

OPERATING MANUAL

Titan

PI HOIST



CONFORM TO EUROPEAN NORM
EN 1808:2015
MACHINE DIRECTIVE 2006/42/EC



WARNING:

- All persons operating this equipment must read and completely understand this manual.
- Only authorized and trained persons, capable of carrying out the daily checklist, shall operate the equipment.
- Any operation in violation of these instructions is at one's own risk and may result in serious injury.
- Keep this manual with the equipment at all times.
- Only use **POWER CLIMBER** original spare parts and steel wire ropes.

Manufacturer

POWER CLIMBER B.V.
Satenrozen 7
B- 2550 Kontich
BELGIUM

Website: www.PowerClimber.be
Tel: +32-3-451.05.00
E-mail: info@PowerClimber.com

Reference: 38761-E

Issue date: 2023AUG09

Revision: C

Page: 1 of 20



Tel. +32-3-451 05 00

E-mail: Info@PowerClimber.com
Website: www.PowerClimber.be

Fax +32-3-451 05 01

Table of Contents

Revision Table	2
Description of the Titan PI hoist	2
General Overview	3
Specifications	4
Hoist installation.....	5
Removing the steel wire rope from the TITAN hoist	7
After work checks.....	7
Maintenance.....	8
Safety Devices	10
Steel wire rope precautions	12
Daily checks.....	13
Appendix 1: Mechanical Integration / Stirrup design.....	14
Appendix 2: Electrical integration	16
Appendix 3: Titan Overload Adjustment.....	20

Revision Table

<u>Revision</u>	<u>Reason</u>	<u>Date</u>
C	Additional info added to appendix 2	2023AUG09
B	Added single phase electrical integration	2023JUL13
A	General check & update + added appendices	2020JUL06
-	Creation	2017JAN03

Description of the Titan PI hoist

The Titan PI hoist is a hoist in the Titan range that has been designed specifically for Permanent Installations (PI).

Different versions of the Titan PI are available, depending on the application and safety features required.

! Warning !: When integrated into a platform, the platform's manufacturer has to take into account a couple of design aspects for all features of the hoist to work as intended.

- The mechanical design aspects can be found under *Appendix 1*.
- The electrical design aspects can be found under *Appendix 2*.

Reference: 38761-E

Issue date: 2023AUG09

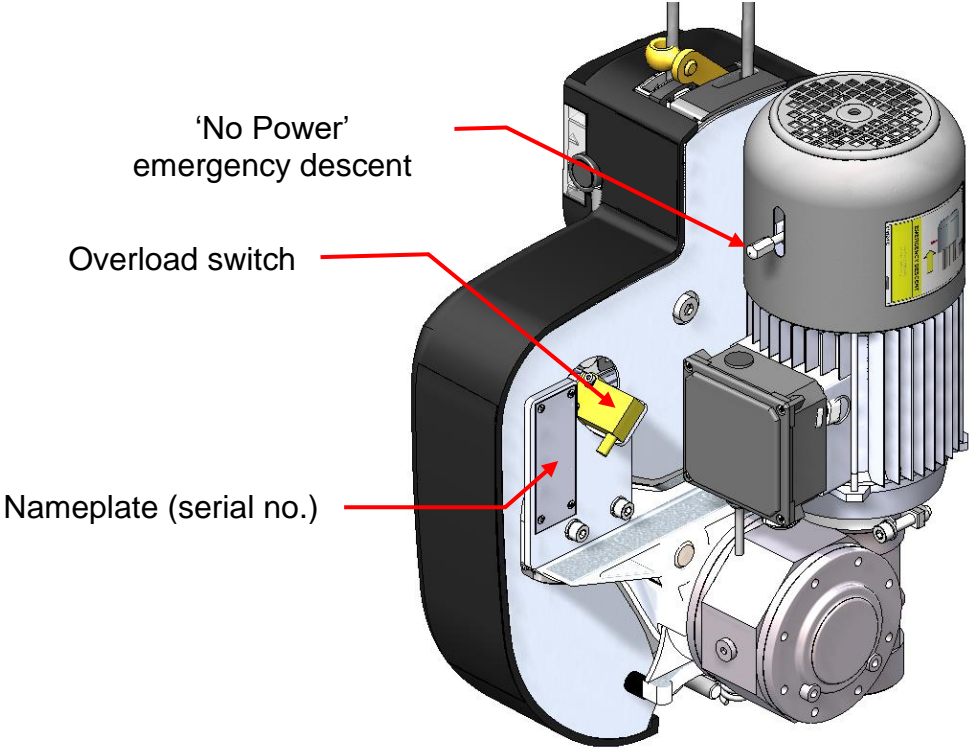
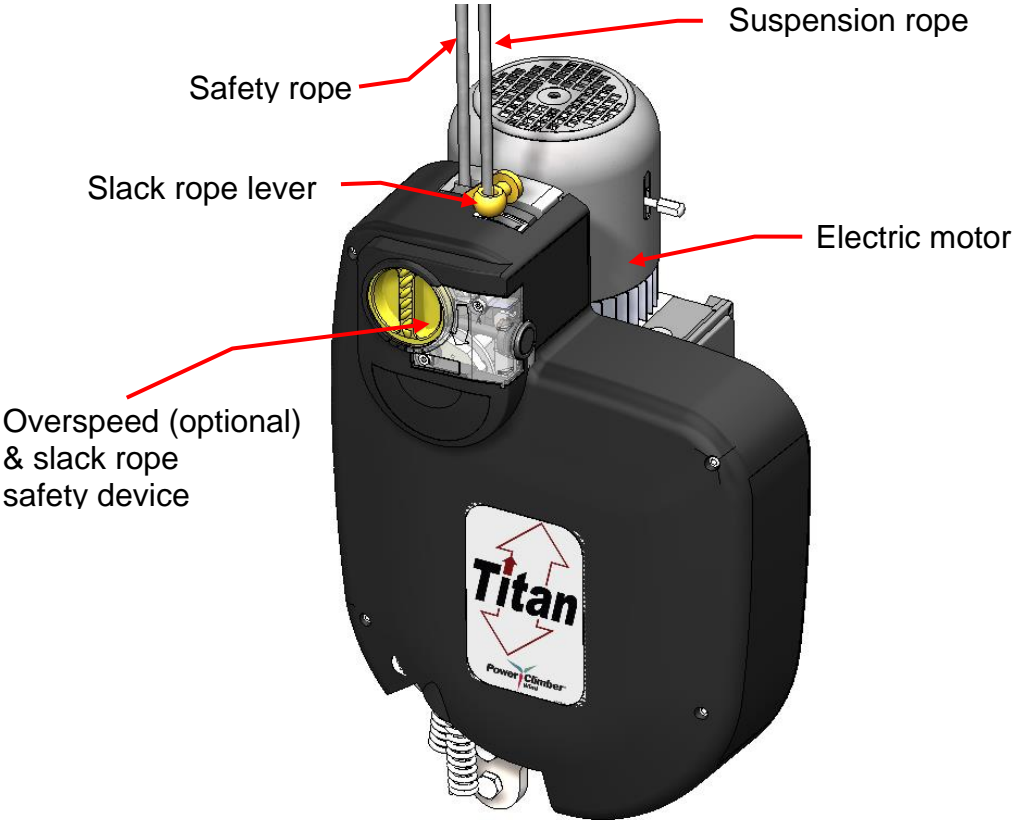
Revision: C

