ProWINCH®
Reg. U.S. TM. Off.

PWRT Series
PWRF Series

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

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Disclaimer

PROWINCH® DISCLAIMER

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

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

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

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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 PWR and PRWC 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 warns for 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 main switch must be de-energized, 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.

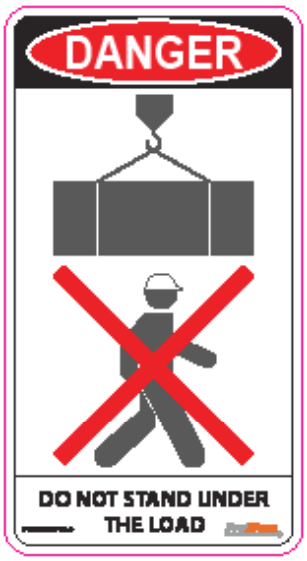
After a careful study and understanding of the User Manual, store it for future reference.

1.2. Before using the Equipment:

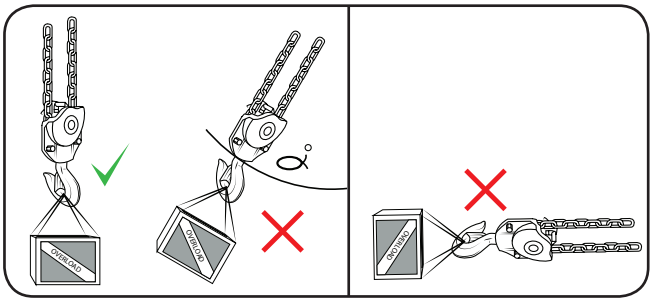
• Read and understand the instructions in this User Manual and all the labels associated with the hoist before operating the equipment.
• Wear appropriate clothing: Do not wear jewelry or loose clothes as they can get caught by the chain or hook.
• Wear leather gloves.
• Wear non-slippery safety shoes, helmet, 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 the 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



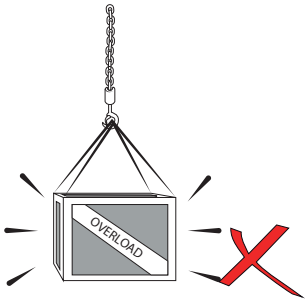
1.4. Inspection, Maintenance and Repairs:

• 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.

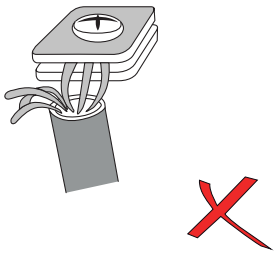
ALWAYS:
• Check the good condition of electrical connections.
• Check the chain and keep it lubricated.
• Prevent others from stepping under lifted load.
• Inspect and maintain the hoist regularly.
• Verify the correct installation of hoist before using.
• Avoid contact with explosive gases or materials.

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 electrical storm.
• **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 environment or other substances which may damage the equipment.

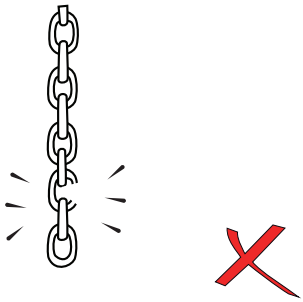
Safety Precautions



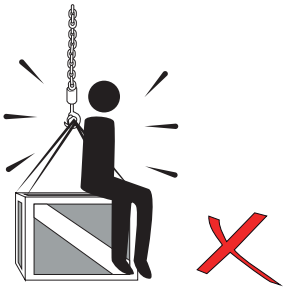
1. Do not overload.



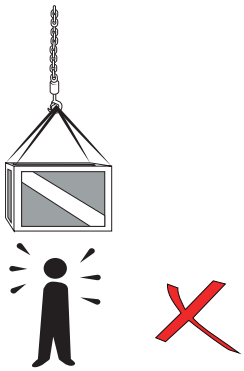
2. Check the proper crimp of the electrical connections.



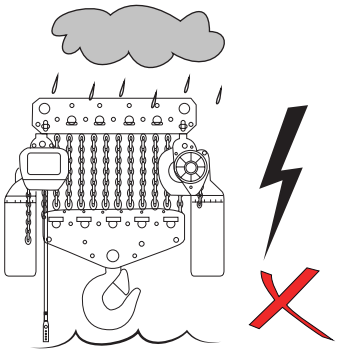
3. Periodically check the chain and keep it lubricated.



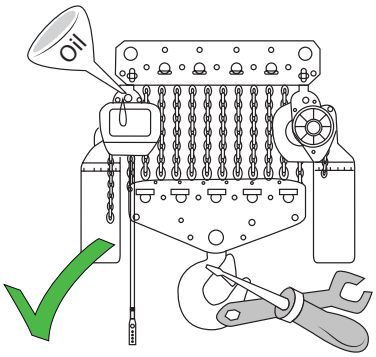
4. Do not transport people or animals with a hoist.



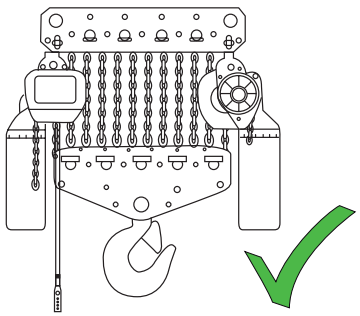
5. Do not step or walk under lifted load and prevent others from doing so.



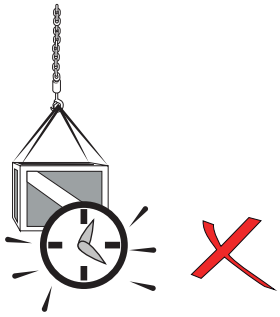
6. Do not use the hoist if exposed to rain, snow or lightning.



7. Inspect and maintain your hoist regularly.

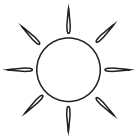


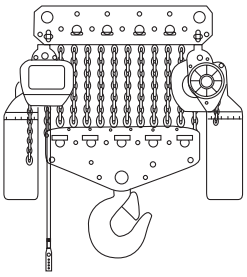
8. Always verify the correct hoist installation before use.



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.

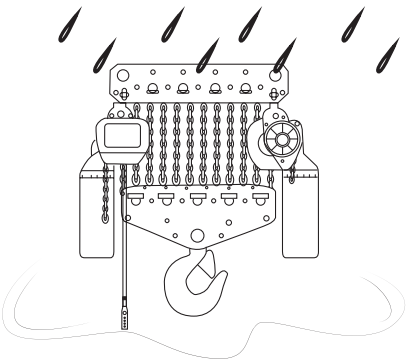


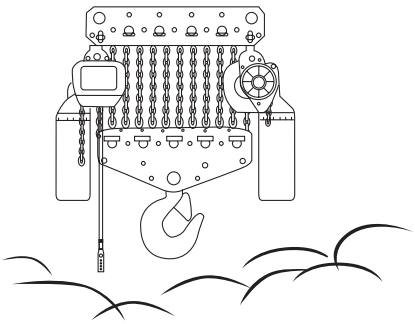


Avoid contact with gases or explosive materials.

Warning:

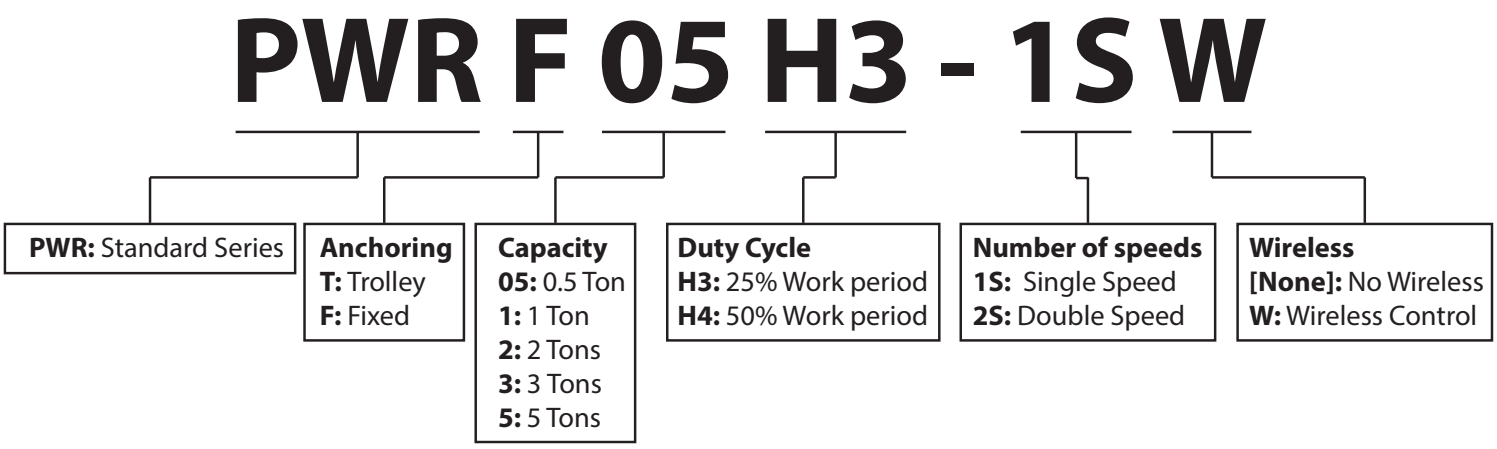
Exposure to water, sand, a corrosive environment, or other potentially harmful elements may damage the equipment.





2. SPECIFICATIONS

2.1. Product Code.



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

Item		Specs	
Operating temperature range (°C)		-20° to ± 40°	
Operating Humidity Range (%)		< 85%	
Protection Class	Hoist	IP55	
	Button Switch	IP55	
Power		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. Hoist Specifications 1 Speed H3 Fixed PWRF_H3-1SW Series

Specifications		Model				
		PWRF05H3-1SW	PWRF10H3-1SW	PWRF20H3-1SW	PWRF30H3-1SW	PWRF50H3-1SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27	26	26	21	11
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728	1728	1728	1728	1728
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	540	650	800	845	1030
	A	515	580	675	675	675
	B	240	260	300	300	300
	D	285	300	430	430	430
	E	165	176	265	265	325

2.5. Hoist Specifications 2 Speed H3 Fixed PWRF_H3-2SW Series

Specifications		Model				
		PWRF05H3-2SW	PWRF10H3-2SW	PWRF20H3-2SW	PWRF30H3-2SW	PWRF50H3-2SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27&9	26&9	26&9	21&7	11&4
Motor Power (kW)		0.75&0.25	1.5&0.5	3&1	3&1	3&1
Rotation Speed (r/min)		3456&1152	3456&1152	3456&1152	3456&1152	3456&1152
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	540	650	800	845	1030
	A	605	642	730	730	730
	B	260	280	320	320	320
	D	285	300	430	430	430
	E	165	176	265	265	325

2.6. Hoist Specifications 1 Speed H4 Fixed PWRF_H4-1SW Series

Specifications		Model				
		PWRF05H4-1SW	PWRF10H4-1SW	PWRF20H4-1SW	PWRF30H4-1SW	PWRF50H4-1SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27	26	26	21	11
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728	1728	1728	1728	1728
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	455	520	640	685	870
	A	566	627	733	733	733
	B	266	302	343	343	343
	D	285	300	430	430	430
	E	165	176	265	265	325

2.7. Hoist Specifications 2 Speed H4 Fixed PWRF_H4-2SW Series

Specifications		Model				
		PWRF05H4-2SW	PWRF10H4-2SW	PWRF20H4-2SW	PWRF30H4-2SW	PWRF50H4-2SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27&7	26&6.5	26&6.5	21&5	11&3
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728&432	1728&432	1728&432	1728&432	1728&432
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		12	12	12	12	12
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	455	520	640	685	870
	A	566	627	733	733	733
	B	266	302	343	343	343
	D	285	300	430	430	430
	E	165	176	265	265	325

2.8. Hoist Specifications 1 Speed H3 Trolley PWRT_H3-1SW Series

Specifications		Model				
		PWRT05H3-1SW	PWRT10H3-1SW	PWRT20H3-1SW	PWRT30H3-1SW	PWRT50H3-1SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27	26	26	21	11
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728	1728	1728	1728	1728
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	610	650	770	830	1015
	A	515	580	675	675	675
	B	240	260	300	300	300
	D	285	300	430	430	430
	E	165	176	265	265	325

2.9. Hoist Specifications 2 Speed H3 Trolley PWRT_H3-2SW Series

Specifications		Model				
		PWRT05H3-2SW	PWRT10H3-2SW	PWRT20H3-2SW	PWRT30H3-2SW	PWRT50H3-2SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27&9	26&9	26&9	21&7	11&4
Motor Power (kW)		0.75&0.25	1.5&0.5	3&1	3&1	3&1
Rotation Speed (r/min)		3456&1152	3456&1152	3456&1152	3456&1152	3456&1152
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	610	650	770	830	1015
	A	605	642	730	730	730
	B	260	280	320	320	320
	D	285	300	430	430	430
	E	165	176	265	265	325

2.10. Hoist Specifications 1 Speed H4 Trolley PWRT_H4-1SW Series

Specifications		Model				
		PWRT05H4-1SW	PWRT10H4-1SW	PWRT20H4-1SW	PWRT30H4-1SW	PWRT50H4-1SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27	26	26	21	11
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728	1728	1728	1728	1728
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		24	24	24	24	24
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	525	520	610	670	855
	A	566	627	733	733	733
	B	266	302	343	343	343
	D	285	300	430	430	430
	E	165	176	265	265	325

2.11. Hoist Specifications 2 Speed H4 Trolley PWRT_H4-2SW Series

Specifications		Model				
		PWRT05H4-2SW	PWRT10H4-2SW	PWRT20H4-2SW	PWRT30H4-2SW	PWRT50H4-2SW
Capacity (t)		0.5	1	2	3	5
Lifting Speed (ft/min)		27&7	26&6.5	26&6.5	21&5	11&3
Motor Power (kW)		0.75	1.5	3	3	3
Rotation Speed (r/min)		1728&432	1728&432	1728&432	1728&432	1728&432
Insulation Grade		F	F	F	F	F
Power Supply		200-600V	200-600V	200-600V	200-600V	200-600V
Control Voltage		12	12	12	12	12
No. Chain falls		1	1	1	1	2
Spec. of Load Chain		0.25	0.28	0.4	0.44	0.44
Net Weight (lb)						
Basic Dimensions (mm)	H	525	520	610	670	855
	A	566	627	733	733	733
	B	266	302	343	343	343
	D	285	300	430	430	430
	E	165	176	265	265	325

3. General Dimensions

3.1. Hoist Dimensions 1 Speed H3 Fixed PWRF_H3-1SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRF05H3-1SW	540	515	240	285	165	/	/	/	/	Φ34	28	Φ34	25	19	19
PWRF10H3-1SW	650	580	260	300	176	/	/	/	/	Φ42	32	Φ42	32	24	24
PWRF20H3-1SW	800	675	300	430	265	/	/	/	/	Φ49	40	Φ49	40	30	30
PWRF30H3-1SW	845	675	300	430	265	/	/	/	/	Φ59	48	Φ59	48	35	35
PWRF50H3-1SW	1030	675	300	430	325	/	/	/	/	Φ60	48	Φ60	48	43	43

3.2. Hoist Dimensions 2 Speed H3 Fixed PWRF_H3-2SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRF05H3-2SW	540	605	260	285	165	/	/	/	/	Φ34	28	Φ34	25	19	19
PWRF10H3-2SW	650	642	280	300	176	/	/	/	/	Φ42	32	Φ42	32	24	24
PWRF20H3-2SW	800	730	320	430	265	/	/	/	/	Φ49	40	Φ49	40	30	30
PWRF30H3-2SW	845	730	320	430	265	/	/	/	/	Φ59	48	Φ59	48	35	35
PWRF50H3-2SW	1030	730	320	430	325	/	/	/	/	Φ60	48	Φ60	48	43	43

3.3. Hoist Dimensions 1 Speed H4 Fixed PWRF_H4-1SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRF05H4-1SW	455	566	266	285	165	/	/	/	/	Φ35	27	Φ34	25	17	17
PWRF10H4-1SW	520	627	302	300	176	/	/	/	/	Φ42	32	Φ41	32	24	24
PWRF20H4-1SW	640	733	343	430	265	/	/	/	/	Φ48	38	Φ49	40	28	28
PWRF30H4-1SW	685	733	343	430	265	/	/	/	/	Φ59	48	Φ59	48	34	34
PWRF50H4-1SW	870	733	343	430	325	/	/	/	/	Φ69	48	Φ60	48	42	42

3.4. Hoist Dimensions 2 Speed H4 Trolley PWRF_H4-2SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRF05H4-2SW	455	566	266	285	165	/	/	/	/	Φ35	27	Φ34	25	17	17
PWRT10H4-2SW	520	627	302	300	176	/	/	/	/	Φ42	32	Φ41	32	24	24
PWRT20H4-2SW	640	733	343	430	265	/	/	/	/	Φ48	38	Φ49	40	28	28
PWRT30H4-2SW	685	733	343	430	265	/	/	/	/	Φ59	48	Φ59	48	34	34
PWRT50H4-2SW	870	733	343	430	325	/	/	/	/	Φ69	48	Φ60	48	42	42

3.5. Hoist Dimensions 1 Speed H3 Trolley PWRT_H3-1SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRT05H3-1SW	610	515	240	285	165	355	231	206	111	Φ34	28	Φ34	25	19	19
PWRT10H3-1SW	650	580	260	300	176	355	231	206	111	Φ42	32	Φ42	32	24	24
PWRT20H3-1SW	770	675	300	430	265	355	231	237	127	Φ49	40	Φ49	40	30	30
PWRT30H3-1SW	830	675	300	430	265	355	231	265	140	Φ59	48	Φ59	48	35	35
PWRT50H3-1SW	1015	675	300	430	325	355	231	295	156	Φ60	48	Φ60	48	43	43

3.6. Hoist Dimensions 2 Speed H3 Trolley PWRT_H3-2SW Series

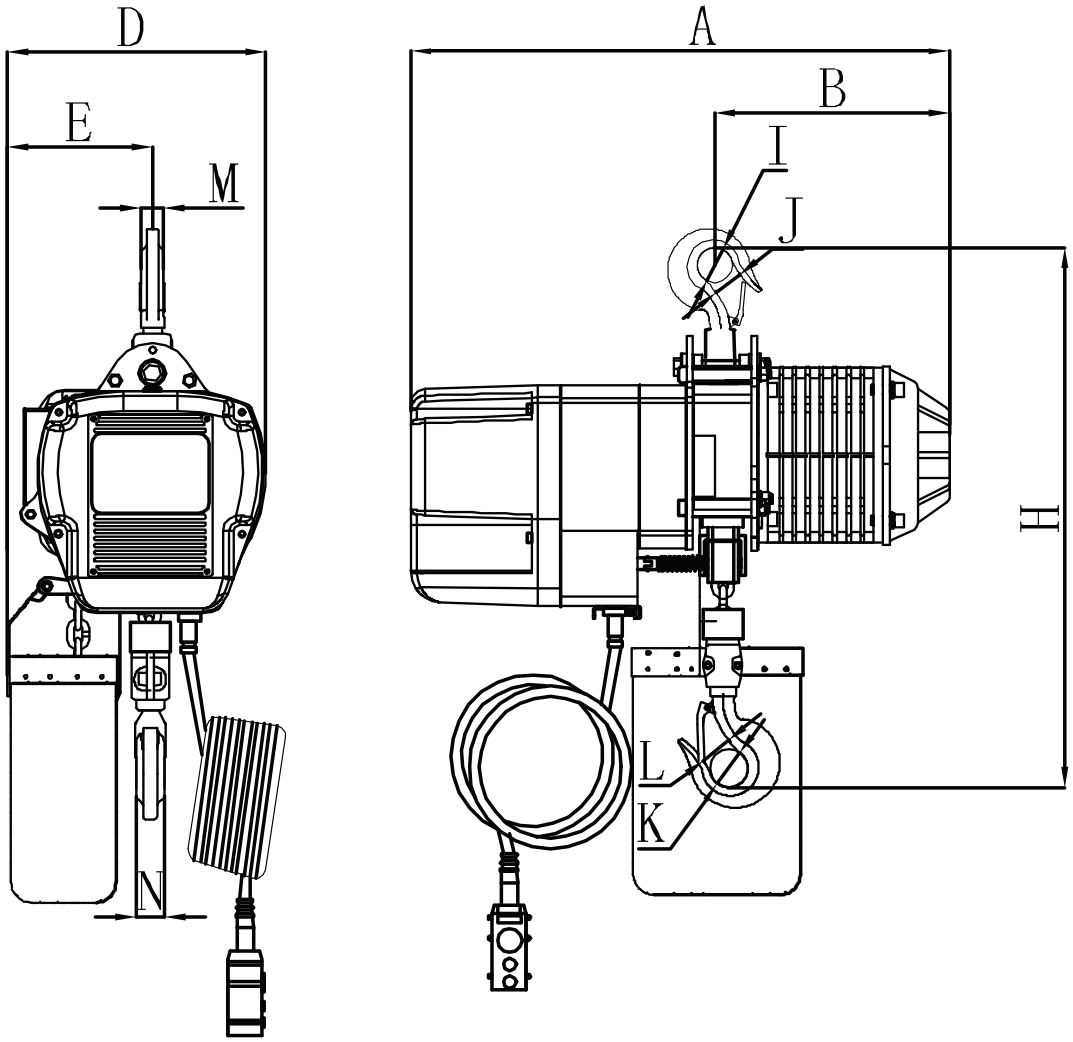
Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRT05H3-2SW	610	605	260	285	165	355	276	206	111	Φ34	28	Φ34	25	19	19
PWRT10H3-2SW	650	642	280	300	176	355	276	206	111	Φ42	32	Φ42	32	24	24
PWRT20H3-2SW	770	730	320	430	265	355	276	237	127	Φ49	40	Φ49	40	30	30
PWRT30H3-2SW	830	730	320	430	265	355	315	265	140	Φ59	48	Φ59	48	35	35
PWRT50H3-2SW	1015	730	320	430	325	355	315	295	156	Φ60	48	Φ60	48	43	43

3.7. Hoist Dimensions 1 Speed H4 Trolley PWRT_H4-1SW Series

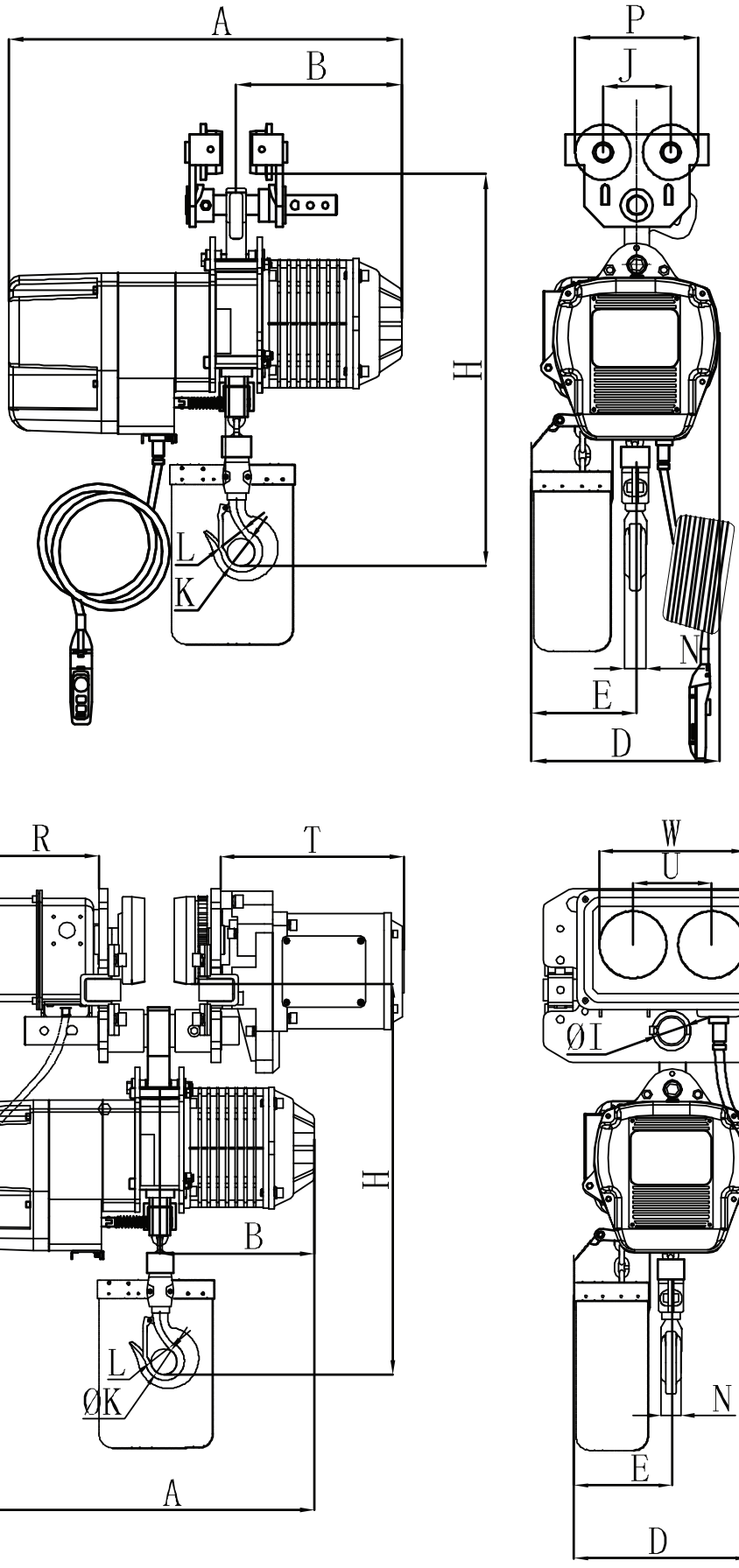
Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRT05H4-1SW	525	566	266	285	165	142	231	206	111	Φ35	27	Φ34	25	17	17
PWRT10H4-1SW	520	627	302	300	176	142	231	206	111	Φ42	32	Φ41	32	24	24
PWRT20H4-1SW	610	733	343	430	265	142	231	237	127	Φ48	38	Φ49	40	28	28
PWRT30H4-1SW	670	733	343	430	265	142	231	265	140	Φ59	48	Φ59	48	34	34
PWRT50H4-1SW	855	733	343	430	325	142	231	296	156	Φ69	48	Φ60	48	42	42

3.8. Hoist Dimensions 2 Speed H4 Trolley PWRT_H4-2SW Series

Model	Dimension (mm)														
	HOIST					TROLLEY				HOOK					
	H	A	B	D	E	R	T	W	U	I	J	K	L	M	N
PWRT05H4-2SW	525	566	266	285	165	142	276	206	111	Φ35	27	Φ34	25	17	17
PWRT10H4-2SW	520	627	302	300	176	142	276	206	111	Φ42	32	Φ41	32	24	24
PWRT20H4-2SW	610	733	343	430	265	142	276	237	127	Φ48	38	Φ49	40	28	28
PWRT30H4-2SW	670	733	343	430	265	142	315	265	140	Φ59	48	Φ59	48	34	34
PWRT50H4-2SW	855	733	343	430	325	142	315	296	156	Φ69	48	Φ60	48	42	42



Specifications



4. Oil & Lubricant Recommendations

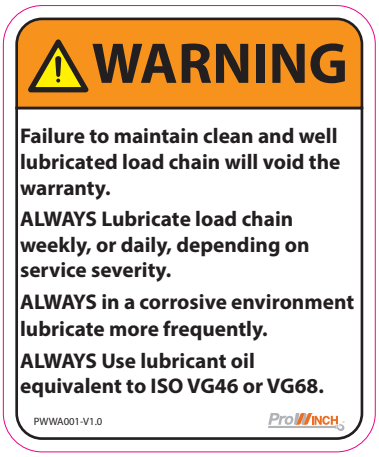
WARNING

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



1. 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.
- Check voltage does not vary by more than ±10% from nominal value.
- Do not use conductors smaller than those listed in this User Manual to supply power to hoist.
- Never bypass limit switches, remove limit switch stops, or alter limit switch devices.

