RTB Series

Cord Reel Manual

Includes all models beginning in KH’s ORB, ORA, and RTB Heavy Duty Retractable Power Cord Reel Series.

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Safety Information Responsibility
All owner, operator, and maintenance personnel must read and understand all manuals associated with this product before installation, operation, or maintenance.

The manual provides information on the recommended installation, operation, and maintenance of this product. Failure to read and follow the information provided could cause harm to yourself or others and/or cause product damage. No one should install, operate, or attempt maintenance of this product prior to familiarizing themselves with the information in this manual.

Safety Messages
The following safety messages are used in this manual to alert you to specific and important safety related information.

**CAUTION**
- CAUTION indicates unsafe actions or situations that have the potential to cause injury, and/or minor equipment or property damage.

**DANGER**
- DANGER indicates hazards that have the potential to cause severe personal injury or death.

**WARNING**
- WARNING indicates unsafe actions or situations that have the potential to cause severe injury, death, and/or major equipment or property damage.

**NOTE**
- NOTE is used to alert you to installation, operation, programming, or maintenance information that is important, but not hazard related.
SECTION 2 - SAFETY

Electrical Warnings
Properly ground this equipment before use in accordance with both the National Electric Code and local electrical codes and ordinances.

Disconnect the electrical power from the cord reel before any service functions are performed.

Do not use this cord reel for loads greater than the current rating listed on the label and voltage greater than 300V with SJOW-A cable OR 600V with SOW-A cable. The ampacity (current) rating of the cable must be in accordance with the National Electric Code.

Electrical wiring on the reel must be done by a qualified electrician.

Operational Warnings
Exercise care when handling the cord reel during normal operation. This cord reel has a rotating spool powered by springs under tension.

Do not allow cable to retract without restraining the retraction speed.

Do not disassemble the spring motor for any reason. Serious personal injury could result. This cord reel is equipped with springs under tension. Contact the factory for assistance:

Call: 1-716-312-0088

Maintenance Warnings
Do not use cable different from that for which the reel is intended. Changes in diameter, weight per foot, length of cable or flexibility will affect the operation of the reel.

Mounting hardware and fasteners should be installed to maintain tightness under vibration and checked periodically to assure tightness.

Overhead installation mountings should be such that the reel is not suspended by bolts in tension. A safety chain or cable is strongly recommended to minimize damage and/or possible injury in the event of mounting failure.

WARNING: Modification of this equipment may cause excessive wear and will void the warranty. Contact the manufacturer regarding changes or modifications of equipment which could affect reliability or safety.
SECTION 2 - SAFETY

Electrical Rating
Reels equipped with or without cable.

Cord reels equipped with cable are rated and should not be used at voltages and/or amperes above the rating on the reel. Please consult factory prior to making any changes in volts and amps of cable, as a change could affect reliability or safety.

<table>
<thead>
<tr>
<th>Location of Ring</th>
<th>No. of Conductor</th>
<th>Base Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>top</td>
<td>Ground</td>
<td>Green</td>
</tr>
<tr>
<td>2nd from top</td>
<td>2</td>
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</tr>
<tr>
<td>3rd from top</td>
<td>3</td>
<td>White</td>
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<tr>
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<td>4</td>
<td>Red</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Cable AWG / # of Cond.</th>
<th>Ampacity</th>
</tr>
</thead>
<tbody>
<tr>
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<td>10</td>
</tr>
<tr>
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<td>15</td>
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<td>12/3</td>
<td>20</td>
</tr>
<tr>
<td>12/4</td>
<td>16</td>
</tr>
</tbody>
</table>

Labels & Marking
Every cord reel is marked with a label which includes the KH Industries name and logo, the product catalog number, the individual product serial number, NEMA rating, Amps, Volts, Watts and Cable Footage.

The UL / CSA Listing mark is applied to reels that comply with the applicable requirements and identified with the authorized mark.