Page: 2 of 20



OPERATING MANUAL - TITAN PI

General Overview



Reference: 38761-E	Issue date: 2023AUG09	Revision: C	Page: 3 of 20
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OPERATING MANUAL - TITAN PI

Specifications

A. Three Phase versions

Titan-PI (Three Phase)						
Power Supply *		3 x 400V (+N) +E , 50Hz				
W.L.L. Range (kg)		150-250	250-350	350-450	450-550	550-650
Motor Power (kW)		0.45	0.6	0.7	0.9	0.9
Current at max. WLL	Run (A)	2	2.5	3	3.3	3.5
	Start (A)	6	7.5	9	9.9	10.5
Wire rope type		Type 8 **				
Hoisting speed		ca. 8 m/min				
Noise Level		< 80 dBA				
IP-rating		IP 54				
Self-weight		36 kg				

B. Single Phase versions

Titan-PI (Single Phase)		
Power Supply *		1 x 230V +E , 50Hz
W.L.L. Range (kg)		275-400 375-500
Motor Power (kW)		0.55 0.74
Current at max. WLL	Run (A)	3.7 4.5
	Start (A)	14.8 18
Wire rope type		Type 8 **
Hoisting speed		ca. 8 m/min
Noise Level		< 80 dBA
IP-rating		IP 54
Self-weight		36 kg

* Other voltages and frequencies available on demand. Contact manufacturer for specifications.

** Type 8 steel wire rope: All steel wire ropes tested and approved by Power Climber for use with Titan hoist

Reference: 38761-E

Issue date: 2023AUG09

Revision: C

Page: 4 of 20



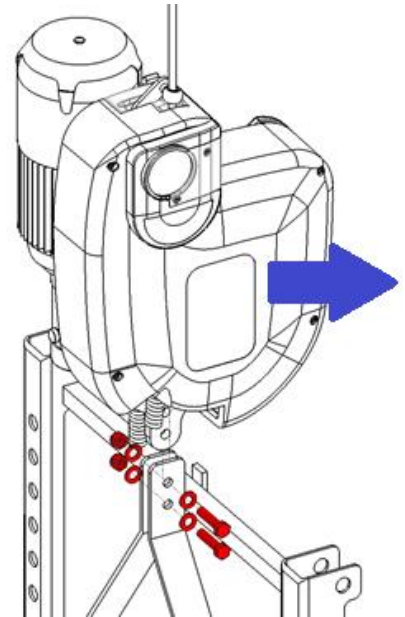
OPERATING MANUAL - TITAN PI

Hoist installation

A. Attach the TITAN hoist to the [Power Climber] stirrup

- 1) Lift the TITAN up from the ground, line up the holes in the stirrup bar with the holes in the stirrup.
- 2) Attach the TITAN hoist to the stirrup of the platform using M12 bolts, washers and self-locking nuts. Make sure that the TITAN hoist is mounted as shown, with the blue arrow pointing towards the middle of the platform!

Note: The hoist should not be clamped tight in the stirrup and should be able to move around within the play of the bolt holes.



For more information on the hoist's stirrup design, see *Appendix 1*.

B. Connect the hoist electrically to the Central Control box (CCB)

The electricals can be hard-wired or can be connected using a plug, depending on how the hoist has been integrated by the platform's manufacturer. If unclear, contact the platform's manufacturer.

For more information on the hoist's electrical connection, see *Appendix 2*.

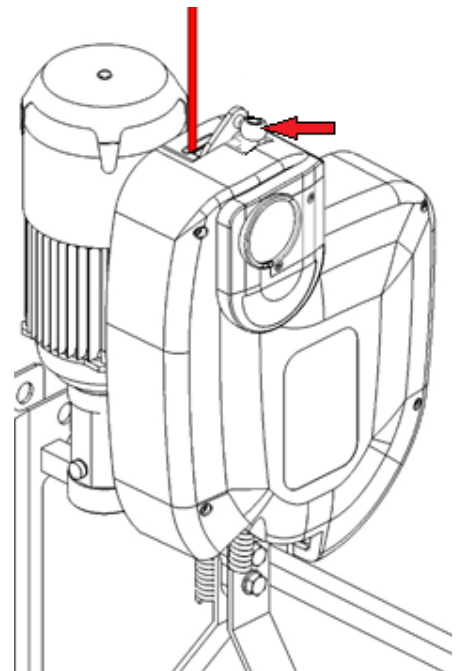
C. Reeve the safety rope in the TITAN hoist

At roof level, uncoil the safety ropes and lay them on the roof surface. Attach the safety ropes to the suspension system and lower the ropes to the ground. Verify if the rope is long enough.

