

SAN YUAN

SINCE 1982 MATERIAL HANDLING

Professional Design & Manufacturer

**MAINTENANCE AND
OPERATIONAL INSTRUCTIONS**

ELECTRIC CHAIN HOIST

ER3-Series

Patent No. US D846827 S
TW D187828

SAN YUAN CHAIN HOIST CORP.

www.TaiwanHoist.com

Thank you for your wise choice of our distinguished electric hoist.

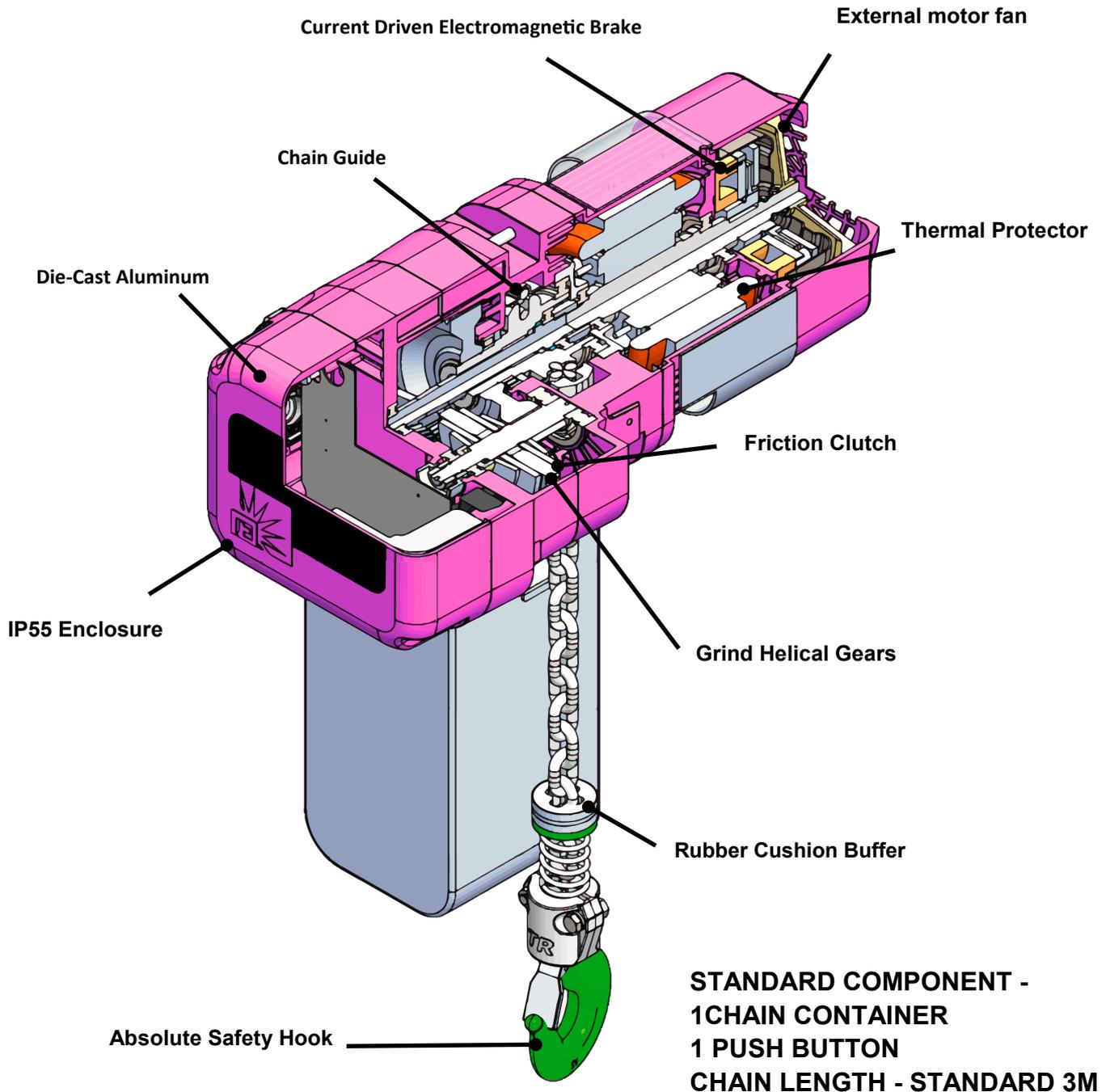
For your better understanding of the performance of this model,

