Cable Reel Manual
Series 5159PR

CONDUCTIX wampfler

Conductix Incorporated

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RECORD

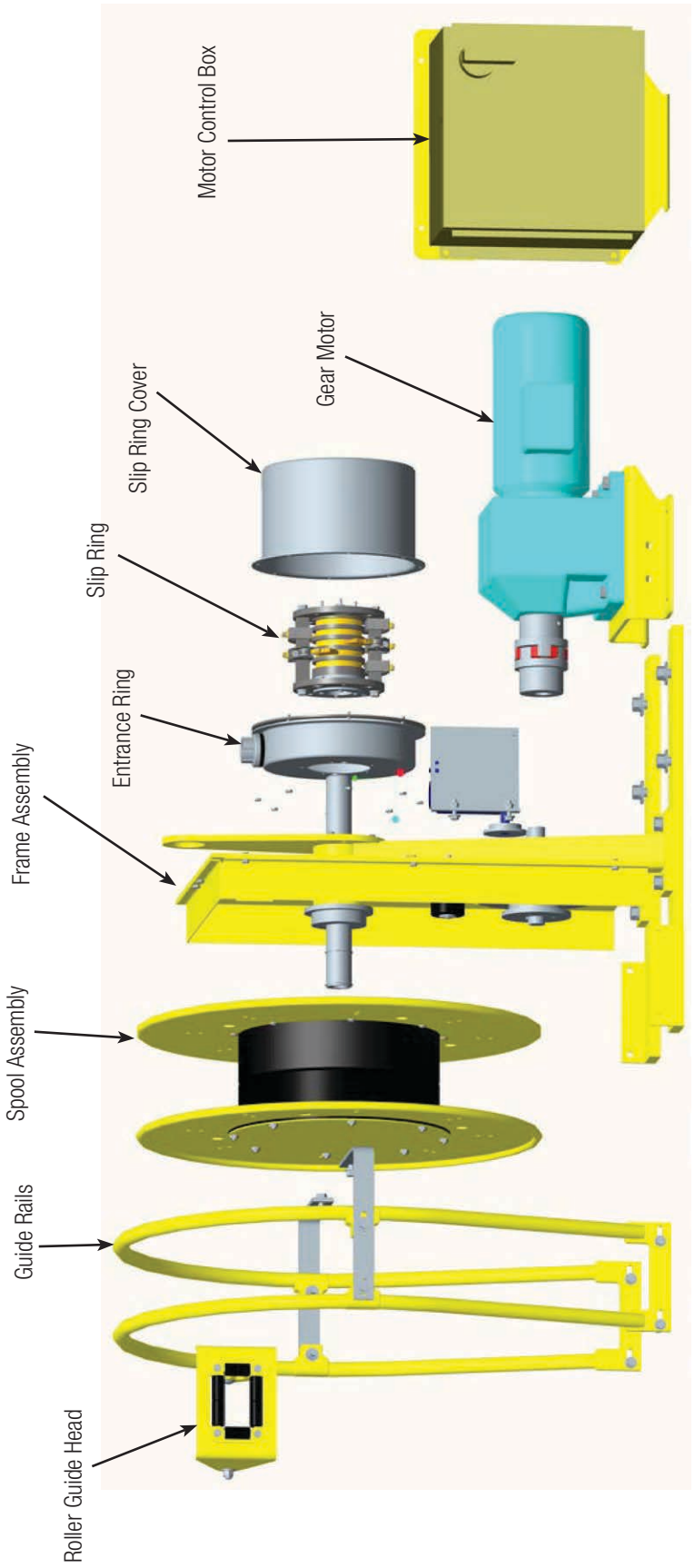
The catalog number of the reel and the serial number of the reel are required when ordering replacement parts or discussing the reel with the factory. Please record this information now in the spaces provided below.

CATALOG NO. OF REEL _____

SERIAL NO. _____

DATE INSTALLED _____

5159PR Overview



1.0 Safety

1.1 Electrical Warnings

1.1.1 This equipment should be properly grounded before use, in accordance with both the National Electric Code and local codes and ordinances.

1.1.2 The electrical power should be disconnected from the cable reel before any service functions are performed.

1.1.3 The cable reel must not be used for loads greater than the voltage and current rating of the cable. The ampacity rating of the cable reel shall be in accordance with the National Electric Code.

