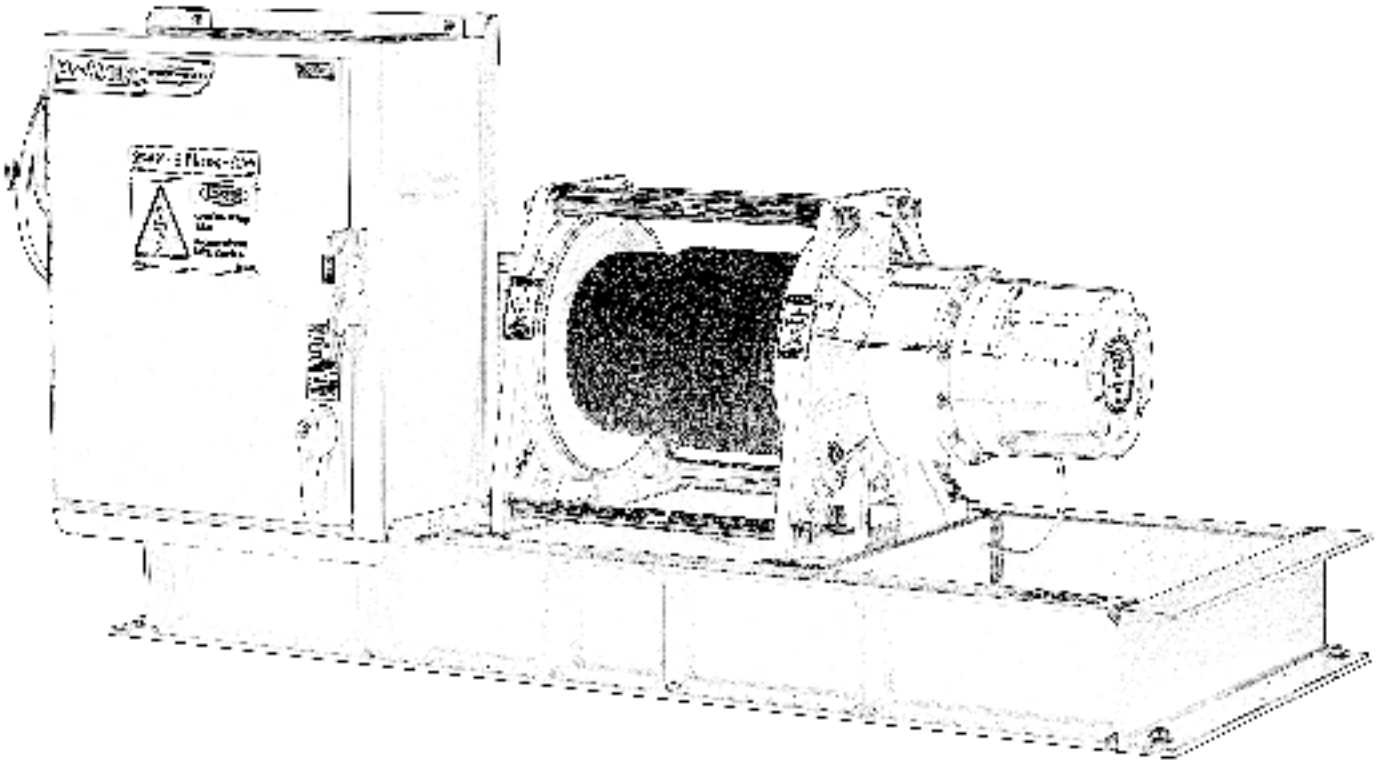
ProWINCH®

Reg. U.S. TM. Off.

PWK4300i-240-VS-UL

User's Manual / Manual de usuario
Safety Warnings / Advertencias de seguridad



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Disclaimer

PROWINCH® DISCLAIMER

Prowinch® LLC declares that it has made available to the Customer each and every one of the security warnings related to the purchased product and that, as a result, it does not assume any responsibility for any damages or losses that may be suffered by the client or third parties. cause or as a direct or indirect consequence of the breach or omission of any of the instructions or safety warnings contained in the User Manual and Security Warnings corresponding to the unit purchased.
In this sense, Prowinch® LLC will not be liable for accidents and / or damages to persons and / or property resulting from the negligent use of the product.
In no case does Prowinch® LLC assume any liability arising from the use of these voluntary recommendations, and does not offer any guarantee in relation to them. These recommendations do not take precedence over the current safety regulations of the plant.
For purposes of enforcing the Warranty of the product purchased, Prowinch® LLC, will only be liable for any damage when it is possible to prove that the user has followed each and every one of the warnings contained in the User Manual and Safety Warnings.

1. It is the sole responsibility of the Client / User to verify that the acquired equipment, products and accessories comply with the characteristics, capacities, requirements, components, accessories and other conditions for the use that the Client / user intends to give it.
2. It is also the sole responsibility of the Client / User to ensure that the equipment and products purchased are operated and maintained with adequate safety standards and by personnel duly trained in the use thereof. The Client / User is also responsible for implementing all the security measures necessary to prevent accidents or damages to people or property and for following the indications and warnings of the corresponding manual.
3. Any assistance provided by Prowinch® LLC in the selection of the equipment, the capacities and characteristics required by the clients is delivered free of charge and based on the information about the application, use and requirements indicated by the Client itself. It does not correspond to Prowinch® LLC to verify the accuracy of the given information. It is the sole and exclusive responsibility of the Client -or who will use the equipment and products acquired- to ensure that the specifications comply with the capabilities, characteristics, up-to-date maintenance and everything necessary for a correct and safe operation in relation to the intended use.
4. Prowinch® LLC recommends the use of winches with 4 brakes for personnel lifting. The use of winches of 3 brakes or less or safety features lower than the best available for personnel lifting, is the sole responsibility of the customer.
5. In order to guarantee the safety of the personnel and users of the equipment it is necessary to carry out the inspections and maintenance of the equipment according to the recommended frequency in relation to its work cycle. It is mandatory to keep record and evidence the written and photographic reports of: Maintenance, Start-up, Load Tests, Training, Certifications, Inspections and Reports of failures and accidents.
6. The aforementioned reports must be sent by email to registros@prowinch.com within the first 7 calendar days after the occurrence of an event.
7. Compliance with the timely implementation of the mandatory activities described in points 6 and 7 in addition to all the activities mentioned in the corresponding rules applied are the sole responsibility of the user. Failure to comply with the foregoing conditions releases Prowinch® LLC from any type of Liability and Warranty to the team, customer, staff or user, or any other liability that could be attributed to Prowinch® LLC.

The information contained in this manual may contain technical errors or inaccuracies. Prowinch® LLC is not responsible for typing errors, omission or incorrect information.
This manual is subject to change without prior notice. Download the latest version available at www.prowinch.com.
Always check www.prowinch.com for the latest information regarding this product.

WARNING

Hoists, Cranes and other Lifting and material-movement related equipment USERS, must be knowledgeable about the safe and proper use of this equipment and be aware of their responsibilities as outlined in all applicable standards and regulations.

The ASME/ANSI B30 Standard contains provisions that apply to the construction, installation, operation, inspection, testing, maintenance, and use of cranes and other lifting and material-movement related equipment.

As OSHA's, ASME and ANSI standards state, the installation, setup and operation of these units and equipment shall be performed by a qualified person.

OSHA requires rated load tests for new and altered cranes, OSHA's standard at 29 CFR 1910.179(k) states:

Operational tests.
Prior to initial use all new and altered cranes shall be tested to insure compliance with this section including the following functions:
Hoisting and lowering.
Trolley travel.
Bridge travel.
Limit switches, locking and safety devices.
The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located so that it will trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.
Rated load test. Test loads shall not be more than 125 percent of the rated load unless otherwise recommended by the manufacturer.
Once a rated load test is performed, paragraph 1910.179(k)(2) requires that "[t]he test reports shall be placed on file where readily available to appointed personnel."

In order to ensure Safety and installation requirements Prowinch requires Load Tests to be performed prior to initial use for all Hoists, Winches and Cranes, as well as other related components. Not fulfilling this requirement is dangerous, could lead to equipment failure and will automatically void the warranty.

The B30 Standard is intended to:

(a) Prevent or minimize injury to workers, and otherwise provide for the protection of life, limb, and property by prescribing safety requirements.

(b) Provide direction to manufacturers, owners, employers, users, and others concerned with, or responsible for, its application.

WARNING

(c) Guide governments and other regulatory bodies in the development, promulgation, and enforcement of appropriate safety directives.
The equipment covered by the B30 Standard is subject to hazards that cannot be abated by mechanical means, but only by the exercise of intelligence, care, and common sense. It is therefore essential to have personnel involved in the use and operation of equipment who are competent, careful, physically and mentally qualified, and trained in the proper operation of the equipment and the handling of loads. Serious hazards include, but are not limited to, improper or inadequate maintenance, overloading, dropping or slipping of the load, obstructing the free passage of the load, and using equipment for a purpose for which it was not intended or designed.

Failure to Read, Understand and Follow the information in the corresponding ASME B30 Standard for your Hoist and Lifting equipment may result in severe INJURY or DEATH. It is YOUR RESPONSIBILITY to consider all risk factors and follow all the equipment related ASME B30 standard, which comprises the following volumes:

B30.1 Jacks, Industrial Rollers, Air Casters, and Hydraulic Gantries.
B30.2 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist).
B30.3 Tower Cranes.
B30.4 Portal and Pedestal Cranes.
B30.5 Mobile and Locomotive Cranes.
B30.6 Derricks.
B30.7 Winches.
B30.8 Floating Cranes and Floating Derricks.
B30.9 Slings.
B30.10 Hooks.
B30.11 Monorails and Underhung Cranes.
B30.12 Handling Loads Suspended From Rotorcraft.
B30.13 Storage/Retrieval (S/R) Machines and Associated Equipment.
B30.14 Side Boom Tractors.
B30.15 Mobile Hydraulic Cranes.
B30.16 Overhead Hoists (Underhung).
B30.17 Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist).
B30.18 Stacker Cranes (Top or Under Running Bridge, Multiple Girder With Top or Under Running Trolley Hoist).
B30.19 Cableways.
B30.20 Below-the-Hook Lifting Devices.
B30.21 Lever Hoists.
B30.22 Articulating Boom Cranes.
B30.23 Personnel Lifting Systems.
B30.24 Container Cranes.
B30.25 Scrap and Material Handlers.

WARNING

B30.26 Rigging Hardware.
B30.27 Material Placement Systems.
B30.28 Balance Lifting Units.
B30.29 Self-Erecting Tower Cranes.
B30.30 Ropes.

DO NOT

WARNING

1. DO NOT Operate, install, or repair the hoist unless trained and authorized.
2. DO NOT Operate the hoist unless you have first read the operator's manual.
3. DO NOT Operate the hoist without appropriate PPE and without performing a pre-shift inspection.
4. DO NOT Operate the hoist if not complying with all required OSHA regulations.
5. DO NOT Lift more than the rated load.
6. DO NOT Lift people or lift loads over people.
7. DO NOT Wrap the hoisting rope or chain around the load.
8. DO NOT Operate with the chain/rope not properly seated in the sprockets, drum, or sheave.
9. DO NOT Operate unless the direction of the hook travel agrees with the direction shown on the control.
10. DO NOT Operate the hoist unless the hook travel limit devices function properly. (Test without a load PRE-SHIFT)
11. DO NOT Operate the hoist with twisted, kinked, damaged, dirty, or unlubricated chain or rope.
12. DO NOT Operate a damaged or malfunctioning hoist.
13. DO NOT Operate the hoist when the hook is not centered under the hoist
14. DO NOT Remove or obscure this tag or other WARNING & SAFETY LABELS.

DAILY CHECKLIST

WARNING

TAGGED HOIST: Ensure the crane or hoist is not tagged out of order.

CONTROL DEVICES: Test Run. Ensure all motions agree with control device marking.

BRAKES: Check all motions for excessive drift and abnormal stopping distances.

HOOK: Check for damage, cracks, nicks, gouges, deformations on throat opening, wear on saddle or load-bearing point, and twist.

HOOK LATCH: Check for proper operations.

Safety Bulletin

WARNING

WIRE ROPE: Check for broken wires, broken strands, kinks, and deformation or damage to the rope structure.

CHAIN: Check for corrosion, wear, elongation, twist, nicks, or gouges. Keep Chain/ Wire Rope Clean and Lubricated.

REEVING: Check the rope for proper reeving and that rope parts are not twisted.

LIMIT SWITCHES: Ensure that all limit devices stop lifting motion before the load block or chain/rope stop strikes the hoist.

OIL LEAKAGE: Check for any signs of oil leakage on the crane/hoist and the floor.

UNUSUAL SOUNDS: Check for unusual sounds from the hoist while operating.

WARNING & SAFETY LABELS: Ensure that labels are not missing and they are legible.

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Thank you for purchasing our Prowinch® Electric Winch. This User Manual provides important information for personnel involved with the installation, operation, and maintenance of this product. Read this User Manual before installing, operating, or maintaining the product.

1. SAFETY PRECAUTIONS

Prowinch®'s winches are designed for delivering a safe and trustable service if they are operated according to this manual.
This manual contains important information to help you properly install, operate and maintain your winch for maximum performance, economy and safety. Please study its contents thoroughly before putting your winch into operation. By practicing correct operating procedures and by carrying out the recommended preventive maintenance suggestions, you will experience long, dependable and safe service.
After you have completely familiarized yourself with the contents of this manual, we recommend that you carefully file it for future reference.

Mandatory use of:

Hard Hat

Safety Glasses

Safety Gloves

Safety Shoes

1.1. Winch Safety Precautions

WARNING:
This symbol indicates unsafe practices or situations which may cause damage to the property and even injuries to the personnel.

DANGER:
This symbol indicates a potentially dangerous situation which if not avoided may cause severe injuries or death

DANGER

All operators and other users who are near the steel wire rope or its load must wear required safety equipment: gloves, safety helmet / hard hat, safety shoes and eye protection.

WARNING

Before installing, removing, inspecting, or performing any maintenance on the winch, the unit must be unplugged, locked out, and tagged out.
Do not use this equipment in hazardous locations.

Read and understand the contents of this User Manual thoroughly before handling the electric winch. Practicing correct and safe operating procedures and carrying out the recommended preventative maintenance will ensure a long, reliable, and safe service.

After carefully reading and understanding the User Manual, store it for future reference.

1.2. Before using the Equipment:

• Read and understand the instructions in this User Manual and all the labels associated with the winch before operating the equipment.
• Wear appropriate clothing: Do not wear jewelry or loose clothes as they can get caught by the wire rope or hook.
• Wear leather gloves.
• Wear non-slip safety shoes, hard hat, and eye protection.
• Perform a full check of winch. Check for damaged parts or unusual conditions.
• Keep a safe distance: suggested distance is at least 1.5 times the length the of winch's wire rope. A broken or loose wire rope may cause injuries or death.
• Check that the winch and wire rope are properly lubricated.
• Secure the electric winch to a suitable support.
• Visually inspect all electric winches before each use in addition to the regular inspections and maintenance.

1.3. During Operation:

ALWAYS:
• Refer to the maximum load capacity displayed on the ID plate attached to the winch, not the capacity of the hook.
• Stop operation immediately if unauthorized personnel enter the working area.
• Check the working condition of winch: If the motor gets too hot stop the winch and let it cool down for a while.
• Stop, check, and secure the load if winch stops or loses movement during operation.
• Focus on the operation. Pay attention at all times and keep proper balance.
• Unplug the winch after operation.

NEVER:
• **Never** exceed the maximum load capacity of the winch.
• **Never** operate a damaged or malfunctioning winch.
• **Never** operate the winch if it shows an abnormal behavior.
• **Never** lift, support, or transport people or loads over people.
• **Never** Walk or step on the wire rope.
• **Never** operate the electric winch with twisted, kinked, damaged or worn load wire rope.
• **Never** use the load wire rope as a sling around load.
• **Never** operate a winch if the ID plate or safety labels are missing or illegible.
• **Never** operate an electric winch if exposed to rain or water.
• **Never** use if operator is sick or not completely attentive.
• **Never** leave the winch unattended while energized or loaded.
• **Never** operate the winch with non-centered load.
• **Never** operate beyond the limits of the load wire rope or extend wire rope.
• **Never** use the load wire rope or hook as an electrical or welding ground.
• **Never** remove the labels placed on the electric winch.
• **Never** use the winch to lift load at an angle, nor pull or drag

1.4. Inspection, Maintenance and Repairs:

• Only trained and authorized personnel may perform repairs to the equipment.
• Use only original ProWinch® parts. The use of any other part immediately voids the warranty.
• Failure to use only original ProWinch® parts may create a dangerous condition for the operator.

ALWAYS:
• Check the condition of electrical connections.
• Check the wire rope and keep it lubricated.
• Prevent others from stepping under lifted load.
• Inspect and maintain the winch regularly.
• Verify the correct installation of winch before using.
• Avoid contact with explosive gases or materials.

NEVER:
• **Never** overload the winch.
• **Never** transport people or animals with the winch.
• **Never** stand under suspended load.
• **Never** use the winch if exposed to rain, snow, or lighting
• **Never** leave loads suspended for an extended period of time. This may cause component deformation and accidents.
• **Never** exceed the allowable operating temperatures stated in this User Manual (differs depending on the model).
• **Never** expose the winch to water, sand, corrosive materials or other substances which may damage the equipment.

1.5. Handling Precautions:

• Keep the winch in best conditions. Failure to adequately align, support, or attach winch to a suitable mounting base could result in a loss of efficiency or premature failure of winch, wire rope, or mounting base.
• Do not use any wire rope or cable that was not designed for the unit you are using.
• To avoid an electrical discharge, make sure that your equipment is adequately grounded, by certified personnel.
• Make sure the winch works properly without load , before applying loads.
• Do not lift weight with the edge of the hook.
• Do not perform lifting with more than one winch at once.
• Never exceed the maximum weight lifting capacity.
• Disconnect the equipment from the power supply in order to avoid any involuntary use.
• Do not use pulleys or accessories that are not approved for this winch.

1.6. Wear appropriate protective clothing:

• Do not use loose clothing or any jewellery when operating this equipment.
• You must wear protective leather gloves when handling the winch rope.
• You must wear non-slippery safety footware,safety helmet.
• Long hair must be tied back to operate this equipment.
• You must wear appropiate safety glasses to operate this equipment

1.7. Keep a safe distance:

• Always stand clear, keep hands clear, keep others away at least 1.5 times the lenght of the wich rope. Wire rope can break without warning.
• Never touch the rope or hook while they are in tension or under load. Even at rest, the winch may have the rope in tension. Never guide a rope under tension onto the drum with your hands.

1.8. Power cord misuse:

• Do not lift the winch or any equipment from the power cord.
• Never route electrical cables across sharp edges.
• Never route electrical cables near parts that get hot.
• Never route electrical cables through or near moving parts.
• Never route electrical cables over battery terminals.
• Always insulate and protect all exposed wiring and electrical terminals.

1.9. Do not overwork the equipment:

• If the motor overheads, stop any operations let the winch cold, check for any damage before restart operation.
• If the winch stops during it's operation, stop and check for any damage before restart operation.
• Do not exceed maximum rated capacity.

1.10. Check for damaged parts:

• Before using this equipment, check for any visual damage in the motor or wire rope.

1.11. Winch repair:

• In order to repair a Prowinch® winch, use only original Prowinch® parts. Using unauthorized parts will void warranty.