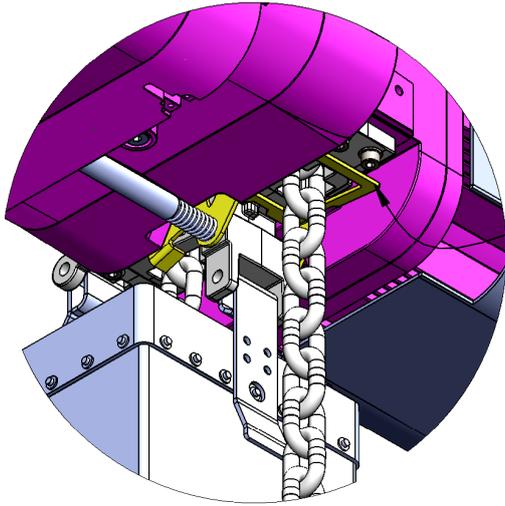
Operational safety and inspection, please read carefully and keep this manual in a safe place.

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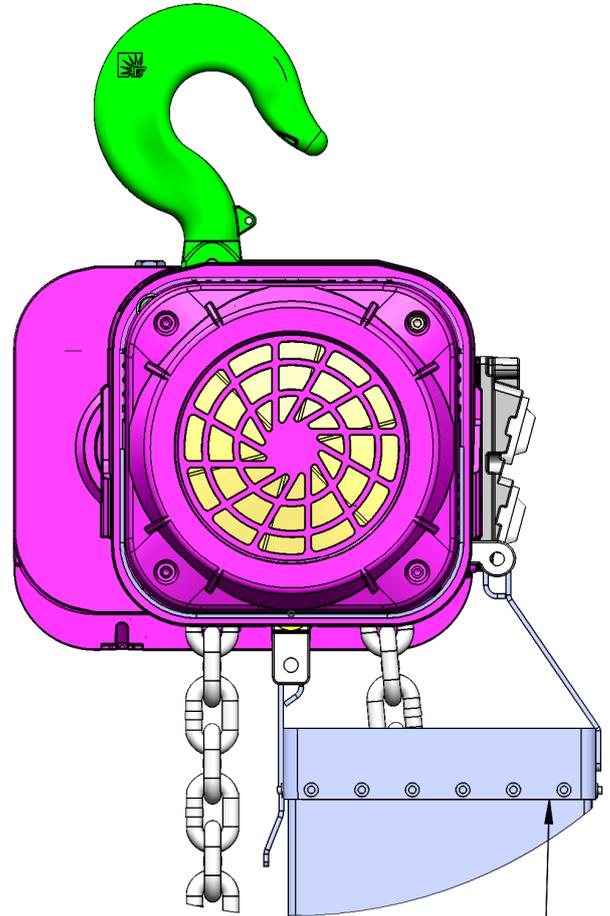
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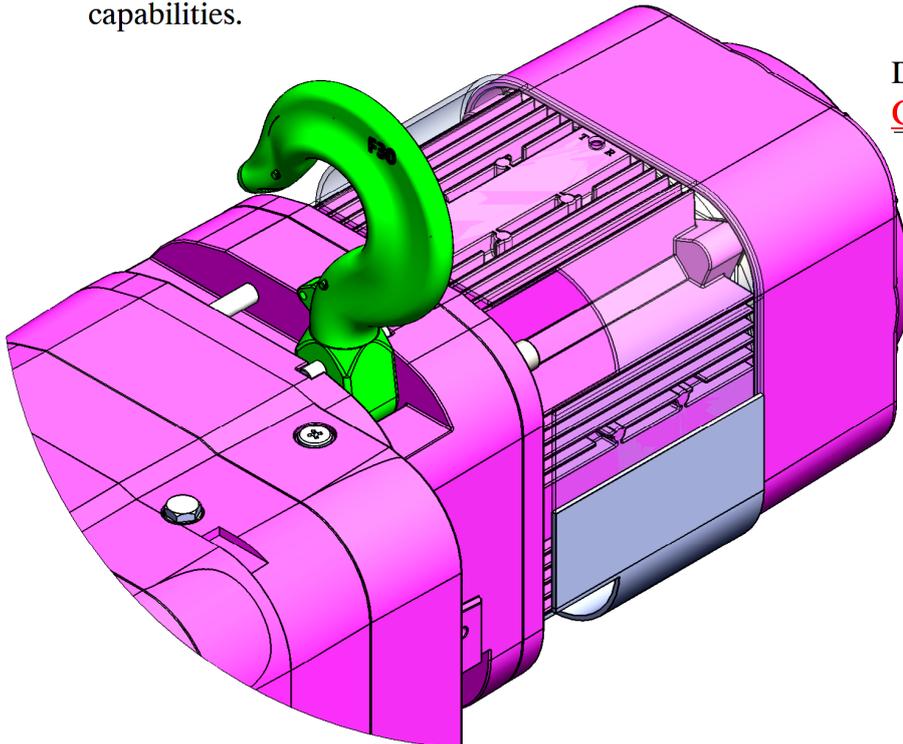
In the event that a load is lifted or lowered excessively, the **limit switch** stops the motor, preventing hoist or load chain damage. (Not regular use)



Unique motor frame fins & fan cover

A unique fan-cooled motor with motor frame fins and a cover have been configured into a purpose built design. This design produces a much quieter motor unit as well as enhanced fan cooling capabilities.

