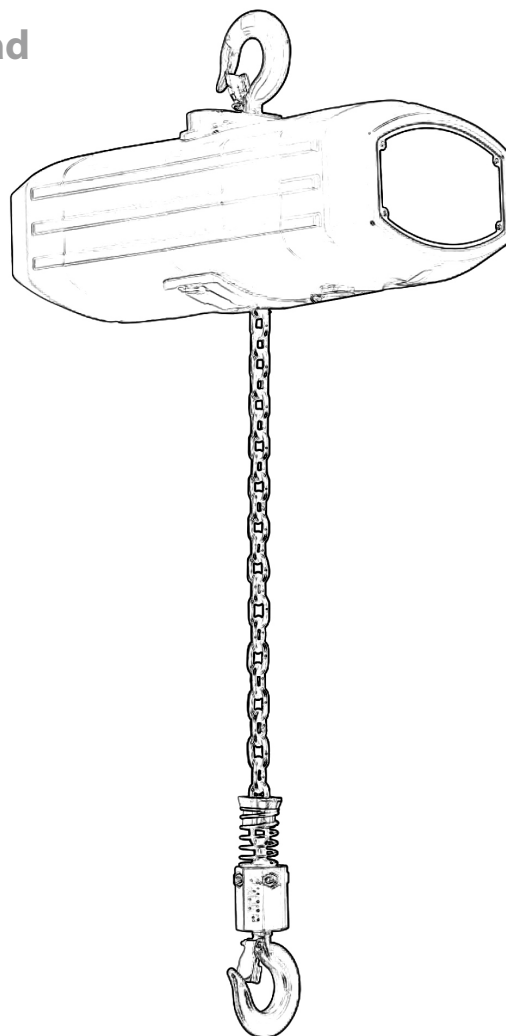




## **PWRT & PWRF Single phase models**

---

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



**This page intentionally left blank**

PROPERTY REGISTRY N° 189487  
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.
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](mailto: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](http://www.prowinch.com).

Always check [www.prowinch.com](http://www.prowinch.com) for the latest information regarding this product.

Disclaimer .....	3
Safety Precautions .....	6
Hoist Safety Precautions .....	7
Before Using the equipment .....	7
During Operation .....	8
Inspection, Maintenance and repairs .....	8
Specifications .....	11
Product Code .....	11
Specification Chart .....	11
Load Level and Service Life .....	12
Fixed Hoist Specifications .....	13
Trolley Hoist Specifications .....	17
Hoists Dimensions .....	18
Oil & Lubricant Recommendations .....	19
Installation .....	19
Installation .....	19
Unpacking .....	19
Chain Bag Assembly .....	20
Electrical Connections .....	21
Install Trolley (models with trolley) .....	23
Adjust Trolley Width (models with trolley) .....	23
Install Trolley into Beam (models with trolley) .....	23
Supply Voltage .....	23
Operation .....	24
Qualified Operator .....	24
Handling Precautions .....	24
Recommended Operation .....	25
Parts .....	27
Exploded view and parts list .....	28
Motor and body assembly drawing .....	28
Motor and body assembly parts list .....	28
Trolley assembly drawing .....	30
Trolley assembly parts list .....	31
Inspection & Maintenance .....	32
Operation .....	32
Periodic Inspection .....	32
Troubleshooting .....	36
During operation .....	36
Power Cable .....	38
Motor .....	38
Brake .....	39
Inside Wiring .....	39
Transformer .....	40
Contactor & Electric Reply .....	40
Limit switch .....	41
Push Button switch .....	41
Electric shock .....	42
Hook .....	43
Load Chain .....	43
Chain Wheel .....	44
Load pulley and empty pulley .....	44
Chain guide .....	44
Chain wheel, junction part .....	44
Bearing .....	44
Trolley .....	45
Electric Trolley .....	45
Manual Trolley .....	45

**Wiring Diagram ..... 46**  
    **Conventional Hoist wiring diagram (PWRP-PWRT) ..... 46**  
    **Hoist Wiring Diagram 1000lbs ..... 46**  
    **Hoist Wiring Diagram 2000 - 4000 lb ..... 47**  
    **Trolley Wiring Diagram (All models) ..... 48**

Thank you for purchasing our Prowinch® Electric Chain Hoist. 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

The Prowinch® Electric Chain Hoist is designed for a safe and reliable service if operated according to the User Manual. Respect and follow all warnings for personnel and third party safety indications. Inadequate operation may cause serious risks of injuries to personnel or damage to the equipment. Read and understand this User Manual carefully before installing and commissioning the equipment. Always keep this User Manual in an accessible place for future reference. The compact and lightweight structure of the PWRT and PWRP models together with their ease of use makes them a preferred hoist for daily use in factories, mines, sea ports and

warehouses. Improperly installed, maintained, or operated hoists can be the cause of serious accidents or death. This User Manual highlights symbols and notes for caution, warning and danger. Following these indications greatly improves the safety of the operator and personnel in the area.

### Mandatory use of:



**Hard Hat**



**Safety Glasses**



**Safety Gloves**



**Safety Shoes**

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

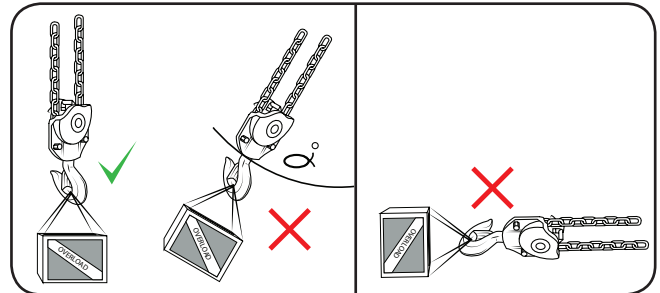
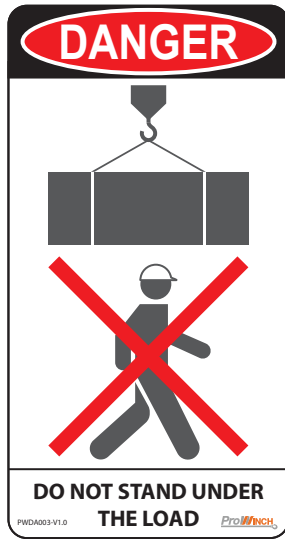
## 1.3. During Operation:

### ALWAYS:

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

### NEVER:

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



## 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.

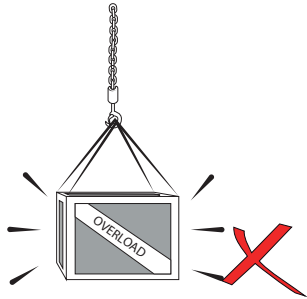
### ALWAYS:

- Check the condition of electrical connections.
- Check the chain and keep it lubricated.
- Prevent others from stepping under lifted load.
- Inspect and maintain the hoist regularly.
- Verify the correct installation of hoist before using.
- Avoid contact with explosive gases or materials.

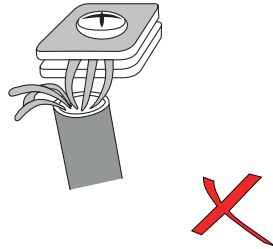
### NEVER:

- **Never** overload the hoist.
- **Never** transport people or animals with the hoist.
- **Never** stand under suspended load.
- **Never** use the hoist if exposed to rain, snow, or lightning
- **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 hoist to water, sand, corrosive materials or other substances which may damage the equipment.

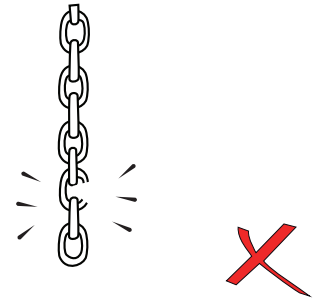




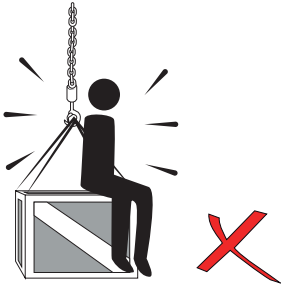
1. Do not overload.



