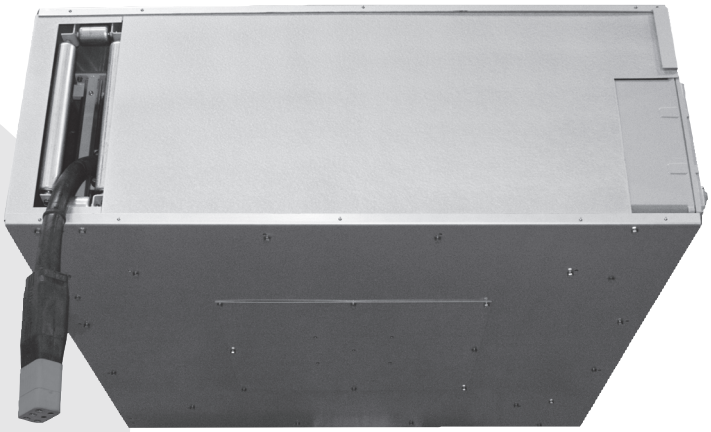
Motor Driven Cable Reel
PBL400 Series
Manual



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SECTION 1 - SAFETY

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.

Limitation of Liability

All data and information in this mounting instructions have been compiled in compliance with the applicable standards and regulations, best practice and our many years of experience and knowledge.

The manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document
- Improper use
- Use by untrained personnel
- Unauthorized modifications
- Technical changes
- Use of unauthorized replacement parts and accessories
- The actual scope of delivery may differ from the explanations and descriptions provided here if the model in question is a special one, if additional equipped has been ordered or due to recent technical changes.

The obligations agreed upon in the delivery agreement and our General Terms and Conditions of business apply, as do the delivery conditions of the manufacturer and the legal regulations applicable at the time the contract was concluded.

All products are subject to technical modifications in the context of improvement of function and further development.

SECTION 1 - SAFETY

Personnel Requirements-Qualifications

WARNING

Inadequately trained persons are at risk of injury!

Improper use can result in serious personal injury or material damage. All activities must only be performed by qualified personnel.

Only persons who can be expected to perform their work reliably are acceptable personnel. People whose reactions are impaired by drugs, alcohol or medications, for example, are not authorized.

When selecting personnel, follow all age- and occupation-specific guidelines applicable at the location of use.

The following qualifications are specified in the operating instructions for certain fields of activity.

Trained personnel and operators

- The owner of the machine or system must document that the appropriate training has taken place.

Specialist personnel

- Will consist of persons capable of performing assigned tasks and independently identifying and avoiding potential hazards based on their specialist training, knowledge and experience as well as their knowledge of the applicable regulations.
  Persons are deemed to be technically qualified if they have successfully completed training as a master electrician, apprentice electrician, electrical engineer or electrical technician. Persons are also considered technically qualified if they have been employed in an appropriate capacity for several years, receiving theoretical and practical training in that line, and their knowledge and skills have been tested by a specialist in the appropriate field of training.
- The machine or system owner must document that the appropriate certificates or other proofs of qualification have been or are being provided.

Personnel Requirements-Unauthorized Personnel

WARNING

Danger due to unauthorized personnel!

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the working area. Keep unauthorized personnel away from the working area. In case of doubt, address the person and direct them away from the working area. Stop working, as long as unauthorized persons are in the working area.

Personnel Requirements-Training

Before commissioning the equipment, personnel must be trained by the owner. Log the implementation of training for better traceability.

Example of a training log:

Date	Name	Training Type	Training Instructor	Signature
11/5/2019	John Doe	First safety training for personnel	Dave Miller	

Personal Protective Equipment

For every task, always use:

Safety helmet: For protection against falling or flying parts and materials.

Protective gloves: For the protection of hands against friction, scrapes, puncture or deeper wounds, as well as against contact with hot surfaces.

Protective work clothing: Primarily for protection against entrapment by moving machine parts. Work clothing must be close fitting with a low resistance to tearing; it must have close-fitting sleeves and no protruding parts.

Protective footwear: For protection against heavy failing parts and slipping on slippery floors.

For special tasks, specific protective equipment is required when executing particular tasks:

Safety eye wear: For eye protection against harmful influences such as strong light, chemicals, dust, splinters or weather effects.

Hearing protection: For protection against loud noises and to prevent acoustic trauma.

Breathing mask (FFP-3) - according to country-specific requirements): For protection against materials, particles, and organisms. In this case, for protection against the dust produced by the abrasion of carbon brushes and the PVC insulation of the conductor rail.

SECTION 2 - GENERAL INFORMATION

Introduction

The Conductix PLB400 is a motorized cable reel designed specifically for the storage and protection of 400 Hz aircraft cable. It is designed to be used in a variety of mounting positions and locations where 400 Hz ground power is required to be provided to an aircraft.

This manual is designed to provide the information required to install, operate, maintain, and perform basic repair of the PLB400 series reels. All the above functions should be performed by qualified individuals. In the event that technical assistance is needed, please contact:

Conductix-Wampfler

10102 F St.

Omaha, NE 68127 USA

Phone: 1-800-521-4888 | 402-339-9300

Fax: 1-800-780-8329 | 402-339-9627

www.conductix.us

Specifications

Drive Motor Power: Three Phase

Power: 1 HP (745 W)

Voltage: 200/208/220/230/240/380/400/440/460 Volts (Depending on Model)

Frequency: 50/60 Hz

Control Circuits:

Voltage: 24 Volts DC

Slip Ring:

Power Circuits:

Voltage: 600 Volts maximum

Amperage: 260 Amps maximum

Control Circuits:

Voltage: 250 Volts maximum

Amperage: 2 Amps maximum

Cable Travel:

90 feet (27 meters) maximum with 2.38 inch (60 mm) diameter cable

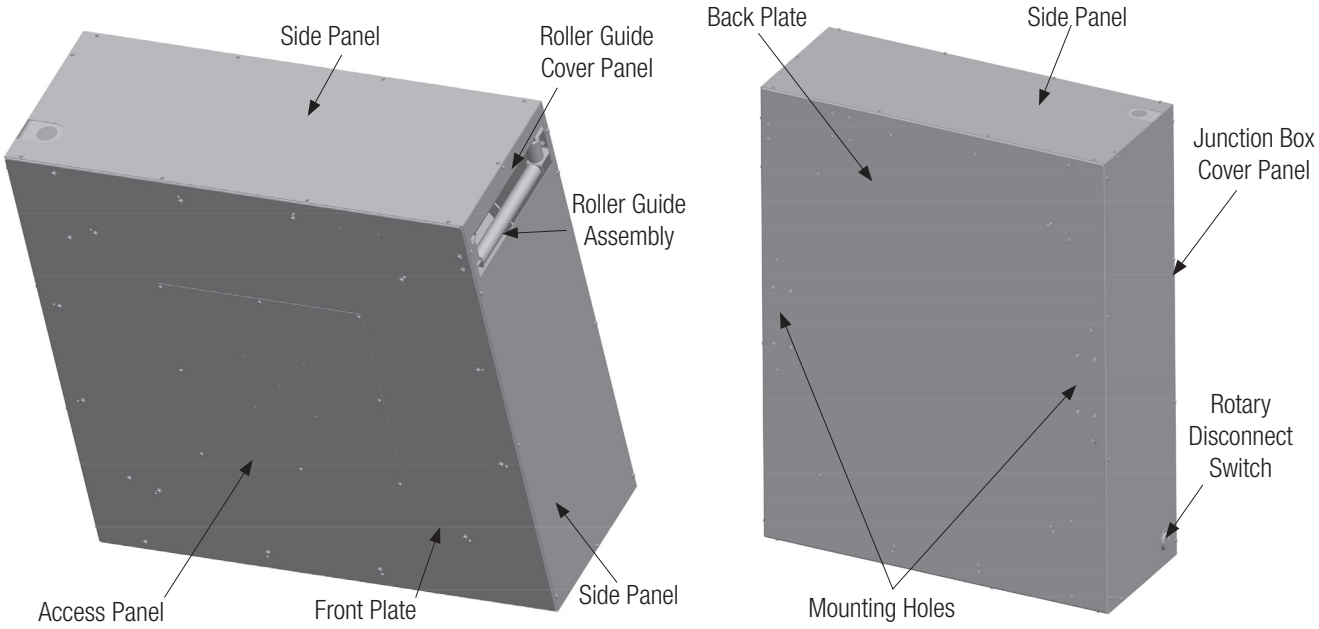
125 feet (38 meters) maximum with 1.69 inch (43mm) diameter cable

Cable Speed:

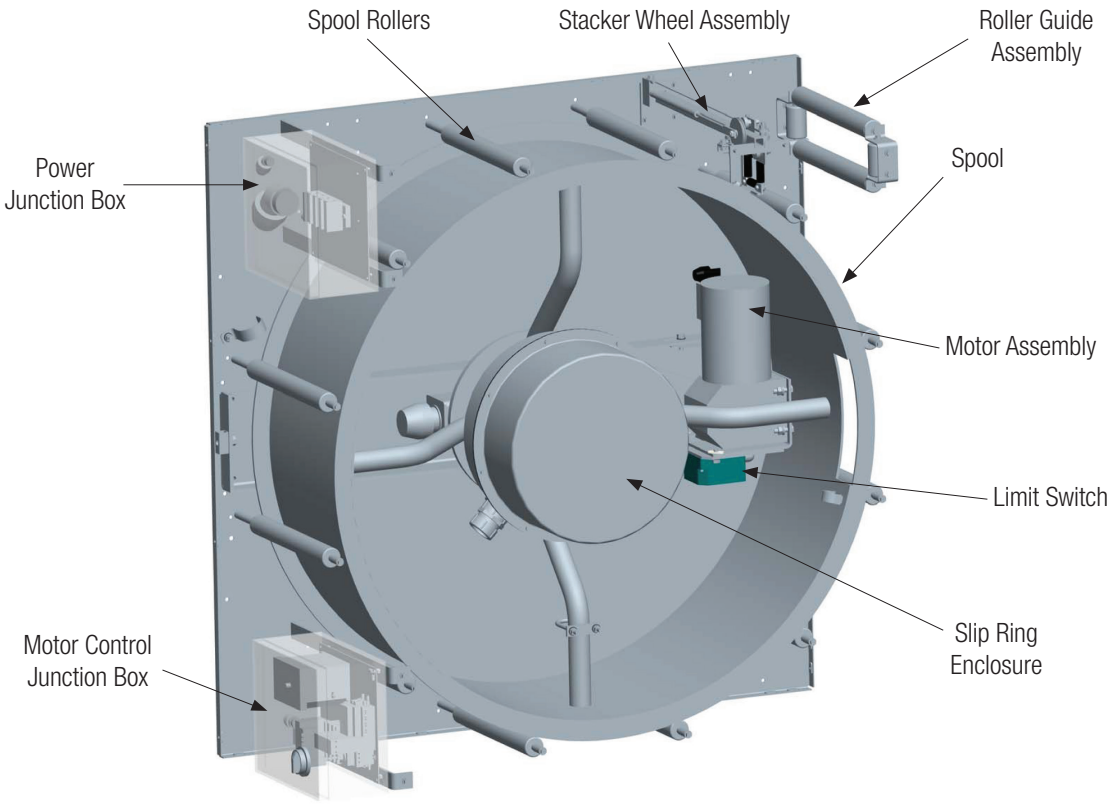
100 feet per minute (30 meters per minute) maximum

