Spiral®

Installation Manual

Models

L & L/R (9-½” Side Column)

S & S/R (14” Side Column)

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INTRODUCTION

The information contained in this manual will allow you to install your Rytec Spiral® Door in a manner which will ensure maximum life and trouble-free operation.

Any unauthorized changes in procedure, or failure to follow the steps as outlined in this manual, will automatically void the warranty. Any changes in the working parts, assemblies, or specifications as written that are not authorized by Rytec Corporation will also cancel the warranty. The responsibility for the successful operation and performance of this door lies with the owner of the door.

DO NOT OPERATE OR PERFORM MAINTENANCE ON THIS DOOR UNTIL YOU READ, UNDERSTAND, AND FOLLOW THE INSTRUCTIONS CONTAINED IN THIS MANUAL.

If you have any questions contact your Rytec representative or call the Rytec Technical Support Department at 800-628-1909. Always refer to the serial number of the door when calling a representative or Technical/Customer Support.

The wiring connections and schematics in this manual are for general information purposes only. A wiring schematic is provided with each individual door specifically covering the control panel and electrical components of that door. That schematic is shipped inside the System 4 control panel.

HOW TO USE MANUAL

Throughout this manual, the following key words are used to alert the reader of potentially hazardous situations, or situations where additional information to successfully perform the procedure is presented:

WARNING

WARNING is used to indicate the potential for personal injury, if the procedure is not performed as described.

CAUTION

CAUTION is used to indicate the potential for damage to the product or property damage, if the procedure is not followed as described.

IMPORTANT: IMPORTANT is used to relay information CRITICAL to the successful completion of the procedure.

NOTE: NOTE is used to provide additional information to aid in the performance of the procedure or operation of the door, but not necessarily safety related.

DOOR SERIAL NUMBER(S)

To obtain your DOOR SERIAL NUMBER, there are four universal locations that this information can be attained. These are on the left side column (at approximately eye level), on the head assembly drive motor, on the non-drive side head assembly console, and inside the System 4 control panel. (See Figure 1)

IMPORTANT: When installing multiple doors of the same model, verify & match the serial numbers of all the components for each door (i.e. control panel, side columns, head assembly, etc.). Identify & mark any items that may not have a serial number label before taking out of the shipping container (right side column assembly for instance).

NOTE: The following illustration shows the front side of the door. Left and right are determined when viewing the front side of the door.

Figure 1
INSTALLATION-MATERIAL, TOOLS, AND EQUIPMENT

INSTALLATION

MATERIAL, TOOLS, AND EQUIPMENT

1. Threaded rod (Ø½-inch) and other various wall anchor hardware and material. Concrete anchor bolts (Ø1-½-inch). (See “ANCHORING METHODS” on page 3)

2. Assorted shim stock. (See Figure 12, Figure 13, Figure 14, & Figure 16)

3. Double-sided tape.

4. Package of oversize plastic cable ties.

5. Mounting hardware for field-installed brackets.

6. Carpenters or spirit level (4-ft. minimum length).

7. Carpenter’s square.

8. Fish tape.


10. Masonry drill bit (for Ø1/2-in. anchors).

11. Three or four bar clamps (18-in. long).

12. Hammer or mallet and blocks of wood.

13. Crowbar or pry bar.

14. Assorted hand tools (pliers, tape measure, etc.).

15. Plumb bob with line.


17. T-30, T-40, & T-50 Torx head drivers.

18. Water level, line level, laser level, or transit.

19. Two ladders or scissors lift. (taller than height of door opening).

20. Forklift (see “Forklift Requirements” on page 2).

ADDITIONAL REQUIREMENTS

Labor and Site Requirements

1. Two installers.

2. A licensed electrician is required for making all electrical connections. (See “Electrician’s Responsibilities”.)

NOTE: All electrical work must be performed in accordance with local, state, and all applicable building codes.

3. 100% accessibility to the door opening during the entire installation process. No traffic should be allowed to pass through the opening while the door is being installed.

Forklift Requirements

A forklift supplied by the customer, dealer, or installer is mandatory for the safe and proper installation of this door. The forklift should have:

- 4,000-pound lift capacity.
- minimum height ability — door height plus 12 in.
- 48-in. wide fork
- side-shift capability (desired).

Electrician’s Responsibilities

For complete details on the responsibilities of the electrician, refer to the Rytec System 4 Drive & Control Installation & Owner’s Manual.

NOTE: See “CONTROL SYSTEM” on page 20 for complete details on the electrical work to be performed.

1. Install fused disconnect and Rytec control panel. (See Figure 2 for typical installation.)

2. Install all necessary conduit tubing.

NOTE: Separate conduit must be run for high & low voltage wiring.

3. Run electrical power lines to disconnect.

4. Run power lines from disconnect to control panel.

5. Run power lines from control panel to upper junction box.

6. Run power lines from control panel to door motor.

7. Run low-voltage cables from door to control panel.

8. Mount rear photo eyes as necessary (for older version doors & additional optional PE’s).

9. Wire low-voltage safety devices and activators (if used).

Run high & low voltage wires/cables in separate metal conduit to the bottom of the System 4 control panel.

All wires/cables must be cut to length. DO NOT leave excess wire/cable loops on the door or in the control panel. Excess wires/cables can cause problems.

Floor-Loop Activator Requirements (If Used)

If a floor-loop activator was ordered & shipped with your Rytec door, the following additional items are required to install the activator:

NOTE: Complete floor-loop installation instructions are shipped with the activator.

1. Concrete saw (with water-cooling attachment).

2. Water supply and garden hose.

3. Wet/dry shop vacuum.
4. 200–500 ft. of 16-gauge, 19-strand, type XLPE, copper, crosslink polyethylene jacket wire (or equivalent). The size of the floor loop will determine the length of wire required.