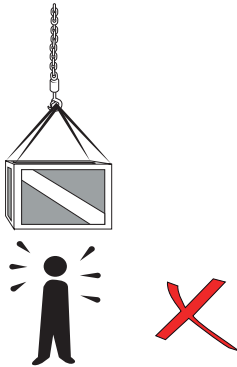
2. Check the proper crimp of the electrical connections.



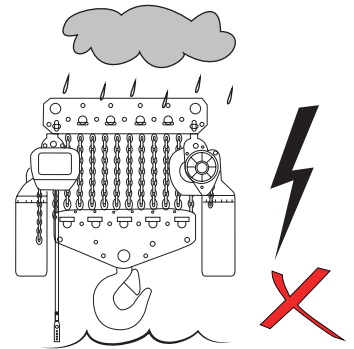
3. Periodically check the chain and keep it lubricated.



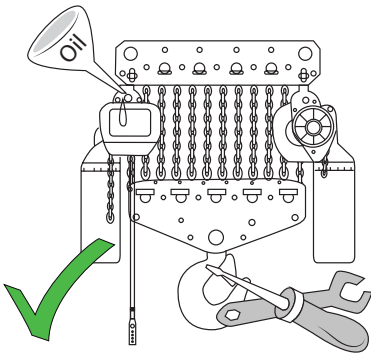
4. Do not transport people or animals with a hoist.



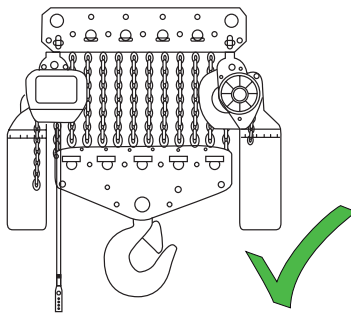
5. Do not step or walk under lifted load and prevent others from doing so.



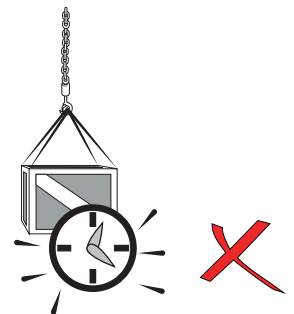
6. Do not use the hoist if exposed to rain, snow or lightning.



7. Inspect and maintain your hoist regularly.

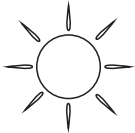


8. Always verify the correct hoist installation before use.

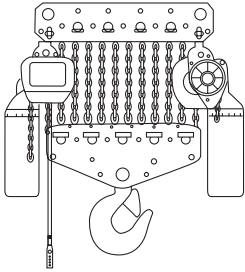


9. Do not leave the load lifted for long periods of time. It may cause deformation of the equipment and increase the risk of an accident.

Do not exceed the operating temperatures for which the hoist is designed. This range is indicated in this manual and may vary depending on the model.

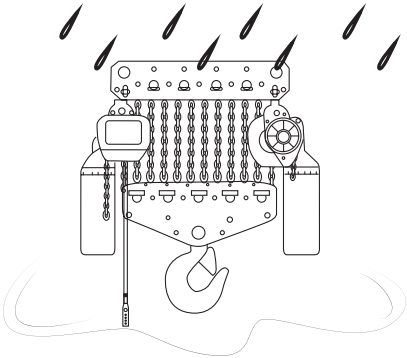
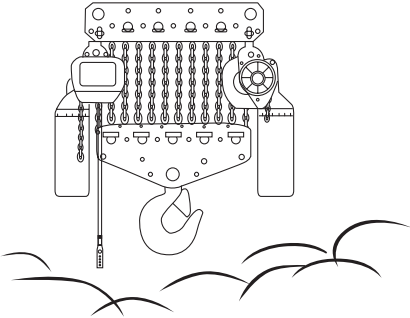


Warning:



Avoid contact with gases or explosive materials.

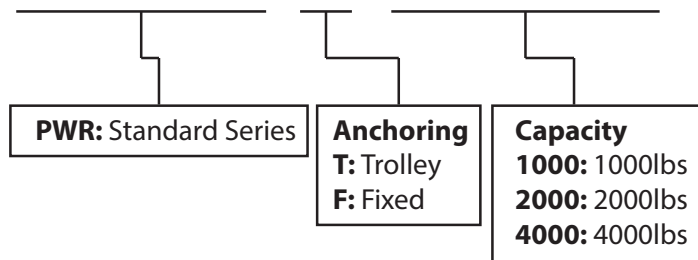
Exposure to water, sand, a corrosive environment, or other potentially harmful elements may damage the equipment.



## 2. SPECIFICATIONS

### 2.1. Product Code.

# PWR F 1000



### 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		3 Phases, 200V - 600 V, 50/60Hz	
Noise Level (db)	Single Speed Hoist	81db	
	Double Speed Hoist	81db	
Chain Specs	Working Load Limit	Diameter (in)	Chain Pitch (in)
	0.3t - 0.5t	0.25	0.4
	1t, 2t, 3t	0.28	0.82
	1.5t, 2t	0.4	1.2
	2.5t, 3t, 5t, 7.5t, 10t, 15t, 25t	0.44	1.33

### 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

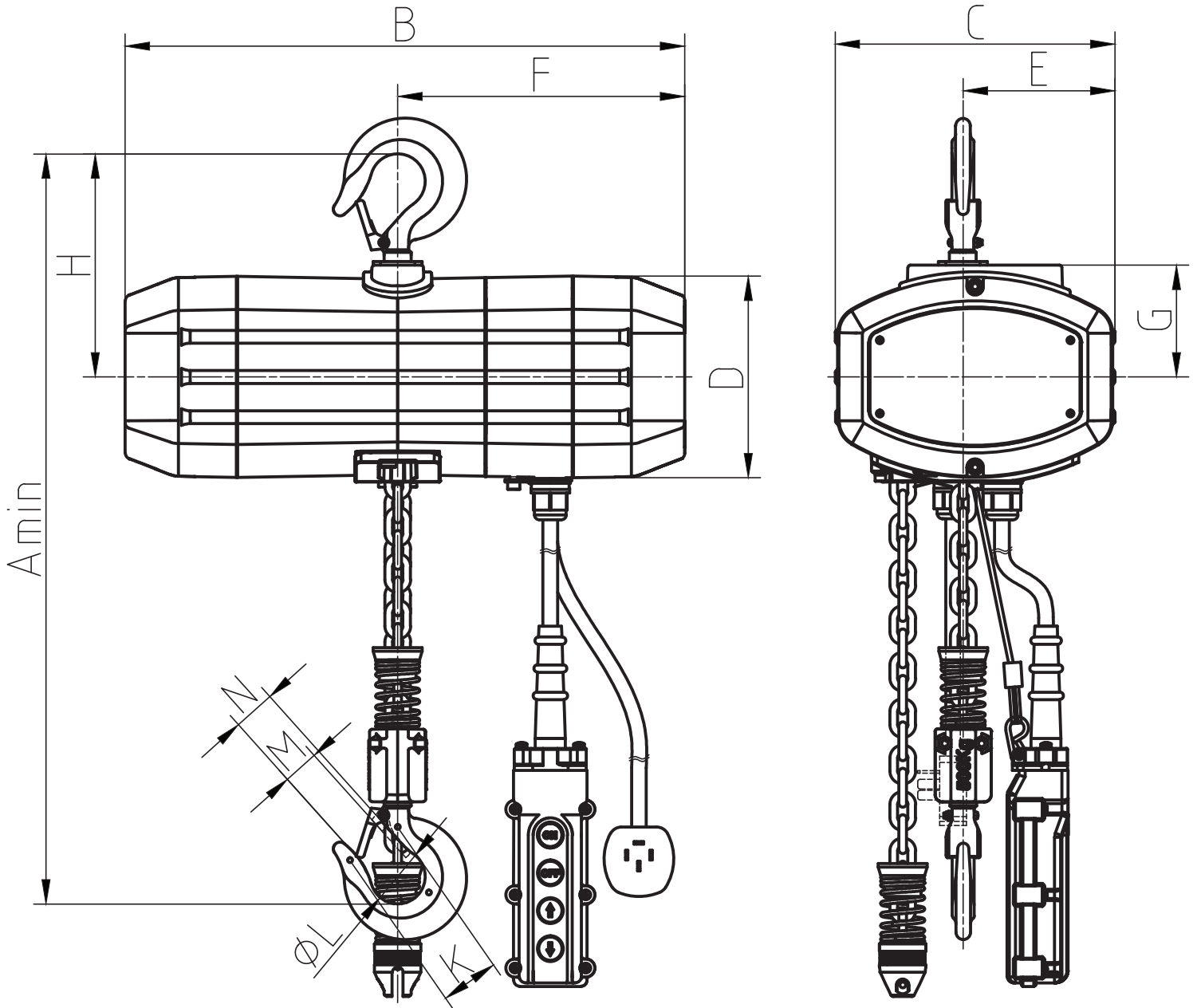
Working Conditions		Load	Time	Maintenance Interval (Months)	Expected Life [Working Hours]				
					800	1600	3200	6300	12500
Light	Light Mechanisms subjected normally to light loads and very rarely to the maximum load.			6 - 12	H1	H2	H3	H4	H5
Normal	Mechanisms subjected normally to moderate loads and 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			