Component Overview

Mechanical Component Overview



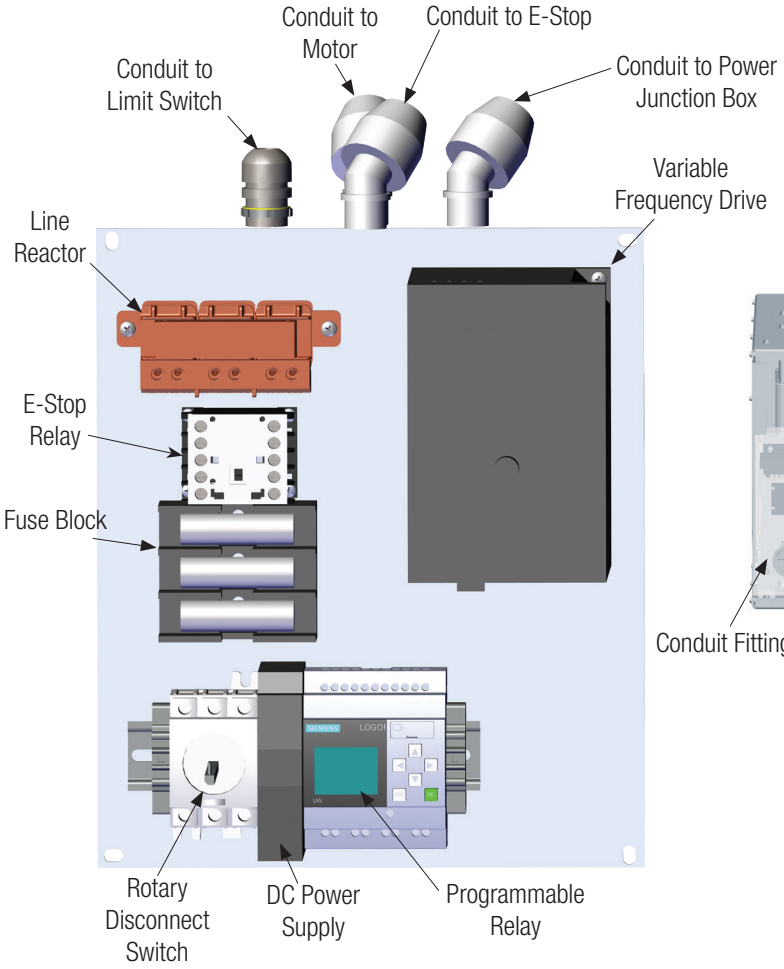
SECTION 2 - GENERAL INFORMATION

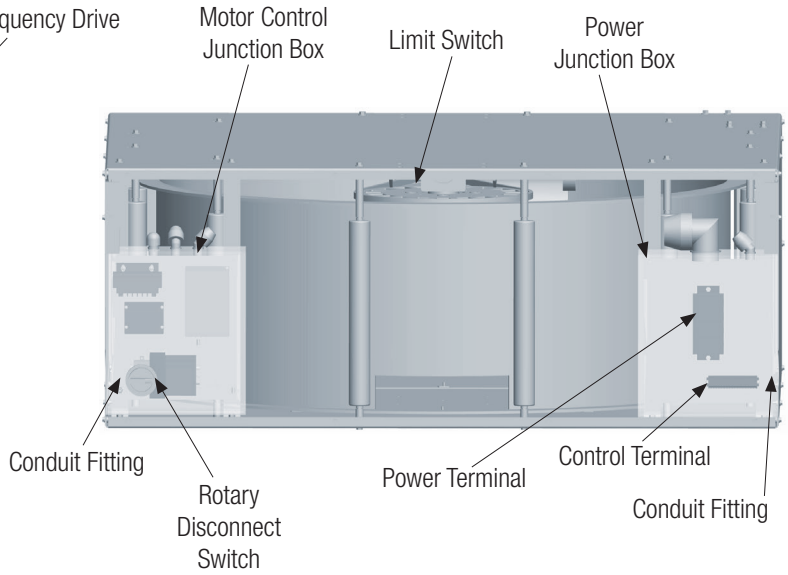


Part Name	Function Performed
Side and Access Panels	Provides physical protection to personnel from moving parts, provides access points of entry to perform maintenance and repairs, and structurally connects the front frame plate to the back frame plate.
Front Plate	Structural frame.
Roller Guide Assembly	Guides the cable in and out of the reel enclosure without letting it rub on any stationary surfaces.
Back Plate	Structural frame and mounting points.
Mounting Holes	Threaded holes provided for use as mounting points to mount the reel to a support structure. Requires use of M12-1.75 (size, thread of bolts)
Rotary Disconnect Switch	Main power switch for the drive and controls of the cable reel. This does not disconnect power to the cable.
Power Junction Box	Electrical enclosure that contains the connector blocks and leads for incoming 400Hz power, interlock controls with the passenger loading bridge and 400Hz generator, and reel drive motor incoming power if entering all from one conduit.
Motor Control Junction Box	Electrical enclosure that contains the reel drive and controls as well as fuses. It can also be the point of incoming reel drive motor power if this power is entering separate from the 400Hz power.
Spool	Circular body which the cable is wrapped around when retracting.
Spool Rollers	Ensures that the cable remains in proper position on the spool at all times.
Slip Ring	The sliding rotary electrical contact which transfers the 400Hz power and reel motor controls from the stationary mount to the rotating spool cable.
Slip Ring Enclosure	Electrical enclosure that contains the slip ring.
Motor Assembly	Drive motor which provides power to the spool to extend or retract the cable.
Stacker Wheel Assembly	Mechanical device that guides cable to the proper position on the spool for proper cable wrap and spool fill.

SECTION 2 - GENERAL INFORMATION

Electrical Component Overview





Motor Control Junction Box

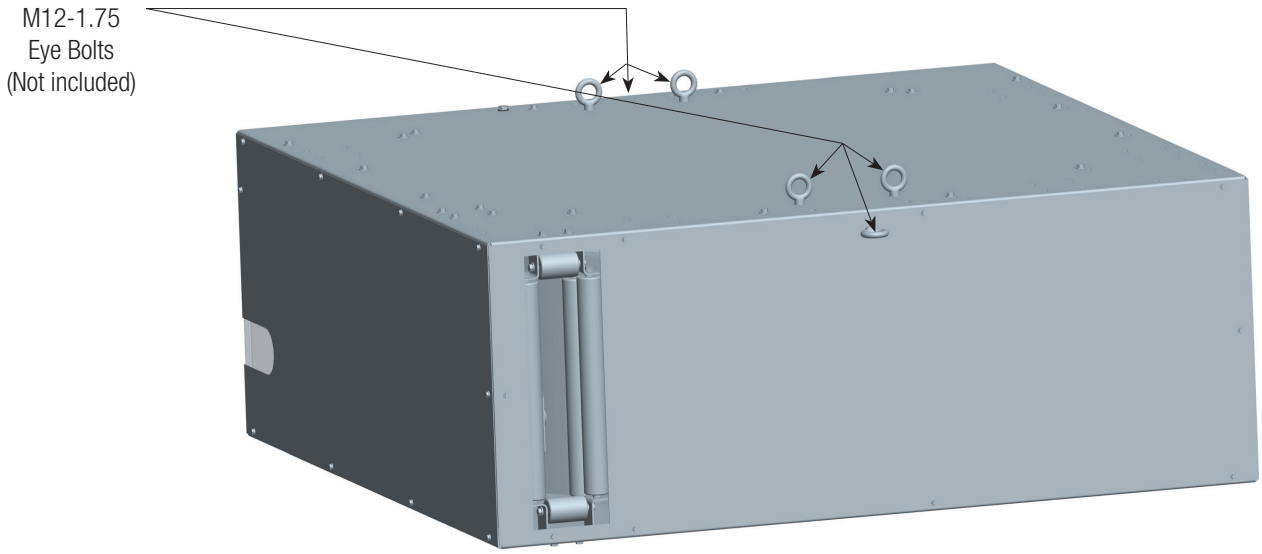
Part Name	Function Performed
Power Terminal	Electrical connector block for connection of 400Hz power to the cable.
Control Terminal	Electrical connector block for connection of interlock signal wires and remote reel control wire.
Rotary Disconnect Switch	Main power switch for drive and controls of the cable reel. **This does not disconnect power to the cable.**
Limit Switch	Provides signals to determine the limits of cable travel.
Variable Frequency Drive	Controls the input power to the reel drive motor. It is used to control the motor speed and direction and monitor the motor performance.
Programmable Relay	Programmable control which monitors all inputs and provides output to the variable frequency drive and the motor brake.
Line Reactor	Filters out voltage inconsistencies on the incoming power to protect the variable frequency drive.
E-Stop Relay	Disconnects power to the drive and controls when pressed. **This only stops operation and does NOT disconnect the 400Hz power.**
Fuse Block	Overload protection on the incoming power to the variable frequency drive.
DC Power Supply	Power source for the programmable relay electronics as well and signal circuitry.

SECTION 3 - HANDLING

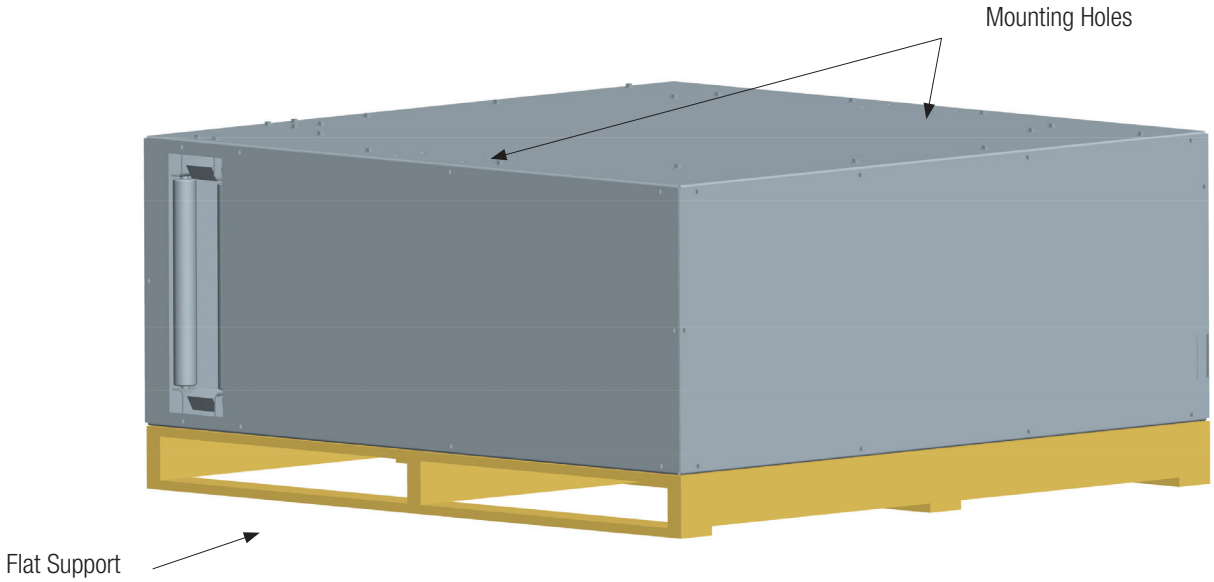
WARNING

When handling the reel, only lift using approved methods at specific locations.

Lifting eye bolts or other rigging mounted to reel mounting holes.