1.2 Operational Warnings

1.2.1 Exercise care when handling the cable reel during normal operation.

1.2.2 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.

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

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

1.3 Maintenance Warnings

1.3.1 **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.

1.4 Specifications & Listings

1.4.1 The following specifications apply to all 5159PR Series Cable Reels.

1.4.1.1 5159PR Series Cable Reels are intended for commercial / industrial use and are provided with a permanent mounting base.

1.4.1.2 5159PR Series Cable Reels are built to NEMA 4 Specifications and are suitable for indoor/ outdoor use.

1.4.1.3 Ampere capacity of the 5159PR Series Reels range from 10 to 225 Amperes at 600 Volts maximum. Reels are available in 3 to 37 conductor configuration.

1.4.1.4 5159PR Series Cable Reels are available with optional features which increase serviceability. Options include: pivot base, junction box, and limit switch.

1.4.1.5 Custom power and signal circuit slip rings using silver plated rings and silver graphite brushes are available upon request.

1.5 Electrical Rating

1.5.1 Reels not equipped with Cable

1.5.1.1 Reels not equipped with flexible cable are rated in amperes and volts for the cable intended or the slip ring capacity. Consult table on Page 6 for appropriate cable/conductor combinations.

1.5.1.2 The rating of the cable should not be greater than the ampacity of the slip ring circuit. See Slip Ring Replacement Chart on Page 13. Consult Table on Page 6. for appropriate cable/conductor combinations.

1.5.2 Reels Equipped with Cable

1.5.2.1 Reels equipped with flexible cable should not be used at voltages and/or amperages above the rating of the reel or cable.

1.6 Labels & Marking

1.6.1 Every cable reel is marked with a label on the frame which includes the Conductix name and logo, the product catalog number and the individual product serial number.

1.6.2 Reels equipped with cable:

1.6.2.1 The marking on reels equipped with a flexible cable shall include the current and voltage ratings.

1.6.3 Reels not equipped with cable:

1.6.3.1 The rating of the reel not equipped with cable is completed upon installation and is based on the wire size and number on conductors. (See Tables 1.6 below). The marking shall include the following:

__# The type (SOW, W, G-GC, etc.),
__# The AWG cable size,
__# The maximum length of cable with which the reel is intended for use.

1.6.3.2 The maximum cable footage, amperage and voltage rating for every cable reel supplied without cable is marked on the Conductix Identification Label. The actual cable installed should not differ from what is indicated on the Conductix 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 reel.

Type W (90ºC)	
Cable	Ampacity
W 8/2	50
W 8/3	50
W 8/4	45
W 6/2	65
W 6/3	65
W 6/4	55
W 4/2	75
W 4/3	75
W 4/4	65
W 2/2	110
W 2/3	110
W 2/4	100
W 1/2	140
W 1/3	130
W 1/4	110
W 1/0 2	150
W 1/0 3	145
W 1/0 4	130
W 2/0 2	195
W 2/0 3	170
W 2/0 4	150
W 3/0 2	225
W 3/0 3	195
W 3/0 4	170
W 4/0 2	260
W 4/0 3	220
W 4/0 4	190

Type G-GC (90ºC)	
Cable	Ampacity
G 8/3	50
G 6/3	65
G 4/3	85
G 2/3	115
G 1/3	130
G 1/0 3	145
G 2/0 3	170
G 3/0 3	195
G 4/0 3	220

Type SOW-A, SOOW-A (90º C)			
Cable	Ampacity	Cable	Ampacity
16/2	10	12/2	20
16/3	10	12/3	20
16/4	8	12/4	16
16/5	8	12/5	16
16/6	8	12/6	16
16/7	7	12/7	14
16/8	7	12/8	14
16/10	7	12/10	14
16/12	7	12/12	14
16/14	7	12/14	14
16/16	7	12/16	14
16/20	7	12/20	14
16/24	6	12/24	14
16/30	6	12/30	12
16/36	6	10/2	25
14/2	15	10/3	25
14/3	15	10/4	20
14/4	12	10/5	20
14/5	12	10/6	20
14/6	12	10/7	17.5
14/7	10.5	10/8	17.5
14/8	10.5	10/10	12.5
14/10	10.5	10/12	12.5
14/12	10.5	10/14	12.5
14/14	10.5	10/16	12.5
14/16	10.5	10/20	12.5
14/20	10.5	10/24	12.5
14/24	10.5	10/30	12.5
14/30	9	-	-
14/36	6	-	-