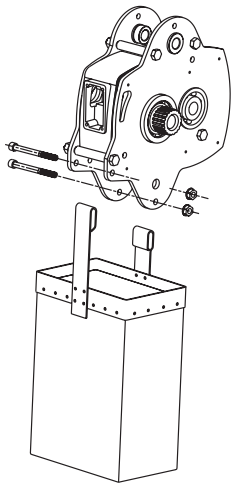
1.1 Unpacking

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

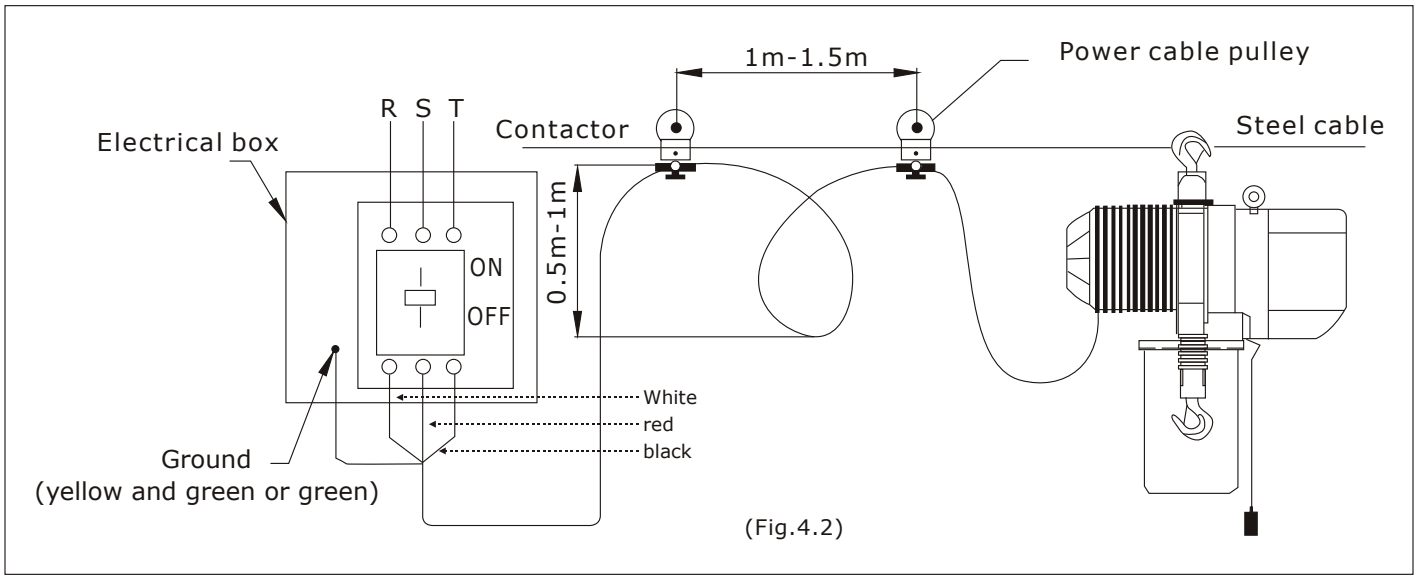
1 Chain bag (box)	1pcs
2 Control wire rope	1 m
3 Button switch	1 pcs

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

1.2 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 (ensure the chain connection pin is installed properly).
Remarks :If the hoist is equipped with electric trolley , the first step (to separate the upper hook from the hoist body) can be omitted ,it is only required to 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)



(Fig.4.2)

1.3. Electrical Connections

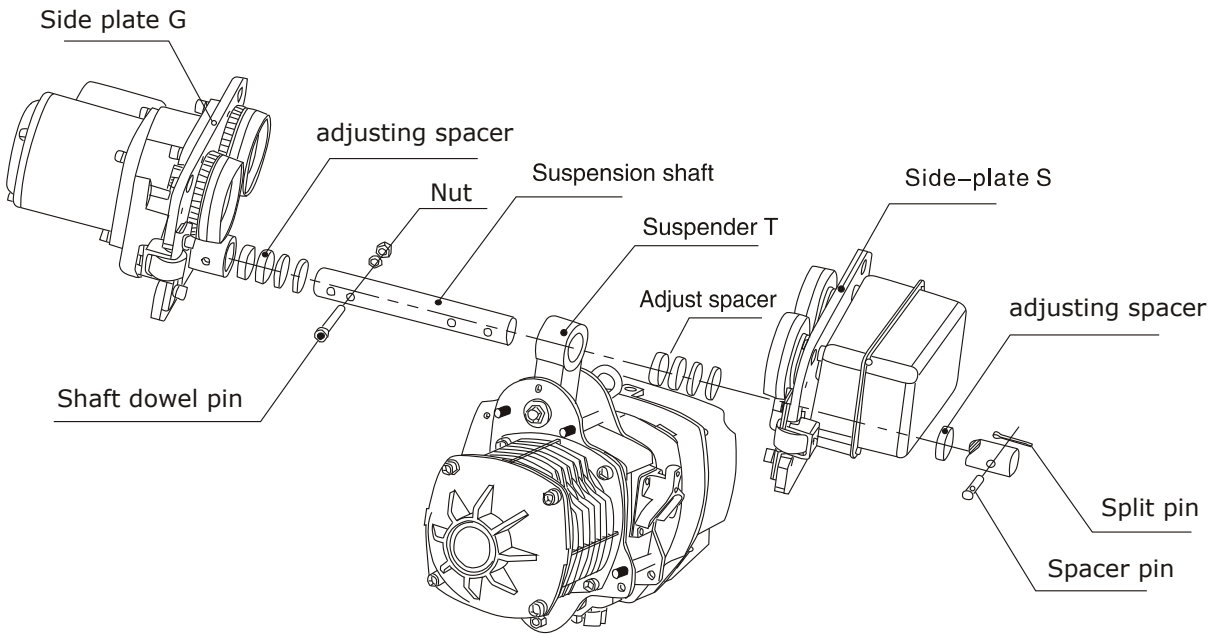
Operator and/or owner must provide main power supply hardware (cable, conductor bar, fuses, disconnect switch, etc.)

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

1.4. Install Trolley (models with trolley)

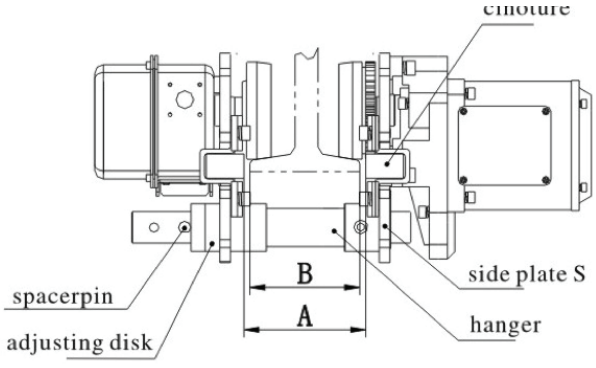
1.- Insert suspension pins into lateral plate G and lock it with suspension pin bolts and nuts.
2.- Install suspension pin with adjusting disk.
3.- Install suspension pin into hanger T. The nameplates of hoist and trolley should be in the same direction.
4.- Install additional gaskets into suspension 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.



(Fig.4.6)

1.5. Adjust Trolley Width (models with trolley)

• Adjust width of trolley according to drawing (below) 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.

1.6. Install Trolley into Beam (models with trolley)

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

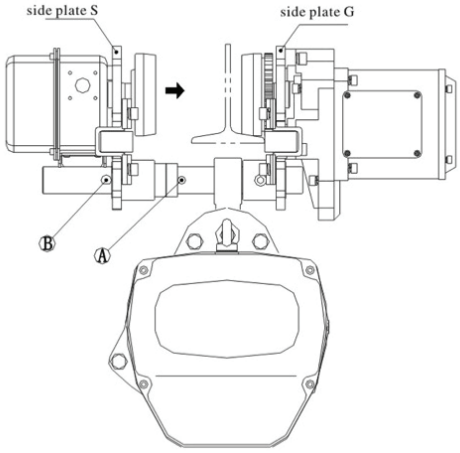
2. If first method is unavailable:

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

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

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

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



1.7. Supply Voltage

WARNING

Check supply voltage before everyday 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.

1. OPERATION

1.1. 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.

A 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, OSHAS and ASME.

This hoist must not be operated by someone 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 a 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 a practical operation of hoist.

1.2 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 directions.
- Check functions of hoist and trolley without any 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 load.

NEVER:

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

1.3 Recommended Operation

WARNING

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

Start with Operational Test

1. Press (down) button lowering unloaded hook down until limit spring touches limit switch. Be sure hoist stops automatically before totally compressing spring.
2. Press (up) button hoisting unloaded hook up until limit spring touches limit switch. Be sure hoist stops automatically before totally compressing spring.
3. Test correct function of emergency stop button. When pressing button (up), (down) press emergency stop button. Ensure hoist stops immediately after pressing emergency stop switch. Hoist should not start again if any other movement button is activated.
4. Rotate emergency stop switch clockwise to original position. When it bounces back, hoist can be started again. If any of the above tests fail, unit must remain out of service, lockout/tag-out power and request maintenance authorized personnel to check circuit layout for automatic locking emergency stop switch.
5. Check lubricating condition of load chain (load chain has been lubricated before delivery, but could be dried in transportation).
Apply lubricant into chain bag to protect load chain.
6. Check direction of chain eyes. All welding points should be same direction. Hoist cannot be operated properly unless all welding chain eyes are in same line.
6.1. Position hoist in vertical position to load. Before moving trolley, make sure path of hook is free from any obstacle.
6.2. Lower hook near master link to hoist load and make final adjustments to secure a 90º vertical lift operation without any lateral deviation. Improper life angle may cause swinging of load.
6.3. Attach hook to load link and make sure there are no people in working area. Check that no loose items can fall from load.
6.4. Begin by hoisting load two inches and stop. Check brakes are fully operational and load doesn't lower while stopped. Also check load is balanced and secured. Load may have changed shape or center of gravity when suspended.
6.5. To reach a desired position, movements must be smooth and continuous. Repeatedly pressing buttons may heat up motor and damage equipment.
6.6. Avoid sudden directions changes. These movements may damage equipment, prematurely wear down brakes and cause accidents.

WARNING

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

7. Avoid any obstacle when hoisting or traveling load.
8. Start movement of trolley and check there is no swinging of load and no obstacles in path. Stop movement and make necessary adjustments if one of these conditions is present.

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

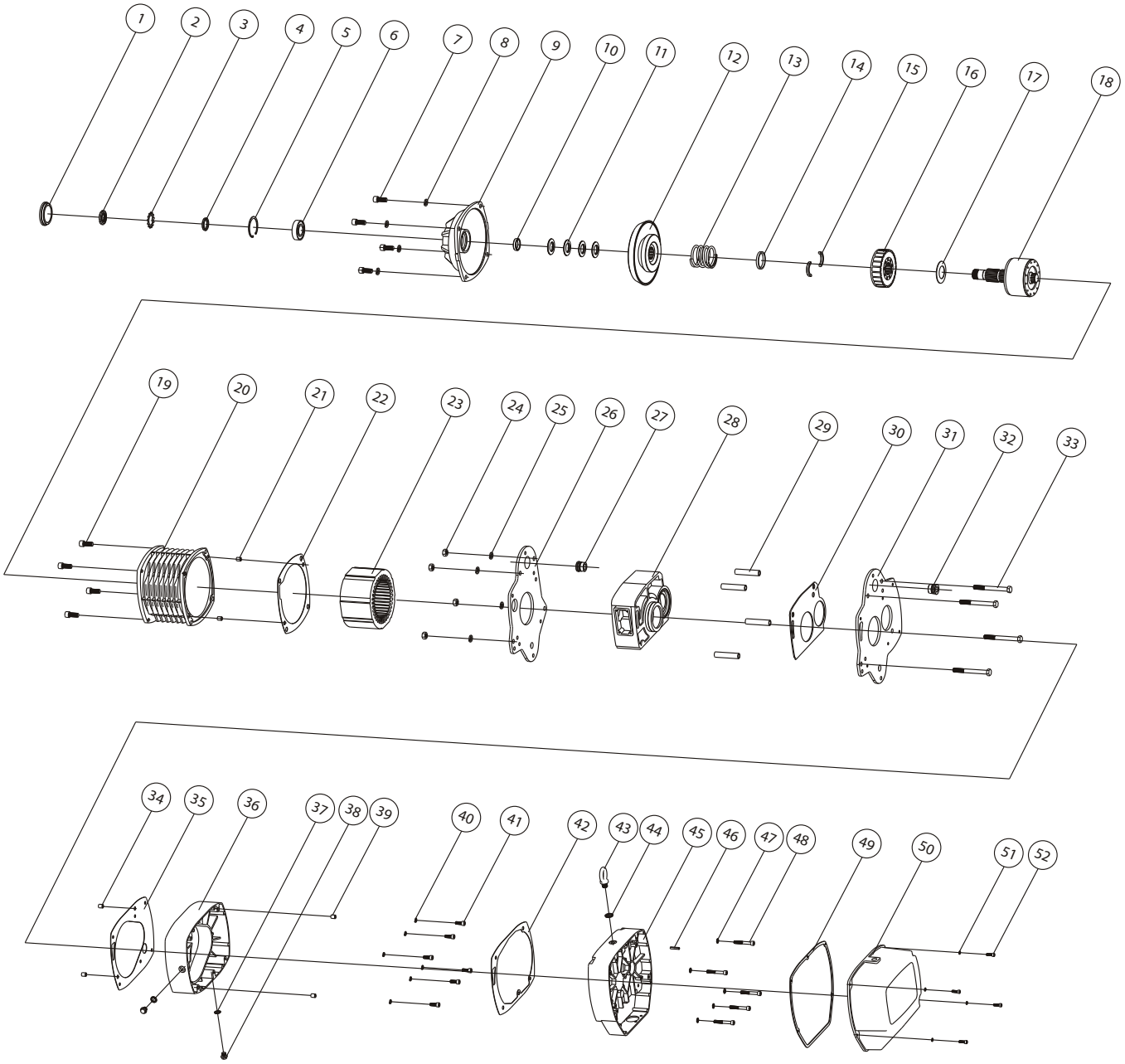
10. Gradually lower load until it is secured on resting surface. Avoid hitting surface at high speed. If necessary, stop movement before reaching surface and gradually lower to land load.

DANGER

NEVER leave load suspended without attention of the hoist operator!

1. H3 EXPLODED VIEW AND PARTS LIST

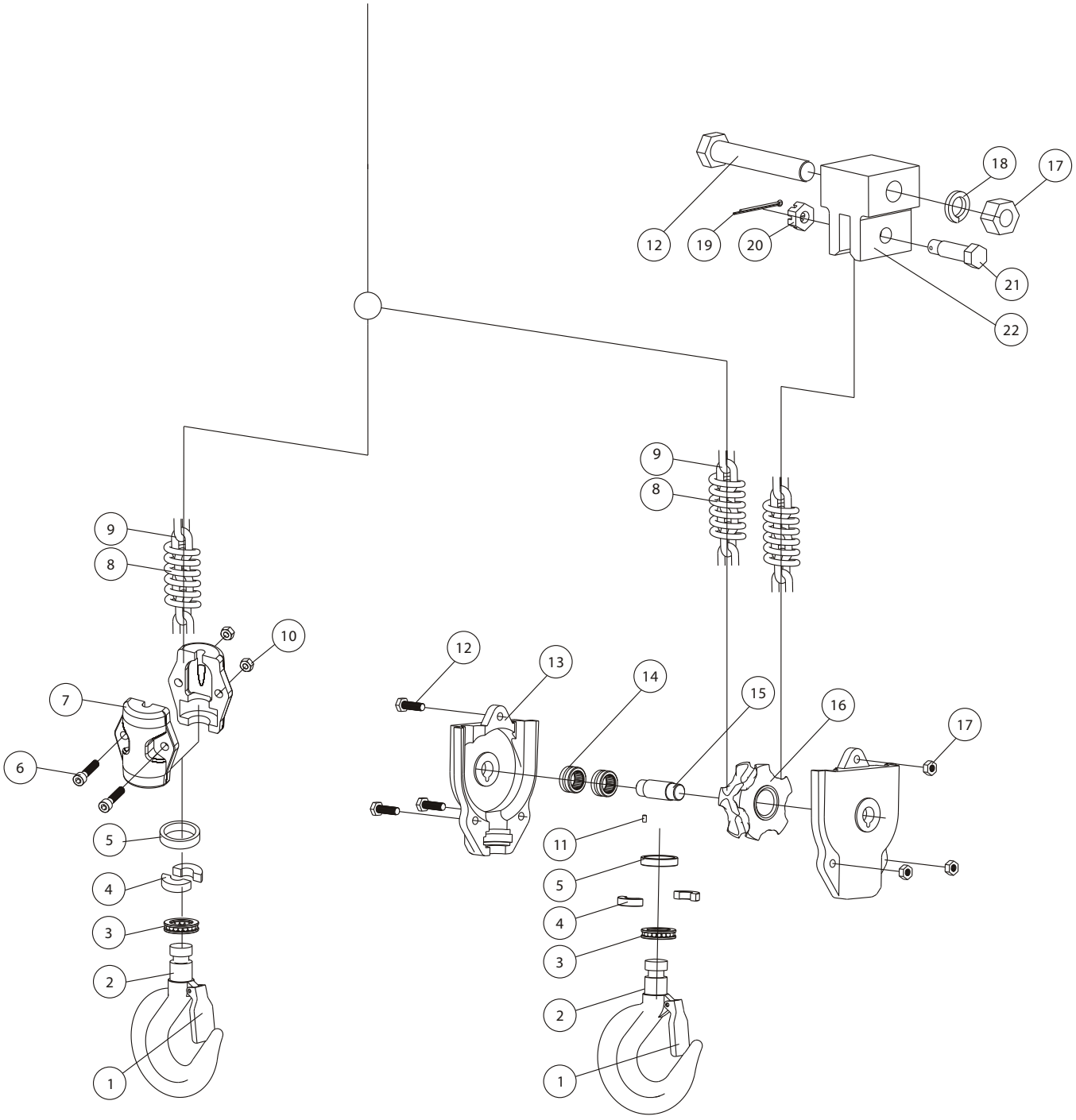
1.1 Motor and body assembly drawing



1.2 Motor and body assembly parts list

Item	Spare parts name	QTY	Item	Spare parts name	QTY
1	Rubber cover	1	31	Bottom plate for gearbox	1
2	Nut	1	32	Upper hook bearing brush	1
3	Motor back end locking plate	1	33	Sleeve bolt	4
4	Ring upper washer	1	34	Dowel pin	2
5	Circlip for hole	1	35	Gasket C	1
6	Deep groove ball bearing	1	36	Middle ware	1
7	Socket head cap screw	4	37	Hex screw washer	2
8	Spring washer	4	38	Hex screw	2
9	Motor Cover	1	39	Dowel pin	2
10	Rotor washer	1	40	Spring washer	6
11	Plate spring	4	41	Socket head cap bolt	6
12	Brake pad assembly	1	42	Gasket D	1
13	Brake spring	1	43	Eye Bolt	1
14	Brake magnet locking sleeve	1	44	Eye Bolt gasket	1
15	Brake magnet split ring	2	45	Gear box	1
16	Traction Block	1	46	Dowel pin	1
17	Plate spring	1	47	External tothed washer	5
18	Rotor assembly	1	48	Socket head cap bolt	5
19	Socket head cap screw	4	49	Gasket E	1
20	Motor cover	1	50	Electrical section cover	1
21	Spring-type straight pin	2	51	Spring washer	4
22	Gasket A	1	52	Socket head cap bolt	4
23	Motor Stator	1			
24	Hex nut	4			
25	Spring Washer	4			
26	Motor bottom plate	1			
27	Upper hook bearing brush	1			
28	Chain wheel case	1			
29	Sleeve	4			
30	Gasket B	1			

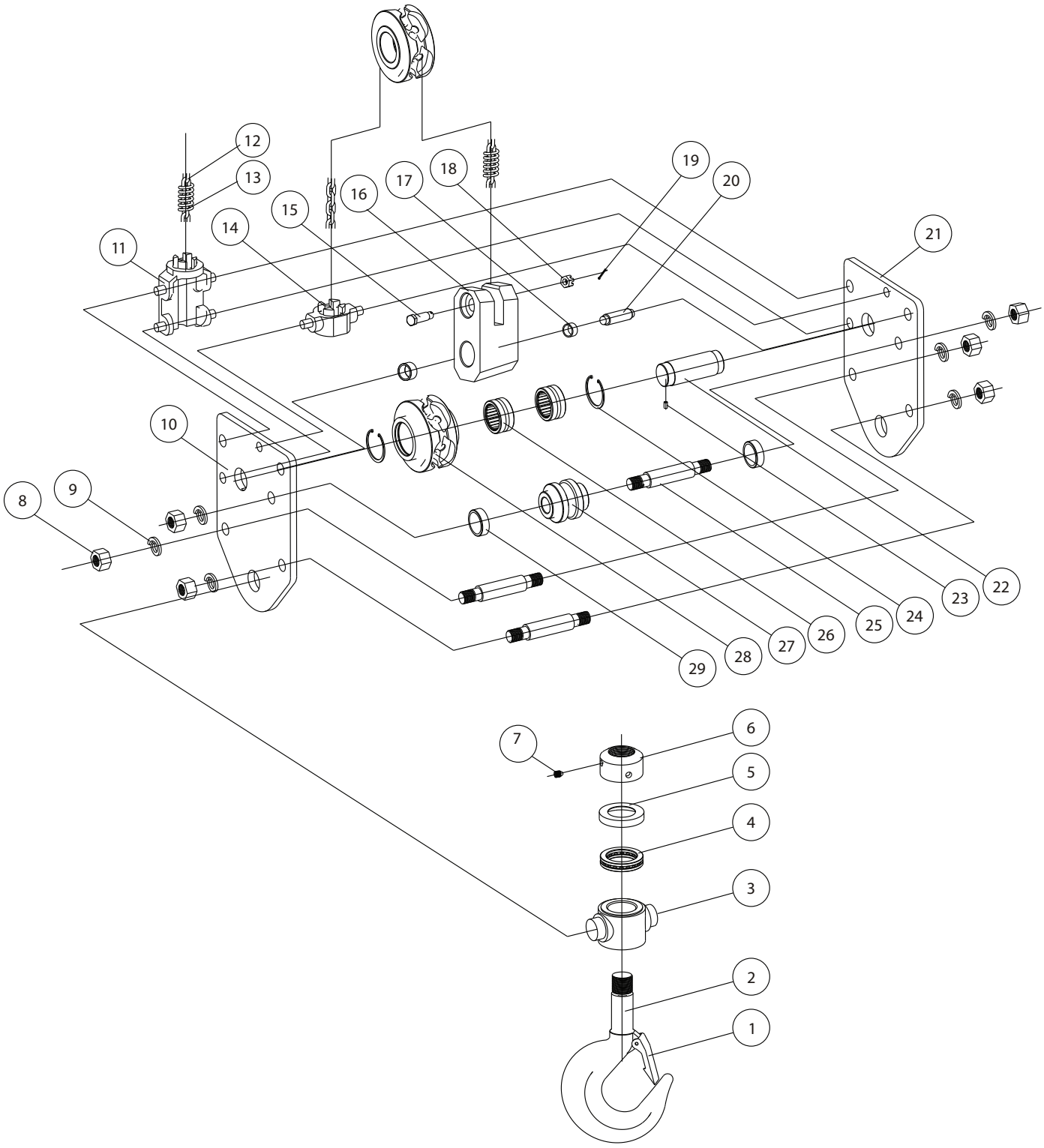
1.3 Hook assembly drawing (0.5, 1, 2, 3, 5 Ton)