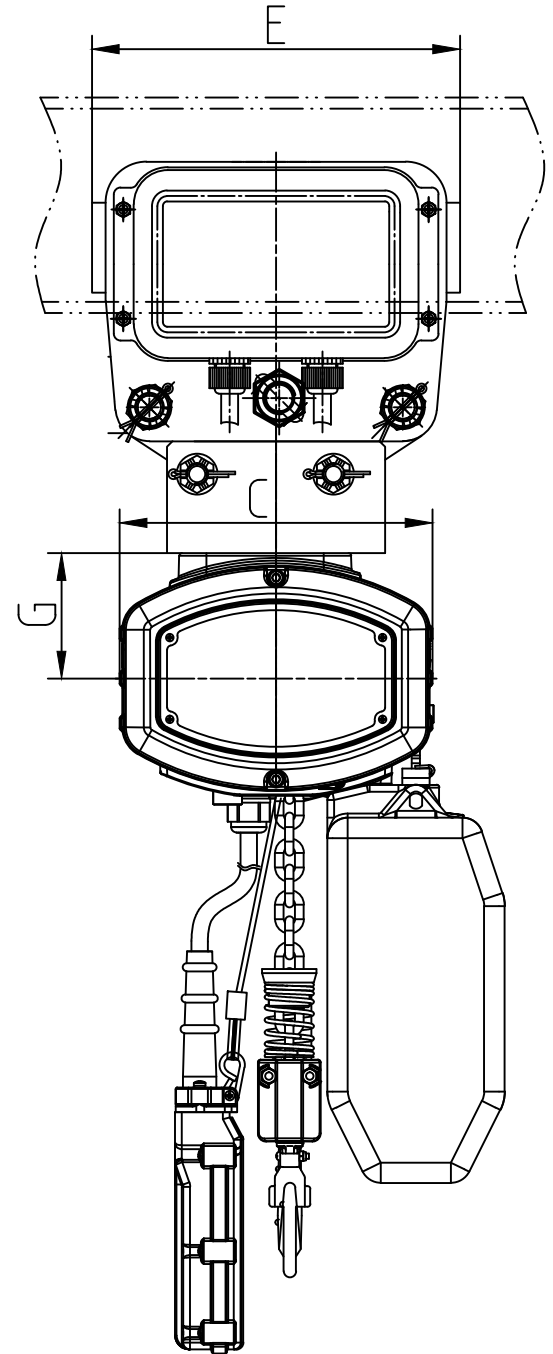
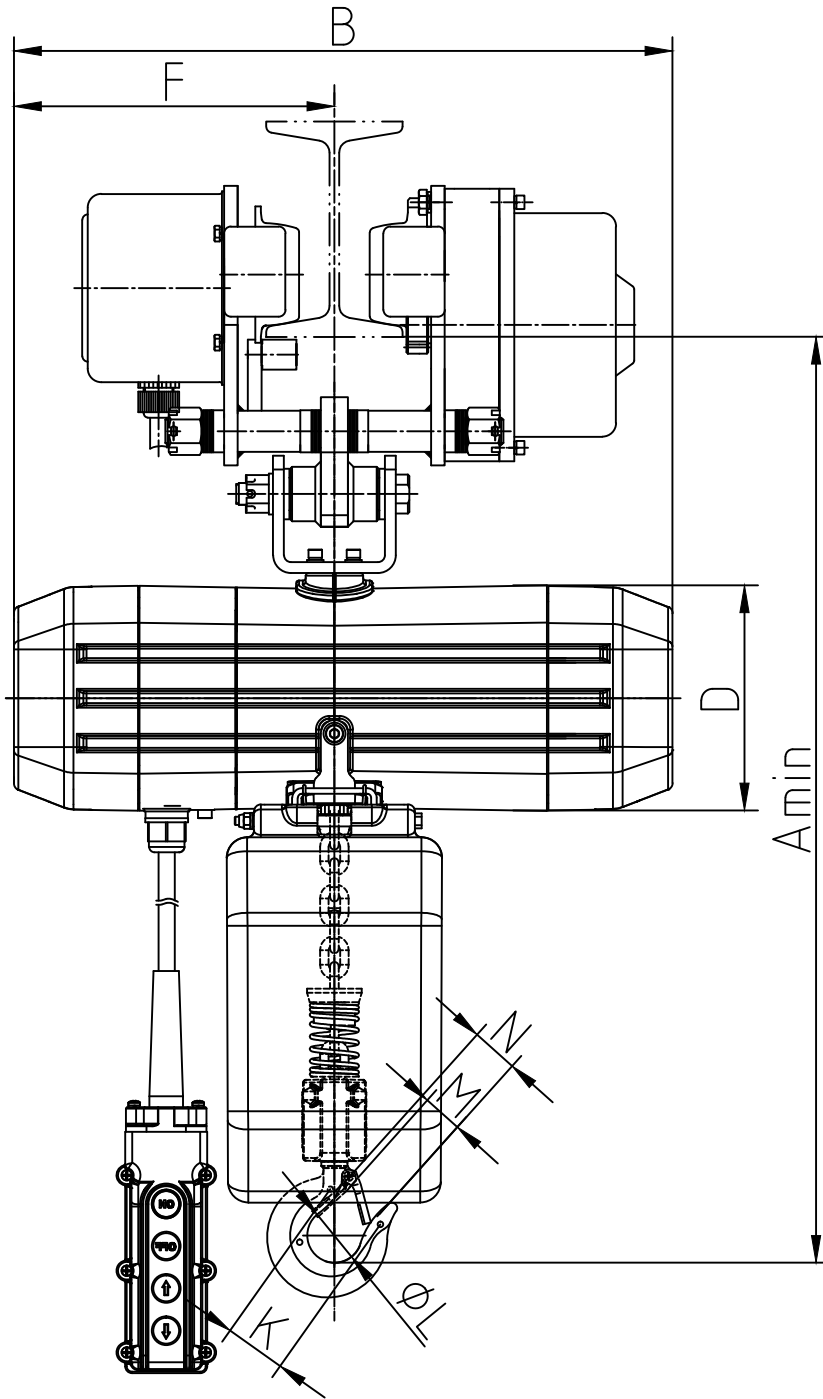
### 2.4. Fixed Hoist Specifications

