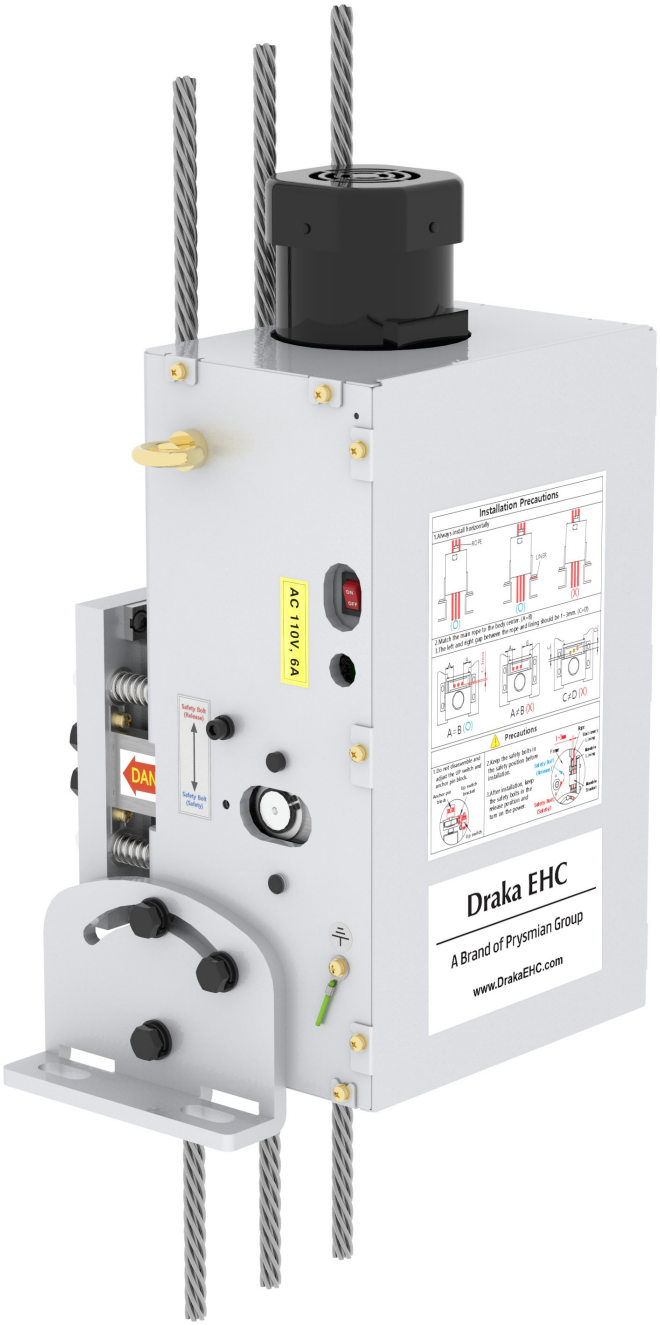
# Elevator Rope Brake (ERB)

## Models ERB10 / ERB20 / ERB35
## Specifications and Installation Guide




Draka EHC

A Brand of Prysmian Group

ERB INSTALLATION GUIDE 100822

# CONTENTS


| Description | Page |
|---|---|
| Safety notes | 2 |
| Certifications and quality testing | 2 |
| Description | 3 |
| Dimensions | 4 |
| Operating parameters | 5 |
| Circuitry and controls | 6 |
| Understanding the LED displays | 7 |
| Installing and powering | 8 - 9 |
| ERB35 Extension Kit (3/4 in.,18 mm Rope) | 10 |
| Testing | 11 |
| Emergency release methods | 12 |
| Maintenance - Replacing the brake lining | 13 |
| Maintenance - Troubleshooting and maintenance | 14 - 15 |
| Required inspection | 16 |
| Part numbers/ordering | 16 |


# IMPORTANT SAFETY NOTES! READ BEFORE INSTALLING

**DO NOT put your fingers between the plates - severe injury may result.**

**Make sure that you have the right rope brake for your installation by checking the table on page 4.** Important specifications would include the car rated load, speed, weight, and the number/spread of the ropes.

**The Elevator Rope Brake (ERB) is heavy.** Depending on the model, it weights between 82 lbs • 37 kg and 117 lbs • 53 kg. Use appropriate equipment to lift and move it, and wear gloves and steel-toed shoes during installation.

**The ERB is only meant to be an emergency brake to stop unintended motion or overspeed conditions.** DO NOT use it to hold an elevator in place for service or repair. Running the rope brake for an extended period (more than a minute) could overheat and possibly damage the brake.

If langs lay ropes are used Draka EHC recommends that retaining means designed in accordance with ASME A17.1, 2.24.2.5.1 and 8.4.3.1 are installed to prevent the displacement of suspension members following the activation of the emergency brake.

**DURING INSTALLATION**

- Make sure the elevator is disabled. Lock out the power supply.
- Do not try to adjust any of the mechanical or electrical components unless specifically instructed to do so.
- The ERB operates at 110VAC, 1Ø, 6A power. Take all necessary precautions to prevent electrocution.
- If any part is damaged during installation, contact us for replacement. Using non-factory parts may cause the brake to fail and will void the warranty.

# CERTIFICATIONS AND QUALITY TESTING

**CERTIFICATIONS**

CSA Certificate: ERB10 / ERB20 / ERB35

KC Certificate: ERB10 / ERB20 / ERB35

Japan Certificate: ERB10 / ERB20 / ERB35

ISO 9001 Certificate

Certified by Liftinstituut to meet ASME A17.1-2019, CSA B44.1/ASME A17.5, EN 81-20:2020, and EN 81-50:2020 Standards

**PATENTS**

United States: No. US 8,973,717 B2 -"Rope Braking Apparatus"

Korea: No. 10-1011024 - "Rope Brake"

China: No. CN 103052584 B -"Rope Brake"

Korea: No. 10-1996602 - "Rope Brake"

**PERFORMED TESTS**

A complete inspection system based on ISO 9001

Operational at 0°C to 40°C @ ≤90% relative humidity

Voltage variation test

Brake performance test (500 cycles)

Durability test (3,000 cycles)

Tower UCMP and ACOP test:
Braking performance, braking distance and deceleration

# DESCRIPTION

The rope brake acts as an emergency method of bringing an elevator to a fast halt. In 'ready' mode, a solenoid restrains a spring that holds a powerful mechanism that will close a clamp positioned to grab the hoist ropes.

Should an elevator have unintended motion (such as starting with the door open or when an up/down overspeed condition occurs), the elevator controller cuts the power to the device. This demagnetizes the solenoid and releases the compressed springs, causing the rope brake to close on the ropes. This is the 'triggered' mode.

The clamp remains closed until the unit is reset or power is restored to the device. When power is returned to the rope brake, an integrated motor resets the closing mechanism and opens the clamp.

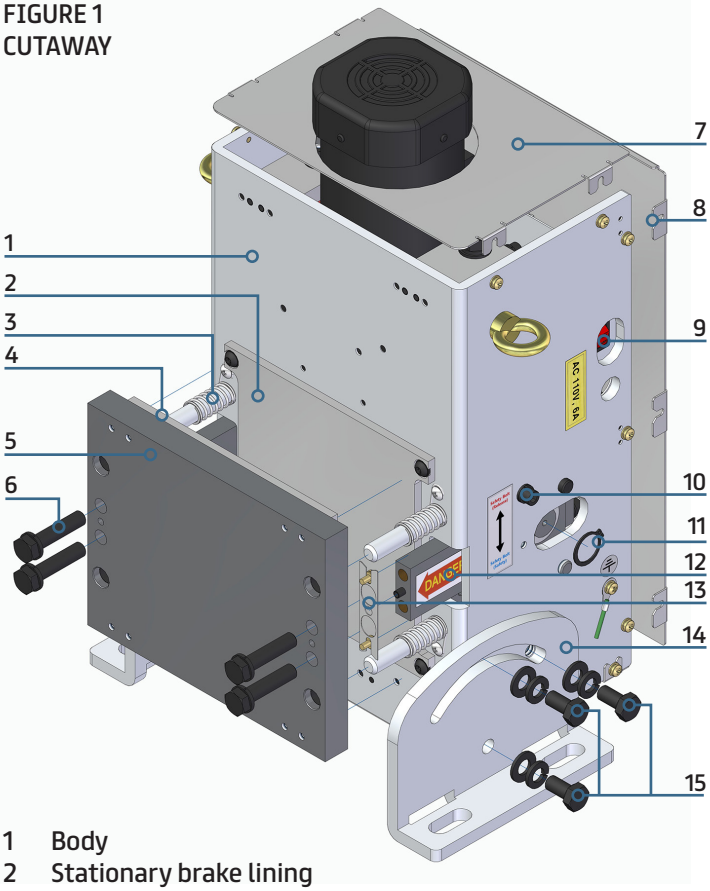
The ERB differs from other rope brakes in that it is a fully electromechanical device – it does not require an additional hydraulic unit to operate. This saves time as well as eliminating environmental issues that may occur with leaking oil. It also features an indirect braking technology that multiplies the braking force by a factor of ten.