1.4 Hook assembly part list (0.5, 1, 2, 3, 5 Ton)

Item	Spare parts name	QTY
1	Hook safety latch	1
2	Lower hook	1
3	Thust ball bearing	1
4	Lower hook split ring	2
5	Lower hook locking sleeve	1
6	Socket head cap screw	2
7	Lower hook swivel shell	2
8	Chain limit spring	1
9	Chain	3m
10	Self-Locking nut	2
11	Slotted spring	/
12	Outer hexagonal case	/
13	Lower load bock case	/
14	Needle bearing	/
15	Lower load block chain wheel shaft	/
16	Lower load chain wheel	/
17	Hex-nut	/
18	Spring washer	/
19	Split pin	/
20	Hex slotted nut	/
21	Chain bolt	/
22	Chain locking block	/

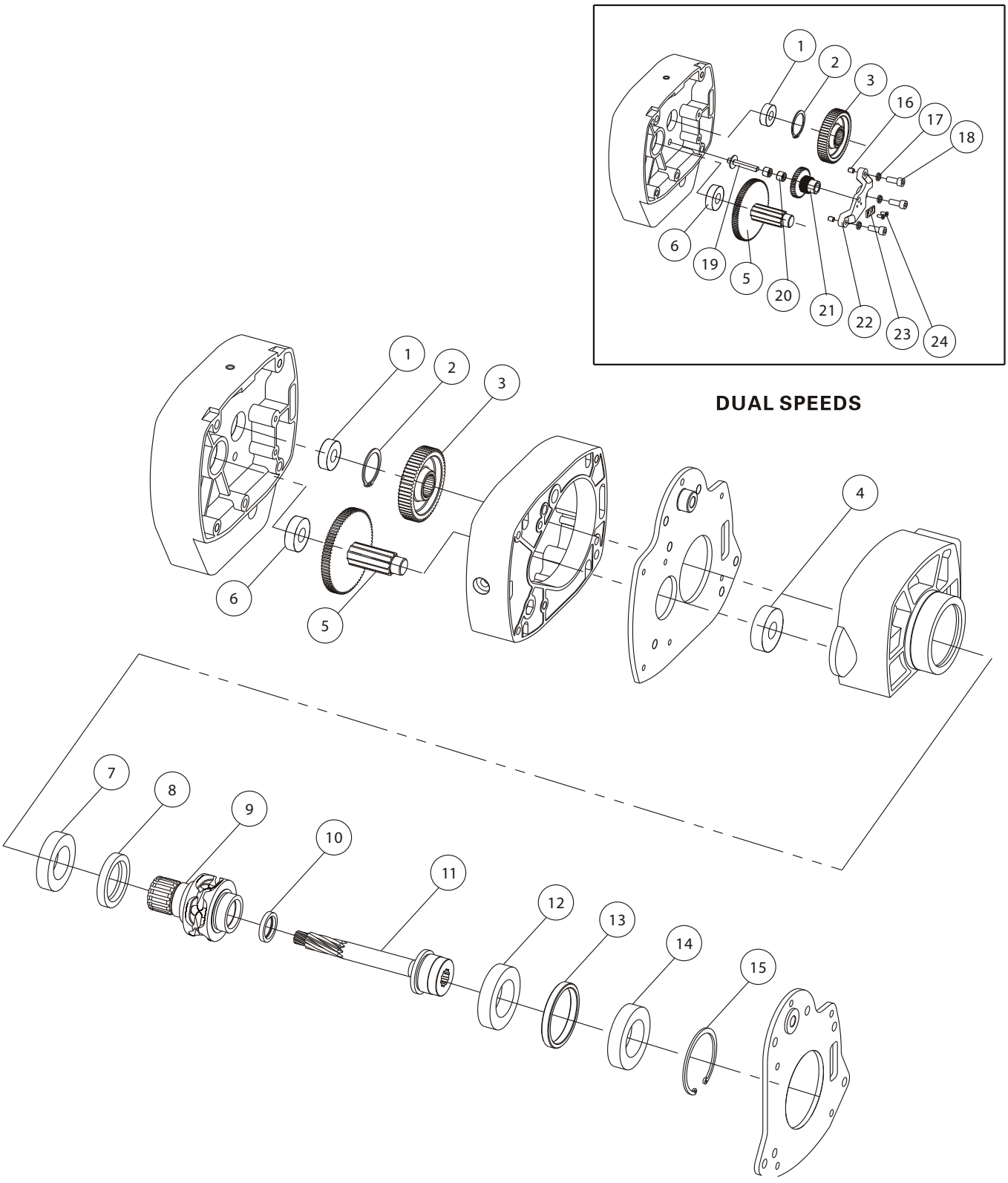
1.5 Hook assembly drawing (7.5 Ton)



1.6 Hook assembly part list

Item	Spare parts name	QTY
1	Hook safety latch	1
2	Lower Hook	1
3	Lower Hook swivel	1
4	Thrust ball bearing	1
5	Bearing Sheath	1
6	Hook nut	1
7	Hex-end tight set screws	1
8	Hex-nut	6
9	Spring Washer	6
10	Stent motherboard under	1
11	Chain guide	1
12	Chain	9m
13	Limit Spring	1
14	Chain Guide body	1
15	Chain bolt	1
16	Chain locking block	1
17	Gasket locking block	2
18	Hex slotted nut	1
19	Split pin	1
20	Shaft locking block	1
21	Stent vice board under	1
22	Lower hook chain wheel shaft	1
23	Spring straight pins	1
24	Cir-clip for hole	2
25	Stents double nuts	3
26	Needle bearing	2
27	Guiding pulley	1
28	Chain wheel	1
29	Circlip	2

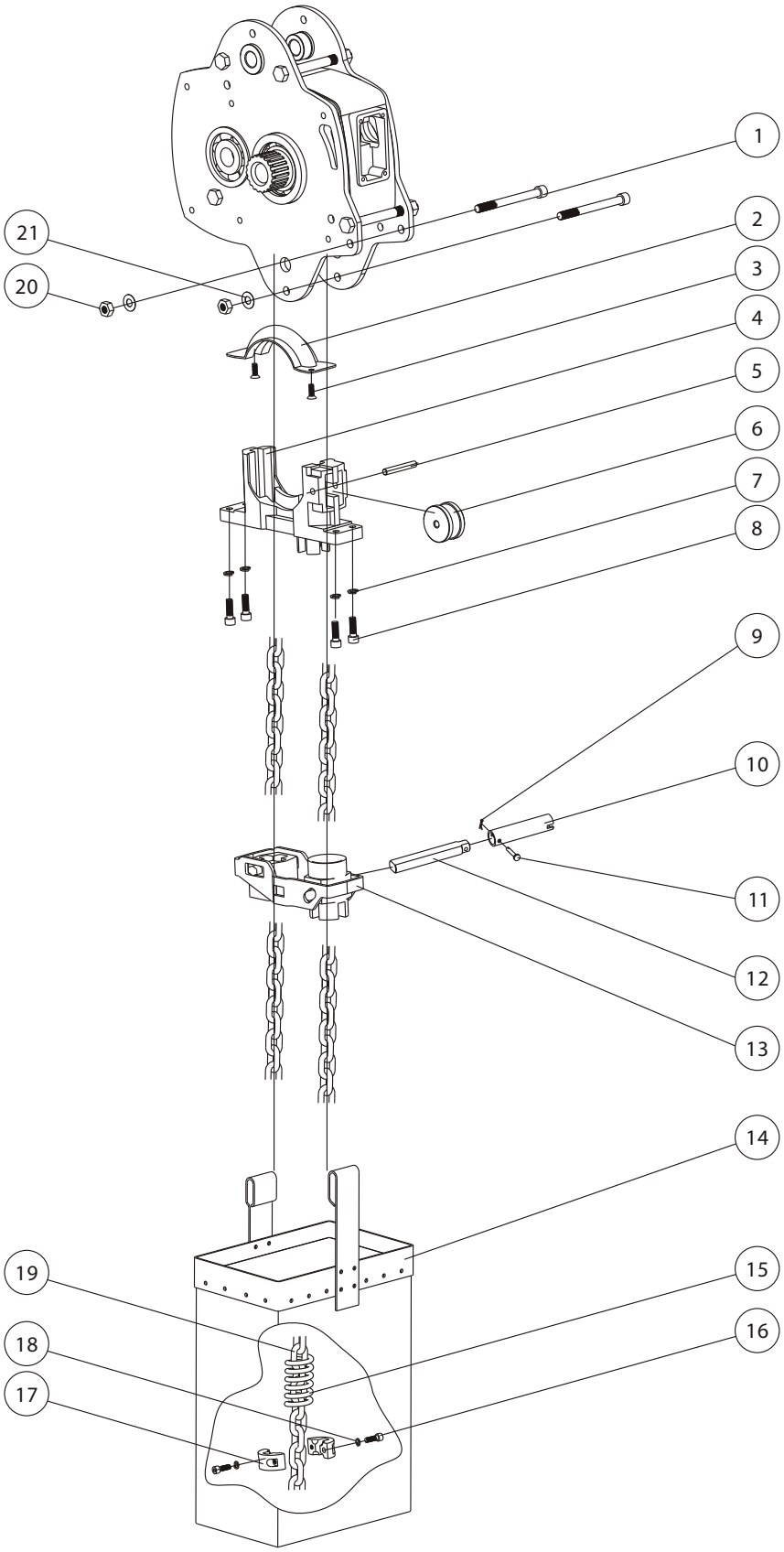
1.7 Gear Box Assembly drawing



1.8 Gear Box parts list

Item	Spare parts name	QTY
1	Deep groove ball bearing	1
2	Circlip for shaft	1
3	Output gear	1
4	Deep groove ball bearing	1
5	Gear-gear shaft	1
6	Deep groove ball bearing	1
7	Deep groove ball bearing	1
8	Oil seal	1
9	Chain wheel	1
10	Oil seal	1
11	Output shaft assembly	1
12	Deep groove ball bearing	1
13	Bearing fixed ring	1
14	Deep groove ball bearing	1
15	Circlip for hole	1
16	Spring straight pins	/
17	Spring washer	/
18	Socket head cap screws	/
19	Reduction gear fixed axis	/
20	Bearing	/
21	Dual Gears	/
22	Reduction gear fixed frame	/
23	Reduction gear fixed stator	/
24	Cross Recessed Countersunk screw	/

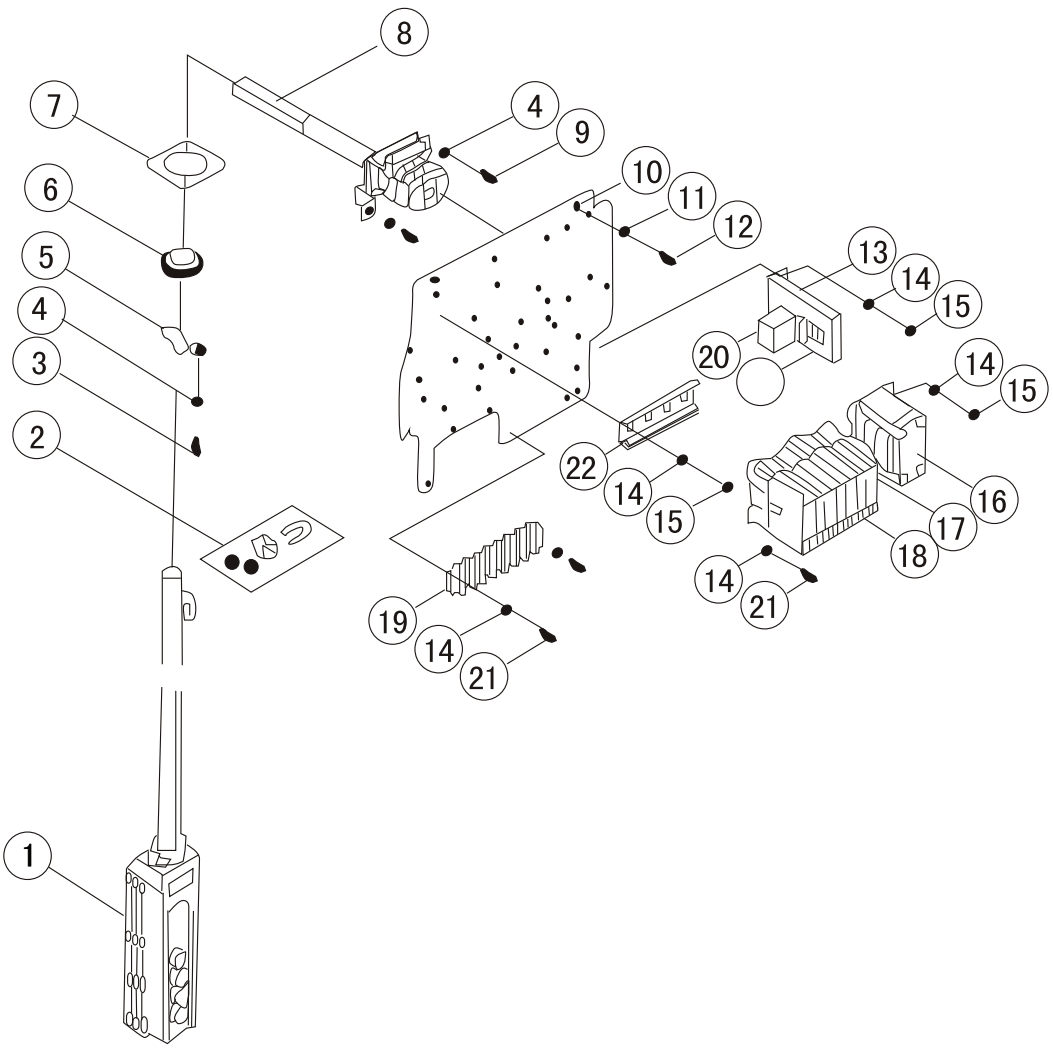
1.9 Chain assembly drawing



1.10 Chain assembly parts list

Item	Spare parts name	QTY
1	Socket head cap screws	2
2	Oriented iron	1
3	Slotted countersunk head screw	2
4	Chain guide	1
5	Pulley shaft	1
6	Oriented pulley	1
7	Spring washer	4
8	Socket head cap screws	4
9	Split pin	1
10	Limit switches connection shaft	1
11	Middle pin axis	1
12	Guide frame middle pin	1
13	Guide frame assembly	1
14	Chain bag	1
15	Limit spring	1
16	Socket head cap screws	2
17	Chain split ring	2
18	Spring washer	2
19	Chain	3m
20	Nut	2
21	Spring washer	2

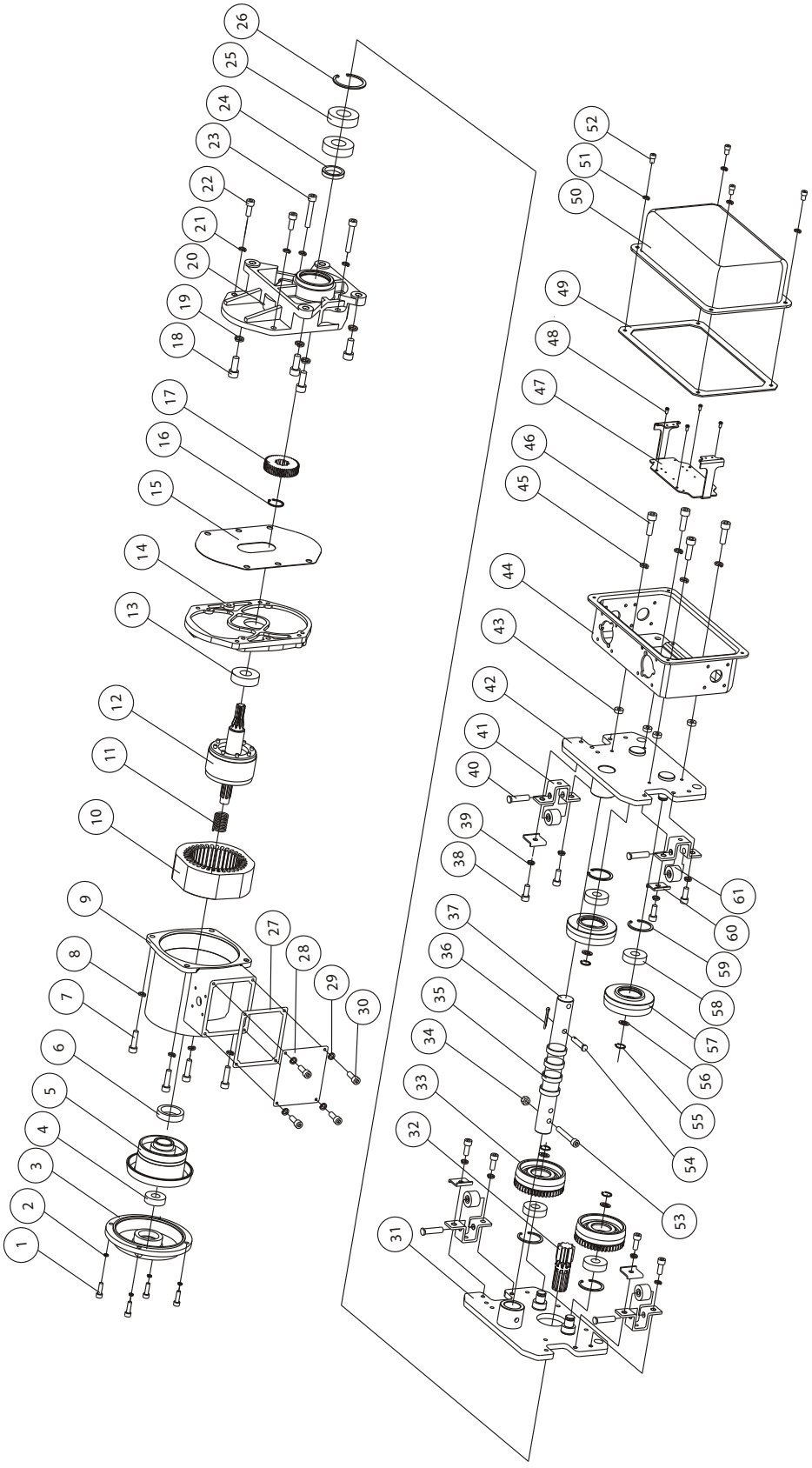
1.11 Gear Box Assembly drawing



1.12 Gear Box parts list

Item	Spare parts name	QTY
1	Control Switch	1
2	Tightrope Buckle	1
3	Round Buckle	2
4	Spring Washer	4
5	Wiring fixed ring accessories	1
6	Cable sheath	1
7	Fixed wiring ring	1
8	Connecting shaft assembly for control switch	1
9	Round cross screw M6*10	2
10	Electrical Installation Plate	1
11	Spring washer Ø6	4
12	Round cross screw M6*10	4
13	Reverse Bracket B	1
14	Spring washer Ø4	5
15	Round cross screw M4*10	5
16	Transformer	1
17	Electromagnetic contactor	2
18	Mechanical Linkage	1
19	Terminal Block	1
20	Reverse Phase Protector	1
21	Round cross screw M4*15	2
22	Fixed Rail	1

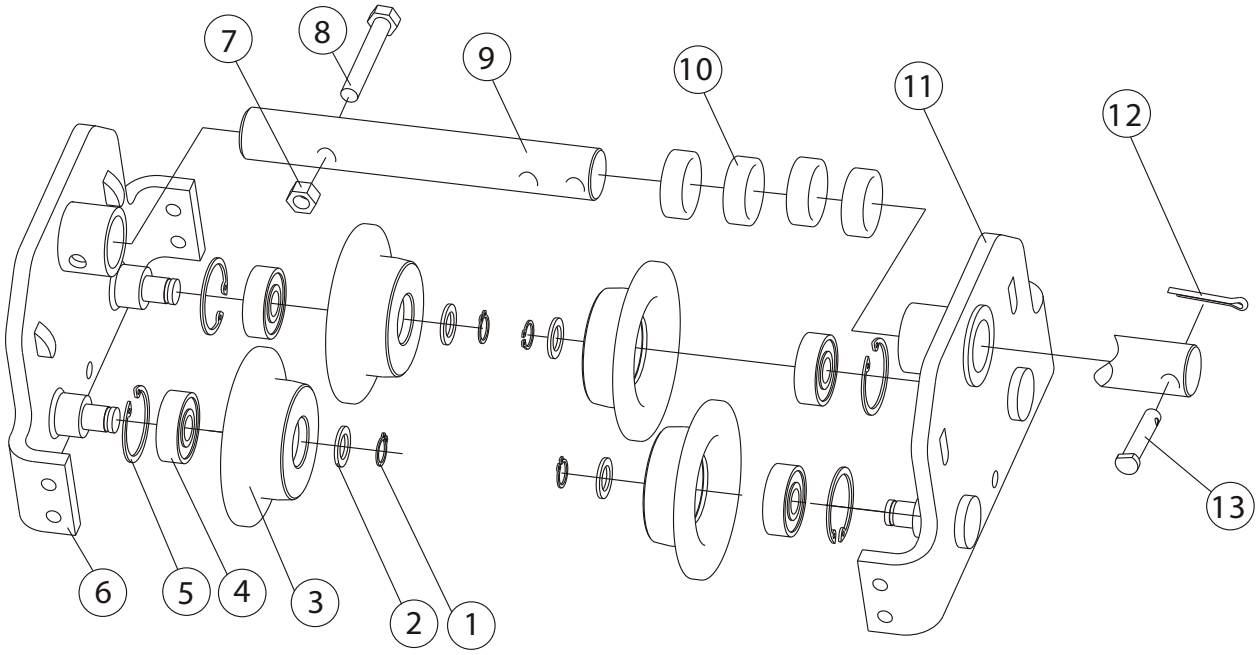
1.13 Electric Trolley assembly drawing



1.14 Electric Trolley assembly parts list

Item	Spare parts name	QTY	Item	Spare parts name	QTY
1	Socket head cap screws M6*20	4	33	Toothed driving wheel	2
2	Spring washer Ø6	4	34	Self-locking nut	1
3	Motor back end cover	1	35	Adjusting spacer	8
4	Deep groove ball bearing 6202	1	36	Split pin	1
5	5-Brake Assembly	1	37	Trolley shaft	1
6	Rubber Circlip	1	38	Socket head cap screw	8
7	Socket head cap screws	4	39	Spring washer	8
8	Spring washer	4	40	Auxiliary wheel shaft	4
9	Motor Cover	1	41	Auxiliary wheel bracket	4
10	Motor Stator	1	42	Trolley subplate assembly	1
11	Brake Spring	1	43	Gasket	4
12	Rotor Assembly	1	44	Electric control case cover assembly	1
13	Deep groove ball bearing	1	45	Spring washer	4
14	Motor bottom plate	1	46	Socket head cap screw	4
15	Motor bottom plate gasket	1	47	Wire connection bracket	1
16	Circlip for shaft	1	48	Cross Recess Head screw	4
17	Gear	1	49	Electric control case cover assembly	1
18	Socket head cap screw	4	50	Electric control case cover	1
19	Spring washer	4	51	Spring washer	4
20	Gear box	1	52	Socket head cap screw	4
21	Spring washer	4	53	Socket head cap screw	1
22	Socket head cap screws	2	54	Trolley shaft dowel pin	1
23	Socket head cap screws	2	55	Circlip for shaft	4
24	Circlip	1	56	Troley wheel washer	4
25	Deep Groove ball bearing	2	57	Trolley wheel	2
26	Circlip for hole	1	58	Deep groove ball rolling bearing	4
27	Slide plate gasket	1	59	Circlip for hole	4
28	Slide plate	1	60	Auxiliary wheel bracket gasket	4
29	Spring Washer	4	61	Trolley auxiliary wheel	4
30	Socket head cap screw	4			
31	Trolley main plate assembly	1			
32	Spline gear shaft	1			