1.12. Winding the winch cable:

• You must wear leather gloves to handling the winch rope. To proceed properly you need to apply and maintain a small load on the rope. While the operator winds the rope someone else should lead to correct location. Start as far as possible keeping it centered.
• Do not let the winch rope falls off and always keep a safe distance from the winch.
• Repeat this process until one (1) meter of cable was been left unwind.
• Disconnect the remote or/and from the power source.
• The last five wraps of wire rope must be left on the drum to assist the wire rope clamp in holding the load.

When using IWRC wire, wear leather gloves, to eliminate or reduce the possibility of cuts caused by broken strands. Inspect the cable and equipment frequently. The cable must be replaced immediately if signs of wear, kinks, rust, broken strands or any other signs of deterioration.
Prowinch® and its distributors trained and awarded certificates of training in the use and maintenance of the entire product line.

2. SAFETY HANDLING PRECAUTIONS:

PROWINCH LLC® has no direct control over the use of this equipment and its operation. In accordance with good practice and safety is the responsibility of the owner, the operator and operational staff to follow these rules.

ASME B30.7-2011 has been used as a guide to prepare this list of what should and should not be done. All personnel must be properly trained and accredited for the use of this equipment

DANGER

Improper operation of the system can potentially create a situation dangerous, if not avoided, it could result in death or serious injury. To avoid a potentially hazardous situation, the operator:

Safety Precautions

1. Do not operate the winch until you have read and understood all these rules and the equipment manual delivered by PROWINCH LLC® , including instructions and maintenance manuals.

2. Do not operate a damaged equipment, that functions incorrectly.

3. Do not operate a equipment that has been modified without previous PROWINCH® approval.

4. Do not exceed the max. rated load.

5. Do not use this equipment with cable damage: twists, bends, rust, broken strands or worn.

6. Do not use any extensions or modifications to the equipment.

7. Do not release the load when the equipment is loaded.

8. Do not use this equipment to lift people except for those equipments that meet the standard ASME B30.7-2011 in facilities that comply with the ASME B30.23-2005 or are approved by SERNAGEOMIN.

9. Do not lift loads over people and make sure that all personnel remains distant from the supported load.

10. Do not try to extend or repair the cable.

11. Protect the loading cable from welding spatters or other harmful contaminants.

12. Do not operate the winch if there is any object or friction element or improperly deviating the cable.

13. Do not apply the load to the tip of the hook or to the hook latch.

14. Do not use equipment with an accessory, pulley, sling, shackle or any additional element that is not in proper condition and meets the specifications required for loading the maneuver.

15. Do not operate beyond the limits of travel.

16. Do not leave any load being lifted by the equipment without specific precautions are taken.

17. Do not use the load cable as a ground for welding.

18. Do not allow the cable or hook to be touched by a welding electrode.

19. Do not loose or hide this Safety Handling Precautions.

20. Do not operate an equipment that has not been installed and anchored meeting the calculations and regulations.

21. Do not lift loads that are not in balance.

22. Do not lift loads that are not balanced and that the holding action is not secure, always keeping the corrisponding slack.

23. Report any malfunction or irregular operation of the equipment.

24. Do not operate any equipment on which the safety placards or decals are missing or illegible.

25. Do not operate the equipment without safety wear: safety footwear, protective gloves, safety helmet, safety glasses and any additional required element.

26. Unplug the power cord if the equipment will not be used.

27. Electrical connection must have a circuit breaker that allows de-energize the equipment. This should be within reach of the operator.

28. Do not operate the equipment without engine and moving parts protection.

Safety Precautions

WARNING

Before installing, removing, inspecting, or performing any maintenance on the winch, the unit must be unplugged, locked out, and tagged out.
Do not use this equipment in hazardous locations.

1. You must install the equipment leveled on a firm foundation and sure to be in a secure position.
2. You must check brake operation, stressing the equipment before every lifting operation.
3. You must use hook latches. Latches are to retain slings , wire ropes, etc. in loading operations.
4. You must ensure that the hook latches are closed and not supporting any loads.
5. Load should be free to move without obstruction.
6. You must avoid swinging the load or hook.
7. Inspect equipment regularly , replace damaged or worn parts, and keep appropriate records of maintenance.
8. Only use PROWINCH® recommended parts to repair this equipment
9. You must use only cables which are in good condition and according to the recommendations manufacturer.
10. Do not reach to the equipment cable's limit, always leave five (5) turns of cable inside the drum.
11. Do not distract your attention from the operation of the equipment.
12. Do not allow the equiment to be subjected to sharp contact with other equipment, structures, or objects through misuse.
13. Do not adjust or repair the winch unless you are qualified to perform such adjustments or repairs.

DANGER

Be sure to disconnect the power supply once the operation is completed. Never leave powered equipment without operator supervision.

DANGER

The use of these units is exclusively stationary, any external force can exceed the rated capacity and damage the equipment.

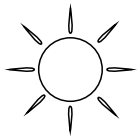
3. GENERAL ENVIRONMENTAL PRECAUTIONS

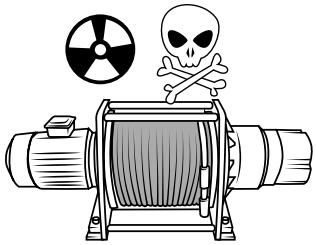
DANGER

The following environmental conditions can cause malfunction of the winch.

The following environmental conditions may cause mal functions in the equipment.

When operated outdoor, a shelter should be used for extreme weather conditions: below -10º C or above 40º C

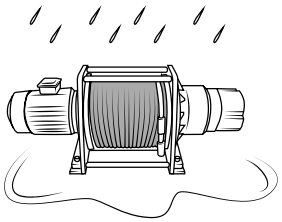


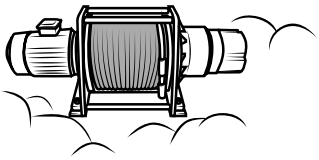


Avoid exposure to rain or extreme humidity. It may cause rusting of the equipment.

If used near chemicals, corrosive gas or explosives may cause an explosion.

Exposure to salt or acids may cause malfunctioning.





Exposure to sand may cause malfunctioning.

Warnings:

4. STRUCTURAL SPECIFICATIONS

This equipment works with single-phase and three-phase motor and NGW planetary transmission, using a hook and steel cable. The brake disk is unlocked electromagnetically .

Control switch: dead man's switch.

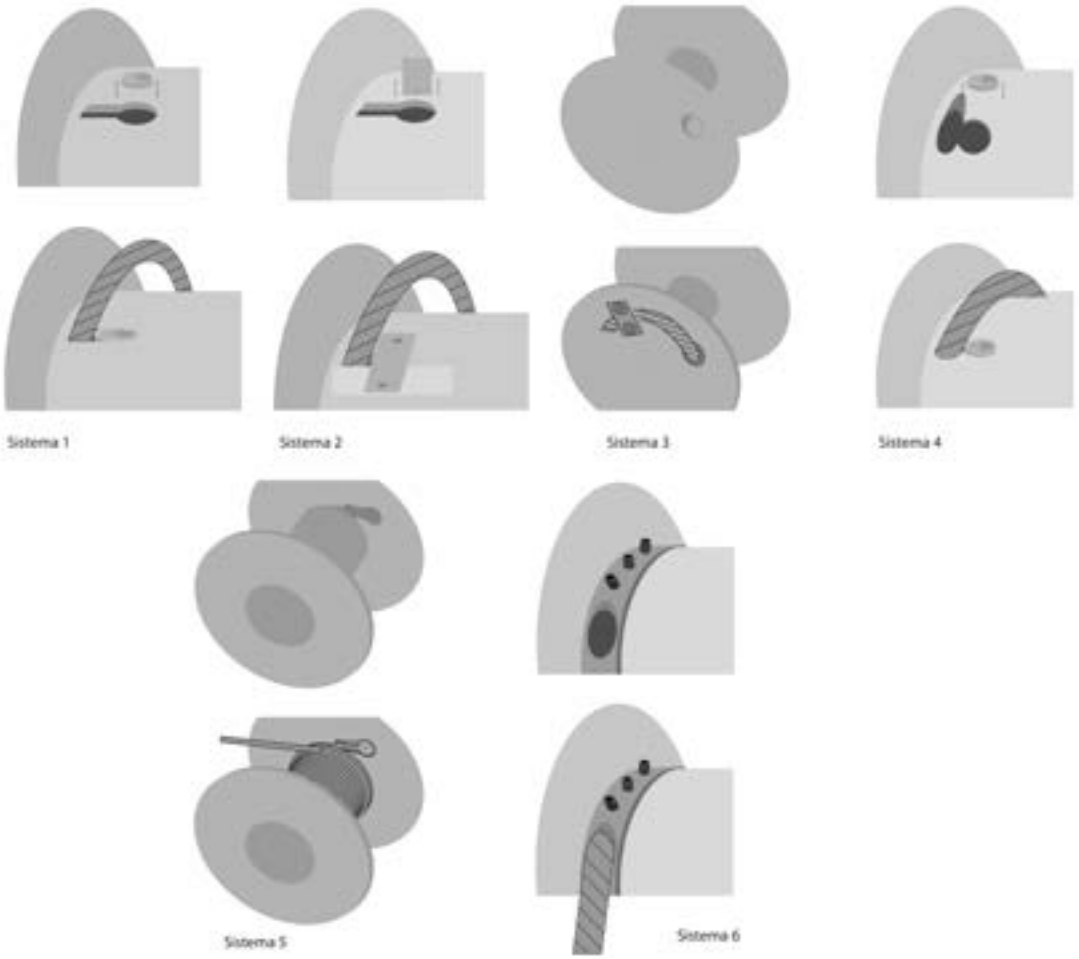
Motor: Single-phase and three-phase motor, isolated, with high power and low inertia.

Transmission: NGW planetary gear reduction, advanced steels, providing a long life service.

Electromagnetic brake: If you lose electrical power, it is mechanically braked automatically, safe and reliable.

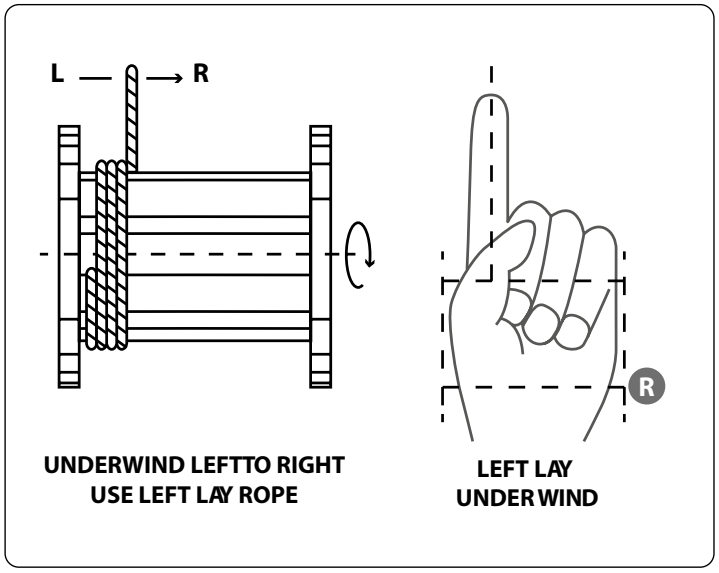
Steel Cable and Drum: The steel cable is installed on the drum. Fixed with safety pin ensures that the steel cable is released. You can easily change the steel cable or adjust its direction.

4.1. Steel Cable anchoring system to the drum



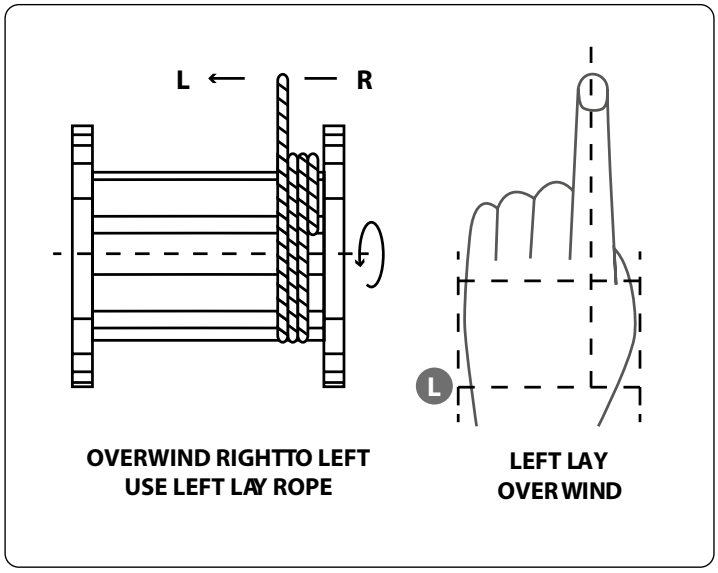
4.2. Proper procedure to correctly apply the rope

By holding the right hand or left hand with the index finger extended, palm up or palm down, the proper procedure for applying left and right lay rope can easily be determined.



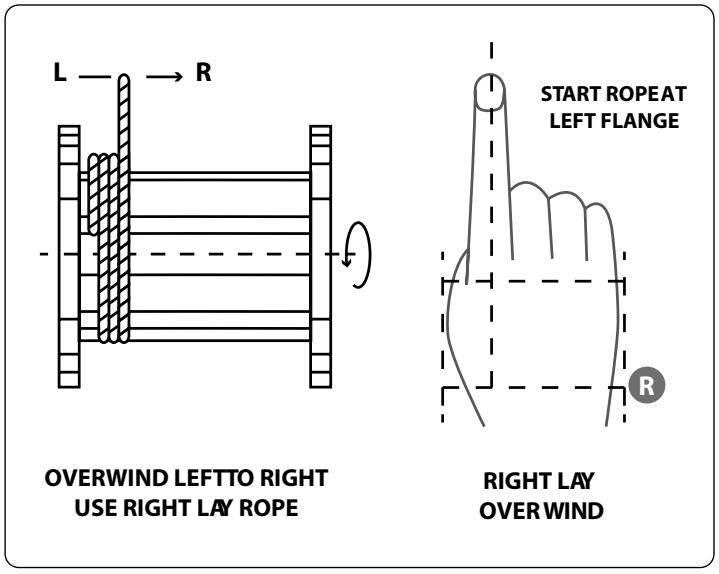
UNDERWIND LEFTTO RIGHT
USE LEFT LAY ROPE

LEFT LAY
UNDER WIND



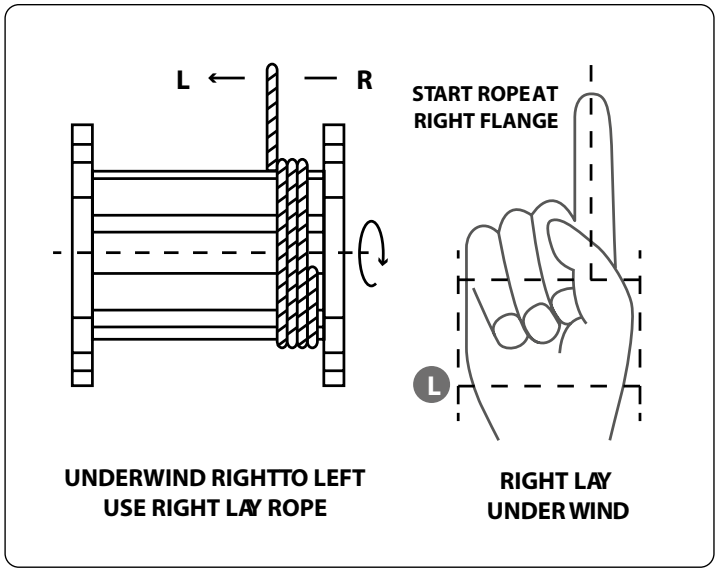
OVERWIND RIGHTTO LEFT
USE LEFT LAY ROPE

LEFT LAY
OVER WIND



OVERWIND LEFTTO RIGHT
USE RIGHT LAY ROPE

RIGHT LAY
OVER WIND



UNDERWIND RIGHTTO LEFT
USE RIGHT LAY ROPE

RIGHT LAY
UNDER WIND

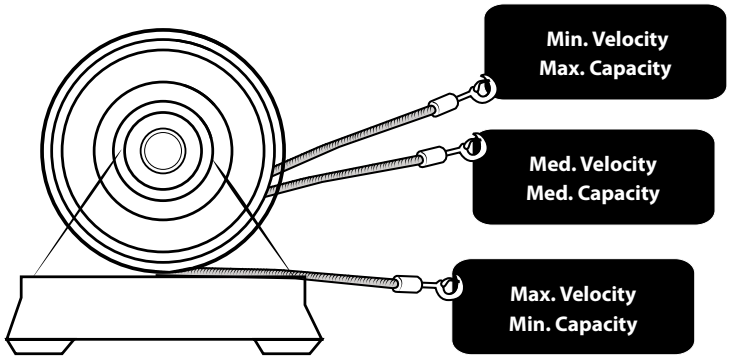
5. INSTALLATION AND TESTING PROCEDURE

5.1. Installation

• The supporting structure the winch is mounted to, must be designed by an engineer, to withstand the loads and forces by the winch for the rated load.
• Install in location that allows the operator to move and stay clear of the load.
• Locate pendant controls at a convenient level above the operating floor.
• Do not install where the load hook can be lowered beyond rated hook travel under normal operating conditions.
• Check that power supply meets the requirements of the equipment to be installed. If the power supply does not meet the requirements stipulated in the nameplate of the equipment can cause damage to electrical parts and winch motor. The voltage should be +/-5% fo the specified value.
• If the circuit of the electrical connection is correct, the operating direction of the winch should be as the control switch. Otherwise check that the phases are not reversed.

5.2. Testing

• Check operating mechanisms for proper operation, proper adjustment, and unusual sounds such as, but not limited to, binding noise of the wire rope and bearing squeal.
• Check winch upper limit device without a load on the hook at the beginning of each shift.
• **Unload testing:** Operate several times, there can't be vibration and/or unusual sound.
• **Loaded testing:** Pull rated load several times, checking drum's rotation, electric conections; there can't be vibration and / or unusual sound.
• **Breaking system:** Breaking system must automatically stop and hold up to the rated load if the operating controls are released and in the event of complete power failure.
Breaking systems must limit the speed of load during lowering, with or without power, to prevent uncontrolled or fast lowering.
• **Hook inspections:** Check hooks for distortion (bending, twisting or increased throat opening;
wear, cracks; damaged or malfunctioning latch)
• **Winch Rope Inspection:** Visual inspection daily for excessive wear and/or distortion.



5.3. Load calculation

• Pulley Coeficient

Pulley number	1	2	3	4
Bearing Pulley	0.98	1.96	2.94	3.92
Bushing Pulley	0.92	1.92	2.88	3.84

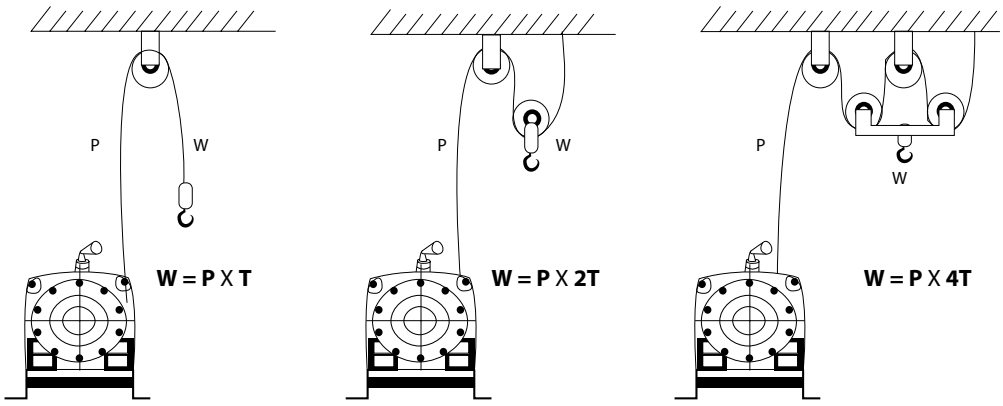
P - Rope tension
T - Pulley coefficient
W -Load

a. Truck capacity to pull the load

Rolling resistance can be caused by the degree of the angle, the type of track and the state of the car.