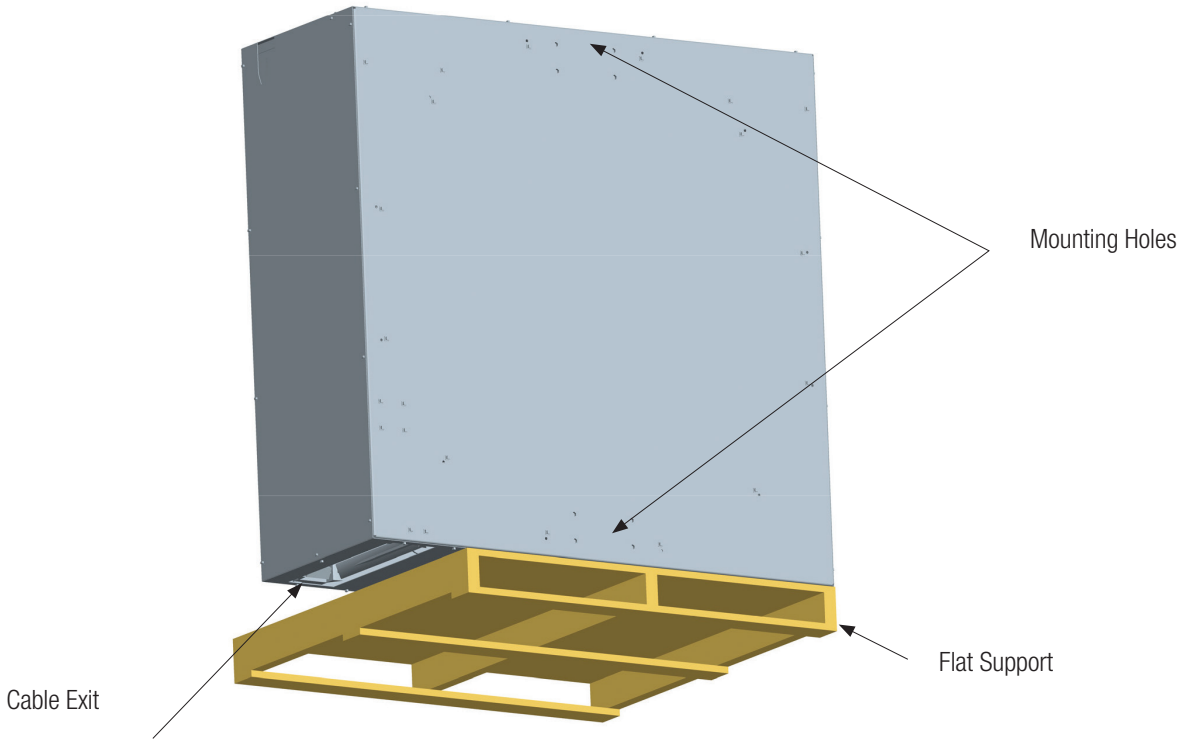


Flat support from bottom for horizontal mount.

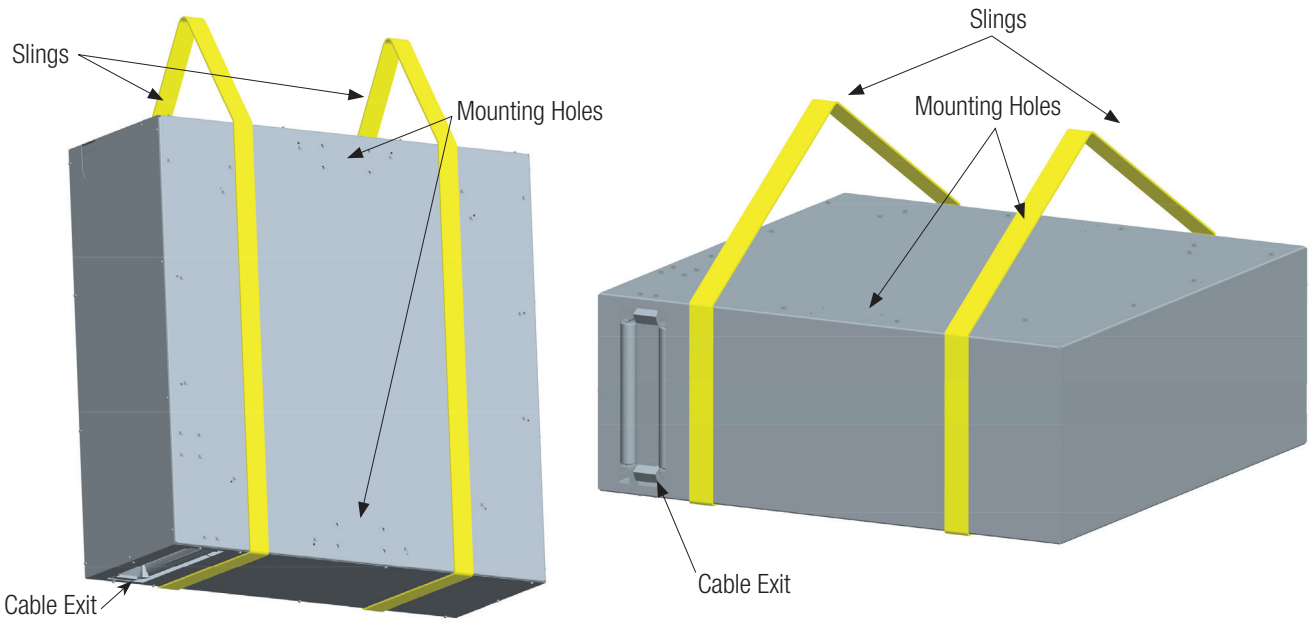


SECTION 3 - HANDLING

Flat support from bottom for vertical mount.



Slings around the reel.



NOTE

- **Slings must be at least 15ft long.**

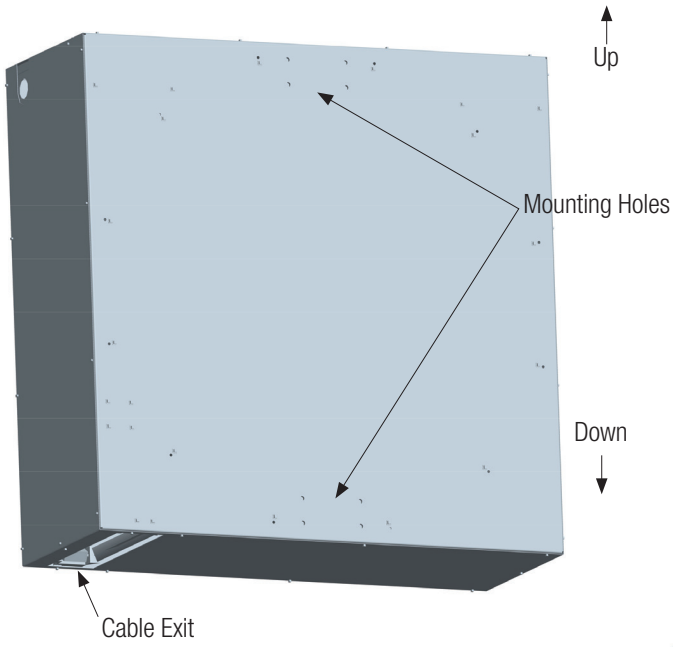
SECTION 4 - INSTALLATION

Mounting

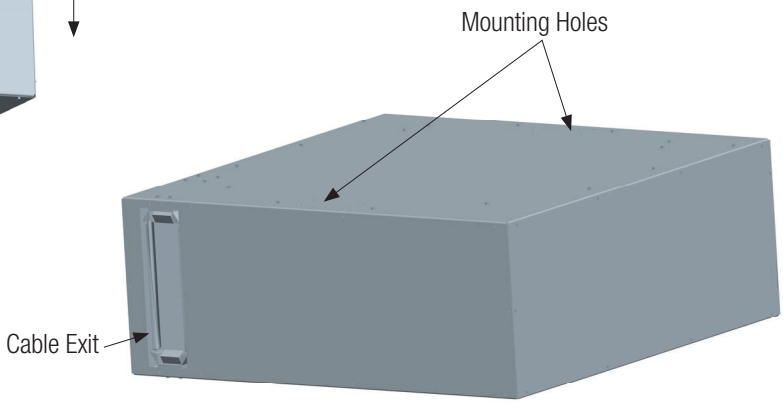
NOTE: Check installation drawings to determine reel **orientation when installed.**

- If the reel is to be mounted in a vertical position on the passenger loading bridge, the mounting holes must be oriented such that one set is along the upper edge of the back plate, the other set is along the lower edge of the back plate, and the cable exits from the bottom side of the reel. See illustration.
- If the reel is to be mounted in a vertical position on the tarmac, the mounting holes will be oriented with one set along each vertical side of the back plate, and the cable exits from a vertical side of the reel or can be mounted in the same vertical orientation as on a passenger loading bridge by mounting the reel on 40 inch (1m) risers to allow the cable room to exit the bottom side of the reel.
- If the reel is to be mounted in a horizontal position, regardless of location, the mounting holes must be oriented upward with the reel hanging below the supporting structure. The cable will then exit on one of the vertical sides.

Mount the reel to a frame structure capable of supporting a minimum of a 1000lb (454kg) load using eight M12-1.75 class 8.8 bolts in the eight threaded mounting holes provided.



Vertical Position



Horizontal Position

SECTION 4 - INSTALLATION

Wiring

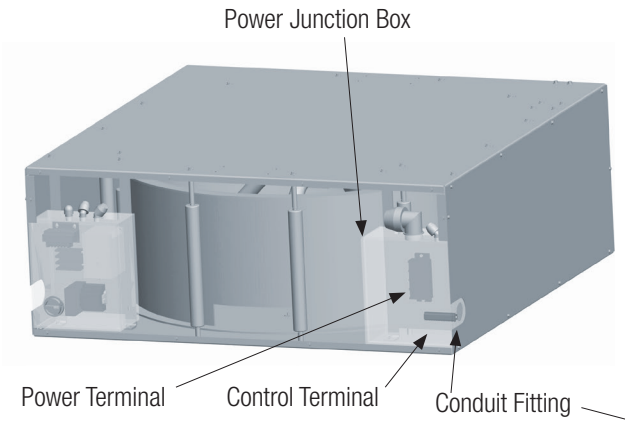
NOTE: Your reel may be set up for all incoming wiring to enter through one conduit or two separate conduits, one for motor power and one for cable power and control signals. Follow the instructions that follow for either single or dual conduit depending on your specific application.

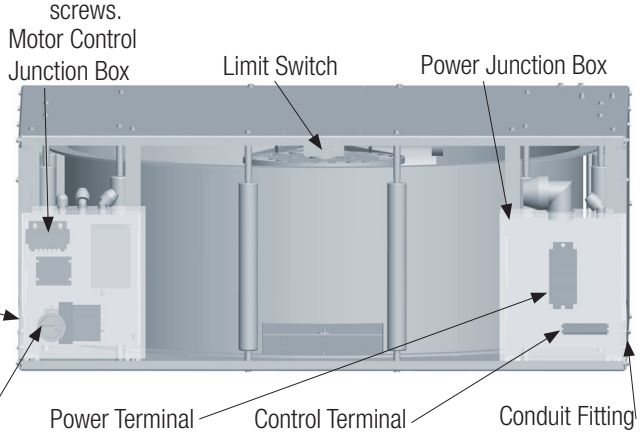
Single Conduit

1. Locate and remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
2. Install a seal type conduit fitting and conduit into the power junction box. This is the junction box without a visible disconnect switch handle.
3. Pull 400 Hz power leads, interlock safety wires, remote reel control wires, and reel motor power wires through the conduit and into the power junction box.
4. Terminate the 400 Hz power leads in the large terminal block as labeled.
5. Terminate the smaller wires in the small terminal strip as labeled. This is a cage clamp type terminal strip. To insert the wires, insert a narrow straight bit screw driver in the slot above the wire entrance and press firmly with the screw driver. This will release the clamp spring. You must hold pressure on the screw driver while inserting the wire.
6. Close the power junction box lid and secure latching screws.
7. Reinstall the junction box cover panel and the mounting screws.

Dual Conduit

1. Locate and remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
2. Install a seal type conduit fitting and conduit into the power junction box. This is the junction box without a visible disconnect switch handle.
3. Install a seal type conduit fitting and conduit into the motor control junction box. This is the junction box with the visible disconnect switch handle.
4. Pull 400 Hz power leads, interlock safety wires, and remote reel control wires through conduit and into the power junction box.
5. Terminate the 400 Hz power leads in the large terminal block as labeled.
6. Terminate the smaller wires in the small terminal strip as labeled. This is a cage clamp type terminal strip. To insert the wires, insert a narrow straight bit screw driver in the slot above the wire entrance and press firmly with the screw driver. This will release the clamp spring. You must hold pressure on the screw driver while inserting the wire.
7. Terminate the motor power leads at terminals L1, L2, and L3 of the rotary disconnect switch.
8. Terminate the ground lead into the ground wire connector. This connector can be identified with the green/yellow wires that all terminate in it. To connect the wire, strip the insulation off the end of the wire about .25-.38 inches (6-10mm) and push the wire into an open hole of the connector. When inserted fully you will be able to see the wire strands through the clear cover on the opposite side of the connector. The wire can not be removed once inserted.
9. Close both junction box lids, ensuring that the disconnect handle rod engages into the disconnect handle on the motor control junction box, and secure the latching screws.
10. Reinstall the junction box cover panel and the mounting screws.