1.15 Trolley assembly drawing

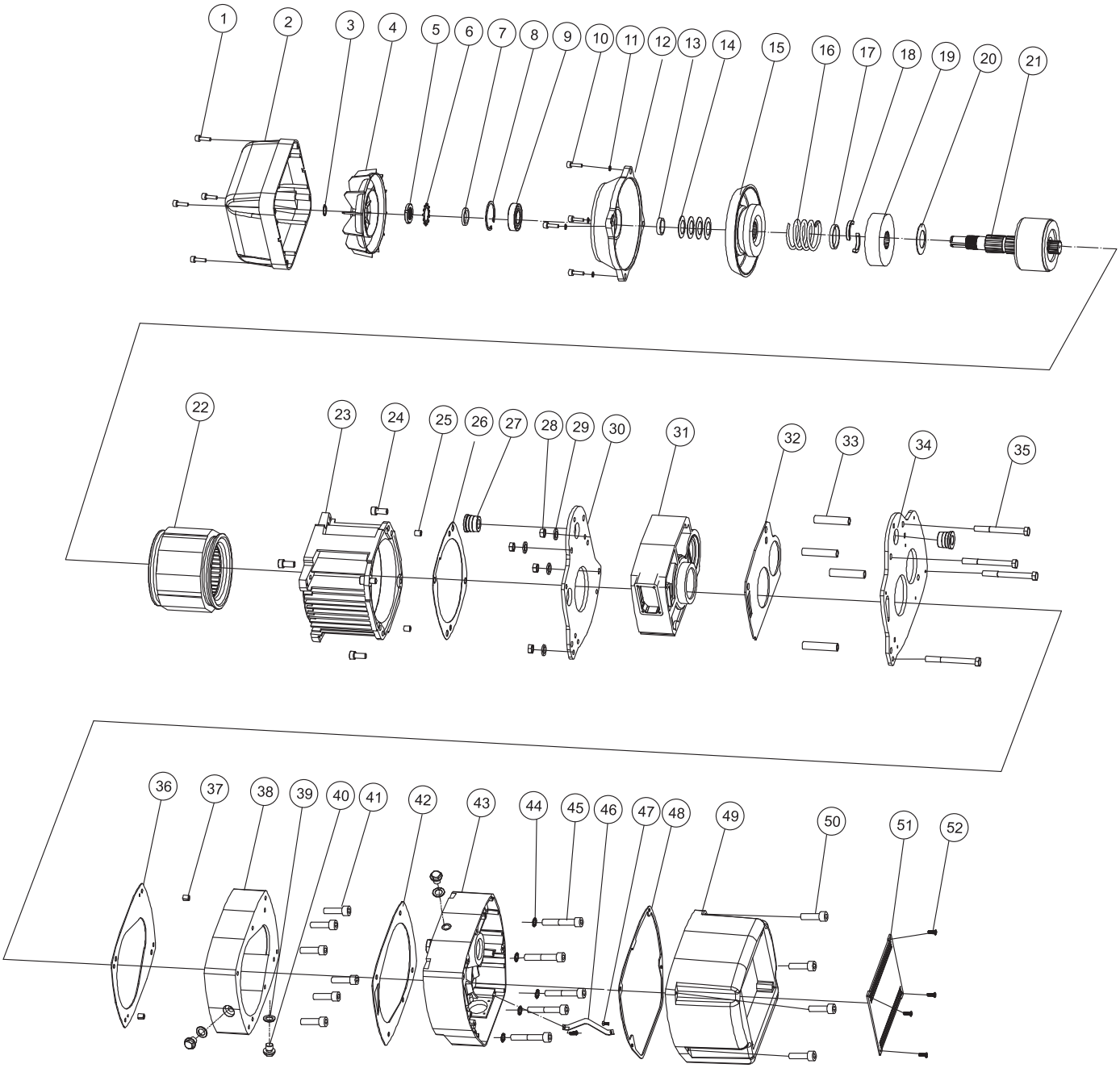


1.16 Trolley assembly parts list

Item	Spare parts name	QTY
1	Circlip for shaft	4
2	Trolley wheel washer	4
3	Trolley wheel	4
4	Deep groove ball bearing	4
5	Circlip for hole	4
6	Trolley main plate assembly	1
7	Self-locking nut	1
8	outer hexagonal screw	1
9	Trolley shaft	1
10	Adjusting spacer	8
11	Trolley subplate assembly	1
12	Split pin	1
13	Trolley shaft dowel pin	1

2. H4 EXPLODED VIEW AND PARTS LIST

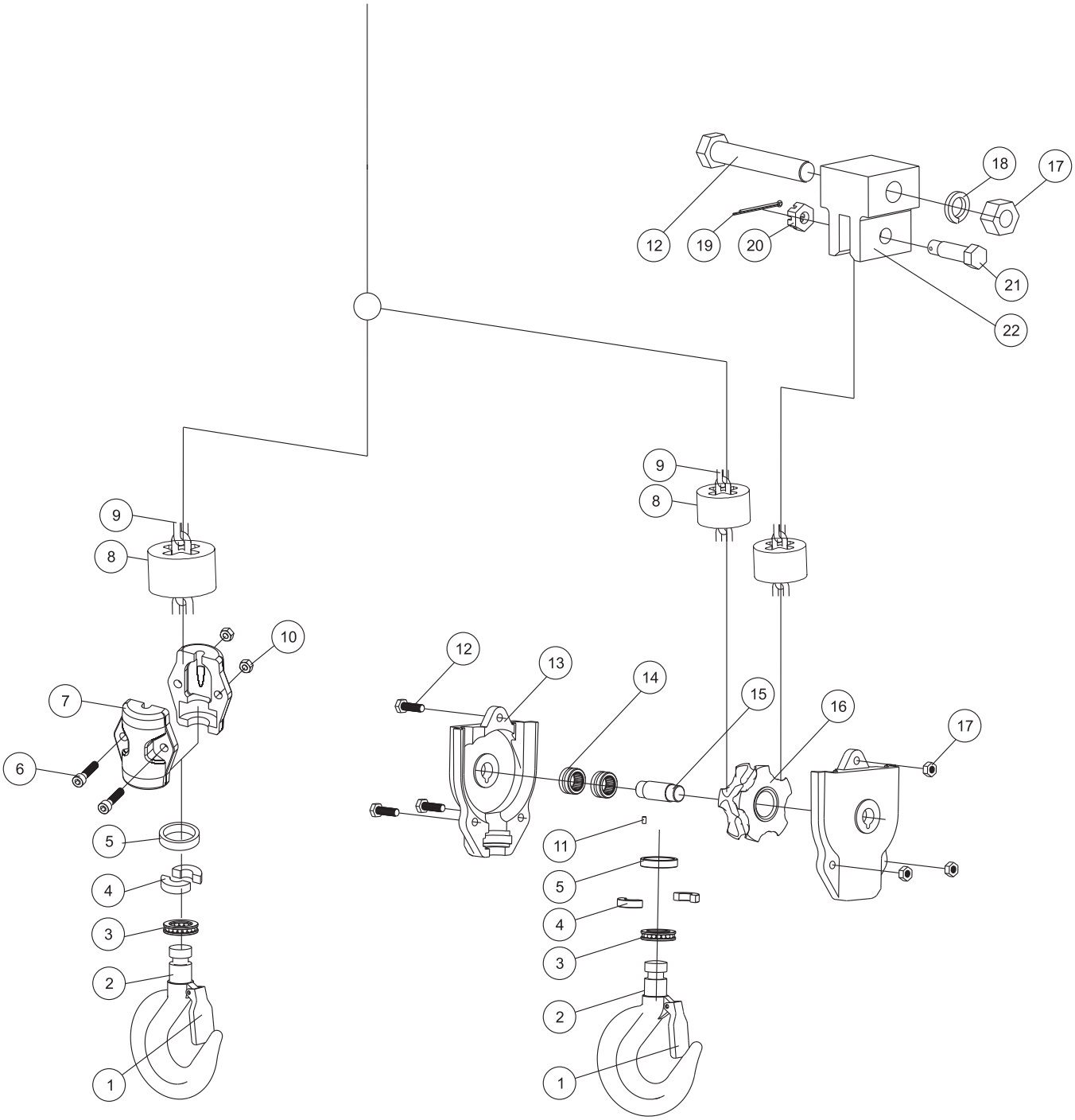
2.1 Motor and body assembly drawing



2.2 Motor and body assembly parts list

Item	Spare parts name	QTY	Item	Spare parts name	QTY
1	Socket head cap screw	4	31	Chain wheel case	1
2	Fan cover	1	32	Gasket B	1
3	Washer for shaft	1	33	Sleeve	1
4	Fan blade	1	34	Upper hook bearing brush	1
5	Nut	1	35	Sleeve bolt	4
6	Motor back end locking plate	1	36	Gasket C	1
7	Ring upper washer	1	37	Dowel pin	4
8	Circlip for hole	1	38	Middle Ware	1
9	Deep groove ball bearing	1	39	Hex screew washer	2
10	Socket head cap screw	4	40	Hex screew	2
11	Spring washer	4	41	Socket head cap bolt	6
12	Motor cover	1	42	Gasket D	1
13	Rotor washer	1	43	Gearbox	1
14	Plate spring	4	44	External toothed washer	4
15	Brake pad assembly	1	45	Socket head cap bolt	4
16	Brake spring	1	46	Cover belt	1
17	Brake magnet locking sleeve	1	47	Cross Recess Head Screw	2
18	Brake magnet split ring	2	48	Gasket E	5
19	Traction block	1	49	Electrical section cover	1
20	Plate spring	1	50	Socket head cap bolt	4
21	Rotor assembly	1	51	Cover plate	1
22	Motor Stator	4	52	Slotted countersunk head screw	4
23	Motor cover	1			
24	Socket head cap screw	4			
25	Spring-Type straight pin	2			
26	Gasket A	1			
27	Upper	2			
28	Hex nut	4			
29	Spring washer	4			
30	Motor bottom plate	1			

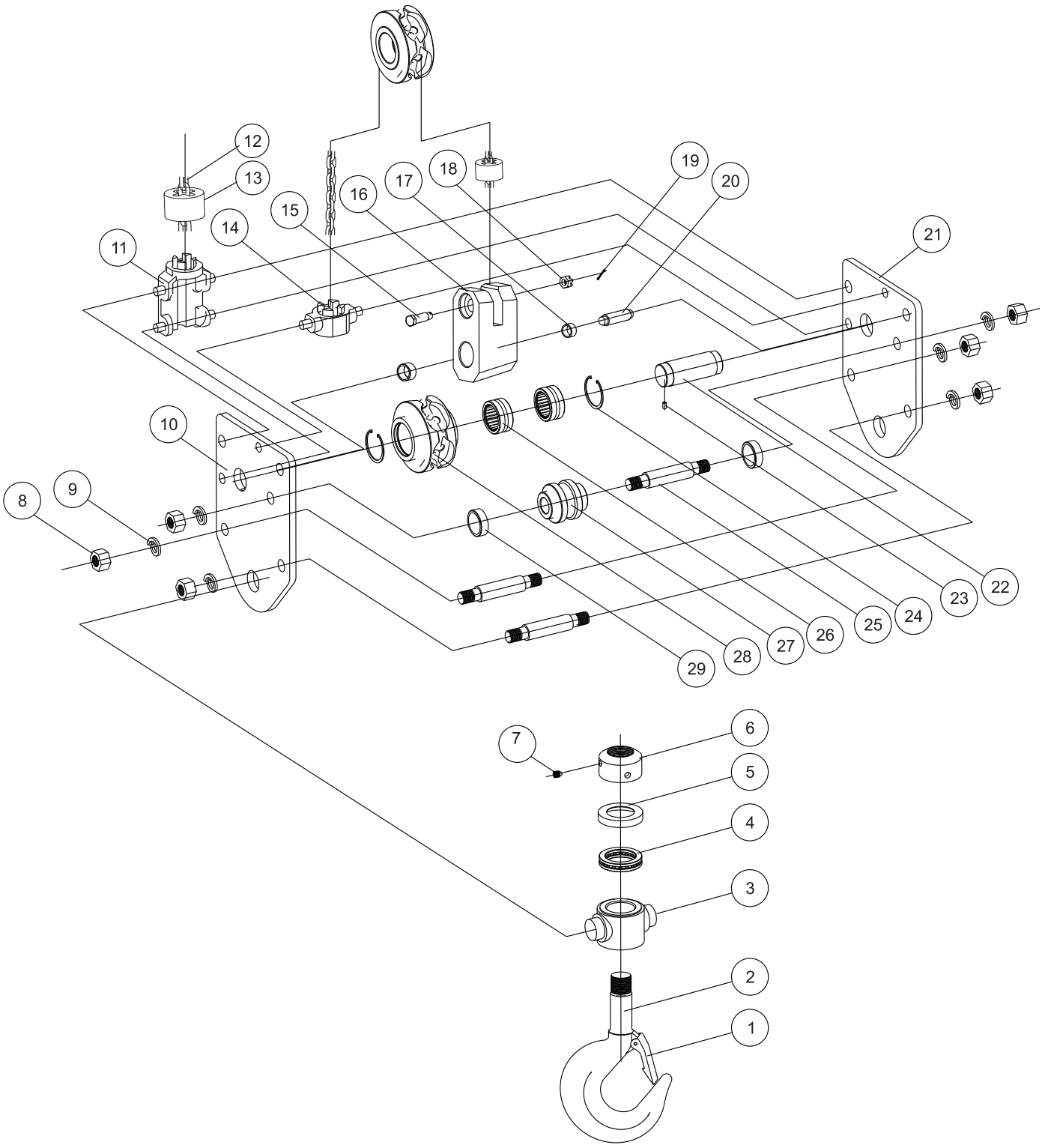
2.3 Hook assembly drawing (0.5, 1, 2, 3, 5 Ton)



2.4 Hook assembly part list (0.5, 1, 2, 3, 5 Ton)

Item	Spare parts name	QTY
1	Hook safety latch	1
2	Lower hook	1
3	Thurst ball bearing	1
4	Lower hook split ring	2
5	Lower hook locking sleeve	1
6	Socket head cap screw	2
7	Lower hookswivel cover	2
8	Cahin limit spring	1
9	Chain	3.5 m
10	Self-locking nut	2
11	Slotted spring pins	/
12	Outer Hexagonal cover	/
13	Lower load block cover	/
14	Needle bearing	/
15	Lower load block chain wheel shaft	/
16	Lower load chain wheel	/
17	Hexnut	/
18	Spring washer	/
19	Split pin	/
20	Hex slotted nut	/
21	Chain bolt	/
22	Chain locking block	/

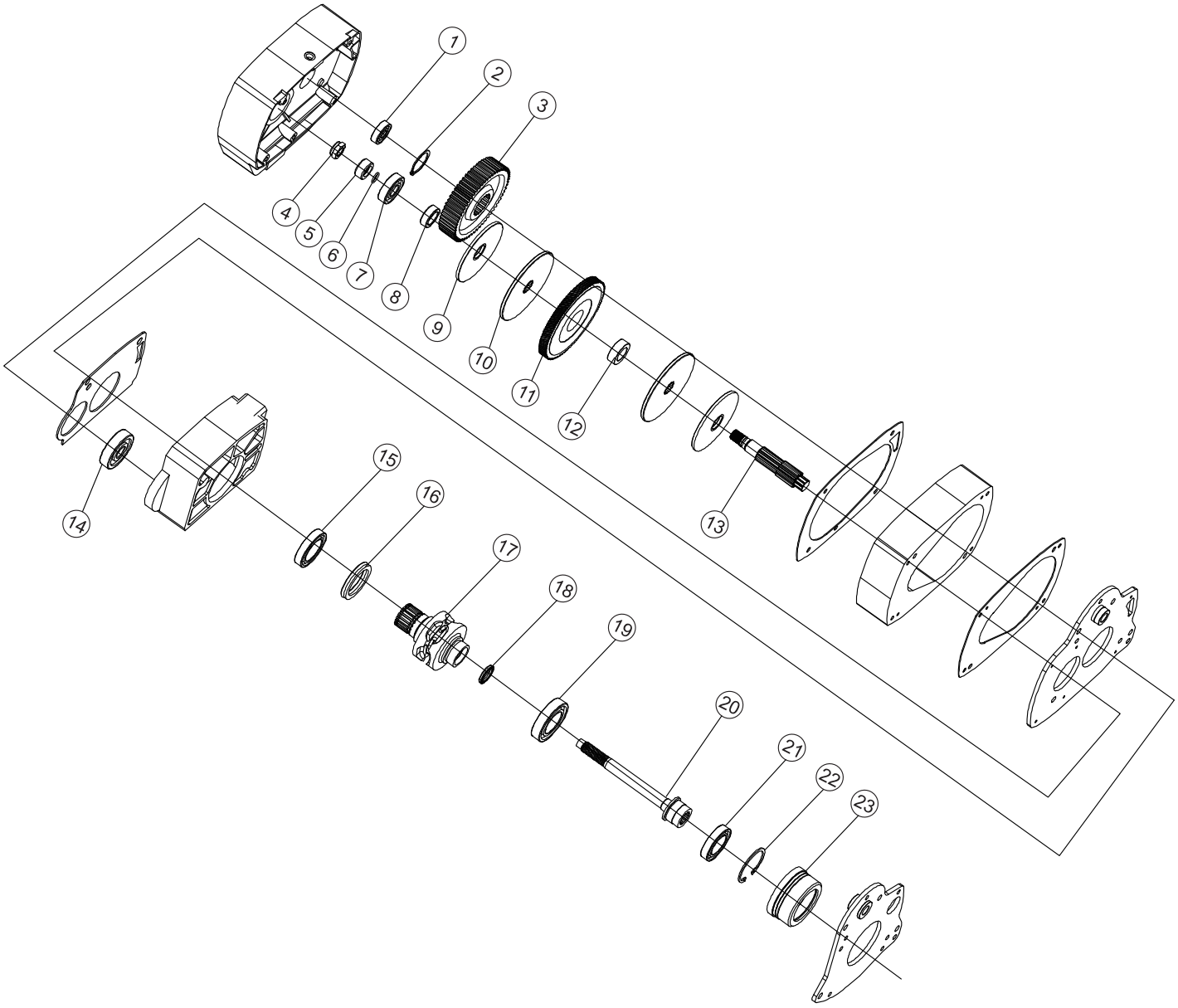
2.5 Hook assembly drawing (7.5 Ton)



2.6 Hook assembly part list

Item	Spare parts name	QTY
1	Hook safety latch	1
2	Lower Hook	1
3	Hook to undertake block	1
4	Thrust ball bearing	1
5	Bearing sheath	1
6	Hook nut	1
7	Hex-end tight set screws	1
8	Hexnut	6
9	Spring Washer	6
10	Stent motherboard under	1
11	Chain guide	1
12	Chain	10.5 m
13	Limit Spring	1
14	Guide chain body	1
15	Chain bolt	1
16	Chain locking block	1
17	Locking gasket block	2
18	Hex lotted nut	1
19	Split pin	1
20	Locking shaft block	1
21	Stent vice board under	1
22	Lower hook chain wheel shaft	1
23	Spring straight pins	1
24	Circlip for hole	2
25	Stents double nut	3
26	Deedle bearing	2
27	Guiding pulley	1
28	Chain wheel	1
29	Circlip	2

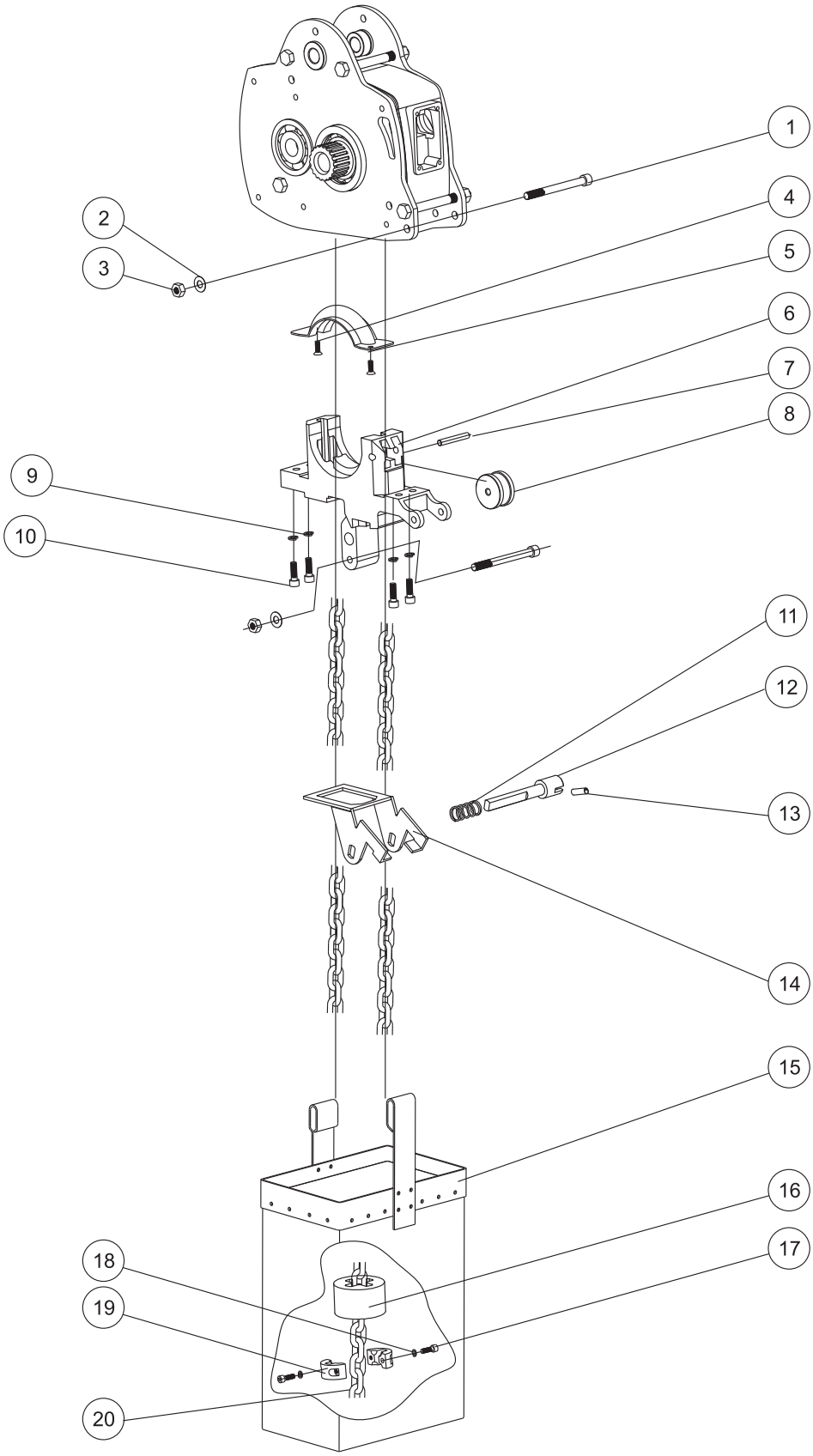
2.7 Gear Box Assembly drawing



2.8 Gear Box parts list

Item	Spare parts name	QTY
1	Deep groove ball bearing	1
2	Shaft circlip	1
3	Output gear	1
4	Torque nut	1
5	Oil seal fixing sleeve	1
6	O ring	1
7	Deep groove ball bearing	1
8	Spring plate fixing sleeve	1
9	Disc Spring plate	2
10	Braking Plate	2
11	Intermediate gear	1
12	Gear fixing plate	1
13	Gear shafe	1
14	Deep groove ball bearing	1
15	Deep groove ball bearing	1
16	Oli seal	1
17	Chain wheel	1
18	Oil seal	1
19	Deep groove ball bearing	1
20	Output shaft assembly	1
21	Deep groove ball bearing	1
22	Circlip for hole	1
23	Motor base plate spare parts	1