Color Code Chart		
Cond. No.	Base Color	Tracer Color
1	Black	-
2	White	-
3	Red	-
4	Green	-
5	Orange	-
6	Blue	-
7	White	Black
8	Red	Black
9	Green	Black
10	Orange	Black
11	Blue	Black
12	Black	White
13	Red	White
14	Green	White
15	Blue	White
16	Black	Red
17	White	Red
18	Orange	Red
19	Blue	Red
20	Red	Green
21	Orange	Green
22	Black	-
23	White	-
24	Red	-
25	Green	-
26	Orange	-
27	Blue	-
28	White	Black
29	Red	Black
30	Green	Black
31	Orange	Black
32	Blue	Black
33	Black	White
34	Red	White
35	Green	White
36	Blue	White

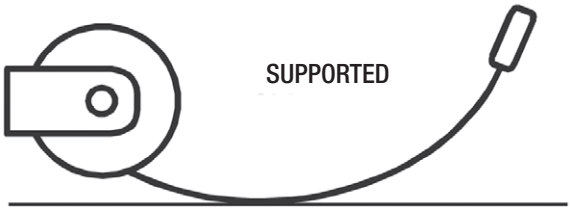
2.0 Installation

2.1 Application Types

2.1.1 Stretch Applications

2.1.1.1 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 6% sag. On long applications where sag cannot be tolerated, it is sometimes desirable to put supports at intervals of 5 to 10 feet.

2.1.3 Drag Applications

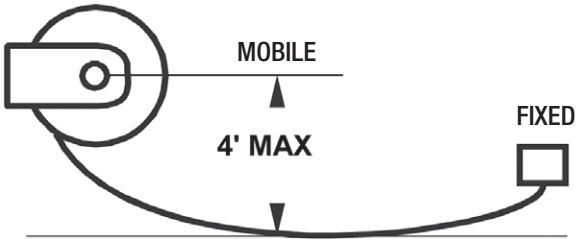


2.1.3.1 The reel is mounted on a stationary object and is required to drag the cable over the surface to the reel. A ratchet and/or ball stop may be desired.

2.1.2 Lift Applications

2.1.2.1 The cable is lifted vertically. The reel is normally designed to handle only the total weight of the cable. Some lift applications may require a ratchet and/or ball stop to control the retracted length of cable.

2.1.4 Retrieve Applications



2.1.4.1 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 power source. Vertical Retrieve applications are possible.

2.2 Mounting

2.2.1 Standard Mounting

2.2.1.1 Mount the base of the reel to any flat surface which is structurally sound enough to support the reel and the forces of winding and unwinding the cable.

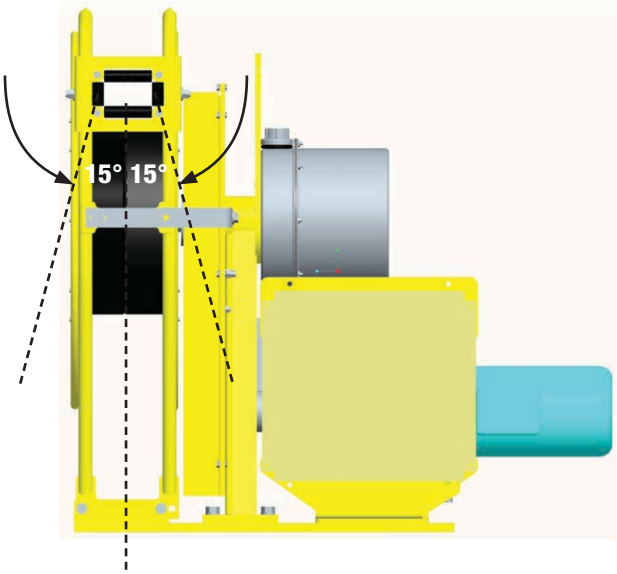
2.2.1.2 The spool drum must be mounted such that the axis of rotation is horizontal.

2.2.1.3 The cable should extend perpendicular to the rotation of the spool. The total cable deflection should not exceed 15° to either side of the centerline of the spool.