5. Bondo P606 Flexible Embedding Sealer (or equivalent) - required to fill saw cuts in floor after the activator is installed. For cold temperature applications, Bondo P610 Speed Set must be added to the P606 to ensure the sealer cures properly.

**GENERAL ARRANGEMENT OF DOOR COMPONENTS**

Figure 2 shows the location of the major components of your Spiral door. This illustration should be used as reference only and should not be considered as part of the installation instructions.

**ANCHORING METHOD**

Correct anchoring of the side columns to the wall and floor is important for the smooth and safe operation of the door. The wall material should be strong enough to support the weight of the door and all wall anchors.

Figure 3 details the wall load requirement for supporting the Rytec Spiral door. Figure 4 through Figure 7 show anchoring methods for various types of walls. Use the method best suited for your particular installation site.
1. Remove the two side column assemblies, spring pack assemblies, head assembly, and the small parts carton from the shipping crate. (See Figure 8)

NOTE: Remove parts and sub-assemblies from the shipping crate in the order directed throughout this manual.
SAMPLE OBJECT LIST

Included with every door shipped is an Object List as shown in Figure 9 which is a sample version. This list contains key information specific to the door such as the model, serial number, door Production Size specifications, etc. Locate this document (it will be with the small parts for the door) as you will need information on it which will be crucial for proper installation, operation, and maintenance. Keep this document along with the manuals in a safe place for future reference.

Figure 9
INSTALLATION-DOOR OPENING CENTERLINE LOCATION

DOOR OPENING CENTERLINE LOCATION

NOTE: Accurate measurements are critical for the proper installation and operation of your Rytec door. Verify all measurements.

1. Measure the width of the door opening. Then divide the measurement in half to locate the centerline. Mark the centerline along the floor. (See Figure 10)

   ![Figure 10](image)

   **Figure 10**

   Overall Width of Door Opening
   Half Width of Door Opening

LOCATING SIDE COLUMNS

1. Locate the object list for the door. It should be located in the small parts carton. This List identifies the production width & other important information for your door. (See Figure 9)

2. Using the centerline as a reference point, layout and mark half of the door's production width along the floor. (See Figure 11)

   ![Figure 11](image)

   **Figure 11**

   Half of Door Production Width
   Centerline of Opening
   Extend and Mark Edges of Door along Floor

3. With a carpenter's square placed against the wall, mark both sides of the door along the floor. Extend the line along each edge.

4. Check that the floor is level across the door opening. The floor must be level within 0.12 in. (3 mm) from side to side. If one side of the opening is higher than the other by this amount, a shim will be required under the side column.

   ![Figure 12](image)

   **Figure 12**

   Line Level
   This Dimension Must Be Equal on Both Sides of Door Opening
   Shim Plate (As Required)

5. Use a plumb bob, laser level, or carpenter’s level to check the wall for plumb in the areas where the side columns are to be mounted. Also, inspect the wall for any obstructions. If the wall is not plumb, use shims. If you find an obstruction, remove it or shim the column to avoid the obstruction. (See Figure 14)

   ![Figure 13](image)

   **Figure 13**

   This Dimension Must Be Equal on Both Sides of Door Opening
   Water Level
   Shim Plate (If Required)
SIDE COLUMNS

⚠️ CAUTION

Side columns may be heavy; use proper lifting and support equipment when removing from crate & handling. Personal injury may result from using improper handling procedures.

1. To install the first side column, first remove and retain the screws used to secure the side column cover to the side column assembly. Lift the cover away from the side column assembly.

2. Stand the side column assembly on the floor, with the back of the column firmly against the mounting wall. (See Figure 15)

   NOTE: Set the inside edge of the column flush with the door layout line.

3. Position the side column assembly so that it is plumb to the wall and vertical on the floor.

   A plumb bob, laser level, or carpenter’s level are recommended for setting the column plumb & square. Using bar clamps or similar clamps to temporarily secure the column to the wall for installation is advised. When required, shim behind the side column if the wall is out of plumb. Use double-sided tape to hold the shims in place on the wall or side column(s) until the side column(s) is/are secured to the wall. (See Figure 16)

USING A PLUMB BOB

To check for plumb measure a few inches away from the face of the side column near the top (Dimension A) and lower the plumb bob as shown. (See Figure 15)

Mark the floor where the plumb bob touches. Compare the upper measurement to the lower measurement. Shim the column toward or away from the wall, as required, until the two measurements are equal and the column is plumb to the wall.
INSTALLATION-SIDE COLUMNS

Also, measure a few inches away from the side of the column near the top (Dimension B) and lower the plum bob. (See Figure 15) Mark the floor where the plum bob touches. Compare the upper measurement to the lower measurement. Lean the column to the left or the right until the two measurements are equal and the column is plumb with the floor (or shim plate).

USING A CARPENTER'S LEVEL

Hold the level firmly against the face & side of the column. Make the necessary adjustments to set the side column level.

4. Temporarily clamp the side column to the wall once the column is properly positioned.

5. Using the predrilled anchor points in the back of the column as a reference, mark their location on the wall. (See Figure 17)

6. Using the predrilled anchor points in the base plate as a reference, mark their location on the floor. (See Figure 18)

NOTE:
If Threaded Rod Is Used in Upper, Inside Pair of Anchor Points, Rod Must Not Extend Past Nut Threaded on the End of the Rod

IMPORTANT:
Locate and drill the holes in the center of each slot and hole.

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Locate and drill the holes in the center of each slot and hole.

7. Unclamp and set the column aside. Drill holes into the floor and through the wall for all anchors.

8. Reposition & re-clamp the side column to the wall. Secure the base plate to the floor with the appropriate anchors. Do not over-tighten the anchors at this time.

9. Anchor the side column to the wall using the appropriate anchors (see “ANCHORING METHOD” on page 3) and all drilled anchor points. Do not fully tighten the anchors at this time. They should just be snug.