- Necessary conditions to use

1. Pull evenly using only a steel cable.
2. Depending on the inclination, the maximum capacity to drag is up to 10 times the lifting capacity indicated on the equipment, which includes the weight of the car.
3. The steel trolley must have wheels with precise wheel control.
4. The track of the car can not have an error greater than 2 degrees of lateral deviation.

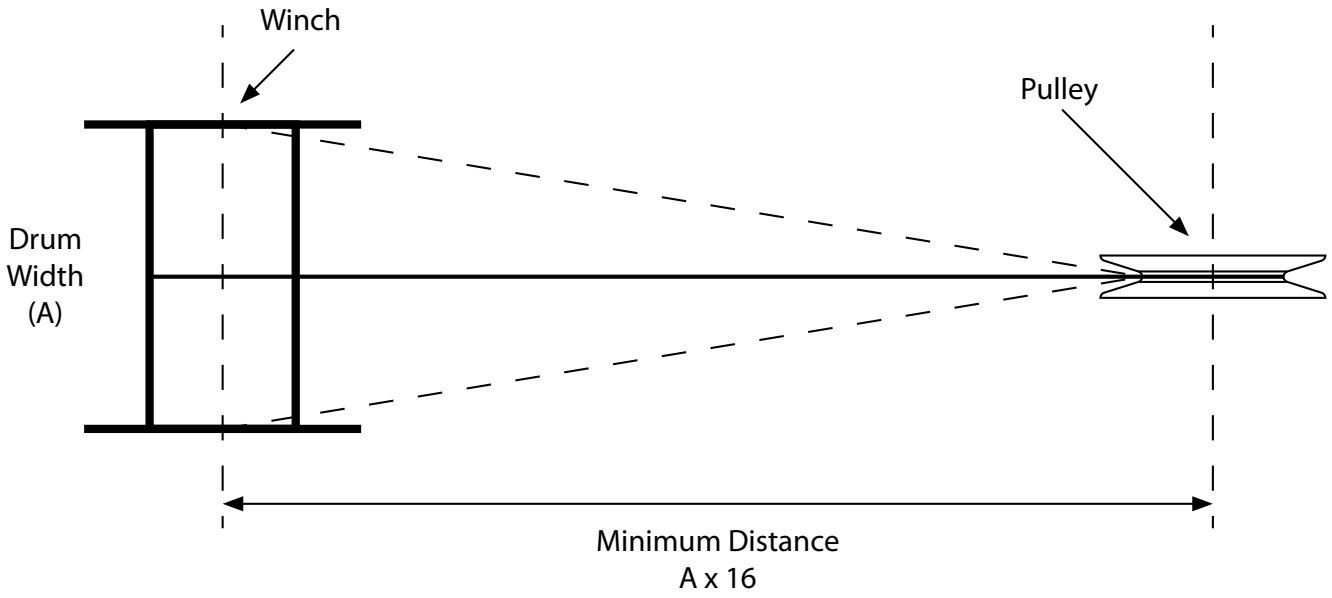


b. Calculation of work angle

To obtain a uniform winding of the steel cable, the working angle must not exceed 1.5 degrees.

In the case of units with a fixed deflecting pulley, it is necessary to multiply the drum width by 16. The result is the minimum distance for the location of the deflecting pulley (in the case it is fixed).

Example: A drum 11 centimeters wide (11cm x 16 = 176 cm) can work at a minimum distance of 1.76 meters.
In the image we see the Drum (A) and the pulley, sprocket or roller.



WARNING

All electrical installation must consider the peak or maximum consumption at Start.
Note: Verify curve of the Circuit Breaker.

6. TRAINING AND CERTIFICATION

In order to contribute to the protection and safety of all users, workers , employees, employers, owners and all those involved
in the operation and use of winches, Prowinch® provides training for use and maintenance of winches applied to different types of work .
On the understanding that safety has not only to do with a particular equipment, but also with the whole wire rope of processes involved in the installation, operation, maintenance and use of such equipment.
For this purpose we have developed manuals applied to the installation, usage and maintenance of winches and lifting of personnel platforms , which contain important references and indications that are necessary to know, consider or check for safe and proper use of winches, that together with its parts and
accessories can meet safely the expected life cycle and work.
This manuals have been developed considering our experience
and based on the main indications emanating from ASME B30.7 and ASME B30.23 Personnel Lifting Systems.
Prowinch® has acquired the rights and received the necessary authorizations and licenses by the American Society of Mechanical Engineers ASME to translate and reproduce these standards, with the written consent of the ASME, in order to apply them in our instruction manuals in a number of controlled and copyright corresponding copies.
We invited you to come and meet us and we will give our advice.

WARNING

The owner assumes responsability to install the unit by qualified professional. All structural calculations must be done by a Certified Structural Engineer. An improper installation will lead to accidents that could harm or cause death to users or people near work site. An improper installation and incorrect electrical connection will terminate the warranty. Any intervention to this unit without Prowinch®'s aproval will terminate the warranty.

7. MAINTENANCE

The equipment has a planetary gear for maximum mechanical efficiency. Verify your equipment is well lubricated. Apply grease in the grease fitting every three months (only for models with that fitting).

Keep lubricated steel cable, if it is oxidized or is corroded by rain water or weather, please remove the entire cable and apply the recommended lubricant . If corrosion has affected the cable, replace it.
The electric winch must be inspected and frequently used. It should be fully inspected every six months.

WARNING

It is your responsibility to periodically check the condition of the steel cable, anchor or any parts that can be worn loose or damaged in both the unit and the object to move.

8. MAIN TECHNICAL DATA

Model	
	PWK4300i-240-VS-UL
Rated Load (lb)	9600
Speed (ft/min)	70
Cable Length (ft)	656
Rated Power (kW)	9.2
Voltage	230
Frequency (Hz)	60
Current (A)	33
Wire rope diameter (in)	9/16
N.W. (lb)	TBA
Duty Cycle	H4
Motor Brand and Model	SEW Eurodrive DRN132L4/BE11HR/FF/V
Dynamic Brake	PW-RS-4500-44x2 (4.5 kw - 22 Ohms)
Motor Brake	SEW BE11HR Electromagnetic Brake Disc
Variable Fequency Driver	Invertek ODP-2-42150-3HF42-MN

Duty Cycle

Working Conditions		Load	Time	Maintenance Interval (Months)	Expected Life [Working Hours]				
					800	1600	3200	6300	12500
Light	Light Mechanisms subjected normally to light loads and very rarely to the maximum load.			6 - 12	H1	H2	H3	**H4**	**H5**
Normal	Mechanisms subjected normally to moderate loads and frequently to the maximum load.	< 65%	< 25%	6 - 12	H2	H3	**H4**	**H5**	
Heavy	Mechanisms subjected normally to loads of heavy magnitude and frequently to the maximum load.	> 65%	> 25%	3 - 6	H3	**H4**	**H5**		
Severe	Mechanisms subjected regularly to the maximum load	Abnormal conditions Environmental, Geographical, etc <100% < Duty Cycle Limit		1 - 3	**H4**	**H5**			

9. GENERAL METHOD FOR CABLE SIZING

1. Power cable specification affects the lifetime and performance of the electric winch and motor. It is very important to read the contents on the following chart carefully before use. You can not use a power cord that is lower than those in the chart below.

Three-phase 380V/480V	1100W	2200W	3000W	4000W	5500W	7500W
Diameter (mm^2)	2.5	2.5	4	4	5.5	8

2. Power cable must not exceed 50 meters of length, if exceeded , use a larger diameter cable to ensure proper operation.

3. To construction applications, use power cable with low section cores, for great flexibility and improved safety.

4. Connect the power cable directly into the power supply , ensuring all connection with the respective fasteners.

5. Each line connection cable must be secured in place using bolts to prevent sparks, high temperatures, overheating, etc. This can decrease life service of this equipment.

6. The power cable line must be fixed from one end. If the power cable comes loose the voltage would drop, which would influence seriously on this equipment performance.

7. To ensure the safety, the green wire must be properly grounded.

10. SAFETY USE

1. To install and use this equipment should consider safety as the first principle.

2. This equipment must be operated by a qualified worker with knowledge in Industrial safety.

3. When the machine is in use, the staff can not use the framework hook , lifting platform for other work or remain under the equipment or load.

4. Do not repair or modify this equipment without authorization of Prowinch . Replacement parts and service must be performed in Prowinch.

5. This equipment must be operated with empty load before using each time, to check the following actions:

a. Whether the switch is flexible, the control switch coincides with the operation of the equipment, lifting and lowering the load, and can be stopped at any time.
b. Whether there are unusual noises while operating.
c. Whether the wire or/and wire rope has any visual damage. If there is damage, please stop the operation and change it immediately to guarantee safety.
d. Never operate winch with less than three (3) wraps of rope around the drum. Rope could come loose from the drum, as the rope attachment to the drum is not designed to hold a load.
e. Whether the fastener of every position of machine becomes flexible.

6. Please use according to this instructions and recommendations. Also follow the recomendations for voltage and rate load. Never exceed equipment or rope rated capacity.

7. Always wear heavy leather gloves when handling winch rope.

8. Never use winch as a winch or to suspend a load.

9. Do not apply the load to the tip of the hook or to the hook latch.

10. Do not keep hanging loaded objects for long periods of time.

11. Do not use the equipment to lift or move people.

12. While changing the steel wire rope, must pay attention to the head of steel wire rope.

13. Attention: the motor work system of this electric winch is S3-25% 20min (one duty cycle is 20 minutes, work for five minutes, let the equipment rest for 15 minutes).

11. INSTALLATION AND TESTING

1. Installation

Attachments and anchorages of this equipment must provide a balanced mounting and be capable of withstanding loads imposed by the equipment under operating conditions.
It is the installer or/and owner's responsibility to carry out all structural tests to ensure proper installation.
Prowinch® is not responsible of improper installations.

2. Testing

a. Whether the working voltage of testing installation site accords with the demand stipulated on the data plate of the products, lest makes the machine burn out because the power sends mistake, its voltage should be range in specified value ± 10%.

b. Whether the circuit of the electric apparatus connection reliable, the direction of the rising and dropping should according to the direction of the switch.

c. Unload testing ----Winching or lower the number of times, there can't be vibration and unusual sound.

d. The load is testing ---Go up and down rated load for several times, check machinery its rotate, electric attachmenT and connection normal and reliable.

e. When the rated load drops, applies the brake hang in the air , its gliding amount should not exceed 1 of the length of the steel wire rope involved in for less than one minute 1.5%.

11.1 Maintenance

1. This machine adopts the planet gear to speed down power of transfer , it is guarantee have good lubricate state, please put grease to lubricate in the filler hole in every three months.

2. Steel wire rope is for go up and down contained article, if get rusty or rainwater corrode, please pull out the whole steel wire rope and wipe the lubricate grease and keep maintain.

3. The electric winch should be followed and used the frequent degree. Overhaul in an all-round way through certain time, should generally go on once every year.

12. COMMON TROUBLE AND SOLUTIONS

Problem	Reason	Solution
Manually pressing any button won't make the unit work.	1. Unit has no power. 2. Broken or loose power cable. 3. The button doesn't work.	1. Power the unit. 2. Check the wiring and repair if necessary. 3. Repair or replace the switch.
Drum rotates too much after releasing the button.	1. The brake spring is deformed. 2. Brake pad worn out. 3. Grease contamination on the brake pad. 4. Overload.	1. Replace the brake spring. 2. Check and replace the brake pad. 3. Clean the brake pad if necessary. 4. Remove load.
Noise	1. Bad lubrication 2. Gear or bearing damaged. 3. Unit not anchored properly	1. Add lubrication to the gearbox. 2. Check and replace the gears and bearing. 3. Fasten loose nuts and bolts.
Electric Shock	1. Ground not properly installed. 2. Internal exposed wires touching the case.	1. Check and connect the ground if necessary. 2. Check and isolate any exposed wires.
Motor humming after pressing any button. Sparks inside the Pendant Control. Can't lift a load.	1. Power and control circuits are shorting out. 2. The Power Cable gauge is too small, causing the voltage to drop. 3. Brake is stuck. 4. Brake coil burnt.	1. Check voltage of the control circuit. 2. Check if the wire gauge is appropriate. 3. Check the tolerances in the airgap of the brake. 4. Replace the brake coil if necessary.

Daily	Quarterly	Monthly	Annual		Part	Normal Condition	Revision Method
			x	Label	Label and Information plates	All visible labels	Visual
		x		Installation	Winding and positioning of the rope	Working angle	Visual and measurement
x				Control / Switch	Operation	Appropiate functioning	Manual
	x				Circuit wiring condition	No visible damage	Visual
		x			Wear of electric contacts	No visible damage	Visual
x		x			wear of power cord	No visible damage	Visual
	x				Ground Cable	No visible damage, appropiate contact	Visual
		x			Insulation	1 QM min	Resistance test
			x	Motor	Insulation	1 QM min	500V Isolation/Resistance test
			x		Stains	Abnormality	Check Failures
	x			Brake	Bolts	Tighten	Check Failures
		x			Wear of the Disk	No visible wear	Check Failures
x	x				Performance	Not above 1.5% the wire rope length rolled in 1 min	Visual
			x	Gears	Wear	No vissible wear	Check Failures Measuerement
		x			Lubrication	Use sufficient recommended lubricant	
						(Mobilux, EP2, Shell Unedo 2, Esoo Beacon EP2)	
				Steel rope	Strand Break	Less than 10%	Visual
x					Diameter Decrease	Max. 7% of nominal diameter	Visual
x					Rust	No severe	Visual
x					Anchoring Condition	Sufficient to lift the load	Visual
x					Rolling Condition	Regular	Visual
x					Lubrication	Sufficient	Visual
x	x			Case	Structure	No damage	Visual
x	x			Drum	Broken tap	No damage	Visual
		x			Wear of the Drum	No vissible wear	Visual
x				Operation	Wind Direction	Appropiate direction	Visual
x					Abnormal Sounds	No oscilation or impact sound	Auditory
			x		Overload Test	Abnormality	Test

Maintenance

WARNING

Any modification or repair without prior Prowinch's authorization will void the warranty of the equipment.
It is your responsibility to periodically check the condition of the steel wire rope, anchor or any parts that can be worn loose or damaged in both the unit and the object to move.

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13. TROUBLESHOOTING AND POSSIBLE SOLUTIONS

Before using the winch Prowinch®, check the drum to ensure that the wire rope is coiled properly. To ensure that the winch operates smoothly, test the control button. If winch fails after several attempts, check the following points:

1. Non functioning
a. Power supply.
b. Check the Emergency Stop Switch.

2. Produces noices but is not functional
a. Check the brake coil and/or circuit.
b. Check the Switch and replace the cable.
c. Check for faults in the Power Supply.

3. Low velocity and vibration
a. Shortcut in the ignition capacitor.
b. Contact of the centrifugal switch.

4. Ignition failure
a. Check the brake coil and/or circuit.
b. Ignition capacitor.
c. Worn brake disc.

5. Brake failure or lubricant spill
a. Brake coil.
b. Brake disc.
c. Metal brake disc.
d. Brake spring.
e. Possible brake action due to voltage drop.

6. Reversed direction (Thee-phase equipments)
a. Phase reversal

7. Electric leakage
a. Check ground connection
b. Internal circuit wiring is touching the equipment's case. Check electrical wiring and replace or repair if necessary.

8. Unusual noice
a. Lubricate all moving parts, using recommended lubricators.
b. Worn gears or bearings. Check and replace if necessary.
c. Bolts or nuts loose. Check all bolts and nuts and tighten them properly.

9. When pressing the switch, engine noise is heard, but it does not turn
a. Insufficient voltage from power supply.
b. Power cable lenght is to large.
c. Burned brake coil.

10. SAFETY USE

1) Warranty is only valid with the receipt or legal invoice for a period of 3 years from it's issue date and with the Prowinch maintenance up to date (yearly)

2) This lifting equipment, even though it was designed to lift or pull weight, it's not designed lo lift people or similar objects.
People must keep away from the wire rope (or chain), hook and load.

3) It's user's responsibility to install the unit by certified personnel who are fully capable of performing that labor by the norms. Every structural calculation must be done by a calculation engineer accredited who must certify the installation. A wrong installation process will invalidate the unit's warranty.

4) Is responsibility of every person who uses the equipment, to operate according to ASME B30 norms. Is also responsible for doing and keeping record of maintenance donde to the equipment. Prowinch offers training and certifies operators.

5) In case of performing any electric connection that differs from the user's manual, the warranty will immediately expire.

6) The equipment owner is responsible for checking regularly the wire rope (or chain), hook or any other piece of the equipment that may be loose or damaged, on the equipment or the load to be manipulated.

7) The user is responsible for wearing the safety equipment indicated in the manual for the operation of this equipment. Strong globes, working helmet, safety shoes and eye glasses protection. This applies for any person surrounding the equipment.

8) The warranty will expire immediately if any type of intervention is done to the equipment.
9) Every Prowinch equipment has a warranty seal. In case it is broken, warranty will expire immediately.

10) Warranty will end if equipment in not installed in an adequate levelled surface and without the right perforations and anchorages.

11) It's user's responsibility to comply with the right electrical specifications of the equipment.

12) This warranty only covers fabrication defects.

13) Every unit that may show signs of abuse, loading more than the indicated weight, has evidence of burned circuits, has broken or damaged parts will not be covered for this warranty.

14) It's users responsibility not to overload the equipment above the weight indicated on the nameplate of the unit.

15) This warranty is given within Prowinch headquarters. Replacement parts covered by this warranty are sent to destination. Shipping and handling costs are not included and must be paid by the owner.