Push back the slack rope lever to open the jaws of the slack rope safety device and push the safety rope through the slack rope compartment till it comes out at the bottom of the hoist.

If wire winders are used, route the steel wire rope to the wire winder drum and use the wire winder motor to coil the remainder of rope on the drum. Make sure to guide the steel wire rope above the centre of the wire winder drum.

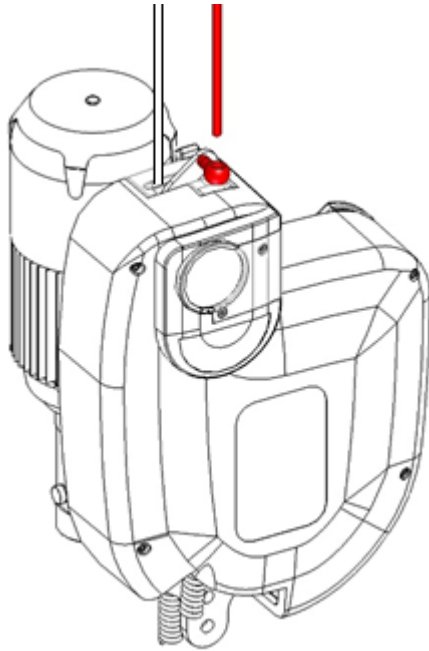
If used without wire winders, take out all slack by pulling it through the hoist by hand and adding a weight on the tail end of the safety rope.



OPERATING MANUAL - TITAN PI

D. Reeve the suspension rope in the TITAN hoist

At roof level, uncoil the suspension ropes and lay them on the roof surface. Attach the suspension ropes to the suspension system and lower the ropes to the ground. Verify that the rope is long enough.



Push back the slack rope lever and manually insert the suspension rope through the eye of the slack rope lever and into the hoist until it stops.

Push the 'up' button on the CCB and the steel wire rope passes through the hoist automatically. The end of the rope will come out from the bottom of the hoist. Make sure the outlet is free and the wire rope can come out.

If wire winders are used, feed the rope to the drums and coil the remainder of the wires using the 'up' button.

Tip: If there is any difficulty reeving the suspension rope it helps to put a small bend in the end of the rope before feeding it into the hoist.

Tip: Separately reeving the safety rope and the suspension rope, will avoid getting them twisted together.

E. Carry out Daily Checklist

Carry out the Daily Checklist prior to your first ascent to install the top limit switch striker plates. Always check the suspension system for stability and safety before launching the platform. Also verify that the Working Load Limit (W.L.L.) of the suspension system is rated for the application.

Note: Depending on local regulations, a top- and/or an ultimate limit switch are required. They can be mounted to the hoist (Optional) or to the stirrup frame.

F. Install Top Limit Switch Striker Plates

The striker plate activates the top limit switch and must be clamped on the safety wire at a distance of min. 20cm from the Talurit clamp.

Important note! Clamp the striker plate to the safety rope ONLY so that the suspension rope passes freely through the slot in the plate.

Removing the steel wire rope from the TITAN hoist

Tip: Remove the safety rope first and keep the suspension rope taut, so that the slack rope safety device stays open and allows easy passage of the safety rope.

A. Safety rope

Remove the weight that kept the steel wire rope taut.
Manually pull the safety rope out of the slack rope safety device by hand.

B. Suspension rope

Push the 'down'-button on the CCB until the suspension rope no longer comes out of the top of the hoist and pull out the remainder of the rope by hand.

Tip: Push up on the slack rope lever for easy removal of the suspension rope.

Tip: If the hoist is equipped with an overspeed safety device, hold on to yellow reset knob while pulling out the remainder of the rope to prevent the overspeed device from tripping.

After work checks

- The platform is cleared of tools and equipment.
- LOTO (LogOut-TagOut) the equipment such that all electrical power has been switched off from the equipment.
- Equipment has been secured where it will not be accessible to be tampered with.

OPERATING MANUAL - TITAN PI

Maintenance

A. Routine maintenance

➔ **At least every 3 months under normal use, or 50 operating hours, whichever comes first.**

Note: *No specialized training is required to perform this basic maintenance.*

- 1) Check all plugs and socket connections of the hoist and central control box for any signs of water penetration, visual damage or loose wires / glands.
- 2) Make a general inspection of hoist for excessive wear and damage.
- 3) Remove the hoist's main cover and inspect mechanism for any signs of excessive dirt and corrosion. If required, blow out with air or rinse with water.
- 4) Check that traction roller rotates when reeving / de-reeving the steel wire rope through the hoist.
- 5) Check the slack rope safety device for excessive dirt and corrosion. If required, blow out with air or rinse with water. Check that the slack rope lever can move smoothly up and down. If necessary, lubricate lightly with a dry wax-based spray lubricant.
- 6) If applicable, check the optional overspeed safety device for excessive dirt and corrosion. Check that the overspeed governor can rotate freely. Check that the centrifugal masses can move freely and that the springs aren't corroded or damaged. Check if the overspeed safety device triggers properly by pressing the black manual release button. If necessary, lubricate lightly with a dry wax-based spray lubricant.
- 7) Re-install main cover.
- 8) Carry out the Daily Check List before using the platform.
- 9) Write a maintenance record indicating:
 - Any discrepancies noted and action taken.
 - Hour meter reading of the hoist (if integrated by Power Climber: hour meter can be found in the Central Control Box).

Reference: 38761-E

Issue date: 2023AUG09

Revision: C

Page: 8 of 20



OPERATING MANUAL - TITAN PI

B. Annual Maintenance

Note: *To be carried out annually by an authorized service center.*

- 1) Completely strip the hoist, clean and inspect all parts for wear and damage. Replace worn parts when necessary.
- 2) Clean, lubricate and re-assemble the hoist. Particular attention must be given to the slack rope and the optional overspeed safety device.
- 3) Place the hoist on a test rig and test that it can lift the rated Working Load Limit.
- 4) Check all plugs and socket connections of the hoist and central control box for any signs of water penetration, visual damage or loose wires / glands.
- 5) Reinstall the hoist and control box back on the platform and carry out the Daily Check List.
- 6) Write a maintenance record indicating:
 - Repairs carried out and/or parts replaced.
 - Hour meter reading of the hoist (if integrated by Power Climber: hour meter can be found in the Central Control Box).