The maximum cable footage, amperage and voltage rating for every cable reel supplied without cable is marked on the KH Industries Identification Label. The actual cable installed should not differ from what is indicated on the KH Industries label. If the cable must be different please consult the factory prior to installing the cable to ensure the change will not affect the reliability of the reel or the safety of the people working with the cord reel.
**SECTION 2 - OVERVIEW**

Exploded View

### RTB Series Ball Stops

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>KH200-00287</td>
<td>For cable O.D. ranges 0.188” to 0.438”</td>
</tr>
</tbody>
</table>

**Type B**

<table>
<thead>
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<th>Part No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>KH200-00269</td>
<td>For cable O.D. ranges 0.438” to 0.624”</td>
</tr>
<tr>
<td>KH200-00007</td>
<td>For cable O.D. ranges 0.625” to 0.749”</td>
</tr>
<tr>
<td>KH200-00322</td>
<td>For cable O.D. ranges 0.750” to 1.05”</td>
</tr>
</tbody>
</table>
SECTION 3 - INSTALLATION

Application Types

Lift Applications
The cable is lifted vertically in lift applications. The reel is normally designed to handle only the total weight of the cable. Some lift applications may require a ball stop and ratchet to control the length of cable to be retracted. See Figure 8-1.

Drag Applications
The reel is mounted on a stationary object and is required to drag the cable over the surface to the reel. The cable is supported by the ground or some type of cable tray. A ball stop may be required. All RTB Series reels sold with cable have a ball stop installed on the reel. See Figure 8-2.

Stretch Applications
The cable is suspended without any intermediate support. Stretch reels generally require a line pull equal to two times the weight of the cable, which allows approximately 10% sag at full extension. On long applications where sag cannot be tolerated, it is sometimes desirable to put supports at intervals of 5 to 10 feet. See Figure 8-3.

Retrieve Applications
The reel is mounted on the moving object and winds up or pays out the cable as the machine approaches or moves away from the fixed end. See Figure 8-4.
### Mounting

**Standard Mounting**  
The reel may be mounted by bolting the base to any flat surface which is structurally sound enough to support it and the forces of winding and unwinding the cable.

The spool drum must rotate on a horizontal axis.

The reel should be oriented so that the cable extends perpendicular to the rotation of the spool. The cable deflection should not exceed 15° to either side of center. See Figure 9-5.

If deflection is constant to either side of the reel and operation is impaired, re-mount the reel. See Figure 9-5. If the total angle of deflection exceeds 30° a Pivot Base should be used, otherwise excessive cable wear and unreliable operation will result.

We recommend a safety chain for all overhead installations. Attach the safety chain using the 0.39 hole provided in the base.

---

**Cable Deflection with Roller Guide**

![Figure 9-5](image)
SECTION 3 - INSTALLATION

Pivot Base Mounting (Optional Accessory)
All RTB Series Cord Reels can be furnished with a pivot base to allow the reel to rotate and keep the extended cable perpendicular to the application. See Figure 10-1.

The PVB Pivot Base will rotate up to 345°. Travel can be limited to 90°, 180°, or 270° by installing an additional roll pin in the appropriate available hole.

A pivot base is required for carousel or loop track applications.

When a pivot base is used the reel must be mounted horizontally (“ceiling” or “floor” mounted).

The roller guide should be mounted to require the cable to travel perpendicular to the axis of rotation. This will guard against cable twisting and ensure effective swivel action from the pivot base.

Swing mount and swivel base available, consult factory.

Roller Guides
All RTB Series units are equipped with a roller guide. The guide’s function is to center the cable on the spool and to help the reel wrap cable more evenly. See Figure 10-2.

The cable should not bear against either end of the spool during winding as this will tend to inhibit level winding of the cable.

The guide should be secured at the best of twelve possible positions so that a minimum change of direction occurs at the guide; otherwise, cable life will be reduced.

A max 15° angle from guide arm center to cable pay out from reel is suggested.

The guide arm is shipped attached to the reel. The guide must be located and secured in the most appropriate position with the 5/16-18 x 5/8” hex head screw and lock washer provided, prior to making any electrical connections.
Ratchet

**Ratchet Lock**
The ratchet lock can be engaged or disengaged, depending upon the application. Reels are sent from factory with ratchet lock engaged. See **Figure 11-1**.

