1.0 Safety Instructions
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7.0 Replacement Parts List
INSUL-8 CORPORATION

The technical data and images which appear in this manual are for informational purposes only. NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE CREATED BY THE DESCRIPTIONS AND DEPICTIONS OF THE PRODUCTS SHOWN IN THIS MANUAL. Insul-8 makes no warranty (and assumes no liability) as to function of equipment or operation of systems built according to customer design or of the ability of any of its products to interface, operate or function with any portions of customer systems not provided by Insul-8.

Seller agrees to repair or exchange the goods sold hereunder necessitated by reason of defective workmanship and material discovered and reported to Seller within one year after shipment of such goods to Buyer.

Except where the nature of the defect is such that it is appropriate, in Seller's judgement, to effect repairs on site. Seller's obligation hereunder to remedy defects shall be limited to repairing or replacing (at Seller's option) FOB point of original shipment by Seller, any part returned to Seller at the risk and cost of Buyer. Defective parts replaced by Seller shall become the property of Seller.

Seller shall only be obligated to make such repair or replacement of the goods which have been used by Buyer only in service recommended by Seller and altered only as authorized by Seller. Seller is not responsible for defects which arise from improper installation, neglect, or improper use or from normal wear and tear.

Additionally, Seller's obligation shall be limited by the manufacturer's warranty, (and shall be not further warranted by Seller) for all parts procured from others according to published data, specifications or performance information not designed by or for Seller.

Seller further agrees to replace or at Seller's option to provide a refund of the sales price of any goods that did not conform to applicable specifications or which differ from that agreed to be supplied which non-conformity is discovered and forthwith reported to Seller within thirty (30) days after shipment to Buyer. Seller's obligation to replace or refund the purchase price for non-conforming goods shall arise once Buyer returns such good FOB point of original shipment by Seller at the risk and cost of Buyer. Goods replaced by Seller shall become property of Seller.

There is no guarantee or warranty as to anything made or sold by Seller, or any service performed, except as to title and freedom from encumbrances and, except as herein expressly stated and particularly, and without limiting the foregoing, there is no guarantee or warranty, express or implied, of merchantability or of fitness for any particular purpose or against claim of infringement or the like.

Seller makes no warranty (and assumes no liability) as to function of equipment or operation of systems built to Buyer's design or of the ability of any goods to interface, operate or function with any portions of Buyer's system not provided by Seller.

Seller's liability on any claim, whether in contract, or (including negligence), or otherwise, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair, replacement or use of any products or services shall in no case exceed the price paid for the product or services or any part thereof which give rise to the claim. In no event shall Seller be liable for consequential, special, incidental or other damages, nor shall Seller be liable in respect to personal injury or damage to property on the subject matter hereof unless attributable to gross misconduct of Seller, which shall mean an act of omission by Seller demonstrating reckless disregard of the foreseeable consequences thereof.

Seller is not responsible for incorrect choice of models or where products are used in excess of their rated and recommended capacities and design functions or under abnormal conditions. Seller assumes no liability for loss of time, damage or injuries to property or persons resulting from the use of Seller's products. Buyer shall hold Seller harmless from all liability, claims, suits and expenses in connection with loss or damage resulting from operation of products, utilization of services, respectively, of Seller and shall defend any suit or action which might arise there from in Buyer's name - provided that Seller shall have the right to elect to defend any such suit or action for the account of Buyer. The foregoing shall be the exclusive remedies of the buyer and all persons and entities claiming through the Buyer.
1.0 Safety

1.0.1 ATTENTION: Read this entire booklet prior to attempting any installation and/or maintenance.

1.1 Electrical Warnings

1.1.1 Install and ground the slip ring and the entire unit in accordance with the National Electric Code and local codes and/or ordinances.

1.1.2 DANGER: Hazard of electrical shock or burn. Always disconnect the power from the collector ring before attempting to perform any service function. Follow lock out/tag-out procedures as outlined in OSHA section 1910.147 where appropriate.

1.1.3 Do not use this slip ring with electrical loads greater than the rated current and voltage. (See page 8).

1.1.4 Information regarding the current and voltage rating of each slip ring is recorded on a tag permanently fastened to the ring assembly.