SECTION 5 - OPERATION

Initial Operation

The reel is factory programmed to the operating specifications given for the installation intended, no further programming is required for initial start up.

The reel is equipped with an electronically controlled brake motor. Do not attempt to extend the cable or pull the cable from the reel by any means other than the reel control buttons. Doing so will cause damage to the reel and result in undesirable operation. The reel is usually shipped with the cable in a fully retracted position.

1. Turn on the motor power and control power to the reel.
2. Rotate the rotary disconnect handle on the motor control junction box from the OFF to the ON position.
3. Allow 30 seconds for the electronic controls to boot up.
4. Press the DOWN button on the power cable head. The reel will start to extend the cable. Release the button to stop the reel if needed.
5. Hold the DOWN button until the reel stops automatically. Be sure to manually pull the cable across the ground so it does not tangle in a pile on the ground.
6. Ensure that a minimum of one full wrap of cable is left on the spool drum after full extension. If less than one full wrap is left on the drum, consult the factory.
7. Press the UP button on the power cable head. The reel will retract the cable. Again, release the button to stop the reel if needed.
8. Hold the UP button until the reel stops automatically.

⚠ WARNING

If the reel does not stop before 2 feet (.6m) of cable is left outside the reel, release the UP button so the reel does not retract the power cable head into the roller guide. Consult factory to determine why the reel did not stop.

9. The reel is now fully operational.

General Operation

1. Turn rotary disconnect switch to ON.
2. Press and hold the DOWN button on the power cable head or at a remote control location to extend the cable. Release the DOWN button to stop the reel. The reel will stop automatically when it reaches the maximum extension length of the cable.
3. Press and hold the UP button on the power cable head or at a remote control location to retract the cable. Release the UP button to stop the reel. The reel will stop automatically when it reaches the cable storage length.

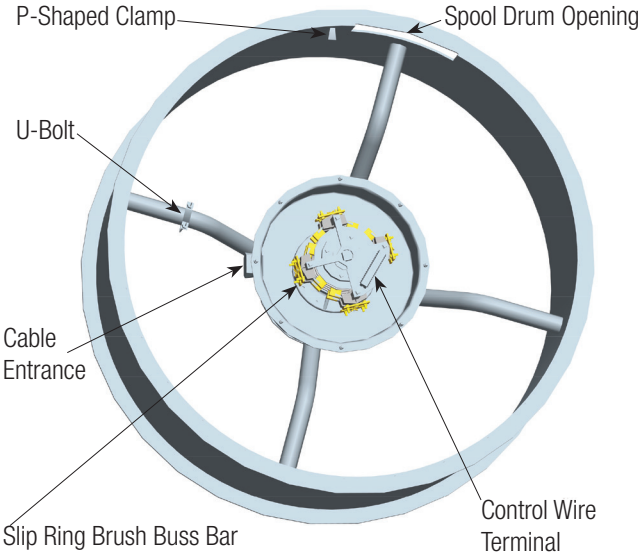
NOTE: The reel is equipped with a drive overload detection system. When the reel detects an overload situation, typically caused by an obstruction of the cable movement, the reel will automatically stop all motion and will be disabled for 30 seconds. If the reel does not run or is running and stops and will not restart, check for obstructions or pinch points on the cable.

Mechanical Components
Cable Replacement

WARNING

The replacement cable must be exactly the same length as the original cable in order to ensure proper operation of the reel and prevent damage to the reel or cable.

1. Extend the cable to the end limit.
2. Disconnect all power sources to the reel following required lock-out tag-out procedures.
3. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
4. Remove the eight M6 nuts securing the slip ring cover and the slip ring cover.
5. Record all wire identifications and termination locations. Disconnect the large power lead connections at the slip ring brush buss bar points.
6. Disconnect the control wires from the terminal block. To do this insert a narrow straight bit screwdriver into the slot above the wire entrance. Press firmly with the screw driver. This will release the connector.
7. Loosen the watertight gland nut where the cable enters the slip ring enclosure.
8. Clamping the cable to the reel is one P-shaped clamp on the inside of the spool drum and one U-bolt that clamps the cable to a spool spoke. Look through the access panel and locate the P-shaped clamp.
9. Remove the M6 nut of the P-shaped clamp and M10 U-bolt retaining the cable.
10. Slip the cable out of the slip ring enclosure entrance, through the spool drum opening, out the stacker wheel guide, and out of the cable guide.
11. Insert new cable by threading the cable through the cable guide assembly and stacker wheel assembly.
12. Feed the cable around the spool drum to the spool drum opening. Make sure the cable is between the spool drum surface and each of the rollers and not over the outside of any roller.
13. Pass the cable through the spool drum opening.
14. Slip the watertight gland nut, then thrust washer, and finally the gland onto the end of the cable.
15. Insert the end of the cable into the slip ring enclosure.



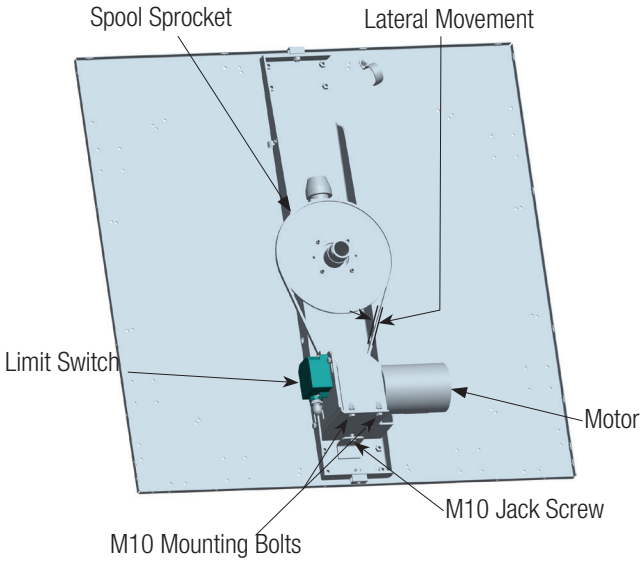
16. Terminate the control wires in the reverse order of removal. Install the control wires into the terminal strip in the same manner that the old ones were removed.
17. Insert the watertight gland into the watertight body and follow with the thrust washer and gland nut.
18. Tighten the watertight gland nut.
19. Make a gradual transition loop of cable from the slip ring entrance to the spool drum opening.
20. Clamp the cable in place to a spool spoke using the M10 U-bolt.

Note: Use caution to ensure there is clearance between the cable or U-bolt and the top of the motor when the spool rotates. Also, do not over tighten the U-bolt. Over tightening will cut the cable or damage the conductors. This U-bolt, in combination with the short section of cable between the U-bolt and slip ring entrance, serve as the drive arm for the slip ring. Ensure that the U-bolt is positioned 10 inches (254mm) or closer to the slip ring entrance to avoid excessive stress on the cable.

21. Reinstall the P-shaped clamp on the M6 stud in the spool drum.
22. Reinstall the slip ring cover.
23. Reinstall the side panel.
24. Reinstall the access panel.
25. Turn on the power to the cable reel.
26. Press the IN button and check the running limits of the reel. They should not have changed. If the retraction limit is different than previously, the new cable length may be different than the old cable.

SECTION 6 - MAINTENANCE & REPAIR

Chain Circuit Inspection



1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
3. The drive chain is located behind the slip ring cover and spool spokes but is in plain view. Observe the straight sections of the chain spanning between the motor sprocket and the spool sprocket. One side will have tension on it while the other side will have slack.
4. Check the lateral movement of the slack side of the chain. You should be able to move the chain between 0.25 and 0.75 inches (6-20mm). If the lateral movement exceeds 0.75 inch (20mm), the chain needs to be tightened. Proceed to next section. If the lateral movement is within the specified range, no adjustment is necessary; replace access panel.

Chain Tension Adjustment

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel as described in the previous procedure if not already done.
3. Loosen the four M10 bolts that mount the motor mount bracket to the reel frame. Be careful not to allow the chain to loosen such that it jumps sprocket teeth. This will allow the spool to rotate and may cause injury.
4. Loosen the two M10 bolts that hold the limit switch bracket to the motor mounting bracket.
5. Turn the M10 motor jack screw clockwise to tighten the chain. Check the lateral movement of the loose side of the chain. You should be able to move the chain 0.25inches (6mm). If the lateral movement exceeds 0.25 inches (6mm), continue turning the jack screw in a clockwise direction.
6. Retighten the four M10 bolts to hold the motor in the new location.
7. Adjust the limit switch bracket until the sprocket fully engages the drive chain. Be careful to avoid using the limit switch or bracket to apply tension to the drive chain. Tighten the two M10 bolts to hold the limit switch in position.
8. Replace the access panel.

Motor Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
3. Remove the eight M6 nuts securing the slip ring cover and remove the slip ring cover.
4. Secure the spool and cable so that the spool can not rotate. Once the chain has been removed the spool is free to rotate. This could allow the cable to free spool off of the reel. Such uncontrolled motion can be dangerous and could cause personal injury or damage to the reel.
5. Loosen the four M10 bolts that mount the motor mount bracket to the reel frame.
6. Loosen the two M10 bolts that hold the limit switch bracket to the motor mounting bracket. Remove the nylon block mounted between the chain and the limit switch bracket.
7. Turn the M10 motor jack screw in a counter clockwise direction and slide the motor in the slotted holes of the reel frame toward the spool shaft to loosen the chain.
8. Remove the chain from the motor sprocket.
9. Open the motor junction box and disconnect the three power leads, two brake lead wires, and one ground wire. Mark or record which power lead is hooked to which motor leads as this may vary for different applications.
10. Support the motor and remove the four M10 bolts previously loosened to remove the chain.
11. Remove the motor and mounting bracket between the spool spokes and along side the slip ring. Be careful not to hit the slip ring or dislocate the slip ring brushes.
12. Remove the four M12 bolts that attach the motor to the motor mount bracket.

Motor Replacement (continued)

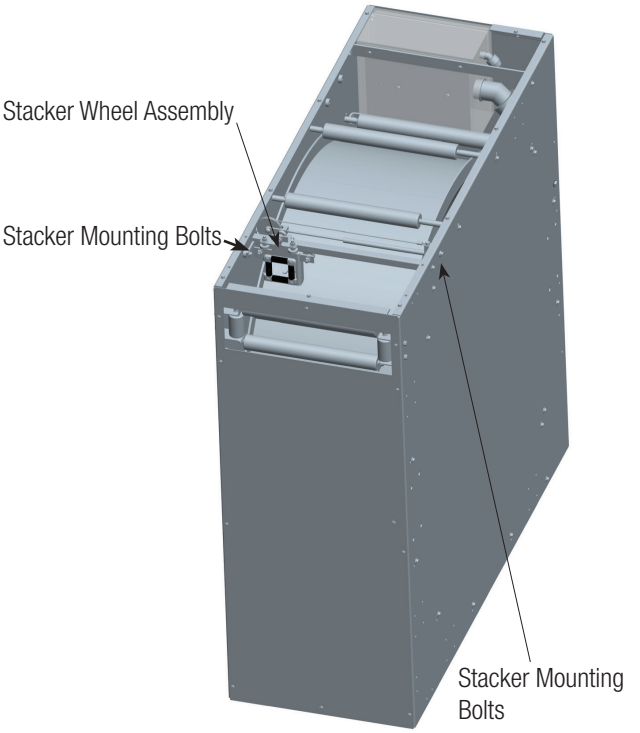
13. Install the motor mount bracket onto the new motor.
14. Measure the distance of the chain sprocket from the motor gearbox.
15. Remove the chain sprocket from the old motor output shaft and install on the new motor in the same position relative to the gearbox. Apply a thread locking compound to the sprocket set screws and ensure the set screws are installed to the proper torque.
16. Mount the new motor in reverse order of removing the old motor then follow the Chain Tension Adjustment section to set the chain tension, and Extension and Retraction Limit Changes section to reset the cable end limits.