2.2.1.4 If deflection is constant to either side of the reel and operation is impaired, re-mount the reel.

2.2.1.5 If the angle of deflection exceeds 30°, a Pivot Base or two way payout guide should be used, otherwise excessive cable wear and unreliable operation will result.

2.2.1.6 A safety chain is recommended for all overhead installations. Attach the safety chain using the 0.39" hole provided in the base.



2.3 Guide Rails

2.3.1 Guide Rails provide a barrier between the cable and the rotating spool flange rim. They also act as a safety barrier for installations where human contact with the rotating spool flange is likely to occur.

2.3.2 Guide Rails provide additional assurance that the cable will wrap efficiently on the spool for applications involving rigorous motion.

2.3.3 Guide Rails can act as a substitute for the roller guide in applications that require a two-way pay-out.

2.4 Roller Guides

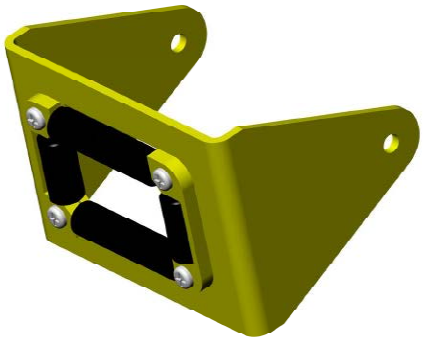
2.4.1 All 5159PR Series Cable Reels are equipped with an adjustable roller guide. The guide's function is to center the cable on the spool and to help the reel wrap cable more evenly.

2.4.2 Level winding is inhibited by the cable bearing against either of the spool flanges during operation. The Roller Guide helps to alleviate this condition.

2.4.3 The guide consists of the guide head. The guide must be adjusted and secured prior to terminating any electrical connections.

2.4.4 The guide should be secured at the position that causes the least change of cable direction to occur at the guide; otherwise, cable life will be reduced.

2.4.4.1 The guide head is mounted to the guide rails with the use of two clamps and four 1/4 - 20 carriage bolts. Mount the guide head on the guide rails in the desired position by placing one clamp on each side of each rail and placing the guide head around the outside of the clamps. Insert the bolts from the inside outward such that the head is towards the center of the spool. This will prevent the cable from rubbing on any square edges. Install lock washers and nuts. The guide head my be tipped through 90° of travel to allow for minimum cable drag through the roller guide.

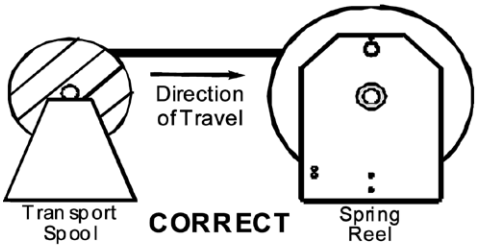


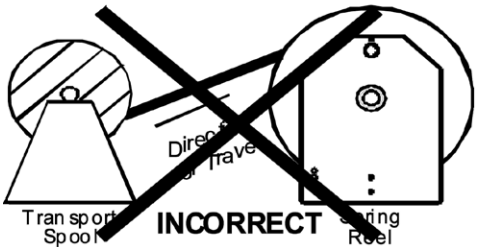
2.5 Cable Installation & Replacement

2.5.1 Cable Removal

2.5.1.1 Disconnect all power as per Lock-Out / Tag-Out procedures as outlined in OSHA section 1910.147.

2.5.1.2 If an existing cable is being replaced you must first remove the old cable.





2.5.1.3 Remove Spool Drum Cover Plate.

2.5.1.4 Mark existing cable connections on terminals.

2.5.1.5 Disconnect wires at the Drum Terminals.

2.5.1.6 Loosen the cable clamp and release the cable.

2.5.1.7 Loosen strain relief/watertight in the recessed Inlet Box on the spool.

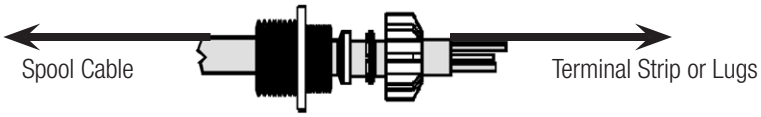
2.5.1.8 Pull out and discard old cable.

2.5.2 Cable Installation

2.5.2.1 Prepare the cable to be loaded on to the reel. Support the cable as shown, or lay the full length of cable out in the direction of travel. Make sure the cable will lay flat by removing any twist from the cable.