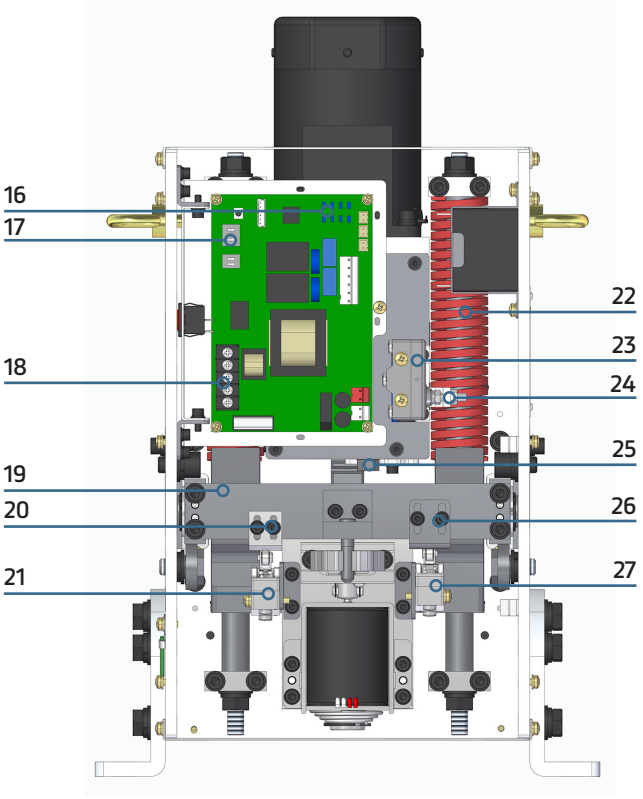
The brake linings on the clamp are made of an alloy that eliminates the need to 'groove' the linings.

An additional feature of the ERB is that it senses if the brake linings are worn out, signaling that they need to be replaced.

The ERB10 and ERB20 can accommodate rope diameters from 3/8 to 5/8 inches (9.5 to 16 mm) while the ERB35 can accommodate rope diameters from 7/16 to 3/4 inches (11 to 18 mm). See instructions on page 8 on how to modify the rope brake for your rope diameter.

FIGURE 1
CUTAWAY




1 Body
2 Stationary brake lining
3 Brake clamp spring on guide rod
4 Brake clamp lining
5 Brake clamp
6 Brake clamp attachment bolts
7 Top cover
8 Front cover
9 Power switch
10 Safety bolt (shown in upper hole/ready position)
11 Snap ring (shown removed)
12 Clamp arm
13 Shim (spacer)
14 Mounting bracket
15 Angle adjustment bolts

16 LED display (on PC board - page 5 for detailed view)
17 DIP switches
18 Power connections
19 Anchor pin block plate
20 Lining switch activator
21 Lining switch
22 Clamp spring
23 Down switch
24 Down switch lever
25 Hexagonal shaft (wrench supplied)
26 Up switch activator
27 Up switch

# ERB10 / ERB20 / ERB35 DIMENSIONS

Dimensions are in inches • millimeters

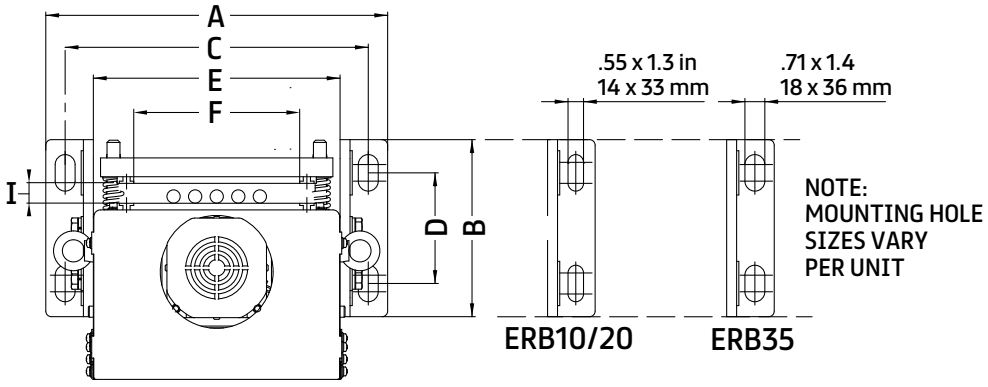
| MODEL | A | B | C | D | E | F standard (optional) | G | H |
|---|---|---|---|---|---|---|---|---|
| ERB10 | 12.2 • 309 | 6.29 • 160 | 10.8 • 274 | 3.94 • 100 | 8.78 • 223 | 4.92 • 125 (5.98 • 152) | 9.75 • 247.6 | 6.03 • 153.2 |
| ERB20 | 12.2 • 309 | 6.29 • 160 | 10.8 • 274 | 3.94 • 100 | 8.78 • 223 | 4.92 • 125 (5.98 • 152) | 9.75 • 247.6 | 6.03 • 153.2 |
| ERB35 | 13.2 • 335 | 6.89 • 175 | 11.8 • 300 | 4.06 • 103 | 9.80 • 249 | 6.30 • 160 (7.56 • 192) | 9.87 • 250.6 | 6.62 • 168.2 |

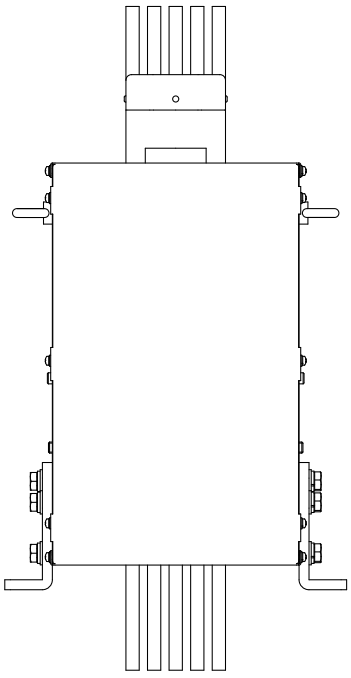
| MODEL | I** | J | K | L | M | N | O | P * | Q * |
|---|---|---|---|---|---|---|---|---|---|
| ERB10 | Ø+ 0.43 • 11 | 17.7 • 450.6 | 15.2 • 387.4 | 5.38 • 136.7 | 3.15 • 80 | 0~45˚ | 4.10 • 104.2 | 11.8 • 299.6 | 15.1 • 383.4 (Q1) |
| ERB20 | Ø+ 0.40 • 10 | 18.3 • 465.6 | 15..2 • 387.4 | 5.38 • 136.7 | 3.15 • 80 | 0~45˚ | 4.10 • 104.2 | 12.2 • 310.3 | 15.5 • 394.0 (Q1) |
| ERB35 | Ø+ 0.40 • 10 | 19.8 • 502.3 | 17.0 • 431.9 | 5.93 • 150.7 | 3.44 • 87.5 | 0~45˚ | 4.49 • 114.1 | 13.3 • 336.9 | 16.6 • 421.1 (Q1) |

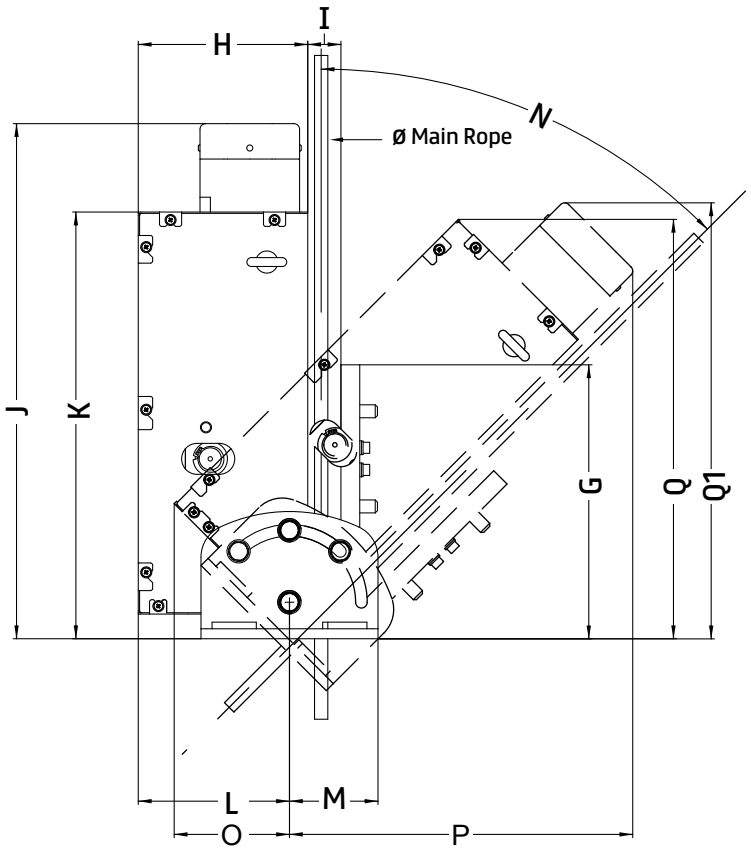
Ø = rope diameter

* P and Q if the N dimension is 45° - Reference the highest point of the rope brake, either Q or Q1 depending on the angle, when adjusting the brake
All dimensions are approximate and are for sizing reference