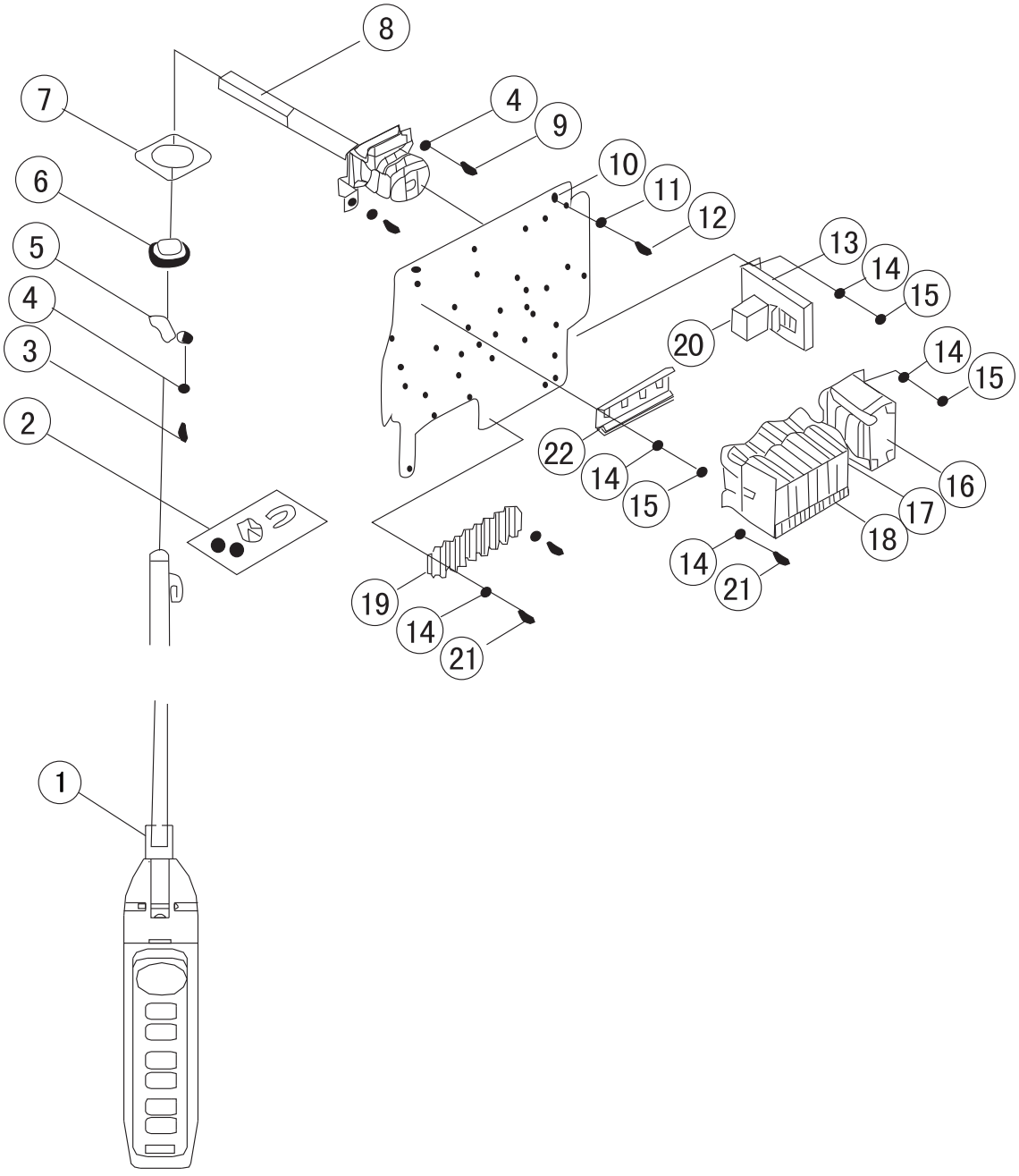
2.9 Chain assembly drawing



2.10 Chain assembly parts list

Item	Spare parts name	QTY
1	Socket head cap bolt	2
2	Spring washer	2
3	Hex nut	2
4	Slotted counter sunk head screws	2
5	Oriented iron	1
6	Chain guide	1
7	Pulley Shaft	1
8	Oriented pulley	1
9	Spring washer	2
10	Socket head cap screws	2
11	Limit switch spring	1
12	Guide limited pin	1
13	Elastic cylindrical pin	1
14	Limit guide frame	1
15	Chain bag	1
16	Bumper block	1
17	Socket head cap screws	2
18	Spring washer	2
19	Chain split spring	2
20	Chain	3.5 m

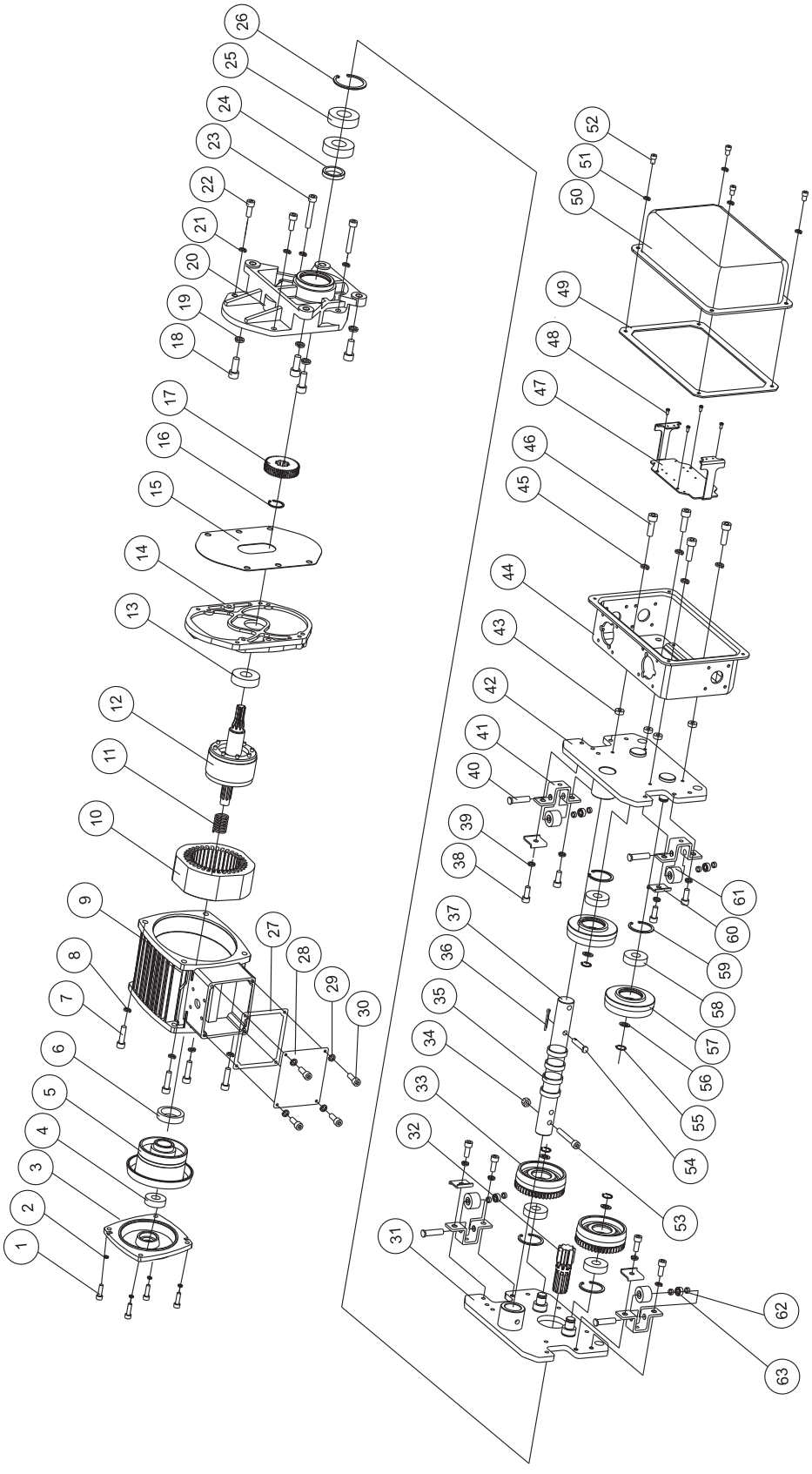
2.11 Gear Box Assembly drawing



2.12 Gear Box parts list

Item	Spare parts name	QTY
1	Control Switch	1
2	Tightrope buckle	1
3	Round cross screw M6x12	2
4	Spring washer	4
5	Wiring fixed ring accessories	1
6	Cable sheath	1
7	Fixed wiring ring	1
8	Control switch connection shaft	1
9	Round cross screw M6x10	2
10	Electrical installation plate	1
11	Spring washer Ø6	4
12	Round cross screw M6x15	4
13	Reverse bracket B	2
14	Spring washer Ø4	5
15	Round cross screw M4x10	5
16	Transformer	1
17	Electromagnetic contactor	2
18	Mechanical linkage	1
19	Terminal block	1
20	Reverse polarity protector	1
21	Round cross screw M4x15	2
22	Fixed rail	1

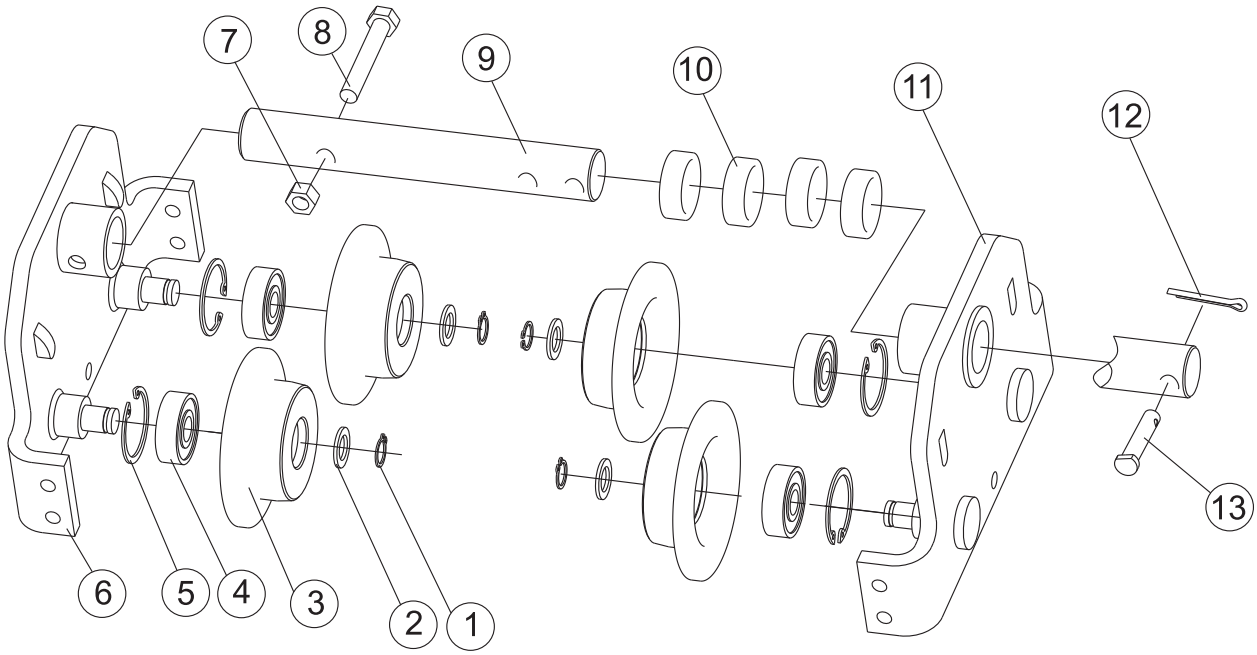
2.13 Electric Trolley assembly drawing



2.14 Electric Trolley assembly parts list

Item	Spare parts name	QTY	Item	Spare parts name	QTY
1	Socket head cap screws M6x20	4	33	Toothed driving wheel	2
2	Spring washer Ø6	4	34	Self-locking nut	1
3	Motor back end cover	1	35	Adjusting spacer	8
4	Deep groove ball bearing 6202	1	36	Split pin	1
5	Brake Assembly	1	37	Trolley shaft	1
6	Rubber Clip	1	38	Socket head cap screw	8
7	Socket head cap screws	4	39	Spring Washer	8
8	Spring washer	4	40	Auxilliary wheel shaft	4
9	Motor Shell	1	41	Auxilliary wheel bracket	4
10	Motor Stator	1	42	Trolley subplate assembly	1
11	Brake Spring	1	43	Gasket	4
12	Rotor Assembly	1	44	Electric control case assembly	1
13	Deep groove ball bearing	1	45	Spring washer	4
14	Motor bottom plate	1	46	Socket head cap screw	4
15	Motor bottom plate gasket	1	47	Wire connection bracket	1
16	Shaft Circlip	1	48	Cross recess head screw	4
17	Gear	1	49	Electric control case gasket	1
18	Socket head cap screw	4	50	Electric control case	1
19	Spring washer	4	51	Spring Washer	4
20	Gear box	1	52	Socket head cap screw	4
21	Spring washer	4	53	Socket head cap screw	1
22	Socket head cap screw	2	54	Trolley shaft dowel pin	1
23	Socket head cap screw	2	55	Circlip for shaft	4
24	Circlip	1	56	Trolley wheel washer	4
25	Deep Groove ball bearing	2	57	Trolley wheel	2
26	Circlip for hole	1	58	Deep groove ball rolling bearing	4
27	Slide plate gasket	1	59	Circlip for hole	4
28	Side plate	1	60	Auxiliary wheel bracket gasket	4
29	Spring washer	4	61	Trolley auxiliary wheel	4
30	Socket head cap screw	4	62	Trolley auxiliary wheel washer	8
31	Trolley main plate assembly	1	63	Deep groove ball bearing	4
32	Spline gear shaft	1			

2.15 Trolley assembly drawing

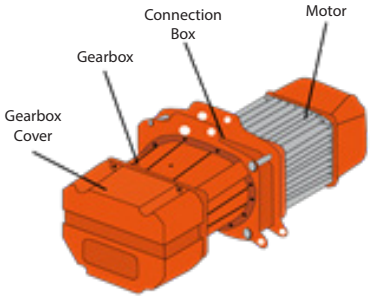


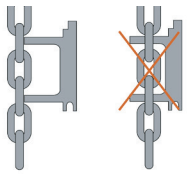
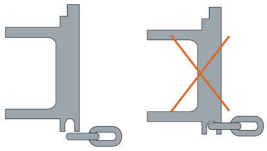
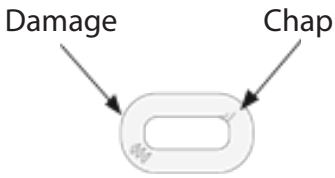
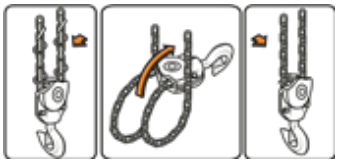
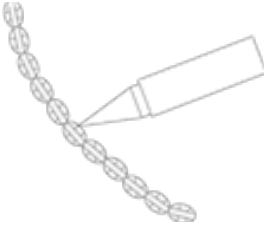
1.16 Trolley assembly parts list

Item	Spare parts name	QTY
1	Circlip for shaft	4
2	Trolley wheel washer	4
3	Trolley wheel	4
4	Deep groove ball beearing	4
5	Circlip for hole	4
6	Trolley main plate assembly	1
7	Self-locking nut	1
8	Outer heaxagonal screw	1
9	Trolley shaft	1
10	Adjusting spacer	8
11	Trolley subplate assembly	1
12	Split pin	1
13	Trolley shaft dowel pin	1

1. OPERATION

1.1. Periodic Inspection

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

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

<table>
<tr><th>Items</th><th>Inspection Method</th><th colspan="3">Standards</th><th>Correction</th></tr>
<tr><td>Limit switch</td><td>Check by pushing button</td><td colspan="3">Operate until upper and lower limit cause automatic motor shutdown</td><td>Replace limit switch, disassemble and clean limit lever</td></tr>
<tr><td>Movement confirmation</td><td>Check by pushing button</td><td colspan="3">-Load chain can roll up easily
-Motor shutdown immediately when operation stops
-All movements shutdown when E-stop button pushed
-Other buttons cannot cause movement when pushing the E-stop button -All movements return to normal operation when E-STOP button relieved</td><td></td></tr>
<tr><td>Brake</td><td>Check by pushing button</td><td colspan="3">Brake quickly activates and operation of bottom hook immediately stops (amount of movement of the load chain is within 2 to 3 rings)</td><td></td></tr>
<tr><td rowspan="5">Chain Spring</td><td rowspan="5">Visual inspection and measure dimensions</td><td rowspan="2">Chain</td><td colspan="2">Length of spring</td><td rowspan="5">Replace chain spring
  </td></tr>
<tr><td>Standard</td><td>Limits</td></tr>
<tr><td>Ø6.3</td><td>145</td><td>140</td></tr>
<tr><td>Ø7.1</td><td>145</td><td>140</td></tr>
<tr><td>Ø10.0</td><td>135</td><td>129</td></tr>
<tr><td>Ø11.2</td><td>160</td><td>152</td></tr>
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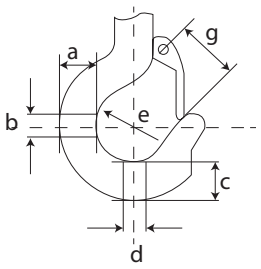
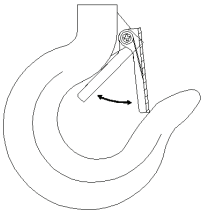
<table>
<tr><th>Items</th><th>Inspection Method</th><th>Standards</th><th>Correction</th></tr>
<tr><td>Attrition and opening of the hook</td><td>Visually check and with vernier caliper tool
 
</td><td>No remarkable opening or attrition
<table>
<tr><th>Load</th><th>a</th><th>b</th><th>c</th><th>d</th><th>e</th><th>g</th></tr>
<tr><td>0.3 -0.5</td><td>27</td><td>18</td><td>25</td><td>17</td><td>35</td><td>28</td></tr>
<tr><td>1</td><td>34</td><td>24</td><td>30</td><td>24</td><td>42</td><td>32</td></tr>
<tr><td>2</td><td>46</td><td>29</td><td>39</td><td>30</td><td>49</td><td>40</td></tr>
<tr><td>3</td><td>56</td><td>35</td><td>49</td><td>34</td><td>59</td><td>48</td></tr>
<tr><td>5</td><td>67</td><td>43</td><td>67</td><td>44</td><td>60</td><td>48</td></tr>
<tr><td>7.5 - 10</td><td>82</td><td>55</td><td>80</td><td>48</td><td>85</td><td>80</td></tr>
<tr><td>15</td><td>110</td><td>78</td><td>120</td><td>80</td><td>120</td><td>90</td></tr>
<tr><td>20 - 25</td><td>142</td><td>95</td><td>155</td><td>98</td><td>150</td><td>115</td></tr>
</table></td><td></td></tr>
<tr><td>Deformation, damage and corrosion</td><td>Visual check</td><td>No remarkable deformation, harmful damage and corrosion</td><td>Replace hook</td></tr>
<tr><td>Hook safety block</td><td>Visual inspection, fold and unfold actions</td><td>-Can exactly fold inside the hook
-No deformation
Dangerous
-Do not use hook if safety block is loosening
Improper use will lead to death or serious injury</td><td>Replace hook safety block
  </td></tr>
<tr><td>Hook movements (rotate)</td><td>Visual inspection and manual rotation</td><td>-No remarkable space between bottom supporting and top
-equal at right and left
-easy to rotate 360°</td><td>Replace hook</td></tr>
</table>

1.3. During Operation:

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

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

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

Power Cable

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

Motor

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

Brake

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

Inside Wiring

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

Transformer

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

Contactor & Electric Reply

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

Limit switch

Condition	Reason	Action	Cause	Correction
No operation (Contactor)	Contact fused	Operate limit switch. Check continuity of contactor, replace if result is negative	Limit switch overuse	Avoid overuse of switch
	Wire break	Inspect cable, change if wire breakage or replace limit switch	Vibration, drop	Avoid excessive bumping in usage
	Moveable 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 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

Electric shock

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

Hook

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

Load chain

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

Chain Wheel

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

Load pulley and empty pulley

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

Chain Guide

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

Chain Wheel, Junction Part

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

Bearing

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

Trolley

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

Electric Trolley

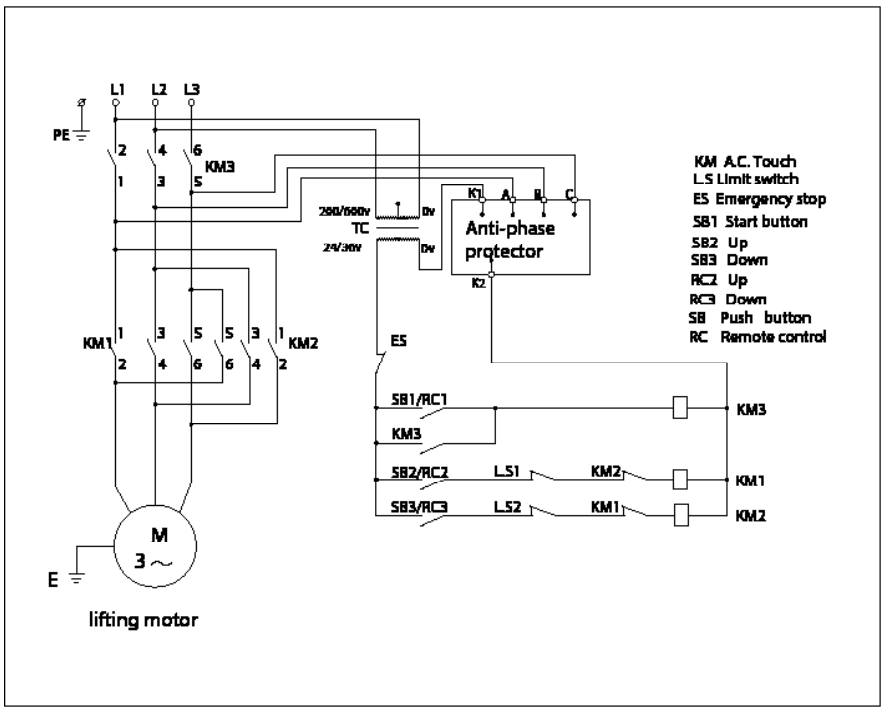
Condition	Reason	Action	Cause	Correction
Wheels stopped revolving	Brake gelling	Open motor cover remove rust and dirt	Usage environment	Inspect regularly
	Electric fault	Refer to items of electric chain hoist		
Abnormal sound	Wear of edge guide wheel	Confirm wear degrees	Reaching service life	Confirm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

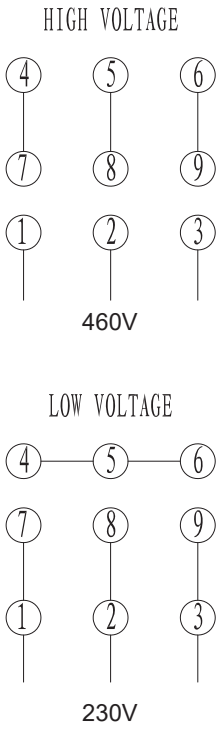
Manual Trolley

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

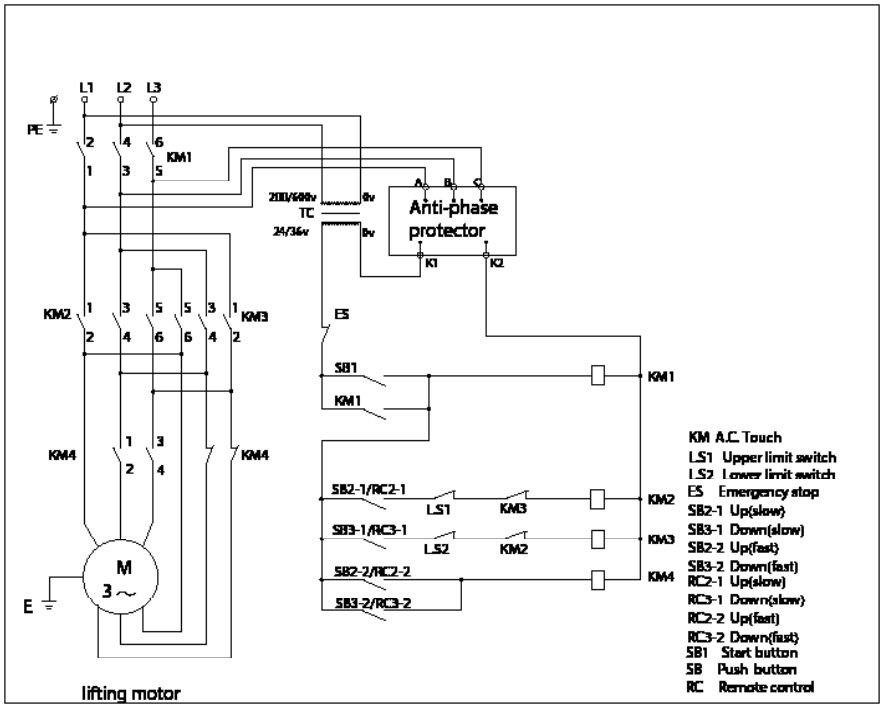
7. CONVENTIONAL HOIST WIRING DIAGRAM (PWRF - PWRT)

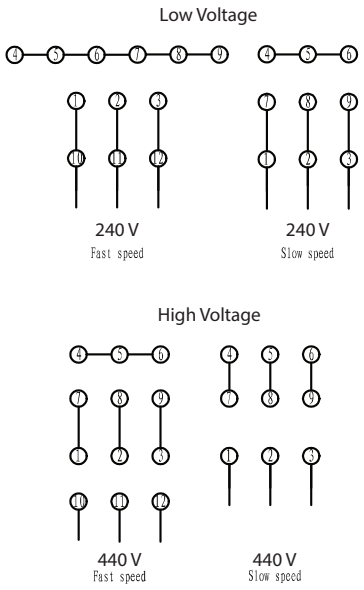
7.1. Hoist Wiring Diagram 1 Speed H3 Fixed PWRF_H3-1SW Series



