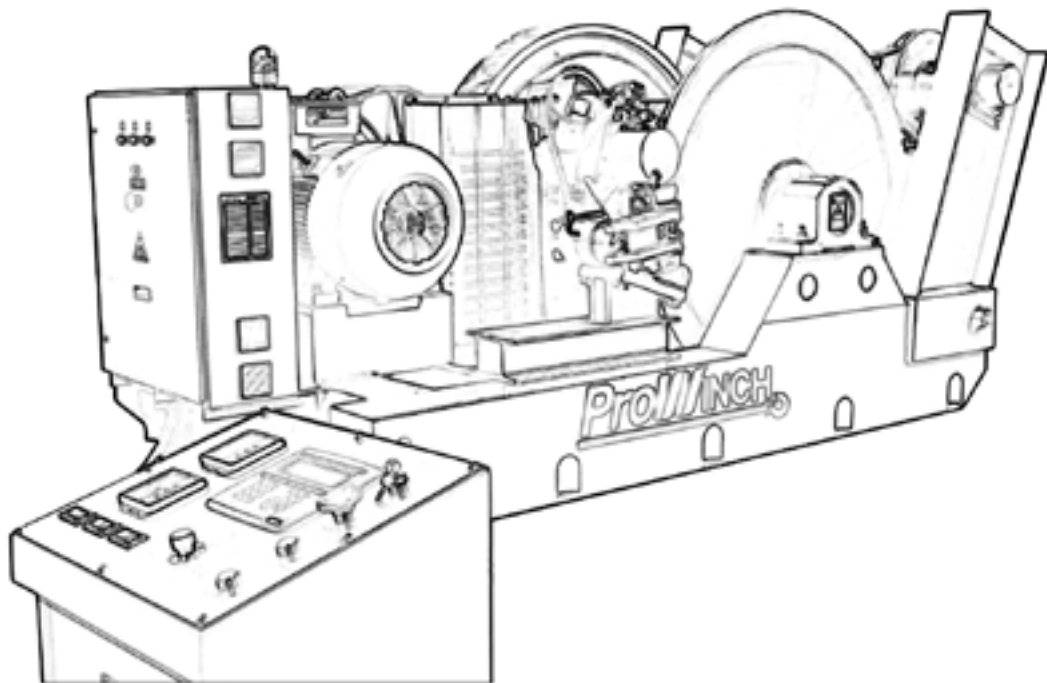




PWM - PWK - PWZ Powered Electric Chain Hoist

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



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ANY REPRODUCTION IS FORBIDDEN
PROPERTY OF PROWINCH® 2018 - V8.0 ALL RIGHTS RESERVED
PROWINCH LLC COMPANY WITH QUALITY MANAGEMENT SYSTEM

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 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.

5. The aforementioned reports must be sent by email to registros@prowinch.com within the first 7 calendar days after the occurrence of an event.

6. 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.

7. The information contained in this manual may contain technical errors or inaccuracies. Prowinch® LLC is not responsible for typing errors, omission or incorrect information.

8. This manual is subject to change without prior notice. Download the latest version available at www.prowinch.com.

9. Always check www.prowinch.com for the latest information regarding this product.



PWMD1T24M

1 ton 24 mts. 4 ways
2 Speed M3 / H2
Optional Wireless

PWM135VFD

135 Tons Winch Heavy
Duty Industrial 3
Phase



PWM135VFD

1 ton 24 mts. 4 ways
2 Speed M3 / H2
Optional Wireless

PWM30VFD-HS

22 Tons Winch Heavy
Duty Industrial 3
Phase



PWM22VFD

22 Tons Winch Heavy
Duty Industrial 3
Phase

PWM35VFD

35 Tons Winch Heavy
Duty Industrial 3
Phase



PWM33VFD

22 Tons Winch Heavy
Duty Industrial 3
Phase

PWM52VFD

52 Tons Winch Heavy
Duty Industrial 3
Phase

PWM70VFD

70 Tons Winch Heavy
Duty Industrial 3
Phase



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.



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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WWW.PROWINCH.COM

Thank you for purchasing a Prowinch® winch. This manual describes the operation and maintenance of the winch. All information in this publication is based on the newest production information is available at print time.

1. SAFETY PRECAUTIONS

Prowinch®'s winches are designed for delivering a safe and confident 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.

Applications for PWM PWK y PWZ Prowinch® winches

Choose the Prowinch® winch that is right for you: PWM PWK y PWZ series offers you top of the line models from 9500 lb up to 17000 lbs, featuring standard and optional accessories for recovery applications. We offer you lightweight, durable and affordable winches. Specially design for recovery applications, our winches are equipped of a durable wound motor for long life and extra pulling power, featuring a tough 3 stage planetary gear box delivering power and reliability. The body and frame of your winch are corrosion resistant stainless steel to provide a long life.

Mandatory use of:



Hard Hat



Safety Glasses



Safety Gloves



Safety Shoes

1.1. 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



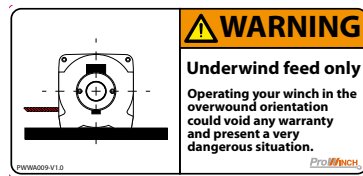
DANGER

All operators and other users who are near the steel chain 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 product. 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.