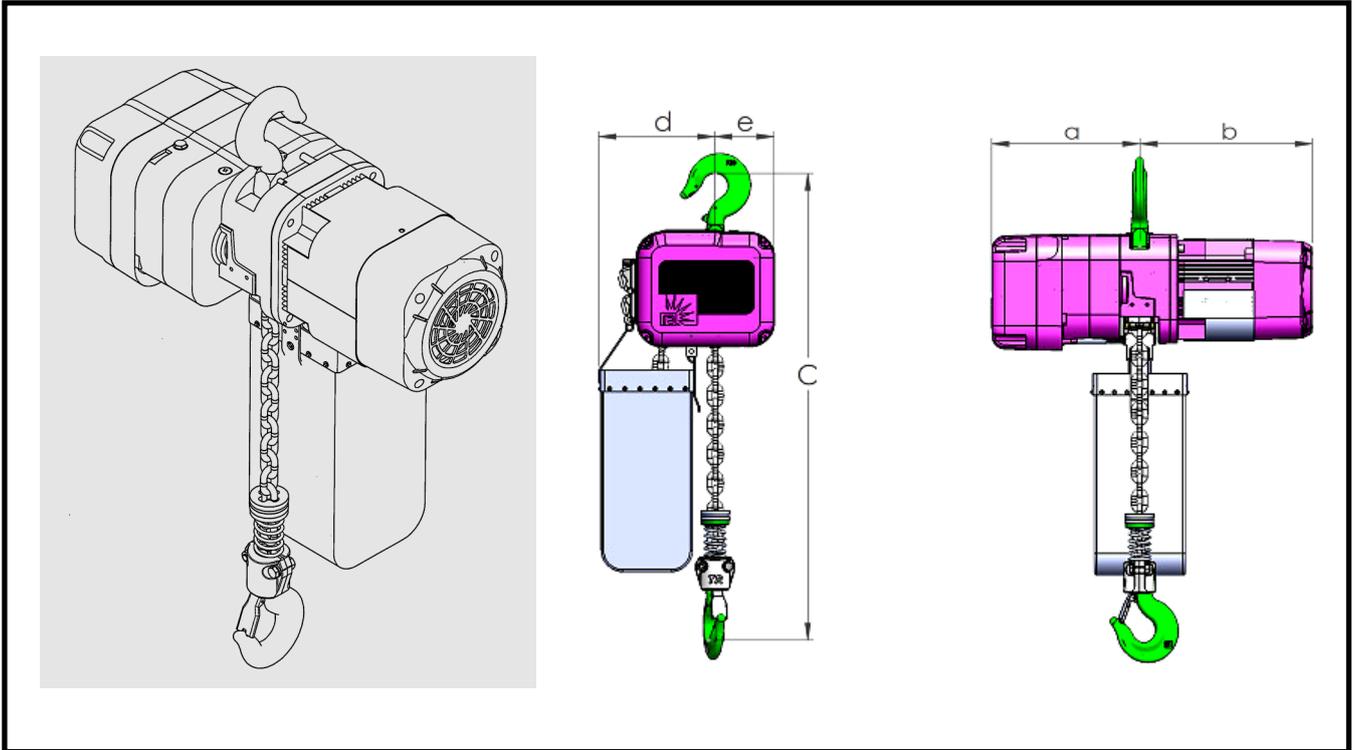
Durable plastic or canvas **Chain container** is standard.