** Inner dimension between stationary and clamp linings





# OPERATING PARAMETERS

| Criteria | Unit | ERB10 | ERB20 | ERB35 |
|---|---|---|---|---|
| Power Supply | | 110VAC 6A | 110VAC 6A | 110VAC 6A |
| Contact Ratings | | 120VAC, 1Ø, 2A | 120VAC, 1Ø, 2A | 120VAC, 1Ø, 2A |
| Spread of Main Ropes*<br>standard (optional) | in<br>mm | 4.92 (5.98)<br>125 (152) | 4.92 (5.98)<br>125 (152) | 6.30 (7.56)<br>160 (192) |
| **1 : 1 ROPING** | | | | |
| Rated Speed (min - max) | ft/min<br>m/sec | 78 - 606<br>0.4 - 3.1 | 78 - 786<br>0.4 - 4.0 | 78 - 606<br>0.4 - 3.1 |
| Car Rated Load (min - max) | lbs<br>kg | 772 - 2205<br>350 - 1000 | 1322 - 3527<br>600 - 1600 | 2205 - 5511<br>1000 - 2500 |
| System Mass (min - max)<br>(Car, CWT & Rope) | lbs<br>kg | 2094 - 9480<br>950 - 4300 | 3306 - 14880<br>1500 - 6750 | 4630 - 18740<br>2100 - 8500 |
| Total Mass (min - max)<br>(Car, Load, CWT & Rope) | lbs<br>kg | 2866 - 11684<br>1300 - 5300 | 4630 - 18408<br>2100 - 8350 | 6834 - 23149<br>3100 - 10500 |
| **2 : 1 ROPING** | | | | |
| Rated Speed (min - max) | ft/min<br>m/sec | 39.6 - 312<br>0.2 - 1.6 | 39.6 - 396<br>0.2 - 2.0 | 39.6 - 312<br>0.2 - 1.6 |
| Car Rated Load (min - max) | lbs<br>kg | 1543 - 4409<br>700 - 2000 | 2644 - 7054<br>1200 - 3200 | 4410 - 11022<br>2000 - 5000 |
| System Mass (min - max)<br>(Car, CWT & Rope) | lbs<br>kg | 4189 - 18960<br>1900 - 8600 | 6612 - 29760<br>3000 - 13500 | 9260 - 37490<br>4200 - 17000 |
| Total Mass (min - max)<br>(Car, Load, CWT & Rope) | lbs<br>kg | 5732 - 23369<br>2600 - 10600 | 9260 - 36816<br>4200 - 16700 | 13669 - 46297<br>6200 - 21000 |
| **DIMENSIONS/WEIGHT** | | | | |
| System Footprint (W x L) | in<br>mm | 8.5 x 12.2<br>215.9 x 310 | 8.5 x 12.2<br>215.9 x 310 | 9.4 x 13.2<br>238.8 x 335 |
| Net Weight | lbs<br>kg | 82<br>37 | 82<br>37 | 117<br>53 |
| Packing Size (W x L x H) | in<br>mm | 13.4 x 18.9 x 9.8<br>340 x 480 x 250 | 13.4 x 18.9 x 9.8<br>340 x 480 x 250 | 13.8 x 20.9 x 10.2<br>350 x 530 x 260 |
| Gross Weight | lbs<br>kg | 86<br>39 | 86<br>39 | 124<br>56 |

*Determine whether standard spread or optional spread (wide) version is required:
Φ + P × (n-1) < maximum rope spread width (Φ = rope diameter, P = Pitch, n = number of ropes)

Examples (ERB20: 125 mm)
Φ12 + 19 mm × (6 - 1) = 107 mm (< 125 mm, standard spread is recommended)
Φ12 + 19 mm × (7 - 1) = 126 mm (> 125 mm, optional spread is recommended)

# UNDERSTANDING THE PRINTED CIRCUIT BOARD (PCB) AND CONTROLS

The ERB is controlled by a programmed printed circuit board (PCB) located inside the body of the brake (see FIGURE 2). It is accessed by removing the brake's front cover.

Electrical power and signal is delivered through terminal blocks in the lower left corner. RB1 and RB2 are for the main power input, and RB4 and RB5 are for signals from the elevator controller.

On the upper left, there are three DIP switches. The AUTO/MANUAL and DOWN/UP switches are used during testing and electrically opening/closing the clamp. AUTO and DOWN are the normal positions for these DIPs. The center DIP should be set for 110VAC/60 Hz.

Above the DIP array is the RESET button. The rope brake returns to ready state automatically if the DIP switches are set to AUTO and DOWN and power is on. When in AUTO mode, the RESET button is only used in case of a PCB error. When the DIP is set to MANUAL, pressing the RESET button once will rotate the motor up or down. Press the RESET button a second time to stop motor rotation.

On the upper right are eight LEDs that show status of various functions of the rope brake (shown in close-up in FIGURE 3):

**S/ACTION:** Green LED (R20) indicates that the brake is in the process of returning to the ready position. The S/ACTION light turns on for 0.5 seconds while the brake is resetting. Once the UP switch is set to the AUTO mode, the light turns off and the S/KEEP LED turns on.

**S/KEEP:** Green LED (R18) indicates that the brake is in the ready mode.

**UP:** Green LED (R13) is ON when the rope brake is open and the Up sensor is triggered by the Up switch and OFF when the rope brake is operated and the Up switch returns to the OFF position.

**DOWN:** Green LED (R15) is ON when the Down switch is operated and is OFF when it returns to the off position.

**LINING_ERR:** Red LED (R14) is ON when the lining needs replacing.

**LOCK_ERR:** Red LED (R19) is ON when the locking anchor pin fails to lock four times.

**OVER_CUR:** Red LED (R17) is ON when the motor is experiencing a power surge.

**TIME_ERR:** Red LED (R16) is ON when the Up or Down switch exceeds the set time.

The connectors in the upper right corner are for the Up, Down and Lining wear sensor microswitches.

Below them are the capacitor and A/C motor connections.

In the lower right are the connections to the solenoid.

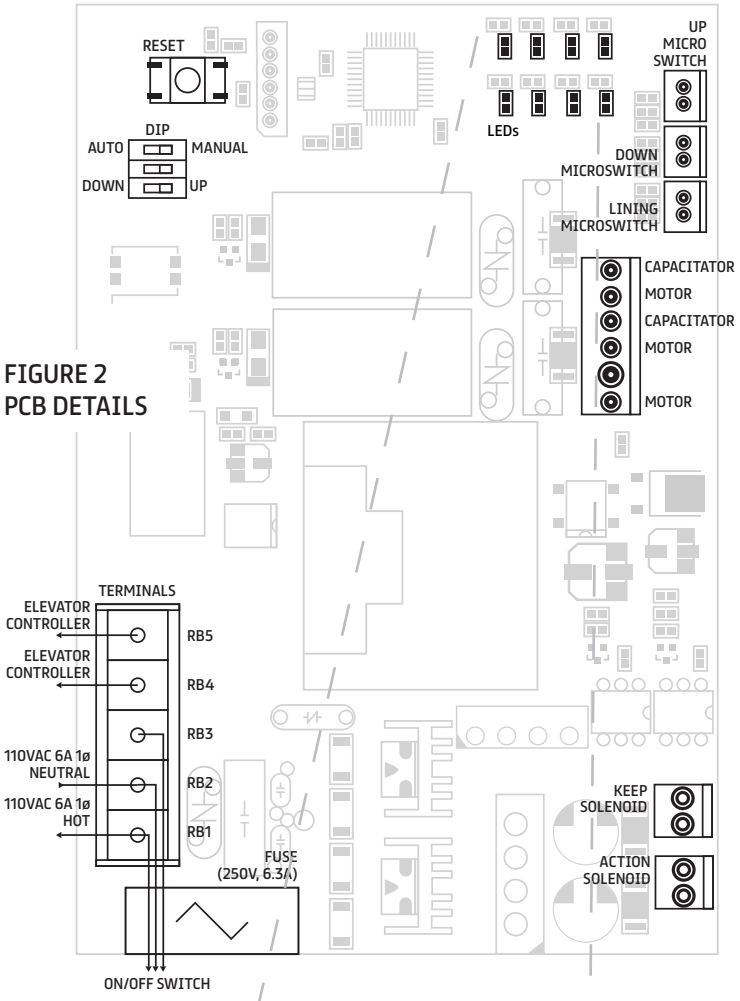



FIGURE 2
PCB DETAILS

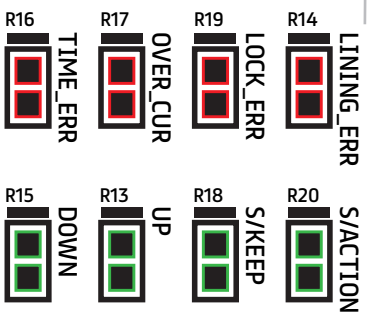



FIGURE 3
LED ARRAY

# OPERATIONS SHOWN BY THE LED DISPLAYS

## READY MODE

When the rope brake is in the 'ready' mode, the elevator operates normally. The clamp is held open because the springs that operate the clamp are compressed and held in position by a solenoid.

