLOW and BLACK connection cables to the Control box communication ports (see diagram, #2) and the other end of each to the YELLOW receptacle on the Portable Base.
3. Connect one end of the BLACK Ethernet cable to the Touchscreen Panel communication port (see diagram, #4) and the other end to the BLACK Ethernet port on the Control box.
4. Turn on the inoRAC2P™ by placing the ON/OFF switch, located on the front of the Control box, into the “ON” position.
5. Start the inoRAC2P™ by pressing the “Racking Unit Control” button on the Touchscreen Panel.
6. Ensure the inoRAC2P™ is not connected to a circuit breaker. Ensure the inoRAC2™ is free to operate all accessories. Follow the Operator Panel instructions for calibrating the inoRAC2P™.
7. Select the operation to be performed, “Operate Pushbutton” on the Operator Panel.
8. Adjust the inoRAC2P™ height to the level of the pushbutton to press via the “Raise” and “Lower” buttons on the Operator Panel.
9. Place the inoRAC2P™ 2” from the pushbutton to press.
10. Set the brakes on the inoRAC2P™.

11. Move to a safe location outside the arc flash hazard boundary with the Operator Panel.
12. Follow the Operator Panel instructions for pressing the pushbutton.
13. Turn off the inoRAC2P™ by placing the ON/OFF switch on the side of the control enclosure into the “OFF” position.

## 4.2 User Setup Instructions

1. Connect 120 VAC (230 VAC for European models) to the inoRAC2P™ via the receptacle on the side of the Portable Control box. **DO NOT POWER ON THE UNIT AT THIS TIME.**
2. Connect one end of the YELLOW and BLACK connection cables to the Control box communication port (see diagram, #2) and the other end of each to the YELLOW receptacles on the Portable Base.
3. Connect one end of the BLACK Ethernet cable to the Touchscreen Panel communication port (see diagram, #4) and the other end to the BLACK Ethernet port on the Control box.
4. Turn on the inoRAC2P™ by placing the ON/OFF switch, located on the front of the Control box, into the “ON” position.
5. Start the inoRAC2P™ by pressing the “Racking Unit Control” button on the Touchscreen Panel.
  
6. Ensure the inoRAC2P™ is not connected to a circuit breaker. Ensure the inoRAC2™ is free to operate all accessories. Follow the Operator Panel instructions for calibrating the inoRAC2P™.

7. Select the operation to be performed, “BUTTON SETUP” on the Operator Panel.
8. A Logon screen will appear. The User is “Admin”. The Password is “9330”. Log in.
9. Re-select the operation to be performed, “BUTTON SETUP” on the Operator Panel.
10. Press the text on the respective button to edit the text. An editor will appear. Type the desired text via the on screen keyboard. Hit the return key to accept.
  - a. The labels for each of the eleven screens can be changed.
11. Press the number next to the respective button to edit the pointer. An editor will appear. Type the desired number via the on screen keyboard. Hit the return key to accept.
  - a. This number is the pointer to the specific breaker profile in the master breaker list. Contact inoLECT for the pointer for your specific breakers.
  - b. Improper pointers will likely result in improper and unsafe breaker racking operation.
12. Press the “OK”, and “NO” buttons to show or not show the respective button.
13. Follow the on screen instructions for saving the button setup.

### **4.3 Profile Breaker Instructions**

This button allows for new breaker profiles to be created. Contact inoLECT for instructions.

## 4.4 Calibrate Accessory Actuators Instructions

1. Connect the required accessories to the inoRAC2™.
2. Connect 120 VAC (230 VAC for European models) to the inoRAC2™ via the receptacle on the side of the control enclosure.
3. Turn on the inoRAC2™ by placing the ON/OFF switch on the side of the control enclosure into the “ON” position.
4. Start the inoRAC2™ by pressing the “Racking Unit Control” button on the Operator Panel.
5. Ensure the inoRAC2™ is not connected to a circuit breaker. Ensure the inoRAC2™ is free to operate all accessories.
6. Select “CALIBRATE ACCESSORY ACTUATORS” on the Operator Panel.
7. Acknowledge each of the three checklist questions by selecting the “NO” buttons to the right of each item. After all three checklist items are acknowledged, the “CALIBRATE” button will display.
8. Select the “CALIBRATE” button. “CALIBRATING” will be displayed for approximately 45 seconds.
9. When “CALIBRATION COMPLETE” is displayed, the actuator of the connected accessory’s position reference is calibrated and the accessory is ready for use.

