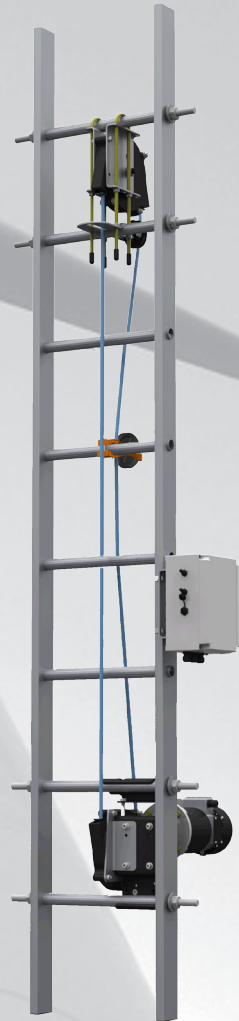




OPERATORS MANUAL

IBEX® 1000 Series
Climb Assist System

(Models 1050, 1065, 1080, & 1100)



WARNING:

- The IBEX® 1000 Climb Assist System is **NOT** a safety device and must only be used when user is connected to independent fall arrest system.
- All personnel operating this equipment must read and completely understand this manual.
- All personnel must be thoroughly trained in the use of the equipment and its operational and safety features.
- Only authorized and physically fit personnel shall operate the equipment.
- All persons operating this equipment must wear a safety harness at all times and tie-off as required.
- Any operation in violation of these instructions is at the operator's own risk and may result in serious injury.
- Only use spare parts supplied by Power Climber Wind.

Manufacturer

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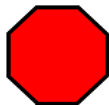
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1. SYMBOLS USED IN THIS MANUAL



STOP

Stop action and follow the instructions before continuing.



WARNING

Warns against possible immediate serious injury or death.



CAUTION

Warns against possible injury.



ELECTRICAL HAZARD

Warns against possible electrical shock hazard.



NOTE

Must read this before performing any action that follows.



INFORMATION

Remember and take this into account.

2. EQUIPMENT DESCRIPTION

2.1. General Description

The IBEX® 1000 climb assist system is a motorized, continuous loop system that provides load support to the climber on both the ascent and descent. The system allows user-adjustable support settings at 50, 75, 100, and 125 pounds, and provides constant load support regardless of climbing speed via a feedback loop between the motor drive and load-sensing EasyClimb Controller that attaches the climber to the belt.

The mounting system is adaptable and can be fitted to any ladder or tower with minimal adjustment necessary (excluding the belt, which must be sized appropriately).

2.3. Approvals

All electrical components of the IBEX® 1000 are UL® listed. Moving parts are guarded in compliance with OSHA 1917.151.

This device has been tested and complies with the limits for a Class A digital device, pursuant to 47 CFR Part 15 of the FCC rules. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation is subject to the following two conditions:

- 1 This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation of the device.

The IBEX® is permanently installed on a specific WTG ladder and consists of:

1. Top Sheave Assembly
2. Motor Assembly
3. Electrical control box
4. EasyClimb Controller (a mobile device kept by the climber)
5. Round reinforced polymer belt and belt guides
6. Upper and lower ladder rung reinforcements
7. Belt Guide accessories

2.2. Specifications

Power Supply	110Vac 60 Hz; 230 Vac 50 Hz 1ø, 0.5HP Motor
Amperage Draw	10 maximum
Belt Diameter	10.5mm
Environmental Rating	IP44
Corrosion Protection	Class 3
Noise level	75 dBA
Temperature Range	-35C to +40 C Operating -40C to +60C Storage -31F to +104F Operating -40F to +140F Storage

FCC Warning: Changes or modifications not expressly approved by Power Climber Wind for compliance could void the user's authority to operate the equipment.