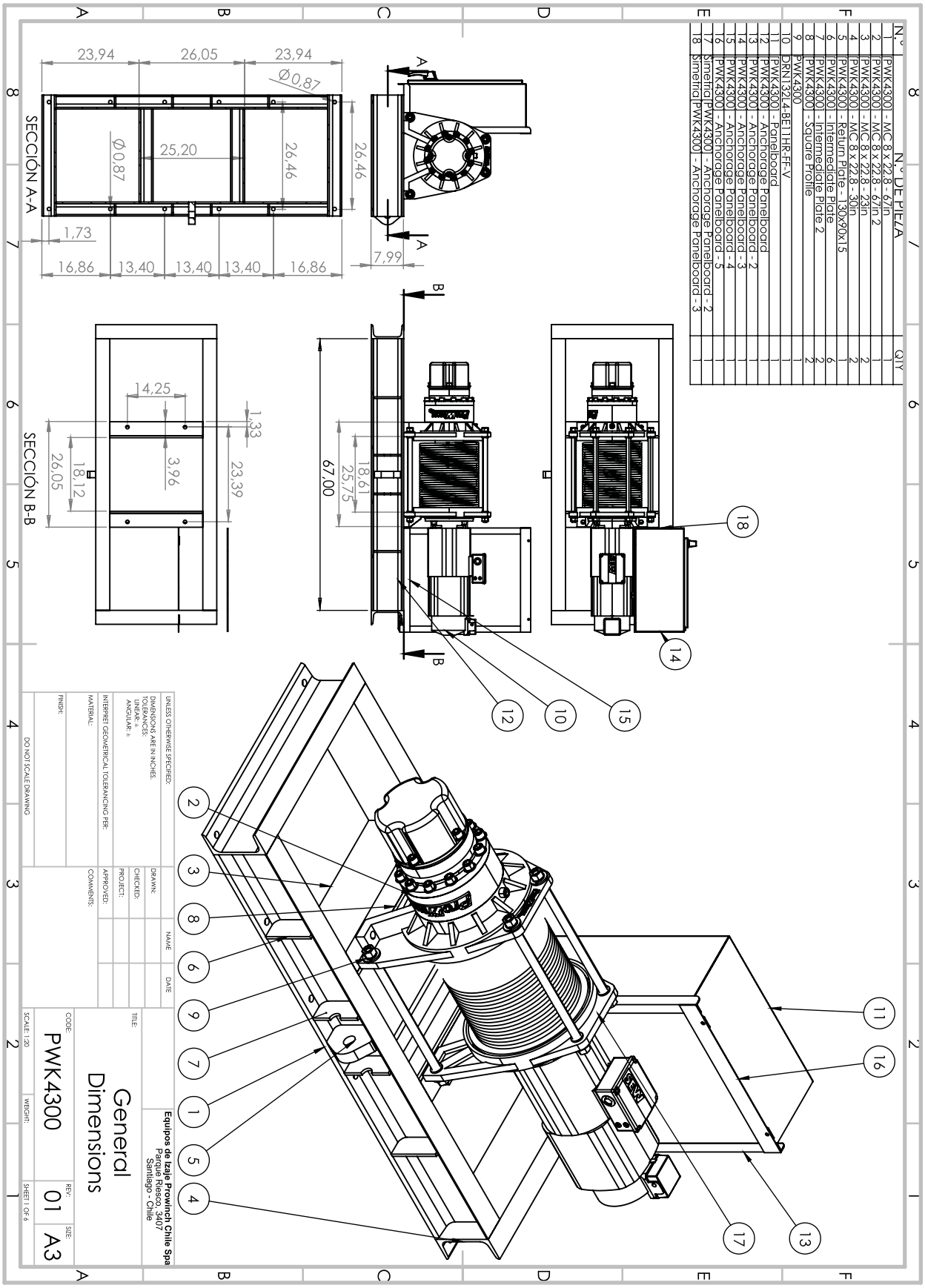
16) Warranty does not cover equipment transportation, unloading, personnel transportation or any other cost that may be related to not using the equipment.

17) In case a technical visit is solicited and scheduled at customers site, it shall be paid in advance even though the visit involves services covered by this warranty.

18) The warranty is only valid to the direct buyer, not to other people in case of resale, renting or passing the equipment to others.

Warranty exclusions:

- If the damage is produced by meteorological agents.
- If the damage is produced by external agents such as: fire, water, crushing, wrong voltage usage or inadequate energy use.
- If any damage is caused by inadequate transportation, vandalism, sand or natural disasters such as earthquakes, flood or fire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4 PWK4300 - MC 8 x 22.8 - 30in 2
5 PWK4300 - Return Plate - 130x90x15 1
6 PWK4300 - Intermediate Plate 6
7 PWK4300 - Intermediate Plate 2 2
8 PWK4300 - Square Profile 2
9 PWK4300 1
10 DRN1321.4-BE11HR-FF-V 1
11 PWK4300 - Panelboard 1
12 PWK4300 - Anchorage Panelboard 1
13 PWK4300 - Anchorage Panelboard - 2 1
14 PWK4300 - Anchorage Panelboard - 3 1
15 PWK4300 - Anchorage Panelboard - 4 1
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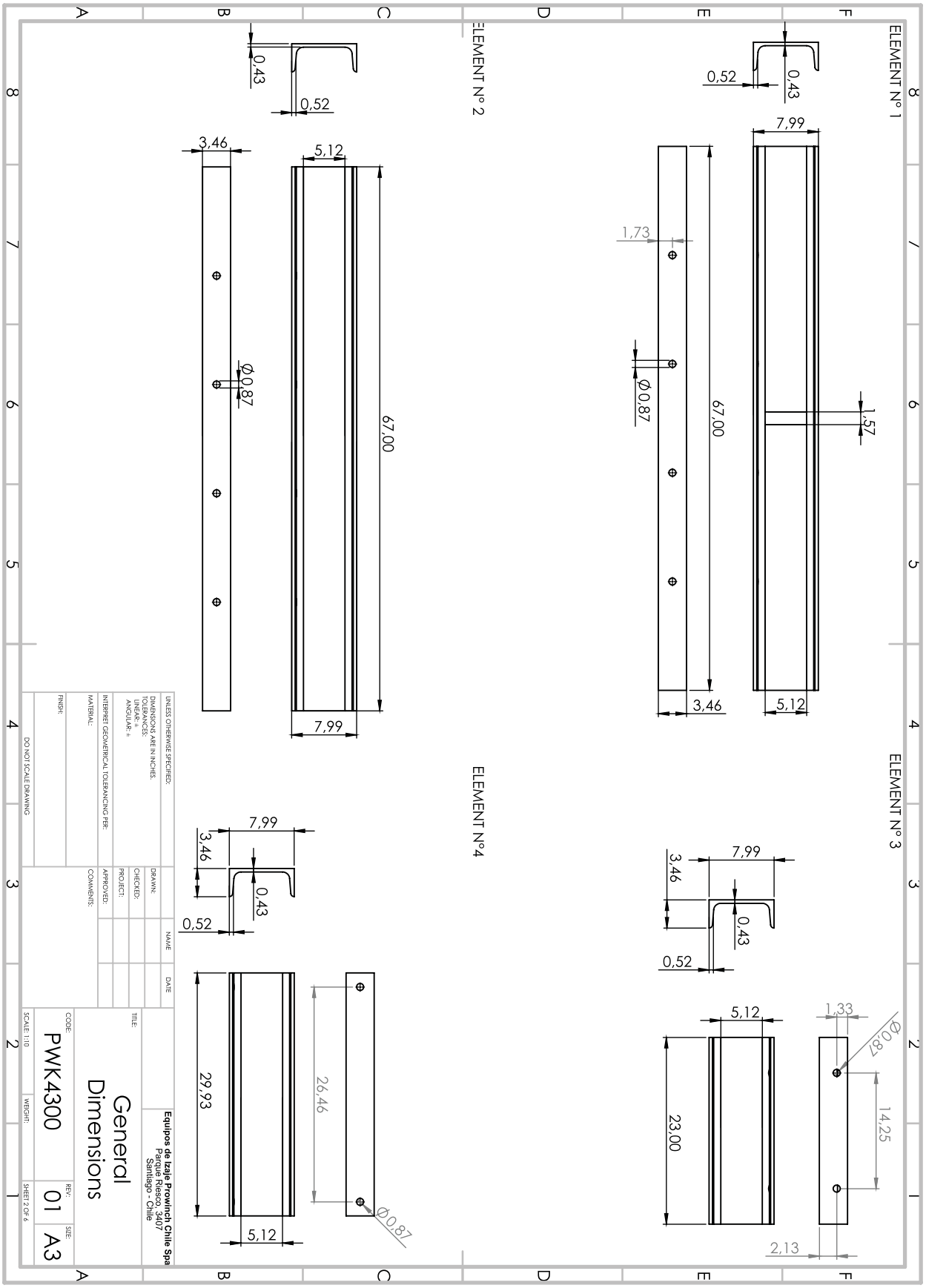
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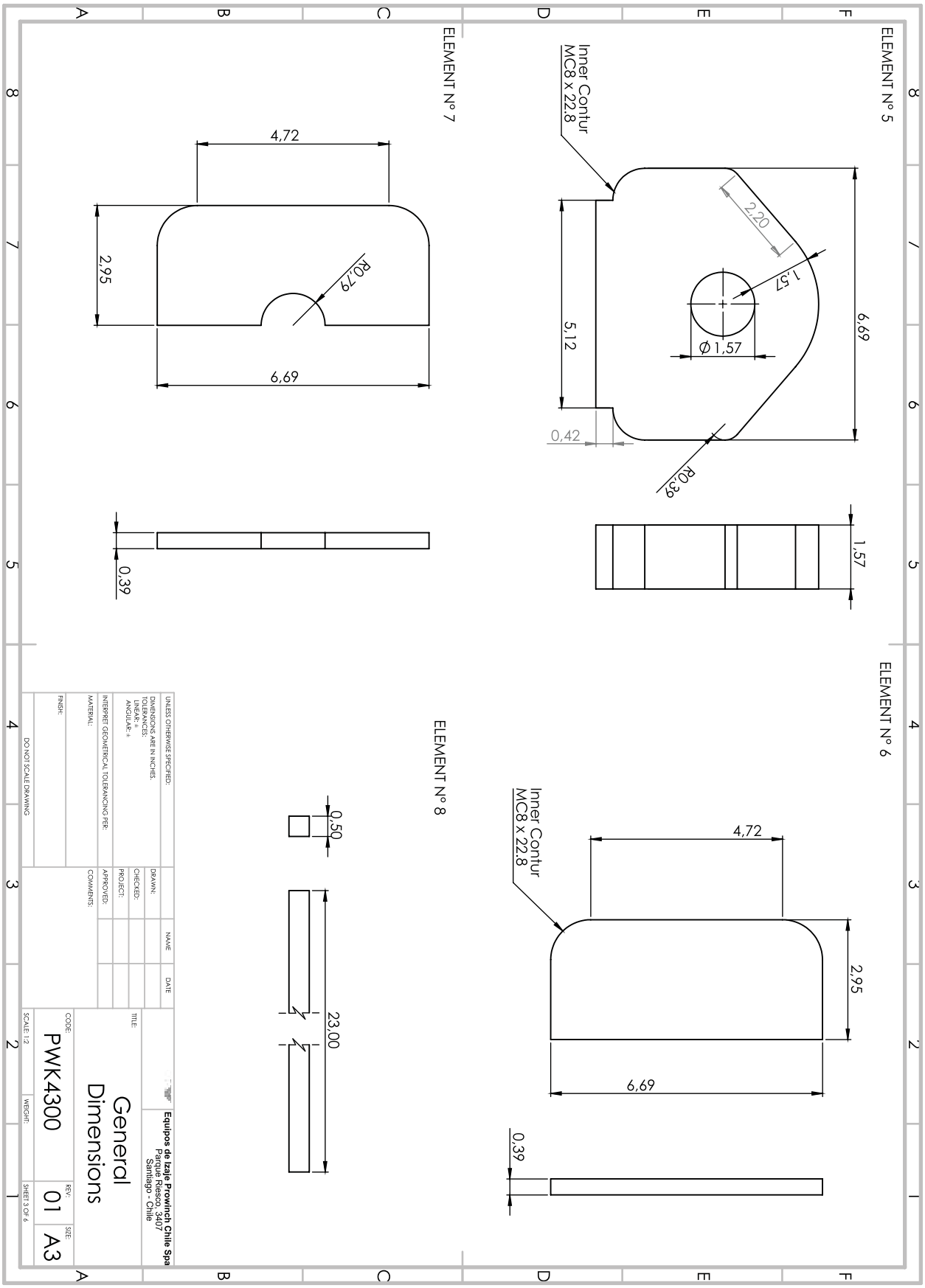
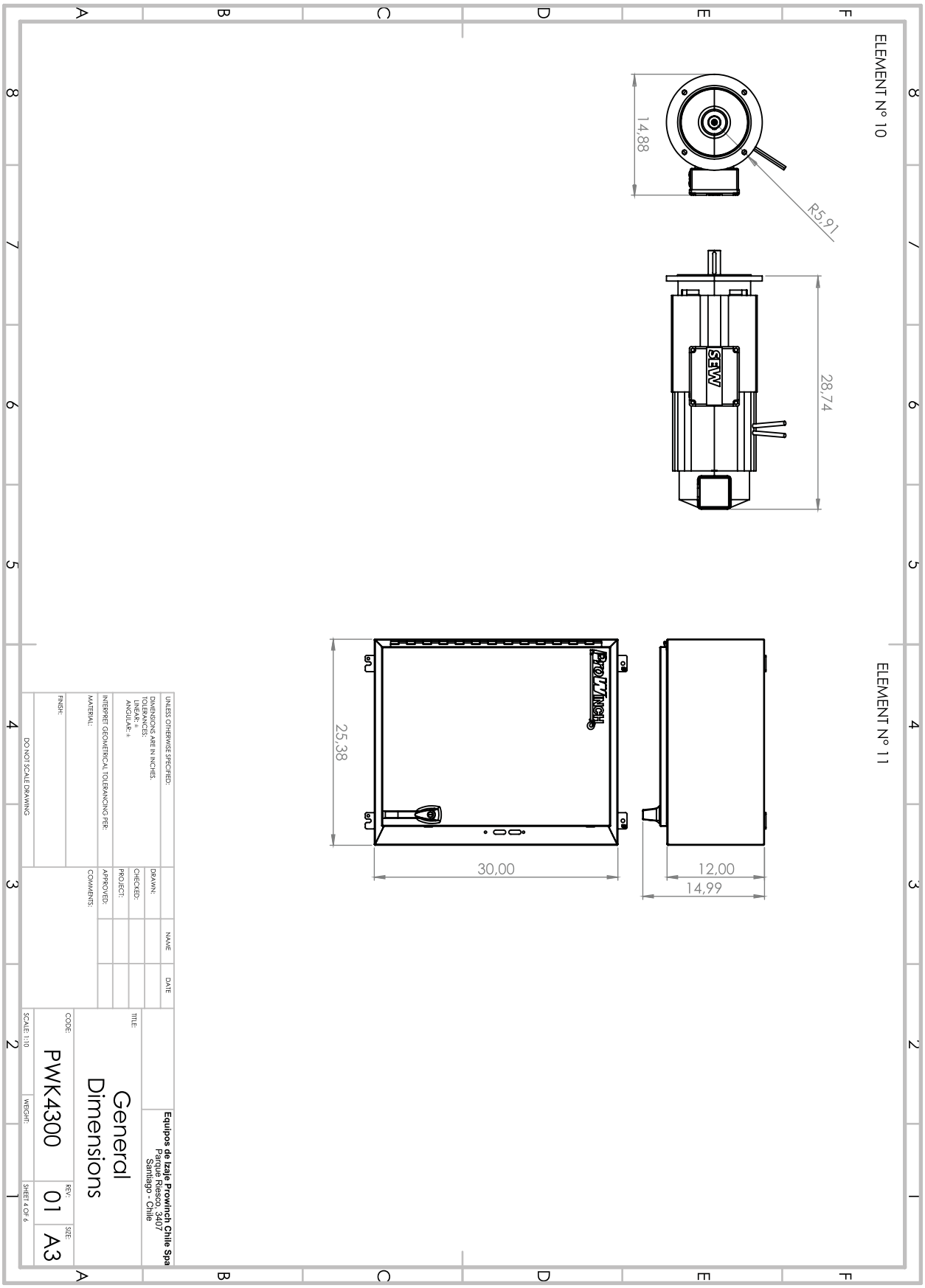
Technical Specifications

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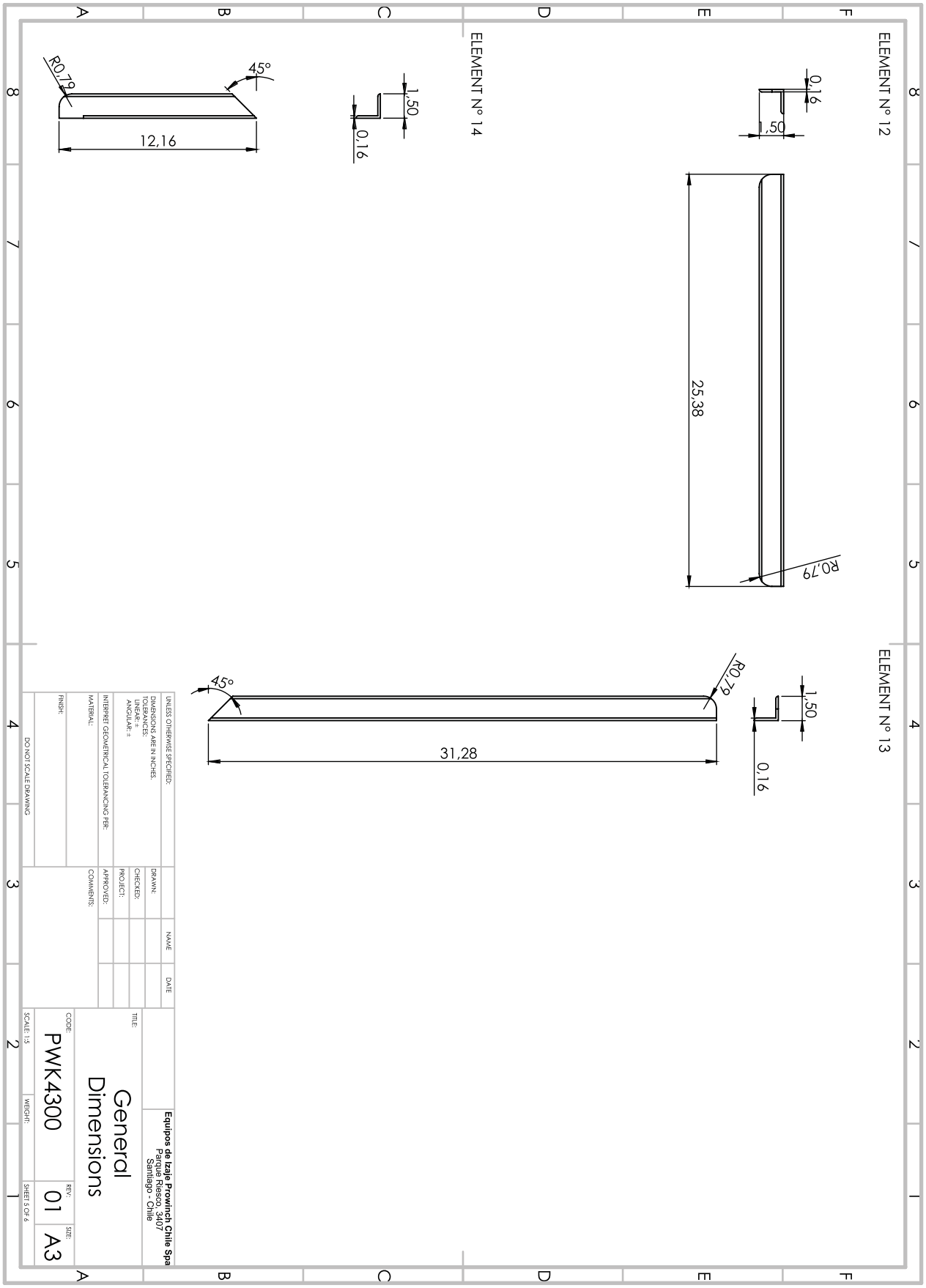
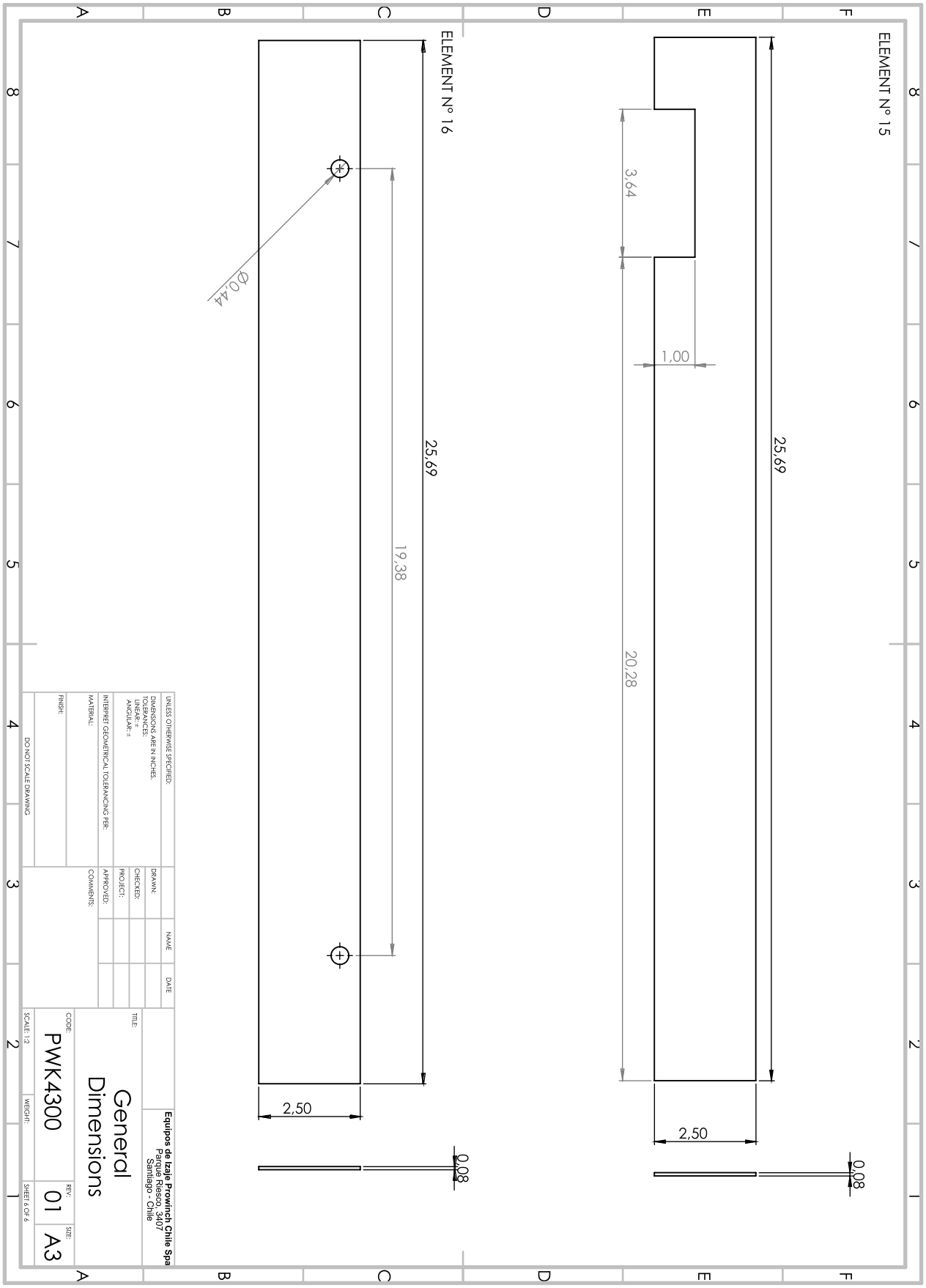
Technical Specifications