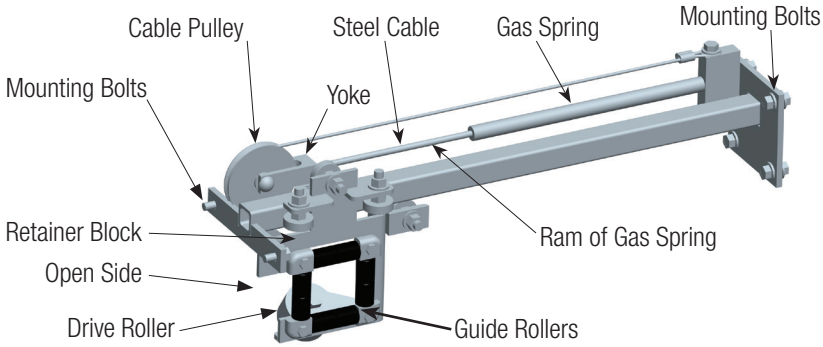
Stacker Wheel Assembly Inspection

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the eight M6 screws along the outer edge of the reel, for the side panel adjacent to the cable entrance, and the side panel.
3. Check the condition of the guide rollers where the cable passes through as well as the drive roller on the outside of the roller box. Look for excessive wear or damage to these rollers. Verify that the rollers all turn freely.
4. Check the steel cable that connects the gas spring to the frame and the guide head for damaged sections.
5. Check the cable pulley to ensure it still rolls freely.
6. Check for loose or missing hardware.
7. If any of the above components except the guide rollers are damaged, replace the entire stacker wheel assembly.
8. Check the gas spring to ensure it still provides enough force to hold the guide head firmly against the previous wrap of cable on the spool and that the gas spring has not been bent. Look for signs of oil leaking from the gas spring.
9. If the gas spring shows signs of damage or weakening but the other components of the stacker assembly look good, you may replace only the gas spring.

Stacker Wheel Guide Roller Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the eight M6 screws along the outer edge of the reel, for the side panel adjacent to the cable entrance, and the side panel.
3. Reach through the cable guide opening with one wrench and through the side that the panel was removed from and remove the M6 screw and nut that hold the roller retainer block in place for each corner of the roller guide.
4. Remove the worn or damaged rollers and axle(s).
5. Place the new axle(s) and rollers in the retainer block.
6. Reinstall the retainer block on the guide head frame.
7. Reinstall the side panel.





Stacker Wheel Assembly Replacement

1. Extend the cable to the end limit.
2. Disconnect all power sources to the reel following required lock-out tag-out procedures.
3. Remove the eight M6 screws along the outer edge of the reel, for the side panel adjacent to the cable entrance, and the side panel.
4. One side of the guide head frame is open to allow the cable to pass through. Remove the two M6 retainer block screws and nuts that hold the guide roller over the open guide head frame side.
5. Remove the two retainer blocks, the guide roller, and guide roller axle from the open frame side. Note: The adjacent two rollers and roller axles may become loose with the retainer blocks removed. If these parts are loose, remove them as well to prevent dropping the parts into the reel.
6. Remove the six M8 bolts that mount the stacker wheel assembly frame between the reel main panels.
7. Slip the cable out of the guide head through the opening and pull the stacker assembly out of the reel.
8. Install the new stacker wheel assembly in the reverse order.
9. Ensure the stacker drive roller is on the outside of the last wrap of cable next to the wrap that is currently being placed on the spool.
10. Check that the clearance between the stacker drive wheel and the spool drum in not more than ½ inch (12mm).
11. Replace all the reel panels, reconnect the power, and retract the cable.

Stacker Wheel Spring Replacement

1. Extend the cable to the end limit.
2. Disconnect all power sources to the reel following required lock-out tag-out procedures.
3. Remove the eight M6 screws along the outer edge of the reel, for the side panel adjacent to the cable entrance, and the side panel.
4. The end of the gas spring that mates with the frame assembly has a threaded stud but is simply inserted into a clearance hole. Use a small pry bar or a large straight bit screwdriver to pry the base part of the spring out of the hole.
5. Tip the base end of the gas spring away from the frame and lift the spring and pulley assembly out of the cable.
6. The ram end of the gas spring also has a threaded stud which is threaded into the yoke and pulley assembly. Unscrew the yoke and pulley assembly from the gas spring.
7. Screw the yoke and pulley assembly onto the ram end of the new gas spring. Tighten the joint by hand but do not use a wrench to tighten. If needed, use a locking pliers to hold the ram of the gas spring but it must be used only on the shoulder right next to the yoke. Damage or scoring on the ram surface will cause the gas spring to leak and fail prematurely.
8. Place the pulley into the steel cable near the guide head assembly like it was when removed.
9. Using a small pry bar or large straight bit screwdriver, compress the spring against the steel cable. Use caution not to bend the spring ram.

WARNING

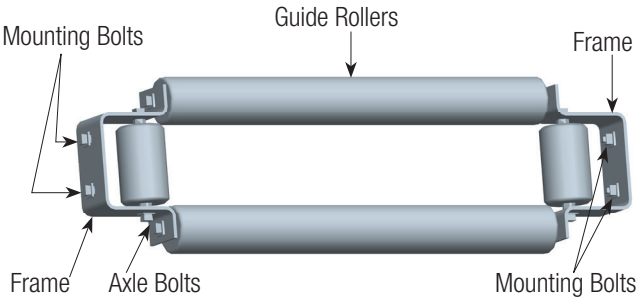
The gas spring has a limited extension rate however it is still a source of stored energy and must be handled with care.

10. While compressing the spring manipulate the base end onto the frame block, then slide it over until the threaded stud drops into the clearance hole.
11. Replace the reel side panel, reconnect the power, and retract the cable.

Guide Roller Inspection

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Check the condition of the guide rollers where the cable passes through. Look for excessive wear on the roller surfaces as well as the bearings.
3. Check to see that all the rollers rotate freely.
4. Check for loose or missing hardware.

Roller Guide Replacement



1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the three M6 screws along the outer edge of the reel, for the small side panel covering the cable entrance, and the side panel.
3. Continue to the following sections for appropriate repair being performed.

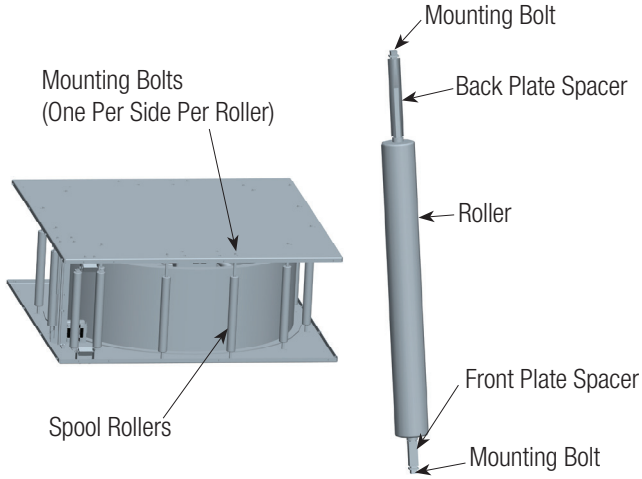
SECTION 6 - MAINTENANCE & REPAIR

Complete Guide Replacement

1. If replacing the entire guide, remove the four M8 bolts (two on each end) that attach the roller guide frame pieces to the reel main panels.
2. Tip the roller guide to the side to allow the guide to pass through the reel opening.
3. Pass the cable guide head through the roller guide.
4. Install the new guide assembly in reverse order.

Single Roller Replacement

1. If replacing a single roller, remove the two M8 bolts that are threaded into the axle of the roller being replaced. There is one in each end of the axle.
2. Slide the axle and roller assembly out from their mounting position in the guide frame.
3. Slide the axle out of the roller.
4. Check the axle for straightness. If it is bent, replace it at this time as well.
5. Slide the axle through the new roller.
6. Reinstall the new assembly in reverse order of removing the old one.



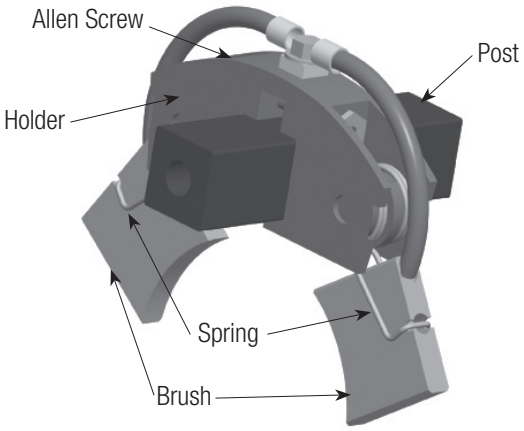
Spool Roller Inspection

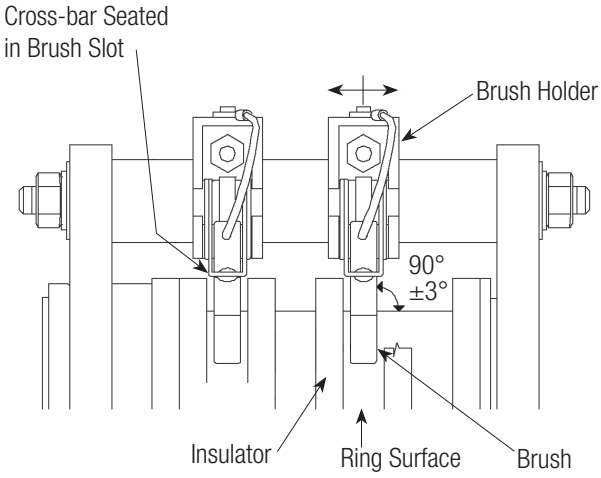
1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. For the side panel covering the rollers to be inspected, and the side panel, remove the eight M6 screws along the outer edge of the reel.
3. Check the condition of the rollers. Look for excessive wear on the roller surfaces as well as the bearings.
4. Check to see that all the rollers rotate freely.
5. Check for loose or missing hardware.

Spool Roller Replacement

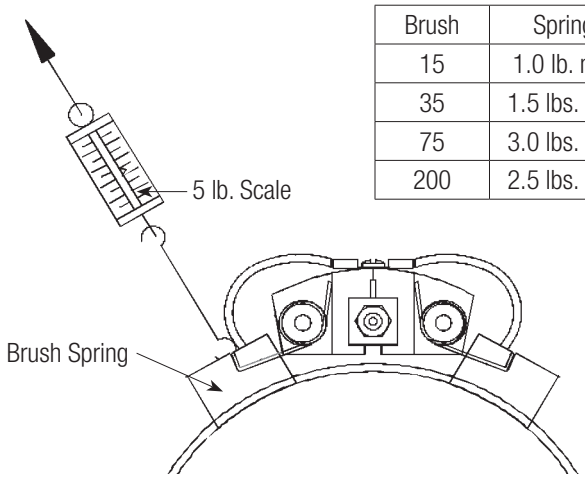
1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the eight M6 screws along the outer edge of the reel, for the side panel covering the rollers to be replaced, and the side panel.
3. Remove the two M8 bolts that are threaded into the axle of the roller being replaced. There is one in each end of the axle. The heads of these bolts are visible on the outside of the reel.
4. Tip the roller sideways to remove it from between the reel main panels.
5. Slide the axle out of the roller.
6. Check the axle for straightness. If it is bent, replace it at this time as well.
7. Slide the axle through the new roller.
8. Reinstall the new assembly in reverse order of removing the old one.

Slip Ring Inspection





Slip Ring Inspection (continued)



Brush Spring Tension

Brush	Spring
15	1.0 lb. min
35	1.5 lbs. min
75	3.0 lbs. min
200	2.5 lbs. min

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
3. Remove the slip ring cover. This is the round can directly behind the access cover. It is mounted with eight M6 nuts on studs and a gasket.
4. Check 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.
5. Check brush holder clamps for tightness. Set clamp bolt torque at 10in-lbs (1.13N-m) max.
6. Check for brush wear. If the distance from the top of the insulator to the lower part of the brush spring is 0.093 inches (2.4mm) or less, replace the brush.
7. Check the brushes, ring contact surfaces, and insulators for dust or other debris or contaminates. Clean as needed. Also, check for pitting or other physical damage to brush and ring surfaces.