10. Check for plumb and level. Reposition the side column to the wall if needed.

11. Mount the remaining side column assembly to the floor & wall in the same manner as outlined for the previous side column.

NOTE: To ensure the side columns are positioned identically, take measurements for each column from similar points of reference.
12. With both side columns set & snugly bolted in place, check the overall plumb, level, vertical, & square of the mounted columns. (See Figure 19)

Compare the diagonal measurements and the upper & lower horizontal measurements across the columns. The columns are square & parallel when the diagonal measurements are equal & the horizontal measurements are equal.

If either column requires slight repositioning (when the difference of either comparison is greater than ¼ in.), use a block of wood and a mallet to move the column into position.

13. Double-check all measurements. Then firmly tighten all floor & wall anchors.

### REAR SPREADER BAR

To make it possible to install the spreader bar, and the head assembly later on, the door track running along the inside edge of each side column must first be released and slid out of the way.

1. Each section of door track is attached to the side column by a series of aluminum clips that are bolted to the back of the side column. Loosen the hex nut that locks each clip in place. (See Figure 20)

2. Once each clip is loose, slide the door track to the bottom of the side column.

3. With the curved side of the spreader bar facing away from the wall, attach the ends of the spreader to the side columns. Use two M6 – 1x20 hex head screws & washers at each end. The screws are located in the small parts carton. (See Figure 21)

4. Using the appropriate hardware, secure the spreader bar to the wall at the two anchor points in the center of the spreader as shown. The rear spreader must be secured to the wall at all anchor points. (See Figure 21)

**NOTE:** When securing the spreader to the wall, it will be necessary for you to mark the location of the wall anchors using the spreader holes as a reference. After drilling the required holes and installing the anchors, permanently secure the spreader bar to the wall.

Additionally, if shims or spacers were installed behind the side columns, it will be necessary for you to shim behind the spreader to match the side columns.

5. Tighten all hardware in the side columns and rear spreader. Check the alignment of the side columns and rear spreader with a level. Adjust as necessary.
CAUTION

Lifting pockets are provided on the shipping cradle for some models. (See Figure 22) If lifting pockets are not provided, place the forks under the cradle & clamp the cradle to each fork.

DO NOT lift the cradle/head assembly without clamping it or securing it to both forks of the forklift. Failure to securely fasten the cradle/head assembly to the forklift may result in property damage and/or personal injury.

The head assembly is heavier at the motor end. If lifting pockets are not provided, offset the forklift to counterbalance the load.

1. Using a forklift, carefully lift and remove the head assembly from the shipping crate. (See Figure 22)

2. Before lifting the head assembly into position, remove the 2 end caps & the primary drive belt guard. Retain all fasteners. For the S – Size, remove, rotate, and re-attach the wall attachment bracket at each end of the head assembly. (See Figure 23 & Figure 24)

3. Raise and position the head assembly above each side column. Position the head so that it is parallel to the wall & level with each side column. Then carefully lower the head assembly onto the side columns. (See Figure 24 & Figure 25)

NOTE: Use extreme care when lowering the console assembly into position.
4. Attach the head assembly to the two side columns. Six M10 x 20 mm hex head screws (bolts) & washers are installed at each end of the head assembly. Remove the mounting hardware, position the side column & re-install hardware. (See Figure 26)

**S-size models:** secure wall attachment brackets on each end using the appropriate anchor hardware for your wall. Use all available holes in both brackets and make sure they are tightly secured to the head assembly.

5. Before lowering the forklift, disconnect the steel cradle assembly from the head assembly. To do this, simply remove the two pairs of screws securing the ends of the cradle to the ends of the head assembly. (See Figure 27)

6. Discard the cradle once it has been removed.

7. Now the straight length of door track in each side column can be slid into position. Located in the upper end of each track is a grouping of four holes. These holes mate with a set of alignment pins that are located on the end of each spiral track. (See Figure 28)

8. Slide each length of straight track up tight against the spiral track. To secure the track to the side column, lock the retaining clips tight against the track by threading the hex nut tight against the clip. (See Figure 29)
SPRING PACK SYSTEM

The spring pack system designed specifically for each door consists of spring assemblies & belts. It balances out the weight of the door panel assembly. This system is designed to assist the drive motor in opening & closing the door.

Depending on the size of the door, up to 12 springs may be used. Springs are arranged in spring pack assemblies consisting of 1, 2, or 3 springs. The springs are installed as listed in the Object List (See Figure 9). A nylon strap attached to the upper end of each spring pack connects the pack to the drive shaft located in the console assembly. (See Figure 30)

NOTE: Leave the door panel in the position it was shipped when installing each spring pack. If the door is repositioned at any time prior to the completion of the entire installation, the door may not operate properly & damage can result.

1. Locate the nylon spring strap(s) on the end(s) of the drive shaft. They are located inside the head assembly. To lower the strap through the side column, first carefully cut the plastic cable tie securing the strap to the drive assembly. (See Figure 31)

NOTE: Each spring pack has its own dedicated nylon spring strap. Do not unwind any of the strap from around the drive shaft.

2. Hang each spring pack assembly from its associated spring strap. Make sure the straps are not twisted. Use the hardware provided with the spring pack to attach the strap to the pack. (See Figure 32)
NOTE: Arrange spring packs in the side column with the largest packs in the back of the column. Also, outside-facing spring packs have a special guide bracket for mounting the spring pack to the side column.

3. With the spring packs attached to the straps, mount the outside-facing spring pack (with the guide bracket) to the side column. The two (2) M8 x 12mm Button head Torx screws used to attach the spring pack to the side column are located in the small parts carton. (See Figure 32)

4. Before a spring pack can be attached to the base plate, it must first be preloaded (sized) for your particular door. The preload information you will need for this procedure is provided on the Object List Sheet packed in the small parts carton for your door. (See Figure 9) The sample object list shows that 5.866” of preload are required for that specific door.