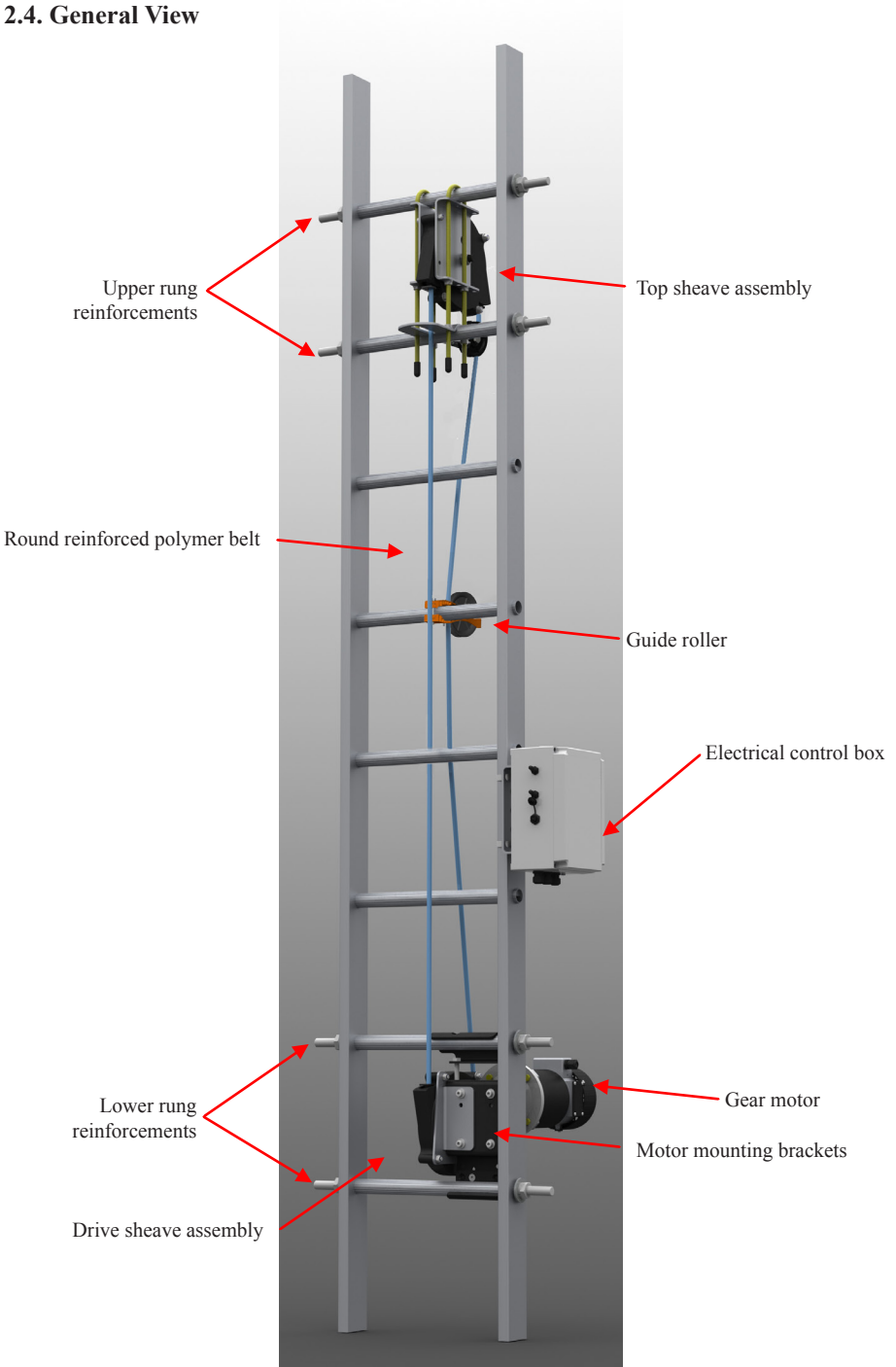


CAUTION: People with implanted pacemakers should not use this equipment. Radio waves could have unexpected effects on the operation of medical devices.



WARNING: The IBEX® 1000 climb assist system is NOT a safety device and must only be used in conjunction with an independent personal fall arrest system.

2.4. General View



3. ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Standard Components

The IBEX® 1000 climb assist system consists of the following parts:

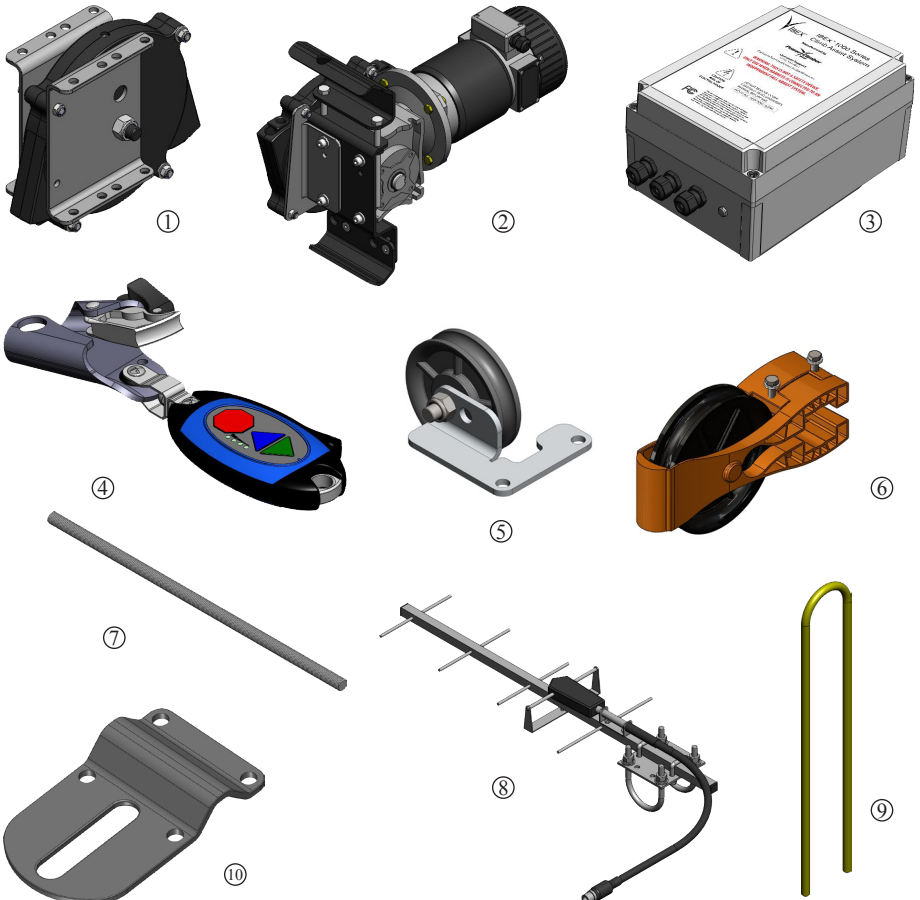
1. Top sheave assembly (1)
2. Gear motor assembly (1)
3. Electrical control box (1)
4. EasyClimb Controller (1)
5. Roller (1)
6. Roller (Model specific)
7. Upper and lower rung reinforcements (4)
8. Radio antenna and mounting bracket (1)
9. U-Bolt (2)
10. Rung Support Bracket (1)
11. Hardware kit “UPPER” (not shown)
12. Hardware kit “LOWER” (not shown)
13. Hardware kit “EXTRA” (not shown)
14. Reinforced round polymer belt, (Model specific) (not shown)



NOTE: These installation instructions are only a guide. Each tower can present unique complications that must be addressed on an individual basis. Installation of the IBEX® requires two properly trained technicians. Contact Power Climber Wind to arrange for training and product support.



CAUTION: Personal Protective Equipment (PPE) must be worn at all times within the tower. All tools must have lanyard attachment to a secure location.



Fasteners:

- The components of the IBEX® 1000 are assembled using standard fasteners.
- All bolts should be firmly tightened. If nylon lock nut is used, bolt thread shall protrude passed the nylon lock nut by at least one thread. If a lock washer is used, bolt should be tightened to compress lock washer flat.



NOTE: Either a lock washer, star washer or Nylok nut shall be used for all fasteners

3.2. Bottom Assembly

1. **Unpack the following** items and arrange them near the ladder:

Item	Description	Qty
1	Gear Motor Assembly	1
2	Rung Supports	2
3	Lower Hardware Kit (Not Shown)	1

2. **Choose the mounting position.** The Bottom Assembly requires access to two rungs. Choose the lowest possible rungs. The IBEX® may be installed as high as chest height before climbing is significantly impeded.

3. **Install Rung Supports** in the rungs directly above and below the Bottom Assembly mounting position. Thread four (4) ¾" or M20 for EU Nuts, Lock-Washers, and Fender Washers and tighten until Lock-Washers have been fully compressed using 29mm Wrenches. If fall arrest system or other rung supports are present, these may be used if long enough to accommodate additional width.

4. **Adjust Motor Assembly** to fit rung spacing. Loosen or tighten 10mm shown in red Figure 3.2.1 until upper and lower brackets can clear the installation rungs.

5. **Install the Motor Assembly** with the brackets flush to the ladder. Install upper bracket over rung and tighten bolt until lower bracket is tight to ladder.



NOTE: Tools Required: 17mm and 13mm Combination Wrenches, 5mm Hex Wrench and (2) 29mm Wrenches



TIP: If the fall arrest system is mounted at the ladder center, installing the IBEX® offset from center by up to three inches will not affect performance.