This is indicated by the green glow of the UP, DOWN, and S/KEEP LEDs (FIGURE 5).

FIGURE 4
CLAMP IN
'READY' MODE

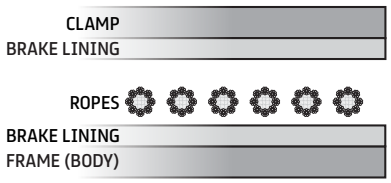
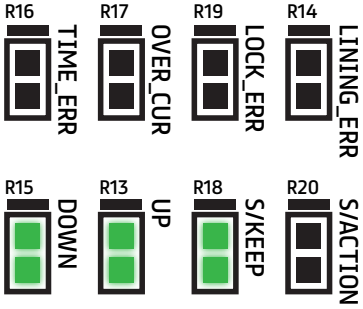



FIGURE 5
LEDs IN
'READY' MODE

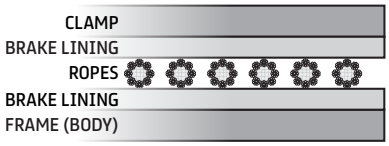



## TRIGGERED MODE

Should the elevator go into an overspeed condition, or if it starts to move with the doors open, the elevator controller cuts power to the rope brake. This releases the solenoid pin that keeps the springs compressed. The springs instantly expand to activate the braking mechanism which causes the clamp to tightly close on the ropes, stopping the car. A signal is also sent to the elevator controller. Triggered mode is maintained until the rope brake is reset.

Note: if the power is turned off for any other reason and if the DIP switches are in their normal operating positions, the rope brake will be triggered as described above.

FIGURE 6
CLAMP IN
'TRIGGERED'
MODE




## RELEASE MODE

When the power is restored, the motor activates the rack gear and lifting plate to move the wedge upwards to re-compress the springs.

The UP switch activator triggers the microswitch. The motor stops and the solenoid turns back on to hold the springs in the ready, compressed position.

The motor then reverses and the DOWN microswitch (Down switch) is triggered. The motor stops and the rope brake returns to the ready state.

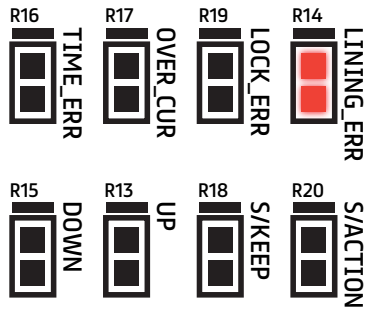
When the clamp is opened, the elevator is free to operate and the UP, DOWN, and S/KEEP LEDs glow green.

## REPLACE BRAKE LINING MODE

If the rope brake lining wears out, the lining switch is trigged by lining switch activator.

The LINING_ERR (and, eventually, the TIME_ERR LED) will glow red. This action prevents the rope brake from being reset and the elevator will be held in position until the brake lining is replaced.

FIGURE 7
LEDs INDICATING
BRAKE LINING
NEEDING
REPLACEMENT



# INSTALLING AND POWERING

## BEFORE YOU BEGIN

Prior to installation, please review the IMPORTANT SAFETY NOTES on page 1. The rope brake must be securely bolted to the machine beam which was made and installed by the elevator manufacturer.

### STEP 1

Set the brake on the traction machine. Make sure that the brake is NOT connected to any power circuit.

### STEP 2

Make sure the power switch (9) is in the OFF position.

### STEP 3

Make sure that the SAFETY BOLTS (11) are screwed in the safe position lower holes.

### STEP 4

Loosen the four CLAMP PLATE ATTACHMENT BOLTS (6) and remove the BRAKE CLAMP PLATE (5). DO NOT remove the four BRAKE CLAMP SPRINGS (3) - they should remain on the bolts.

### STEP 5

Test fit the rope brake by positioning it at the mounting site on the machine frame. (The ERB must be bolted to the frame that supports traction machine - see steps 8 through 10 below.) Center the brake on the rope array.

### STEP 6

Loosen the six ANGLE ADJUSTMENT BOLTS (14) and tilt the rope brake so that the STATIONARY BRAKE LINING (2) is parallel to the ropes. Firmly hand-tighten the ANGLE ADJUSTMENT BOLTS so that the rope brake holds that angle.

### STEP 7

Adjust the position of the rope brake so there is a gap of 0.08 in • 2 mm between the ropes and the stationary lining. The gap MUST be equal across the spread of the ropes.

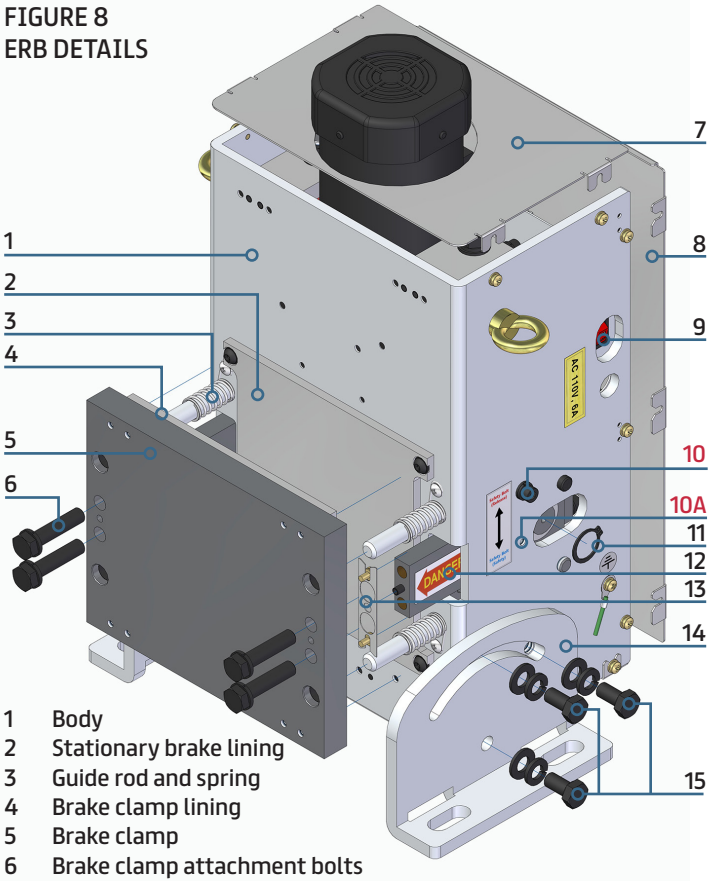
### STEP 8

Center the rope brake on the rope array (dimensions A=A and B=B). Mark the position of the mounting holes and drill four holes to bolt the MOUNTING BRACKETS (13) to the machine frame. For the ERB10 and ERB20, use 1/2 inch • M12mm bolts, grade minimum 10.9. For the ERB35, use 5/8 inch • M16mm bolts, grade minimum 10.9.

### STEP 9

Position the rope brake on the frame and hand-tighten the bolts enough to keep the rope brake in place, but allow slack for slight adjustments. The rope brake should be mounted square to the frame and centered on the rope array as in steps 3, 4 and 8.