Preload is the measured distance from the base plate to the forked plate of the spring pack. To pre-load a spring pack, spin the adjustment rod until the rod assembly is the correct length. (See Figure 33)

5. On the end of the adjustment rod is a forked mounting plate. It is used to attach the spring pack to a pair of mounting posts on the base plate. A pair of nuts on each post will lock the spring pack to the plate. (See Figure 33 & Figure 34)

NOTE: If two spring packs are installed in a side column, be sure the spring straps are hanging straight and not tangled. Also, face the forked mounting plates toward each other and use plastic cable ties to help pull & secure the plates tight against the posts. Plastic cable ties are not required but help to prevent the forks from slipping out while tightening the nuts.

SECONDARY DRIVE BELT & GUIDE PULLEY SYSTEM

A drive belt is used to raise & lower the door. Once the spring pack system is installed the secondary drive belts can be installed in each side.
1. Each drive belt has been factory mounted to a drive pulley and a guide pulley. Also, each belt has been packed for shipping inside its respective drive assembly. Carefully cut the plastic cable tie that is temporarily securing the belt to the drive assembly. (See Figure 35)

![Carefully Cut Plastic Cable Tie to Release Belt & Pulley](A9500161)

**Figure 35**

**NOTE:** Leave both drive belts on the drive shaft pulley in the position found. Do not re-index either drive belt on the drive shaft. Otherwise, the “timing” of the door travel will be affected, which may result in damage to the door.

2. Pass the belt, along with the guide pulley, down the side column.

3. The nearest pair of mounting posts on the base plate are used for mounting the guide pulley as shown. Remove the two upper nuts from this set of posts to make it possible to place the pulley. (See Figure 36)

![Mount Pulley Bracket on Nearest Set of Posts](A9500219)

**Figure 36**

4. Secure the pulley bracket to the base plate using only the back post. Position that end of the pulley as close to the base plate as possible.

5. The front post is used to set the tension on the drive belt. Thread the upper nut down against the pulley bracket until the belt is properly tensioned. Tighten the lower nut against the bottom of the pulley to lock in the tension. (See Figure 38)

**NOTE:** If you find it difficult to reach the front post with the pulley, give the belt some slack by repositioning the pulley bracket on the back post. Also, it is important that the pulley bracket be level.

6. To make the belt run true, use the bolt & two nuts on each tab of the pulley assembly to level the assembly. (See Figure 37)

![Belt Guide Pulley Assy](A9500226)

**Figure 37**

7. Level the pulley assembly as required and tighten hardware. (See Figure 38)

**CAUTION**

Make sure the guide pulley bracket is level when the door is in operating mode. Damage to the belt or pulley components may occur if the guide pulley bracket is not level.
BRAKE RELEASE

This Rytec door is equipped with a brake override system that allows the door to be manually opened or closed in the event of an emergency or power outage. A steel cable links the electrical brake mechanism, located just above the drive motor, to a brake release handle mounted on the drive side column. The brake release handle is typically mounted on the side column but can also be mounted remotely or just remotely (on the opposite side of the wall).

When the brake release has been engaged, a properly installed door should automatically lift to about 1/3 to 1/2 open.

Side Column Mounted

The side column mounted brake release is mounted on the front side column on the door’s drive side.

1. One end of the steel cable was connected to the brake mechanism at the factory. For shipping, the other end has been routed out through the side of the motor-side drive assembly. Pull the cable back through the drive assembly & route it down through the side column to the brake release handle. (See Figure 39 & Figure 40)

   NOTE: Tug on the free end of the cable to check that it is not caught or hung up.

2. With the brake release handle fully extended out or at 90°, feed the cable through the eyelet in the bottom of the handle. Slide a crimp nut over the end of the cable with the nut tight against the eyelet. Then with the majority of slack removed from the cable, tighten down the setscrew. The crimp nut is located in the small parts carton. (See Figure 40)

3. Pull the handle several times to stretch the cable and remove any slack. Check the action of the lever on the brake mechanism for proper travel. If necessary, reposition the crimp nut.

   NOTE: Ensure that the cable isn’t so tight that the brake mechanism cannot re-engage once the lever is released and put back in place.

4. Cut the cable to length, an inch or two after the crimp nut. (See Figure 40)

5. Disengage the electric brake by pulling the brake release handle. Then by, hand, manually lower the door a few inches to verify that the door is not bound or caught up in the head assembly.

6. To re-engage the electric brake to lock the door in place, put the brake release handle back against the side column.
INSTALLATION-PHOTO EYES

Remote Mounted

The remote mounted brake release is mounted on the opposite side of the wall to the door. The cable is routed through the wall & connected to the motor’s brake release. This feature can be used in combination with or in place of the side column mounted brake release.

1. One end of the steel cable was connected to the brake mechanism at the factory. For shipping, the other end has been routed out through the side of the drive console. Securely route the brake release cable down the wall along the side column to about 12” above where the front mount brake release is or would be located. (See Figure 41)

2. Using the front brake release or it’s mounting holes located on the front of the side column as a placement guide for mounting the remote brake release, drill at least a Ø3/8” hole through the wall to the opposite side just above it. Route the cable through the wall to the opposite side. (See Figure 41)

3. Finish routing the cable through to the brake release handle. Mount the brake release to the wall. (See Figure 41)

NOTE: Tug on the free end of the cable to check that it is not caught or hung up.

4. With the brake release handle fully extended out or at 90°, feed the cable through the eyelet in the bottom of the handle. Slide a crimp nut over the end of the cable with the nut tight against the eyelet. Then with the majority of slack removed from the cable, tighten down the setscrew. The crimp nut is located in the small parts carton. (See Figure 40)

5. Pull the handle several times to stretch the cable and remove any slack. Check the action of the lever on the brake mechanism for proper travel. If necessary, reposition the crimp nut.