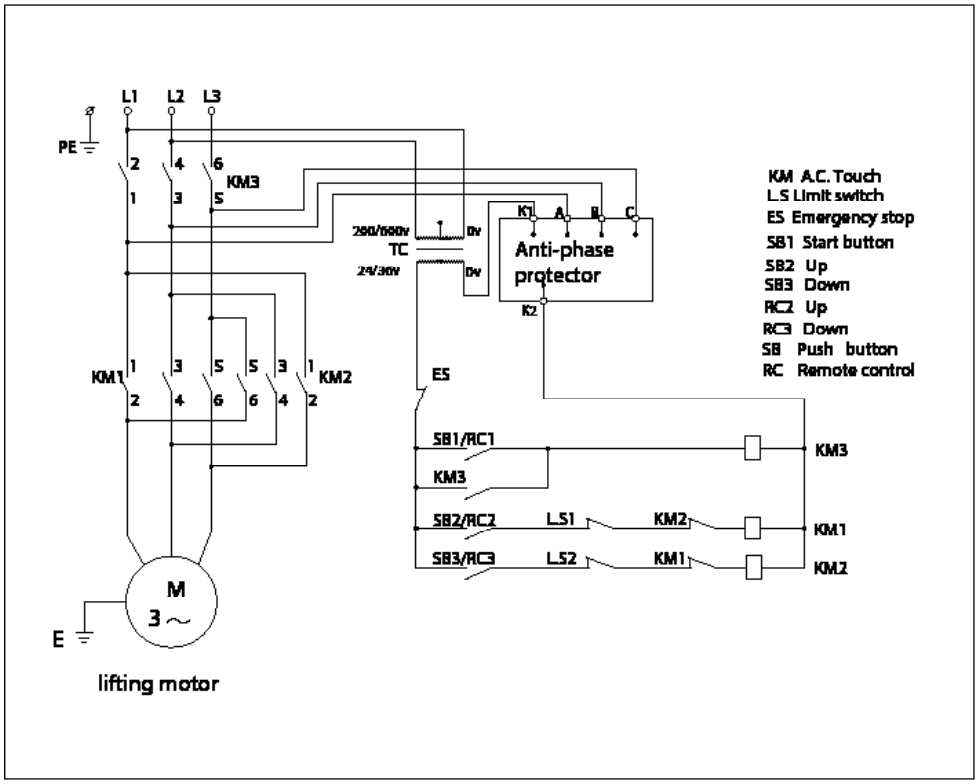


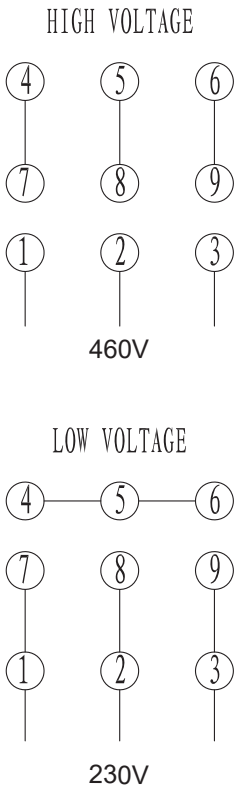
7.2. Hoist Wiring Diagram 2 Speed H3 Fixed PWRF_H3-2SW Series



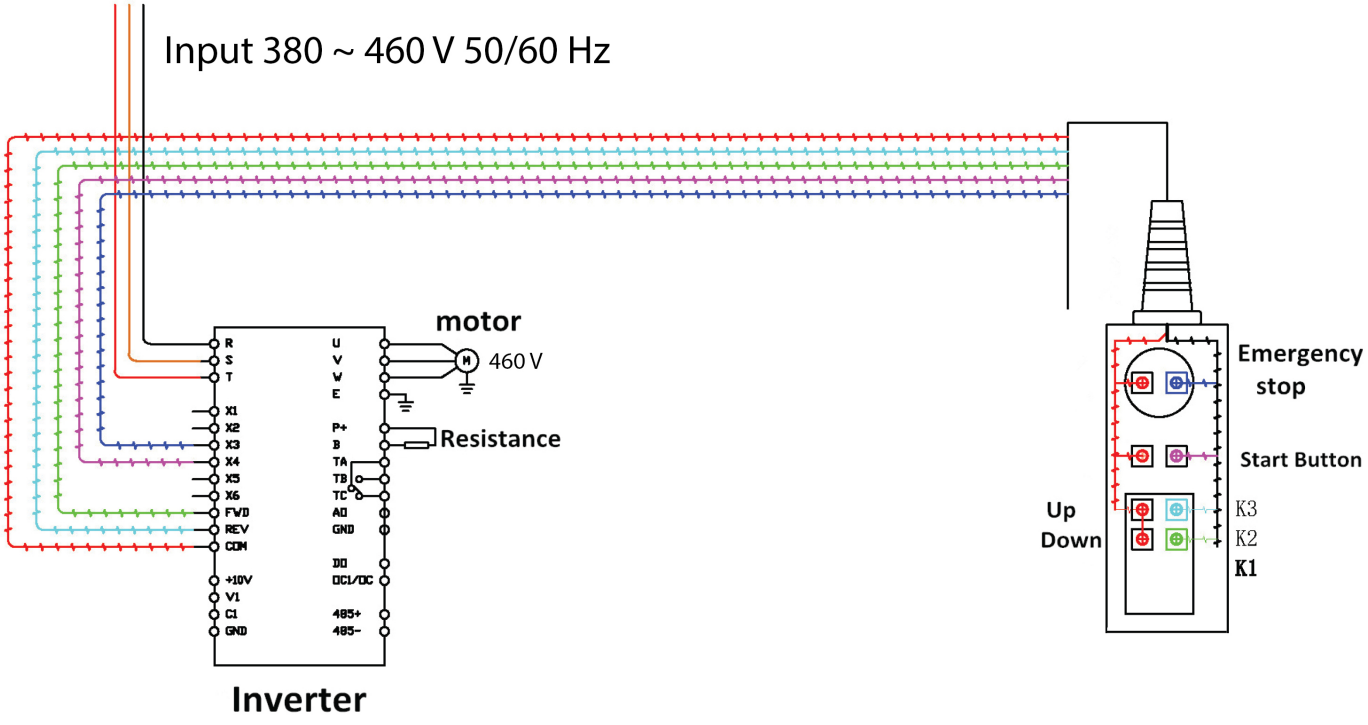


7.3. Hoist Wiring Diagram 1 Speed H4 Fixed PWRF_H4-1SW Series

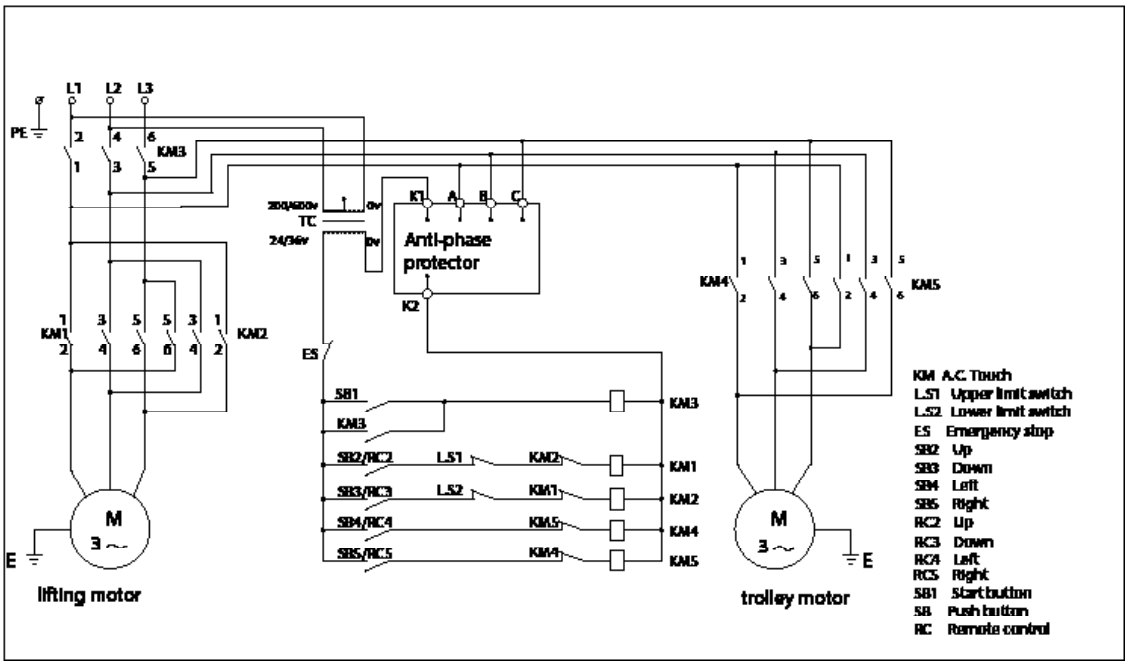


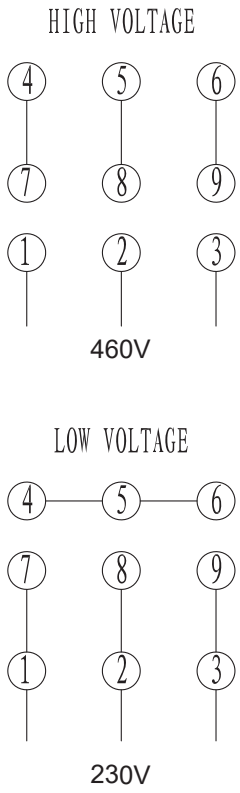


7.4. Hoist Wiring Diagram 2 Speed H4 Fixed PWRF_H4-2SW Series

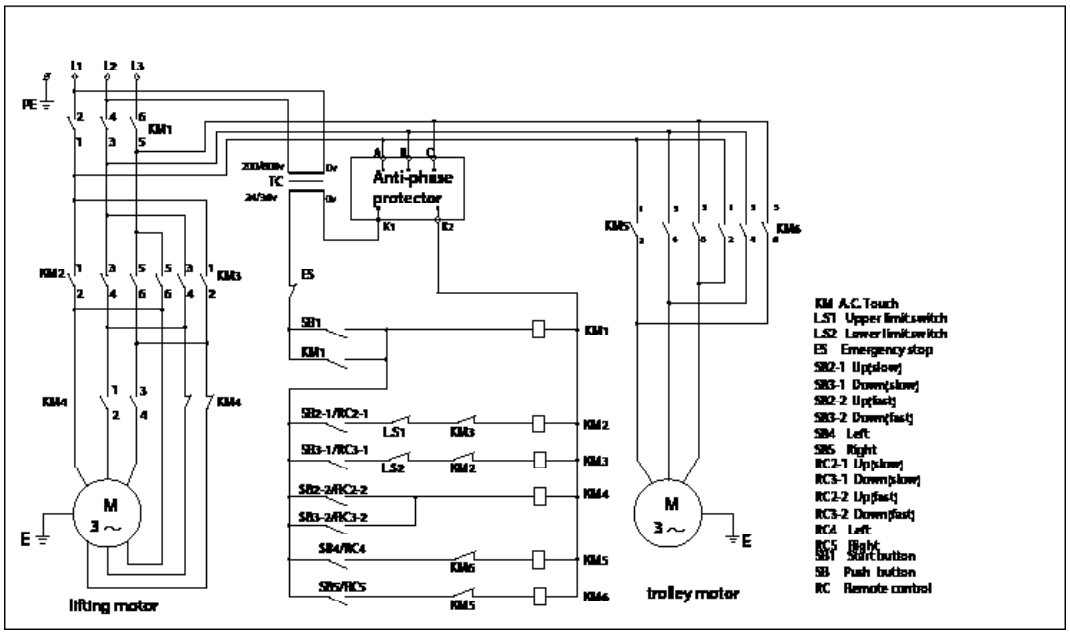


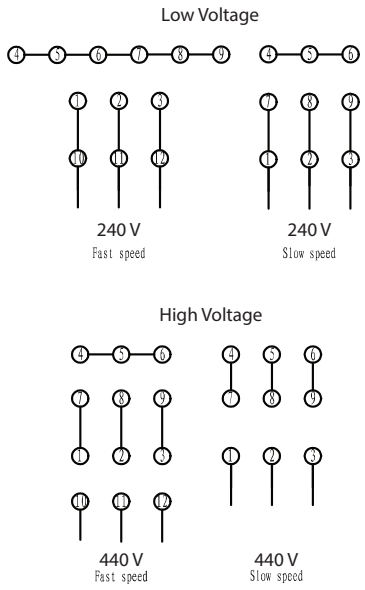
7.5. Hoist Wiring Diagram 1 Speed H3 Trolley PWRT_H3-1SW Series



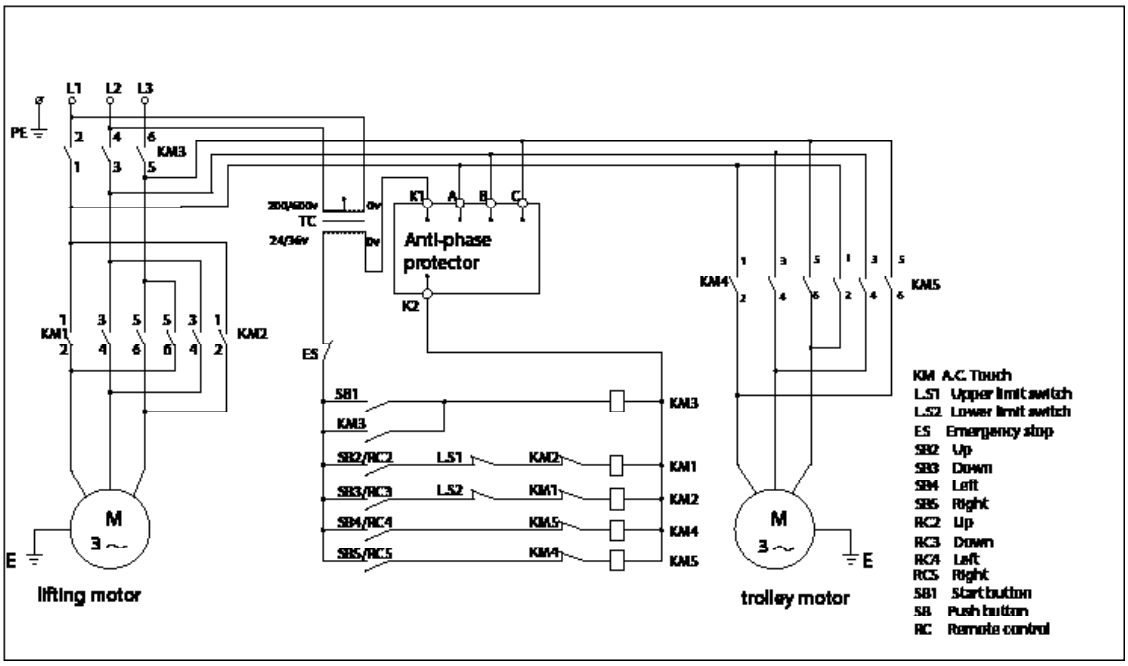


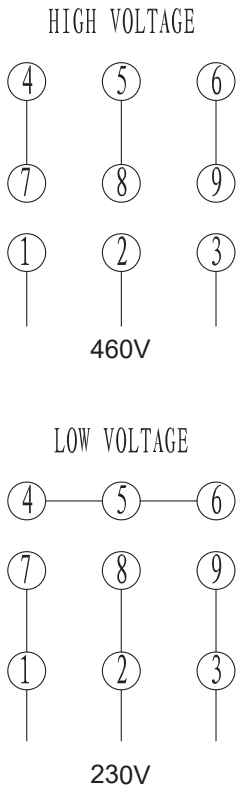
7.6. Hoist Wiring Diagram 2 Speed H3 Trolley PWRT_H3-2SW Series



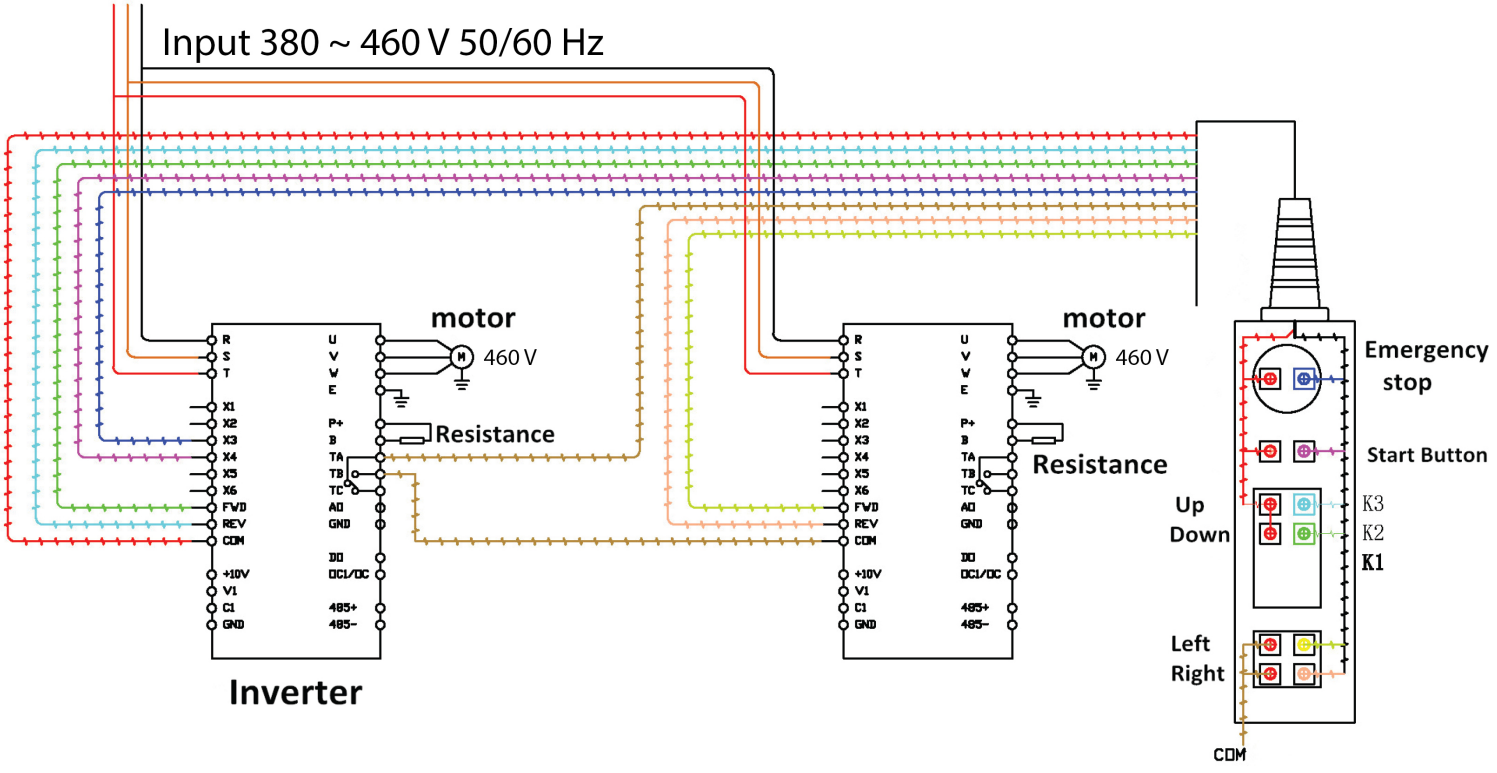


7.7. Hoist Wiring Diagram 1 Speed H4 Trolley PWRT_H4-1SW Series





7.8. Hoist Wiring Diagram 2 Speed H4 Trolley PWRT_H4-2SW Series



1. VFD MANUAL

Chapter 1 Summaries

1.1 Product confirmation

Upon unpacking,please confirm the following:Any damage occurred during transportation;Check whether the model and specifications on the nameplate of inverter are in accordance with your order.

If there is any error, please contact us or distributors.

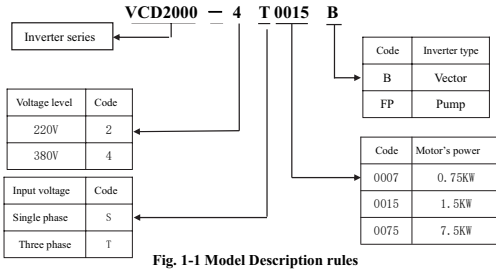
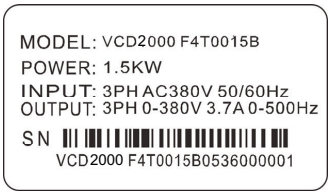


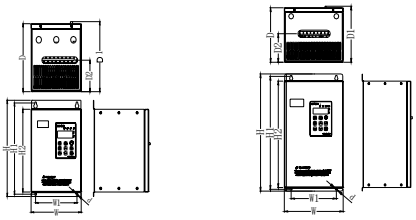
Fig. 1-1 Model Description rules

The nameplate is on the right bottom of the case of the inverter.The contents are shown



Note: subject to the real equipment.

1.2 Size



(a)、Size of inverter below 2.2 Kw **(b)、Size of inverter between 3.7 and 7.5 Kw**

Table 1-1 Inverters' specification and installation series size (mm)

Specifiction	W	W1	H	H1	D	D1	d
VCD2000-2S0004	83	66	166	156	118	/	5
VCD2000-2S0007							
VCD2000-2S0015							
VCD2000-4T0007							
VCD2000-4T0015							
VCD2000-4T0022							
VCD2000-2S0022	106	95	170	157	160	60	5
VCD2000-4T0022							
VCD2000-4T0030							
VCD2000-4T0040							
VCD2000-4T0055	152	135	230	215	160	68	6
VCD2000-4T0075							
VCD2000-4T0110	200	180	300	280	193	195	6
VCD2000-4T0150							

Note: subject to the real equipment

Chapter 2 Installation and Cable Connection

2.1 Major loop Terminal Connection Methods

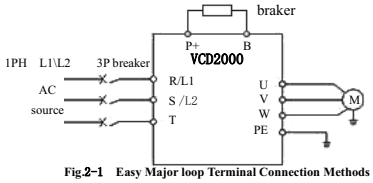
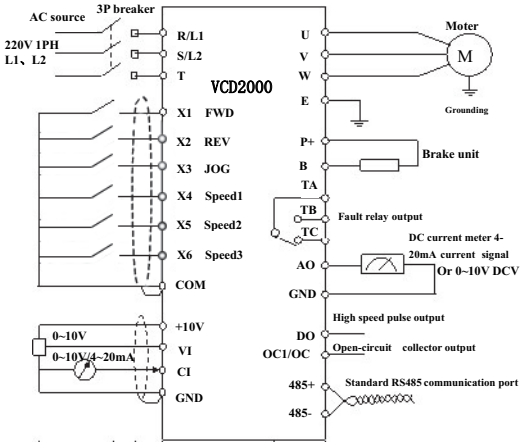


Fig.2-1 Easy Major loop Terminal Connection Methods

2.2 Basic Wiring Diagram



2.3 Major loop terminal connection methods

(1) Function of CN 1 terminal as Table 2-1

Table 2-1 Function of CN5 terminal

Sort	Terminal	Name	Terminal function	Spec
Output terminal of relay	TA	Multifunctional relay output terminal	Programmable is defined as multifunctional relay output terminal,compare with P4.11 description in Chapter 6	TA-TC:NC,TA-TB:Normally point capability AC250V/2A (COSΦ=1) AC250V/1A (COSΦ=0.4) DC30V/1A
	TB			
	TC			

(2) Control loop terminal CN2,arranged as Fig.2-2

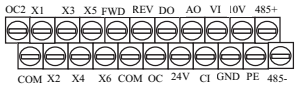


Fig.2—2 Control terminal arranging

(3) Function of CN2 terminal as Table 2-2

Table 2-2 Function of CN2 terminal

Sort	Terminal	Name	Terminal function	Spec
Communi-cation	485+	RS485 communication port	RS485 differential signal positive terminal	Twisted-pair/shielding wire in Rs485 port
	485-		RS485 RS485 differential signal negative terminal	
Multifunctional output terminal	OC	Open circuit collector output terminal 1, 2	Programmable is defined as multifunctional switch quantity output terminal,compare with P4.10 description in Chapter 6 (Common port:COM)	Light pair isolation output workin gvoltage range: 9～30V. Max output current:50mA. usage method compare with P4.10 function description
	OC2			
Pulse output terminal	DO	Open circuit collector pulse output terminal	Programmable is defined as multifunctional pulse output terminal, compare with P4.19,P4.20 description in Chapter 6 (Common port:COM)	Output frequency range depend on P4.20.Max frequency is 20KHz
Analog quantity input	VI	Analog quantity input VI	Analog voltage quantity input is accepted (Ground:GND)	Input voltage range : 0~10V (input impedance: 47KΩ) Resolution: 1/1000
	CI	Analog quantity input CI	Analog voltage/current input, Voltage/current are selected by JP3.Default setting is voltage. (Ground:GND)	Input voltage range: 0~10V (input impedance: 47KΩ) Input current range: 0~20mA (input impedance: 500Ω) Resolution: 1/1000
Analogquantity output	AO	Analog quantity output AO1	Analog voltage/current output, 7varieties expressed,voltage/current are selected by JP3.Default setting is voltage. (Ground:GND)	Current output range : 4~20mA Voltage output range : 0~10V
Multifunctional output terminal	X1	Multifunctional INput terminal1	Programmable is defined as multifunctional switch quantity input terminal, compare with P4 series description in Chapter 6 (Common port:COM)	Light pair isolation input Input impedance:2KΩ Max input frequency: 200Hz input voltage range:9～30V X1~X6 — Effective When closing CO
	X2	Multifunctional INput terminal2		
	X3	Multifunctional INput terminal3		
	X4	Multifunctional INput terminal4		
	X5	Multifunctional INput terminal5		
	X6	Multifunctional INput terminal6		
	FWD	Multifunctional INput Forward	Normal function Forward	As X1~X6
	REV	Multifunctional INput Reversal	Normal function Reversal	As X1~X6
Power source	24V	+24V power source	+24V power supply(negative pole:COM)	
	10V	+10V power source	+10V power supply(negative pole:GND)	Max output current:50mA
	GND	+10V common port	Ground of analog signal and +10V power source	COM is isolated from GND inside
	COM	+24V common port	Digital signal input,output common port	

Chapter 3 Function Parameter Table

3.1 Symbol Description

"○": Means the parameter can be revised during inverter's running state.