2.5.2.2 Insert the end of the cable to be connected to the slip ring through the guide and through the recessed inlet box on the spool. Pull enough cable through the inlet box and cable clamp to allow unrestrained connections to the terminals.

2.5.2.3 Unscrew the two parts of the strain relief / watertight and slide both sections and the neoprene grommet over the end of the cable as shown. Be sure to keep the fastening end last.



2.5.3 Cable Connections

2.5.3.1 Connect the cable to the terminals.

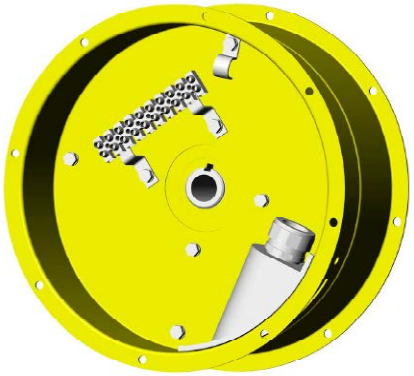
2.5.3.2 Secure the watertight connector. Jacketed cable should intrude 1-2 inches into the drum.

2.5.4 Cable Loading

2.5.4.1 Energize the motor to wind the cable onto the spool by rotating the spool counterclockwise, as viewed from the spool side. (For standard rotation reels).

2.5.4.2 Verify all connections before initiating or restoring electrical power to the cable reel.

2.5.4.3 Visually inspect both reel and cable after initial electrification.



2.6 Slip Ring Replacement

2.6.1 Disconnect and secure the electrical power as per Lock-Out/Tag-Out procedure outlined in OSHA 1910.147.

2.6.2 Remove the Slip Ring cover.

2.6.3 Disconnect the Feeder Cable Connections from the Slip Ring Brush Terminals. Mark/Note the existing cable connections.

2.6.4 Disconnect the Slip Ring Core Leads from the spool terminals.

2.6.5 Loosen the two 1/4-20 Set Screws in the drive collar using a 1/8" Hex (Allen) Wrench.

2.6.6 Remove the Slip Ring from the end of the spool shaft.

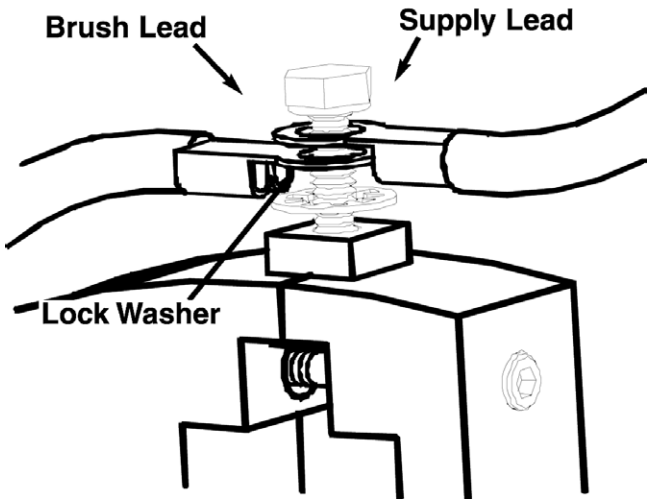
2.6.7 After removing the Slip Ring use a file or emery cloth to remove the set screw burrs from the spool shaft. If the burrs are not removed the Slip Ring may not slide on the shaft. Be sure to clean out all filings and dust from inside the enclosure.