NOTE: Ensure that the cable isn’t so tight that the brake mechanism cannot re-engage once the lever is released and put back in place.

6. Cut the cable to length, an inch or two after the crimp nut.

7. Disengage the electric brake by pulling the brake release handle. Then manually lower the door a few inches to verify that the door is not bound or caught up in the head assembly.

8. To re-engage the electric brake to lock the door in place, place the brake release handle back in the disengaged position.

PHOTO EYES

This door uses two sets of photo eyes to monitor the front & back sides of the door. Each set consists of two photo eye modules. There are front factory-installed photo eyes that are located in the left - front and right – front corners of the door side columns. There are also rear factory-installed photo eyes which are installed in the left – rear & right – rear corners of the door’s side columns. (See Figure 42)
Factory - Installed Photo Eyes

1. Locate each factory installed photo eye module and its required wire cable. (See Figure 43)

2. Each cable has been routed up through a vertical raceway located in the corner of the side column. Locate the free end of each photo eye cable. (See Figure 44)

3. Route the non-motor side photo eye cable(s) straight up into the console assembly, then across the rear spreader to the motor side console. This rear spreader runs between the console assemblies along the top. (See Figure 45)

   Check to make sure the cable(s) are lying on top of the rear spreader. Once all wiring is complete, plastic cable ties must be used to secure the cable(s) to the rear spreader.

4. Continue routing the cable(s) through to the motor side head console assembly & over to the door head assembly junction box, located behind a panel on the drive side console. (See Figure 46)

   NOTE: Route cable away from all belts, pulleys, and moving parts. Separate high & low voltage cables to prevent signal interference.
5. Remove the junction box cover & save the hardware for later use. Then pass the non-drive side front photo eye cable through the double-cable cord grip on the side of the junction box. Do not tighten the cord grip at this time. (See Figure 47)

NOTE: Take note that the two available cord grips are different – one is a single-cable grip, the other a double grip.

6. Route the drive side photo eye cable(s) out the hole near the back of the drive console. This hole is located just above the raceway. (See Figure 48)

7. From the hole, pass the photo eye cable(s) into the drive-side console and over to the door head assembly junction box. (See Figure 49)

NOTE: Make sure to route the wire cables away from all belts, pulleys, & moving parts. Separate high & low voltage cables to prevent signal interference.

8. Pass the drive side front photo eye cable through the double-cable cord grip along with the other front photo eye cable. Tighten the cord grip to lock both photo eye cables to the junction box. (See Figure 47)

9. Route the rear set of side column photo eye cables to the control panel.

NOTE: Be sure the path through which the cables are routed hides & protects them from damage. If necessary, run conduit to the console to protect the cables. Note the end of the cable intended for the photo eye. DO NOT connect the photo eye cables to the control panel at this time.
10. Connect the control lines for the front set of side column factory-installed photo eyes to the door head junction box as indicated on the electrical schematic shipped with the System 4 control panel assembly.

WIRELESS ANTENNA BRACKET

The Spiral is equipped with a wireless reversing edge. The antenna & cable is packed into the motor side head console with a piece of foam over the antenna quills to protect them from damage. (See Figure 50)

1. Locate the antenna, Z-bracket, & cable in the motor side head console assembly. The antenna must be routed back through the head assembly. Pass the antenna through the opening near the motor & exit out the top of the side column. The tan cable needs to follow closely to the inside of the head assembly. Use cable ties to hold the cable away from moving objects. (See Figure 51)

NOTE: Right hand drive is a mirror image of the left hand side drive assembly.

2. Attach the assembly bracket to the head assembly with 2 of the Button Head M8 1.25x20MM, T40 screws. (See Figure 51 & Figure 52)

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Right Hand Side Console Shown

Wireless antenna located under white protective foam.

Figure 50

Figure 51

LEFT Hand Side Console Shown

Antenna enters here

EXIT out of head console here

Figure 52

Figure 53

Exit out of head console here

LEFT Hand Side Console Shown

Antenna Z-Bracket Assy

Assembly Bracket

LEFT Hand Side Console Shown

Antenna Z-Bracket Assy

M4 Hex Nuts

M4 x 16 Cap Screws

M4 x 12 Cap Screws

Button Head Cap Screws
3. Attach the antenna & Z shaped bracket assembly to the larger wireless bracket. Use the shorter 12mm screws, washers, & standard M4 hex nuts for mounting them. The antenna cable **MUST** exit towards the floor, from the antenna, as shown. (See Figure 53)

**CONTROL SYSTEM**

Once the door has been assembled, see the Rytec System 4 Drive & Control Installation & Owner’s Manual for information on control panel installation, electrical connections, and door limit settings.

**NOTE:** To expedite the installation of this door, it is recommended that the electrical disconnect and control panel be installed prior to installing the door. Review the “GENERAL ARRANGEMENT OF DOOR COMPONENTS” section of this manual to determine where these major electrical components are to be located. The control panel & disconnect are typically mounted adjacent to the side column on the motor mount side of the door.

If you have any questions regarding this installation, contact your Rytec representative or the Rytec Technical Support Department at 800-628-1909.

**WARNING**

The disconnect must be in the OFF position & properly locked & tagged before performing the following procedure.

**IMPORTANT:** All high & low voltage cables must be installed in separate conduit & cut to length with no excess or loops.

**NOTE:** All wiring & required conduit between the electrical disconnect and the control panel, between the control panel and the small junction box near the drive motor, and between the control panel and the floor, must be supplied by the owner of the door. All wiring & conduit must meet all local & state building codes & requirements.

Wires provided with the door have been identified with terminal or contact numbers.

All conduits entering the control panel **MUST** enter from the bottom through a removable knockout plate. **DO NOT** run any conduit into or through either the top or side of the control panel.

Protect the components inside the control panel from metal chips when installing the conduit. Seal the conduit where it enters the control panel – particularly if the conduit is routed from one area to another, where the two areas can have different ambient air temperatures. If the conduit is not sealed properly, condensation can form inside the control panel, which can lead to serious electrical problems.