**Operation with Ratchet**
The ratchet pawl is spring loaded. It is designed to function in all acceptable mounting configurations. See **Figure 11-1**.

A slight pull on cable will disengage the ratchet. See **Figure 11-1**.

**Operation without Ratchet**
Disengage the ratchet by pivoting the lock-out bar to the lower position. This will remove the ratchet pawl from the path of the ratchet plate. Locate the dimple on the lock-out bar in the hole provided. See **Figure 11-1**.

---

**WARNING**

- Do not engage the ratchet abruptly. Sudden engagement may cause excessive shock loads to the ratchet pawl.

---

**Figure 11-1**

Push on this end to rotate lockout arm to engage or disengage position.

Push to release dimple from hole latching arm in engaged position.
Cable Installation

Either of two methods for installing cable on the reel may be used. The first method is to simply lay the cable out straight along the path of travel and wrap onto the reel. The second method requires using a support for the cable being wrapped (see Figure 13-1, next page). In either method, it is important that the cable not twist or loop.

1. Remove the 4 screws securing the outer flange. Remove outer flange, gasket and drum from the remaining assembly.
2. Strip back approximately 6” of cable jacket.
3. Feed cable through the watertight and the drum, so that 1” of the jacket is through the watertight. Secure a cable-tie 1/4” from the end of the jacket and tighten watertight. Replace inner flange gasket if damaged (see Figure 13-3, next page).
4. Cut the individual wires such that the white and green wires extend 3” beyond the cable jacket and the red and black wire extend 6” beyond the cable jacket. Strip approximately 1/2” of insulation. Insert each cable wire and its corresponding slip ring brush wire into the toggle lock wire connector. See Figure 12-1.
5. Perform a continuity check to verify circuits.
6. Attach outer flange gasket and outer flange to drum (replace outer flange gasket if damaged). Attach with 10-32 x 3-1/2” screws. Longer screws will damage the reel.
7. Wrap new cable on drum spool.
8. Adjust spring tension by following spring tension adjustment procedure (page 14).

Figure 12-1

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Plastic Washer</td>
</tr>
<tr>
<td>2</td>
<td>Bearing</td>
</tr>
<tr>
<td>3</td>
<td>Cotter Pin</td>
</tr>
<tr>
<td>4</td>
<td>Ground Ring</td>
</tr>
<tr>
<td>5</td>
<td>Ring 2</td>
</tr>
<tr>
<td>6</td>
<td>Ring 3</td>
</tr>
<tr>
<td>7</td>
<td>Ring 4</td>
</tr>
</tbody>
</table>

Figure 12-2

<table>
<thead>
<tr>
<th>Location of Ring</th>
<th>No. of Conductor</th>
<th>Base Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>top</td>
<td>Ground</td>
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<tr>
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<td>3</td>
<td>White</td>
</tr>
<tr>
<td>bottom</td>
<td>4</td>
<td>Red</td>
</tr>
</tbody>
</table>
**Figure 13-1**

**Direction of Travel**

- **Correct**
- **Incorrect**

**Figure 13-2**

**Power Connection**

- **Cable Tie**
- **Spring Motor Shaft**
- **Power Supply**
- **Feeder Cord**
- **Water Tight**

**NOTE:**
1. After installing cable tie slide cable back into shaft so cable tie goes in contact with water tight
2. Tighten water tight so cable is firmly secured to reel

**Figure 13-3**

**Spool Drum Connection**

- **Cable Tie**
- **Spool Drum**
- **Water Tight**
- **Cable Installed on Drum**
- **.25" -.38"**
- **6"**

**NOTE:**
1. After spool cable is connected to slip ring tighten water tight so cable is firmly secured to drum
SECTION 3 - INSTALLATION

Feed Cord Connection
Power supply should have overcurrent protection to prevent overheating of the reel and cable.

Follow procedure in Section 5 - Maintenance if feed cord is not installed on reel.

1. Connect feed cord to power supply, per NEC and local codes.

Spring Tension Adjustment
To assure that the cable will retract properly and operate under the correct tension, the reel should be tested.