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SHEET 6 OF 6
Equipos de Izaje Prowinch Chile Spa
Parque Riesco, 3407
Santiago - Chile

3. INSTALLATION

WARNING

Before installing, removing, inspecting, or performing any maintenance on the hoist, the main switch must be de-energized, locked out, and tagged out.
Do not use this equipment in hazardous locations.

Installation Process:

- Electric chain hoists must be grounded properly.
- Lock-out and tag-out the main disconnect switch in de-energized position before performing any service on hoist.
- Customer must provide power supply cable, fuses, and main disconnect switch.
- Check supply voltage is same as nameplate voltage on hoist.
- Ensure that the voltage does not vary by more than ±10% from nominal value.
- Do not use conductors smaller than those listed in this User Manual to supply power to hoist.
- Never bypass limit switches, remove limit switch stops, or alter limit switch devices.

3.1 Unpacking

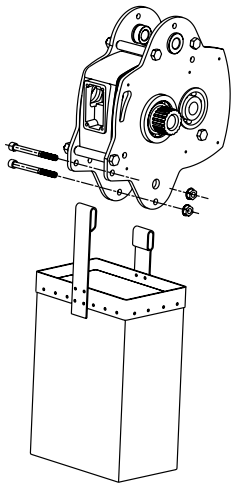
Hoist should be carefully inspected upon delivery for any damage that may have occurred during shipment or handling. Check the hoist frame for: dents or cracks, external cords for damaged or cut insulation, control station for cut or damaged enclosure, and load chain for nicks and gouges.

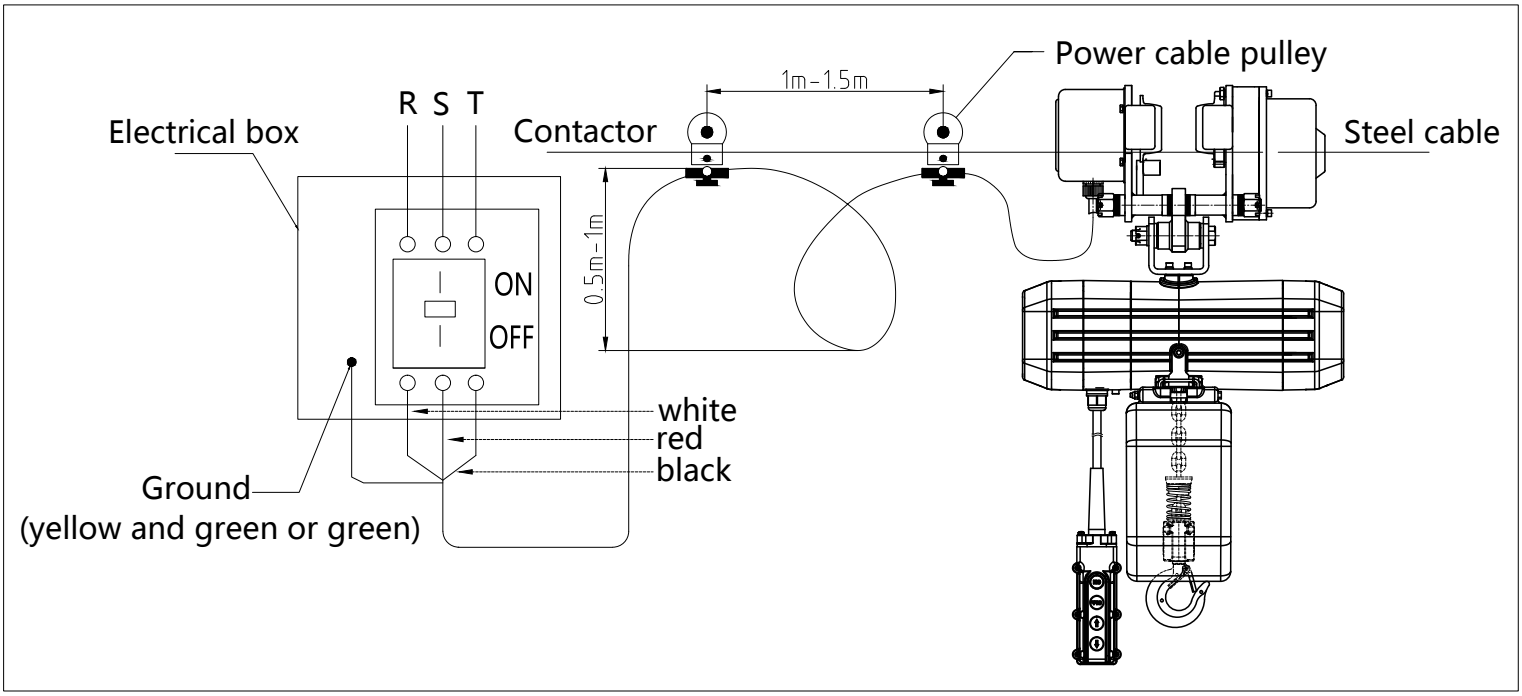
1 Chain bag (box)	1pcs
2 Control wire rope	1 m
3 Button switch	1 pcs

Check and document hoist characteristics:
a. Model number
b. Rated capacity (tonnage)
c. Lifting length of load chain (meter)
d. Power supply
e. Push button pendant assembly (2 button, 4 button or 6 button)
f. Specially ordered optional items
g. Beam width for trolley installation

3.2 Chain Bag Assembly

4.3.1 Before installing the hoist , please confirm the whole upper hook assembly has been firmly assembled to the hoist body and that the chain connection pin is installed properly.
Remarks: If the hoist is equipped with electric trolley , the upper hook does not need to be removed. Install the hoist between two side plates of trolley, and lock the upper hook.
4.3.2 Assemble chain bag (Fig.4.1)
4.3.3 Link the power supply and operate the push button, the procedure should be performed by professional trained person .(Fig.4.2)





3.3. Electrical Connections

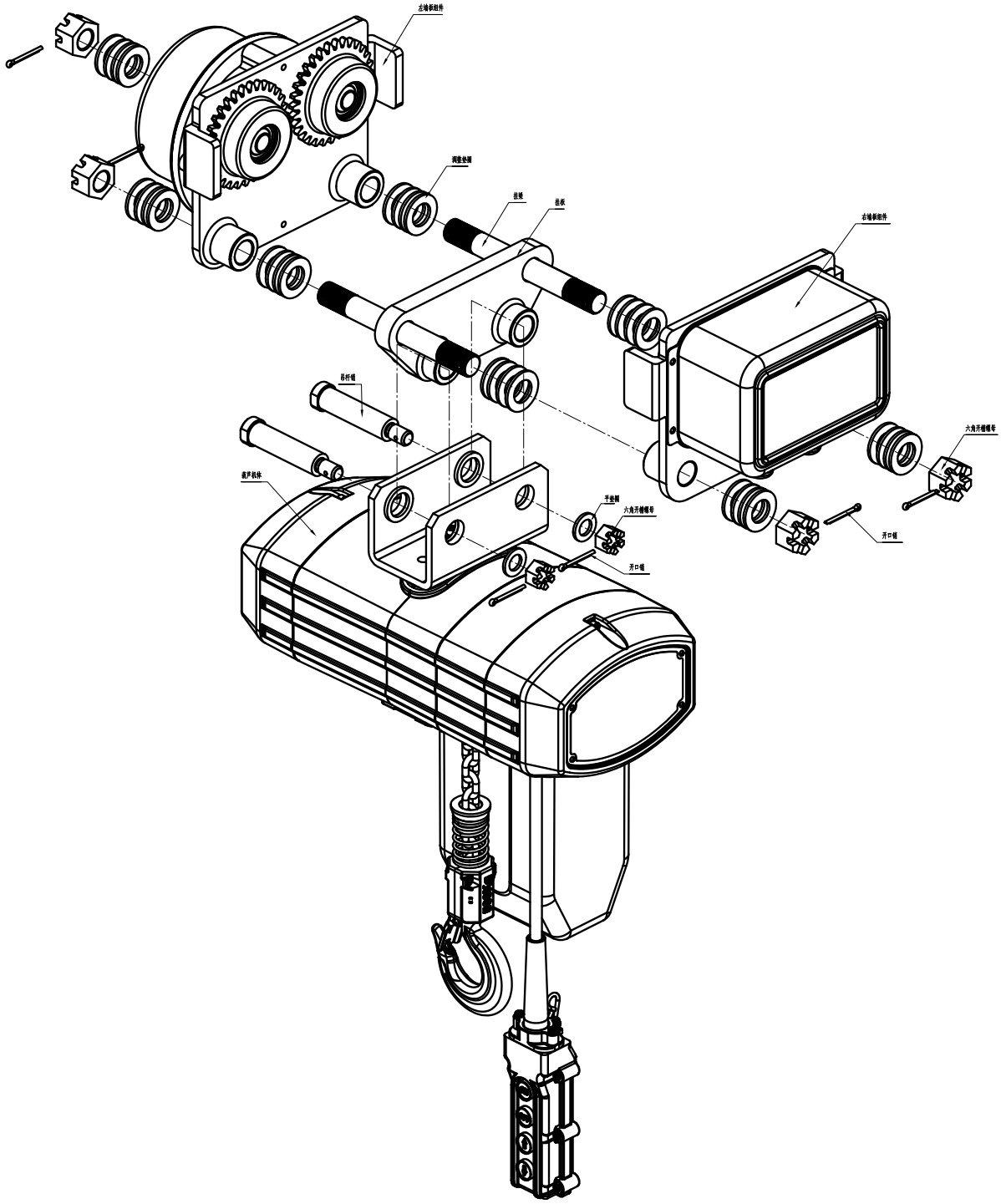
Operator and/or owner must provide main power supply hardware (cable, conductor bar, fuses, disconnect switch, etc.)

WARNING

Fuses and other current overload devices must be in place to protect power supply.
Do not use power supply cables with solid conductors.
An improper or insufficient ground connection creates an electrical shock hazard when touching any part of hoist or trolley

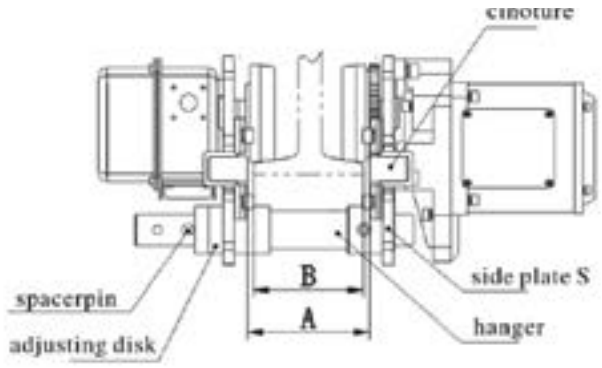
3.4. Install Trolley (models with trolley)

1.- Insert suspension pins into lateral plate G and lock it with suspension pin bolts and nuts.
2.- Install suspension pin with adjusting disk.
3.- Install suspension pin into hanger T. The nameplates of hoist and trolley should be in the same direction.
4.- Install additional gaskets into suspension pin before inserting it into lateral plate S.
5.- Install outside adjusting disk and spacer pin into suspension pin. Insert cotter pin into spacer pin.
6.- Cotter pin should be seen at the left side from front of trolley switch box.



3.5. Adjust Trolley Width (models with trolley)

• Adjust width of trolley according to drawing (right) for appropriate clearance.
• Size A is the dimension of two side plates that stretch outside completely.
• Size A must be approximate B (the width of rail flange) + 4mm.
• Adjust size A by increasing or decreasing adjusting disk.
Insert cotter pin into spacer pin and bend two branches of cotter pin
until size A is correct.



Nut must be tight, insert cotter pin and bend it completely.

3.6. Install Trolley into Beam (models with trolley)

1. Install trolley at end side of beam and slip trolley which has already been connected with hoist to the appropriate place. This is the preferred method.

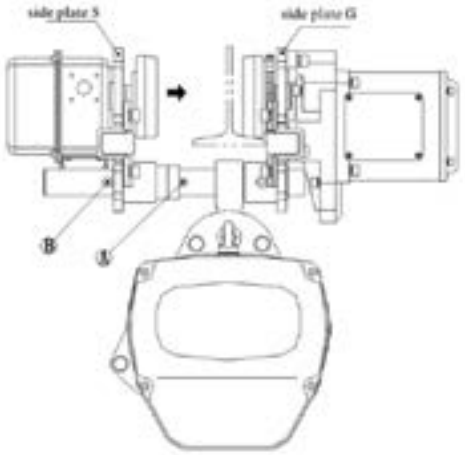
2. If first method is unavailable:

a) Unload brake stopper from hole A on suspension pin, and insert it into hole B. Insert cotter pin again and bend it completely.

b) Pull side plate S and G outside, then lift trolley until orbit wheel and orbit surface are in same horizontal position. Put orbit wheel of side plate G onto surface of orbit.

c) Hold side plate G and stop it from dropping from orbit. Firmly push side plate S and put its orbit wheel onto surface of beam.

d) Unload brake stopper from hole B and insert into hole A. Do not forget to bend cotter pin.



3.7. Supply Voltage

WARNING

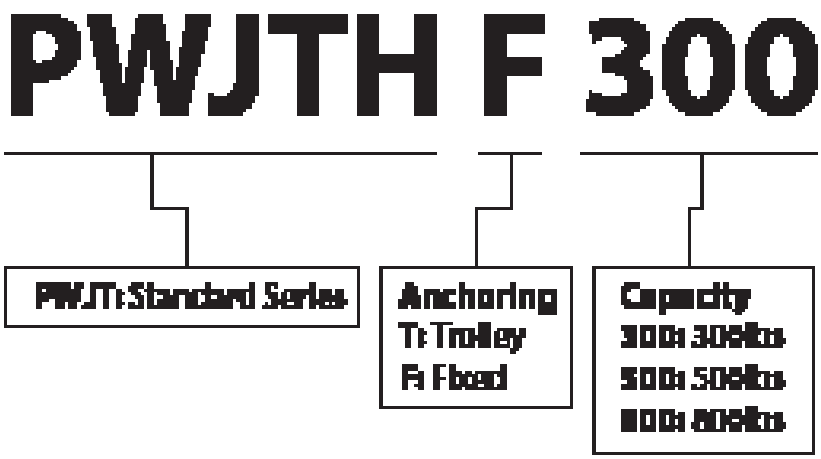
Check supply voltage everyday before use. If voltage varies more than 10% of rated value, electrical devices may not function normally and cause damage to equipment.

WARNING

Do not connect equipment to power supply before completing the installation process.

2. SPECIFICATIONS

2.1. Product Code.



2.2. Specification Chart (For all models of Prowinch® Electric chain hoists).

Item		Specs
Operating temperature range (°C)		-20° to ± 40°
Operating Humidity Range (%)		< 85%
Protection Class	Hoist	IP55
	Button Switch	IP55
Power		1 Phase, 120V @ 50/60Hz
Noise Level (db)	Single Speed Hoist	81db
	Double Speed Hoist	81db

Observations

Do not use Prowinch® Electric Chain Hoists when the temperature or humidity exceeds the range stated in the Specification Chart.

Our hoists are designed to lift loads vertically under normal atmospheric and working conditions.