⚠ WARNING

Never use solvents or other cleaning agents to clean the slip rings. Only use compressed air to remove contaminants and dust.

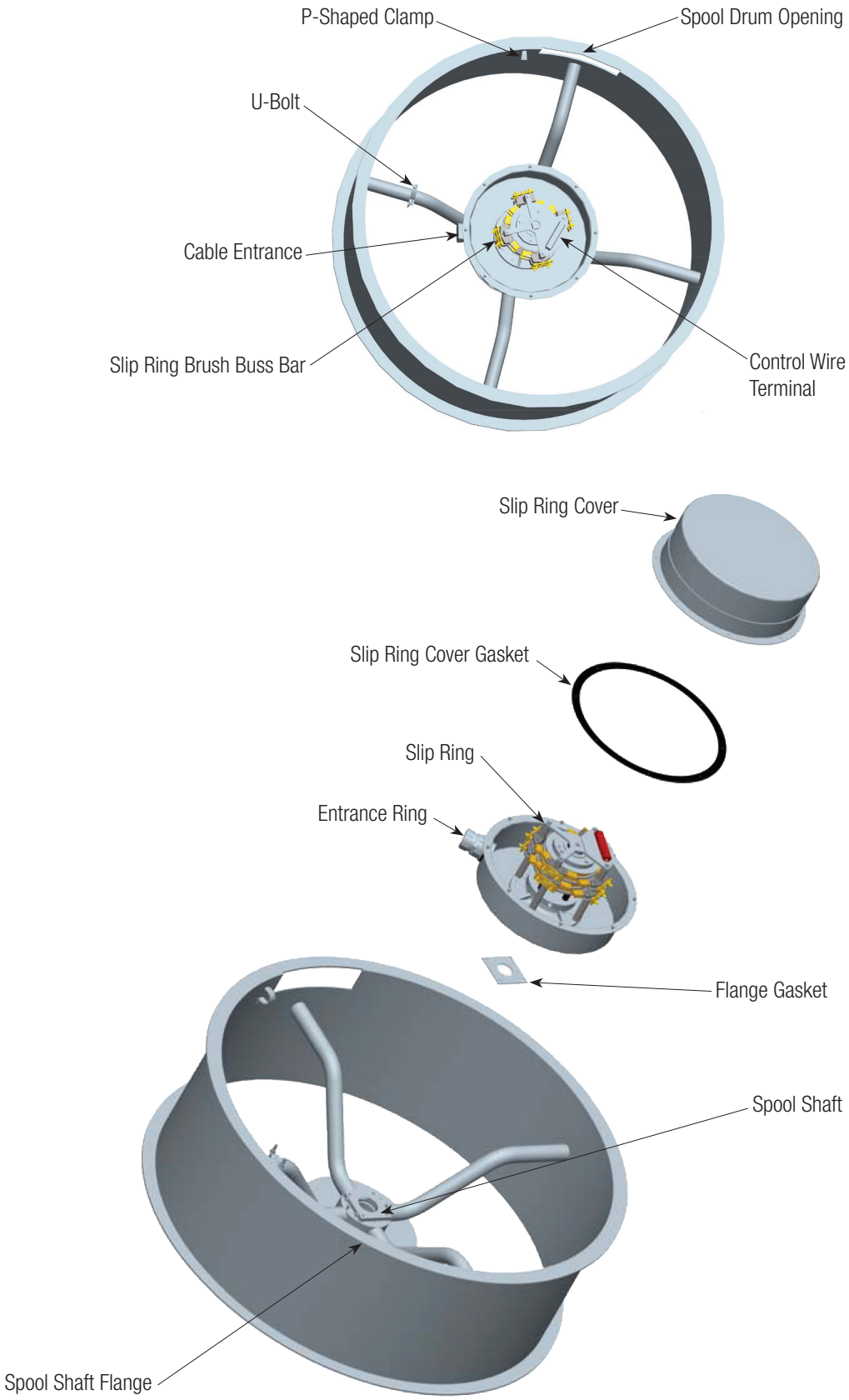
8. Check brush spring pressure to ensure uniform pressure and recommended pressure. Test brush spring pressure as shown in the illustration. The brush pressure should be 3.0 lbs (1.36 kg) minimum.
9. Check all electrical connections for corrosion and tightness. Loose and/or corroded terminations will cause a concentration of excessive heat in power circuits and a loss of signal in control circuits.
10. Check slip ring cover gasket for tears or damage. Moisture intrusion can be a serious problem in the slip ring enclosure. If there is any question about the cover gasket, replace it.

⚠ WARNING

Do not use Acetoxy cure silicone sealers as a gasket replacement on an electrical enclosure. These silicones release acetic acid while curing that can promote corrosion of the electrical components. Only use neutral cure RTV silicone sealers when working on electrical enclosures.

Slip Ring Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
3. Remove the slip ring cover. This is the round can directly behind the access cover. It is mounted with eight M6 nuts on studs and a gasket.
4. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
5. Open the power junction box. This is the junction box without a disconnect handle visible on the outside.
6. Disconnect the control wire leads of the slip ring from the small terminal block. To disconnect the wires, insert a narrow straight bit screw driver in the slot above the wire entrance and press firmly with the screw driver. This will release the clamp spring.
7. Disconnect the large 400 Hz power leads of the slip ring from the large terminal block.
8. Disconnect the spool cable control leads from the terminal strip on the top of the slip ring. This terminal is the same design as described in previous steps.
9. Disconnect the spool cable 400 Hz power leads from the slip ring brush terminals.
10. Loosen and remove the watertight gland nut and watertight gland from the slip ring enclosure cable entrance.
11. Pull the spool cable from the slip ring enclosure. You may need to remove the M10 U-bolt to get enough room to remove the cable.


P-Shaped Clamp
Spool Drum Opening
U-Bolt
Cable Entrance
Slip Ring Brush Buss Bar
Control Wire Terminal
Slip Ring Cover
Slip Ring Cover Gasket
Slip Ring
Entrance Ring
Flange Gasket
Spool Shaft
Spool Shaft Flange

Slip Ring Replacement (Continued)

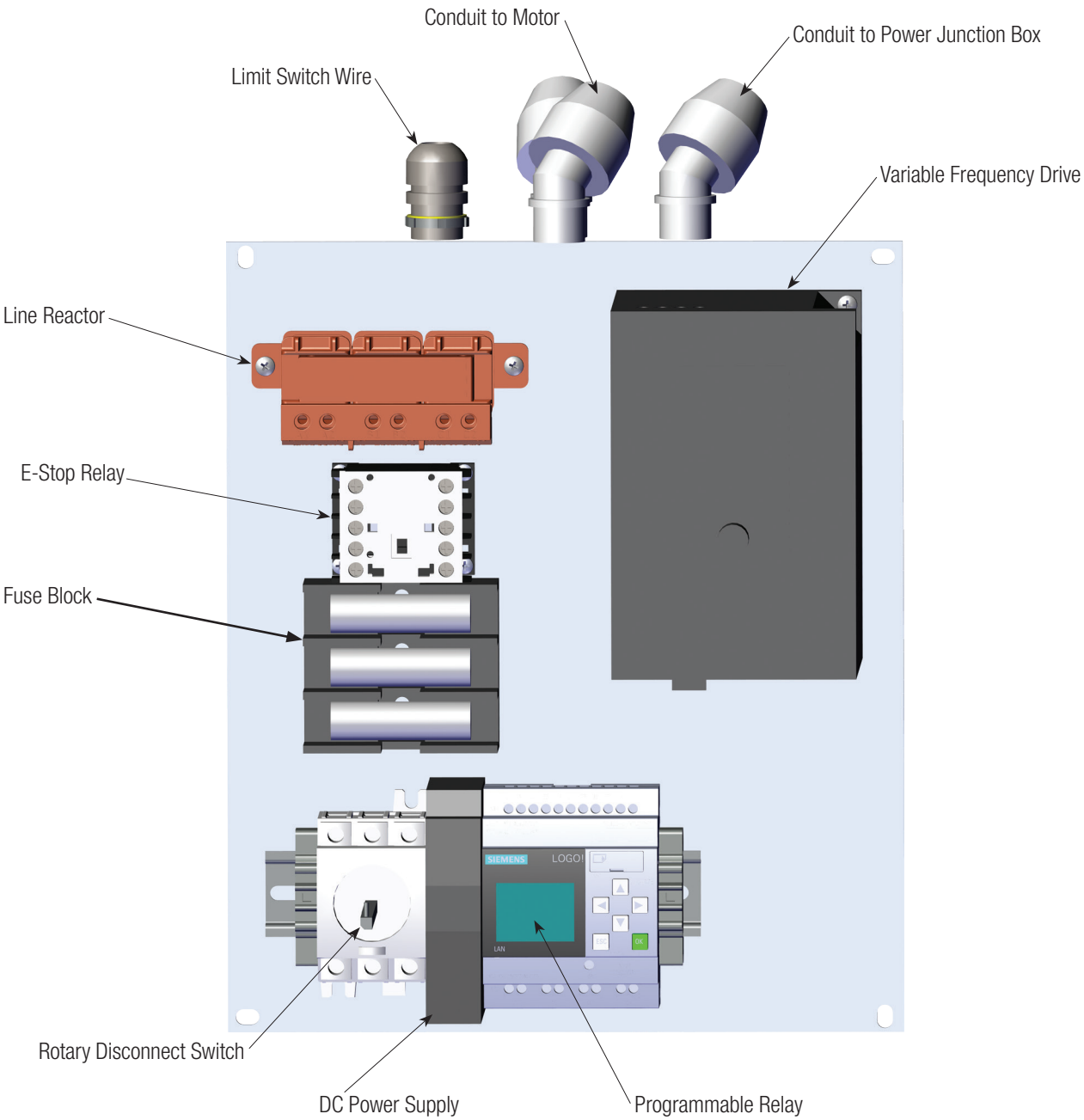
12. Remove the four M10 slip ring mounting screws from the shaft flange.
13. Pull firmly on the slip ring enclosure bottom half. You will be pulling the power and control cable through the large conduit. Be careful not to pull off any of the control wire connections.
14. Remove the four M8 screws from the shaft elbow box cover plate and remove the cover plate.
15. Prepare the shaft core leads of the new slip ring by taping the ends of the leads into one bundle. Be sure the control cable is well attached to a power lead in such a manner that when pulled on the power lead pulls tight but slack is still present in the control cable between the first anchor point and the splice connections. Keep the lead wires as straight as possible so that they do not cross or twist.
16. Apply a small bead of silicone sealer to the end surface of the spool shaft and position a new flange gasket on the spool shaft flange.
17. Apply a generous amount of wire pulling lubricant to the core leads.
18. Insert the core leads into the spool shaft.
19. Use the elbow box opening to reach inside and start the wire bundle around the corner into the conduit.
20. Continue pushing the wire leads into the conduit until the slip ring flange mates with the shaft flange and the leads extend into the power junction box. Make sure the slip ring cable entrance is oriented between the correct two spool spokes.
21. Install the four M10 slip ring mounting bolts.
22. Apply a small bead of silicone sealer to the elbow box cover plate gasket and reinstall the shaft elbow box cover plate.
23. Reconnect the control and 400 Hz power leads in the power junction box.
24. Insert the spool cable end into the watertight fitting of the slip ring enclosure.
25. Reconnect the control and 400 Hz power leads to the slip ring.
26. Insert the watertight gland into the watertight body and install the gland nut.
27. Install the U-bolt if removed previously.
28. Install the slip ring cover gasket and slip ring cover.
29. Install the access panel.

Slip Ring Brush Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
3. Remove the slip ring cover. This is the round can directly behind the access cover. It is mounted with eight M6 nuts on studs and a gasket.
4. Remove the brush shunt lead and brush lead wiring from the top of the brush holder by removing the top terminal screw.
5. Lift the spring slightly with a hook type tool.
6. Tilt the brush out from under the spring and away from the holder for removal.
7. Reassemble in reverse order.

Electrical Components

NOTE: Reels built for cold environments may include a heater in the enclosure.