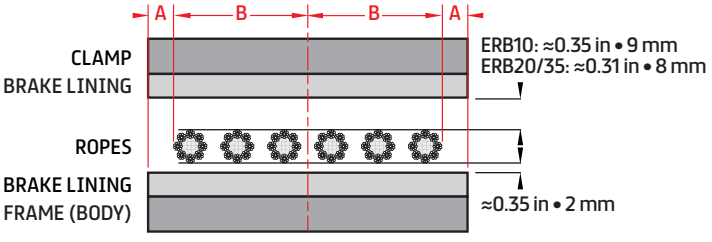
FIGURE 8
ERB DETAILS



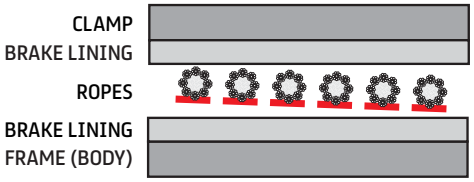

1 Body
2 Stationary brake lining
3 Guide rod and spring
4 Brake clamp lining
5 Brake clamp
6 Brake clamp attachment bolts
7 Top cover
8 Front cover
9 Power switch
10 Safety bolt upper hole (shown in ready position)
10A Safety bolt (move here when installing/powering)
11 Snap ring (shown removed)
12 Clamp arm
13 Shim (spacer)
14 Mounting bracket
15 Angle adjustment bolts

FIGURE 9
ROPE ALIGNMENT
IN THE CLAMP

### CORRECT - CENTER AND PARALLEL ALIGNMENT




### INCORRECT - SLANTED ALIGNMENT



# INSTALLING AND POWERING

## STEP 10

Once the rope brake is in the test fitting position and the stationary brake lining is the correct distance from the ropes, firmly tighten the four mounting bolts.

## STEP 11

Select the proper-sized shims (if required) for the rope diameter (see SHIM SELECTION CHART below). The rope brake comes shipped with 0.5 mm shims installed for accepting 3/8 in. • 9.5 mm rope. If the shims are removed, the rope brake is now sized for 9 mm rope. Any rope above 9 mm will need shims corresponding to the increase in diameter (example: 1/2 in. • 12.7 mm rope) will need 3.2 mm shims in addition to the 0.5 mm shims installed from the factory (12.7 mm – 9 mm = 3.7 mm = 3.2 mm shim + 0.5 mm shim).

In order for the ERB35 to work with 3/4 in. rope, the attachment bolts and shim combinations must be modified with an ERB35 extension kit (ELH-ERB35-EXTKIT).

## STEP 12

Make sure that the CLAMP SPRINGS are still on the GUIDE RODS (see FIGURE 10). Reattach the clamp plate (with shims if necessary) to the ends of the clamp arms with the four CLAMP ATTACHMENT BOLTS, tightening them alternately until all are equally and firmly tightened.

## STEP 13

Remove the rope brake FRONT COVER (8) and attach the power and signal cables (see FIGURE 11). Input power (110VAC, 6A, 1ø) goes to RB1 (hot) and RB2 (neutral) terminals.

Attach the ground wire to the PCB mount below the terminal strip. The brake can also be grounded by attaching a ground wire to the outside of the brake chassis below the power switch at the position marked by the ground symbol.

## STEP 14

Remove the SAFETY BOLTS (11) and screw them into the upper tap holes for the rope brake test. When all is secure, turn on the power at the breaker.

## STEP 15

Flip the power switch to ON.

NOTE: If the rope brake motor does not operate, or if any of the top row LEDs turn red, turn off the power, flip the power switch to OFF, and check your electrical connections. Note which LED(s) are lit and refer to the Troubleshooting and Maintenance section (pages 13 - 14) for additional guidance.

FIGURE 10
DETAIL OF
CLAMP
ATTACHMENT

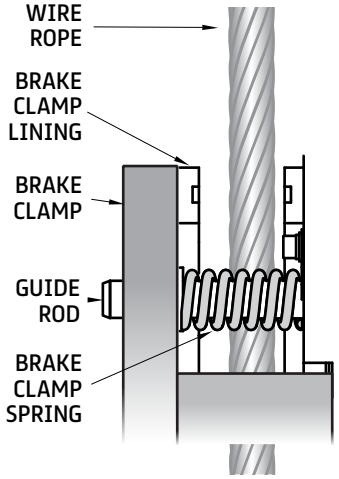
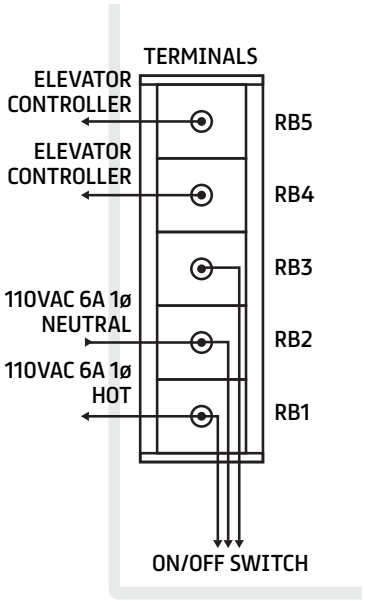



FIGURE 11
DETAIL OF
POWER
TERMINALS
IN PCB




## SHIM SELECTION CHART

| Model | 3/8" 9.5 mm | 7/16" 11.1 mm | 1/2" 12.7 mm | 9/16" 14.3 mm | 5/8" 15.9 mm | 11/16" 17.5 mm | 3/4" 19 mm |
|---|---|---|---|---|---|---|---|
| ERB10 | Attached 0.5 + 1 mm | + 1.6 mm | + 3.2 mm | + 1.6 + 3.2 mm | + 3.2 + 3.2 mm | N/A | N/A |
| ERB20 | Attached 0.5 mm | + 1.6 mm | + 3.2 mm | + 1.6 + 3.2 mm | + 3.2 + 3.2 mm | N/A | N/A |
| ERB35 | Contact factory | Attached 0.5 mm | + 1.6 mm | + 3.2 mm | + 1.6 + 3.2 mm | + 3.2 + 3.2 mm | + 3.2 + 3.2 + 1.6 mm |

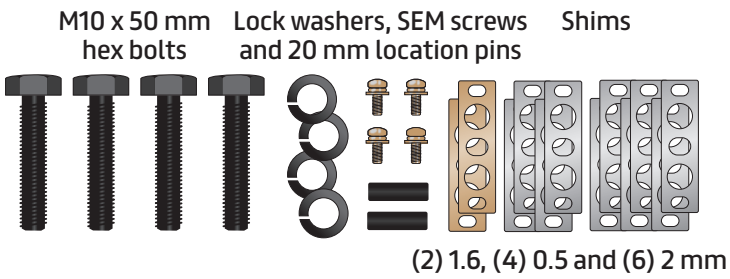
| Model | 8 mm | 9 mm | 10 mm | 12 mm | 14 mm | 16 mm | 18 mm |
|---|---|---|---|---|---|---|---|
| ERB10 | Contact factory | Remove shims | + 0.5 mm | + 0.5 + 2 mm | + 0.5 + 2 + 2 mm | + 0.5 + 2 + 2 + 2 mm | N/A |
| ERB20 | Contact factory | Remove shims | + 0.5 mm | + 0.5 + 2 mm | + 0.5 + 2 + 2 mm | + 0.5 + 2 + 2 + 2 mm | N/A |
| ERB35 | N/A | N/A | Contact factory | + 0.5 + 0.5 mm | + 0.5 + 0.5 + 2 mm | + 0.5 + 0.5 + 2 + 2 mm | + 0.5 + 0.5 + 2 + 2 + 2 mm |

# ERB35 EXTENSION KIT FOR 3/4 IN. AND 18 MM ROPE

This kit contains all of the hardware required to adapt the ERB35 rope brake for use with 3/4 in. and 18 mm rope.

## CONTENTS

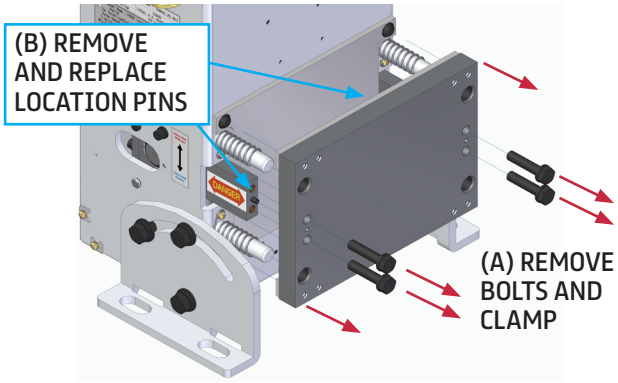
Four (4) M10 x 50 mm hex head bolts
Four (4) lock washers
Four (4) SEM M4 x 18 mm bolts
Two (2) 5 x 20 mm location pins
Two (2) 1.6 mm shims
Four (4) 0.5 mm shims
Six (6) 2 mm shims




## STEP 1 - REMOVE THE CLAMP

(A) Remove the four (4) existing hex head bolts to remove the clamp.

(B) Replace the two (2) 15 mm location pins with the 20 mm location pins from the kit.