2.3. Load Level and Service Life

Hoist Duty Class	Typical Areas of Application	Operational Time Ratings at K = 0.65			
		Uniformly Distributed Work Periods		Infrequent Work Periods	
		Max. On Time, min/hr	Max. No. Starts/hs	Max. No. Time From Cold Start	Max. No. of Starts
H1	Powerhouse and utilities, infrequent handling. Hoists used primarily to install and service heavy equipment, where loads frequently approach rated load, and where the hoist is idle for 1- to 6-month periods between periods of operation.	7.5 (12.5%)	75	15	100
H2	Light machine shop, fabricating service, and maintenance. Loads and utilization randomly distributed. Rated loads infrequently handled. Total running time not more than 12.5% of the work period.	7.5 (12.5%)	75	15	100
H3	General machine shop, fabricating, assembly, storage, and warehousing. Loads and utilization randomly distributed. Total running time not more than 25% of the work period.	15 (25%)	150	30	200
H4	High-volume handling of heavy loads, frequently near rated load in steel warehousing, machine and fabricating shops, mills, and foundries, with total running time not more than 50% of the work period. Manual or automatic cycling operations of lighter loads with rated loads infrequently handled such as in heat treating and plating operations, with total running time frequently 50% of the work period.	30 (50%)	300	30	300
H5	Bulk handling of material in combination with buckets, magnets, or other heavy attachments. Equipment often cab operated. Duty cycles approaching continuous operation are frequently necessary. User must specify exact details of operation, including weight of attachments.	60 (100%)	600	N/A	N/A

Working Conditions		Load	Time	Maintenance Interval (Months)	Expected Life [Working Hours]				
					800	1600	3200	6300	12500
Light	Light Mechanisms subjected normally to light loads and very rarely to the maximum load.			6 - 12	H1	H2	H3	**H4**	**H5**
Normal	Mechanisms subjected normally to moderate loads and frequently to the maximum load.	< 65%	< 25%	6 - 12	H2	H3	**H4**	**H5**	
Heavy	Mechanisms subjected normally to loads of heavy magnitude and frequently to the maximum load.	> 65%	> 25%	3 - 6	H3	**H4**	**H5**		
Severe	Mechanisms subjected regularly to the maximum load	Abnormal conditions Environmental, Geographical, etc <100% < Duty Cycle Limit		1 - 3	**H4**	**H5**			

2.4. Fixed Hoist Specifications

Specifications		Model		
		PWJTHF300	PWJTHF500	PWJTHF800
Capacity (lb)		300	500	800
Lifting Speed (ft/min)		14	7	7
Motor Power (W)		160	160	200
Insulation Grade		IP55		
Power Supply		120VAC		
Control Voltage		120VAC		
No. Chain falls		1	2	2
Spec. of Load Chain		5x15	5x15	5x15
Net Weight (lb)		28	40	40
Basic Dimensions (in)	**H**	5.4	5.4	5.7
	A	15	16	16.7
	B	14	14	14.0
	D	4.3	4.3	4.3
	E	2.8	2.8	2.8

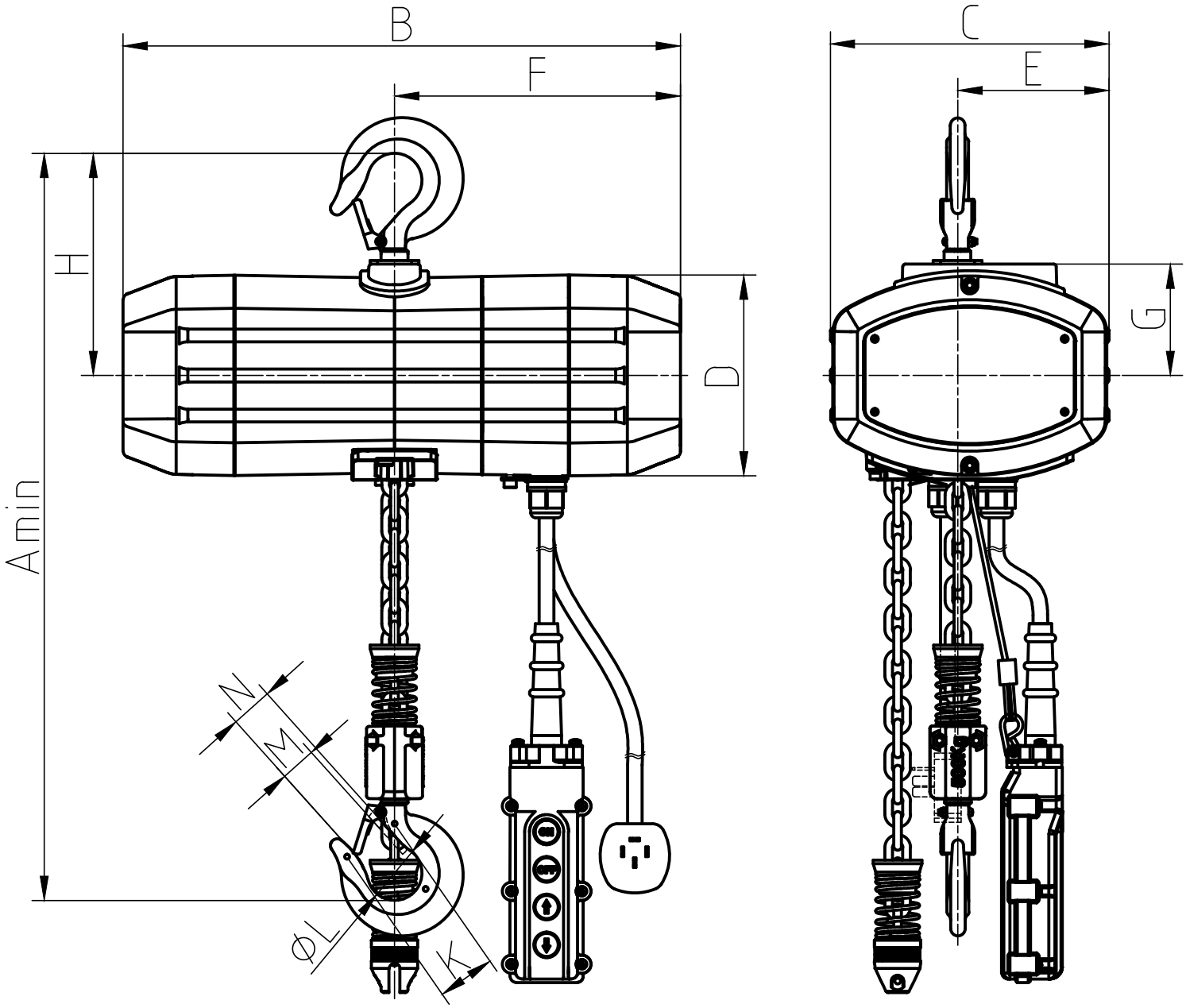
2.5. Trolley Hoist Specifications

Specifications		Model		
		PWJTHT300	PWJTHF500	PWJTHT800
Capacity (lb)		300	500	800
Lifting Speed (ft/min)		14	7	7
Motor Power (W)		160	160	200
Insulation Grade		IP55		
Power Supply		120VAC		
Control Voltage		120VAC		
No. Chain falls		1	2	2
Spec. of Load Chain		5x15	5x15	5x15
Net Weight (lb)		28	40	40
Basic Dimensions (in)	H	5.4	5.4	5.7
	A	15	16	16.7
	B	14	14	14.0
	D	4.3	4.3	4.3
	E	2.8	2.8	2.8

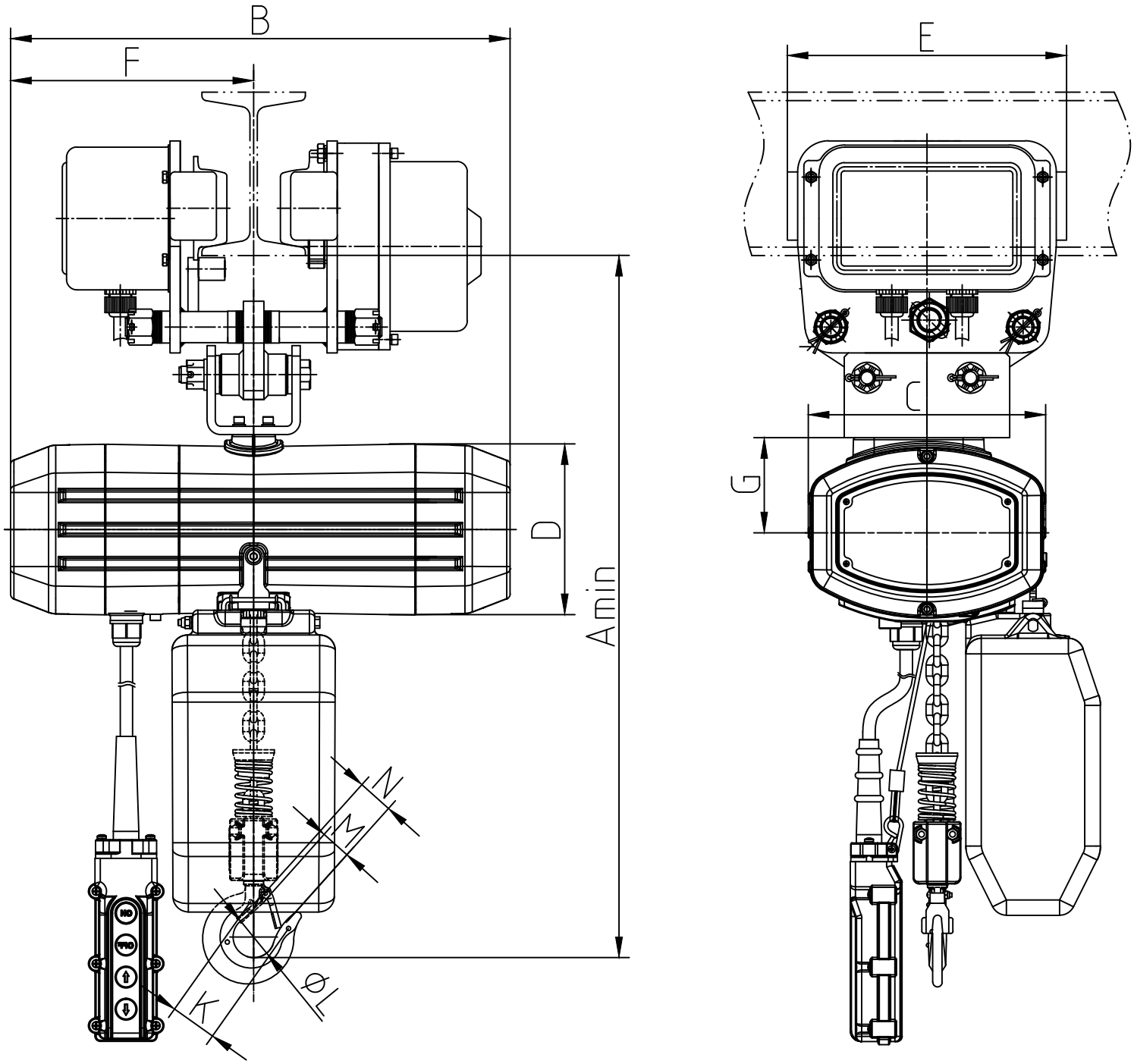
2.6. Hoists Dimensions

Model	Dimension (in)											
	A	B	C	D	E	F	G	H	L	K	M	N
PWJTHF300	14.5	14.1	6	4.3	2.8	7.9	3.0	5.5	1.4	/	0.91	1.0
PWJTHF500	16.0	14.1	6	4.3	2.8	7.9	3.0	5.5	1.4	/	0.91	1.0
PWJTHF800	16.7	14.1	6	4.3	2.8	7.9	3.0	5.7	1.5	/	0.98	1.1
PWJTHT300	14.5	14.1	6	4.3	2.8	7.9	3.0	5.5	1.4	/	0.91	1.0
PWJTHT500	16.0	14.1	6	4.3	2.8	7.9	3.0	5.5	1.4	/	0.91	1.0
PWJTHT800	16.7	14.1	6	4.3	2.8	7.9	3.0	5.7	1.5	/	0.98	1.1

Specifications



Specifications



3. Oil & Lubricant Recommendations

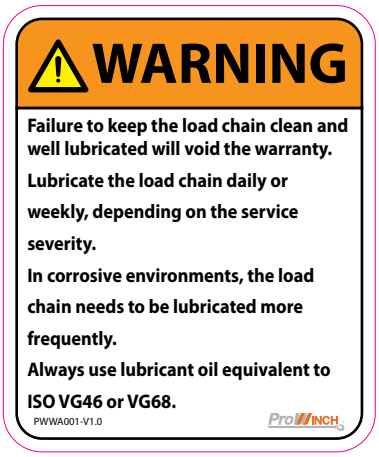
WARNING

Do not allow chain to run dry.

Lubricant greatly increases the life of load chain. Weekly lubrication and cleaning is satisfactory, but under hot, dirty, and extreme conditions it may be necessary to clean the chain at least once a day and lubricate it several times between cleaning. Apply sufficient lubricant to obtain natural runoff and full coverage, especially in interlink area.

Suspension pins should be lubricated at least twice per year for normal usage; more frequently for heavier usage or severe conditions.

Item	Lubricant	Interval	
		Normal Working Conditions	Heavy / Severe Working Conditions
Chain	Lubriplate® Bar and Chain Oil 10-R	Weekly	Daily
	Gear Oil ISO46 – ISO68	Twice Weekly	Daily
Gearbox	Meropa 320 (TEXACO)	Twice per year	Every other month
Hooks, Suspension pins & components	General lithium grease	Weekly	Daily



4. OPERATION

4.1. Qualified Operator

Hoist operators are required to read and fully understand the operation section of this manual, all warnings contained in the manual, and labels attached to the equipment.

Operator training must be provided to ensure proper operation of equipment in compliance with instructions provided by the equipment manufacturer and the provisions of ASME B30, and proper rigging procedures for the attachment of loads to the hoist.

Safe and efficient operation of hoist requires an operator who exercises caution, common sense, and good judgment in anticipating the effects of operating the hoist. The operator must be fully alert, focused, and aware of the surroundings at all times.

The job must be strictly carried out under the good practices defined by the applicable international and national safety standards, such as ANSI, OSHA and ASME.

This hoist must not be operated by individuals who:

- Cannot read, understand and speak the language in which the security labels, ID Plate and User Manual of equipment is written.
- Does not meet the legal age requirements.
- Is under the influence of alcohol, drugs, or medication.
- Has visual or hearing impediments, or below normal reaction times.
- Has a history of or experiences seizures, mental, heart, or other illnesses that could interfere with safe operation of the equipment.
- Has not been trained for the proper use of the hoist.
- Has not received and read the User Manual for the exact equipment.
- Has not demonstrated qualifications through practical operation of hoist.

4.2 Handling Precautions

ALWAYS:

- Keep hoist in good condition and make sure chain is lubricated and free to operate.
- Make sure electrical connection is grounded.
- Make smooth movements; avoid sudden changes of direction.
- Check the function of the hoist and trolley without a load before operation.
- De-energize equipment after using it to avoid unintentional operation.
- Keep everyone a distance of at least 1.5 times the length of chain. If load falls it can cause serious injuries and death.
- Make sure no one is beneath the load.

NEVER:

- Use pulleys or other accessories that are not specifically approved for the relevant hoist model.
- Hoist load with the tip of the hook.
- Hoist a load which is not vertical to the hook.
- Use the hoist to pull or drag the load.
- Exceed the maximum capacity of hoist.

4.3 Recommended Operation

WARNING

Always carry out a complete inspection before starting the operation of the hoist. See ASME B30.
Always let all personnel know that crane maneuvers are about to begin!
Do not allow Unauthorized Personnel to be in the lifting area.

Start with Operational Test

1. Press (down) button to lower the unloaded hook until the limit spring touches the limit switch. Be sure the hoist stops automatically before totally compressing the spring.
2. Press (up) button to raise the unloaded hook up until the limit spring touches the limit switch. Be sure the hoist stops automatically before totally compressing the spring.
3. Test correct function of emergency stop button. When pressing (up), and (down) buttons press the emergency stop button. Ensure the hoist stops immediately after pressing the emergency stop switch. The hoist should not start again if any other button is pressed.
4. Rotate the emergency stop switch clockwise to its original position. When it bounces back, the hoist can be started again. If any of the above tests fail, the unit must remain out of service, lockout/tag-out power and request authorized personnel to check the circuit layout for the automatic locking emergency stop switch.
5. Check lubricant condition of the load chain. Apply lubricant into the chain bag to protect the load chain.
6. Check the direction of chain eyes. All welding points should face the same direction. The hoist cannot be operated properly unless all welding chain eyes are in the same line.

6.1. Position the hoist vertical to the load. Before moving the trolley, make sure the hook's path is free from any obstacles.
6.2. Lower the hook near master link to hoist load and make final adjustments to secure a 90º vertical lift operation without any lateral deviation. Improper lift angle may cause the load to swing.
6.3. Attach the hook to the load link and make sure there are no people in the working area. Check that no loose items can fall from the load.
6.4. Begin by hoisting the load two inches, then stop. Ensure the brakes are fully operational and the load doesn't lower while stopped. Also ensure the load is balanced and secured. The load may have shifted when suspended.
6.5. To reach a desired position, movements must be smooth and continuous. Repeatedly pressing buttons may heat up the motor and damage equipment.
6.6. Avoid sudden directional changes. These movements may damage the equipment, prematurely wear down brakes and cause accidents.

WARNING

If the hoist model has dual/speed capabilities, always start with slower speed to avoid sudden accelerations. Decelerate before completing a stop.

7. Avoid any obstacles while hoisting or traveling the load.
8. Start movement of the trolley and ensure that the load is not swinging and there are no obstacles in its path. Stop movement and make necessary adjustments if one of these conditions is present.

9. Once the desired position is reached, slowly stop the trolley. Position the load completely vertical to the desired spot where load will be lowered.

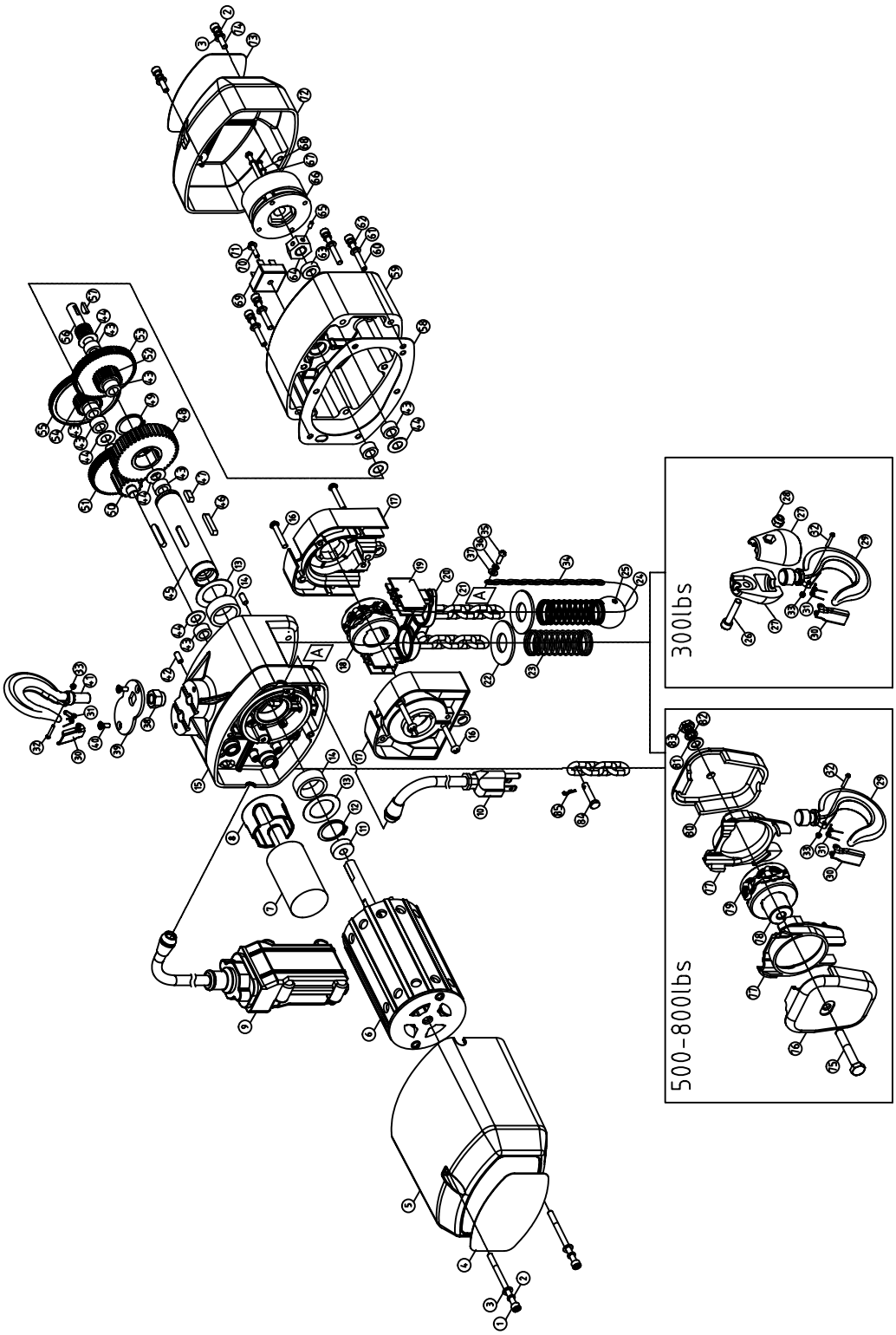
10. Gradually lower load until it is secured on resting surface. Avoid hitting surface at high speed. If necessary, stop movement before reaching surface and gradually lower to land load.