2. GENERAL SAFETY PRECAUTIONS

1. Take time to fully read the instructions from this User's Manual, in order to understand your winch and its operations.
2. Do not exceed winch or winch wire rope rated capacity. Double line using a snatch block to reduce winch load.
3. Do not use winch or winch wire rope for towing. Shockwave can damage, overload and break wire rope.
4. Do not use a winch to secure a load.
5. Do not operate this winch when under the influence of drugs, alcohol or medication.
6. Always wear heavy leather gloves when handling winch wire rope.
7. Always remove jewelry and wear eye protection.
8. Always be aware of possible hot surfaces at winch motor, drum or wire rope during or after winch use.
9. Inspect equipment regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
10. Use only PROWINCH®'s recommended parts for replacement. Any modifications or repairs without the approval from PROWINCH® will void warranty.

2.1. SAFETY INSTALLATION

1. Choose a mounting location that is sufficiently strong to withstand the maximum pulling capacity of your winch.
2. Use class 8.8 metric (grade 5) or better hardware.
3. Do not weld mounting bolts.
4. Use factory approved mounting hardware, components, and accessories.
5. Do not use bolts that are too long.
6. required bolt length to ensure proper thread engagement.
7. Complete the winch installation and hook attachment before installing the wiring.
8. Always keep hands clear of winch wire rope, hook loop, hook and fair lead opening during installation, operation, and when spooling in or out.
9. Always position fair lead with warning readily visible on top.
10. Preselect wire rope and re spool under load before use. Tightly wound wire rope reduces chances of binding, which can damage the wire rope.
11. Insulate and protect all exposed wiring and electrical terminals.
12. Do not route electrical cables across sharp edges, near parts that get hot and/or through or near moving parts.
13. Always place the supplied terminal boots on wires and terminals as directed by the installation instructions.
14. Do not lean over battery while making connections.
15. Do not route electrical cables over battery terminals.
16. Do not short battery terminals with metal objects.
17. Battery Recommendations A fully charged conventional automotive battery with a minimum rating of 650 cold cranking amps is recommended to obtain peak performance from your winch. Make sure all electrical connections are clean and tight.
18. Consult this User's Manual for proper wiring details.

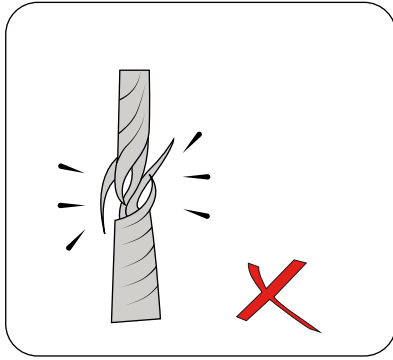


DANGER:

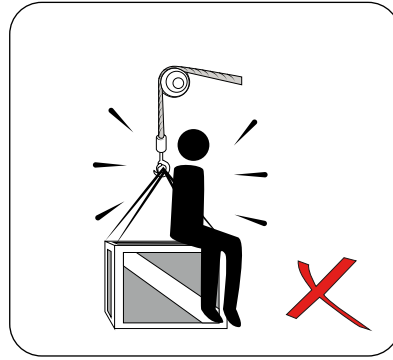
Failure to observe these instructions could lead to serious injury or death.