## STEP 2 - ADD THE SHIMS

The clamp will already have two (2) 0.5 mm shims in place on the clamp as shown.

**FOR 3/4 IN. ROPES**

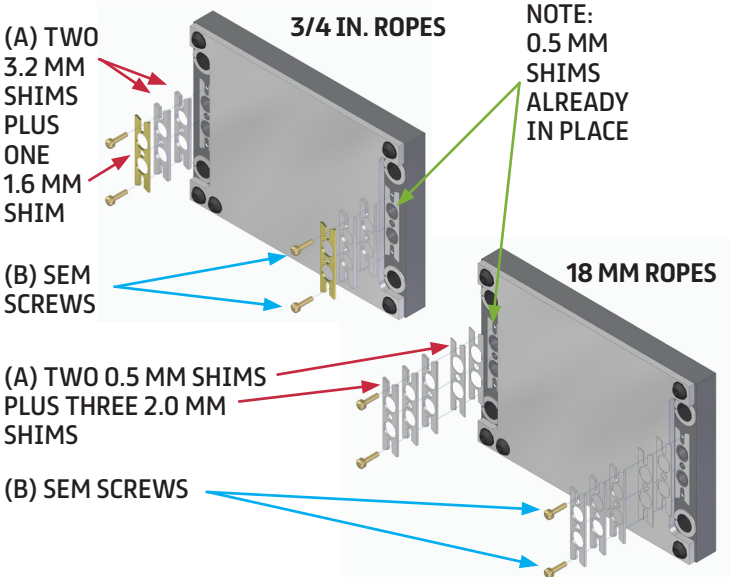
(A) On the left side of the clamp, place two (2) 3.2 mm shims (grey in color) and one (1) 1.6 mm shim (gold in color) on top of the 0.5 shim.

(B) Secure the shims with two (2) of the SEM screws provided in the kit. Repeat (A) and (B) on the right side.

**FOR 18 MM ROPES**

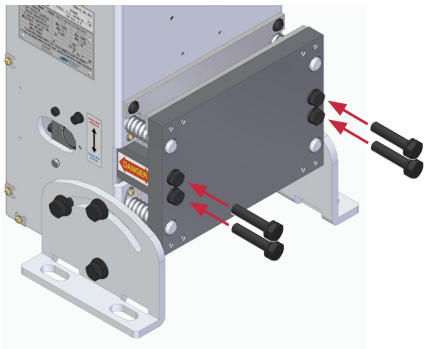
(A) On the left side of the clamp, place two (2) 0.5 mm shims and three (3) 2 mm shims (both grey in color) on top of the 0.5 shim.

(B) Secure the shims with two (2) of the SEM screws from the kit. Repeat (A) and (B) on the right side.




## STEP 3 - REATTACH THE CLAMP

Reattach the clamp with the four (4) M10 x 50 mm hex bolts and four (4) lock washers from the kit.



# TESTING

## IMPORTANT!

NOTE: When the power switch is set to OFF, the rope brake will close. Keep your hands free of the clamp and ropes.

## BASIC OPERATION TEST

### STEP 1

Confirm that the machine's traction brake is set.

### STEP 2

Confirm that the power switch is in the ON position. The clamp should be open and the DOWN, UP and S/KEEP LEDs should be green.

### STEP 3

Flip the power switch to OFF. The clamp should operate and grab the ropes.

When the clamp closes, the DOWN, UP and S/KEEP LEDs will turn off.

### STEP 4

Release the traction brake. The ropes should not move. If they do, you may need to adjust the location or position of the rope brake. Reapply the traction brake and open the clamp by flipping the power switch to ON, and then make the adjustments.

Another possible problem is that your rope brake may not be the correct model for the ropes you are using.

## DOOR ZONE (UCMP) TEST

NOTE: Observe all safety measures (warning signs or barricades at the open door, etc.) during this test.

### STEP 1

Set the car at an open door and apply the machine's traction brake.

### STEP 2

Confirm that the power switch is flipped to ON. The clamp should be open and the DOWN, UP and S/KEEP LEDs should be green. Release the traction brake. As the car moves out of the zone, the rope brake clamp should immediately close.

### STEP 3

Check the stop distance. Perform tests as outlined in ASME A17.1 and confirm that all requirements are met. Then open the clamp and return the car to its pre-test condition.

## OVERSPEED GOVERNOR TEST

### STEP 1

Confirm that the power switch is flipped to ON. The clamp should be open and the DOWN, UP and S/KEEP LEDs should be green.

### STEP 2

Manually trip the governor overspeed switch. The clamp should close.

### STEP 3

Return the overspeed switch to its normal position. The clamp should open and the rope brake should return to 'ready' condition.

## LOCKING MECHANISM (SOLENOID) TEST

The solenoid pin holds a set of jaws (the locking housing) closed on the anchor pin, which is attached to the anchor pin block plate. When the power is turned off due to unintended movement, the magnets holding the solenoid spring deactivate and the solenoid spring forces the solenoid pin down releasing the jaw's grip on the pin and allowing the clamp arm to move.

The solenoid pin is in the locking housing's jaws when the clamp is in a 'ready' state, and is pulled away to activate the clamp to grip the ropes when required.

Turn the power switch to OFF. The clamp should close. If it has not closed,the solenoid pin may be manually forced to move by using a screwdriver to pull down on the snap ring at the bottom of the solenoid (see FIGURE 13). **Keep hands free of all moving parts when troubleshooting the rope brake.**

If the locking housing has to be released manually each time, then the solenoid is faulty. More than one failure of this device is cause to return the unit for inspection/repair.

If the pin doesn't engage to return the rope brake to 'ready' state, the clamp arms could be stuck because the rope brake is not positioned square with the ropes or other installation issue. See the Troubleshooting section on how to deal with this situation.

FIGURE 12
SOLENOID IN 'READY' STATE
(LOCKING STATE)

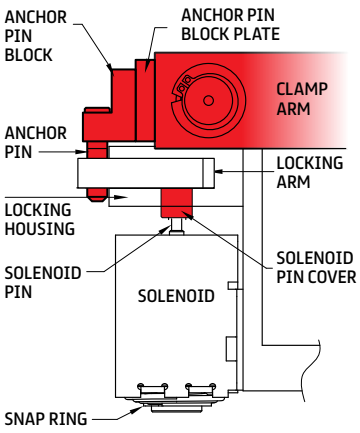
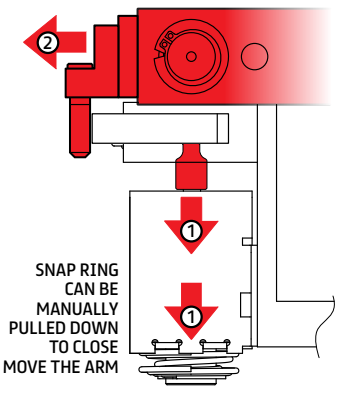



FIGURE 13
MANUAL RELEASE
OF SOLENOID
(RELEASE STATE)



# EMERGENCY MANUAL AND ELECTRICAL RELEASE METHODS

## MANUAL RELEASE (POWER OFF)

If the rope brake should fail to reset after it closes and stops an occupied elevator, you will need to manually open the rope brake clamp.

### STEP 1

Flip the power switch to the OFF position and remove the front cover.

### STEP 2

There is a hexagonal shaft located slightly right of center in the middle of the rope brake body (see FIGURES 14 and 15). Use the supplied wrench to turn the shaft right-to-left to open the clamp. Keep turning until the clamp plate is about 1/16 of an inch (a bit more than 1 mm) clear of the ropes. The elevator can now be moved to evacuate passengers. (NOTE: the rope brake will need to be completely opened before it is reset and returned to service.)

**CAUTION: If the brake clamp does not open even after turning the hexagonal shaft, detach the brake clamp by removing the attachment bolts. Go no further until you contact the factory.**

### STEP 3

Replace the front cover and reactivate the rope brake by flipping the power switch to ON. This will restore the rope brake to its ready state.

### STEP 4

If the rope brake does not return to the ready state, trouble-shoot the rope brake to find the cause of the failure to release.

## ELECTRICAL RELEASE (POWER ON)

### STEP 1

Flip the power switch to the OFF position and remove the front cover.

### STEP 2

Flip the DIP switches to the MANUAL and UP positions.

### STEP 3

Flip the power switch to the ON position and press the RESET button (press it again to stop).

### STEP 4

The clamp will release and the green UP LED will light. The elevator can now be moved to evacuate passengers.

### STEP 5

When the elevator is empty, flip the power switch to OFF and return the DIP switches to the AUTO and DOWN positions. Replace the front cover and flip the power switch to ON to return the rope brake to its ready state.

### STEP 6

Troubleshoot the rope brake to find the cause of the failure to release.