INTRODUCTION

1. Connected in series to a motor circuit, a **Current Driven Electromagnetic Brake** does not release unless the motor is energized. This concurrent drive increases safety of the circuit compared to separate circuits for the motor and the brake.
2. Uniquely-structured **Chain Guide** for smooth chain-feeding.
3. Tough body is made by **Die-Cast Aluminum** to keep dimension precision & outlook smooth..
4. **External motor fan.**
5. **Thermal Protector** Sensor overheating to shut off the current.
6. **Friction Clutch** Emergency overload protection to slip the force from the motor when subjected to an excessive load over the rated capacity. It is not easily compromised with changes in the surrounding temperature. In the case of irregular loading, this operates in advance to prevent the hoist body or load chain from being damaged.
7. **Grind Helical Gears** reduces operating noise.
8. **IP55 Enclosure** Dust-protected and jet protected.
9. **Absolute Safety Hook** Equipped with a bearing & characterized by gradual elongation, not sudden breakage under overload conditions. The notched latch for firm contact improves resistance against lateral force.
10. **Rubber Cushion Buffer.**

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Single Speed Hoist Dimensions

Type		ER3-025S	ER3-028S	ER3-030S	ER3-050S
Cap (Ton)		2.5	2.8	3	5
Test Load %		125 %			
Rating %ED		60 %			
Lift (m)		3			
Lifting Speed (M/min)	50HZ	5.7	5	5	2.5
	60HZ	6.8	6	6	3
Lifting Motor (Kw)		4	3.75	3.75	4
Load Chain (mm)X Falls		Φ11.2 X 1	Φ11.2 X 1	Φ11.2 X 1	Φ11.2 X 2
Diameter (mm)	C	625	785	785	850
	a	337	347	347	337
	b	399	356	356	399
	d	173.5	216	216	231.5
	e	142.5	82	82	84.5

Mounting the Hoist

1. Each hoist is supplied as standard with the following accessories:
 - (1) Chain bucket 1 set
 - (2) Push button control switch 1 piece
2. Prior to mounting the hoist ensure that the suspension and the supporting structure are adequate to support the hoist and its loads. If necessary consult a professional that is qualified to evaluate the adequacy of the suspension location and its supporting structure.
3. Hook Mounted to a Fixed Location - Attach the hoist's top hook to the fixed suspension point.
4. Connection to power supply before installation procedures having been completed is strictly prohibited.
5. **Voltage**
If power supply deviates from standard by more than $\pm 10\%$ abnormal operation or damage to the motor may result. It is imperative to ensure correct voltage supply before commencing operation.
6. When it is necessary to keep the unit outdoors, a protective covering should be fitted.

Do not use the



DANGER

sive atmosphere.

hoist in explo-

CAUTIONS IN OPERATION AND MAINTENANCE

An electric hoist has been used as a safe and convenient machine to save time and labor in operation. Before use, however, careful attention must be paid to operational safety and inspection procedures. Therefore, before operating this electric hoist, please read the following instructions and follow correct operational methods. Otherwise, it will not perform properly as is expected.

(A) Before the installation, please ensure the delivery to have the exact specifications as you had purchased. This machine has been subjected to strict inspection before delivery ex-work. In case of any trouble caused during the handling process, please contact your local distributor or service station. We shall provide best services to meet your satisfaction.

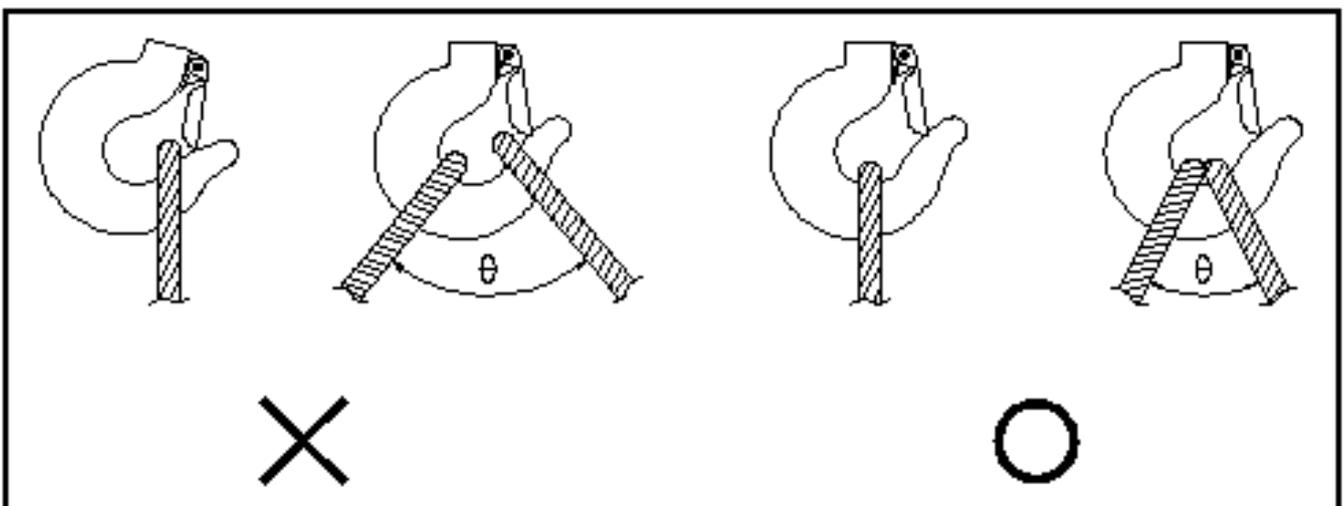
(B) Items to be inspected before operation :