2.2. SAFETY OPERATION

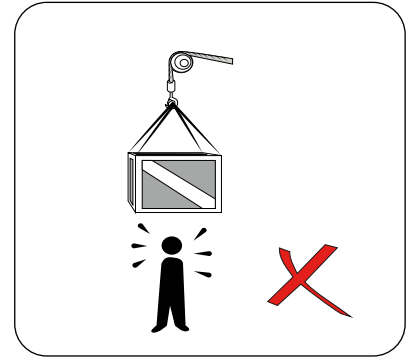
- 1.** Inspect winch wire rope, hook, and slings before operating winch. Frayed, kinked or damaged winch wire rope must be replaced immediately. Damaged components must be replaced before operation. Protect parts from damage.
- 2.** Remove any element or obstacle that may interfere with safe operation of the winch.
- 3.** Always be certain the anchor you select will withstand the load and the strap will not slip.
- 4.** Always use supplied hook strap whenever spooling winch wire rope in or out, during installation and during operation.
- 5.** Always require operators and bystanders to be aware of vehicle and or load.
- 6.** Be aware of stability of vehicle and load during winching, keep others away. Alert all bystanders of an unstable-condition.
- 7.** Always spool as much winch wire rope as possible when rigging. Double line or pick distant anchor point.
- 8.** Take time to use appropriate rigging techniques for a winch pull.
- 9.** Do not touch winch wire rope or hook while someone else is at the control switch or during winching operation.
- 10.** Do not engage or disengage clutch if winch is underloaded, winch wire rope is in tension or drum is moving.
- 11.** Do not touch winch wire rope or hook while under tension or under load.
- 12.** Stand clear of winch wire rope and load and keep other away while winching.
- 13.** Do not use vehicle to pull load on winch wire rope. Combined load or shock load can damage, overload and break wire rope.
- 14.** Do not wrap winch wire rope back onto itself. Use a choker chain or tree trunk protector on the anchor.
- 15.** Do not operate winch with less than 5 wraps of winch wire rope or 10 wraps of synthetic rope around the drum. Wire rope could come loose from the drum, as the wire rope attachment to the drum is not designed to hold a load.
- 16.** Do not use winch as a hoist or to suspend a load.
- 17.** Always be certain anchor will withstand load, use appropriate rigging and take time to rig correctly.
- 18.** Do not use winch to lift or move persons.
- 19.** Do not use excessive effort to free pool winch wire rope.
- 20.** Always use proper lifting technique or get lifting assistance while handling and installing.
- 21.** Always wind the winch wire rope on bottom (mount side) of drum.
- 22.** Do not wind wire rope over top of drum. Always spool the winch wire rope onto the drum in the direction in this manual.
- 23.** Do not leave remote control where it can be activated during free spooling, rigging, or when the winch is not being used.
- 24.** Do not leave the winch remote control plugged in when installing, free-pooling, rigging, servicing or when the winch is not being used.
- 25.** Do not operate any equipment on which the safety placards or decals are missing or illegible.
- 26.** Report any malfunction or irregular operation of the equipment.
- 27.** Do not operate an equipment that has been modified without previous PROWINCH® approval.
- 28.** Winch damper helps to prevent wire rope recoil in the event of a wire rope failure. Do not approach or move the damper once tension is applied. Do not allow it to get pulled into the fair lead.



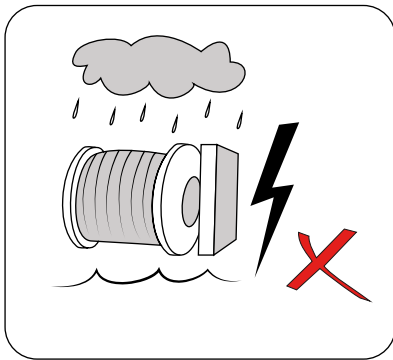
1. Do not exceed winch or winch rope rated capacity.



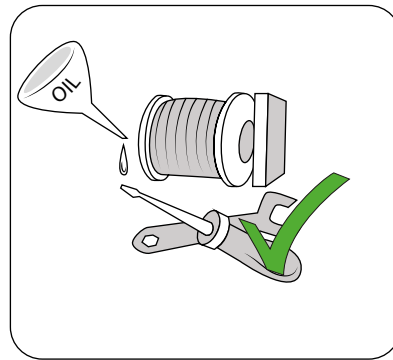
2. Do not route electrical cables across sharp edges, near parts that get hot and/ or through or near moving parts.



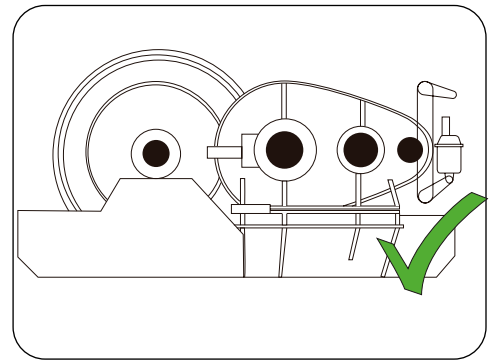
3. Always inspect winch rope, hook, and slings before operating winch. Frayed, kinked or damaged winch rope must be replaced immediately.



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



5. During winching operation always be aware of stability of vehicle and load during winching, keep others away. Alert all bystanders of an unstable condition.



6. Always verify installation before operating.

STRUCTURAL CHARACTERISTICS

After years of experience with these Winch models we have responded to the requests of our clients, improving the design constantly, the Prowinch® Winch now features the following advantages: German drivers, various options of brakes to the motor, to reducer and direct to the drum according to request. The Prowinch® Electric Winch consists of a base, drum, reduction mechanism, motor, brake systems, cable and guide cable as optional. It can be easily installed and disassembled, which is convenient for transportation. All parts of the frame are made of steel and compact in shape.

It has no chains or straps, making this unit very reliable and without risk of failure. The brake system, the mechanism gearbox and electrical components are components Standards. These parts can be easily replaced. All the units have an emergency stop button, and dead man's keypad, it also offers a wide range of controls according to your need.

The available systems allow different configurations, for travel limiters, travel control via encoder, speed sensor, speedometer, odometer, voltmeters, ammeters and a number of functions available and programmable according to your need.