## 5.0 Maintenance

The inoRAC2P™ is designed to be a very low maintenance device. However as with all equipment it should be checked for proper operation and condition on a periodic basis.

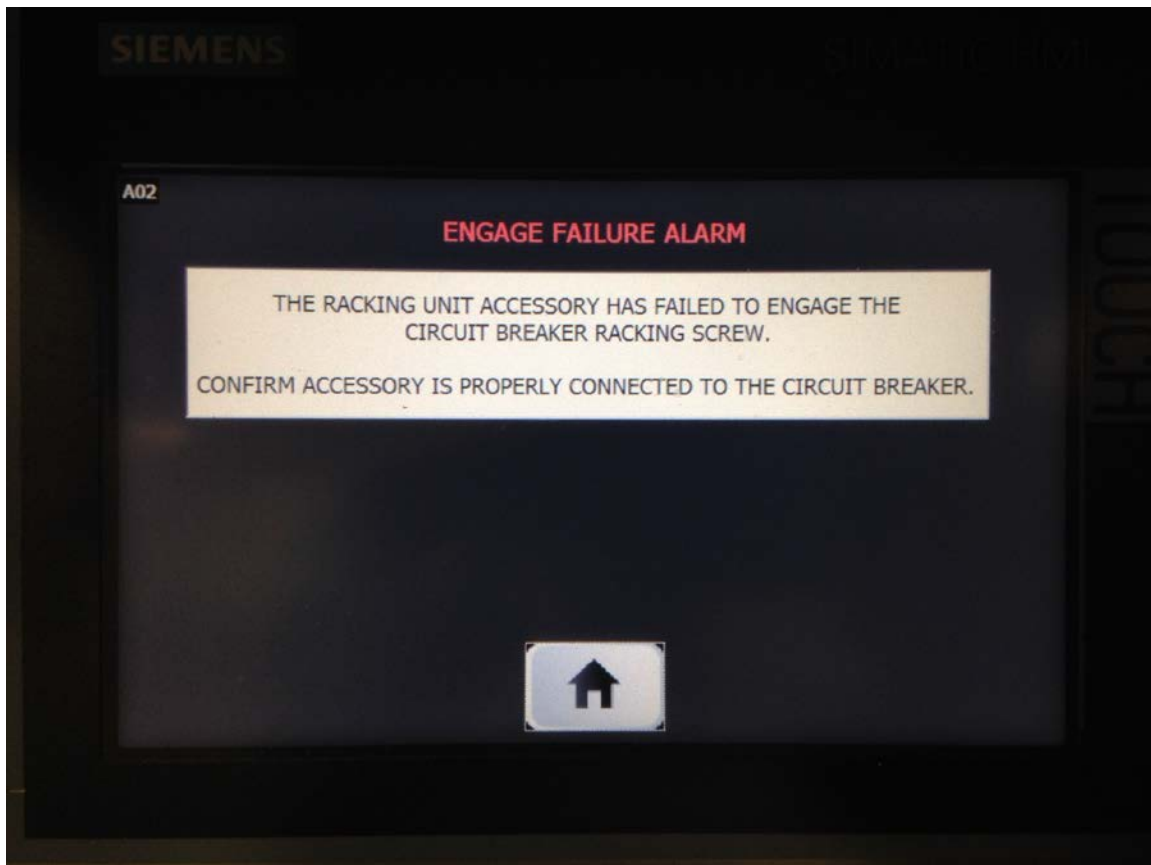
The following maintenance items should be performed on a periodic basis.

- Power up the inoRAC2P™ to operate a circuit breaker without connecting the inoRAC2P™ to an actual circuit breaker.
  - Check that all hardware and fasteners are in good condition and check for tightness.
  - Lubricate actuator lift chain.
  - Mobilgrease® 28 lubricant is recommended.
  - Lubricate wheels and casters.
  - Mobilgrease® 28 lubricant is recommended.
  - Check actuator lift track slides for hardware tightness and for smooth, free operation. Lubrication is not required.
  - Check motor base slides for hardware tightness and for smooth, free operation. Lubrication is not required.
  - Check linear springs for wear or damage. Check hardware for tightness.
  - Check brakes for loose or damaged hardware. Check brakes for proper adjustment.
  - Check the cable to the operators touch screen panel for wear or damage.
- 
- Inspect the control components in the control box for loose or damaged items and for loose or damaged wiring.