Specifications	Model			
	PWRF1000	PWRF2000	PWRF4000	
Capacity (lb)	1000	2000	4000	
Lifting Speed (ft/min)	16	16	8	
Motor Power (kW)	500	1300	1600	
Insulation Grade	IP55			
Power Supply	120VAC			
Control Voltage	24V			
No. Chain falls	1	1	2	
Spec. of Load Chain	6.3x19	8x24	8x24	
Net Weight (lb)	94.8	70.5	174.2	
Basic Dimensions (in)	H	6.6	7.8	8.9
	A	17.9	21.5	26.2
	B	18.6	19.4	19.4
	D	6.5	7.6	7.6
	E	4.9	6.7	5.5

## 2.5. Hoist with Trolley Specifications

Secifications	Model			
	PWRT1000	PWRT2000	PWRT4000	
Capacity (t)	1000	2000	4000	
Lifting Speed (ft/min)	16	16	8	
Motor Power (kW)	500	1600	1600	
Insulation Grade				
Power Supply	120VAC			
Control Voltage				
No. Chain falls	1	1	2	
Spec. of Load Chain	6.3x19	8x24	8x24	
Net Weight (lb)	183.0	229.3	262.4	
Basic Dimensions (in)	H	6.6	7.8	8.9
	A	22.0	24.8	29.1
	B	18.6	19.4	19.4
	D	6.5	7.6	7.6
	E	10.6	10.6	10.6







## 2.6. Hoists Dimensions

Model	Dimension (in)											
	A	B	C	D	E	F	G	H	L	K	M	N
<b>PWRF1000</b>	17.9	18.6	9.0	6.5	4.9	9.3	3.6	6.6	1.6	1.8	1.1	1.2
<b>PWRF2000</b>	21.5	19.4	11.6	7.6	6.7	9.7	4.5	7.8	1.8	1.9	1.2	1.4
<b>PWRF4000</b>	26.2	19.4	11.6	7.6	5.5	9.7	4.8	8.9	2.2	2.5	1.5	1.7
<b>PWRT1000</b>	22.0	18.6	9.0	6.5	10.6	9.3	3.6	6.6	1.6	1.8	1.1	1.2
<b>PWRT2000</b>	24.8	19.4	11.6	7.6	10.6	9.7	4.5	7.8	1.8	1.9	1.2	1.4
<b>PWRT4000</b>	29.1	19.4	11.6	7.6	10.6	9.7	4.8	8.9	2.2	2.5	1.5	1.7

## 2.7. 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

### WARNING

**Failure to keep the load chain clean and well lubricated will void the warranty.**

**ALWAYS Lubricate load chain weekly, or daily, depending on service severity.**

**ALWAYS in a corrosive environment lubricate more frequently.**

**ALWAYS Use lubricant oil equivalent to ISO VG46 or VG68.**

PWWA001-V1.0

### 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  $\pm 10\%$  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)	1 pcs
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

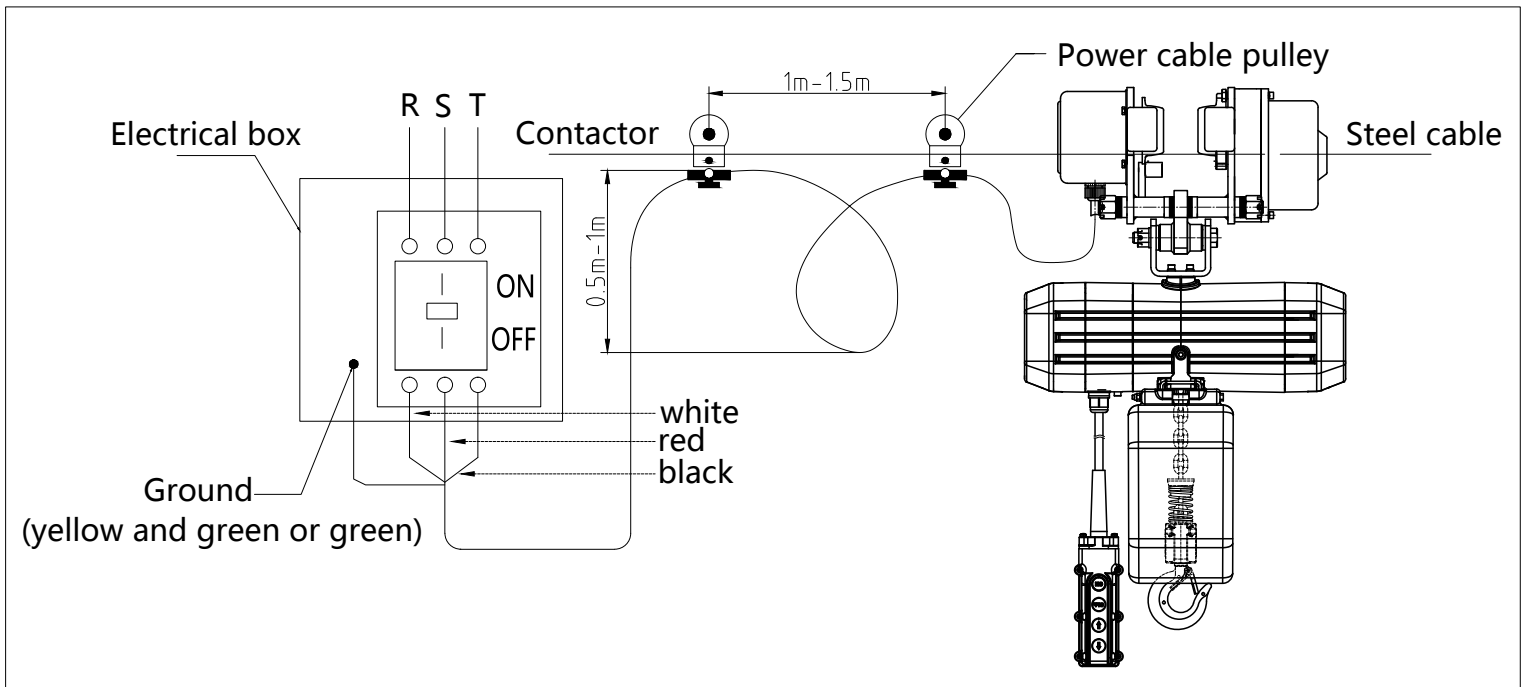
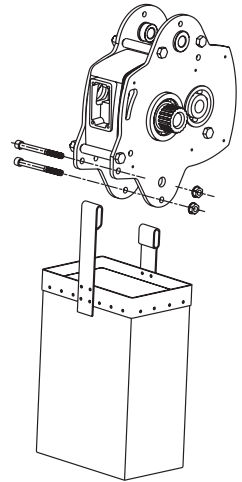
## 3.2 Chain Bag Assembly

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.