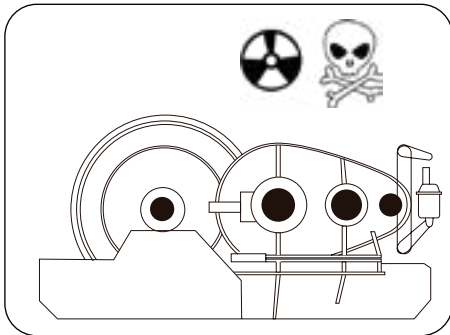
GENERAL ENVIRONMENTAL PRECAUTIONS



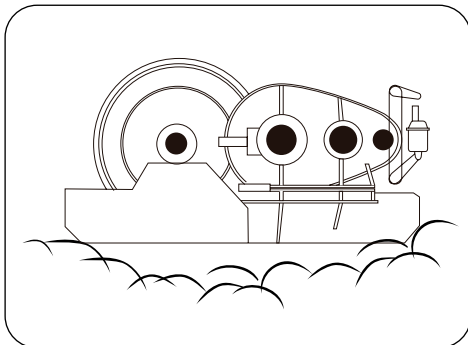
DANGER:

The following environmental conditions can cause malfunction of the winch.

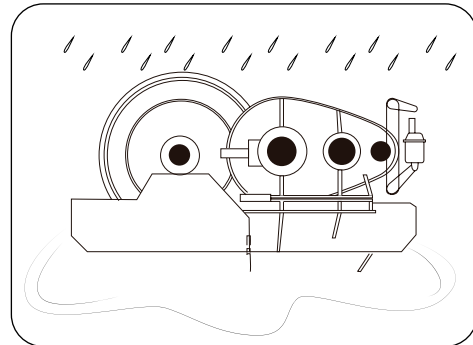
The following environmental conditions may cause malfunctions in the equipment. When operated outdoor, a shelter should be used for extreme weather conditions: below -10°C or above 40°C



If used near chemicals, corrosive gas or explosives may cause an explosion. Exposure to salt or acids may cause malfunctioning.



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



Exposure to sand may cause malfunctioning.

WARNINGS



**WARNING:**

The customer assumes the responsibility of having his unit installed by qualified persons who comply with the standards required in this manual. All structural calculations must be done by a Calculation Engineer duly accredited and certifying the installation. Improper installation can cause serious Accidents to users and people close to the unit's place of operation. Poor installation or incorrect will immediately expire the warranty of the unit, as in the case of performing a electrical connection that does not meet the specifications described in the Manual of each unit or the general rules for its consumption.

**WARNING:**

All electrical installation must consider the peak or maximum starting consumption.
Note: Check the automatic curve.

Installation and test run

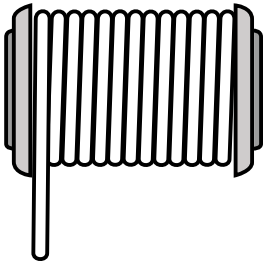
- At the job site, install the machine and secure it according to standards calculation.
- Test that the electrical installation meets the requirements of the unit to be installed. If the working voltage tested in the site does not meet the requirements stipulated on the plates product data, it may cause damage to parts winch electric and motor. The voltage should be in the range +/- 5% of the specified value.
- If the electricity connection circuit is correct, the direction operating conditions of the winch should match the of the control keypad. If not, check that the phases are not reversed.
- Before using the Winch Prowinch®, run it empty, without load and ensure that each component and system of brake are all in good condition. After do this, get to work.
- Initial no-load test: While raising or lowering a certain number of times, there should be no vibration or any unusual sound.
- Load Test: Raise and lower a rated load multiple times. Check Winch and Carriage During Test, Check and Measure electrical connections to confirm that they are normal and reliable.
- When the test load is lowered, apply the brake while still It is found hanging in the air to test its effectiveness.

**WARNING:**

The installation of winches on bases not properly aligned and without the exact anchor holes, unit warranty expires immediately

Wire rope installation

The direction of the steel cable must be as shown in the illustration. It is necessary that the end of the cable is coiled at least 5 turns on the drum to support the load.



WARNING:

It is the user's responsibility to periodically check the condition of the steel cable, anchor or any part that may be loose, worn or damaged, both on the unit and on the object to be towed.



DANGER:

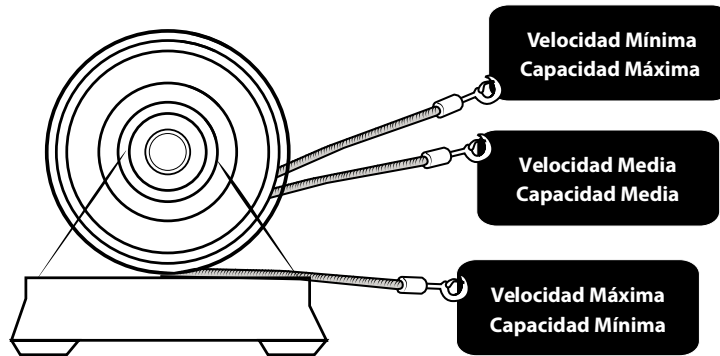
Only change the steel cable with a cable that Prowinch® Recommend you.

Load capacity

The load capacity and speed vary according to how much steel cable is in the drum. The first layer of cable in the drum moves at a slower speed, but can move more than the stated capacity.