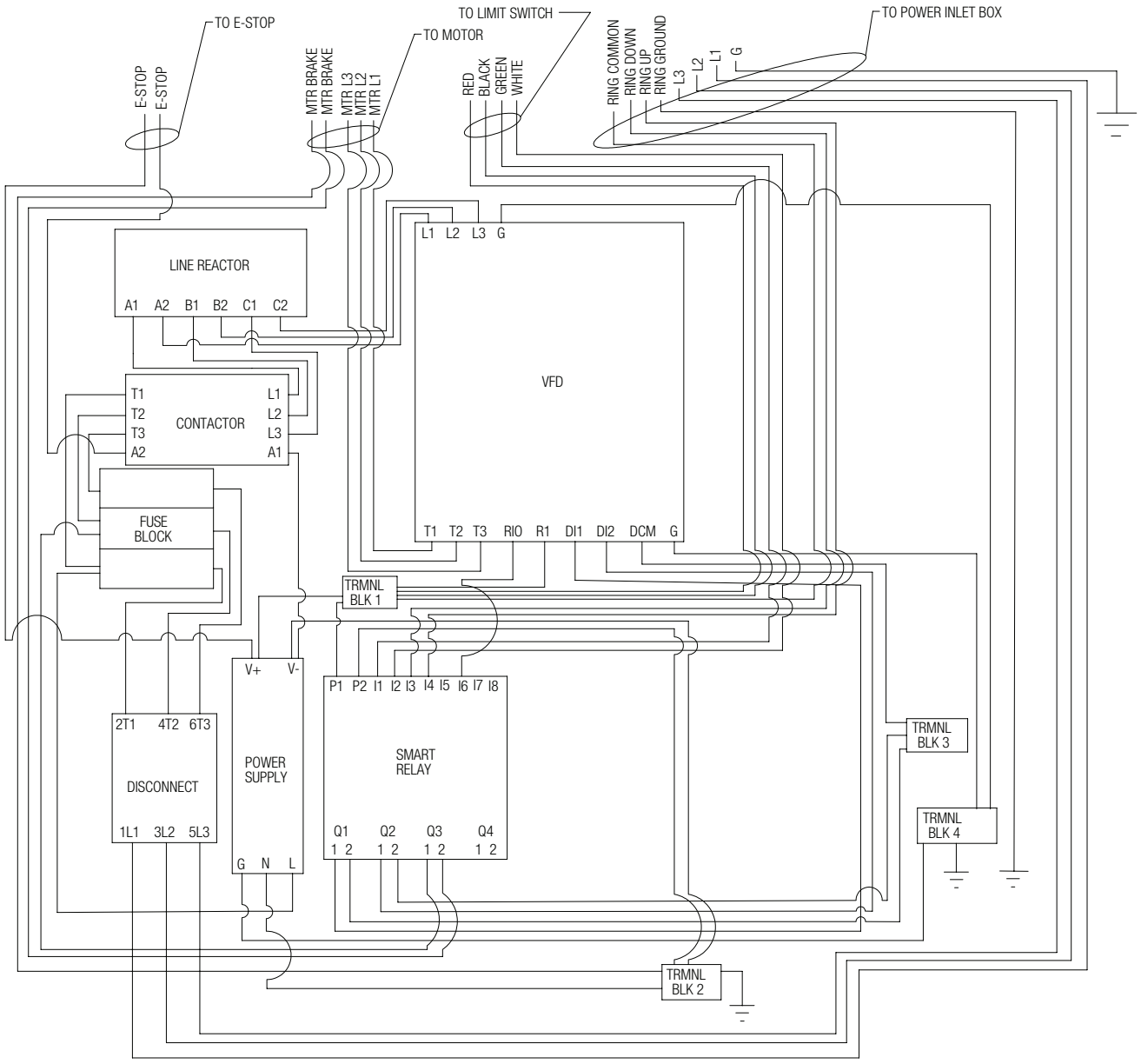


SECTION 6 - MAINTENANCE & REPAIR

Electrical Components

PLB400 Signal Terminations					
Terminal Number	**Slip Ring Lead Color**	**Slip Ring Extension Wire**	**Description**	**Triad Color Group**	**Spool Wire Color**
1	BLK	BLK	N/A	BRN-BLK-WHT	BLK
2	BRN	RED-BLK	OUT (DOWN)	ORG-BLK-WHT	ORG
3	RED	RED	F	RED-BLU	RED
4	ORG	ORG	OFF	GRN-BLK-WHT	BLK
5	YEL	ORG-BLK	N/A	BRN-BLK-WHT	BRN
6	GRN	GRN	ON	ORG-BLK-WHT	BLK
7	BLU	BLU	E	WHT-WHT	WHT
8	VIO	BLU-BLK	N/A	BRN-BLK-WHT	WHT
9	GRY	BLK-RED	IN (UP)	GRN-BLK-WHT	GRN
10	WHT	WHT	F	RED-BLU	BLU
11	WHT-BLK	WHT-BLK	UP - IN COMMON	ORG-BLK-WHT	WHT
12	WHT-BRN	RED-GRN	DOWN - OUT COMMON	GRN-BLK-WHT	WHT
13	WHT-RED	WHT-RED	N/A	N/A	N/A
14	WHT-ORG	ORG-RED	OFF COMMON	GRY-WHT	WHT
15	WHT-YEL	RED-WHT	N/A	N/A	N/A
16	WHT-GRN	GRN-WHT	ON COMMON	GRY-WHT	GRY
17	WHT-BLU	BLU-WHT	E	WHT-WHT	WHT
18	WHT-VIO	BLU-RED	N/A	N/A	N/A
G	N/A	N/A	MTR GND	N/A	N/A
L1	N/A	N/A	MTR L1	N/A	N/A
L2	N/A	N/A	MTR L2	N/A	N/A
L3	N/A	N/A	MTR L3	N/A	N/A

Motor and Safety Interlock Diagram



NOTE:

1. The back panel mounting screws are used for grounding lugs.
2. Use wire ties to bundle wires that go to common locations. Do NOT bundle power leads with signal leads. Keep the wiring neat and tidy.

SECTION 6 - MAINTENANCE & REPAIR

Retraction Limit Changes

1. Retract the cable until it is at the desired position for the Retraction (Lower) limit.
2. Disconnect all power sources to the reel following the required lock-out tag-out procedures.
3. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 Bolts.
4. Remove the cover of the limit switch. There may be an adjustment tool inside the limit switch, if there is no tool a screwdriver may be used instead.
5. Loosen the screw on the cam wheel nearest the switch with the green wire attached to it.
6. Using the provided tool (or a screwdriver) rotate the cam wheel until the switch clicks. Hold the cam in place with the tool and tighten the screw on the cam wheel. Be careful not to over-tighten the screw.
7. Remove all tools and any loose covers or hardware from the inside of the reel and turn the rotary disconnect switch handle on the outside of the motor control junction box to the ON position.
8. Extend the cable out about 2 meters (6ft) and retract it until it stops at the limit. If the cable does not stop where desired, repeat the steps above.

NOTE: Adjustment of the cam wheel is very sensitive.

9. If the reel will not extend but only retracts you have set the wrong switch, repeat the steps above for the other switch.
10. Replace all covers and panels.

Extension Limit Changes

1. Extend the cable until it is at the desired position for the Extension (Upper) limit.

⚠ WARNING

There must be a minimum of one full wrap of cable on the spool when cable is fully extended. The wheel on the stacker guide assembly must ride on the cable at all times.

2. Disconnect all power sources to the reel following the proper lock-out tag-out procedures.
3. Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.
4. Remove the cover of the limit switch. There may be an adjustment tool inside the limit switch, if there is no tool a screwdriver may be used instead.
5. Loosen the screw on the cam wheel nearest the switch with the white wire attached to it.
6. Using the provided tool (or screwdriver) rotate the cam wheel until the switch clicks. Hold the cam in place with the tool and tighten the screw on the cam wheel. Be careful not to over-tighten the screw.
7. Remove all tools and any loose covers or hardware from the inside of the reel and turn the rotary disconnect switch handle on the outside of the motor control junction box to the ON position.
8. Retract the cable reel about 2 meters (6ft) and extend it until it stops at the limit. If the cable does not stop where desired, repeat steps above.

NOTE: Adjustment of the cam wheel is very sensitive.

9. If the reel will not retract but only extends you have set the wrong switch, repeat the steps above.
10. Replace all panels and covers

SECTION 6 - MAINTENANCE & REPAIR

Limit Switch Replacement

1. 5.2.3.1 Disconnect all power sources to the reel following required lock-out tag-out procedures.

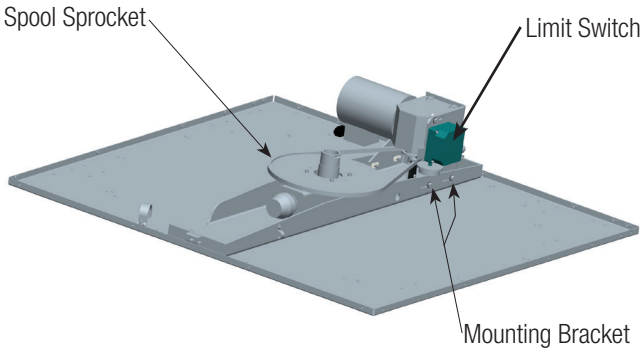
2. 5.2.3.2 Remove the access panel from the reel. This is the panel mounted to the large face of the reel opposite of the mounting side. It is held in place by eight M6 bolts.

3. 5.2.3.3 Remove the limit switch cover and remove lead wires from limit switch terminals. Make note of the relative positions of the wires and switches in the limit switch.

4. 5.2.3.4 Loosen the gland nut, slide cable gland bushing and nut back on cable and remove cable from limit switch.

5. 5.2.3.5 Remove the nylon block mounted between the chain and the limit switch bracket.

6. 5.2.3.6 Remove the two M10 bolts from the limit switch mounting plate and remove the limit switch and bracket assembly from the reel.



7. Remove the sprocket, cable gland hub, and reducer bushing from the old limit switch. Remove the old limit switch from the mounting bracket.
8. Mount the new limit switch on the bracket and install the reducer bushing and cable gland hub. Place the sprocket on the new limit switch shaft.
9. Reinstall the limit switch and bracket assembly in the reel and install the nylon block on the bracket.
10. Adjust the limit switch bracket until the sprocket fully engages the drive chain. Be careful to avoid using the limit switch or bracket to apply tension to the drive chain. Tighten the two M10 bolts to hold the limit switch in position.
11. Install the cable in the new limit switch making sure to put the wires in same place as they were when removed. Reinstall the cable gland bushing and nut.
12. Replace all covers and panels.
13. Follow the Extension and Retraction Limit Changes sections to reset the cable end limits.

Fuse Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Pull the fuses straight out of the fuse holder, one at a time and use a continuity tester to check for the bad fuse.

NOTE: If a fuse is bad, there is probably some other electrical issue that has caused the fuse to blow. Check for electrical shorts that may cause a fuse to blow before re-energizing the system.

6. Replace any bad fuses with equivalent replacements.
7. Push the replacement fuse straight into the fuse holder until is snaps into place.
8. Close the junction box.
9. Reinstall the side panel.
10. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the ON position.

SECTION 6 - MAINTENANCE & REPAIR

Variable Frequency Drive Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Mark and disconnect all the wires connected to the variable frequency drive.
6. Remove the four Phillips head screws that mount the back panel to the back of the junction box.
7. Tip the panel forward to access the variable frequency drive mounting screw nuts.
8. Remove the two variable frequency drive mounting screws and the drive.
9. Mount the new drive using the same mounting holes and hardware.
10. Reinstall the back panel to the back of the junction box.
11. Connect all the wires that were disconnected from the old drive to exactly the same terminals of the new drive.
12. Continue by following the Variable Frequency Drive Programming section of this manual.

Variable Frequency Drive Programming

Note: The variable frequency drive will only need programmed if the drive is replaced. The original drive provided in the reel has been factory programmed. The variable frequency drive will not lose the program even when power has been disconnected for a long period of time.