1. Install cable on drum but do not connect the free end of cable. Securely mount reel before testing.
2. Pull the cable out approximately 20 - 30 feet and allow it to rewind. This procedure should be repeated 5 to 10 times in order to set the spring.
3. Walk the cable back to the reel during the spring tension adjusting process.

WARNING
• Do not allow cable to retract without restraining the retraction speed. Always maintain two full cable wraps on drum at maximum cable extension, size cable accordingly.

4. With all the cable wound on the reel, grasp the end of the cable and rotate the drum and cable together in a clockwise direction in order to pre-tension the spring. Generally, one full turn is adequate for most applications. Use no more than two full turns for pre-tension. See Figure 14-1.

5. Feed the end of the cable through the cable guide and pull the cable out the required length.

NOTE
• The number of spool revolutions including the pre-tension turns should not exceed 26 full turns on models with model numbers beginning with RTBB or 30 turns on models with model numbers beginning with RTBA. Consult factory or your representative if number of spool turns are not within parameter.

6. Repeat steps if necessary to add or decrease tension. See Figure 14-1.

NOTE
• All reels with factory installed cable have one full pre-wrap on the reel, but has not had the spring tension adjustment process completed.

Figure 14-1

Adding Spring Tension
Rotate Spool while Holding Cable to Test the Spring Tension
Adding Spring Tension

Viewing from Outer Flange
Viewing from Outer Flange
• Do not exceed the voltage or ampere rating of the reel. Overheating, fire, damage to equipment or personal injury could result.
• Do not allow cable to retract without restraining the retraction speed.
• Operate the reel within the cable size and length and spring tensioning limits for which it was intended.
• Two wraps of cable should remain on the reel at maximum extension to avoid excessive tension on the cable entrance watertight.
• The spring should not be wound to its last two turns at maximum payout to avoid over-stressing the spring, thus reducing its life or damaging the reel.
• Keep the reel and cable clean to avoid excessive wear and damage.
• Arrange for maintenance service if damage is found on the cable or reel.
• Cable should be fully retracted when not in service to maximize spring life.
SECTION 5 - MAINTENANCE

BE SURE THE POWER IS OFF FOR ALL MAINTENANCE.

Lubrication
- All springs and bearings are lubricated for life at the factory. Additional lubrication should not be required.
- Do not apply any lubricants or solvent cleaning agents to slip ring, brush or insulator surfaces.

Inspections
- Periodically check the reel for any loose or missing fasteners. Tighten or replace as necessary.

NOTE
- Do not over tighten, this will cause fasteners to snap.
- The slip ring assembly should be checked periodically as follows:
  » Clean to remove dust and dirt from the slip ring housing area and all slip ring assembly and brush surfaces.
  » Inspect cable for damage or wear which would make it unsafe to use.

Slip Ring & Feed Cord Replacement
The slip ring assembly should be replaced, not rebuilt, if it becomes damaged.

1. Remove the 4 screws securing the outer flange. Remove outer flange and gasket from remaining assembly. Remove or unwrap the cable from the drum and lay it next to the reel. See Figure 16-1.
2. Disconnect the wires from the spool cable. Remove the drum (black plastic tube) from the reel and place next to the slip ring.
3. Loosen feed cord watertight located at the shaft end.
4. Remove the brush block from the slip ring by removing the cotter pin and washer at the top of the slip ring assembly. Remove the 2 screws securing the slip ring to the shaft. See Figure 16-1.
5. Remove the slip ring from the shaft while feeding in the feed cord through the shaft. Cut wires if they are butt spliced or disconnect connectors if locking wire connectors are used. Reinsert the washer and cotter pin after removal of the slip ring from the shaft to keep the assembly together.
6. Carefully and thoroughly clean the inside surfaces of both flanges and the drum. Inspect both gaskets for damage and replace as necessary. **Caution:** Damaged gaskets may affect UL / CSA rating of reel.
7. Remove old feed cord and insert approximately 5” -10” of new feeder cord through the watertight and shaft. Secure cable-tie as shown in Figure 13-2 (page 13).
8. Install inner gasket.
9. Connect the slip ring leads to the feed cord with the provided wire connectors and install the slip ring on the shaft. Ensure the wire connectors are outside the shaft and under the slip ring body before securing the slip ring to the shaft. Be careful not to over tighten or strip the Phillips head screws.
10. Install the 2 screws to secure the slip ring to the shaft.
11. For remaining assembly, follow Cable Installation and Spring Tension Adjustment in Section 3.
Cable Replacement
Replacement cable should be the same size and length as existing cable. Any variations to cable specifications should be pre-approved by the factory.