C. Special Conditions

The frequency of inspection and maintenance also depends upon the environmental and working conditions:

- When working with abrasive, adhesive or corrosive materials (epoxy, paint, cement, sand blasting, acids, salt water, spraying,...), the hoist should be protected with a suitable cover and the daily checklist carried out at least once a day.
- Always exercise caution regarding grounding, arcing and insulation, whenever welding or using electrical equipment.

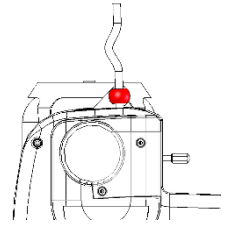
OPERATING MANUAL - TITAN PI

Safety Devices

A. Automatic slack rope safety device:

The automatic slack rope safety device locks mechanically onto the safety rope if:

- The suspension rope loses tension or breaks.
- The platform gets out of level by less than max. 14 degrees. The slack rope safety device on the lower hoist will lock mechanically onto the safety rope. This protects against a slow creep down of the hoist.



B. Overspeed Safety device (optional):

Important Note!: ! Mandatory in single hoist applications!

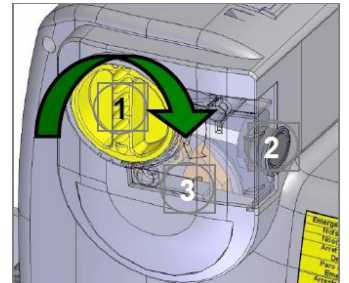
The overspeed safety device locks onto the suspension rope and is factory set to trip at around 15 m/min.

The overspeed safety device is triggered by an overspeed governor, which is being rotated by the passage of the suspension rope through the hoist. Spring-loaded centrifugal masses on this governor will trigger the device when the threshold speed is exceeded.

The rotation of the governor can be visually checked through the inspection window during travel.

The overspeed safety device can be triggered manually by pressing the black manual release button.

- 1) Reset Knob. Turn in direction of arrow to reset overspeed.
- 2) Manual trip button
- 3) Inspection window and overspeed governor (visible through the window)



To reset the overspeed safety device, first drive the hoist up a few centimetres and then turn the yellow reset knob.

C. Overload detection device

Each hoist is fitted with an overload detection device.

The overloads should be set to stop travel if the rated load (RL) of the platform is exceeded by 25%.

See *Appendix 3* to adjust the overload setting.

To release the overload detection device, remove the excessive load.

Tip: In addition to removing the excessive load, it may be required to remove part of the normal load in order to reset the overload detection device.

Once the overload detection device is reset, the platform can once again be loaded with the full normal load.



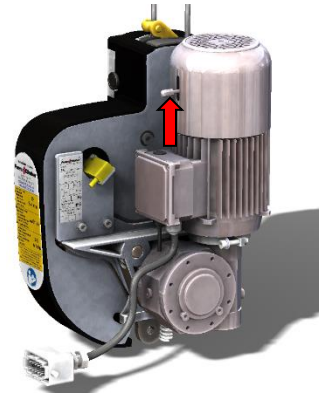
OPERATING MANUAL - TITAN PI

D. 'No-Power' descent

In the event of a power failure, the platform can be lowered at a controlled speed (ca. 6 m/min.), by pulling the 'No-Power' descent lever on the electro-magnetic service brake.

To avoid wearing the friction disc from the brake, make sure to fully open the brake. Never apply excessive force on the lever.

Warning: Never use the emergency manual descent when normal powered movement is possible.

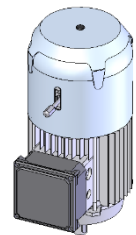


E. Overheating protection for electric motor

The hoist motors are fitted with a thermal contact, which can be used to cut power to the motors in case of overheating.

If a hoist motor has overheated, allow it to cool down to continue.

As the thermal contact is a bi-metal, it will automatically reset once the motor is cooled down.



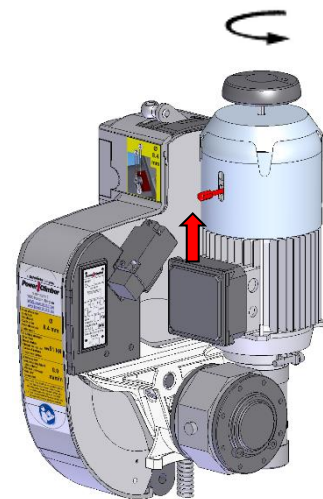
F. Use of Handwheel to reset safety device in case of power failure

If the slack rope safety device or overspeed safety device (*optional*) has been activated and there is no power to the platform, it will be necessary to wind the hoist up a few centimetres manually, to be able to reset the safety device.

- 1) Turn off main power supply switch on the central control box.
- 2) Remove plastic plug from top cover of motor to expose hub for handwheel.
- 3) Remove the handwheel from its storage position and insert shaft into hub.
- 4) Wind the hoist in the up-direction counter clockwise $\frac{1}{2}$ turn at the same time as you lift the emergency descent lever to open the brake.
- 5) Release lever and repeat.

Tip: Grab the handwheel firmly while opening the brake to prevent it from turning and going back down.

- 6) Put the plastic plug back in place and return the handwheel to its storage position after use.
- 7) Turn the main power supply back on and resume.



OPERATING MANUAL - TITAN PI

Steel wire rope precautions

Important note!: Only use Power Climber recommended steel wire ropes!

- The end of the steel wire ropes should be brazed to form a 'bullet' end with a maximum length of 10mm, without loose or broken wires.