DANGER

NEVER leave load suspended without attention of the hoist operator!

1. H3 EXPLODED VIEW AND PARTS LIST

1.1 Motor and body assembly drawing



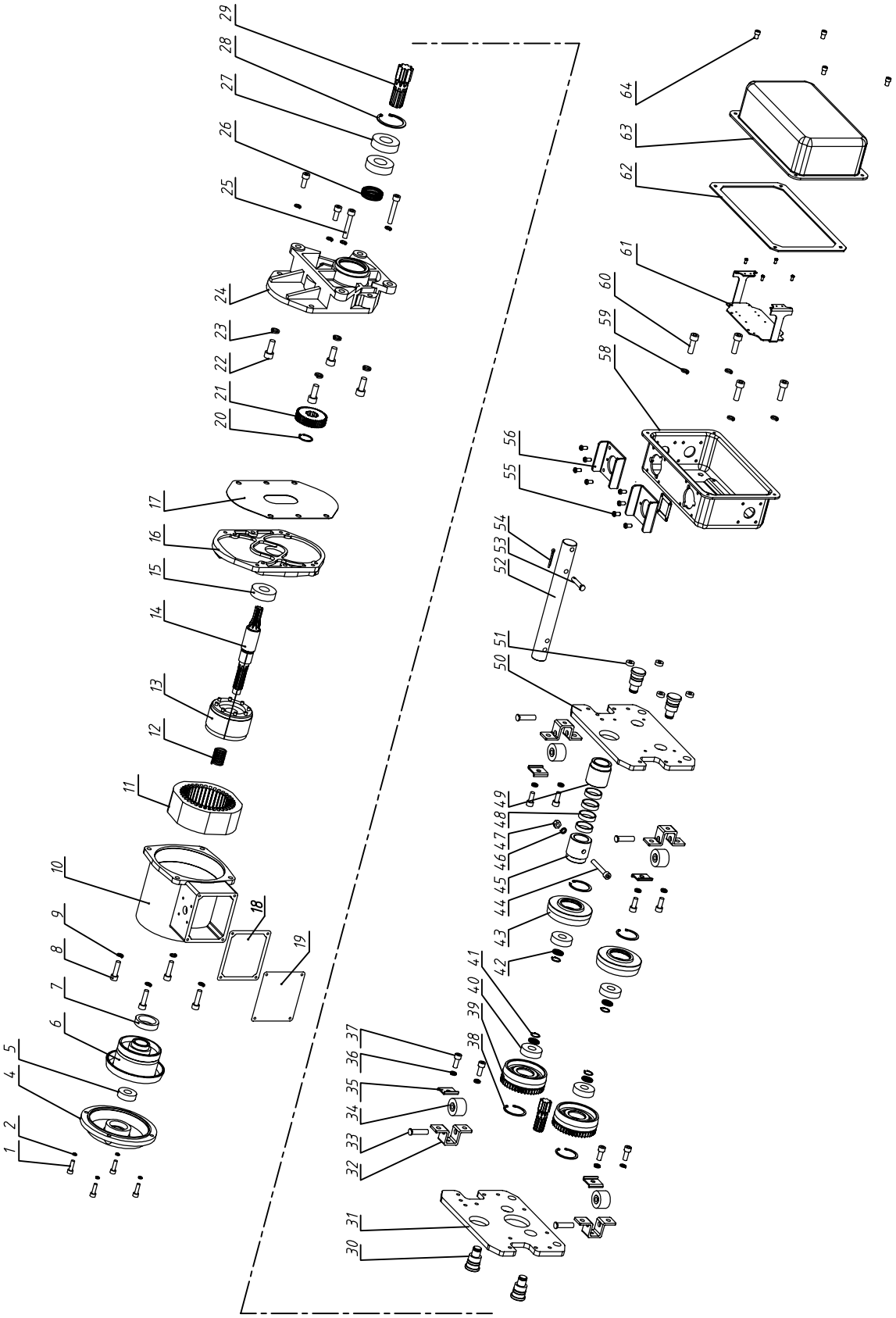
1.2 Motor and body assembly parts list

No.	Part Name	No.	Part Name
1	Hexagonal socket cylindrical head screw	38	Hex Nut
2	Spring Washer	39	Dead Plate
3	Flat Washer	40	Lock Plate Screw
4	Nameplate	41	Upper Hook
5	Motor Cover	42	Cylindrical Pin
6	Electromotor	43	Needle Bearing
7	Capacitors	44	Gasket
8	Capacitor Holder	45	Sprocket Shaft
9	Pendant Control assembly	46	Key
10	Power Cord	47	Key
11	Deep groove ball bearing	48	Lifting Gear
12	Washer	49	Washer
13	Gasket	50	Intermediate gear shaft
14	Needle bearing	51	Intermediate gear C
15	Hanging Bracket	52	Intermediate gear B
16	Lock Plate screw	53	Intermediate gear A
17	Chaing guide	54	High gear B
18	Load Chain Wheel	55	High gear A
19	Limit Stopper	56	Pinion shaft
20	Limit baffle	57	Woodruff Key
21	Load Chain	58	Gearbox Gasket
22	Limit Ring	59	Gear Case
23	Limit Spring	60	Hexagonal Screw
24	Chain Stopper	61	Flat Washer
25	Spring Pin	62	Spring Washer
26	Chain Shaft	63	Seal
27	Lower hook housing	64	Brake Nut
28	Hex nut	65	Hexagonal Screw
29	Bottom Hook	66	DC Brake
30	Safety Latch	67	Lock Plate Screw
31	Dual Spring	68	Spring Washer
32	Lock Plate screw	69	Rectifier
33	Hex Nut	70	Lock Plate Screw
34	Chain Ø1.2 - Ø2 x 4 - 5	71	Flat Washer
35	Lock Plate Screw	72	Brake Cover
36	Spring Washer	73	Name Plate
37	Flat Washer	74	Allen Screw

1.3 Motor and body assembly parts list

No.	Part Name	No.	Part Name
75	Lower Hook	81	Flat Washer
76	Lower Hook Housing	82	Spring Washer
77	Lower Hook Housing Cover	83	Hexagon thin nut
78	Swim Shaft	84	Chain hoist pin
79	Chain Wheel	85	Corrugated pin
80	Lower Hook Cover		

1.4 Trolley assembly drawing

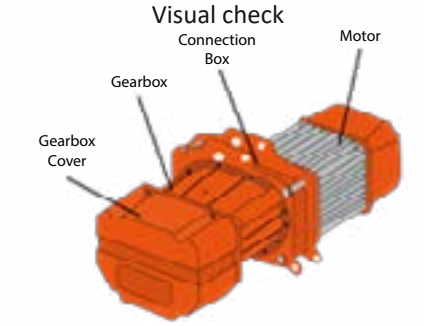


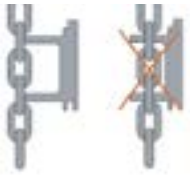
1.5 Trolley assembly parts list.

No.	Part Name	No.	Part Name
1	Hexagonal Screw	33	Edge wheel axis
2	Spring Washer	34	Trolley edge wheel
3	\	35	Side wheel support gasket
4	Motor Back Cover	36	Spring washer
5	Rolling Bearing	37	Hexagonal Screw
6	Brake Assembly	38	Spring Washer
7	Rubber Ring	39	Gear
8	Hexagon socket cylindrical head screw	40	Bearing
9	Spring Washer	41	Washer
10	Motor Cover	42	Trolley wheel washer
11	Motor electronic tape coil	43	Driving wheel
12	Brake Spring	44	Outer hexagonal bolt
13	Rotor	45	Trolley motherboard set
14	Rotor Shaft	46	Spring Washer
15	Bearing	47	Non-metallic hexagonal lock nut
16	Motor base plate	48	Trolley axis adjustment ring
17	Gasket	49	Trolley board set
18	Limit switch gasket	50	Trolley board
19	Limit switch cover plate	51	Board housing washer
20	Washer	52	Trolley shaft
21	Gear	53	Shaft pin
22	Hexagonal Screw	54	Split pin
23	Spring washer	55	Slotted pan head screw
24	\	56	Connection fixing ring
25	Hexagonal Screw	57	\
26	Ring	58	Motor Wiring housing assembly
27	Bearing	59	Spring washer
28	Spring Washer	60	Hexagonal Screw
29	Trolley output head	61	Mounting Plate
30	Trolley round head	62	Motor wiring hood housing gasket
31	Trolley main board	63	Motor Wiring housing assembly
32	Edge wheel bracket	64	Hexagonal Screw

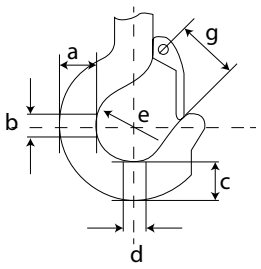
1. OPERATION

1.1. Periodic Inspection

Items	Inspection Method	Standards	Correction
Marks such as name-plates, labels etc.	Visual check	Clear marks and no peeling	Proceed with cleaning, repairing and replacing. Record serial number for replacing
Deformation or damage of body parts	Visual check 	No remarkable deformation, damage, defect or chap	Replace parts which are deformed, damaged, and defective
Bolts, nuts, and cutters loose or falling off	Visual and tool check	- Correct installation -A loose bolt will cause equipment failure - Ensure proper installation to avoid death or serious injury	Precise installation

Items	Inspection Method	Standards	Correction
Extent of pitch	Check by chain measurement tool		
Attrition of chain diameter	Check with chain measurement tool		
Deformation, damage, wind	Visual check Damage Chap  Confirm chain is not stuck to welding spatters by visually inspecting it.	- No deep cut - No Deformation - No deformation - No Wind -No Chap	Replace load chains
Rust and corrosion	Visual check	No remarkable rust and corrosion	Replace load chains
Distortion	Visual check	No distortion due to bottom block rollover of double chain models 	Correct distortion
Oil supply	Visual check	Adequate supply of oil 	Oiling

<table>
<tr><th>Items</th><th>Inspection Method</th><th colspan="3">Standards</th><th>Correction</th></tr>
<tr><td>Limit switch</td><td>Check by pushing button</td><td colspan="3">Operate until upper and lower limit cause automatic motor shutdown</td><td>Replace limit switch, disassemble and clean limit lever</td></tr>
<tr><td>Movement confirmation</td><td>Check by pushing button</td><td colspan="3">-Load chain can roll up easily
-Motor shutdown immediately when operation stops
-All movements shutdown when E-stop button pushed
-Other buttons cannot cause movement when pushing the E-stop button -All movements return to normal operation when E-STOP button relieved</td><td></td></tr>
<tr><td>Brake</td><td>Check by pushing button</td><td colspan="3">Brake quickly activates and operation of bottom hook immediately stops (amount of movement of the load chain is within 2 to 3 rings)</td><td></td></tr>
<tr><td rowspan="5">Chain Spring</td><td rowspan="5">Visual inspection and measure dimensions</td><td rowspan="2">Chain</td><td colspan="2">Length of spring</td><td rowspan="5">Replace chain spring
  </td></tr>
<tr><td>Standard</td><td>Limits</td></tr>
<tr><td>Ø6.3</td><td>145</td><td>140</td></tr>
<tr><td>Ø7.1</td><td>145</td><td>140</td></tr>
<tr><td>Ø10.0</td><td>135</td><td>129</td></tr>
<tr><td>Ø11.2</td><td>160</td><td>152</td></tr>
</table>

<table>
<tr><th>Items</th><th>Inspection Method</th><th>Standards</th><th>Correction</th></tr>
<tr><td>Attrition and opening of the hook</td><td>Visually check and with vernier caliper tool
 
</td><td>No remarkable opening or attrition
<table>
<tr><th>Load</th><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th><th>g</th></tr>
<tr><td>0.3 -0.5</td><td>27</td><td>18</td><td>25</td><td>17</td><td>35</td><td>28</td></tr>
<tr><td>1</td><td>34</td><td>24</td><td>30</td><td>24</td><td>42</td><td>32</td></tr>
<tr><td>2</td><td>46</td><td>29</td><td>39</td><td>30</td><td>49</td><td>40</td></tr>
<tr><td>3</td><td>56</td><td>35</td><td>49</td><td>34</td><td>59</td><td>48</td></tr>
<tr><td>5</td><td>67</td><td>43</td><td>67</td><td>44</td><td>60</td><td>48</td></tr>
<tr><td>7.5 - 10</td><td>82</td><td>55</td><td>80</td><td>48</td><td>85</td><td>80</td></tr>
<tr><td>15</td><td>110</td><td>78</td><td>120</td><td>80</td><td>120</td><td>90</td></tr>
<tr><td>20 - 25</td><td>142</td><td>95</td><td>155</td><td>98</td><td>150</td><td>115</td></tr>
</table></td><td></td></tr>
<tr><td>Deformation, damage and corrosion</td><td>Visual check</td><td>No remarkable deformation, harmful damage and corrosion</td><td>Replace hook</td></tr>
<tr><td>Hook safety block</td><td>Visual inspection, fold and unfold actions</td><td>-Can exactly fold inside the hook
-No deformation
Dangerous
-Do not use hook if safety block is loosening
Improper use will lead to death or serious injury</td><td>Replace hook safety block
  </td></tr>
<tr><td>Hook movements (rotate)</td><td>Visual inspection and manual rotation</td><td>-No remarkable space between bottom supporting and top
-equal at right and left
-easy to rotate 360°</td><td>Replace hook</td></tr>
</table>

7.1. During Operation:

Symptoms			Main Cause	Correction
Hoist does not operate	Brake is inaudible	Contactor is inaudible	Excessive voltage	Power
			Operating circuit break-off, electric parts over-heating	Power supply
				Internal wiring
				Contactor
				Transformer
				Up/Down limit switch
				Button switch
		Contactor is audible	Power circuit break-off, overheating motor, brake	Motor
				Brake
				Internal wiring
				Contactor (junction fusing)
	Brake is audible		Drive overheating, broken bearing	Gear
				Bearing
Operates without load only	Unable to lift (motor roar)		Default phase (single phase operation)	Power
				Feed power
				Motor
				Contactor (junction fusing)
	Slow lifting		Low voltage	Feed power
Unintended reaction from button	Inverse reaction from button		Wrong phase sequence wiring	Feed power
			Incorrect signal wiring	Internal wiring
				Button switch
	No reaction after pressing button		Circuit wire break	Internal wiring
				Button switch
			Electric installation parts	Contactor
				Up/Down limit switch
				Contactor
				Brake
				Feed power
				Internal wiring
				Button switch
				Load chain
				Load pulley, bare pulley
				Gear
				Bearing
	Noise of brake	Running (grating)	Drag	Brake
		Stop	Wear of friction plate	Brake
	Abnormal noise of rail curve (grating)		Obstruction of orbit/wheel	Operation of trolley

Fault		Major Cause	Check Items
Does not move horizontally		Rail declining	Trolley movement
	Electric trolley /manual trolley	Inclined pull (wheel is lifting)	Trolley movement
	Electric trolley /manual trolley	Gear occlusion problem	Trolley movement
	Electric trolley /manual trolley	Brake fastening	Trolley movement
	Electric trolley	Electric faults	Trolley movement
Irregular movement and noise	Electric trolley /manual trolley	Rail & wheel interference	Trolley movement
		Side wheel lacks oil	
		Uneven wheel wear	
		Wheel deformation	
		Rail deformation, wear	
		Bearing wear	
		Brake wear	
Hook		Deformation	Hook
Load chain		Wear, extension, deformation	Load chain
Electric shock upon touching machinery body or control switch		Equipment not properly grounded	Proper electric connection
Does not operate in non-load state	Brake inaudible	Supply power	Supply power voltage
		Operating circuit break-off, electric parts overheating	Cables
			Internal wiring
			Transformer
			Electrical relay
			Limit switch
			Push button switch
		Braking interval too large or small.	Motor
			Calibrate brake
		Tripping as motor overheats	Thermal protector
	Brake audible	Bearing burning out, driving component wear	Replace brake bearing
			Bearing
	Slow load operation	Voltage drop	Feed cable
	Low and high speed status not operating or working slow	Low voltage	Supply power
		Voltage drop	Feed cable
Movement does not correspond with switch button	Movement did not correspond with switch button	Motor wires connected	Motor
		Connection error	Internal wiring
			Push button switch
	Switch button did not work	Operating circuit break-off	Internal wiring
			Push button switch
		Electrical installation error	Limit switch

Condition	Reason	Action	Cause	Correction
No operation	Abnormal supply voltage	Power supply	Improper power supply	Check power supply regularly

Power Cable

Condition	Reason	Action	Cause	Correction
No operation	Wire break	Repair or change cable if broken	Strong force exerted	Firmly fix on cable support or other equipment
			(2 or more)	Use anti-vibration cable in movable part.
			Twisted, knotted	Straighten twists and knots
			Interference with other equipment	Use fixed cable and avoid outside interference
	Overheating	Check cables, exchange if overheating	Temperature rise due to off-capacity	Adopt the proper cable
			Binding cable used	Do not use binding cable
Starting slow or no operation	Off-capacity	Check cable diameter, replace cable if diameter is too small	Voltage drop	Adopt proper cable
Operation only in free load (single phase)	1 wire break or overheating	Refer to above break or overheating item		
Movement did not correspond with switch button (opposite)	Power line connection error	Replace wires	Wiring assembly error	Connect wire as per wiring diagram

Motor

Condition	Reason	Action	Cause	Correction
No operation	Coil burning (above 2 phase)	Measure phase resistance value; change motor if value is infinite.	Excessive current caused by high or low voltage	Operate under rated voltage
			Excessive current caused by overload	Operate under rated voltage
			Beyond short-term rating and intermittent cycle rating	Short-term rating, intermittent cycle rating, operate under rated voltage
				Avoid over-operation
			Excessive current caused by brake	Refer to brake
	Lead wire break (above 2 phase)	Measure phase resistance value; change motor if value is infinite.	Lead wire broken in assembly	Change motor coil
			Vibration, drop	Avoid excessive bumping in usage
Operation only in free load (single phase state)	Coil burning (1 phase only)	Measure phase resistance value; change motor if value is infinite	Poor electric isolation	Ensure foreign matter does not enter motor
	Leading wire break (1 phase only)	Measure phase resistance value; change motor if value is infinite	Leading wire break in assembly	Change motor coil
			Vibration, drop	Avoid excessive bumping