The wiring diagrams & schematics provided in this manual are for informational purposes only. Due to customer requirements for individual installations, a schematic diagram has been prepared for your particular door & installation. That schematic diagram has been shipped with the control panel & must be referred to during this installation.

**WARNING**

All electrical work must be performed by a licensed or certified electrician. All electrical work must be performed in accordance with all local and state building codes & requirements.
CONTROL PANEL CONNECTIONS

Drive Motor to Control Panel
1. Route the drive motor/motor brake power cable, leading from the motor junction box, to the control panel. (See Figure 55)

   NOTE: To properly ground the outer shield of this cable, terminate the end of the cable to the control panel using the grounded cable clamp provided.

2. Connect the drive motor power supply lines to the control panel as indicated on the electrical schematic.

3. Connect the motor brake power supply lines to the control panel as indicated on the electrical schematic.

   NOTE: Separate high & low voltage conduit.

Brake Release Sensor to Control Panel
1. Route the brake release sensor cable, leading from the motor junction box, to the control panel. (See Figure 56)

2. Connect the brake release sensor control lines to the control panel as indicated on the electrical schematic.

Factory-Installed Photo Eyes to Control Panel
1. Route factory installed photo eye control cables, leading from the door head junction box, to the control panel. (See Figure 57)

   NOTE: To properly ground the outer shield of this cable, terminate the end of the cable to the control panel using the grounded cable clamp provided.

2. Connect the control lines for the factory-installed encoder/photo eyes to the control panel as indicated on the electrical schematic, received with the System 4 control panel.

   NOTE: Separate high & low voltage conduit.
Activators

Rytec recommends setting the limits on the door & to operate the door initially without the activators connected. When the limits have been established & the door successfully operated 20 times, then turn OFF the disconnect power & install the activators. Establishing the limits & operating the door allow you to isolate any potential operating issues to the door without the activators connected. Often activators create problems at initial start-up. Connect activators 1 at a time as shown on the schematics provided in the System 4 control panel shipped with the door.

**NOTE:** Separate high & low voltage conduit.

OPERATING CONTROL SYSTEM

The Spiral Door offers high-speed operation with the advantage of providing a secure barrier. All operator inputs and control functions are carried out by the “System 4” drive and control system. (See Figure 58)

**NOTE:** Separate high & low voltage conduit.

MODES OF OPERATION

The door may be operated in 2 ways: Automatically and Manually. The System 4 control panel offers this flexibility of control.

Automatic Mode of Operation

If a *momentary* contact activator such as a push-button, pull cord, radio control, etc., is used to activate the door:

- The door will open when the device is activated.
- A timer, internal to the control system, will start up once the door reaches the full open position.
- When the internal timer clocks out, the door will automatically begin to close.

If a *maintained* contact activator device such as a floor loop, motion detector, etc., is used to activate the door:

- The door will open & remain open for as long as the device is active.
- Once the device becomes inactive, the internal timer will start up.
- When the internal timer clocks out, the door will automatically begin to close.

In the automatic mode, while the timer is running, at any time the activator device or another activator in the system is enabled, the timer will reset & the door will not be allowed to close until the timer runs out. It is only when the timer clocks out that the door will begin to close. (To change the timer setting, see the “System 4 Drive & Control” manual)

In summary, in the automatic mode, an externally installed activator device is used to open the door and an internal timer is used to close the door.

Manual Mode of Operation

If a *momentary* contact activator such as a push-button, pull cord, radio control, etc., is used to operate the door:

- The door will open when the device is activated.
- After passing through the door, a similar type of device must be used to close the door.

In summary, in the manual mode, a manually-operated activator is used to open **and** close the door.

**NOTE:** The System 4 control has separate inputs programmed with or without the use of timers. Any input utilizing a timer can be turned OFF by simply reducing the time to 0 seconds. (See the “System 4 Drive & Control” manual)

INITIAL START-UP

Setting Door Limits

**NOTE:** Once you have set your door limits during this procedure they are permanently stored.

**CAUTION**

Initial system start-up is only to occur once the door and control panel have been properly installed, wired, and all preliminary door adjustments made. Failure to follow the instructions as outlined in the installation manual that was provided with your door can result in damage to the door upon initial system start-up.
**CAUTION**

When limits are established, the display will prompt you to push the down key and begin the auto-calibration process. 1:500 messages will appear on the display. This is normal and the messages should disappear within 10 complete cycles. Keep hands & equipment away from the door until the auto-calibration is complete.

1. Release the brake with the brake lever/handle located on the side column and manually move the door to the half-open position.

2. Apply power to the control system. During the system initialization, the display will indicate that the door close & open limits must be set by displaying “I Set Limits!”. (See Figure 59)

   Then the message Push (→ ● [press the reset (●) key] will appear on the display. (See Figure 59)

![Figure 59](image)

   ! Set Limits ! → ● To Begin

   **CAUTION**

   The door open and close limits are to be set only after verifying that the motor (door) operates in the proper direction when the up (▲) and down (▼) keys are pressed.

3. After the reset (●) key has been pressed one time, verify the motor rotation by briefly pushing the up (▲) & down (▼) keys on the control panel.

   The door should open with the up (▲) key & close with the down (▼) key. If the door does not operate in this manner, reverse two of the motor wires (not the incoming three-phase supply wires).

   NOTE: Reversing the incoming supply voltage lines will not solve the motor rotation problem. Switch the T1 & T2 motor leads.

4. Now set the door close & open limits according to the instructions on the display.

   **NOTE:** If any error messages are displayed, some of the required input connections may be missing. Once the missing inputs are connected, perform the open and close limit set-up. Otherwise, refer to “FAULT CODES” section in the “System 4 Drive & Control” manual.