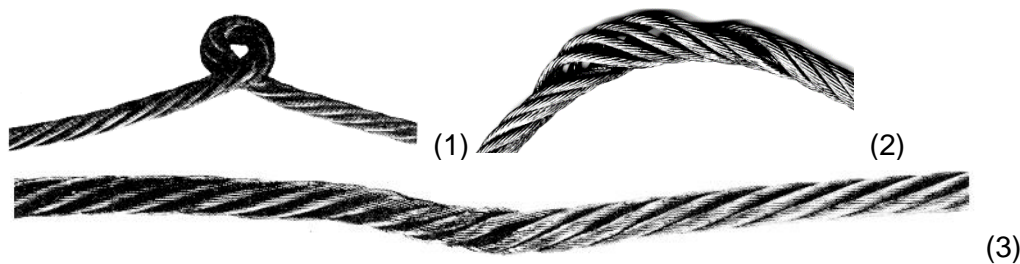


- Use protective gloves to manipulate the Steel Wire Ropes.
- If Steel Wire Ropes are too long, carefully wind any extra cable into a loop (or onto the wire winders) and tie up, leaving the coil suspended just clear of the ground.

! WARNING !

Steel Wires Ropes must be replaced in any of the following conditions:

- More than 10 wires are broken on a length of 25cm
- Excessive corrosion
- Damage due to heat
- Reduction of the nominal diameter by more than 10%.
General rejection diameter for Type 8* steel wire ropes: 7.5mm
- Kinking (1), crushing (2), bird caging (3) or any other distortion of the wire rope structure.



* Type 8 steel wire rope: All steel wire ropes tested and approved by Power Climber for use with Titan hoist

Reference: 38761-E

Issue date: 2023AUG09

Revision: C

Page: 12 of 20

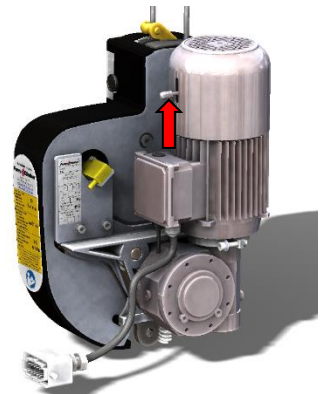


OPERATING MANUAL - TITAN PI

Daily checks

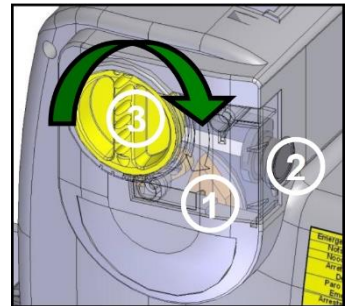
! Tests must be carried out EVERY TIME before using the platform !

- 1) Visually inspect the **platform** for damaged, loose or missing parts.
- 2) Check the **suspension system** for stability before launching the platform
Check that all counterweights are in place and secured
Check that all steel wire ropes are hooked on to the suspension system properly.
Check that the accessories (e.g. hooks, shackles, ...) are in proper state.
- 3) Drive the platform 1-2 meters off the ground to continue the following tests:
 - ON ONE HOIST ONLY, Pull on the '**No Power**' **emergency descent lever** and check that the hoist can be lowered at a controlled speed.
 - Continue releasing the service brake until the **slack rope safety device** is activated (before 14 degrees) and keeps the platform from tilting further.



Repeat the procedure by manually lowering the other end of the platform.

- 4) Run the lift up and down and check that the **overspeed governor (1)** is rotating by looking through the inspection window.
Also check that the weights on the overspeed governor are not stuck and moving slightly as the governor rotates.
 - a. Press the **over speed manual trip button (2)** and **operate the lift down** (electrically or by manual brake release).
Down movement of hoist is halted.
 - b. Pull on the '**No Power**' **manual descent lever** and check that no further down movement is possible.
 - c. To reset, power the hoist up about 10 cm and turn the **reset knob (3)** clockwise till the over speed safety device clicks back into its 'open' position and is re-armed.



IMPORTANT: Make sure that the Overspeed Safety device is reset before running the lift. Failure to do so may result in a ROPE JAM.

- 5) Run the platform to the top and during travel inspect the **steel wire ropes** for kinks, broken wires or other damage.
Inspect the trailing **electrical supply cable** for damage.

At the top of travel, check that the top limit switch **striker plates** are correctly fitted and also that the **top limit switches** are operated by the striker plates.

! DO NOT USE EQUIPMENT THAT IS NOT OPERATING PROPERLY !
! NEVER OVERRIDE LIMIT SWITCHES AND SAFETY DEVICES !

Reference: 38761-E

Issue date: 2023AUG09

Revision: C

Page: 13 of 20



OPERATING MANUAL - TITAN PI

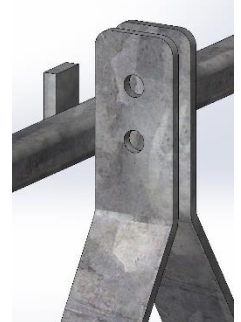
Appendix 1: Mechanical Integration / Stirrup design

Several aspects should be taken into account during the stirrup design to make sure that all (safety) features of the Titan hoist function as intended.

The most common stirrup design consists of two parallel plates where the Titan's 'foot' fits in between and can be bolted into:

Following are the minimum design requirements to be followed when using a similar stirrup design.

For other stirrup designs, contact Power Climber to make sure the design is compatible.



- 1) The hoist should not be clamped tight in the stirrup and should be able to move around within the play of the bolt holes.

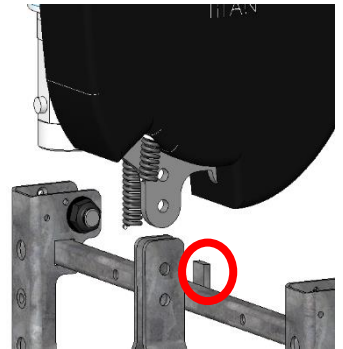
The Titan's foot thickness is 12mm, a gap of 13-14mm between both stirrup plates is recommended.

Do NOT overtighten the M12 bolts so the plates clamp down on the Titan's foot.