Figure 3.2.1

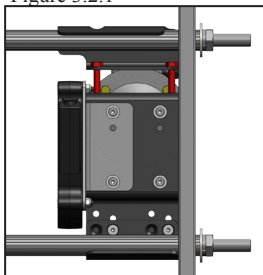
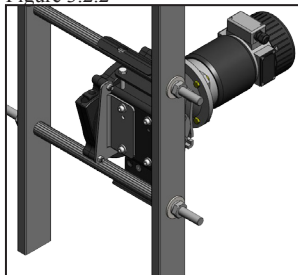


Figure 3.2.2



3.3. Upper Assembly

1. **Unpack the following** and place in the Lift Bag:

Item	Description	Qty
1	Upper Sheave Assembly	1
2	10mm U-Bolt	2
3	Stop Plate	1
4	Pull-In Roller	MS
5	Rung Reinforcements	2
6	Roller	1
7	Upper Sheave Hardware Kit (Not Shown)	1

2. **Choose the mounting position.** The Upper sheave should be mounted approximately in line with the lower sheave. The upper sheave ideally is installed 6-7 rungs above the final tower platform. If the installation height is limited, care must be taken to insure safe disengagement from the system is possible at the installed height.

3. **Install Rung Supports** in the rungs directly above and below the Upper Sheave mounting position. Thread four (4) $\frac{3}{4}$ " or M20 for EU Nuts, Lock-Washers, and Fender Washers and tighten until Lock-Washers have been fully compressed using 29mm Wrenches.

4. Install the Upper Sheave Assembly.

4A. **Unpack the Upper Sheave, (2) U-Bolts, (1) Rung Support Bracket and Upper Hardware Kit** Hold the Upper Sheave in place and install the (2) 10mm U-Bolts over the top supported rung and through the upper and lower mounting holes on the climber side and thread on two (4) nuts with star lock with star facing up move them up the U-Bolt. Install (4) nuts with star lock with star facing down. Adjust nuts up the U-Bolt to make room for the Rung Support Bracket to fit over the bottom supported run

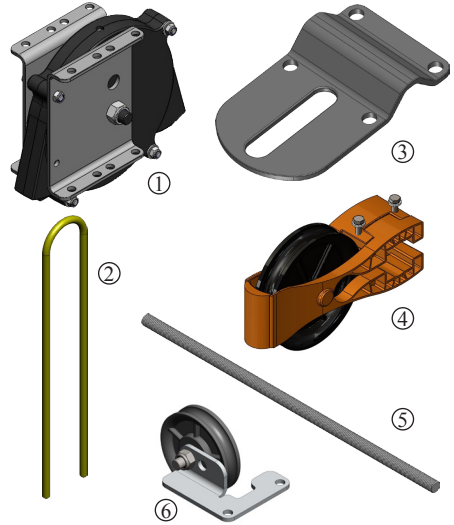
4B. **Tighten (4) upper nuts with star lock** until the Upper Sheave Bracket is tight to the upper supported rung. **Tighten (4) lower nuts with star lock** until the Rung Support Bracket is tightly resting on the lower supported rung. Be sure the Rung Support Bracket appears to be level in all directions and tighten evenly all (4) nuts with star lock until Upper Sheave is firmly secured to the ladder.

4C. **Install 705519-1 roller** using supplied nuts. Align holes with the U-Bolt on non-climbing side of ladder, slide up until it is flush with stop plate. Tighten bolts until snug.

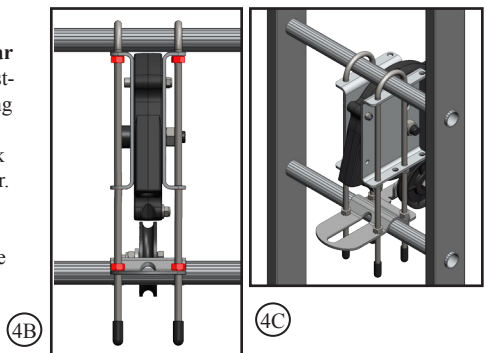
4D. **Install (4) rubber boots** to end of U-Bolts.



NOTE: Tools Required: 17mm combination wrench and Two (2) 29mm Wrenches, Lift Bag capable of holding all tools and components.



TIP: If two rungs or less exist above deck level, installation may be possible just below deck level. This will require user to disconnect from the IBEX® while on the ladder, but connection to fall arrest system must be maintained.



5. Install the Pull-In Roller one rung above deck level. Install the Pull-In Roller on top of the rung and align with the upper sheave assembly. Install the Rung U-Bolt with threads up and fasten with included Nylon Locknuts. Tighten with 11mm Combination Wrench until slight rung deformation has occurred. As shown in image 5.

6. At the base of the ladder, lay belt on side. Pull the belt from the center.

7. At the base of the ladder, attach the belt to the work positioning D-ring using a carabineer and make a loop in the belt using electrical tape wrap 12 times as shown in image 7. Climb to top of ladder, momentarily removes the belt loop and feed the Belt through the Upper Sheave Assembly; then remake the loop in the rope and attach the carabineer to the work positioning D-ring. This person then descends the ladder normally, pulling the Belt into position.