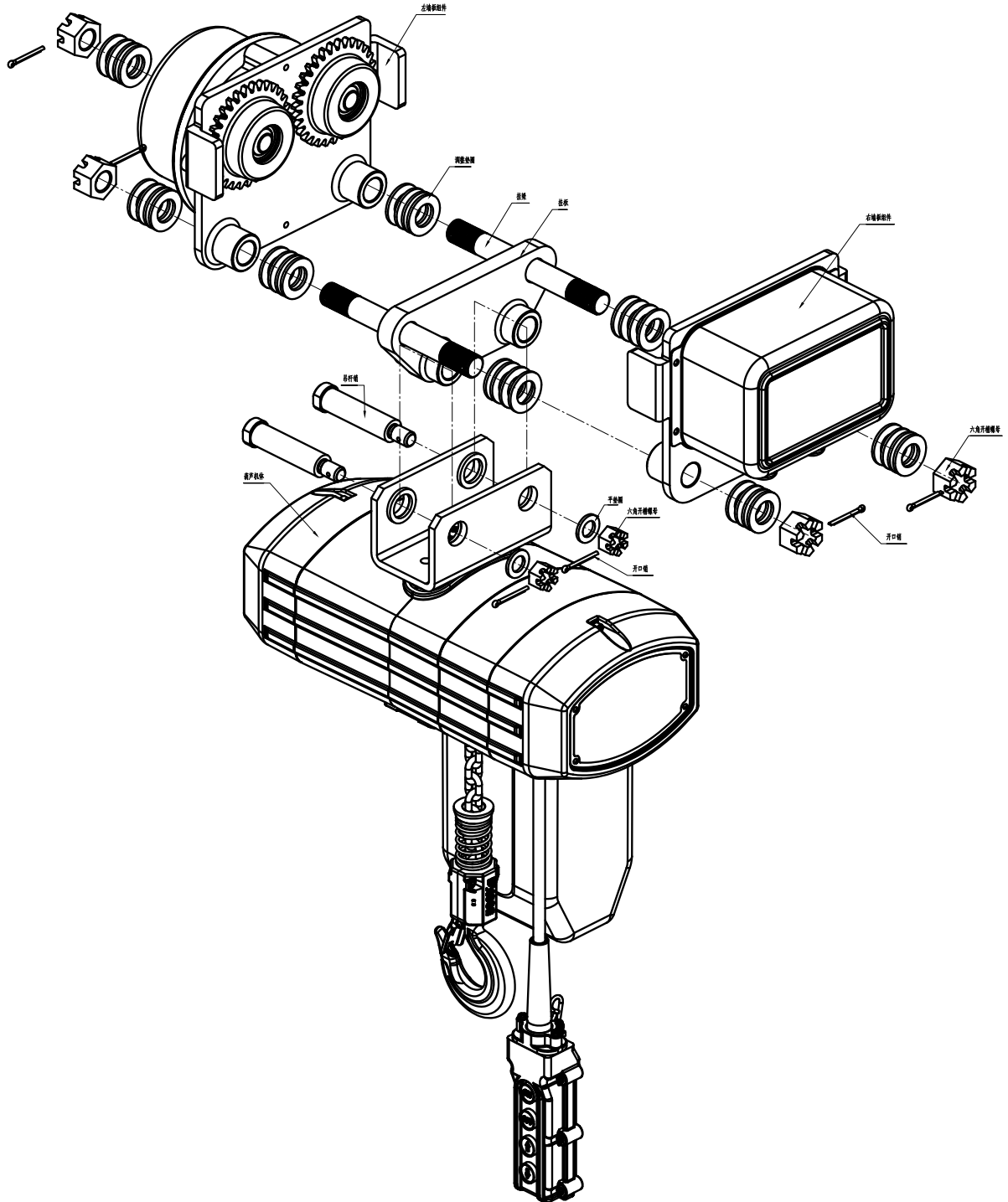
Do not use power supply cables with solid conductors.

An improper or insufficient ground connection creates an electrical shock hazard when touching any part of hoist or trolley



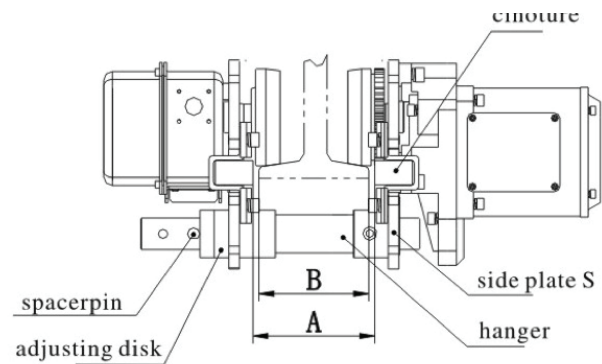
## 3.4. Install Trolley (models with trolley)

- 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.



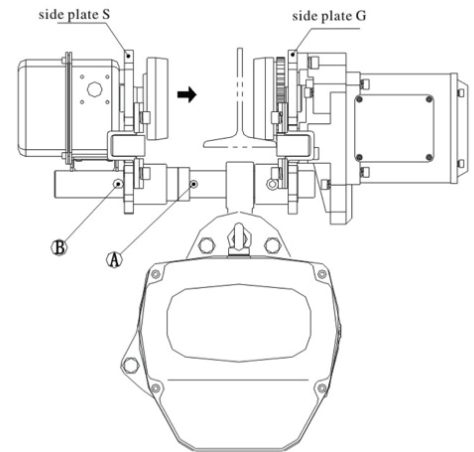
Nut must be tight, insert cotter pin and bend it completely.

### 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:

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

## 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 90° 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.

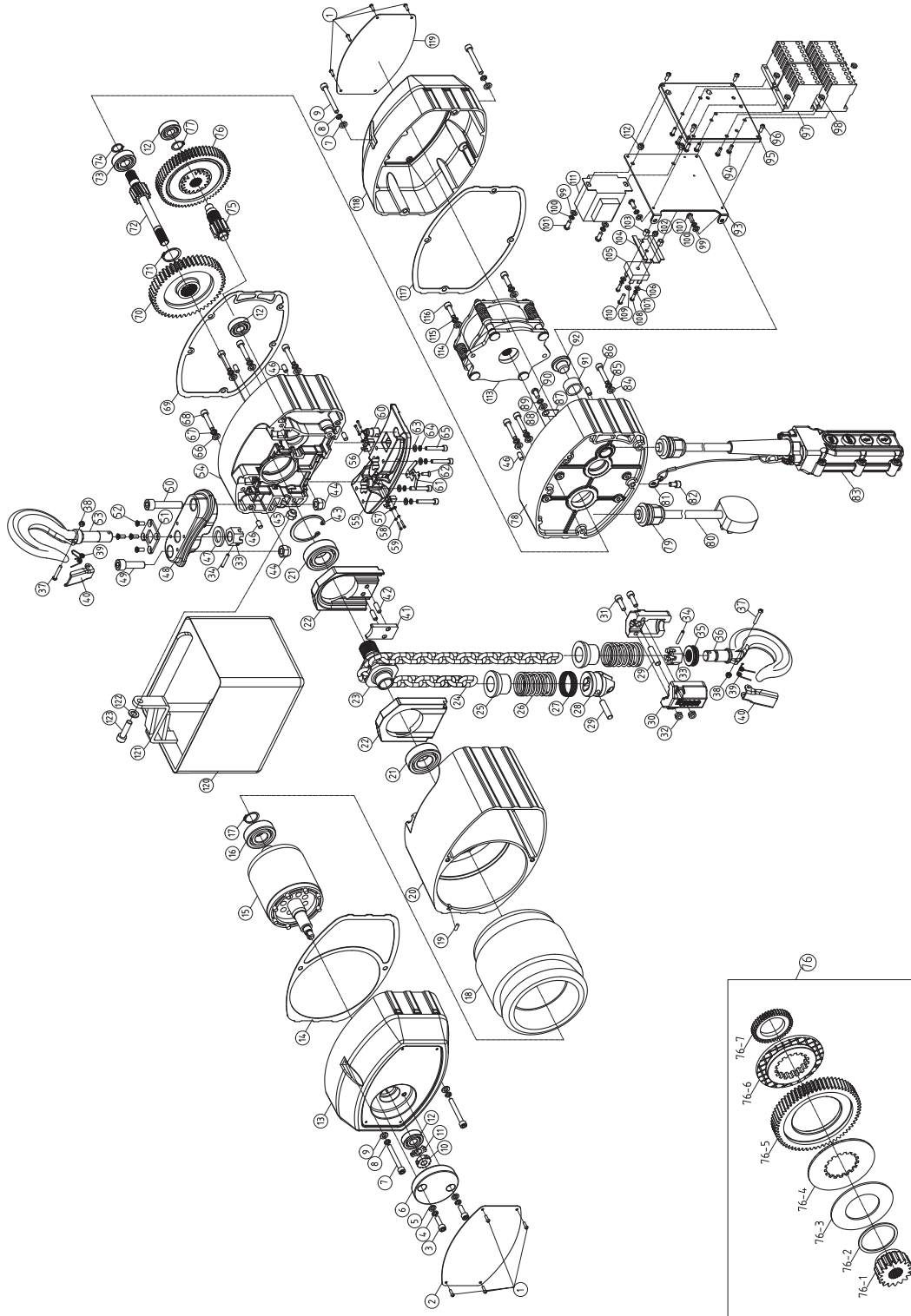


## **DANGER**

NEVER leave load suspended without attention of the hoist operator!