- 2) Add a support lip on the stirrup on the inside of the platform:

This lip has two purposes:

- Limit the amount of degrees that the hoist can pivot because of the play in the bolt holes.
This ensures that the mechanical anti-tilt device (slack rope safety device) engages soon enough.
- Distribute the force over a bigger area of the foot to minimize stress.



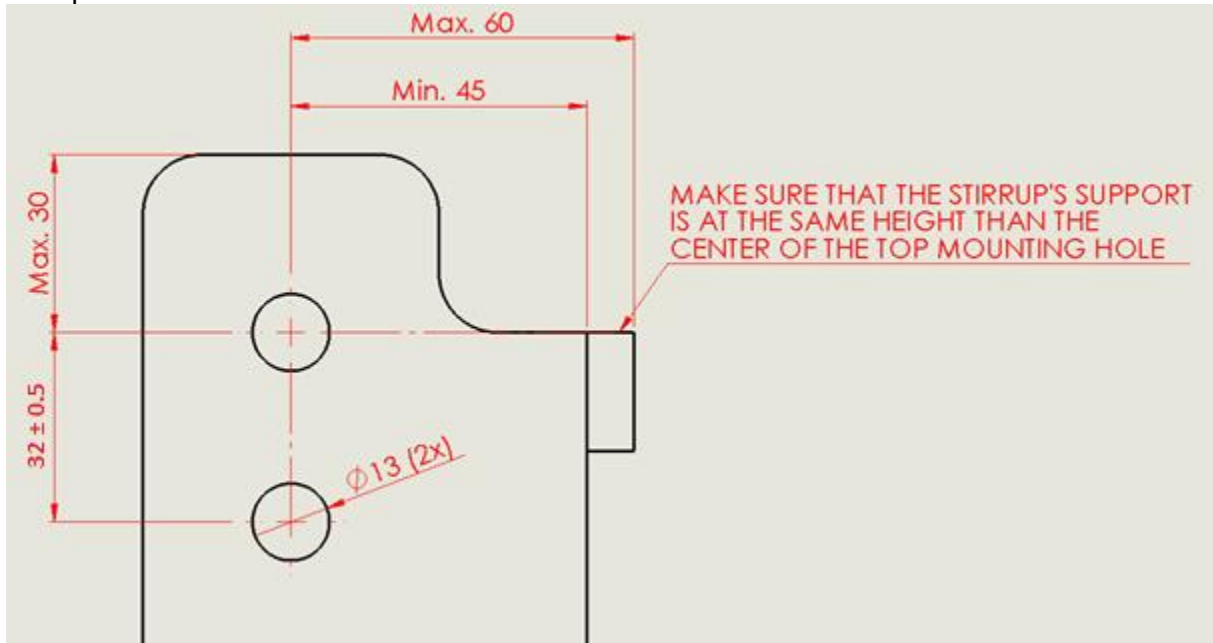
- 3) Make sure that the stirrup (and the complete platform) is designed for the forces coming from the hoist.

The following scenario's should be taken into account:

- a. Vertical force of three times the W.L.L. of the hoist (impact factor of 3).
- b. Inclined force of three times the W.L.L. of the hoist (impact factor of 3), with a maximum angle of 14° from vertical in the platform's longitudinal direction.

OPERATING MANUAL - TITAN PI

The following dimensions are critical and should be taken into account during the design of the stirrup:



OPERATING MANUAL - TITAN PI

Appendix 2: Electrical integration

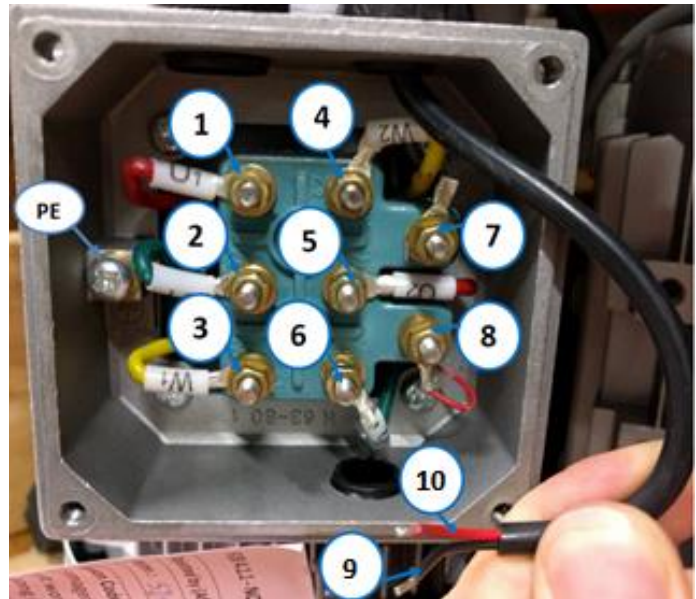
For all of the Titan's safety features to function as intended, it's important to integrate it correctly electrically.

A. Three phase versions

Hoist connections

- Motor Connections

Number	Motor connection
1	U1
2	V1
3	W1
4	W2
5	U2
6	V2
7 - 8	Thermal switch
9	Motor brake (0 VDC)
10	Motor brake (+96 VDC)
PE	Protective Earth



- Overload switch

Each Titan PI hoist will have a separate wire coming from the overload switch. Typically the electrical contact is a positive working (= forced open) NC-contact together with a second NO-contact.

Tip: Use plugs to connect the hoists to the control box to facilitate hoist removal for maintenance.

Electrical diagram

Each Titan PI hoist will be delivered with electrical accessories that need to be integrated in the control box:

- **Brake capacitors:** ensures to have a controlled descent while using the manual brake release lever.