"×": Means the parameter can not be revised during running state.

"* ": Means read-only parameters can not be revised.

3.2 Function code table

P0 Series: Basic running parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P0.00	Control mode selection	0: V/F Control 1: Vector control 2: Torque control	1	0	○
P0.01	Freq.control mode selection	0: Analog potentiometer on panel 1: ▲、▼on key board 2: No.Setting1,operation panel 3: No.Setting2,up/down on terminal 4: No.setting3,serial port 5: VI (VI-GND) 6: CI (CI-GND) 7: Terminal fulse 8: Combination (see P3.00) 9: VI*CI 10: VI *control panel▲、▼ 11: VI *potentiometer on control panel 12: Factory reserved	1	0	○
P0.02	Running freq.Digital setting	P0.19low freq.limit~P0.20high freq.limit	0.01HZ	50.00HZ	○
P0.03	Running command mode selection	0: Panel running freq.Mode 1: Terminal running command mode 2: Uart port running order 485	1	0	○
P0.04	Running direction setting	Unit: 0: Forward 1: REV Decade: 0: allow REV1: prohibit REV	1	10	○
P0.05	FWD/REV dead time	0.0~120.0s	0.1s	0.1s	○
P0.06	Highest output freq.	50.00Hz~500.00Hz	0.01Hz	50.00Hz	×
P0.07	Basic running freq.	1.00Hz~500.00Hz	0.01Hz	50.00Hz	×
P0.08	Highest output voltage	1~480V	1V	Rated voltage	×
P0.09	Torque boost	0.0%~30.0%	0.1%	2.0%	×
P0.10	Cut-off freq.of torque boost	0.00Hz~Basic running freq. P0.07	0.00	25.00Hz	○
P0.11	Torque boost mode	0: Manual 1: Auto	1	0	○
P0.12	Carrier freq.	1.0K~15.0K	0.1K	8.0K	×
P0.13	Acc/Dec mode selection	0: Linear Acc/Dec 1: Curve Acc/Dec	1	0	×
P0.14	Time of S curve's initial part	10.0%~50.0% (Acc/Dec time) P0.14+P0.15 《 90%	0.1%	20.0%	○
P0.15	Time of S curve's rising part	10.0%~80.0% (Acc/Dec time) P0.14+P0.15 《 90%	0.1%	60.0%	○
P0.16	Acc/Dec time unit	0: Second 1: Minute	0	0	×
P0.17	Acc time 1	0.01~6000.0	0.01	20.00	○
P0.18	Dec time 1	0.01~6000.0	0.01	20.00	○
P0.19	High freq.limit	Low freq.limit~highest output freq.P0.06	0.01Hz	50.00Hz	×
P0.20	Low freq.limit	0.00Hz~Upper limit freq.	0.01Hz	0.00Hz	×
P0.21	Lower limit freq. running mode	0: Running at lower limit freq. 1: Stop	1	0	×
P0.22	V/F curve setting	0: Constant torque curve 1: Reduced torque curve 1 (1.2 times the power) 2: Reduced torque curve 2 (1.7 times the power) 3: Reduced torque curve 3 (2.0 times the power) 4: Customized V/F curve	1	0	×
P0.23	V/F Freq.value P3	P0.25 ~ P0.07 Basic running freq.	0.01Hz	0.00Hz	×
P0.24	V/F Volt.value V3	P0.26 ~ 100.0%	0.1%	0.0%	×
P0.25	V/F Freq.value P2	P0.27 ~ P0.23	0.01Hz	0.00Hz	×
P0.26	V/F Volt.value V2	P0.28 ~ P0.24	0.1%	0.0%	×
P0.27	V/F Freq.value P1	0.00~P0.25	0.01Hz	0.00Hz	×
P0.28	V/F Volt.value V1	0~ P0.26	0.1%	0.0%	×
P0.29	Up/down controlled freq. save mode in power off	0: Don't save power lost.When start again, use P0.02 freq. to be the starting value. 1: Save UP/DOWN controlling freq.	1	1	○

P1 Series: Frequency setting parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P1.00	Analog filtering time constant	0.01~30.00s	0.01s	0.20s	○
P1.01	VI channel gains	0.01~9.99	0.01	1.00	○
P1.02	VI min given	0.00~P1.04	0.01Hz	0.00V	○
P1.03	Corresponding freq.to VI min given	0.00~Upper limit freq.	0.01Hz	0.00Hz	○
P1.04	VI max given	P1.04~10.00V	0.01V	10.00V	○
P1.05	Corresponding freq.to VI max given.	0.00~Upper limit freq.	0.01Hz	50.00Hz	○
P1.06	CI channel gains	0.01~ 9.99	0.01	1.00	○
P1.07	CI min given	0.00~ P1.09	0.01V	0.00V	○
P1.08	Corresponding freq.to CI min given	0.00~Upper limit freq.	0.01Hz	0.00Hz	○
P1.09	CI max given	P1.07 ~10.00V	0.01V	10.00V	○
P1.10	Corresponding freq.to CI max given	0.00~Upper limit freq.	0.01Hz	50.00Hz	○
P1.11	Max input pulse freq.	0.1~20.0K	0.1K	10.0K	○
P1.12	Pulse min given	0.0~P2.14 (Pulse max given)	0.1K	0.0K	○
P1.13	Corresponding freq.to pulse min given	0.00~Upper limit freq.	0.01Hz	0.00Hz	○
P1.14	Pulse max given	P1.12 (Pulse min given) ~ P1.11 (Max input pulse freq.)	0.1K	10.0K	○
P1.15	Corresponding freq.to pulse max given	0.00~Upper limit freq.	0.01Hz	50.00Hz	○
P1.16	The analog input accuracy	0.0~100%	0.1%	0.2%	○

P2 Series: Start/Break parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P2.00	Start mode	0: Start from start freq. 1: Brake at first, then start from start freq. 2: Track speed, then start	1	0	×
P2.01	Start freq.	0.40~20.00Hz	0.01Hz	0.50Hz	○
P2.02	Start freq.running duration	0.0~30.0s	0.1s	0.0s	○
P2.03	DC brake current at start	0.0~80.0%	0.1%	0%	○
P2.04	DC brake time at start	0.0~60.0s	0.1s	0.0s	○
P2.05	Stop mode	0: Dec to stop 1: Free stop 2: Dec+DC brake	1	0	×
P2.06	Start freq.of DC brake at stop	0.0~15.00Hz	0.0Hz	3.00Hz	○
P2.07	DC brake time at stop	0.0~60.0s	0.1s	0.0s	○
P2.08	DC brake current at stop	0.0~80.0%	0.1%	0.0%	○

P3 Series: Auxiliary running parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P3.00	Freq.control mode combination	0: VI+CI 1: VI-CI 2: External pulsegiven+ VI+ control panel ▲、▼keys given 3: External pulsegiven-VI- control panel ▲、▼keys given 4: External pulse given+CI 5: External pulse given-CI 6: RS485 Given+VI+Control panel▲、▼keys given 7: RS485 Given-VI-Control panel▲、▼keys given 8: RS485 Given+CI+Control panel▲、▼keys given 9: RS485 Given-CI-Control panel▲、▼keys given 10: RS485 Given+CI+external pulse given 11: RS485 Given-CI-external pulse given 12: RS485 Given+VI+external pulse given 13: RS485 Given-VI-external pulse given 14: VI+CI+Control panel▲、▼keys given +digital given (P0.02) 15: VI+CI-Control panel▲、▼keys given +digital given (P0.02) 16: MAX (VI, CI) 17: MIN (VI, CI) 18: MAX (VI, CI, PULSE) 19: MIN (VI, CI, PULSE) 20: VI, CI (Valid except 0,VI prior)	1	0	×
P3.01	Parameter Initializ-ation setting	**LED units:** 0: All parameters are allowed to be revised 1: All parameters are not allowed to be revised except this parameter itself 2: All parameters are not allowed to be revised except P0.02 parameter and this parameter itself. **LED tens:** 0: Inaction 1: Factory default reset 2: Clear history fault record	1	0	×

P3 Series: Auxiliary running parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P3.02	Parameter copy	0:Inaction 1:Parameter upload 2:Parameter download Note: only valid in remote control mode	1	0	×
P3.03	Auto energy saving running	0: Inaction 1: Action	1	0	×
P3.04	AVR function	0: Inaction 1: Always active 2: Inaction only during Dec	1	0	×
P3.05	Slip freq. compensation	0~150%	1%	0%	×
P3.06	JOG freq.	0.10~50.00Hz	0.01Hz	5.00Hz	○
P3.07	JOG Acc time	0.1~60.0s	0.1s	20.0s	○
P3.08	JOG Dec time	0.1~60.0s	0.1s	20.0s	○
P3.09	Communication configuration	**LED units:baud rate** 0: 1200BPS 1: 2400BPS 2: 4800BPS 3: 9600BPS 4: 19200BPS 5: 38400BPS **LED tens:data format** 0: 1-7-2 Format, no parity	1	154	×

		1：1－7－1 Format, odd parity 2：1－7－1 Format, even parity 3：1－8－2 Format, no parity 4：1－8－1 Format, odd parity 5：1－8－1 Format, even parity 6：1－8－1 Format, no parity **LED hundreds: communication mode** 0：MODBUS，ASCII Mode 1：MODBUS，RTU Mode			
P3.10	Local address	0～248 0：Broadcast address 248：Host address	1	1	×
P3.11	Communication overtime detection time	0.0～1000.0s 0.0：Function invalid	0.1s	0.0s	×
P3.12	Local response delay	0～1000ms	1	5ms	×
P3.13	Communication freq.setting proportion	0.01～1.00	0.01	1.00	×
P3.14	Acc time2	0.1～6000.0	0.1	20.0	○
P3.15	Dec time2	0.1～6000.0	0.1	20.0	○
P3.16	Acc time 3	0.1～6000.0	0.1	20.0	○
P3.17	Dec time 3	0.1～6000.0	0.1	20.0	○
P3.18	Acc time 4	0.1～6000.0	0.1	20.0	○
P3.19	Dec time 4	0.1～6000.0	0.1	20.0	○
P3.20	Acc time 5	0.1～6000.0	0.1	20.0	○
P3.21	Dec time 5	0.1～6000.0	0.1	20.0	○
P3.22	Acc time 6	0.1～6000.0	0.1	20.0	○
P3.23	Dec time 6	0.1～6000.0	0.1	20.0	○
P3.24	Acc time 7	0.1～6000.0	0.1	20.0	○
P3.25	Dec time 7	0.1～6000.0	0.1	20.0	○
P3.26	Multi-stage freq.1	Lower limit freq.~Upper limit freq.	0.01Hz	5.00Hz	○
P3.27	Multi-stage freq.2	Lower limit freq.~Upper limit freq.	0.01Hz	10.00Hz	○
P3.28	Multi-stage freq.3	Lower limit freq.~Upper limit freq.	0.01Hz	20.00Hz	○
P3.29	Multi-stage freq.4	Lower limit freq.~Upper limit freq.	0.01Hz	30.00Hz	○
P3.30	Multi-stage freq.5	Lower limit freq.~Upper limit freq.	0.01Hz	40.00Hz	○
P3.31	Multi-stage freq.6	Lower limit freq.~Upper limit freq.	0.01Hz	45.00Hz	○
P3.32	Multi-stage freq.7	Lower limit freq.~Upper limit freq.	0.01Hz	50.00Hz	○
P3.33	Jump freq.1	0.00～500.00Hz	0.01Hz	0.00Hz	×
P3.34	Jump freq.range 1	0.00～30.00Hz	0.01Hz	0.00Hz	×
P3.35	Jump freq.2	0.00～500.00Hz	0.01Hz	0.00Hz	×
P3.36	Jump freq.range 2	0.00～30.00Hz	0.01Hz	0.00Hz	×
P3.37	Jump freq.3	0.00～500.00Hz	0.01Hz	0.00Hz	×
P3.38	Jump freq.range 3	0.00～30.00Hz	0.01Hz	0.00Hz	×
P3.39	Setting running time	0～65.535K (Hour)	0.001K	0.000K	○
P3.40	Total running time	0～65.535K (Hour)	0.001K	0.000K	*
P3.41	Parameter display selection 1	0000～1111 **Units: running time** 0：Not displayed 1：Displayed **Tens:input/output terminal state** 0：Not displayed 1：Displayed **Hundreds:analog input VI** 0：Not displayed 1：Displayed **Thousands:analog input CI** 0：Not displayed 1：Displayed	1	0000	○
P3.42	Parameter display selection 2	0000～1111 **Units: External pulse input value** 0：Not displayed 1：Displayed **Tens:Inverter rated current** 0：Not displayed 1：Displayed **Hundreds: Inverter rated voltage** 0：Not displayed 1：Displayed	1	0000	○
P3.43	Parameter display selection 3	00～15 0：The output frequency 1：According to a set frequency 2：According to the output voltage 3：According to the output current 4：According to the dc bus voltage 5：Temperature display module 6：According to motor speed 7：Shows that the frequency converter has run time 8：According to the input terminals 9：According to VI value 10：According to CIvalue 11：According to PLUSE value 12：According to inverter rated current 13：According to inverter rated voltage 14：Show no unit of speed，Pole at the end of the shaft speed 15：According to frequency converter model	1	00	○
P3.44	Without unit display coefficient	0.1～60.0	0.1	1.0	○
P3.45	JOG/REV function selection	0：Select JOG running 1：Select reverse running	1	0	×

P4 Series： Terminal function parameter					
Func. Code	**Name**	**Range of settings**	**Min. Unit**	**Factory setting**	**Change**
P4.00	Input terminal X1 function selection	0：Terminal idle 1：Multi-stage speed control terminal 1 2：Multi-stage speed control terminal 2 3：Multi-stage speed control terminal 3 4：External FWD/JOG control input 5：External REV/JOG control input 6：Acc/Dec time selection terminal 1 7：Acc/Dec time selection terminal 2 8：Acc/Dec time selection terminal 3 9：3-wire control mode 10：Free stop input (FRS) 11：External stop command 12：DC braking stop input command (DB) 13：Inverter running prohibited 14：Freq.increase command(UP) 15：Freq.decrease command(DOWN) 16：Acc/Dec prohibited command 17：External reset input 18：External fault input (normally open) 19：Freq. control mode selection 1 20：Freq. control mode selection 2 21：Freq. control mode selection 3 22：Switch to terminal control mode 23：Running command control mode selection 1 24：Running command control mode selection 2 25：Wobbulation running start 26：Wobbulation running reset 27：Close loop disabled 28：Simple PLC running pause command 29：PLC disabled 30：PLC reset in stop state 31：Switch to CI freq.given 32：Counter trig signal input 33：Counter clear input 34：External interrupt input 35：Pulse freq.input (only valid to X6) 36：Actual length clear input 37：Three line running control downtime，Normal Open 38：FWD 39：REV 40：Reserve	1	38	×
P4.01	Input terminal X2 function selection	Ditto	1	39	×
P4.02	Input terminal X3 function selection	Ditto	1	4	×
P4.03	Input terminal X4 function selection	Ditto	1	1	×
P4.04	Input terminal X5 function selection	Ditto	1	2	×
P4.05	Input terminal X6 function selection	Ditto	1	3	×
P4.06	Input terminal FWD	Ditto	1	0	
P4.07	Input terminal REV	Ditto	1	0	
P4.08	FWD/REV running mode selection	0：2-wire control mode 1 1：2-wire control mode 2 2：3-wire control mode 1 3：3-wire control mode 2	1	0	×
P4.09	UP/DN speed rate	0.01－99.99Hz/s	0.01	1.00Hz	○
P4.10	2-way open collector output terminal OC	0：Inverter running signal(RUN) 1：Freq.arrive signal(FAR) 2：Freq.detected signal level(FDT1) 3：Freq.detected signal level(FDT2) 4：Over load pre-alarm signal(OL) 5：Undervoltage lock(LU) 6：External fault stop（EXT） 7：Output freq.upper limit arrive (FH) 8：Output freq.lower limit arrive (FL) 9：Inverter zero speed running 10：Simple PLC stage running finish 11：One PLC running cycle finish 12：Setting count value arrive 13：Specified count value arrive 14：Inverter ready for running(RDY) 15：Inverter fault 16：Start freq.running time 17：DC brake time at start 18：DC brake time at stop 19：Wobbulation upper/lower freq. limit 20：Setting running time arrive 21：Constant pressure water supply pump output control	1	0	×

P4.11	Relay output selection	Ditto	1	15	×
P4.12	Freq.arrive detected range (FAR)	0.00～50.00Hz	0.01Hz	5.00Hz	○
P4.13	FDT1 level	0.00～Upper limit freq.	0.01Hz	10.00Hz	○
P4.14	FDT1 lag	0.00～50.00Hz	0.01Hz	1.00Hz	○
P4.15	FDT2 level	0.00～Upper limit freq.	0.01Hz	10.00Hz	○
P4.16	FDT2 lag	0.00～50.00Hz	0.01Hz	1.00Hz	○
P4.17	Analog output (AO) selection	0：Output freq.(0~upper limit freq.) 1：Output current(0~2 times motor rated current) 2：Output voltage(0~1.2 times inverter rated voltage) 3：Busbar voltage（0～800V） 4：PID given 5：PID feedback 6：VI（0～10V） 7：CI(0～10V/4～20mA)	1	0	○
P4.18	Analog output (AO) gain	0.10～2.00	0.01	1.00	○
P4.19	DO output terminal function selection	0：Output freq.(0~upper limit freq.) 1：Output current(0~2 times motor rated current) 2：Output voltage(0~1.2 times inverter rated voltage) 3：Busbar voltage（0～800V） 4：PID given 5：PID feedback 6：VI（0～10V） 7：CI(0～10V/4～20mA) 8：Constant pressure water supply pump output control	1	0	○
P4.20	DO max pulse output freq.	0.1K～20.0K（Max 20KHz）	0.1KHz	10.0KHz	○
P4.21	Setting count value given	F4.22～9999	1	0	○
P4.22	Specified count value given	0～F4.21	1	0	○
P4.23	Over load pre-alarm detected level	20%～200%	1	130%	○
P4.24	Over load pre-alarm delay time	0.0～20.0s	0.1s	5.0s	○
P4.25	2-way open collector output terminal OC2	Same as P4.10	1	0	×
P4.26	Terminal signal filtering	0～4	1	4	×

P5 Series：Protection function parameter

Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P5.00	Motor over load protection mode selection	0：Stop output 1：Inaction	1	0	×
P5.01	Motor over load protection coefficient	20～120%	1	100%	×
P5.02	Over voltage stall protection	0：Prohibited 1：Allowed	1	1	×
P5.03	Over voltage stall point	380V：120～150% 220V：110～130%	1%	140% 120%	○
P5.04	Auto current limit level	10%～200%	1%	150%	○
P5.05	Freq.drop rate druing current limit	0.00～99.99Hz/s	0.01Hz/s	15.00Hz/s	○
P5.06	Auto current limit selection	0：Invalid during constant speed run 1：Valid during constant speed run Note: Always valid during Acc/Dec	1	1	×
P5.07	Restart setting after power failure	0：Inaction 1：Action	1	0	×
P5.08	Restart waiting time after power failure	0.0～10.0s	0.1s	0.5s	×
P5.09	Fault self-recovery times	0～10 0：Self-recovery invalid Note: Self-recovery invalid while over load or over heat	1	0	×
P5.10	Self-recovery interval time	0.5～20.0s	0.1s	5.0s	×
P5.11	Output missing phase protection	0. Inaction 1. Action	1	1	×
P5.12	Input missing phase protection	0. Inaction 1. Action	1	0	0
P5.13	Overheating protection module	0～200	1	80	0

P6 Series：Fault record parameter

Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P6.00	Last fault record	Last fault record	1	0	*
P6.01	Output freq. in last fault	Output freq.in last fault	0.01Hz	0	*
P6.02	Setting freq. in last fault	Setting freq.in last fault	0.01Hz	0	*
P6.03	Output current in last fault	Output current in last fault	0.1A	0	*
P6.04	Output voltage in last fault	Output voltage in last fault	1V	0	*
P6.05	DC busbar voltage in last fault	DC busbar voltage in last fault	1V	0	*
P6.06	Module temperature in last fault	Module temperature in last fault	1℃	0	*
P6.07	Last 2 fault record	Last 2 fault record	1	0	*
P6.08	Last 3fault record	Last 3 fault record	1	0	*
P6.09	Last 4 fault record	Last 4 fault record	1	0	*
P6.10	Last 5 fault record	Last 5 fault record	1	0	*
P6.11	Last 6 fault record	Last 6 fault record	1	0	*

P7 Series：Close loop control parameter(PID)

Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P7.00	Close loop running control selection	0：Invalid PID 1：Valid PID	1	0	×
P7.01	Close loop given channel selection	0：Digital given 1：VI analog 0~10V voltage given 2：CI analog given 3: Control panel potentiometer given 4：RS485 Communications given 5：PLUSE given，only X6 effectivity	1	0	○
P7.02	Feedback channel selection	0：VI analog 0~10V input voltage 1：CI analog input 2：VI+CI 3：VI-CI 4：Min {VI，CI} 5：Max {VI，CI} 6：Pulse feedback	1	0	○
P7.03	Given channel filtering time constant	0：No feedforward function 1：P7.05 Digital setting feedforward 2：VI analog 0~10V voltage feedforward 3：CI analog feedforward 4：Control panel potentiometer feedforward 5：RS485 Communications feedforward 6：PLUSE feedforward，only X6 effectivity	1	0	○
P7.04	Feedback channel filtering time constant	0.01～50.00s	0.01s	0.50s	○
P7.05	Given value digital setting	0.000～20.00MPa refer to P7.27	0.001Mpa	0.000Mpa	○
P7.06	Close loop regulation characteristic	0: Positive effect 1: Negative effect	1	0	○
P7.07	Feedback channel gain	0.01～10.00	0.01	0	○
P7.08	Lower limit pressure value	0.001～P7.09	0.001	0.001	○
P7.09	Upper limit pressure value	P7.08～P7.27	0.001Mpa	1.000Mpa	○
P7.10	Proportional gain(KP1)	0～6000.0	0.1	20.0	○
P7.11	Proportional gain(KP2)	0～6000.0	0.1	200.0	○
P7.12	Proportional gain(KP3)	0～6000.0	0.1	1000.0	○
P7.13	Proportional gain(KP4)	0～6000.0	0.1	5000.0	○
P7.14	Sampling period	0.01～1.00s	0.01s	0.10s	○
P7.15	Allowed deviation limit	0～20%	1%	0%	○
P7.16	PID feedback disconnection detection threshold	0.0～20.0%	0.1%	0.0%	○
P7.17	PID feedback disconnection action selection	0：Stop. 1：Running at freq.defined by P0.02 2: Running at upper limit freq. 3：Running at half of upper limit freq.	1	0	○
P7.18	PID feedback disconnection action delay time	0.01～5.00s	0.01s	1.00s	○
P7.19	Revival pressure threshold	0.001～P7.27	0.001Mpa	0.001Mpa	○
P7.20	Sleeping pressure threshold	P7.19～P7.27	0.001Mpa	1.000Mpa	○
P7.21	Sleeping threshold continuous time	0～250s	1	10s	○
P7.22	Sleeping freq.	0.00～500.00Hz	0.01	20.00Hz	○
P7.23	Sleeping freq.continuous time	0～250s	1	10s	○
P7.24	Alarm lower limit pressure	0.001～P7.25	0.001Mpa	0.001Mpa	○
P7.25	Alarm upper limit pressure	P7.24～P7.27	0.001Mpa	1.000Mpa	○
P7.26	Constant pressure water supply mode	0：Constant pressure water supply mode invalid 1：1-drive-1 water supply mode 2：1-drive-2 water supply mode	1	0	○
P7.27	Pressure meter measuring range	0.001～20.00Mpa	0.001Mpa	1.000Mpa	○
P7.28	Multi pumps running mode	0：Fixed order switch 1：Timing rotation	1	0	○
P7.29	Timing rotation interval time	0.5—100.0 Hour	0.1 Hour	5.0 Hour	○
P7.30	Pump switch judge time	0.1 — 1000.0s	0.1s	300.0s	○
P7.31	Solenoid switch delay time	0.1～10.0s	0.1s	0.5s	○
P7.32	Water supply monitoring parameter display selection	0：B-09, B-10 display VI, CI voltage value 1：B-09, B-10 display PID given pressure and feedback pressure	1	0	○
P7.33	given channel filtering	0.01～50.00s	0.01s	0.50s	○