5. H3 EXPLODED VIEW AND PARTS LIST

5.1 Motor and body assembly drawing



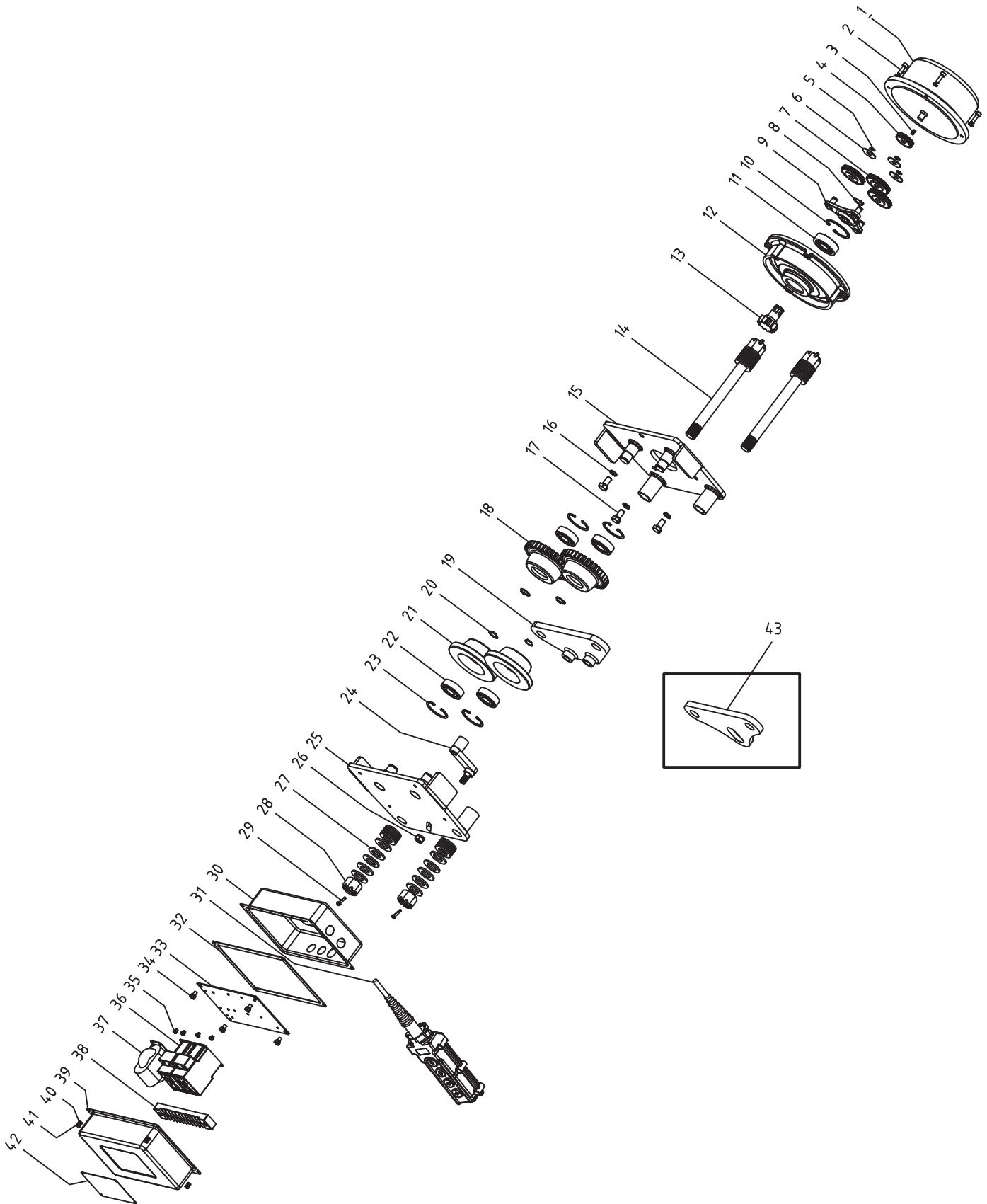
## 5.2 Motor and body assembly parts list

No.	Part Name	Qty.	No.	Part Name	Qty.
1	Screw M3x6	8	37	Screws M4x22	2
2	Capacity label	1	38	Hex lock Nuts M4	2
3	Screw M6x20	2	39	Dual Spring	2
4	Spring washers 6	2	40	Safety Latches	2
5	Small washers 6	2	41	Baffle	1
6	Bearing cap	1	42	Pins 6x18	2
7	Screw M6x50	4	43	Snap ring for hole 52	1
8	Spring washers 6	4	44	Screw M10	2
9	Small washers 6	4	45	Screw M8	2
10	Round nut M10x1	1	46	Pins 6x12	6
11	Lock Washer 10	1	47	Thrust washer 16 (Ø17xØ30x2.75)	1
12	Bearings 6201 Ø12xØ32x10	3	48	Connecting bar	1
13	Motor housing cover	1	49	Screws M10x35	1
14	Motor house gasket	1	50	Screws M10x50	1
15	Motor Rotor	1	51	Fixing Plate	1
16	Bearing 6204 Ø20xØ47x14	1	52	Screws M5x10	4
17	Snap ring	1	53	Upper hook	1
18	Stator	1	54	Gear Case	1
19	Pin 6x8	1	55	Limit block	1
20	Motor Case	1	56	Limit Switches	2
21	Bearings 6205 Ø25xØ52x15	2	57	Flat washers 2	4
22	Chain Guides	2	58	Spring Washers 2	4
23	Sprocket Wheel	1	59	Screws M2x12	4
24	T-Grade DT-Type Load Chain 6.3x19	1	60	Seal ring	1
25	Touch blocks A	2	61	Spring Plate	1
26	Limit Springs	2	62	Screws M4x10	1
27	Steel Cable baffle ring	1	63	Small washers 5	4
28	Chain Stop	1	64	Spring Washers 5	4
29	Pins	2	65	Screws M5x25	4
30	Lower Hook Block	2	66	Small washers 6	4
31	Screws M6X20	2	67	Spring washers 6	4
32	Hex lock Nuts M6	2	68	Screws M6X30	4
33	Slotted Hex nuts M16	2	69	Back frame gasket	1
34	Spring Pin 4x25	2	70	Lift gear	1
35	Thrust bearing 51103	1	71	Snap ring for shaft 25	1
36	Lower Hook	1	72	Pinion	1

### 5.3 Motor and body assembly parts list

No.	Part Name	Qty.	No.	Part Name	Qty.
73	Bearing 6202Ø15xØ35x11	1	95	Electric component board	1
74	Snap ring for shaft 15	1	96	Screws M4x10	4
75	Middle gear shaft	1	97	Contactora	3
76	Overload limit clutch	1	98	Hex nut M4	6
76-1	Spline Bushing	1	99	Plain Washers 5	4
76-2	Adjusting washer	1	100	Spring Washers 5	4
76-3	Belleville Spring	1	101	Screws M5X12	4
76-4	Clutch Support	1	102	Hex lock nuts M4	1
76-5	Idler gear shaft	1	103	Aluminum sheath	2
76-6	Clutch friction plate	1	104	Cooling Fin	1
76-7	Adjusting round nut	1	105	Rectifier 50A	1
77	Snap ring for shaft 16	1	106	Plain washers 3	2
78	Brake frame	1	107	Spring Washers 3	2
79	Waterproof Nylon cable clamping joint M20x1.5	2	108	Screws M3x12	2
80	Power Line components	1	109	Plain Washers 4	1
81	Rope fastener	1	110	Screws M4x20	1
82	Screws M6x20	1	111	Transformer Assembly	1
83	Control button assembly	1	112	Hex lock nuts M5	2
84	Small washers 6	3	113	DC brake (spline hole)	1
85	Spring washers 6	3	114	Small Washers 6	2
86	Screws M6X30	3	115	Spring washers 6	2
87	Grounding mark	1	116	Screws M6X20	2
88	Small washers 6	1	117	Back frame gasket	1
89	Spring washers 6	1	118	Back frame cover	1
90	Screws M6x12	1	119	Name Plate	1
91	Copper bushing	1	120	Chain container No. 3	1
92	Rubber Seal	1	121	Chain container frame No.3	1
93	Contactora support	1	122	Plain Washer 8	1
94	Screws M4X12	6	123	Screws M8X25	1