1.2 Operational Warnings

1.2.1 Slip rings must be enclosed and protected from any contact by personnel. Means for the provision of this protection is the responsibility of the user. Various enclosure styles are available from Insul-8.

1.2.2 WARNING: Modification of this equipment may cause excessive wear or failure and will void the warranty.

1.2.3 WARNING: Modification may cause safety and fire hazards. Contact the manufacturer regarding any modifications which could affect safety or reliability.

1.3 Maintenance Warnings

1.3.1 Exercise care while servicing, adjusting, and operating the slip ring.

1.3.2 Periodically check all fasteners and hardware to assure tightness.

1.3.3 Install all mounting fasteners and hardware so as to maintain tightness under vibration.

1.3.4 If you have any questions about the use or the installation of your R-Series Slip Ring that are not answered in this documentation contact the factory for assistance.

U.S. 1-800-521-4888
Canada: 1-800-667-2487

1.4 Specifications & Listings

1.4.1 R-Series Slip Ring products are built to UL specifications but are not generally or certified or listed by an independent certifying or regulatory body.

1.4.2 The following specifications apply to all R-Series Slip Rings.

1.4.2.1 R-Series Slip Rings are intended for industrial use and require a permanent mounting means.

1.4.2.2 Maximum RPM for units with out ball bearings is 125. Maximum for units with ball bearings is 500 RPM.

1.5 Temperature & Ampere / Voltage Ratings

1.5.1 R-Series Slip Rings withstand a maximum ambient temperature of 220°F.

1.5.2 The actual ampacity of the Slip Ring assembly may be affected by the type and size of the core lead wire (refer to NEC Table 310-16, 17, 18, 19 and applicable notes).

1.6 Markings

1.6.1 Every slip ring is marked with a label on the outboard bearing (or enclosure) which includes the Insul-8 name and logo, the product catalog number and the individual product serial number.

1.6.2 The marking on slip rings include the maximum amperage and voltage.
### 2.0 Installation

#### 2.1 Handling

2.1.1 Carry unit by core attachment or through core rod for vertical support.

2.1.2 Carry unit by horizontally supporting outboard bearings.

#### 2.2 Application Types

2.2.1 Slip ring assemblies can be purchased without an enclosure. User must enclose the ring appropriately to meet safety codes and to protect the ring.

#### 2.3 Mounting & Connections

2.3.1 Slip Rings w/o Enclosure or with Wrap Around Shroud (R-U)

2.3.1.1 Install the slip ring assembly on the shaft and lock it into place with set screws on the drive collar.

2.3.1.2 Make connections at lugs on the brush holders and ends of core lead wires or buss bars. Be sure connections on the brush assemblies do not interfere or exert tension on the brush holders. We recommend using flexible wire for brush and core terminations. All wire sizes and types must be appropriate to the required ampacity and voltage (refer to NEC Table 310-16, 17, 18, 19 and applicable notes).

2.3.1.3 Bring a pin, bolt, torque arm, or suitable member to hold the brush carriage stationary (or rotate it) into the 0.53" dia. holes provided on the outboard bearing. To avoid putting strain on the bearings, the drive connection is to be a loose link or floating type connection.

#### 2.3.2 Warning: During installation of slip ring with enclosure, maintain minimum 3/8" air space between enclosure and uninsulated terminal connections.

#### 2.3.3 Slip Ring in Revolving Enclosure (RAR)

2.3.3.1 Mount shaft flange or internal thread on shaft to rotating or stationary point. Incoming core leads pass up through hollow of shaft and connect to slip ring core leads using crimp connections.

2.3.3.2 Incoming leads to brush carriage of slip ring come through NPT hub provided and connect to screw connectors on brush holders (see 2.2.1.2).

2.3.3.3 Enclosure can be held stationary (or rotated) by means of the incoming brush cable or flexible conduit. Larger enclosures may require user provided drive arm connected in a flexible manner to the enclosure.
2.3.4 Slip Ring in Swivel Enclosures (RAQ/RBQ)

2.3.4.1 Mount enclosure using the mounting straps or mounting feet provided.

2.3.4.2 Connect incoming core leads through the swivel elbow provided and onto ring core leads using crimp connectors. Swivel elbow is either held stationary or rotated with incoming cable or flexible conduit.