1. Mount the hoist in position. Make sure to secure the power cords and control cables, so as to avoid poor electrical connection.
2. For the wiring system, this machine must be grounded (green wire) to avoid slight leakage caused by static charge.
3. Depress the button switch when the machine runs in idle and check if the UP (↑) and DOWN (↓) operation is consistent with the switch indication.
4. The surface of chain (Wire ROPE) must be kept clean and oiled, to avoid the chain (Wire ROPE) from interwinding.
5. To store the chain, lower the chain to the lower limit, mount the chain bag onto the hoist, then, put the chain into the chain container.
6. Check the correct operation of the limit switch for upper and lower limits and brake stop device.

(C) CAUTIONS FOR THE USE OF ELECTRICAL HOIST

1. For the sake of safety, do not apply a load in excess of the rated load.
2. Ensure if the load is tightly fastened?
3. Before applying the load, the chain (Wire ROPE) must be straightened to buffer the impact.

4. The center of gravity of the load should be hoisted. Never operate unbalanced hoisting. For inclined hoisting by the electric hoist, the inclination should be kept within 15°.
(If possible, try to avoid inclined hoisting.)
5. During the hoisting of load, allow no person to stay below or nearby the load, to avoid any injury.
6. To move the electric hoist with a load, do not pull the control cable in a transverse direction, so as to avoid the electric cable from being broken.
7. Make sure to depress the switch to the full limit. NEVER operate abrupt positive then reverse rotation or inch movement.
8. During hoisting, try to keep the hook from reaching the upper and lower limits, so to minimize the wear of the Clutch lining.
9. A stop device must be fitted when the transverse pulley reaches the terminal of I-beam, so to avoid the hoist from damage or slipping off the end.
10. For outdoor use of electric hoist, keep the hoist from direct sunshine, rain and wind. There should be a proper shelter (such as rain resistant hood, etc.)
11. There is a stop button on the lower hook to prevent the steel cable from escaping. Therefore, make sure the cable is in the correct position on the lower hook and keep the safety angle within 60°. (See diagram)



(D) Routine and regular inspection items of electrical hoist :

To ensure the proper performance of this machine and extend its service life, please make the following routine checks.

D-1 Routine inspection items:

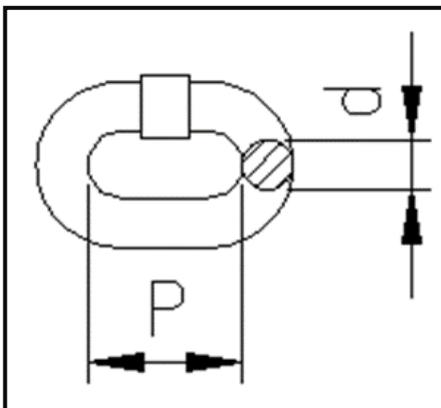
1. Depress the button switch and let the hoist run idle, check if the upward and downward operation are normal?
2. Is the hoist operation smooth? Is there abnormal noise when it is with load?
3. Check if the chain is oiled or damaged?
4. Is the brake operation normal when the winding is stopped?
5. Is the lower hook wassily rotating?

D-2 Regular inspection items:

1. Inspection of LINK chain

LINK chain is the most important part of the electrical chain hoist, which is made of special alloy steel with heat treatment. The purpose is to withstand wear and tension. In case the surface is dried and rusted, it will cause interwoven chains which may break. Therefore, the surface must be oiled frequently (use normal lubricating oil). In case the chain is deformed, cracked, elongated, worn, in excess of the following standards, new parts must be replaced:

Please refer to the measurement standard on page 11.



Cap (Ton)	Dimensions (mm)	
	d	p
2.5、2.8、3	11.2	34
5	11.2	34

2. Inspection of gear:

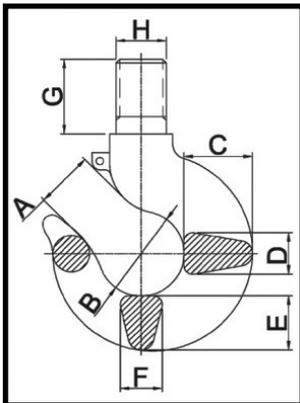
- a. Regular replacement of lubricating oil in the gearbox.
- b. Check if the gear surface is cracked or worn.