The first maintenance period should be 6 months after receiving inoRAC2P™ and then continue at 12 month intervals.

▶ 5.1 Alarms and Troubleshooting

**Engage Failure Alarm**



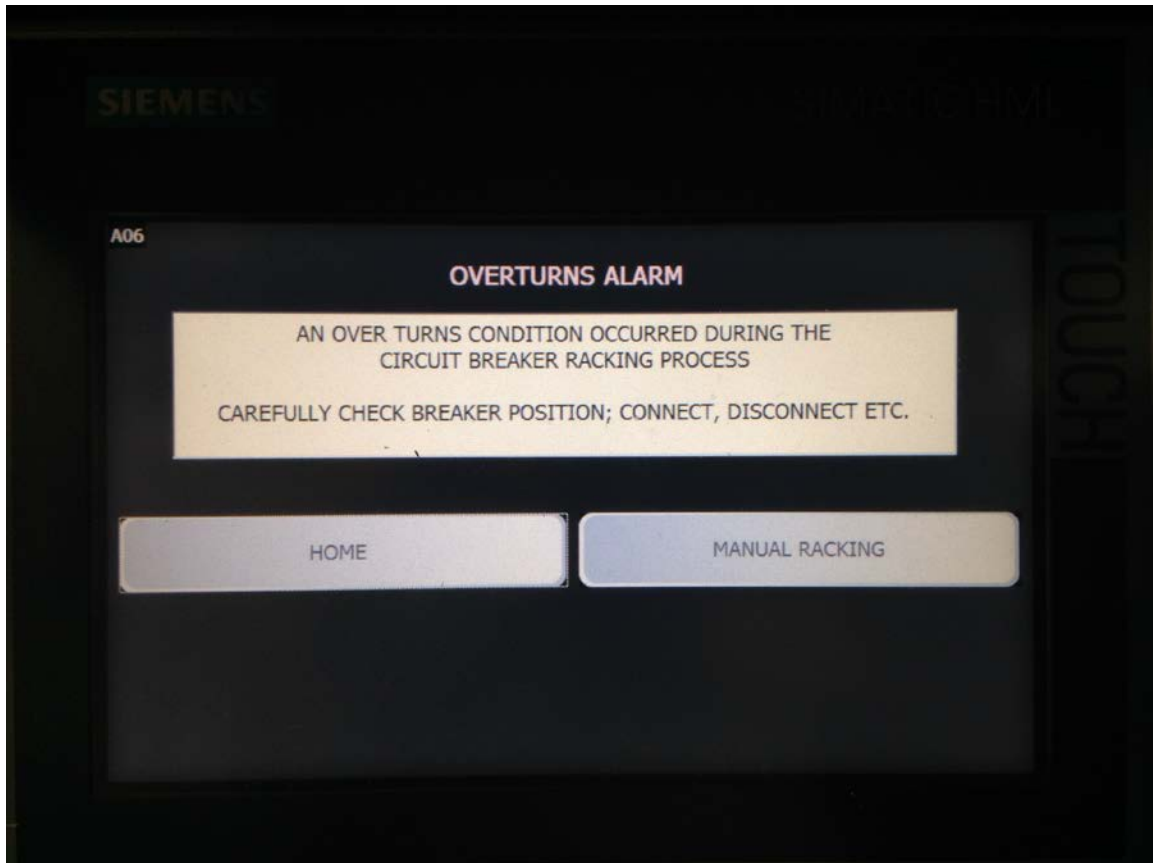
**Problem:**

The Unit has failed to engage the breaker racking screw.

**Solution:**

Confirm accessory is properly connected to the circuit breaker and retry.