2.6.8 Install the new Slip Ring on the shaft.

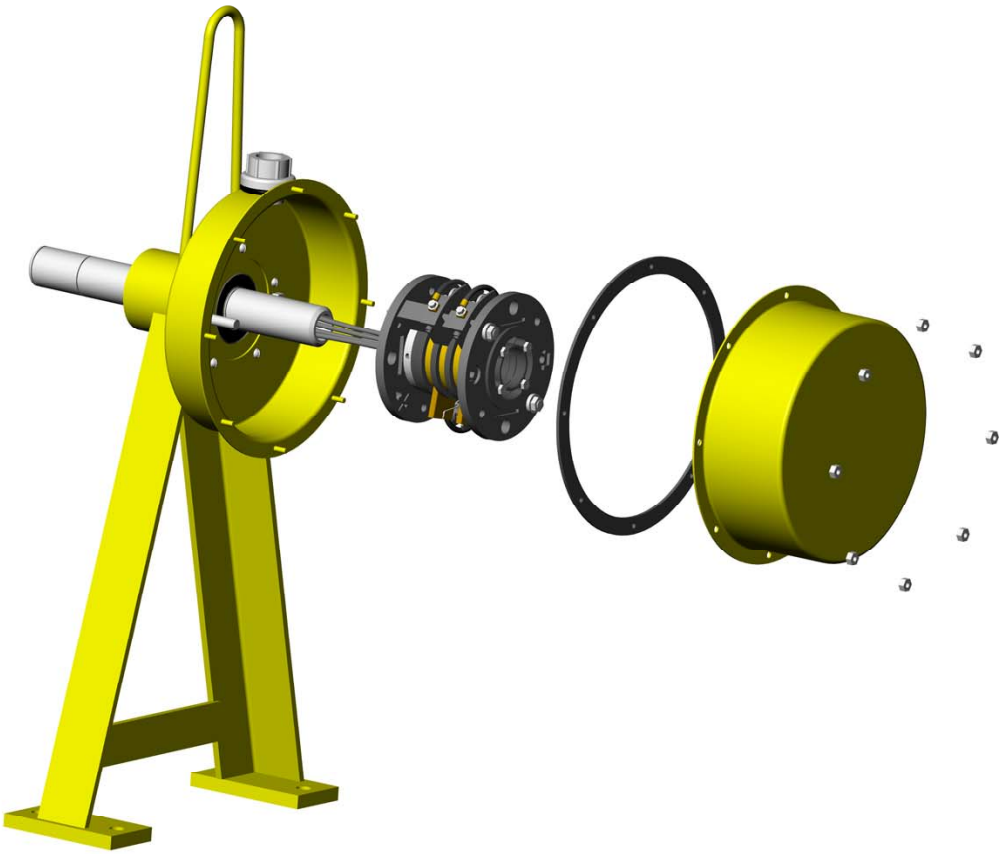
2.6.9 Be sure the hole in the Slip Ring Outboard Bearing closest to Brush #2 fits over the Drive Pin. The Drive Pin must extend through the hole.

2.6.10 Secure Set Screws to 7 ft-lbs.

2.6.11 Connect the new Slip Ring to both the Spool Cable and Feeder Wire Connections.



CAUTION: INCORRECT CONNECTION OF LEAD TERMINALS WILL RESULT IN UNIT FAILURE.



2.0 Installation

2.7 Spool Electrical Connections

2.7.1 Electrical Warnings

2.7.1.1 Electrical connections are determined by the requirements of the application and the configuration of the reel.

2.7.1.2 All electrical work should be performed by a qualified electrician.

2.7.1.3 Factory installed cable is wired with ring one (the ring closest to the drive collar) designated as ground, wired with the green cable conductor.

2.7.1.4 A continuity check should be performed prior to energizing the reel to verify electrical connections.

2.7.2 Spool Cable Connections

2.7.2.1 See Section 2.7 for information on connecting the cable from the spool to the slip ring.

2.7.3 Supply Cable Connections

2.7.3.1 Supply cable connections are made to the brush leads of the slip ring using crimp ring connectors. (See diagram in Section 2.6)

2.7.3.2 Connections made at the slip ring require adequate clearance.

2.8 Motor Electrical Connections

2.8.1 The 5159PR Series Cable Reels are available with a variety of motor control options. These include, but are not limited to, on the reel control switch, remote mounted control switch, radio control, and variable frequency drive with PLC interface. This set of installation instructions simply covers the motor connections in general. Specific connection for each control package must accompany the control package.

2.8.2 The 5159PR Series Cable Reels are designed to be powered both in the retraction and the payout direction. A motor control package must be used that is capable of reversing the motor rotation. If manual payout is required consult Conductix-Wampfler for options.

2.8.2.1 Verify the voltage requirements on the drive motor match the supply voltage and specification of the control package.

2.8.2.2 Make motor power lead connections to the motor control package following the wiring diagram inside the motor junction box lid. Follow the appropriate diagram for the voltage of operation.

2.8.2.3 Make brake lead connections per motor manufacturers included instructions. **Note:** If connecting the motor to a variable frequency drive (VFD), the brake leads must be connect to an output relay on the VFD of other switching device and not directly to the power leads between the VFD and the motor.