3. Inspection of hook:

- a. In case of abnormal deformation, damage or breakage at the opening of the hook, it must be replaced with new.
- b. In case the wear extent of the hook is in excess of 10%, it must be replaced with a new part.

4. Inspection of pushbutton switch:

- a. Are the inner and outer screws of the pushbutton switch loosened? Is the electric wire damaged?
- b. Is there foreign substance between the contact points? Are the contact points abnormally worn?



Cap (Ton)	Dimensions (mm)					
	A	B	C	D	E	F
2.8、3	49	59	52	32	46	32
5	52	62	67	45	60	45

5. Inspection of main unit:

- a. Is the wiring system in the main unit secured? Is the electric wire aged or damaged?
- b. Are the inner or outer screws of the main unit loosened?
- c. Is the panel or casing of the main unit deformed?

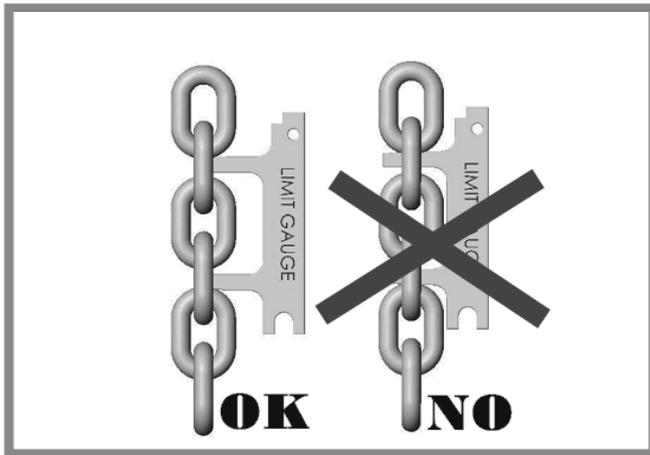
6. Inspection of main unit:

- a. Is the wiring system in the main unit secured? Is the electric wire aged or damaged?
- b. Are the inner or outer screws of the main unit loosened?
- c. Is the panel or casing of the main unit deformed?

◆ **Periodic Inspection: Check by your technical staff according to the work environment.**

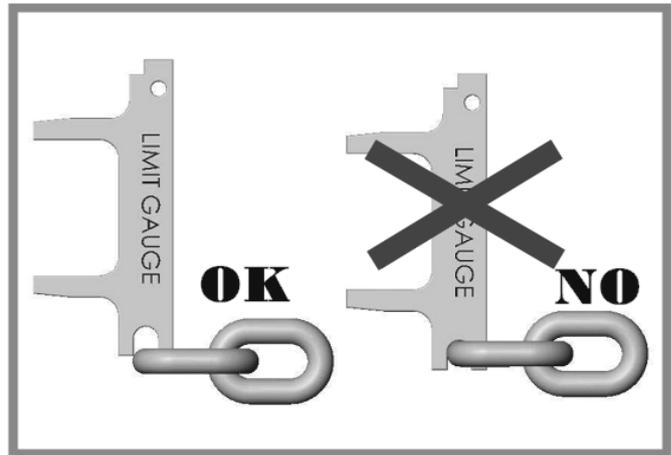
Chain Gauge – Wear and Stretch Measuring

- (1) The chain gauge is useful and convenience for measuring.
- (2) Please use a chain gauge to measure the chain pitch and diameter, such as illustrations (1) and (2).
- (3) Every chain ring must be measured , and the chain must be replaced when one of chain rings is wear or stretch.
- (4) It will be a cutting-out possibility if you use a chain fall either wear or stretch during operation.
- (5) Do not replace a chain fall by yourself and do please contact specific either service centers or contractors to help you out.
- (6) The chain fall must be replaced whole instead of a partial part.
- (7) The load sheave, regulator, and chain compressing wheel must be replaced the same time as you do a second time replacement.
- (8) Chain must be perfect condition without any defects and attachments.



(1)

Chain pitch measure



(2)

Diameter measure

Parts - Rectifier Type Distinction

1. Hoist : Full/Half wave Rectifier (Black)

AC220V input : DC220V / 99V output

AC380V input : DC380V / 199V output

Brake coil resistor

Design value :

220 ohm / AC220 input

380 ohm / AC380 input

2. Hoist : Full wave Rectifier

AC22V / 380V input : DC220V / 380V output

Brake coil resistor

Design value : 0 ohm

3. Motor Trolley : Half wave Rectifier (Red)

AC220V input : DC99V output

AC380V input : DC199V output

Brake coil resistor

Design value :

220 ohm / AC220 input

380 ohm / AC380 input

CAUTIONS FOR THE USE OF ELECTRICAL HOIST

Our electrical hoist is a heavy-duty motor hoist with high frequency.