⚠ WARNING

Some of the following steps involve procedures that must be done in the motor control junction box while the power is turned on. Use EXTREME caution when working in an energized junction box.

1. Ensure all the wiring is connected in the motor control junction box.
2. Turn on the motor power to the reel.
3. With the motor control junction box lid open, turn the rotary disconnect switch to the ON position.
4. Press the PROGRAM button until the display screen reads “0.00”.
5. Press the ENTER button.
6. Use the up arrow or down arrow buttons to select the value for parameter 0.00 as shown in the “VDF Parameter Settings” table.
7. Press the ENTER button.
8. Repeat the process for each parameter listed in the “VDF Parameter Settings” table. Any parameter not listed in the table leave at the default value.
9. Use the PROGRAM button to toggle between parameter sections 0.00, 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, and 9.00.
10. Use the up and down arrow keys in each section to toggle between each parameter within each section. (ie. 0.00, 0.01, 0.02, 0.03, 0.04) Skip parameters not listed in the parameter table. Be sure to press ENTER button after each parameter is entered.

Note: If an error occurred during programming and you have lost track of what parameters you have changed, go to parameter 9.08 and set it to 99. This will restore all the drive parameters to the drive manufacturers factory default settings. Then start over at the beginning of this section.

11. Turn rotary disconnect switch to the OFF position.
12. Close motor control junction box lid.
13. Reinstall the side panel.
14. With the motor control junction box lid closed turn rotary disconnect switch handle on the outside of the junction box to the ON position.

Variable Frequency Drive Programming (continuted)

VFD Parameter Settings									
		200 Class VFD				400 Class VFD			
	Input Power	200V	208V	220V	230V	380V	400V	440V	460V
Parameter	Description	Value							
0.00	Motor Voltage	200	208	220	230	380	400	440	460
0.01	Motor Amps	3.6	3.5	3.3	3.2	1.9	1.8	1.7	1.6
0.02	Motor Base Frequency	60	60	60	60	50	60	60	60
0.03	Motor Base RPM	1720	1720	1720	1720	1450	1740	1740	1740
1.00	Stop Methods	01	01	01	01	01	01	01	01
1.01	Acceleration Time	.5	.5	.5	.5	.5	.5	.5	.5
3.00	Source of Operation Command	01	01	01	01	01	01	01	01
3.11	Output Terminal 1	07	07	07	07	07	07	07	07
6.07	Over-Torque Detection Mode	01	01	01	01	01	01	01	01
6.08	Over-Torque Detection Level	45	45	45	45	45	38	38	38
6.09	Over-Torque Detection Time	.2	.2	.2	.2	.2	.2	.2	.2
6.10	Over-Torque Stall Prevention 1	75	75	75	75	75	65	65	65
6.11	Over-Torque Stall Prevention 2	75	75	75	75	75	65	65	65

Programmable Relay Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two junction boxes and remove the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Mark and disconnect all the wires connected to the programmable relay.
6. Insert a straight bit screwdriver into the eyelet below the wire entrances of the output side of the programmable relay.
7. Pry the eyelet outward to release that side of the programmable relay from the DIN rail.
8. Lift the programmable relay off of the DIN rail.
9. Hook the input side of the new programmable relay on the top edge of the DIN rail.
10. Push down on the output side of the programmable relay until it snaps into place.
11. Reconnect all the lead wires into the exact positions they were removed from.
12. Proceed to the programmable relay Programming section of this manual.

Programmable Relay Programming

Note: All reels are programmed from the factory for the application they are intended. Attempts should not be made to personally modify the original program; undesirable operational characteristics of the reel could result. Any program changes must be done by a trained Conductix representative.

1. Contact Conductix to obtain a memory card containing the program last known to be active on your reel. If you have had modifications done to your reel program and have obtained a memory card previously with the last active program used on the reel, that card may be used to program the programmable relay.

⚠ WARNING

Warning: Some of the following steps will involve procedures that must be done in the motor control junction box while the power is turned on. Use EXTREME caution when working in an energized junction box.

2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Remove the memory card slot cover from the programmable relay. Use a small straight bit screwdriver to pry the cover out of the slot a small distance using the groove in the top of the slot. Grasp the two sides of the cover and pull it out of the programmable relay.
6. Insert the memory card into the slot. The slot and the card each have a chamfered edge that must match. This ensures the card can only be inserted one way.
7. Turn the red handle of the rotary disconnect switch to the ON position from inside the box. The programmable relay will boot and automatically load the new program from the memory card. When complete, the programmable relay screen will open the main menu. You will see:

   >Program..
   Card..
   Setup..
   Start..

8. Use the arrow up and arrow down buttons on the programmable relay to move the cursor (>) to 'Start'.
9. Press OK.
10. Turn the red handle of the rotary disconnect switch to the OFF position from inside the box.
11. Remove the memory card the same way you removed the card slot cover and replace the cover.

DC Power Supply Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Mark and disconnect all the wires connected to the power supply.
6. Insert a straight bit screwdriver into the eyelet below the wire entrances of the output side of the power supply.
7. Pry the eyelet outward to release that side of the power supply from the DIN rail.
8. Lift the power supply off of the DIN rail.
9. Hook the input side of the new power supply on the top edge of the DIN rail.
10. Push down on the output side of the power supply until it snaps into place.
11. Reconnect all the lead wires into the exact positions they were removed from.
12. Close the motor control junction box.
13. Reinstall the side panel.
14. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the ON position.

Line Reactor Replacement

1. Disconnect all power sources to the reel following required lock-out tag-out procedures.
2. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the OFF position.
3. Remove the eight M6 mounting screws in the outer edge of the side panel that covers the two reel junction boxes and the panel. This panel is the one that has a red rotary disconnect handle visible on it.
4. Open the junction box.
5. Mark and disconnect all the wires connected to the line reactor.
6. Remove the four Phillips head screws that mount the back panel to the back of the junction box.
7. Tip panel forward to access line reactor mounting screw nuts.
8. Remove the four line reactor mounting screws and line reactor.
9. Mount the new line reactor using the same mounting holes and hardware.
10. Reinstall the back panel to the back of the junction box.
11. Connect all the wires that were disconnected from the old line reactor to exactly the same terminals of the new line reactor.
12. Close the motor control junction box.
13. Reinstall the side panel.
14. Turn the rotary disconnect switch handle on the outside of the motor control junction box to the ON position.

SECTION 7 - MAINTENANCE SCHEDULE

Time	Item	Action
Monthly	Cable	Visually inspect for damage. Damage may include cuts in the jacket, excessive abrasion or wear, twisting or general distortion of the cable shape.
	Guide Rollers	Check that the guide rollers turn freely and all mounting hardware is tight.
	Stacker Wheel Assembly	Check that the guide head rollers and drive roller turn freely and all mounting hardware is tight. Also, check that the guide head moves freely and the gas spring is providing sufficient pressure to stack the cable appropriately.
	Spool Rollers	Check that all the spool rollers turn freely and all the mounting hardware is tight.
Semiannually	Drive Chain	Check the chain for corrosion and tension. Lubricate and readjust as needed.
	Slip Ring	Check the slip ring condition as described in the slip ring inspection section of this manual.
	Electrical Enclosures	Check all electrical enclosures for signs of water intrusion.
	Cover Panels	Check all cover panel hardware to ensure it is still tight.

SECTION 8 - TORQUE CHART

Size	Torque (N-m)	Torque (ft-lbs)
M6-1.0	6.55	4.83
M8-1.25	14.92	11.00
M10-1.50	31.41	23.17
M12-1.75	51.19	37.78

SECTION 9 - TROUBLESHOOTING

Problem	Potential Cause / Explanation	Solution
Reel runs a short amount of time, then stops, but will restart after 30 seconds.	Overload sensing is tripped. Programmable Relay display shows “over torque” but clears after 30 seconds. Cable motion is obstructed.	Clear obstruction from the cable path.
	Overload sensing is tripped. Programmable Relay display shows “over torque” but clears in 30 seconds. Cable is free. Spool, slip ring, gear motor, or a guide roller does not turn freely.	Follow the inspection processes in the maintenance & repair section of this manual to determine which component is faulty and replace.
	A signal is present at the fault input terminal from a source other than the overload detection circuit.	Check reel to bridge interlock safety circuitry for proper function.
	Overload sensing is tripped. All the above checks were done and all components appear to be in working order. Speed adjustment has been changed. As the speed is set lower, the motor draws more amperage and can trip the overload detection.	Remove the side panel covering the motor control junction box. Open the motor control junction box and check the potentiometer dial setting. The indicator mark should be turned all the way clockwise to the 100.
	Overload sensing is tripped. Above checks were done and all components appear to be in working order and properly adjusted. Overload sensing parameter is set at too low of a value.	Consult Conductix for procedure to adjust overload detection parameter.

SECTION 9 - TROUBLESHOOTING

Problem	Potential Cause / Explanation	Solution
Cable fills spool leaving gaps between layers causing the spool to become full before all the cable is retracted.	Gas Spring has become weak.	See gas spring replacement is the stacker wheel section of this manual.
	Gas Spring has pressure but the stacker wheel guide head will not slide freely.	See stacker wheel assembly replacement section in this manual.
Reel will operate from stationary remote switches but not from cable push button controls.	Push button switches in cable control head are damaged or bad.	Replace cable push button switches.
	Damage to cable has broken control wires in the cable.	Replace the cable.
	Loose control wire connections at the slip ring, power feed junction box, or motor control junction box.	Check wiring at terminals.
	Control circuit section of the slip ring has failed.	Replace the slip ring.
Reel does not operate regardless of control used.	Bad power input connection.	Remove the side panel covering the motor control junction box. Open the motor control junction box and check the input terminals of the rotary disconnect switch for power.
	Burned out fuse(s).	With the power turned off and the motor control box open, remove the power fuses (located between the rotary disconnect and the line reactor) one at a time and check each one for continuity.
	Loose power wire connections.	With power turned on and motor control box open, check for voltage at the input and output terminals of the rotary disconnect, fuse block, line reactor, and DC power supply.
	Loose signal wire connections.	Check that all wires are fully inserted and tightened in the terminals on the Smart relay and VFD.
	Variable frequency drive fault. (Controls and monitors the motor function.)	With the motor control junction box open, turn the rotary disconnect switch to the ON position. Read the display on the VFD. If the display shows anything other than a number, disconnect power and consult Conductix.
	Programmable relay fault. (Processes inputs from the VFD as well as control switches, interlocks, and safety features, and provides appropriate action inputs to the VFD.)	Consult Conductix: 800-521-4888 | 402-339-9300
	Bad line reactor. (Filters and corrects incoming power to the VFD to provide added protection to the VFD electronics.)	Voltage across terminals A1, B1, and C1 should equal voltage across terminals A2, B2, and C2 respectively.
	Loose wire connections at the motor.	Remove the access panel and motor junction box cover and verify wire connections.
	Motor brake is not releasing.	If the motor brake is not releasing, there will be an audible tone from the motor when operated indicating that it is trying to run. Verify brake lead connections at the motor, and in the motor control junction box.

www.conductix.us

USA / LATIN AMERICA
10102 F Street
Omaha, NE 68127

Customer Support
Phone+1-800-521-4888

Phone+1-402-339-9300
Fax +1-402-339-9627

info.us@conductix.com
latinamerica@conductix.com

CANADA
1435 Norjohn Court
Unit 5
Burlington, ON L7L 0E6

Customer Support
Phone+1-800-667-2487

Phone+1-450-565-9900
Fax +1-450-951-8591

info.ca@conductix.com

MÉXICO
Calle Treviño 983-C
Zona Centro
Apodaca,NLMéxico66600

Customer Support
Phone(+52 81) 1090 9519
(+52 81) 1090 9025
(+52 81) 1090 9013

Fax (+52 81) 1090 9014

info.mx@conductix.com

BRAZIL
Rua Luiz Pionti, 110
Vila Progresso
Itu, São Paulo, Brasil
CEP: 13313-534

Customer Support
Phone(+55 11) 4813 7330

Fax (+55 11) 4813 7357

info.br@conductix.com

Contact us for our Global Sales Offices