2.9 Limit Switch

2.9.1 5159 Series Cable Reels are available with a limit switch option. The limit switch is simply a switch or set of switches that can adjust to open or close along the travel distance of reel. They can be used to control the travel limits of the reel or for other automation purposes that need to be activated based on the position of the reel.

2.9.2 Conductix-Wampfler offers a variety of limit switches based on the needs of your specific application. Connect and adjust limit switch following the manufacturers instructions included with the reel.

3.0 Operation

3.1 Do not exceed the voltage or ampere rating of the cable. Do not exceed the voltage or ampere rating of the reel. Overheating, fire, damage to equipment or personal injury could result.

3.2 Operate the reel within the cable size and length and spring tension limits for which it was intended.

3.2.1 Two wraps of cable should remain on the reel at maximum extension to avoid excessive tension on the cable entrance watertight and slip ring terminations.

3.3 Keep the reel and cable clean to avoid excessive wear and damage.

3.4 Arrange for maintenance service if damage is found on the cable or reel.

4.0 Maintenance

4.1 Maintenance Warnings

4.1.1 Be sure the power is off for maintenance.

4.1.2 Follow lock-out/tag-out procedures as outlined in OSHA section 1910.147.

4.2 Lubrication

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

4.2.2 Do not apply any lubricants or solvent cleaning agents to the slip ring, brush or insulator surfaces.

4.2.3 The gearbox is also lubricated for the life of the reel. The oil should only need to be changed or replaced if leakage has been detected or moisture intrusion has occurred.

4.2.2.1 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 #41286.

4.3 Inspections

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

4.3.2 The slip ring assembly should be checked periodically as follows:

4.3.2.1 Clean and remove any accumulated dust or dirt from the slip ring housing area.

4.3.2.2 Check all brush and ring surfaces in the slip ring assembly and remove any accumulated dust.

4.3.2.3 Brushes should be centered on the slip rings and brush springs should be seated in the slot on top of the brush. Terminal screw connections should be tight.

4.3.2.4 Replace Brushes when the brush spring is within 0.09" of the ring insulator.

4.3.3 Biannually check chain tension and adjust as needed.

4.3.4 Biannually check the condition of the jaw coupler at the motor output shaft.

4.3.5 Biannually check the level of the oil in the gearbox.

4.4 Motor Replacement

4.4.1 Disconnected all power to the drive motor.

4.4.2 Lock the spool from rotating. This can be done by placing a C-clamp on one of the spool flanges, around the guide rail, in a position that when the spool tried to rotate it pulls the clamp against the guide rail.

4.4.3 Disconnect the motor leads inside the motor junction box.

4.4.4 Remove the four motor mounting bolts.

4.4.5 Slide the motor back away from the reel to disengage the jaw coupler.

4.4.6 Install the jaw coupler half from the old motor on the new motor or install a new coupler half of the same brand and size onto the new motor. Be sure the coupler half is installed the same distance onto the new motor shaft as it was on the old one.

4.4.7 Install the new motor onto motor mount with four 1/2 inch bolts. Be sure the jaw coupler properly engages.

4.4.8 Reconnect the motor lead connections. Be sure the motor is wired for the proper supply voltage.

4.4.9 Release the spool clamp.

4.4.10 Verify operation of the reel.

5.0 Replacement Parts

5.1 R-Series Slip Rings for 5159PR Series Cable Reels

In order to get the correct replacement slip ring parts for your 5159PR Series Cable reel, you must first determine which slip ring is in the reel. To do this use the following steps:

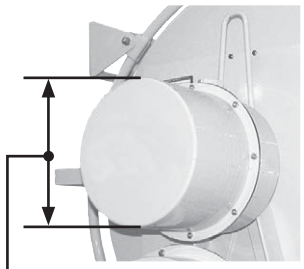
1. Determine the bore size of the slip ring using method described below.
2. Look at the tag located on the frame of the reel to determine the amperage and voltage ratings of the slip ring.
3. Use the chart below to determine the appropriate replacement component.