5. The close limit must be set first. Use the down arrow (▼) button to position the reversing edge gently on the floor. (See Figure 60) DO NOT drive the edge into the floor. When the proper position is achieved push and hold the Reset (●) button until the display reads, “Close limit Set, to open position”.

   ![Figure 60](image)

   Only the rubber flap of the reversing edge should be touching the floor. DO NOT drive reversing edge into the floor.

6. The control will prompt you to set the open position. Use the up arrow (▲) button to position the door in the open position. The open position limit should be set slightly below the door lintel/side column top. Typical open position is the height of the door opening lintel or just below it. (See Figure 61)

   ![Figure 61](image)

   Top of side column cover

   Reversing Edge
CAUTION

When limits are established, the display will prompt you to push the down button/key and begin the auto-calibration process. I:500 messages will appear on the display. This is normal. The I:500 messages should disappear within 10-15 complete cycles. Keep hands and equipment away from the door until the auto-calibration is complete.

7. After the limit positions have been established, the door controller will automatically prompt you to push the down arrow (▼) button/key & begin the auto-calibration/synchronization process.

During the process the display will read “I:515, I:510, & I:555” and this is normal. DO NOT make any changes to the door until the “500” type messages have left the screen. This could take up to 15 cycles to complete.

This is done to optimize performance & will allow the door to run smoothly & efficiently.

NOTE: The door will fine-tune the speed setting based on the programmed limits during the first several cycles. The informational messages I:510, I:515, & I:555 will and may appear during the first 10 cycles of the door operation. This is normal, as the controller is optimizing the operational curve of the AC drive & motor. The door may run erratically during this process. DO NOT change any speed or limit parameters during this time.

If the message does not disappear from the display after 15 cycles, contact Rytec Technical Support at 800-628-1909.

8. The Auto-close timers (ACL1, ACL2, etc.) are set to a default of 10 seconds. To modify ACL1 & ACL2 or any other time settings refer to the “SYSTEM PARAMETERS” section in the “System 4 Drive & Control” manual.

System Reset — Door Reversing Edge

Any time the door is closing and the reversing edge along the bottom bar makes contact with an object, the display will read “F.361” (Edge Trip) and the door will move to the fully open position. With “F.361” displayed, the door will begin to countdown to close. If the reversing edge is impacted three consecutive times the door will remain open until the system is reset.

1. To reset the control system with “F.361” displayed, first make sure the area directly below the path of the door is clear of all objects and personnel.

2. Then press and hold the reset (●) button until the control reads automatic.

3. Press the door close (▼) button to move the door to the fully closed position.

System Reset – Photo Eyes

If either set of photo eyes detects that an object has entered the door opening while the door is closing, the door will reverse direction and move to the fully open position. The door will remain parked in this position until the object has been removed from within the opening. If the front set of photo eyes detects the interruption, the display will read “Photoeye – Fr”. If the rear set of eyes detects the interruption, the display will read “Photoeye– Rr”.

After the door is closed, the display will read “Spiral Door” and the control system will wait for operator input.

Automatic Door Close Time

See “Setting Automatic Delay Timers” section in the “System 4 Drive & Control” manual.

FINAL ADJUSTMENTS

LEVELING DOOR PANEL

1. To check a door panel for level, first position the panel so that it is approximately four or five feet off the floor. Then check the bottom edge of the door panel for level. (The panel is considered level when both sides are within ¼ in. of each other.)

NOTE: Do not check the door panel for level by visually observing how it rests on the floor. Level is referenced off the two side columns and the head assembly.

2. Before making any adjustment to the door, remove all electrical power to the control panel.

WARNING

The disconnect must be in the OFF position and properly locked and tagged before performing the following procedure.

3. Mounted on the bottom corner of the door is an end bracket (one in each corner). This bracket is clamped around the two ends of the Secondary Drive Belt. (See Figure 62)
NOTE: If the door requires adjustment, always lower the high side of the door and never lower the door more than two notches at a time. Also, a reference mark on the drive belt will make it easier to return the end bracket to its original location, should that become necessary.

4. On the side that needs to be lowered, place your hand on the smooth side of the secondary drive belt & begin moving your hand up the belt towards the head assembly. When you're near the top, a "wave" will form & the belt should slip or "jump" on the sprocket. Perform this process until the panels have reached level. DO NOT place your hand between the belt and the sprocket while performing this task. You want the belt to "slip" 1 belt tooth at a time. (See Figure 63)

5. Restore power to the control panel and cycle the door several times. Recheck the panel for level and repeat the above steps, as necessary, until the panel is level.

TESTING REVERSING EDGE

Take precautions to prevent someone else from operating the door as you perform the following procedure. Also, be cautious around the moving parts that are exposed in the side columns.

With the door fully open, press the door close (▼) button. As the door begins to close, test the door reversing edge by hitting the bottom (rubber) edge of the door. (See Figure 64)

The reversing edge sensor is working correctly when the door reverses direction to the fully open position. If the reversing edge is impacted three consecutive times the door will remain open until the system is reset.
1. To reset the control system with “F:361 EDGE TRIPPED” displayed, first make sure the area directly below the path of the door is clear of all objects and personnel.

2. Then press and hold the Reset (●) button until the control reads automatic.

3. Press the door close (▼) button to move the door to the fully closed position.

   NOTE: Avoid tripping the photo eye sensors when testing the reversing edge.

CHECKING PHOTO EYES

The photo eyes are provided as a safety feature. If the photo eyes are correctly installed, interrupting either set of eyes as the door is closing will reverse the direction of the door and hold it in the fully open position until the interruption is removed.

Front Side & Rear Side Column Mounted Photo Eyes

The two modules that make up the set of photo eyes each have one indicator light. The eyes are receiving power & are aligned when the indicator on the emitter module (left-front & right-rear eye) is green and the indicator on the receiver module (right-front & left-rear eye) is yellow. If the receiver module indicator light is out, the eyes are not aligned.