8. Feed the belt through the Lower Sheave and trim to length with no overlap.

3.4. Belt Path Solutions

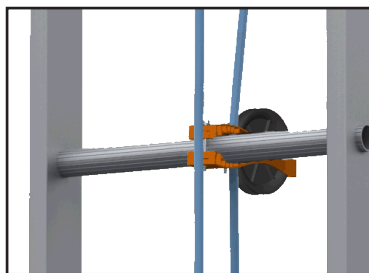
Ensuring a continuous belt path free of abrasion against or possible snags around fixed objects within the tower is critical to the performance of the IBEX® system and the life of the Belt. Below are suggestions regarding the installation of the standard IBEX® belt path components and additional accessories available separately.

3.4.1. Pull-In Belt Rollers

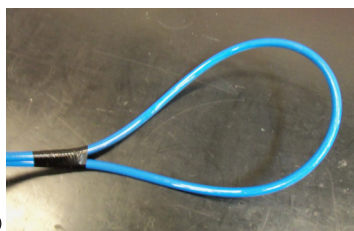
As the Belt passes through decks, there is a potential for Belt abrasion on the non-climber side. It is recommended to install a Pull-In Roller one rung above all decks the belt passes through. If the belt is at an angle greater than 10°, Pull-In Belt Rollers should be used because of the excessive force on Rollers.

INSTALLATION:

1. Unpack one (1) Pull-In Roller and one (1) Rung U-Bolt.
2. Place the Pull-In Roller on top of the installation rung, and install U-Bolt with threads facing up.
3. Install two 11mm Nuts with 11mm combination wrench. Tighten until the rung has slightly deformed.
4. After the Belt has been tensioned properly, load the belt into the belt guide.



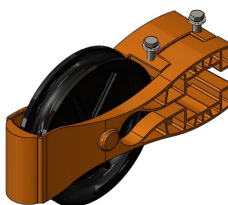
WARNING: This step defines the belt path and care must be taken to ensure that it is free of snags or twists around any obstruction.



⑦

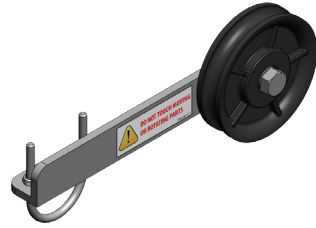


NOTE: Ensure belt is threaded thru sheave inlet and exit guide piece top and bottom.



3.4.2. Push-Out Belt Rollers

For towers with obstructions near the ladder opposite the climber (i.e. flip-down ladder rest stations), Push-Out Belt Rollers can be used to extend the clearance between the belt and the ladder. Installation of Push-Out Belt Rollers is identical to the Pull-In Belt Guides (Section 3.4.1.). IBEX® Push-Out Belt Rollers are included with EU units and sold separately, as required.



3.4.3. Wear Strips

Towers with safety hatches that can be closed over the ladder way at each platform generally require Wear Strips to prevent abrasion of the Belt against the sharp metal of the hatch.

1. Unpack the following:

Item	Description	Qty
1	Wear Strip	1
2	3/16" Rivets	3
3	3/16" Backing Washers	3

2. With safety hatch in closed position, Mark the ladder width on the hatch using the permanent marker.

3. Lift the hatch and install the wear guide over the lip of the hatch. Center the wear guide on the reference marks made in Step 2.

4. Measure 75mm (3in) in from both sides of the Wear Strip and mark with Permanent Marker. Drill #11 hole 12mm (0.5in) from edge of hatch at those marks through Wear Strip, Hatch, and Wear Strip Back. Install the two 3/16" Rivets with Rivet Gun.



NOTE: Tools Required: Permanent Marker, Pop-Rivet Gun for 1/8" shank, #11 Drill Bit (5mm), Cordless Drill, Tape Measure



NOTE: To accommodate the widest possible range of wind turbine tower designs and specifications, the IBEX® system is offered with easily adaptable solutions, which can be ordered on an individual basis or in tower specific kits. Contact Power Climber Wind to receive a Tower Survey form and to discuss which components are needed for your installation.

3.5. Belt Welding

Refer to belt tensioning, welding, and qualification procedures. Only persons trained and qualified by PowerClimber Wind shall complete belt installation.