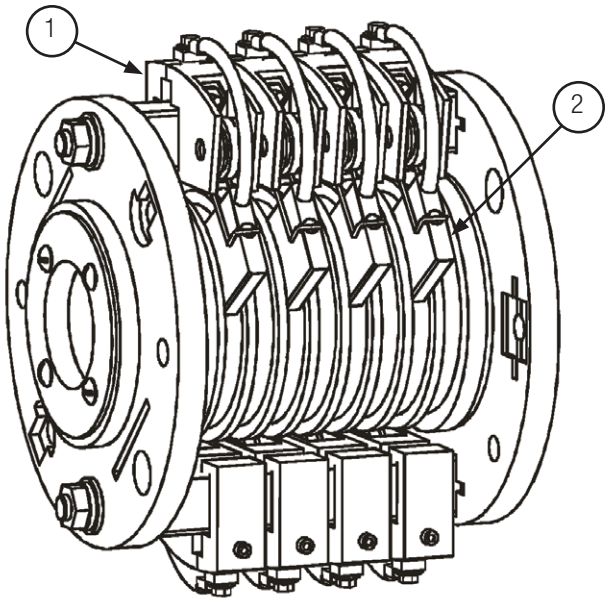
		(1) Brush Holders		(2) Brushes	
Slip Ring Bore Size	Amp / Volt Rating	Single	Double	Single	Double
1.5”	35 AMP / 600V	02801	02808	30068A	30068A (x2)
1.5”	75 AMP / 600V	02802	02809	30069A	30069A (x2)
1.5”	110 AMP / 600V	02803	02810	02840	02840 (x2)
1.5”	150 AMP / 600V	02804	02811	02841	02841 (x2)
2.5”	225 AMP / 600V	02805	02805 (x2)	02847	02847 (x2)
2.5”	300 AMP / 600V	02806	02806 (x2)	02848	02848 (x2)
2.5”	200 AMP / 600V	DRA3-20A-2500		Brushes and Holders are sold as a single unit in this range	
2.5”	400 AMP / 600V	DRA3-20A-2500 (x2)			
2.5”	600 AMP / 600V	DRA3-20A-2500 (x3)			
2.5”	35 AMP / 600V	02801	02808	30068B	30068B (x2)
2.5”	75 AMP / 600V	02802	02809	30069B	30069B (x2)
2.5”	110 AMP / 600V	02803	02810	02845	02845 (x2)
2.5”	150 AMP / 600V	02804	02811	02846	02846 (x2)

To determine the bore size, measure the diameter of the slip ring enclosure.

A 1.5” bore slip ring will have an enclosure with a diameter of 11 5/8”

A 2.5” bore slip ring will have an enclosure with a diameter of 17 7/8”





6.0 Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Cable wraps improperly (uneven wrapping, wraps above or jumps flange).	1) Reel mounting not level. 2) Cable retraction rate too high. 3) Cable guide out of adjustment.	1) Mount reel on level surface. 2) Maintain steady retraction rate. 3) Properly adjust cable guide.
Cable twisting or knotting.	1) Improperly installed cable. 2) Cable rubbing on or bending around fixed object. 3) Excessive tension. 4) Inadequate anchoring of cable.	1) See Cable Install section in Manual. 2) Check roller guide for function and cable pay out path. 3) Quantify application vs. reel selection. 4) Adjust anchoring method. ie. add strain relief.
Open or intermittent circuit.	1) Inadequate connection. 2) Brush loses contact with slip ring. 3) Cable defective.	1) Check all termination points. 2) Check brush wear, spring tension & alignment. 3) Perform continuity check on cable.
Circuit trips and/or Pitted, burned rings or brushes.	1) Inadequate amp ration of reel.	1) Quantify application requirements vs. reel & cable rating.
Circuit arcing	1) Amp or voltage above rating of reel. 2) Excessive carbon dust accumulation. 3) Water or moisture in slip ring. 4) Too low brush pressure.	1) Quantify application requirements vs. reel & cable rating. 2) Clean dust from inside slip ring. 3) Check gasket seal. 4) Replace brush spring.
Motor will not run after a long period of no usage and overload trips.	1) Motor brake is stuck. 2) A foreign object is wedged in the spool or chain. 3) A bearing on the spool, drive shaft, or gear box has seized.	1) Remove fan shroud and fan and manually free the brake. 2) Locate foreign object and remove. 3) Isolate seized component and replace.
Motor overload trips during operation.	1) Cable is getting pinched or caught on something. 2) Motor control is not sized properly for the motor under current operation conditions.	1) Verify cable path is free of obstructions. 2) Verify motor control specifications and replace if needed.

Notes

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