FIGURE 14
MANUAL RESET (HEXAGONAL) SHAFT - FRONT VIEW

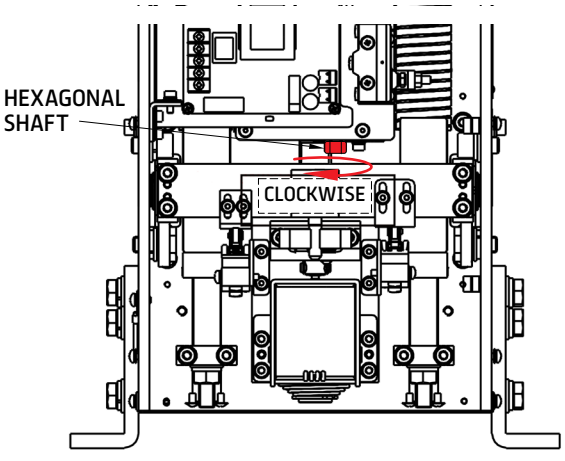
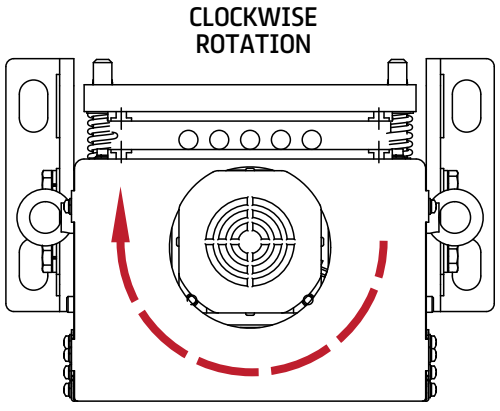



FIGURE 15
MANUAL RESET (HEXAGONAL) SHAFT - TOP VIEW



# MAINTENANCE - REPLACING THE BRAKE LINING

The ERB will tell you that the brake lining needs replacement by lighting the red LINING_ERR LED. Both linings will need to be replaced.

NOTE: Take the elevator out of service and set the traction brake. Be aware that your actions will initially cause the rope brake to close, so keep hands and fingers away from the clamp.

### STEP 1

Flip the power switch to OFF. This will close the clamp.

### STEP 2

Remove the front cover and locate the two DIP switches (AUTO/MANUAL and UP/DOWN) on the upper left corner of the control PCB (see FIGURE 16). Set them to the MANUAL and UP.

### STEP 3

Flip the power switch to ON and press the RESET button (above the DIP switches) once. As the clamp releases, the UP LED will glow green. When the red LINING_ERR LED is lighting, unplug the lining connector (black cable) on the upper right of the PCB.

If there is no power, you may need to open the clamp manually. Rotate the hexagonal shaft (item 25 in the diagram on page 2 and FIGURES 14 and 15 on page 10) clockwise by using the supplied wrench until the clamp is fully open (the wrench will no longer rotate).

### STEP 4

There are two safety bolts located on the sides of the rope brake (see FIGURE 17). Remove them and firmly screw them into the tap holes directly below their safe positions.

### STEP 5

Flip the power switch to OFF.

### STEP 6

Undo the four clamp plate bolts to remove the clamp plate.

### STEP 7

Remove the lining from the clamp plate by undoing the four bolts in the corners. Replace the lining with the new one.

### STEP 8

Repeat this procedure with the lining that is attached to the body of the rope brake. If the ropes are preventing you from doing this, it may be necessary loosen the mounting bracket bolts to move the rope brake body. Once the replacement lining pad is attached to the rope brake body, return the body to its former position and tighten the mounting bracket bolts.

### STEP 9

Make sure all four moving springs are still in place. Replace the clamp plate and the four clamp plate bolts.

### STEP 10

Remove the two safety bolts from the side of the rope brake and screw them back into their original (upper) holes.

### STEP 11

With the power switch in the OFF position, reset the two DIP switches to their original positions of AUTO and DOWN. The unplugged lining connector plugs back into place.

### STEP 12

Flip the power switch to ON. This restores the rope brake to a 'ready' state. Replace the front cover.

FIGURE 16
DIPs SWITCHED TO 'MANUAL' AND 'UP'

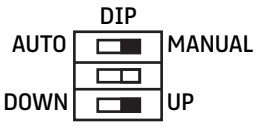
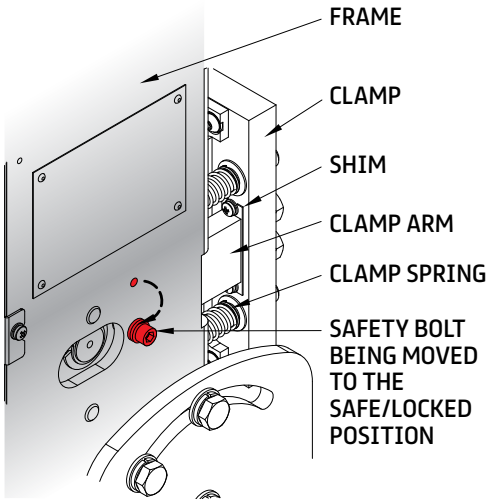



FIGURE 17
SAFETY BOLT LOCATION DETAIL




### STEP 13

To test if the linings have been installed correctly, flip the power switch to OFF. The rope brake will close and grip the ropes.

### STEP 14

Release the brake on the traction machine. If the brake linings have been correctly installed, the ropes and car will not move. If the car does move, reapply the brake on the traction machine and refer to page 7 (Steps 7 and 8 and Figure 9) and page 8 (Step 12).

### STEP 15

Flip the power switch to ON and the clamp should open and be in 'ready' mode.

# MAINTENANCE - TROUBLESHOOTING

| LED indications | Rope brake status | Failure cause | Troubleshooting recommendation |
|---|---|---|---|
| Three LEDs (DOWN, UP, S/KEEP) are green | Ready state | N/A - Rope brake is working | N/A - Rope brake is working |
| Power switch set to ON, but lamp is not lit | Power switch ON, but rope brake has not returned to ready state | ERB is not getting power | Check that RB1 and RB2 terminals are powered and that power source is getting to the ERB |
| Power switch is lit, but no LEDs are lit | Power switch ON, but rope brake has not returned to ready state | PCB fuse is blown<br>Auto/Manual DIP set to Manual<br>PCB is defective. | Check PCB fuse<br>Check DIP settings for AUTO, 60HZ and DOWN<br>Replace PCB |
| Power switch is lit, TIME_ERR red LED ON | Power switch ON, but rope brake has not returned to ready state (clamp is closed) | Motor or PCB problem | 1. Set power switch to OFF<br>2. Check motor and capacitor connections<br>3. Check the voltage to the RB1/RB2 terminals<br>4. Unplug the motor connector, resistance check (black-white, black-red)<br>5. Replace PCB if no other problems detected |
| Power switch is lit, DOWN green LED lit TIME_ERR red LED lit | Power switch ON, but rope brake has not returned to ready state (clamp is closed) | Gearbox problem | Flip power switch OFF and ON<br>If the motor is powered but not working, main springs are not compressed, TIME_ERR red LED ON, replace gearbox |
| Power switch is lit, TIME_ERR red LED lit | Power switch ON, but rope brake has not returned to ready state (Motor powered but not working, vibration detected, clamp open) | Up switch failure or it is not making contact or fan cover is damaged | Replace the UP switch or adjust the UP switch activator<br>1. Set the DIP switches to MANUAL and UP<br>2. Flip power switch OFF and ON<br>3. Press RESET, wait until TIME_ERR red LED ON<br>4. If motor cannot operate due to damaged fan cover, repair or replace fan cover<br>5. Flip power switch OFF and ON (TIME_ERR LED OFF)<br>6. Press the UP switch roller lever:<br>a. If UP LED is ON, adjust UP switch activator for LED ON<br>b. If UP LED is OFF, check wiring or replace UP switch |
| Power switch is lit, TIME_ERR red LED lit UP and S/KEEP green LED ON | Power switch ON, but rope brake has not returned to ready state (Motor powered but not working, vibration detected, clamp open) | Gearbox fault | Check for gearbox fault<br>Lightly push the down switch lever from side to side - If the switch moves 2 - 3 mm, replace gearbox |
| | | DOWN switch fault, or the switch button is not pressed | If there is no movement because of contact between the DOWN switch button and the lever bolt, the DOWN switch must be replaced:<br>1. Set the DIP switches for MANUAL and DOWN<br>2. Flip power switch OFF and ON<br>3. Press RESET, wait for TIME_ERR red LED ON<br>4. Flip power switch OFF and ON - Red LED should be OFF<br>5. Press the UP switch roller lever:<br>a. If the DOWN LED is ON, adjust DOWN switch lever bolt for LED ON<br>b. If the DOWN LED is not ON, check wiring or replace the DOWN switch |
| OVER_CUR red LED ON TIME_ERR red LED ON | Overcurrent error (OVER_CUR) | Motor, solenoid or PCB failure | Flip power switch OFF and ON:<br>1. If ready state returns, return to operation<br>2. If the error repeats, check motor/solenoid resistance:<br>a. if resistance is not correct, replace them<br>b. if resistance is correct, replace PCB |