3.6. Electrical Components

3.6.1. Control Box

1. Unpack the following components:

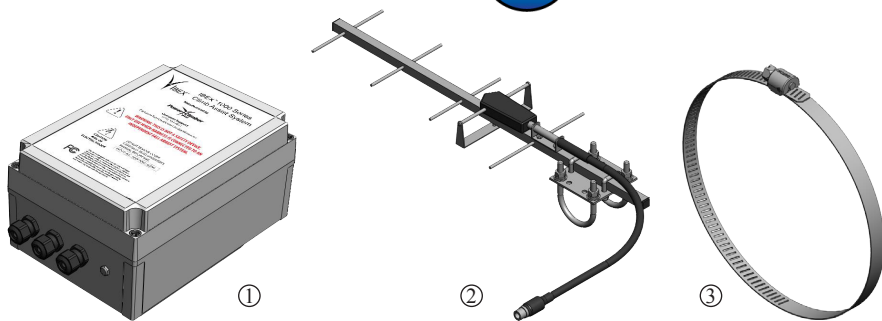
Item	Description	Qty
1	Electrical Control Box	1
2	Antenna and Bracket	1
3	Pipe Clamps	2



NOTE: Tools Required: 13mm Combination Wrench, 6mm Hex Wrench, 11mm Combination Wrench, 7mm Nut Driver, Flathead Screwdriver



TIP: Complete this section during the 25 minute wait for the weld to be complete



2. **Mount the Electrical Control Box** to the ladder and tighten the Pipe Clamps using the **Flathead Screwdriver**.

3. Remove the Motor Electrical Cap from the Motor with a Flathead Screwdriver.

4. Open the Cable Gland and feed the power wires with the ring terminals through the gland.

5. Loosen screws and connect the black wire to the positive contact post (A) and the white wire to the negative contact post (B). Tighten to hand tight using the flathead screwdriver.

6. Remove the green grounding screw located on the outside of the enclosure and attach the green wire to the bung (C) inside the enclosure. Tighten with a Flathead Screwdriver.

7. Re-Install the Motor Electrical Cap and tighten the screws with the flathead screwdriver. Tighten the Cable Gland until snug.

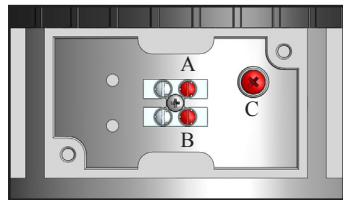
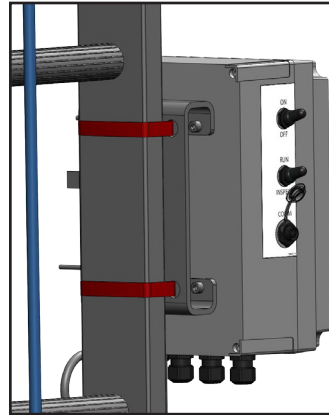
8. Route the AC Power Cord to a standard outlet (120/220 VAC). Make sure the AC Power Cord is hidden and secured with cable ties a minimum of every three (3) feet. If the AC Power Cord is too long bundle the cable into a loop and Cable Tie in place.



TIP: If a clear path to the outlet is not present, a 30mm (1.25in) hole can be drilled in the platform directly below the Electrical Control Box when authorised by an On-Site Competent Person.

9. Install the Antenna to a convenient location. The antenna must be installed between vertical and forty-five degrees and must not be within the ladder path or material hoist paths. Mounting locations must be evaluated on a tower-specific basis.

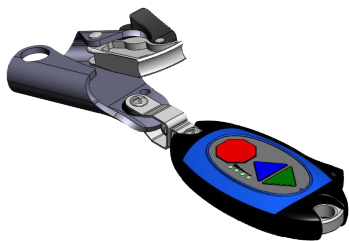
10. Run the Antenna Cable in a manner identical to Step 8.



NOTE:

- Routing of the AC Power Cord from the Electrical Control Box to a standard outlet (120/220 VAC) must be approved by the turbine owner or representative.
- The AC Power Cord shall be routed so as to avoid interference with normal operation of other components or moving parts within the turbine tower, and to avoid any trip and fall or other hazard to personnel moving within the turbine tower.
- If the AC Power Cord is routed above the platform deck in areas of foot traffic, it must be protected using crush-resistant tubing. Alternatively, it may be possible to route the AC Power Cord beneath the platform deck with owner approval.
- The AC Power Cord should be secured in place every three feet (1 meter) using nylon cable ties or equivalent.
- Contact of the AC Power Cord against any unprotected metal edges (i.e., cut diamond plate) should be avoided. Grommets or other protection should be used as required.

3.6.2. EasyClimb Controller



The EasyClimb Controller assembly includes an integrated rope grab and carabiner to connect it to the user's harness at the front D-Ring. The EasyClimb Controller must be charged for 24 hours using the enclosed 12Vdc wall transformer. When not in use the EasyClimb Controller may be safely placed on charge for an unlimited period.

3.7. Commissioning

After Installation is complete, carry out the following steps to commission the installed IBEX® 1000 climb assist system.