To operate, please follow the points below:

A. Inspection of brake:

1. Check the wear and oil all parts.
2. When the load stops, the slipping distance of load is too large.
3. When the electromagnetic iron attracts, it produces abnormal noise. In case of any of the above, please make proper adjustment or replace new parts.

B. Item inspection

1. If you would use the hoist CONTINUALLY for a longer period of time, for example, more than SIX (6) HOURS, you must inspect it monthly so that you can be aware of when would be the time to change new parts to be.
 2. The intervals of the item inspection may be determined according to real condition of use and work classification. Moreover, you should check it according to the environment which it exposed to and the rate of key parts ageing. Periodic inspection such as daily, monthly, quarterly checking are always encouraged by **SAN YUAN** as you may be free from risk.
- ◆ Daily inspection: Before or during daily use, user or technical staff may inspect it visually.
 - ◆ Periodic Inspection: Check by your technical staff according to the work environment.



Before performing maintenance do not forget to affix tags to the power source and the push button switch reading: “DANGER”, “EQUIPMENT BEING REPAIRED”.

Warranty Details

1. This product is warranted to be free from manufacturing defects under normal use and conditions for 1 year.
2. The warranty does not cover the purchaser or any other person for damage, loss, normal wear or faults caused from misuse or incorrect installation of the equipment.
3. To be eligible under this warranty, the equipment is required to have been installed and operated correctly by qualified personnel and has not been subject to abuse, neglect or adjustment carried out by an unauthorized person.
4. The Product consisting of only **SAN YUAN** Hoists approved parts.
5. Non-Warranty Scope:
 - a) Electrical Spare Parts (ex. Contactor, Pendant, Phase Error Relay, etc.)
 - b) Expense Spare Parts (ex. Chain Bucket, Brake Lining, etc.)
 - c) Damage caused by unsuitable operation.
(ex. Galvanize plant, Chemical Plant, Dye-work, etc.)
 - d) Damage caused by operating on the wrong electric voltage.
 - e) Damage caused by user amend the product.
 - f) Damage caused by natural disaster.

Any instructions or warranty included in this manual may be subject to change without notice. For the most up-to-date instructions and warranty information, please contact us or visit our website. <http://www.taiwanhoist.com>

2-1 Regular Inspection

Project	Method	Standard of Judgement	Solution
Label Warning Mark	Inspect visually	Stick correctly clean and clearly read	Change
Control Pendant	Push stop button without load	Hoist stops, rotates at the right side; after pushing the stop button, hoist runs	Change
	Push start button without load	Bottom hook could lift and land	Repair or change
Brake	Lift and land 2 or 3 times without load	Check the Brake effect is good or not	Repair or change
Up & Down position limit	Operate the hook into the limit position without load	When touches the down position limit, the electric motor should stop, but could work in a reverse direction	Repair or change
Lifting chain	Inspect visually	Surface with lubricate grease without deformation, without crackle	Clean. Lubricate it; or change it if necessary
Hook	Inspect functions visually	Without deformation, and it could move, slide, and rotate freely	Change
Position limit spring	Inspect visually	Without deformation	Change



WARNING

Always use the hoist manufacture's recommended parts when repairing a hoist.

2-2 Check List for Periodic Inspection

Project	Method	Standard of Judgement	Solution
Control pendant	Push button to STOP function	Is the push button stable? No problem?	Repair
Power plant	Measure by voltmeter	± 10% rated voltage	Check the power plant and wire
Hoist frame	Inspect visually	Not broken and cracked	Change
Screw	Inspect visually	Screw should not be loosen or missing	Kindly fasten the screw
Abnormal condition of operation	Lifting and landing operation with small capacity load	Users should not be able to hear abnormal sound from hoist machine or lifting motor	Repair
Gear oil	Inspect visually	Should be in accordance with the frequency of use	Add gear oil or use new oil
Brake	Lifting, landing, stopping operation within its rated-capacity load	Stop when landing, the down slide speed cannot over 1% of lifting speed	Repair
Position limit switch	Lift to the limit position with rated-capacity load	Hoist could stop, could move reversely; the spring has certain flexibility	Repair or change
Lifting chain deformation	Inspect visually	without deformation (such as distortion) without deeper scratch and indent	Change
Lifting chain welding scar	Inspect visually	Warning: without welding scar	Change
Lifting clan rust	Inspect visually	Warning: without obvious rust; lubricate the lifting chain with grease	Change
Hook deformation	Inspect visually	Without obvious deformation and crack; without deeper cracks; screw and bolt should be well tightened; without welding scar	Change
Hook rotation	Inspect visually	Hook should rotate normally	Change
Hook	Inspect visually Inspect the overall condition	Hook tab should be in the hook tip	Change
Basal plate	Inspect visually Inspection the overall condition	<ul style="list-style-type: none"> · Should work normally WARNING Please do NOT use the hoist if the hook tab is missing	Change