Brake

Condition	Reason	Action	Cause	Correction
No operation	Braking coil burning	Measure brake phase resistance value; change brake if value is infinite.	Excessive current caused by high or low voltage	Operate under rated voltage
				Avoid over-operation
			Excessive current caused by overload	Operate under rated voltage
				Confirm short-term rating, intermittent cycle rating, operate under rated voltage
			Excessive current caused by operation in singe phase state	Stop immediately if unable to lift load in single phase
	Friction plate beyond brake magnetism scope	Measure brake clearance, replace if space is over usage limit		Avoid over-operation
	Broken brake wire	Ensure wire is connected, replace if disconnected	Lead wire damaged during assembly	Replace coil brake
	Improper connection of brake wire terminal	Replace insert terminal when loose	Assembly error	Proper connection in assembly
	Rust	Replace brake if rust present	Exposure to water in storage	Ensure dry storage
			Condensation	Monitor usage environments
	Friction plate wear	Measure brake clearance, replace if space is over use limit		Avoid over-operation

Inside Wiring

Condition	Reason	Action	Cause	Correction
No operation	Break	Check cable, repair if wire break	Vibration, drop	Avoid excessive bumping in usage
			Leading wire damaged in assembly	Change motor coil
		Check connector, repair if wire break	Connector not properly set	Press by appropriate tool
	Wiring error	Refer to wiring diagram, ensure properly connected	Wiring error	Refer to wiring diagram, ensure properly connected
	Connector screws loose	Fastening	Improper fastening	Ensure effective fastening
	(overheating)		Vibration, drop	Avoid excessive bumping in usage
	Connector, insert terminal improper combination	Proper combination	Bad combination during assembly	Ensure combination is effective

Transformer

Condition	Reason	Action	Cause	Correction
No operation (contractor)	Coil burning, break	Measure coil resistance value; Change transformer if value infinite	Excessive voltage	Operate under rated voltage
				Avoid over-operation
			Excessive current caused by contactor	Refer to contactor items
			Vibration, drop	Avoid excessive bumping in usage
	Wire break	Check leading wire, repair or change transformer if wire	Vibration, drop	Avoid excessive bumping in usage

Contactor & Electric Reply

Condition	Reason	Action	Cause	Correction
Non-stop activation	Junction welding burn out	Change contactor if continuous welding or burn out. For electric reply, visual inspection of junction		Do not over-operate
			Excessive voltage (Excessive current)	Operate under rated voltage
			Excessive current due to overload	Operation under rated voltage
No operation	Coil burning	Measure coil resistance value. Change coil if value infinite.		Avoid over-operation
			Excessive voltage	Operate under rated voltage
			Vibration due to low voltage (Starting current added continuous)	Operate under rated voltage
		Replace contactor if action is not smooth. For electric reply, visual inspection for part breakage	Vibration, drop	Avoid excessive bumping in usage

Limit switch

Condition	Reason	Action	Cause	Correction
No operation (Contactor)	Contact fused	Operate limit switch. Check continuity of contactor, replace if result is negative	Limit switch overuse	Avoid overuse of switch
	Wire break	Inspect cable, change if wire breakage or replace limit switch	Vibration, drop	Avoid excessive bumping in usage
	Movable parts rusting	Check movable parts such as limit lever. Remove if rusty or replace if adhesive	Set in Up/Down limit for long time	Do not set in Up/Down limit
Motor did not stop upon reaching upper and lower limit	Contact welded	Operate limit switch. Check continuity of contactor, replace if does not open	Limit switch used frequently	Avoid overuse of limit switch
	Rusting of movable parts	Check movable parts such as limit lever. Remove if rusty or replace if adhesive	Infrequent usage; use in moist environments.	Regular inspection
	Wiring error	Reference wiring diagram. If limit switch cable is properly connected, it is inversely connected. Swap 2 wire power cords	Wiring error	Properly connect wire power cords as per wiring diagram

Push button switch

Condition	Reason	Action	Cause	Correction
No operation (Contactor)	Emergency button is pressed	Turn button right to recover	Emergency button not reset	Read User Manual before usage
	Switch gear fault	Conduction contacts, replace switch if off	Vibration, drop	Avoid excessive bumping in usage
	Wiring break	Check if button cable is correctly connected to switch device. Repair if broken	Vibration, drop	Avoid excessive bumping in usage
	Terminal screw loose	Tighten screw	Vibration, drop	Avoid excessive bumping in usage
	Button cable wire break	Replace cable or button cable when wire break	Cable coating damaged	Avoid contact with other equipment during operation
			Faulty installation	Install protection line firmly
Action does not correspond with display	Wiring error	Reference wiring diagram. If limit switch cable is properly connected, it is inversely connected. Swap 2 wire power cords	Wiring error	Properly connect wire power cords as per wiring diagram
Operation continues upon button release	Faulty switch gear part	Replace switch if not smooth.	Vibration, drop	Avoid excessive bumping in usage

Electric shock

Condition	Reason	Action	Cause	Correction
Electric shock upon touching machinery or control switch	Equipment not properly grounded	Measure earth resistance. If below 100Ω assemble ground wire	Improper ground wire connection	Firmly connect ground wire
			Ground wire bad connection	Assemble carefully to prevent loose screw
			Cable break	Do not apply excessive force on cable
	Dampness/ water	Clean, use once dry	Wet hands	Do not operate with wet hands

Hook

Condition	Reason	Action	Cause	Correction
Hook mouth open	Hook deformation	Replace hook if deformation is beyond permitted range.	Overload	Operate under rated voltage
			Lifting (hook connected with grounded object)	Do not lift grounded objects.
			Load hanging on hook head; hook pull horizontal	Lifting load properly with hook
			Hanger suspension errors	Lifting angle must be controlled within 120 °
			Load size exceeds rated hook	Using proper hook
Hook twist			Chain wrapped around load	Do not wrap chain
Head hook improper rotating	Bearing rust, corrosion	Hand rotation; maintain or replace if experiencing difficulty rotating	Inadequate grease lubricant; corrosion	Apply grease lubricant regularly; prevent hook contamination of chemical agents
	Bearing damage		Dust	Prevent foreign matter from entering head

Load chain

Condition	Reason	Action	Cause	Correction
Chain is twisted	Bottom hook up-turned	Reset hook	Bottom hook rotation during usage	Check hook state before operation
	Chain twist in machinery body	Reassemble chain guide and load chain	Improper assembly	Ensure proper assembly
Limit switch suddenly activated while lowering	Chain is twisted or knot in chain bag	Confirm chain bag capacity (chain bag nameplate) replace with larger one if capacity insufficient	Chain bag inadequate capacity	Confirm lifting height and chain bag capacity
Crackling sound	Chain is damaged	Measure wear of chain link diameter. Replace if reaching wear limit	Long-term operation with insufficient lubrication	Apply grease lubricant regularly
Irregular sound from springs (cracking sound)	Wear of link part	Measure diameter on wear of chain, and replace when at wear limit	Excessive operation	Avoid excessive operation
			Overload	Use under rated load
			Incline pull	Ensure proper pull direction
			Wear of load pulley and empty pulley	Refer to load pulley and empty pulley
	Extension of pitch	Measure pitch and replace when exceeding limit	Overload	Use under rated load
Irregular sound	Damage or deformation on chain surface	Replace when obvious damage and deformation occur	Use under transition situation	Use under models with multiple chain
			Chain used improperly	Ensure proper assembly
	Mark on chain surface		Damaged by other equipment	Monitor surrounding environment throughout usage to avoid collisions
Discoloration	Rust, corrosion	Apply lubricants and replace when obvious rust and corrosion occurs	Lubricant exhausted	Apply lubricating oil regularly
			Exposure to water	Use in dry places
			Influenced by seawater or chemical agent	Inform us if used in special circumstances to safeguard range
Load chain fractured	Reaching service life	Check chain, replace if differing from benchmark specifications	Mechanical life	Operate correctly and manage properly including inspection before usage and regular check-ups

Chain Wheel

Condition	Reason	Action	Cause	Correction
Improper noise	Wear of chain wheel	Check wear degree on chain, wheel slot, and load chain. Replace if badly worn	Long-term operation with insufficient lubrication	Apply lubricating oil regularly
			Excessive operation	Avoid excessive operation
			Overload	Use under rated load
			Incline pull	Avoid incline pull

Load pulley and empty pulley

Condition	Reason	Action	Cause	Correction
Irregular sound from springs (cracking sound)	Wear of pulley	Measure slot edge thickness and load chain, replace if badly worn	Long-term operation with insufficient lubrication	Apply lubricating oil regularly
			Excessive operation	Avoid excessive operation
			Overload	Use under rated load
			Incline pull	Avoid incline pull

Chain Guide

Condition	Reason	Action	Cause	Correction
Increased shaking	Wear of chain guide and guide pulley	Measure benchmark size and load chain, replace if badly worn and limit size exceeded	Incline pull	Avoid incline pull

Chain Wheel, Junction Part

Condition	Reason	Action	Cause	Correction
Unable to lift loads	Wear, breakage	Replace when obvious wear or breakage occur	Long-term operation with insufficient lubrication	Apply lubricating oil and inspect annually
			Long-term operation with insufficient lubrication (joint part of motor shaft)	Apply lubricating oil and inspect annually
Irregular operation	Wear, breakage		Limit switch used too frequently	Avoid excessive use of limit switch

Bearing

Condition	Reason	Action	Cause	Correction
Unable to lift loads	Breakage	Replace bearing	High temperature or high frequency	Avoid use at high temperatures or high frequency

Trolley

Condition	Reason	Action	Cause	Correction
No drive due to wheel skid	Rail tilt	Confirm rail slope is within 1 °	Improper rail settings	Set up orbit correctly
No drive due to wheel skid	Apply oil above orbit wheel tread.	Ensure wheel is clean and unobstructed	Use in environment which outside material does not interfere with parts	Clean orbit regularly
Audible friction when travelling on curve track	Friction resistance between wheel and rail	Apply lubricating oil on track tread		
No drive on curve track	Interference of curve track and trolley	Confirm that orbit curve's radius is minimal bending radius	Curve track exceeding limit value	Avoid use on curve track exceeding limit value
Wheel raised and unable to be driven	Inclined pull (wheel raised)		Operation method	Correct use
Wheels stopped revolving	Faulty gear connec-tion	Ensure clean space between wheel and gear	Interference from outside material	Check regularly
Abnormal sound	Improper adjustment circle	Confirm adjustment circle number and insert position	Insufficient confirmation	Install correctly
	Wear of wheel	Confirm wear degrees	Traveling surface has bump	Confirm regularly
	Deformation of wheel	Check wheel bending and surface damage	Excessive collision, traveling surface deformed	Replace and use correctly
	Aging of wheel bearings	Confirm irregular sound exists when wheel rotates	Reaching service life	Replace
	Deformation and wear of track	Confirm rail wear and deformation	Overload or reaching service life	Replace and use correctly

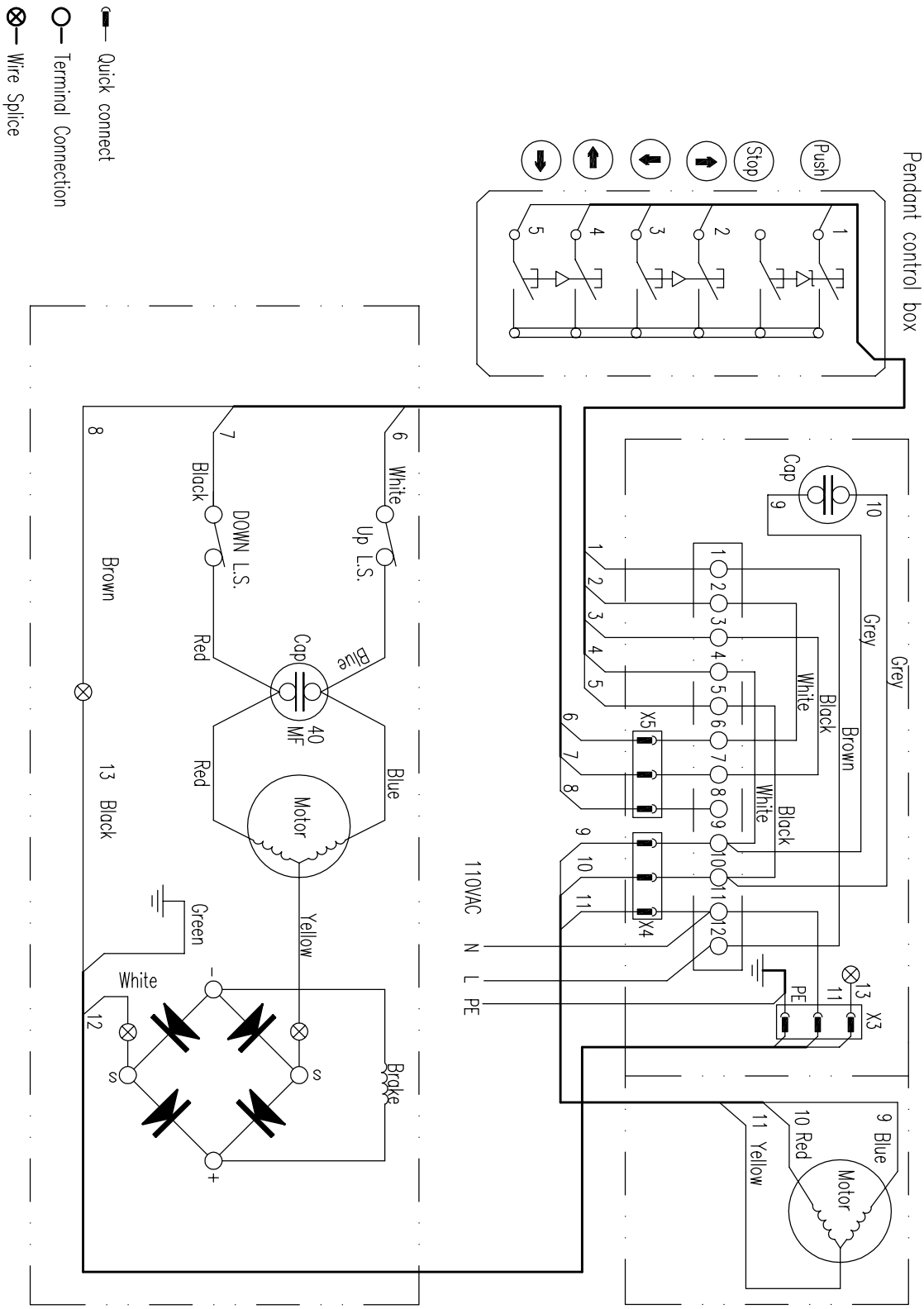
Electric Trolley

Condition	Reason	Action	Cause	Correction
Wheels stopped revolving	Brake gelling	Open motor cover remove rust and dirt	Usage environment	Inspect regularly
	Electric fault	Refer to items of electric chain hoist		
Abnormal sound	Wear of edge guide wheel	Confirm wear degrees	Reaching service life	Confirm regularly
	Wear of friction slices	Confirm wear degrees of friction slices	Reaching service life	Confirm regularly

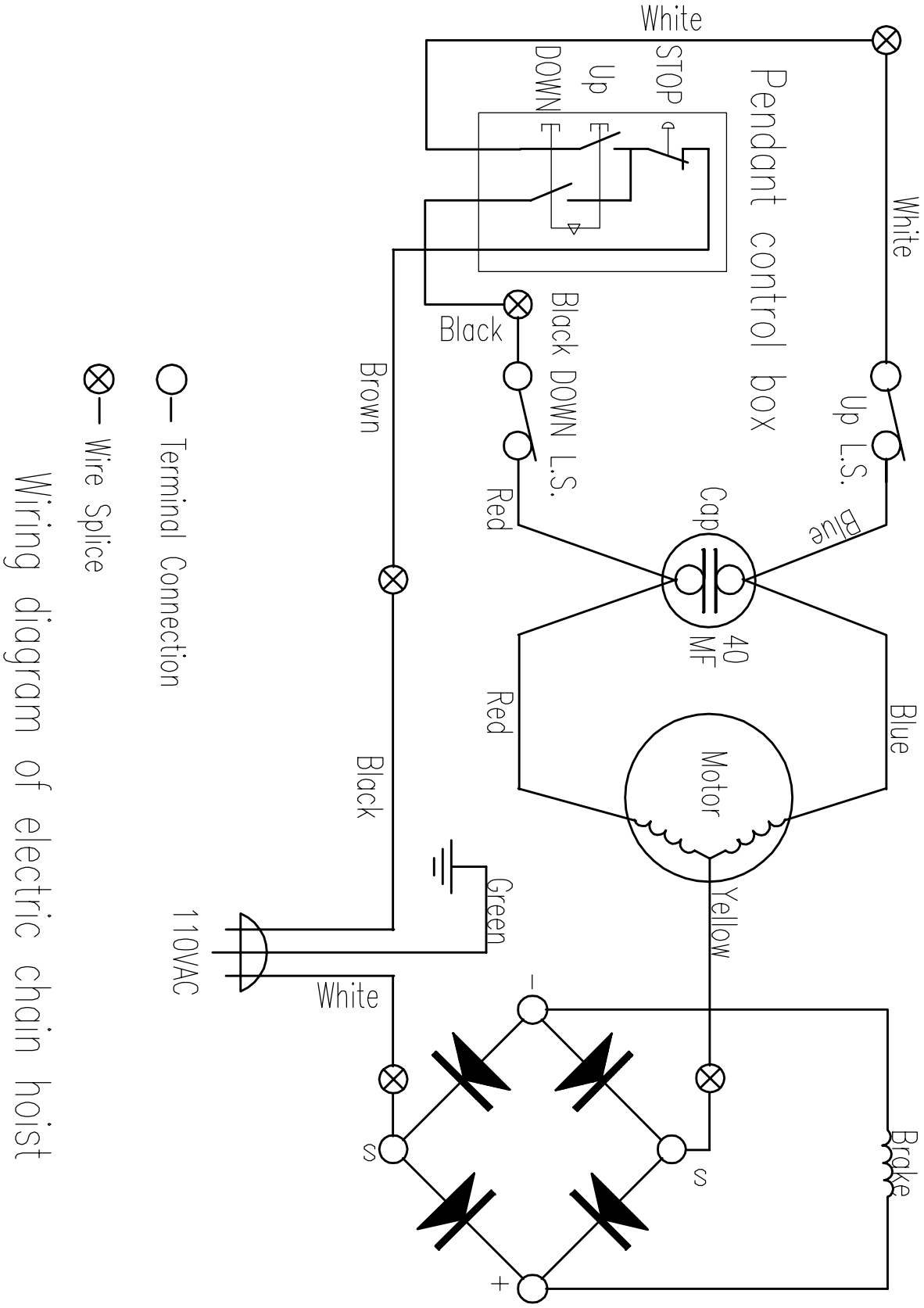
Manual Trolley

Condition	Reason	Action	Cause	Correction
Unable to move hand chain	Bad connection between hand wheel and hand chain	Properly adjust hand chain on hand wheel	Excessive or improper usage	Replace worn or deformed components

7. CONVENTIONAL HOIST WIRING DIAGRAM (PWJTHF - PWJTHT)



Wiring Diagram



Wiring diagram of electric chain hoist

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