1. Disconnect all electrical service to the reel before replacing the cable as per Lock-Out/Tag-Out procedures outlined in OSHA section 1910.147.

2. Disconnect the terminated service end of the cable and allow the cable to retract onto spool. Make sure the end of the cable is through the roller guide. Ensure all spring tension has been relieved by manually rotating the spool counter clockwise as viewed from outer flange.

3. Remove the 4 screws securing the outer flange. Remove outer flange and gasket from remaining assembly. Remove or unwrap the cable from the drum and lay it next to the reel.

4. Disconnect the wires from the spool cable. Remove the drum (black plastic tube) from the reel and place next to the slip ring.

5. Loosen feed cord watertight located at the shaft end.

6. Remove the brush block from the slip ring by removing the cotter pin and washer at the top of the slip ring assembly. Remove the 2 screws securing the slip ring to the shaft (see exploded view).

7. Remove the slip ring from the shaft while feeding in the feed cord through the shaft. Cut wires if they are butt spliced or disconnect connectors if locking wire connectors are used. Reinsert the washer and cotter pin after removal of the slip ring from the shaft to keep the assembly together.

8. Remove cable.

9. Carefully and thoroughly clean the inside surfaces of both flanges and the drum. Inspect both gaskets for damage and replace as necessary.

**CAUTION**

- Damaged gaskets may affect UL / CSA rating of reel.

10. Install inner gasket.

11. For remaining assembly, follow Cable Installation and Spring Tension Adjustment in Section 3.
Spring Motor Replacement

**CAUTION**

- Do not open the spring motor or personal injury may result.

1. The spring replacement process is determined by the spring configuration and cannot be performed in the field. The entire spring motor assembly must be replaced as a unit. See Spring Motor Selection Chart (Figure 19-1) for proper spring motor selection.

2. Disconnect all electrical power to the reel before beginning any maintenance or service.

3. Remove the slip ring and feed cord from the reel by following the procedure in Slip Ring & Feed Cord Replacement section.

4. Remove the watertight and coupling from the shaft.

5. Remove the spring motor by unscrewing the shaft from the mounting base.

6. Re-assemble spring reel in reverse order with the new spring motor. Note the following:
   - A. Shaft must be fully seated on base before installing coupling and watertight.
   - B. Verify drum, slip ring, and ratchet teeth orientation as per Figure 19-1.
   - C. Adjust spring tension.
### Spring Motor Selection Chart

<table>
<thead>
<tr>
<th>Cable Type</th>
<th>Cable Lengths That Use This Spring Motor</th>
<th>Spring Motor Part Number (Spring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14/3 SJEOW-A</td>
<td>Up to 50’</td>
<td>RTPRT-SMG50</td>
</tr>
<tr>
<td>12/3 SJOW-A</td>
<td>Up to 50’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>14/4 SJEOW-A</td>
<td>Up to 50’</td>
<td>RTPRT-SMG50</td>
</tr>
<tr>
<td>12/4 SJOW-A</td>
<td>Up to 40’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>16/3 SOW-A</td>
<td>Up to 50’</td>
<td>RTPRT-SMG50</td>
</tr>
<tr>
<td>14/3 SOW-A</td>
<td>Up to 40’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>12/3 SOW-A</td>
<td>Up to 30’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>16/4 SOW-A</td>
<td>Up to 50’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>14/4 SOW-A</td>
<td>Up to 35’</td>
<td>RTPRT-SMK50</td>
</tr>
<tr>
<td>12/4 SOW-A</td>
<td>Up to 25’</td>
<td>RTPRT-SMK50</td>
</tr>
</tbody>
</table>