## Over-Turns Alarm



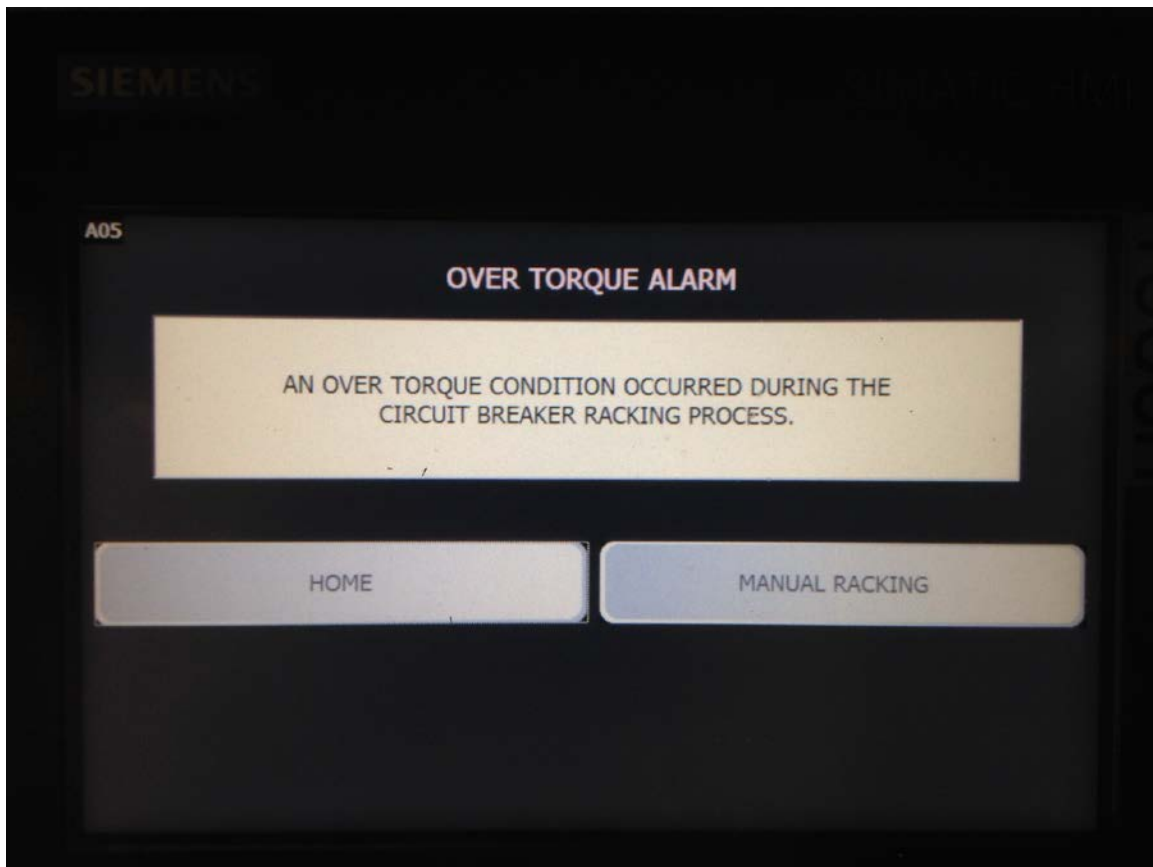
**Problem:**

The unit racked past the number of turns without recognizing the required torque.

**Solution:**

Check the position and retry racking procedure.

## Over-Torque Alarm



**Problem:**

The unit experienced over-torque conditions.

**Solution:**

Disconnect the unit and check the switchgear and breakers for mechanical obstructions.



 **6.0 Spare Parts List**

<i>Part Number</i>	<i>Description</i>
99-1039	Receptacle
99-1044	Control Power Transformer
99-1045	Rectifier
99-1047	On/Off Switch
99-1050	Fuse Holder
99-1051	10A Fuse
99-1054	Cover
99-1070	Caster Wheels
99-1074	Linear Spring
99-1080	Brake Toggle
99-1341	Touch Panel

99-1348	Variable Frequency Drive
99-1349	Programmable Logic Controller
99-1352	1 Analog Input Signal Board
99-1353	CPU Memory Card
99-1357	Terminal Block
99-1358	5 Point Terminal Plug
99-1359	7 Point Terminal Plug
99-1360	8 Point Terminal Plug

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**9330 North Interstate Dr.  
Baton Rouge, LA 70809**

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