2.3.5 Explosion Proof Enclosures (XRU, XSU, and XSU with Optional Air Pass)

2.3.5.1 For all explosion proof enclosures, user must seal incoming and outgoing electrical conduit according to the National Electric Code.

2.3.5.2 Note: Loose connection required for rotating part on XSU with Optional Air Pass.
3.0 Maintenance

3.1 Lubrication
3.1.1 All bearings are lubricated for life at the factory. Additional lubrication should not be required.

3.1.2 CAUTION: Do not apply any lubricants or solvent cleaning agents to any part of the slip ring.

3.2 Inspections
3.2.1 Make the first inspection shortly after installation and before operation. Make continuing inspections on a regular basis after every 200-400 hours of operation under normal conditions.

3.2.2 Brush Holders
3.2.2.1 Inspect brush holders for proper alignment. Locate brush holders so that the entire brush contact surface rides squarely on the ring with the brush moving freely in the brush holder. Position brush holders so the brush makes contact with the middle of the conductor and is not offset.

3.2.2.2 Check brush holder clamps for tightness. Set clamp bolts at 10 in-lb. max.

3.2.2.3 Inspect brush terminations at the holder to assure that no external force is imposed on the holder. We recommend flexible or soft wire leads for these terminations. Use external clamps to support the entire weight of the leads.

3.2.3 Brushes
3.2.3.1 Inspect for wear. If the distance from the top of the insulator to the lower part of the brush spring is 0.093” or less, replace the brush.

3.2.3.2 Inspect brush contact surface by removing the brush. Remove surface dirt, oxidation, pitting, or other contaminants (with a wire brush).

3.2.3.3 To remove and replace brush:
   1) Remove the clamp screw from the brush holder
   2) Remove the screw from the brush lead
   3) Remove the brush holder
   4) Replace the brush
   5) Reassemble

3.3.5 Brush Fit Inspection
3.3.5.1 Brushes must run at 90° ± 3° square on the rings. If brush is not square, adjust position of brush holder on brush post.

3.3.5.2 Brushes need not run on the center of the rings, but there should be no forceful friction against the insulators.

3.3.5.3 The brush spring cross-bar must be seated in the brush slot.

3.2.4 Brush Springs
3.2.4.1 Inspect and test brush springs to assure uniform brush pressure. If brush springs fall below recommended pressure, replace entire brush holder.

<table>
<thead>
<tr>
<th>Brush</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1.0 lb. min</td>
</tr>
<tr>
<td>35</td>
<td>1.5 lbs. min</td>
</tr>
<tr>
<td>75</td>
<td>3.0 lbs. min</td>
</tr>
</tbody>
</table>
3.2.5 Rings
3.2.5.1 Inspect the ring surface for dirt, oxidation, or other contaminants. A properly operating ring will have a film that appears burnished in color with a darker surrounding color where the brushes track. If the ring requires cleaning, order Slip Ring Polishing Kit Part No. 41286.

3.2.6 Electrical Connections
3.2.6.1 Inspect all electrical connections for corrosion and tightness. Loose and/or corroded terminations will cause a concentration of excessive heat.

3.2.7 Brush Rigging
3.2.7.1 Brush posts are supported between two outboard bearings. The brush posts extend to the outboard bearings and are secured by a notch in the outboard bearing. The notch prevents rotation of the brush post.

3.2.7.2 Spacing between the outboard bearings is critical to assure the free rotation of the brush rigging. The brush posts are cut to an exact length in order to provide the proper spacing. Locate the outboard bearings against the insulator and have a 0.20” clearance without deformation of the material.

Caution: Do not overtighten the outboard brush post jam nuts. Make a final check to assure there is no binding of the outboard brush rigging or binding of the brushes with insulator barriers.