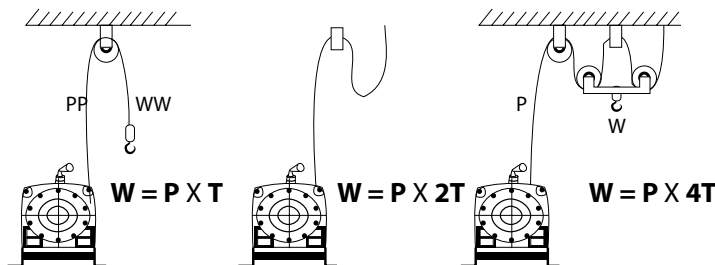
Full drum reaches maximum speed and indicated load.

Therefore, the load capacity of the winch is determined by the capacity of the drum when it is full, that is, it is indicated the minimum capacity of the unit.



Load calculation

- Pulley coefficient



P - String tension
 T - Pulley coefficient
 W - Load

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

Trolley capacity to pull load

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

Necessary conditions to use

1. Pull evenly using only a wire rope.
2. Depending on the incline, the maximum capacity to tow is up to 10 times the lifting capacity indicated on the equipment, which includes the weight of the car.
3. The steel cart must have wheels with wheel control precise.
4. The carriage track cannot have an error greater than 2 degrees lateral deviation.

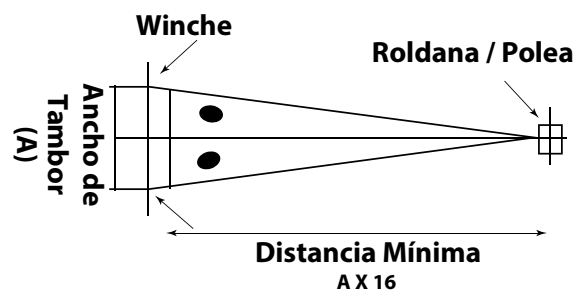
Work angle calculation

To obtain a uniform winding of the steel cable the angle working pressure (θ) should not be higher than 1.5 degrees.

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

Example: A drum 11 centimeters wide ($11\text{ cm} \times 16 = 176\text{ cm}$) can work at a minimum distance of 1.76 meters.

In the image we can see the Drum (A) and the pulley, catalyst or rolled.



Choice and installation of the electric cable.

1. Cable specification affects service life and performance of the electric winch and the useful life of the motor. It's very important read the contents in the list of the following form carefully before using it. You cannot use a power cord. Electricity that is less than those listed on the specification below.

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

Example: A drum 11 centimeters wide ($11\text{ cm} \times 16 = 176\text{ cm}$) can work at a minimum distance of 1.76 meters.

In the image we can see the Drum (A) and the pulley, catalyst or rolled.

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

2. The length of the feeder cable, in the list located on the form, it cannot exceed 50 meters. The feeder cable should be thickened if this measure is exceeded, to avoid a fall tensile.
3. When used in construction, conductor must be used whose conductive core is formed by a series of conductive wires or wires of low section, which gives great flexibility and increased security.
4. When the cable is connected to electricity, it should be done straight to the master switch and held firmly in place using a bolt.
5. Each cable line connection must be secured in its place by using a bolt; if it were released, the contacts would be connected incorrectly, producing sparks or high temperatures, etc. This would influence the life of the machine.
6. The cable line must be fixed from one end. By fixing it, the cable must be firmly connected; if one or more got loose, then the voltage would drop, which would seriously influence on the performance of the machine.
7. To ensure the safety of people the green wire it must make contact "to ground". Your feeder line must be installed inside an additional switch to prevent leakage.

Trainings

Prowinch for the purpose of contributing to the protection and integrity physics of all users, workers, employees, employers, owners and all related persons with the operation and use of winches, conducts training for the use and maintenance of winches applied to different Types of works. This with the understanding that security does not has to do only with a particular product, but that also with the entire chain of processes involved in the installation, operation, maintenance and use of the aforementioned equipment.

For this purpose we have developed Instruction Manuals applied to the Use and Maintenance of Winches and Lifting of Personnel Platforms, which contain important references and indications that must be known, considered and observe to make a safe and correct use of the winches, so that together with their components and accessories can safely comply with the life and work cycle expected. These manuals have been developed with the takes into account the experience gained and based on the main indications emanating from the ASME B30.7 Winches and ASME B30.23 Lifting Systems for Personnel.

It should be noted that Prowinch has acquired the rights and received the corresponding authorizations and licenses by the American Society of Mechanical Engineers ASME to translate and reproduce these standards, with the written consent of the Department of Codes and Standard of the same ASME, in order to apply them in our instructional manuals in a certain number of copies controlled and copyrighted corresponding. We invite you to meet us and we will gladly give you our advice.



WARNING:

Any type of intervention in the unit by people other than Prowinch® or not trained by Prowinch®, will immediately expire the warranty of the same.