P8 Series: PLC running parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P8.00	Simple PLC running selection	0000~1113 LED units: mode selection 0: Inaction 1: Stop after single cycle 2: Running at final freq. after single cycle 3: Continuous cycle LED tens: PLC restart selection 0: Restart from the first stage 1: Restart from the freq.of break stage LED hundreds:PLC state parameter store mode selection 0: Without store 1: Store LED thousands:PLC running time unit 0: Second 1: Minute	1	0000	×
P8.01	Stage 1 setting	000~621 LED units: freq.setting 0: Multi-stage freq.i (i=1~7) 1: Freq.given defined by P0.01 LED tens: direction selection 0: Forward 1: Reverse 2: Controlled by running command LED hundreds:Acc/Dec time selection 0: Acc/Dec time 1 1: Acc/Dec time 2 2: Acc/Dec time 3 3: Acc/Dec time 4 4: Acc/Dec time 5 5: Acc/Dec time 6 6: Acc/Dec time 7	1	000	○
P8.02	Stage 1 running time	0.1~6000.0	0.1	10.0	○
P8.03	Stage 2 setting	000~621	1	000	○
P8.04	Stage 2 running time	0.1~6000.0	0.1	10.0	○
P8.05	Stage 3 setting	000~621	1	000	○
P8.06	Stage 3 running time	0.1~6000.0	0.1	10.0	○
P8.07	Stage 4 setting	000~621	1	000	○
P8.08	Stage 4 running time	0.1~6000.0	0.1	10.0	○
P8.09	Stage 5 setting	000~621	1	000	○
P8.10	Stage 5 running time	0.1~6000.0	0.1	10.0	○
P8.11	Stage 6 setting	000~621	1	000	○
P8.12	Stage 6 running time	0.1~6000.0	0.1	10.0	○
P8.13	Stage 7 setting	000~621	1	000	○
P8.14	Stage 7 running time	0.1~6000.0	0.1	10.0	○

P9 Series: Hunting freq.AND measure function parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
P9.00	Wobbulation function selection	0: Inaction 1: Action	1	0	×
P9.01	Wobbulation running mode	0000~11 LED units: start mode 0: Auto start 1: Manual start by terminal LED tens:Wobbulation amplitude control 0: Variable amplitude 1: Fixed amplitude	1	00	×
P9.02	Preset wobbulation freq.	0.00~500.00Hz	0.01Hz	0.00Hz	○
P9.03	Preset wobbulation waiting time	0.0~3600.0s	0.1s	0.0s	○
P9.04	Wobbulation amplitude	0.0~50.0%	0.1%	0.0%	○
P9.05	Kick freq.	0.0~50.0% (relative to P9.04)	0.1%	0.0%	○
P9.06	Wobbulation cycle	0.1~999.9s	0.1s	10.0s	○
P9.07	Delta wave ascent time	0.0 ~ 98.0 % (The pendulum frequency cycle)	0.1%	50.0%	○
P9.08	Setting length	0.000 ~ 65.535(km)	0.001km	0.000km	○
P9.09	Actual length	0.0~65.535km(Auto store when power failure)	0.001km	0.000km	○
P9.10	Length magnification	0.001~30.000	0.001	1.000	○
P9.11	Length correction coefficient	0.001~1.000	0.001	1.000	○
P9.12	Measurement axis circumference	0.01~100.00cm	0.01cm	10.00cm	○
P9.13	Axis pulse	1~9999	1	1	○
P9.14	User password	1~9999	1	0	○

PA Series: Vector control parameter					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
PA.00	Motor parameter self-learning function	0: Inaction 1: Self-learning at rest 2: Banned from learning, Don't need to lift the load	1	0	×
PA.01	Motor rated power	0.0~900.0KW	0.1	Depends on model type	
PA.02	Motor rated voltage	0~400V	1	Depends on model type	×
PA.03	Motor rated current	0.01~500.00A	0.01A	Depends on model type	×
PA.04	Motor rated frequency	1~500Hz	1Hz	Depends on model type	×
PA.05	Motor rated rotating speed	1~9999 r/min	1r/min	Depends on model type	×
PA.06	Motor poles number	2~16	1	Depends on model type	×
PA.07	Motor stator resistance	0.001~50.000Ω	0.001Ω	Depends on model type	×
PA.08	Motor stator resistance	0.001~50.000Ω	0.001Ω	Depends on model type	×
PA.09	Motor stator inductance	0.1~5000.0 mH	0.1mH	Depends on model type	×
PA.10	Motor rotor inductance	0.1~5000.0 mH	0.1mH	Depends on model type	×
PA.11	Motor stator and rotor mutual inductance	0.01~655.32 A	0.01A	Depends on model type	○
PA.12	Torque current over-current protection factor	0~200.0%	0.1%	150.0%	○
PA.13	Speed deviation ratio adjustment coefficient	0~9999	1	15	○
PA.14	peed deviation integral adjustment coefficient	0~100.00	0.01	2.00	○
PA.15	Vector torque	0~200.0%	0.1%	50.0%	×
PA.16	Low switching frequency	0~400.00Hz	0.01Hz	5.00Hz	○
PA.17	Speed loop gain 2 proportion	0~9999	1	10	○
PA.18	2 speed loop integral time	0.01~100.00	0.01	3.00	○
PA.19	High frequency switching	0.01~400.00Hz	0.01Hz	15.00Hz	○
PA.20	VC slip compensation coefficient	50~200	1	100	○
PA.21	Switching voltage closed-loop flux calculation	0~30	1	15	×
PA.22	Open loop switching frequency	0~10.00Hz	0.01Hz	0.00Hz	×
PA.23	Speed filter coefficients	0~1.000	0.001	0.625	×
PA.24	No-load current compensation coefficient	0~9.999	0.001	1.000	×
PA.25	Compensation coefficient of resistance	0~9.999	0.001	1.000	×

Pb Series: Inhibition of oscillation parameters and torque control					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
Pb.00	Inhibiting oscillation frequency threshold point	0~100%	1%	5%	○
Pb.01	Inhibition of concussion high frequency threshold point	0~100%	1%	5%	○
Pb.02	Restrain oscillation amplitude limit value	0~100%	1%	10%	○
Pb.03	Inhibition of high cut-off frequency oscillation	0~400.00Hz	0.01Hz	12.50Hz	○
Pb.04	Inhibition of shock	0: Open the inhibition of shock 1: Closed inhibit shock	1	0	○
Pb.05	The torque setting	0: Pb.06 digital giving 1: VI mode 0~10V VOLT REF 2: CI analog input 3: Panel potentiometer given 4: RS485 Communications given 5: PLUSE given, only X6	1	0	○
Pb.06	The keyboard is set torque	-200.0%~200.0%	0.1%	50%	○
Pb.07	PWM Mode	**Unit:** 0: 7 sections of cut 5 stages 1: The entire 7 paragraph 2: The entire 5 paragraph 3: Reserve 4: EPS transformer loading **Decade:** 0: Close the overmodulation 1: Open the part over modulation 2: Open all the over modulation **Hundreds:** 0: Reserve 1: Reserve	000~114	000	×

PF Series: Factory parameter					
Func.Code	Name	Range of settings	Min. Unit	Factory setting	Change
PC.00~PC.18	Reserved	—	—	—	—

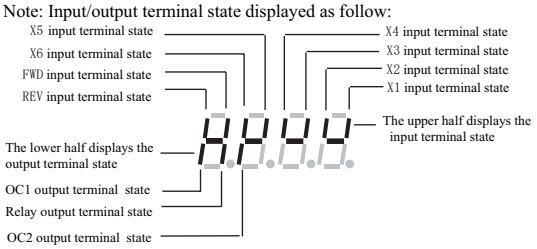
Pd Series: Customized machine parameters					
Func.Code	Name	Range of settings	Min. Unit	Factory setting	Change
Pd.00~Pd.16	Reserved	—	—	—	—

5.3 The state parameter monitor table

B—Monitoring function parameters					
Func. Code	Name	Range of settings	Min. Unit	Factory setting	Change
b-00	Output fre	Current output freq.	0.01Hz		*
b-01	Setting freq.	Current setting freq.	0.01Hz		*
b-02	Output voltage	Effective value of current output voltage	1V		*
b-03	Output current	Effective value of current output current	0.1A		*
b-04	Busbar voltage	Current DC busbar voltage	1V		*
b-05	Module temperature	IGBT heat sink temperature	1℃		*
b-06	Motor speed	Current motor speed	1r/min		*
b-07	Running time	Continuous running time at a time	1 H		*
b-08	Input/output terminal state	Input/output terminal state	——		*
b-09	Analog input VI	Analog input VI value	0.01V		*
b-10	Analog input CI	Analog input CI value	0.01V		*
b-11	External pulse input	External pulse width input value	1 Ms		*
b-12	Inverter rated current	Inverter rated current	0.1A		*
b-13	Inverter rated voltage	Inverter rated voltage	1V		*
b-14	Without unit display	Without unit display	1		
b-15	Inverter model type	Inverter model type	1		

3.3 Terminal Monitoring State

Note: Input/output terminal state displayed as follow:



Note: " " Means invalid (LED OFF) " " Means valid (LED ON)

Chapter 4 Serial Port RS485 MODBUS

4.1 Communication protocol specification

The inverter in the RS485 network can be used as the host, can also be used as the machine, used as a host, can control the other inverter, multi-stage tandem, as from a machine, PC or PLC can work as a host control frequency converter Specific communication methods are as follows.

(1) Inverter for from machine, master-slave point-to-point communication host using radio address send command, the machine does not respond.

(2) The inverter used as host, the broadcast address to send the command to from the machine, the machine does not respond.

(3) The user can be set by using a keyboard or a serial communication mode converter of the machine address Baud rate data format.

(4) From the machine to the host in a recent polling reports the current fault information in the response of the frame.

4.2 Communication interface way

Communication for RS485 interface, asynchronous serial port, half-duplex transmission The default way of communication protocol using the ASCII mode.

The default data format for: 1 a start bit, seven bits, two stop bits.

The default rate for 9600 BPS, communication parameter Settings see P3.09 ~ P3.12 function code.

4.3 ASCII and RTU MODBUS

Character structure:

Box 10 characters（For ASCII）

(1—7—2 Format, no parity)

Start bit	1	2	3	4	5	6	7	Stop bit	Stop bit

(1—7—1 Format, odd parity)

Start bit	1	2	3	4	5	6	7	Parity bit	Stop bit

(1—7—1 Format, even parity check)

Start bit	1	2	3	4	5	6	7	Parity bit	Stop bit

Box 11 characters（For RTU）

(1—8—2 Format, no parity)

Start bit	0	1	2	3	4	5	6	7	Stop bit	Stop bit

(1—8—1 Format, odd parity)

Start bit	0	1	2	3	4	5	6	7	Odd parity	Stop bit

(1—8—1 Format, even parity check)

Start bit	0	1	2	3	4	5	6	7	Even parity check	Stop bit

Communication Data Structure:

ASCII Mode

Pillow	Beginning character = ":" (3AH)
Address Hi	Postal address:
Address Lo	Eight address by two ASCII combination
Function Hi	Function code:
Function Lo	Eight address by two ASCII combination
DATA (n - 1)	Data content:
	N*8 bits of data content by 2*n ASCII combination, high before, and low in the back, n < = 4, the eight largest ASCII
DATA 0	
LRC CHK Hi	LRC check code:
LRC CHK Lo	Eight check code consists of two ASCII combination
END Hi	Termination character:
END Lo	END Hi = CR(0DH), END Lo = CR(0AH)

RTU Mode:

START	Keep no input signal is greater than or equal to 10ms
Address	Postal address: 8-bit binary address
Function	Function Code: 8-bit binary address
DATA (n - 1)	Data content:
	N*8-bit data, N<=8, Maximum 8 bytes
DATA 0	
CRC CHK Low	CRC check code
CRC CHK High	16-bit CRC Check code consists of two 8-bit binary combination
END	Keep no input signal is greater than or equal to 10ms

Postal address:

00H: All inverter radio (broadcast)

01H: To address the inverter communication 01.

0FH: About 15 address inverter communication

10H: About 16 address inverter communication。and so on, Maximum up to 247 (F7H)。

Function code (Function) And the material content (DATA):

03H: Read the register contents.

06H: Write money to expect that register.

08H: Loop detection.

10H: Read more register contents.

Function code 03H: Read a register contents:

For example: Read the register address 2104H content (current output):

ASCII Mode:

Status	Pillow	Address	Function	Content	Check	End
Transmit	:	0 1	0 3	2 1 0 4 0 0 0 1	D 7	CR LF
Hexadecimal	3A	30 31	30 33	32 31 30 34 30 30 30 31	44 37	0D 0A
Response	:	0 1	0 3	0 2	0 0 0 0	D 7	CR LF
Hexadecimal	3A	30 31	30 33	30 32	30 30 30 30	44 37	0D 0A

RTU Mode:

Status	Pillow	Address	Function	Content	Check	End
Send a hexadecimal		01	03	21 04	00 01	CF F7	
In response to hexadecimal		01	03	02	00 00	B8 44	

Function code 06H: Write data to the registers.

For example: The inverter address 01H, Write P0.02=50.00HZ function code

ASCII Mode:

Status	Pillow	Address	Function	Content	Check	End
Transmit	:	0 1	0 6	0 0 0 2 1 3 8 8	5 C	CR LF
Hexadecimal	3A	30 31	30 36	30 30 30 32 31 33 38 38	35 43	0D 0A
Response	:	0 1	0 6	0 0 0 2 1 3 8 8	5 C	CR LF
Hexadecimal	3A	30 31	30 36	30 30 30 32 31 33 38 38	35 43	0D 0A

RTU Mode:

Status	Pillow	Address	Function	Content	Check	End
Send a hexadecimal		01	06	00 02	13 88	25 5C	
In response to hexadecimal		01	06	00 02	13 88	25 5C	

Command code: 08H communication circuit test.

This command is used to test whether or not the communication between main control equipment and frequency

converter to normal Inverter will receive information intact to master device.

ASCII Mode：

Status	Pillow	Address	Function	Content	Check	End
Transmit	:	0 1	0 8	0 1 0 2 0 3 0 4	E D	CR LF
Hexadecimal	3A	30 31	30 38	30 31 30 32 30 33 30 34	45 44	0D 0A
Response	:	0 1	0 8	0 1 0 2 0 3 0 4	E D	CR LF
Hexadecimal	3A	30 31	30 38	30 31 30 32 30 33 30 34	45 44	0D 0A

RTU Mode：

Status	Pillow	Address	Function	Content	Check	End
Send a hexadecimal		01	08	01 02 03 04	41 04	
In response to hexadecimal		01	08	01 02 03 04	41 04	

Check code：

ASCII Mode：double byte code ASCII.

Method: the message sender, the calculation method of LRC England is going to send a message From the machine address to run all data not converted to ASCII byte continuous accumulation, discarded carry a result, the bitwise take the 8-bit bytes, and then add 1 (converted to complement), finally converted to ASCII code, in the inspection area, high byte in the former, in the low byte For the receiver of the message, do the same checksum LRC England method receives the message, and the actual received check and compare, and if equal, receives the message correctly If it is not equal to receive error message If the calibration error, the discarded the message frame, does not make any response, continue to receive the next frame data

RTU Mode：Double byte hexadecimal number。

CRC domain is two bytes, containing a 16 bit binary value It is calculated by the sender, after join the message; Add the first low byte, then the high byte, therefore, the high byte of CRC is sending a message of the last byte Receiving device to calculate the CRC messages are received, and compared with receives the CRC in the domain of value, if there are any errors, two different value is receiving messages to discard the message frame, does not make any response, continue to receive the next frame data CRC checking calculation method refer to the MODBUS protocol.

4.4 Communication protocol parameter definition:

Definition	Parameter address		Function
Internal set parameters	GGnnH		GG: On behalf of the group of parameters，nn: On behalf of the parameter number
For the inverter command（06H）	2000H	BIT 0～1	00B：No function
			01B：Stop
			10B：Running
			11B：Jog
		BIT 2～3	Reserve
		BIT 4～5	00B：No function
			01B：Positive direction to run
			10B：Run the opposite direction
			11B：Change direction
		BIT 6～7	Reserve
	2001H		Serial port command set frequency
Frequency converter fault reset	2002H		00：No function； 01：EF.； 02：Trouble Reset
Monitor the inverter state（03H）	2100H		Read the inverter fault code
	2101H		Read the inverter state
			BIT0：Running a stop sign;0：Stop;1：Running
			BIT1: Undervoltage logo;1：Undervoltage；0：Normal
			BIT2: Positive &negative Peugeot;1reversal;0corotation
			BIT3: Inching operation signs;1：Jog；0：NO jog
			BIT4: Closed loop operation control option;1：Closed loop；0：not a closed loop
			BIT5: pendulum frequency mod;1：swing frequency；0：not a swing frequency
			BIT6:PLC running;1：PLC running;0：NO PLC running
			BIT7: Terminal multistage speed operation;1：multistage speed;0：No
			BIT8: Normal operation sign;1：Normal ruuning;0：No
			BIT9: Main frequency source from the communication interface;1：Yes;0:No
			BIT10: The main frequency source from the analog input;1：Yes;0：No
			BIT11: Run command from the communication interface;1：Yes;0：No
			BIT12: Password protection function parameters;1：Yes;0：No
	2102H		Read inverter set frequency
	2103H		Read the inverter output frequency
	2104H		Read the inverter output current
	2105H		Read the inverter bus voltage
	2106H		Read the inverter output voltage
	2107H		Read the motor speed
	2108H		Read the module temperature
	2109H		Read the VI analog input
	210AH		Read the CI analog input
	210BH		Read the inverter software version
Read function code data（03H）	GGnnH （GG：Function code group no.nn：Function code no.）		Inverter response function code data
Write a function code data（06H）	GGnnH （GG：Function code group no.nn: Function code no.）		data

Error codes defined：

Error codes	State
01H	Function code error frequency converter to ferreting function code：03H，06H，08H。
02H	Data address error data converter can't
03H	Data error information content overrun.

Chapter 5 Troubleshooting

5. 1 Fault Alarm and Troubleshooting

When the inverter is abnormal, protection function acts:LED displays fault code and the content, fault relay acts, the inverter stops output and the motor coasts to stop. VCD2000 series inverters fault contents and troubleshooting is as shown in Table 7-1. After fault alarm occurs, fault phenomenon should be recorded in detail, the fault should be processed according to Table 5-1. When in need of technical assistance, please contact us or your supplier.

Table 5-1 Alarms and troubleshooting

Fault code	Type of fault	Possible fault reasons	Troubleshooting
E-01	Acc over current	Heavy Load. Acc time is too short	Adjust Acc time
		V/F curve setup is not suitable	Adjust V/F curve
		Restart the motor in running	Set start mode as speed tracking restart
		Torque boost setup is too big	Adjust torque boost or set as auto mode
		Inverter capacity is too low	Select inverter with proper capacity
E-02	Dec over current	Dec time is too short	Adjust Dec time
		Potential energy load or load inertia is too big	Add suitable braking device
		Inverter capacity is too low	Select inverter with proper capacity
E-03	over current at constant speed running	Load mutation	Reduce load mutation
		Acc or Dec time is too short	Adjust Acc or Dec time
		Abnormal load	Check load
		Input voltage abnormal	Check input power supply
		Inverter capacity is too low	Select inverter with proper capacity
E-04	Acc ver voltage	Input voltage abnormal	Check input power supply
		Acc time is too short	Adjust Acc time
		Restart the motor in running	Set start mode as speed tracking restart
E-05	Dec over voltage	Dec time is too short	Adjust the Dec time
		Potential energy load or load inertia is too big	Add suitable braking device
E-06	over voltage at constant speed running	Input voltage abnormal	Check input power supply
		Acc or Dec time is too short	Adjust the Acc or Dec time
		Abnormal change of input voltage	Mount input reactor
		Load inertia is too big	Add suitable braking device
E-07	over voltage of control power supply	Input voltage abnormal	Check input power supply
E-08	Inverter over heat	Air duct obstruction	Clean air duct
		Environment temperature is too high	Improve the ventilation or reduce the carrier frequency
		Fan damaged	Replace a new fan
		Inverter module abnormal	Contact us or supplier
E-09	Inverter over load	Acc time is too short	Adjust Acc time
		DC braking value is too high	Reduce DC braking current and add braking time
		V/F curve setup is not suitable	Adjust V/F curve
		Restart the motor in running	Set start mode as speed tracking restart
		Mains voltage is too low	Check mains voltage
		Heavy load	Select inverter with proper capacity
E-10	Motor over load	V/F curve setup is not suitable	Adjust V/F curve
		Mains voltage is too low	Check mains voltage
		Common motor runs at low speed with heavey load for long term	Use variable frequency motor
		Wrong setting of motor over load protection factor	Set the factor right
		Motor choked or sudden change of load	Check load
E-11	Under voltage in running	Very low mains voltage	Check mains voltage
E-12	Inverter module protection	Inverter over current	Refer to over current troubleshooting
		Output 3-phase fault or ground short	Re-wiring
		Air duct obstruction or fan damaged	Clean air duct or replace a new fan
		Environment temperature too high	Reduce environment temperature
		Control board connecting wire or plug-in unit loose	Check and re-wiring
		Current waveform abnormal due to output missing phase, etc.	Check wiring
		Auxiliary power damaged, or driving voltage under voltage	Contact us or supplier

		Control board abnormal	Contact us or supplier
E-13	Peripheral fault	External fault terminal closed	Clear fault
E-14	Current detecting circuit fault	Control board connecting wire or plug-in unit loose	Check and re-wiring
		Auxiliary power source damaged	Contact us or supplier
		Hall component damaged	Contact us or supplier
		Abnormal amplifier circuit	Contact us or supplier
E-15	RS232/485 Communication fault	Wrong baud rate setting	Set baud rate properly
		Serial port communication fault	Press STOP RESET key to reset or contact us
		Improper fault alarm parameter setting	Revise function code P3.09~P3.12
		Upper computer does not work	Check upper computer and connecting cable
E-16	System interference	Serious interference	Press STOP RESET key to reset or install input power source filter
		DSP read/write error	Reset or contact us
E-17	E^2PROM error	Read/write error of control parameter	Press STOP RESET key to reset, or contact us
E-18	Life timer	Equipment, set the time expires	Please contact the vendors
E-21	Accelerate the instantaneous over-current	In the process of accelerating current moment reached 2.5 times of rated, short circuit protection hardware Output short circuit protection	Because be instantaneous over-current, could be a motor, rapid acceleration and deceleration, or motor phase insulation breakdown, lead to motor and short circuit, short circuit or output circuit, a capacitive load, or output by the contactor, etc, please check Of course not rule out the possibility of the inverter itself current detection device problem, inverter can eliminate this as a replacement if the replaced the inverter or frequently, please be sure to repair or replace the motor, otherwise it is easy to burn the inverter In the motor insulation when please use above 1000 volts shaking table, otherwise, is not allowed for inverter output is high frequency and high voltage square wave, requirements for the insulation of the motor is more than 1200 v So the motor may be under 50 hz380v sine wave voltage mains is normal, using frequency converter will be out of the interphase short circuit
E-22	Slow instantaneous over-current	In the process of reduction current moment reached 2.5 times of rated, short circuit protection hardware Output short circuit protection	
E-23	Constant speed instantaneous over-current	In the process of constant speed, or stop instantly at the rated current of 2.5 times, short circuit protection hardware Output short circuit protection	
E-26	U phase missing protection	U phase ouput missing fault	Press STOP RESET key to reset, or check U phase output circuit
E-27	V phase missing protection	V phase ouput missing fault	Press STOP RESET key to reset, or check V phase output circuit
E-28	W phase missing protection	W phase ouput missing fault	Press STOP RESET key to reset, or check W phase output circuit
E-30	Module driving protection	Module when they believe there is a short circuit module	Check for short circuit, the output off load to try again, if there is protection module is broken, if not out with a short circuit to screening, can also try other motor, if changed the motor also have the same protection may be adverse to repair module driver
E-37	Self-learning fault	The vector of parameter self-learning pass it	The motor and frequency converter have no good match

5.2 Fault Record Search

This series inverter record the fault codes occured in the last 6 times and inverter running paratmeter when last fault occured. Please refer to P6 Series.

5.3 Fault Reset

When fault occured, please select the following methods to recover.

(1) When fault code is displayed, after ensure safety in reset, press STOP RESET key to reset.

(2) Set any one of X1~X8 terminal as external RESET input (function=17),refer to P4 Series.

(3) Cut off power.

Attention

(1) Please reset the inverter after clearing the fault throughly, otherwise, the inverter may be damaged.

(2) If fault occurs again after reset, please check the cause of fault, continuous reset may damage inverter.

(3) Reset the inverter after waiting for 5 minutes when over load or over heat protection occurs.

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