3.3.8 Enclosure Inspection
3.3.8.1 Moisture is a major cause of slip ring deterioration. Water will corrode parts and breakdown insulation. Dust and dirt present within the enclosure will effect the proper operation of the assembly. Most dusts cause excessive brush and slip ring wear, and conductive dust, if allowed to accumulate will form a path for short circuiting.

3.3.8.2 A properly designed NEMA 4 enclosure will be dust tight and watertight. However, NEMA 4 enclosures do not eliminate internal condensation. Condensation can be eliminated with the addition of a breather, drain and a thermostatically controlled heater.

3.3.8.3 Periodically perform and inspection by removing the enclosure and checking for condensation, water and dust collection. If contaminants are found, wipe the enclosure and the assembly with a lint free cloth. If the problem persists, take steps to remedy the leakage or condensation problem.

4.0 Storage
4.1 When storing the slip ring, keep it at room temperature in a clean, dry protective place. Place self-contained or bagged absorbent material in the collector ring enclosure during extended periods of storage. Remove absorbent material before putting collector ring into operation.

5.0 Serial Number Record
5.1 Make the following information available when ordering replacement parts or discussing the slip ring with the factory by recording the information in the spaces provided here. This information is located on your packing slip, factory invoice, and serial number tag.

Catalog No. Slip Ring: _____________________
Serial No.: ______________________________
Date of Purchase: ________________________

6.0 Troubleshooting
6.1 Some possible problems are addressed in the table here, otherwise, contact the factory at the numbers provided on the back page.

<table>
<thead>
<tr>
<th>Problem</th>
<th>What to Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent Signal</td>
<td>Verify brush wear per Section 3.2.3</td>
</tr>
<tr>
<td>or Loss of Signal</td>
<td>Check spring pressure per Section 3.2.4</td>
</tr>
<tr>
<td></td>
<td>Check contact surfaces for cleanness.</td>
</tr>
<tr>
<td></td>
<td>(Ring Polishing Kit available. See Replacement Parts.)</td>
</tr>
<tr>
<td></td>
<td>Visually check for spring fit and function. Adjust or replace as necessary</td>
</tr>
<tr>
<td></td>
<td>Check core wiring for short circuit</td>
</tr>
</tbody>
</table>
### 7.0 Replacement Parts

<table>
<thead>
<tr>
<th>Slip Ring Bore Size</th>
<th>Amp / Volts</th>
<th>Brush Holders</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.50” &amp; 2.5”, 3.0”, 3.5”, 4.0”, 4.5”, 5.0”, 6.0”, 8.0”, 10.0”</td>
<td>15 / 250</td>
<td>Single</td>
</tr>
<tr>
<td>28000</td>
<td>02807</td>
<td></td>
</tr>
<tr>
<td>15 / 250</td>
<td>35 / 250</td>
<td>Double</td>
</tr>
<tr>
<td>28000</td>
<td>02808</td>
<td></td>
</tr>
<tr>
<td>28000</td>
<td>02808</td>
<td></td>
</tr>
<tr>
<td>35 / 600</td>
<td>02801</td>
<td>02808</td>
</tr>
<tr>
<td>30067A</td>
<td>30067B</td>
<td>30067C</td>
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<td>02845</td>
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<tr>
<td>110 / 600</td>
<td>02803</td>
<td>02810</td>
</tr>
<tr>
<td>150 / 600</td>
<td>02804</td>
<td>02811</td>
</tr>
<tr>
<td>225 / 600</td>
<td>02805</td>
<td>02805 (x2)</td>
</tr>
<tr>
<td>300 / 600</td>
<td>02806</td>
<td>02806 (x2)</td>
</tr>
<tr>
<td>N/A DRA3-20A-2500</td>
<td>DRA3-20A-4000</td>
<td>DRA3-20A-8000</td>
</tr>
<tr>
<td>N/A 03309</td>
<td>03247</td>
<td>03247</td>
</tr>
<tr>
<td>N/A 03248</td>
<td>03248</td>
<td>03248</td>
</tr>
</tbody>
</table>

* Consult the Factory for Custom Application Configurations

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**Two 35 Amp Brushes replace one 75 Amp Brush**