Operation and maintenance

Lubrication

The quality and service life of the mechanical structure of the winch Electric Prowinch® depend on continuous and correct lubrication, therefore lubrication is one of the main requirements of maintenance. Prowinch® Electric Winch Parts Form Required lubricating oil

N	Name	Oil Application Frequency	Lubricant Type	Materials		
1	Steel wire	Generally once every 15-30 days depends on the actual condition of the lubrication	Heat the lubricating oil to 80 °C- 100 °C, and soak until saturated.	Use greased steel cable with a fiber (Q / SY1125 ~ 65), Use graphite calcium oil (SY1405 ~ 65) or other oil.		
2	Gearbox	Lubricate before first use, then every 6 months.	Check oil level periodically according to indicator rod	Use HL30 sprocket shaft (SY1130-77) (in the summer); Use HL20 gear shaft (SY1130-77) (in winter).		
3	Coupling gear	For the PWK series, once a month; Serie PWM once every 3-6 months.	1) Operating temperature is between -20 °C and 50 °C. 2) Above 50 °C. 3) Lower than -20 °C.	1) Use any lubricant, but not mix different types. 2) Industrial lithium oil (Q / SY1-65), # 1 in the winter and # 2 in the summer. 3) Use # 1 or # 2 special lubricant (QSY-7).		
4	Roller bearing					
5	Slide bearing					
6	Inner wheel reel	For the PWK series, once a day; PWM series, once a week; each major maintenance, lubricate thoroughly				
7	Motor	Annual repair or major maintenance			1) Common motor 2) Grade H insulation and heat belt wet	1) Aluminum oil (Q / SY1105-66) 2) # 3 lithium oil
8	Crank operation ream brake system crank ream	According to need			Axis	HJ20 machine oil
9	Crank brake system ream	Each week	Spring pin	HJ20 machine oil		

Stub shaft maintenance

The stub shaft sprocket has a shape that does not allow you to move in the opposite direction. After the oil on the surface of the sprocket has been removed cannot lubricate. If you do not apply the oil in time it is probably rejected within a few months. Stub Shaft Maintenance Form

Name	Part to review	Repair standard	Review period
Axis of Coupling	1) If there is a crack in the stub shaft. 2) If it is well sealed or not.	1) It has a crack. 2) It is not well sealed.	Every 3 months
	3) Abrasion of the tooth.	3) The tooth size of the lifting mechanism is worn 15% (for lifting dangerous loads, 10%), mechanism tooth size is worn 30%.	
	4) Oil. 5) Gear shaft seal condition	4) Clean and replace the oil every three months. 5) The shaft seal is loose	

Gearbox maintenance

1. Periodically check the oil level and quality.
2. Check for oil leaks.
3. Check condition of gears and teeth.
4. Change oil semi-annually or annually according to use.

Name	Part to review	Repair standard	Review period
Sprocket wheel Gearbox	1) If the gear face tends to tangle and the gear degree of wear.	1) Abrasion of sprocket tooth cannot exceed 15%, Sprocket mechanism abrasion cannot exceed 30%.	Once a week
	2) If there is a defect in the tooth and / or gear.	2) Tooth with defect, and / or ray with defect. 3) Painted surface and fatigue can not chip more than 30% of the surface of the sprocket and cannot be more than 10% of the thickness of the chipped tooth.	
	3) Point of tooth contact.	4) Loose connection 5) You have to hold the bolt that is loose 6) Oil cannot seep over edge. Replace the oil if it is dirty or has metal foam.	

Brake system maintenance

Reasonable maintenance of the brake system is related to the safe operation of the winch. Check calibration, tolerances, condition of brake pads and flywheel, oil level and electrical connections.

As for the electromagnetic brake system, during operation, please pay close attention to the electromagnetic bolt and check whether it is loose. The brake system can't be too tight either.

If it is too tight when lifting a load it can be damaged and that will cause the axle to vibrate.

That affects the life of the entire unit. When the brake system breaks down, you need to pay attention to the following:

1. Check the operating condition of the brake system frequently.
2. All transmission systems in the brake system must respond quickly and the spring pin must not close. Once a month you should coat each transmission joint with lubricant.
3. Empty travel caused by the distance between the brake and the spring pin must be less than 10% of the electromagnetic travel.

Brake check form

Name	Part to review	Repair standard
System brake	Brake flywheel abrasion and play brake	If the abrasion of the pads is greater than 50%, replace them.
	Flywheel brake and surface	When the surface of the brake flywheel wears more than 1.5-2mm or the surface has many holes of 1mm, you have to fill them. After doing that, if the steering wheel wall is less than 50% of its original thickness replace it.
	Pull bar and head abrasion hinge	If the shaft and shaft center abrasion is greater than 5% of the original diameter and the hole abrasion is greater to 5% of the original diameter, then the pull bar and spring will have a crack. It can cause permanent damage. You must replace it.
	Whether the brake is tight or not	Adjust the brakes if they are not tight enough or if they are too tight.

Steel Cable Roll Review Form

Name	Part to review	Repair standard	Review period
Roll of Cable	1) If the cable reel is out of shape or has a defect.	1) It has a defect.	Every 3-6 months.
	2) Abrasion of the roll wall.	2) The wall thickness decreases by 15 - 20%.	