Important Notes!:

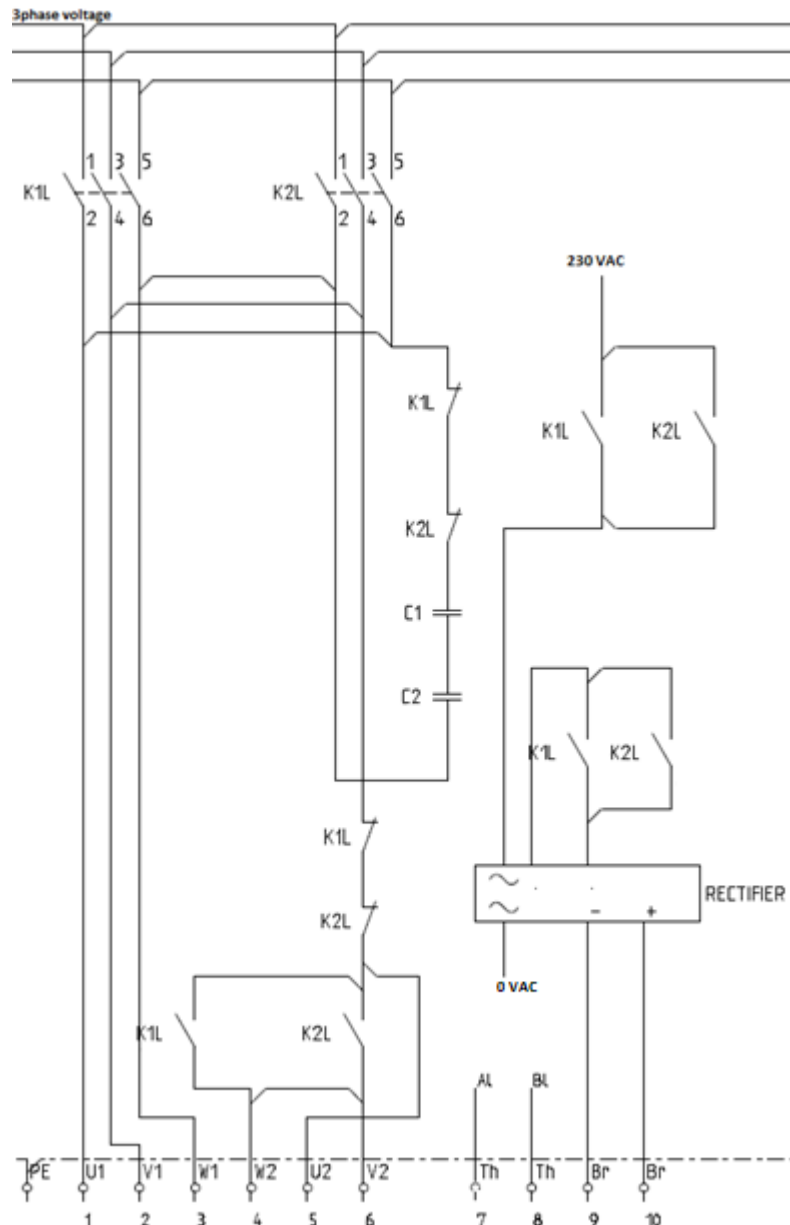
- Make sure the capacitors are installed and wired correctly. If not, the controlled-descent feature is not embedded and will lead to malfunction of the system (going into overspeed-situations, create early-wear on brake discs, overheat the drive train, etc.).
- Verify that the controlled descent speed is equal to the nominal down speed (+/- 10%).
- When 3 capacitors are provided per hoist, contact Power Climber for correct wiring.

OPERATING MANUAL - TITAN PI

- **Rectifier:** provides the correct power supply for the electro-magnetic brakes and ensures the correct functioning of the brake (=powered by DC voltage).

Important Note!: Use provided rectifier and make sure it's wired correctly. Incorrect supply voltage may cause improper opening of the brake or may burn the brake coil.

Wiring example for one hoist:



With:

- K1L and K2L: contacts from UP and DOWN directional power contactors respectively.
- C1 and C2: Two capacitors provided with the hoist.

OPERATING MANUAL - TITAN PI

B. Single phase versions

Hoist connections

- Motor connections

The single phase motors are pre-wired to a plug which is built-in into the motor's housing.

Provide a 10 pole counter-plug with a female insert and a hood for single locking lever of size 57.27.

Example of compatible ILME plug:

- Insert: ILME JNEF 10
- Hood: ILME MHO 10 L20

Equivalent plugs of other brands (Wieland, Harting, etc...) are compatible to as well.

- Overload switch

Each Titan PI hoist will have a separate wire coming from the overload switch. Typically the electrical contact is a positive working (= forced open) NC-contact together with a second NO-contact.

Tip: Use plugs to connect the overload switch to the control box to facilitate hoist removal for maintenance.



Electrical diagram

Each Titan PI hoist will be delivered with electrical accessories that need to be integrated in the control box:

- **Start capacitor (C1)**
- **Brake capacitors (C2 & C3):** ensures to have a controlled descent while using the manual brake release lever.

Important Notes!:

- *Make sure the capacitors are installed and wired correctly. If not, the controlled-descent feature is not embedded and will lead to malfunction of the system (going into overspeed-situations, create early-wear on brake discs, overheat the drive train, etc.).*
- *Verify that the controlled descent speed is equal to the nominal down speed (+/- 10%).*
- **Rectifier:** provides the correct power supply for the electro-magnetic brakes and ensures the correct functioning of the brake (=powered by DC voltage).

Important Note!: Use provided rectifier and make sure it's wired correctly.
Incorrect supply voltage may cause improper opening of the brake or may burn the brake coil.