## 5.4 Trolley assembly drawing

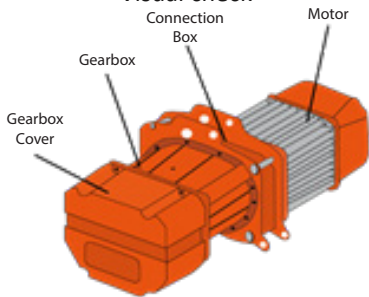


### 5.5 Trolley assembly parts list.

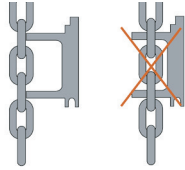
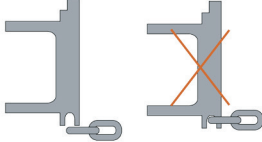


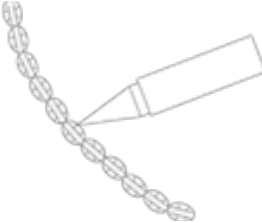
No.	Part Name	No.	Part Name
1	Electric box	21	Inner hex bolt
2	Hex Bolt	22	Bearing race
3	Contactora	23	Flat washer
4	Right side plate	24	Planet bushing
5	Driven wheel	25	Planet plane
6	Bearing	26	Planet axle
7	Safety plate	27	Hex bolt
8	Retainer ring	28	Stationary ring
9	Bearing cage	29	Limit ping
10	Bearing race	30	Flat washer
11	Pinion	31	Hex bolt
12	Left side plate	32	Rolling bushing
13	Thick adjust washer	33	Junction plate
14	Bushing	34	Rolling bearing
15	Gear box	35	Hanger girder
16	Retainer ring	36	Electric unit
17	Planet gear	37	Thin adjustment washer
18	Driver	38	Slotted hex nut
19	Flat Key	39	Connecting plate
20	Disk electric motor	40	Split pin


## 6. OPERATION

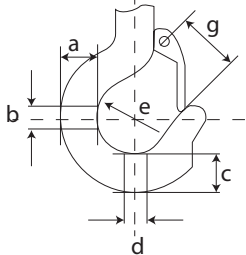
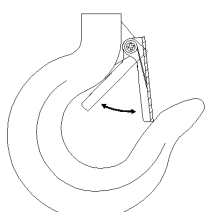
### 6.1. Periodic Inspection

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	<p>Visual check</p> 	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	<ul style="list-style-type: none"> <li>- Correct installation -A loose bolt will cause equipment failure</li> <li>- Ensure proper installation to avoid death or serious injury</li> </ul>	Precise installation



Items	Inspection Method	Standards	Correction
Extent of pitch	Check with chain measurement tool		
Attrition of chain diameter	Check with chain measurement tool		
Deformation or damage	<p>Visual check</p> <p>Damage                  Crack</p>  <p>Confirm chain is not stuck to welding spatters by visually inspecting it.</p>	<ul style="list-style-type: none"> <li>- No gouges</li> <li>- No deformation</li> <li>-No crack</li> </ul>	Replace the load chain
Rust and corrosion	Visual check	No remarkable rust and corrosion	Replace load chains
Distortion	Visual check	<p>No distortion due to bottom block rollover of double chain models</p> 	Correct distortion
Oil supply	Visual check	<p>Adequate supply of oil</p> 	Oiling

Items	Inspection Method	Standards			Correction
Limit switch	Check by pushing button	Operate until upper and lower limit cause automatic motor shutdown			Replace limit switch, disassemble and clean limit lever
Movement confirmation	Check by pushing button	-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			
Brake	Check by pushing button	Brake quickly activates and operation of bottom hook immediately stops (amount of movement of the load chain is within 2 to 3 rings)			
Chain Spring	Visual inspection and measure dimensions	Chain	Length of spring		Replace chain spring 
			Standard	Limits	
		Ø6.3	145	140	
		Ø7.1	145	140	
		Ø10.0	135	129	
	Ø11.2	160	152		

Items	Inspection Method	Standards	Correction																																																															
Attrition and opening of the hook	Visually check and with vernier caliper tool 	No remarkable opening or attrition <table border="1" data-bbox="698 315 1234 672"> <thead> <tr> <th>Load</th> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> <th>g</th> </tr> </thead> <tbody> <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> </tbody> </table>	Load	a	b	c	d	e	g	0.3 -0.5	27	18	25	17	35	28	1	34	24	30	24	42	32	2	46	29	39	30	49	40	3	56	35	49	34	59	48	5	67	43	67	44	60	48	7.5 - 10	82	55	80	48	85	80	15	110	78	120	80	120	90	20 - 25	142	95	155	98	150	115	
		Load	a	b	c	d	e	g																																																										
		0.3 -0.5	27	18	25	17	35	28																																																										
		1	34	24	30	24	42	32																																																										
		2	46	29	39	30	49	40																																																										
		3	56	35	49	34	59	48																																																										
		5	67	43	67	44	60	48																																																										
		7.5 - 10	82	55	80	48	85	80																																																										
		15	110	78	120	80	120	90																																																										
20 - 25	142	95	155	98	150	115																																																												
Deformation, damage and corrosion	Visual check	No remarkable deformation, harmful damage and corrosion	Replace hook																																																															
Hook safety latch	Visual inspection, fold and unfold actions	-Can exactly fold inside the hook -No deformation -Do not use the hook if safety latch is loose -Improper use may lead to death or serious injury	Replace hook safety block 																																																															
Hook movements (rotation)	Visual inspection and manual rotation	-No remarkable space between bottom supporting and top -equal at right and left -easy to rotate 360°	Replace hook																																																															

## 7.1. During Operation:

Symptoms		Main Cause	Correction
Hoist does not operate	Brake 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
Slow lifting		Low voltage	Contactor (junction fusing)
Unintended reaction from button	Inverse reaction from button	Wrong phase sequence wiring	Feed power
		Incorrect signal wiring	Internal wiring
	No reaction after pressing button	Circuit wire break	Button switch
			Internal wiring
		Electric installation parts	Button switch
			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
			Excessive current caused by brake	Avoid over-operation
	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 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
			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
			Chain wrapped around load	Do not wrap chain
Hook twist				
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
	Mark on chain surface		Chain used improperly	Ensure proper assembly
			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 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