# MAINTENANCE - TROUBLESHOOTING

| LED indications | Rope brake status | Failure cause | Troubleshooting recommendation |
|---|---|---|---|
| Power switch is lit, DOWN green LED ON, UP green LED blinking, LOCK_ERR red LED ON | ERB will not operate with power switch OFF, OR power switch ON, but ERB has not returned to ready state (clamp is closed) | Safety bolts in safe/locked position | 1. Unplug the UP switch connector<br>2. Flip power switch OFF and ON<br>3. Flip power switch OFF when the clamp plate opens slightly and stops<br>4. Tighten the safety bolts to the release position<br>5. Plug in the UP switch connector<br>6. Flip power switch ON, return to ready state |
| | | Solenoid pin not unlocking | 1. Force solenoid pin to operate (see page 9)<br>2. Flip power switch OFF and ON<br>3. Power switch OFF after returning to ready state, replace solenoid |
| | | Incorrect ERB installation - Clamp arms or plate are jammed due to improper alignment/positioning | 1. Set power switch to OFF<br>2. Gently tap the clamp with a hammer to move it<br>3. Set the DIP switches for MANUAL and UP<br>4. Flip power switch to ON and press RESET button<br>5. Switch power OFF when UP green LED is ON<br>6. Adjust rope brake to proper alignment (see page 7)<br>7. Set the DIP switches for AUTO and UP<br>8. Switch power ON - ERB should return to ready state<br>9. Switch power OFF - Check operation of ERB, reinstall if still not working |
| Power switch is lit, LOCK_ERR red LED ON, DOWN, UP, S/KEEP green LEDs ON, TIME_ERR red LED ON<br><br>adjustment | Locking error (Locking failed 4 times) | Solenoid problem | 1. Unplug solenoid connector and check resistance:<br>110V - Red: 3kΩ / White: 45Ω<br>220V - Red: 12.6kΩ / White: 192Ω<br>If you do not get these results, replace solenoid |
| | | Incorrect UP switch | 2. Perform Locking Mechanism (Solenoid) test from page 9<br>If pin and arm are centered:<br>a. Set the DIP switches for MANUAL and UP<br>b. Flip power switch OFF and ON<br>c. Adjust UP switch activator for LED ON<br>d. Power switch OFF, DIP switches for AUTO and DOWN<br>e. Power switch ON, return to ready state |
| | | Locking device isn't operation | 3. If pin and arm are not centered:<br>a. Adjust anchor pin block to align with anchor pin<br>b. Power switch ON, return to ready state |
| Power switch is lit, LINING_ERR red LED ON TIME_ERR red LED ON | LINING_ERR, clamp is closed | Linings are worn | Replace linings - for temporary operation, disconnect lining connector (black wire) and flip power switch OFF and ON |
| | | Clamp bolts are loose | 1. Power switch OFF, DIP switches for MANUAL and UP<br>2. Unplug the lining connector (see above)<br>3. Power switch ON, RESET, power switch OFF to open clamp<br>4. Tighten bolts when clamp opened<br>5. Reattach lining connector and set DIP (AUTO/DOWN)<br>6. Power switch ON, return to ready state. |
| | | Shims too thick | Perform steps 1 - 3 above, but disassemble clamp plate<br>Check the rope diameter of the rope, adjust the shim thickness, and reassemble<br>Perform steps 5 - 6 above |
| Power switch ON but not lit, no lit LEDs | Rope slip after ERB operates - when power switch ON, ERB returns to ready state | Shims too thin | See "Shims too thick" instructions above |
| | | Wrong ERB for elevator | Check ERB specifications for your elevator and ropes |
| | | Improper ERB installation | See "Incorrect ERB installation" above |

# MAINTENANCE - REQUIRED MONTHLY INSPECTION

| Classification | Inspection points | Inspection procedure | Troubleshooting recommendation |
|---|---|---|---|
| Monthly inspection | Rope brake operation and lining abrasion | Stop elevator<br>ON/OFF switch OFF<br>Check rope brake operation | If the rope brake does not operate, troubleshoot as required |
| | | ON/OFF switch ON<br>Check automatic return to ready state | If the rope brake does not operate, troubleshoot as required |

# ELEVATOR TEMPORARY OPERATION DURING ROPE BRAKE FAILURE

| Releasing method | Rope brake status | Temporary operation | Troubleshooting recommendation |
|---|---|---|---|
| Electrical release (not automatically releasing at power ON) | Elevator operation not possible (clamp is closed) | Temporary operation during rope brake repair | Refer to Electrical releasing procedure on page 10<br>TEST switch OFF, DIP (Manual/UP)<br>TEST switch ON, reset, motor drive and rope brake release, Unplug terminal 4 of the rope brake and connect it to terminal 5 to get a signal for the elevator to operate. After repair, return the cable to its original position.<br>TEST switch OFF, DIP (Auto/DOWN) |
| | Manual release (when power is available) | Temporary operation during rope brake repair | Refer to Manual releasing procedure on page 10<br>Unplug terminal 4 of the rope brake and connect the wire with the one in terminal 5 to get a signal for the elevator to operate. After repair, return the cable to its original position. |

# PART NUMBERS

| Part Number | Description | ERB10 | ERB20 | ERB35 |
|---|---|---|---|---|
| ELH-DRAKA-ERB10 | ERB10 brake kit for 3/8 to 5/8 in • 9.5 to 16 mm ropes (includes power cable and manual) | | | |
| ELH-DRAKA-ERB10-O | ERB10 brake kit with larger/optional clamp/lining (includes power cable and manual) | | | |
| ELH-DRAKA-ERB20 | ERB20 rope brake kit for 3/8 to 5/8 in • 9.5 to 16 mm ropes (includes power cable and manual) | | | |
| ELH-DRAKA-ERB20-O | ERB20 brake kit with larger/optional clamp/lining (includes power cable and manual) | | | |
| ELH-DRAKA-ERB35 | ERB35 rope brake kit for 7/16 to 11/16 in • 11 to 17.5 mm ropes (includes power cable and manual) | | | |
| ELH-DRAKA-ERB35-O | ERB35 brake kit with larger/optional clamp/lining (includes power cable and manual) | | | |
| ELH-ERB35-EXTKIT | ERB35 extension kit to accommodate 19 mm and 3/4 in ropes | | | |
| ELH-SDT-A5623 | Step-down transformer 230V/120V | ● | ● | ● |
| ELH-RB-ERB-CABLE | Power cable for all ERB units | ● | ● | ● |
| ELH-RB-ERB-MANUAL | Installation manual for all ERB units | ● | ● | ● |
| ELH-RB-ERB1020-PAD | Replacement brake lining (one) for ERB10 and ERB20 | ● | ● | |
| ELH-ERB1020-PAD-O | Replacement brake lining (one) for larger ERB10-O and ERB20-O | ● | ● | |
| ELH-RB-ERB35-PAD | Replacement brake lining (one) for ERB35 | | | ● |
| ELH-ERB35-PAD-O | Replacement brake lining (one) for larger ERB35-O | | | ● |
| ELH-RB-ERB-PCB | Replacement 110V printed circuit board for all ERB units | ● | ● | ● |
| ELH-RB-ERB-SOL | Replacement solenoid for all ERB units | ● | ● | ● |
| ELH-RB-ERB-MS | Replacement short button microswitch for all ERB units | ● | ● | ● |
| ELH-RB-ERB-LMS | Replacement short roller lever microswitch for all ERB units | ● | ● | ● |
| ELH-ERB-LD | Replacement locking device for all ERBs | ● | ● | ● |
| ELH-ERB1020-GB | Replacement gearbox for ERB10 and ERB20 | ● | ● | |
| ELH-ERB35-GB | Replacement gearbox for ERB35 | | | ● |
| ELH-ERB10-MOTOR | Replacement 60w motor for ERB10 | ● | | |
| ELH-ERB20-MOTOR | Replacement 60w motor for ERB20 | | ● | |
| ELH-ERB35-MOTOR | Replacement 60w motor for ERB35 | | | ● |

ERB INSTALLATION GUIDE 100822

Draka EHC

A Brand of Prysmian Group

Draka EHC
2151 N. Church Street | Rocky Mount, NC 27804 | +1-877-DRAKA EP (877-372-5237)
www.DrakaEHC.com | www.prysmiangroup.com