Figure 19-1
## SECTION 6 - TROUBLESHOOTING

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reel will not retract cable but has some tension</td>
<td>1) Improper pretension</td>
<td>1) See tension adjustment section</td>
</tr>
<tr>
<td></td>
<td>2) Incorrect reel for application (lift vs. stretch)</td>
<td>2) Quantify application vs. reel selection</td>
</tr>
<tr>
<td></td>
<td>3) Improper cable or cable length installed</td>
<td>3) Install correct cable type and length</td>
</tr>
<tr>
<td></td>
<td>4) Cable guide adjustment</td>
<td>4) Check guide alignment</td>
</tr>
<tr>
<td>Reel does not have spring tension</td>
<td>1) Broken spring. *Quantify application to prevent reoccurrence</td>
<td>1) Replace spring motor</td>
</tr>
<tr>
<td>Ratchet will not engage</td>
<td>1) Broken ratchet pawl spring</td>
<td>1) Replace ratchet pawl spring</td>
</tr>
<tr>
<td></td>
<td>2) Lock-out option arm disengaged</td>
<td>2) Engage lock-out arm</td>
</tr>
<tr>
<td>Ratchet will not disengage</td>
<td>1) Over-extension of reel</td>
<td>1) Manually rotate reel spool to disengage ratchet. Do not over-extend. (Guide adjustment may prevent lock-up when over-extended)</td>
</tr>
<tr>
<td></td>
<td>2) Adjust ball stop</td>
<td></td>
</tr>
<tr>
<td>Cable wraps improperly (uneven wrapping, wraps above or jumps flange)</td>
<td>1) Reel mounting not level</td>
<td>1) Mount reel on level surface</td>
</tr>
<tr>
<td></td>
<td>2) Cable retraction rate too high</td>
<td>2) Maintain steady retraction rate</td>
</tr>
<tr>
<td></td>
<td>3) Cable guide out of adjustment</td>
<td>3) Properly adjust cable guide</td>
</tr>
<tr>
<td></td>
<td>4) Improper cable or cable length installed</td>
<td>4) Install correct cable type and length</td>
</tr>
<tr>
<td>Cable twisting or knotting</td>
<td>1) Improperly installed cable</td>
<td>1) See cable installation section in IOM</td>
</tr>
<tr>
<td></td>
<td>2) Cable rubbing on or bending around fixed object</td>
<td>2) Check roller guide for function and cable pay out path</td>
</tr>
<tr>
<td></td>
<td>3) Excessive spring tension</td>
<td>3) Quantify application vs. reel selection Also check pretension</td>
</tr>
<tr>
<td></td>
<td>4) Inadequate anchoring of cable</td>
<td>4) Adjust anchoring method (i.e. add strain relief)</td>
</tr>
<tr>
<td>Open or intermittent circuit</td>
<td>1) Inadequate connection</td>
<td>1) Check all termination points</td>
</tr>
<tr>
<td></td>
<td>2) Loss of brush contact to slip ring</td>
<td>2) Check brush wear, spring tension and alignment</td>
</tr>
<tr>
<td></td>
<td>3) Cable defective</td>
<td>3) Perform continuity check on cable termination points</td>
</tr>
<tr>
<td>Circuit trips and/or Pitted burned rings or brushes</td>
<td>1) Inadequate amp rating of reel selection</td>
<td>1) Quantify application requirements vs. reel &amp; cable rating</td>
</tr>
<tr>
<td>Circuit arcing</td>
<td>1) Amp or voltage above rating of reel</td>
<td>1) Quantify application requirements vs. reel &amp; cable rating</td>
</tr>
<tr>
<td></td>
<td>2) Excessive carbon dust accumulation</td>
<td>2) Clean dust from inside slip ring</td>
</tr>
<tr>
<td></td>
<td>3) Water or moisture in slip ring</td>
<td>3) Check gasket seal</td>
</tr>
<tr>
<td></td>
<td>4) Loss of brush to ring contact</td>
<td>4) Replace brush spring</td>
</tr>
</tbody>
</table>
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