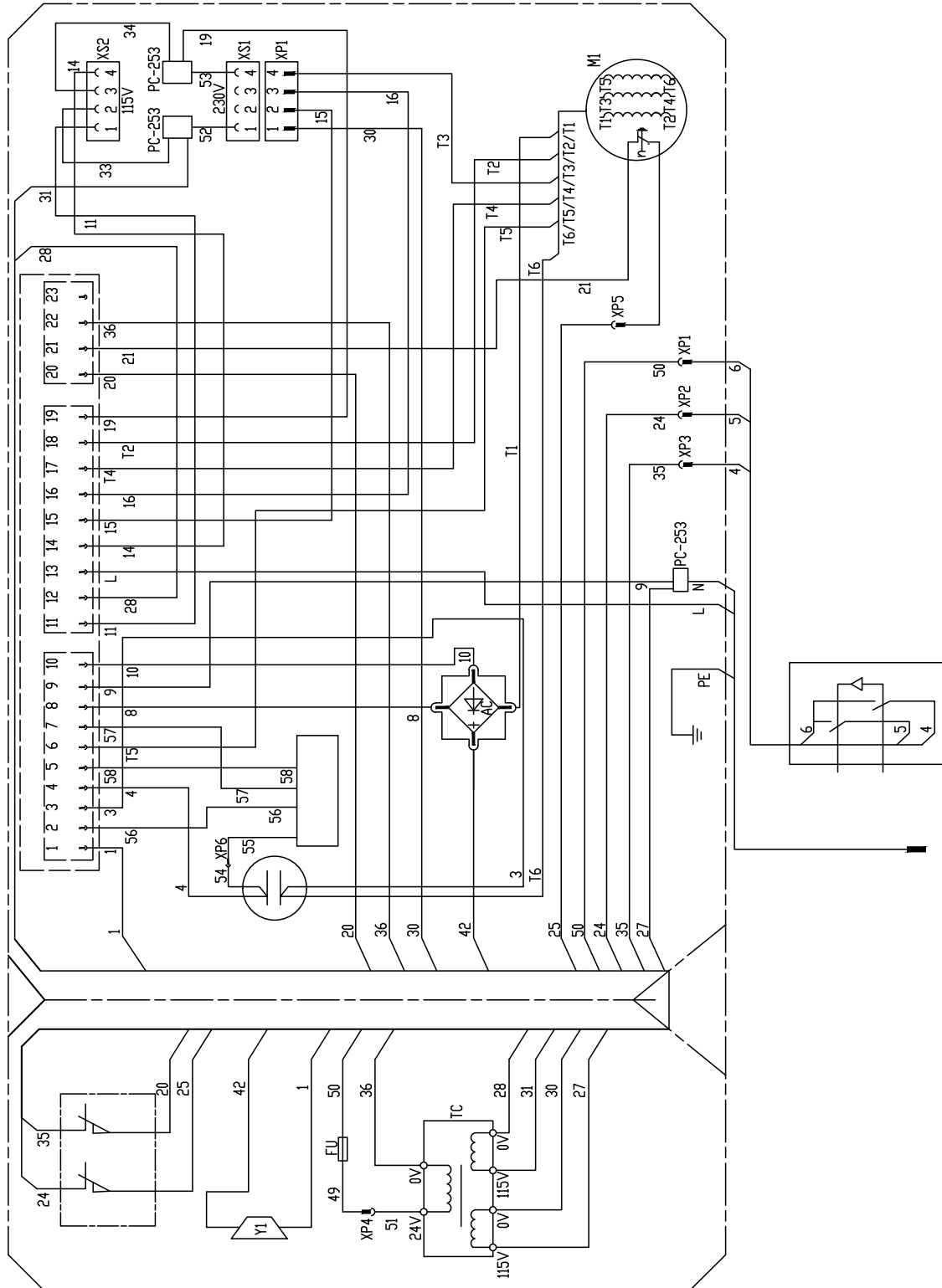
Condition	Reason	Action	Cause	Correction
Wheels stopped revolving	Brake gelling	Open motor cover remove rust and dirt	Usage environment	Inspect regularly
	Electric fault	Refer to items of electric chain hoist		
Abnormal sound	Wear of edge guide wheel	Confirm wear degrees	Reaching service life	Confirm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

## Manual Trolley

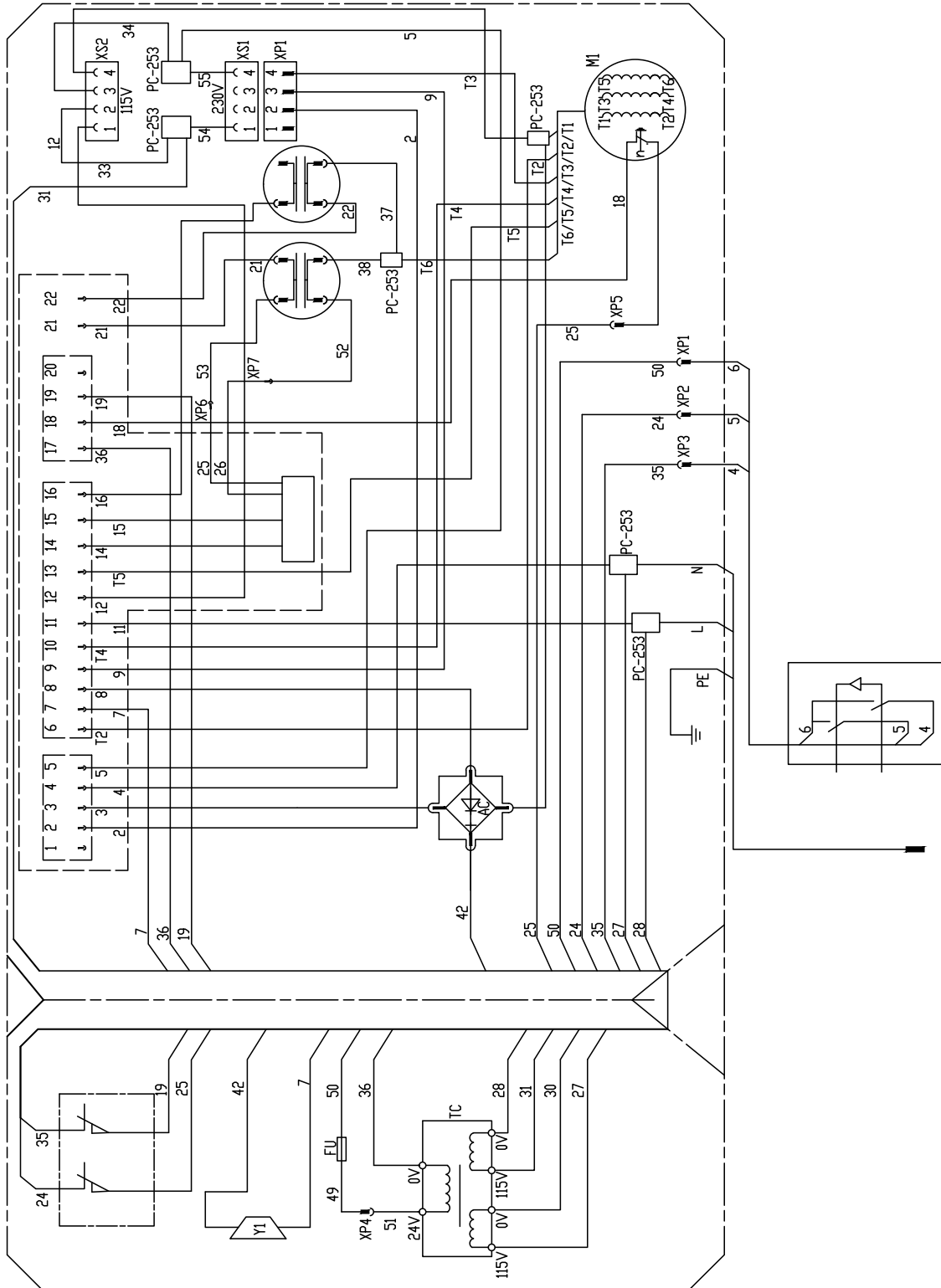
Condition	Reason	Action	Cause	Correction
Unable to move hand chain	Bad connection between hand wheel and hand chain	Properly adjust hand chain on hand wheel	Excessive or improper usage	Replace worn or deformed components

## 8. CONVENTIONAL HOIST WIRING DIAGRAM (PWRF - PWRT)

### 8.1. Hoist Wiring Diagram 1000 lbs.



8.2. Hoist Wiring Diagram 2000 & 4000 lbs.



## .3. Trolley Wiring Diagram (All models)