WARNING:

The installation of winches on bases not properly aligned and without the exact perforations of anchor, unit warranty expires immediately.

PROWINCH® WARRANTY

- 1.** All Guarantee is only valid with its respective Ticket or Invoice for a period of 1 year from the date of issue.
- 2.** Units type Stationary Load Lifting Equipment and with Cart 220V ~ 500V, although they are designed to lift loads, It is strictly forbidden to use it to lift People or objects / load on them. Everyone must keep away from the projection of the cable, hook and load.
- 3.** For 220V ~ 500V units, the capacities indicated in each unit they are supported in all range of travel.
- 4.** It is the responsibility of each user to have their unit installed by qualified and compliant individuals required in the manual of each unit and in these indications. All structural calculations must be done by a Calculation Engineer duly accredited and certifying the installation. Improper installation can cause serious accidents to users and people close to the place of operation of the Unit. An unsuitable installation expires immediately the unit warranty.
- 5.** It is the responsibility of each user to operate the equipment by personal properly qualified according to the corresponding ASME B30 standards. As well as maintain and carry out the guidelines of maintenance and reviews described within the same standard. Prowinch conducts training and certifies operators.
- 6.** In the event of making an electrical connection that does not comply with the specifications described in the manual of each unit or the general rules for its consumption, it will expire immediately the warranty.
- 7.** It is the user's responsibility to periodically check the status of the steel cable, anchors or any part that can be loose, worn or damaged, both in the unit and in the object to be towed or lifted.
- 8.** The user is responsible for using the security elements required for the operation of these units: Leather gloves thick, work helmet, safety shoes and protection of polycarbonate for sight. He also has to ensure that all close people, are using these same elements of security.
- 9.** Any type of intervention in the unit by people or companies outside Prowinch is cause for immediate expiration of the unit's warranty.
- 10.** All Prowinch equipment has warranty stamps on its part motor and reduction gear, the lack or rupture of these seals is a reason immediate expiration of the warranty.
- 11.** Installation of winches on bases not properly aligned and without the exact anchor holes it expires immediately the warranty.
- 12.** It is the responsibility of the user to supply the equipment with stabilized current, with the corresponding voltage and cycling for each unit.
- 13.** The Prowinch warranty covers only manufacturing defects.
- 14.** Any unit that shows signs of abuse, severe use by on their indicated capacities and / or, present Coils, Stators, Rotors, or burnt circuits are not covered by the warranty.

PROWINCH® WARRANTY

15. It is the user's responsibility not to exceed the indicated loads of each unit, if you have any questions about the installation, use or operation of your unit and / or requires training, request technical assistance at www.prowinch.com.

16. All guarantees are given in our facilities. Spare parts sent by guarantee to other cities or countries not include shipping costs, these have to be covered for the client.

17. The warranty does not cover the costs of moving the equipment, dismantling, transfer of personnel, loss of earnings, work stopped or any other cost that could be related to the cessation of operation of a team.

18. In the case a technical visit to the field is requested, it is always will be canceled by the client, regardless of whether she will perform services at no cost covered by the warranty. I know understands the costs involved as a technical visit to the field for the transfer of personnel, transportation, fuel, food, accommodation, overtime, etc.

19. The guarantee is only valid to the direct buyer, not extending if it sells, transfers or transfers the product to third parties.

20. Warranty exclusions:

- If the fault is caused by meteorological agents.
- If the breakdown is caused by external agents such as: fire, water, shock, crushing, or application of voltage or power inadequate.
- Damages caused by physical breakage, such as casing, plastics, paints, enamels, crystals, trimmings, the like.
- Products that present damage caused by improper transport, vandalism, sand, natural disasters such as earthquakes, floods, fires, etc.

21. Expiration of Guarantees:

- Included: 1 Year from the date of purchase indicated on the Bill or invoice.
- Contracted: 2 Years, Extra guarantee contracted by the client at time of product purchase.