The transmitter & receiver can be identified in two ways. The transmitter is designated SMT on the white label or by a single green light that comes on at the clear end of the transmitter. (See Figure 65) The receiver is designated SMR on the white label or by a yellow light that illuminates only when it is in proper alignment with the transmitter. (See Figure 66)

   NOTE: When the cable is connected to the photo eye, there is only a 1/4-inch window to see the green or yellow LED light.

1. The photo eyes are internally mounted on the front & rear of the side column. Check that the photo eye & all connections are secure & there is nothing damaged.

2. Confirm the cable/wires are securely & safely routed as necessary through the side column, across the rear spreader, through the consoles, to the junction box, to the control panel, and correctly wired.

Testing Photo Eyes System

WARNING

To prevent injury to personnel or damage to equipment, the photo eye circuit must be thoroughly tested to make sure the photo eye system is operating correctly.
With the power on, the green light on the emitter/transmitter indicates the photo eye modules are powered up. When the yellow light on the receiver modules are also lit, the transmitter & receiver modules are properly aligned.

Placing your hand in front of the side column mounted receiver breaks the light path and should cause the receiver’s yellow light to go out. Removing your hand should cause the light to go back to their original state.

1. With power applied to the control panel and the door in the fully-open position, press the door close (▼) button to activate the door.

2. When the door is about halfway closed, break the beam of light between the front set of eyes only. The moment the beam of light is interrupted, the control panel should reverse the direction of the door and park it in the fully-open position. When the beam of light is restored, the door should automatically move to the closed position after the Auto-close delay timer period(s) (ACL1, ACL2, and/or ACL3) time out. To modify ACL1, ACL2, or any other time settings refer to the “SYSTEM PARAMETERS” section in the “System 4 Drive & Control” manual.

3. Repeat the above procedure on both sets of photo eyes.

VISION PANEL

Spiral doors with optional window slats have a protective film applied to the Lexan™ window. Remove the protective film when the installation is complete. DO NOT leave the protective film on the window sections after installation.

Vision Slat - Cleaning

1. Rinse with flowing water.

2. Clean with warm water and a small amount of mild non-abrasive soap (dish soap).

3. Lightly rinse vision panels using a water spray.

4. Remove excess water using a clean and dry Micro-fiber or lint free cloth. If practical, use a high velocity fan or blower to air dry for best results.

5. Wipe any additional moisture with a dry micro-fiber or lint free cloth. If practical, use a high velocity fan or blower(s) to air dry the panels for best results.

NOTE: When the front beam of light is interrupted, the display on the control panel will read “Photo Eye – Fr”. When the rear beam of light is interrupted, the display will read “Photo Eye – Rr”.

3. Repeat the above procedure on both sets of photo eyes.

WARNING

The disconnect must be in the OFF position and properly locked and tagged before performing the following procedure.

1. Check to make sure the side columns and head assembly have remained plumb, square, and level. Also check that all floor & wall anchors have remained securely fastened.

2. Install end cap covers to the console assemblies on the head assembly as required. Each is held in place with (3) 20-mm-long, Torx head screws. (See Figure 67 & Figure 68)

3. Mount the primary drive belt guard. It is held in place with (4) 20-mm-long, Torx head screws. (See Figure 67 & Figure 68)

4. Mount the left- & right-hand cover assemblies to the side columns. These are held in place with 20-mm-long, Torx Button head screws. (See Figure 69 & Figure 70)
INSTALLING COVERS-CHECKING PHOTO EYES

“S” Series: Rotate Wall Attachment Brackets prior to Installation

Head Assembly (LH Motor Mount Shown)

Figure 68

Button Head Cap Screws

Assembly Bracket

Left Hand Side Console Shown

Figure 69

Side Column Cover Assembly

Button Head Cap Screws

Figure 70

Left Hand Side Column Shown
**FINAL CHECKS**

**NOTE:** Check all the following door components and systems once the door panel has been cycled at least 20 times.

**Side Columns:** Check that side columns are plumb and square and that all anchor bolts are secure and tight.

**Head Assembly:** Check that all mounting hardware is in place and tight.

**Door Panel Track:** Check the alignment of each door track, particularly where the tracks join up between the side columns and head assembly.

**Covers and Panels:** Check that all covers and panels are in place and securely fastened.

**Motor:** Check that the door travels in the proper direction when the associated buttons are pressed.

**Reversing Edge:** Check that it works properly. As the door is closing, if the reversing edge makes contact with an object, the door should return to the fully open position as described in the “TESTING REVERSING EDGE” section on page 24.

**Photo Eyes:** Check that they work properly. As the door is closing, if the light beam between either set of photo eyes is interrupted, the door should return to the fully open position as described in the “FINAL ADJUSTMENTS–CHECKING PHOTO EYES” section on page 26.

**Spring Packs:** Check that all spring packs are securely fastened to the side column bottom plate and the guide brackets secured to the side column sidewall. Also make sure that each nylon spring strap is securely fastened to the clevis bracket at the top of the spring pack.

**Nylon Spring Straps:** Make sure each spring strap is securely fastened to the drive shaft, not twisted, and running true to its respective spring pack.

**Drive Belts:** Check that each drive belt is properly tensioned and that the ends of each belt are securely clamped to the bracket assembly. Ensure that the pulley assembly is level and that the belt runs true.

**Drive Belt Pulleys:** Make sure each pulley bracket is properly secured to the base plate of the side column.

**Timers:** Automatic timers must be set to ensure that the door closes properly as described in the System 4 Drive & Control manual.

**Activators:** Check that they operate as specified by the manufacturer.

**Caulk:** Ensure that the side columns and head assembly are caulked where they meet the wall of the building

**Vision Panel(s):** Check that the protective film from the factory has been removed & that they are clean to allow unobstructed viewing through them as specified by the manufacturer.