3.7.1. EasyClimb Controller

1. Review section 4.1 below on the operation of the EasyClimb Controller.
2. Press STOP: verify all 4 LEDs flash once.
3. Press and hold STOP, press UP: verify one LED flashes and sequentially cycles in the up direction. Release STOP.
4. Press and hold STOP, press DOWN: verify one LED flashes and sequentially cycles in the down direction. Release Stop.
5. Wait at least 30 sec. after last button operation then repeat 2.

3.7.2. Complete Installation

(Do not connect EasyClimb Controller to belt)

6. Verify belt tension is set according to the table in section 3.5.
7. Connect power to the unit.
8. Set key to Inspect and turn on the power: Verify that the belt runs down (at nominally 60 fpm)
9. Set key to run. Verify belt stops. Cycle power.
10. Press Up (EasyClimb Controller): Verify belt runs up slowly for 2 to 3 seconds.
11. Set EasyClimb Controller to 50 lbs in UP and DOWN direction.
12. Attach rope grab to safety wire.
13. Apply a load to the harness attachment point of the EasyClimb Controller.

14. Press UP (twice if needed): Verify that the belt moves up at a speed that varies inversely with the load applied to the EasyClimb Controller.
15. While load is applied and the belt is running, press STOP: Verify that the belt stops and does not respond to load.
16. Press the DOWN button (twice if needed).
17. Apply a load to the EasyClimb Controller (there may be a short delay in start): Verify that the belt moves down at a speed that varies with the load applied to the EasyClimb Controller.
18. Take all load off the EasyClimb Controller. Verify that the belt stops, and restarts if load is reapplied within 10 seconds, otherwise remains stopped.
19. While load is applied, press STOP: Verify that the belt stops and does not respond to load.
20. Angle the EasyClimb Controller down and press UP multiple times: Verify that the belt remains stationary.

3.7.3. Ride Quality

21. Cycle the power switch to ensure the system is reset.
22. Connect the rope grab to the belt and the carabiner to the harness.
23. Test ride to ensure proper function of system.

4. OPERATION INSTRUCTIONS

4.1. Use of the EasyClimb Controller

4.1.1. To Set Level of Assistance

1. Press and hold the STOP button while:
 - a. Press and release the UP button to set the desired level of assistance for ascent;
 - b. Press and release the DOWN Button to set the desired level of assistance for descent.
2. When the desired levels are set, release the STOP button.
3. At first press, while the STOP button is held, the indicator shows the current setting.
4. With further presses, the indicators will cycle.

4.1.2. To Ascend

1. Couple the EasyClimb Controller between the harness chest ring and the rope grab clipped to the belt.
2. Press and release the UP button. The indicator flashes to show the set level of assist.
3. The belt will slowly start.
4. When the assist is felt, begin climbing up.
5. To stop, stop climbing then press the STOP button, or press the STOP button first.



WARNING: The IBEX® 1000 climb assist system is not a safety device and must only be used in conjunction with an independent personal fall arrest system.



NOTE: To ensure safe operation of the system;

- Pressing the STOP button prevents the assist motor from operating while setting levels.
- Assist levels cannot be set during motor operation. Press STOP before attempting to change assist level settings.
- Assist levels are retained after setting.



NOTE:

- If the level of assist does not reach 9.07 kg. (20 lbs) within 1 second, the motor will stop. Restart by pressing the UP button as above.
- A stop delay is included and is preset to 10 seconds.
- The LED will show the selected level of assist during the climb.



CAUTION: When reaching the top of the ladder, be sure to press the STOP button three feet before the rope grab reaches the stop plate on the Upper Sheave Assembly.

4.1.3. To Descend

1. Connect the EasyClimb Controller between the harness chest ring and the rope grab clipped to the belt.
2. Press and release the DOWN button. The indicator flashes to show the set level of assist.
3. Begin climbing down.
4. To stop, stop climbing or press the STOP button.

4.1.4. To Stop

1. Press the STOP button to stop immediately.

4.1.5. To Shut Down the System

To shut down the system, put the power switch located on the electrical control box in the OFF position. Although not necessary it is recommended to unplug system when not in use.

4.1.6. Miscellaneous

Often, during the ascent, it is necessary to momentarily stop, for example to open or close a hatch. For convenience, a delay is automatically set when the climber stops climbing and the climber remains supported. Provided the ascent resumes within 10 seconds, it is not necessary to press the UP button again, otherwise press UP and resume the ascent. Similarly, during descent, the climber may stop for a delay of 10 seconds before resuming the climb before it is necessary to press the DOWN button. Otherwise press DOWN and resume the descent. Because the climber is remote from the motor controls, and to ensure that the system responds to the climber's intentions and does not operate from unintended actions, it is necessary to press the UP or DOWN button to initiate a climb.