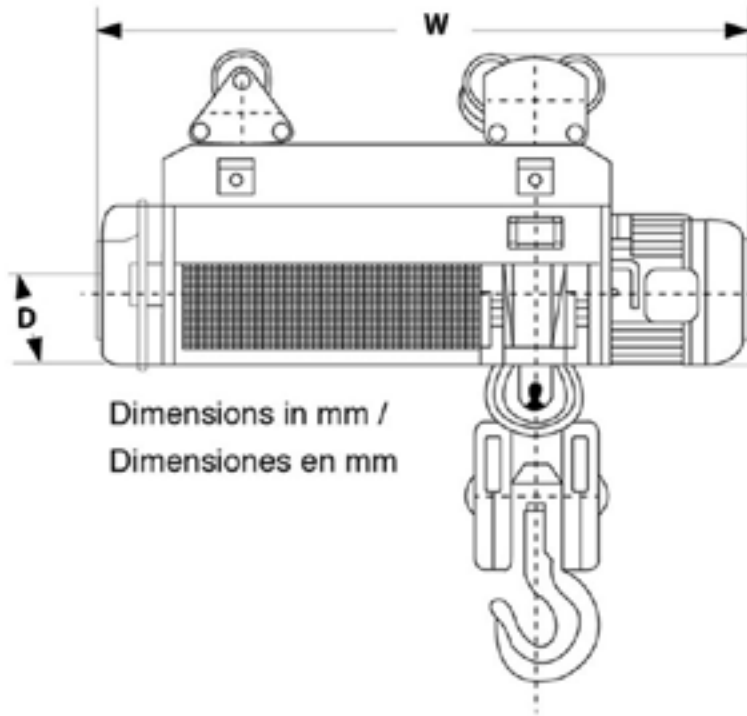
PWMD1T24M



Code		PWMD1T24M
Capacity	Lb	2204
Lifting Height	Ft	80
Motor Power	kW	0.4-3
Voltage	V	220~240/380/440~480V 50/60Hz 3 Phase
Motor Speed	RPM	
Insulation Grade	Grade	F
Noise Level	dB	82
Control Voltage	V	24
Weight	Lb	
Duty Class	FEM/ISO	
Standards		ASME HST-4 , ASME B30.16 , B30.17 , EN14492-2 , EN60204-32
Wire Rope		ø9/16 in x 79 ft

3 Years Warranty

Part List



Faults, Cause, and Correction

Faults		Major Cause	Check Items	Remarks
Does not operate in non-load state	Brake inaudible	Excessive voltage	Power	
		Contactor is inaudible	Operating circuit break-off, electric parts overheating	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 audible		Drive overheating, broken bearing
Operates in non-load state	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	Anti-phase wiring	Feed power	
		Incorrect 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 Load chain Load pulley, bare pulley Gear Bearing	
			Running (grating)	Drag
Noise of brake Stop	Wear of friction plate		Brake	
Abnormal noise of rail curve (grating)	Obstruction of orbit/wheel	Operation of trolley		

Faults, Cause, and Correction

Faults	Major Cause	Check Items	Remarks
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	
Load chain	Equipment not properly grounded	Proper electric connection	
Does not operate in nonload state	Brake inaudible	Supply Power	Supply power voltage
		Operating circuit break-off, electric parts overheating	Cables
			Internal wiring
			Transformer
			Electrical relay
			Limit switch
		Braking interval too large or small.	Motor
	Tripping as motor overheats	Calibrate brake	
	Brake audible	Bearing burning out, driving component wear	Thermal Protector
			Replace brake bearing
Slow load operation	Bearing		
Low and high speed status not operating or working slow	Voltage drop	Feed cable	
	Low voltage	Supply power	
Movement does not correspond with switch button	Movement did not correspond with switch button	Voltage drop	Feed cable
		Motor wires connected	Motor
	Switch button did not work	Connection error	Internal wiring
		Operating circuit break-off	Push button switch
	Electrical installation error	Internal wiring	

Faults, Cause, and Correction

Faults		Major Cause	Check Items	Remarks
Does not move horizontally	Electric trolley /manual trolley	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	Brake fastening	Trolley movement	
Irregular movement and noise	Electric trolley /manual trolley	Electric faults	Trolley movement	
		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	

Does not operate in nonload state	Brake inaudible	Supply power	Supply power voltage	
			Cables	
			Internal wiring	
		Operating circuit break-off, electric parts overheating	Transformer	
			Electrical relay	
	Brake audible		Push button switch	
		Braking interval too large or small.	Motor	
			Calibrate brake	
	Slow load operation	Tripping as motor overheats	Thermal protector	
		Bearing burning out, driving component wear	Replace brake bearing	
		Bearing		
Low and high speed status not operating or working slow	Voltage drop	Feed cable		
	Low voltage	Supply power		
Movement does not correspond with switch button	Movement did not correspond with switch button	Low voltage	Feed cable	
		Motor wires connected	Motor	
	Switch button did not work	Connection error	Internal wiring	
			Push button switch	
		Operating circuit break-off	Internal wiring	
		Push button switch		
		Electrical installation error	Limit switch	

Issues & Measures

Power supply

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.
	Overheating	Check cables, exchange if overheating	Twisted, knotted	Straighten twists and knots
			Interference with other equipment	Use fixed cable and avoid outside interference
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 2phase)	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 single 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	
Friction plate wear	Measure brake clearance, replace if space is over use limit		Condensation	Monitor usage environments	
				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	
			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 (overheating)	Fastening		Improper fastening	Ensure effective fastening
				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

Contactors & 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 fused	Operate limit switch. Check continuity of contactor, replace if cannot stop	Limit switch used frequently	Avoid overuse of limit switch
	Rusting of moveable 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

C

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 twist	Bottom hook upturned	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 in decline	Chain twist 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 damage	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
	Mark on chain surface		Chain used improperly	Ensure proper assembly
Discoloration	Rust, corrosion	Apply lubricants and replace when obvious rust and corrosion occurs	Damaged by other equipment	Monitor surrounding environment throughout usage to avoid collisions
			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
Abnormal sound	Aging	Replace bearing		

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 traveling 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 connection	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