Reference: 38761-E

Issue date: 2023AUG09

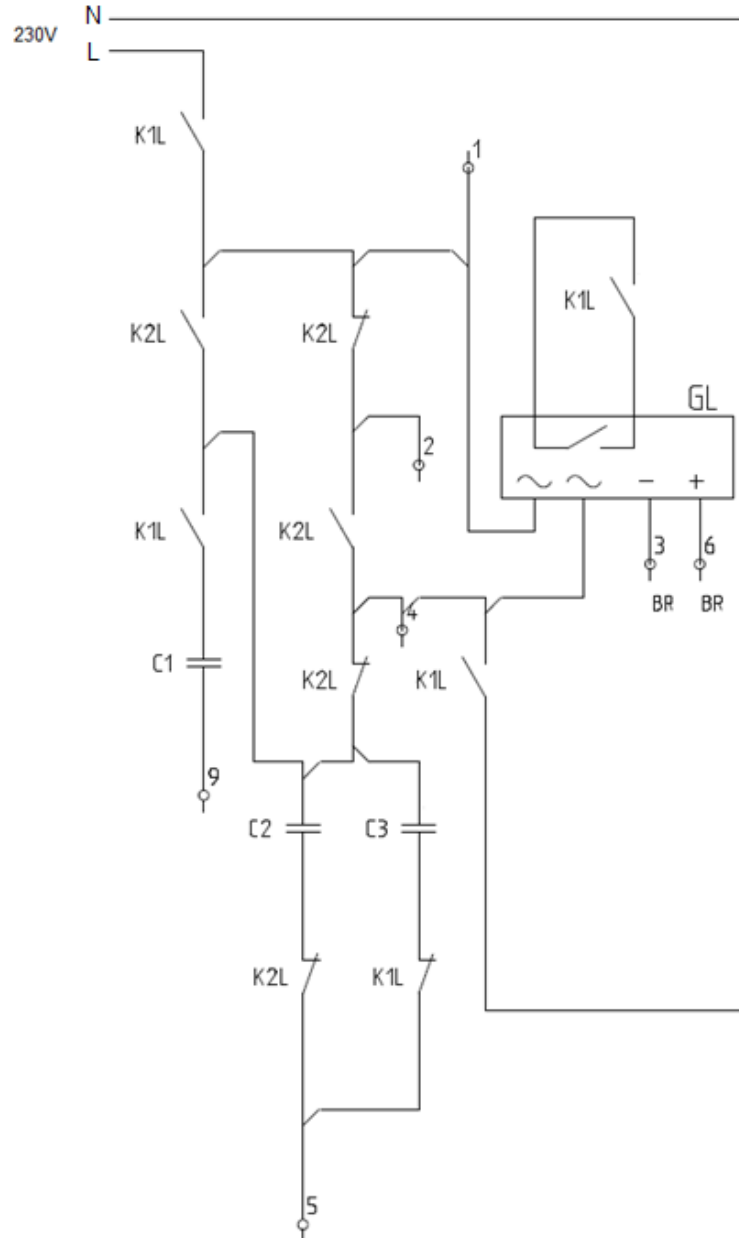
Revision: C

Page: 18 of 20



OPERATING MANUAL - TITAN PI

Wiring example below for a single hoist. The pin numbering refers to the pins of the motor's 10 pole plug.



With:

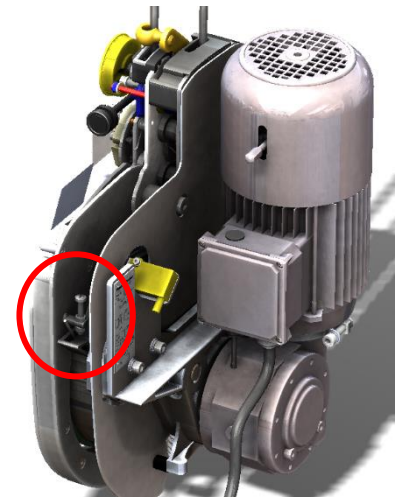
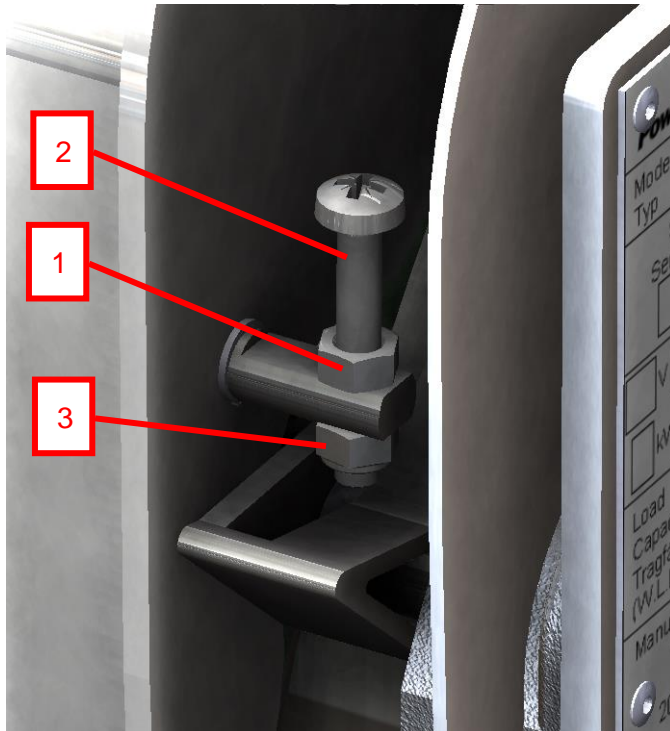
- K1L and K2L: contacts from the contactors that control the direction of rotation.
 - Operate K1L contactor **only** to move upwards.
 - Operate **both** K1L and K2L contactors **simultaneously** to move downwards.
- C1: Start capacitor
- C2 and C3: Brake capacitors
- Pin 7-8 (not shown on example diagram): Thermal protection of motor, to be integrated into the system's safety line. Stop operation of hoist when this NC switch opens.

Appendix 3: Titan Overload Adjustment

- 1) Remove black Front Cover (with Allen key n°4)
- 2) Loosen lock nut (1)
- 3) Turn Phillips screw (2) clockwise (downwards) to decrease the overload setting.
Turn Phillips screw (2) anti-clockwise (upwards) to increase the overload setting.

Set the overload at 25% above the Safe Working Load or Rated Load of the platform.

- 4) Secure the Phillips screw again by tightening the lock nut. Re-check the overload tripping point after tightening.
- 5) Fit back the black Front cover.



Remarks:

- Never remove or unscrew bottom locknut (3).
- Overload setting should be done in hanging position of the cage.