4.2. Safety

To ensure that operation of multiple EasyClimb Controllers does not cause unexpected actions, each EasyClimb Controller has a unique serial number. Concurrent operation of more than one EasyClimb Controller in a tower may cause the motor to stop and remain stopped for 30 seconds. To prevent erroneous operations, it is only possible to communicate with the motor drive while the EasyClimb Controller is pointed up.



NOTE:

- If the load in the EasyClimb Controller does not reach 9.07 klg. (20 lbs) within 15 seconds, the motor will stop. Restart by pressing the DOWN button as above.
- The LED will show the selected level of assist during the climb.



NOTE: You may have your weight on the EasyClimb Controller before pressing UP or DOWN

5. MAINTENANCE INSTRUCTIONS

The IBEX® 1000 requires minimal maintenance. All bearings are sealed and do not require lubrication

5.1. Periodic Inspection

5.1.1. Belt Inspection

As a moving part, the round assist belt is subject to wear with use. Visual inspection of the belt for abrasion or other damage or weld separation should be performed regularly. Closer inspection of the entire belt length should be performed once annually. Setting the lower switch on the electrical control box to INSPECT will engage the maintenance mode. In this mode, the motor will drive the belt at a slow speed. While at the ladder base, allow the belt to pass through the inspector's hand while also visually inspecting the belt as it moves.

Surface scarring from use of rope grabs is normal and will not affect performance or safety of the belt. However, if excessive scarring or abrasion against the ladder or platforms is discovered, the worn section may be removed and a replacement section spliced into place according to the belt splicing procedures in section 3.5.

5.2. Troubleshooting

Symptom	Consider
Belt slips on the drive sheave	<ul style="list-style-type: none"> • Check for oil on the belt or drive sheave. Use a dry cloth to clean the belt using maintenance mode. • Will occur if the belt tension is too low during installation. See tension table in section 3.5.
EasyClimb Controller LEDs do not indicate	<ul style="list-style-type: none"> • Place the EasyClimb Controller on the charger for at least 24 hours
Belt stops when the EasyClimb Controller is in the upper zone of the tower	<ul style="list-style-type: none"> • Verify that the antenna is connected, correctly aligned and is not damaged.
Belt will not respond to controller commands	<ul style="list-style-type: none"> • Ensure that the EasyClimb Controller is pointing up with the stop button highest.
Belt stops at random times and will not operate again for 30 seconds	<ul style="list-style-type: none"> • Check to see if a second EasyClimb Controller is causing interference.

5.3. Replacement of Damaged Components

Service of the EasyClimb Controller and electrical control box shall be performed by Power Climber Wind by factory return. During the warranty period a replacement controller or control box will be supplied if required.



WARNING: Only use parts supplied by Power Climber Wind. Use of non-authorized parts will void the warranty.

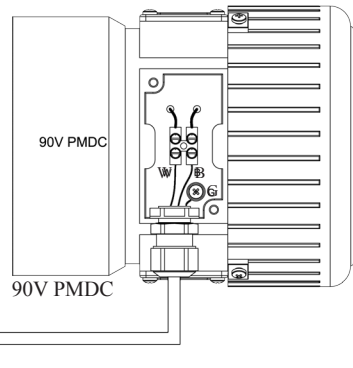
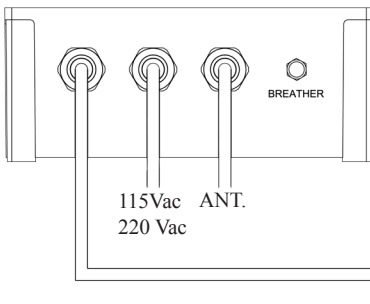
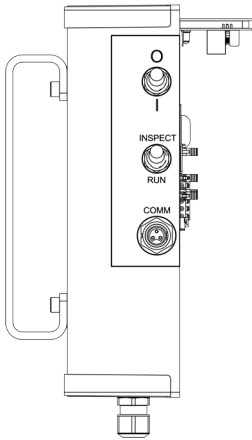


NOTE: See the spare parts list in section 5.5 for replacement items.



NOTE: Replacements are to be made following the installation procedure detailed in section 3.

5.4. Electrical Schematics and Wiring Diagrams



5.5. Customer Service

For service requests or spare parts orders, contact Power Climber Wind Customer Service in the U.S. or Canada at CustomerService@PowerClimberWind.com or via telephone inside the U.S. at +1 (877) PC-WIND1 or outside the U.S. at +1 (206) 394-5306. In Europe/Asia Pacific call +32 3 451 05 00 or e-mail Wind@PowerClimber.be