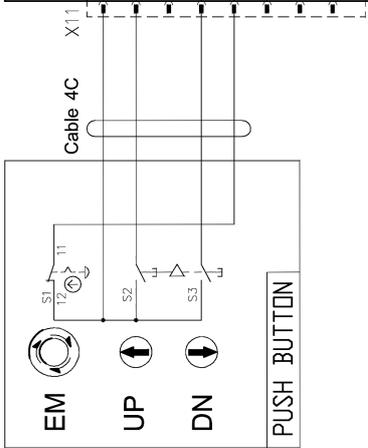
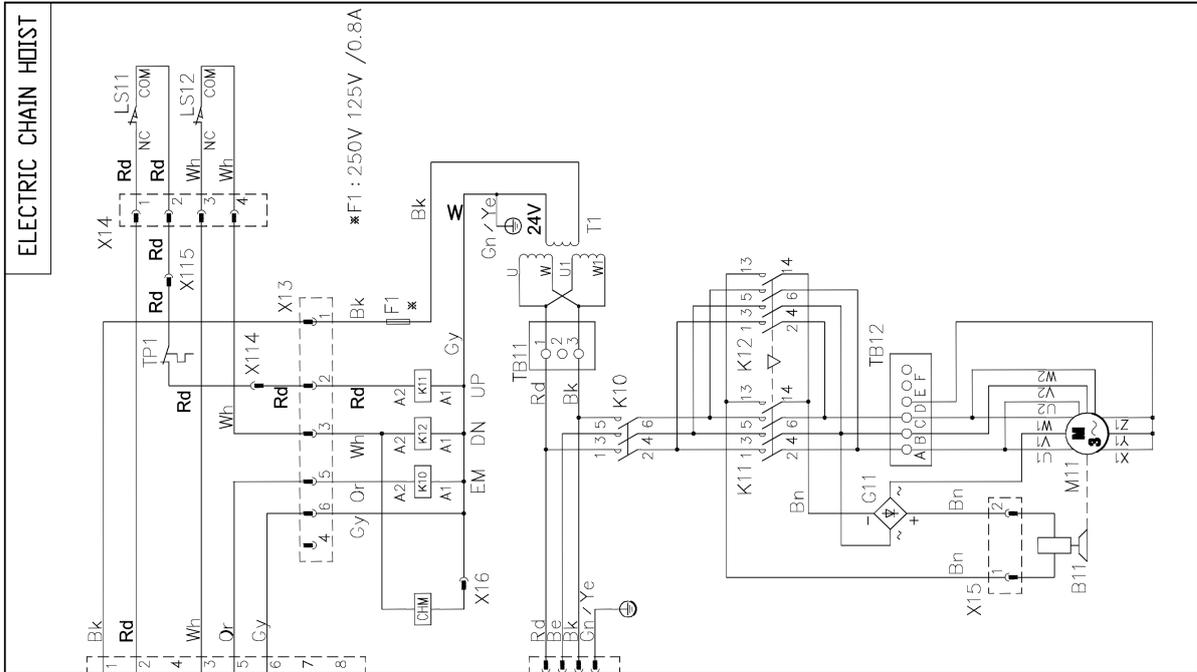
C. Malfunctions and Solutions

Malfunctions	Causes	Solution
The hoist unable to operate when it is switched on	Wire disconnected or power off due to plug loosened	Check and fasten all the wire connection points
	Electrical parts were damaged	Replace with new electrical parts
After switched off, the load dropped while braked	Dust or oil in the brake disc	Clean the disc
	Severe abrasion of disc	Replace with new disc
Chain runs with strange noise	The chain was not well-lubricated	Lubricate chain by oil or grease
	Load-guider broken	Change a new load-guider
Leakage of electricity	The electricity was not well-earthed	Ensure the earthed connection
	High humidity	Use dehumidifier to eliminate the problem
	Too much dust in the electrical parts	Clean the electrical parts
Skid when lifting the load	Load limit is flexible	Screw down the load limiter
Hook extension	Maintain the load with hook tip	Maintain the load at the middle section of hook
	The chain sling of load is not correct	Use a correct chain sling

Abbreviation	
Gn: Green	BK: Black
Ye: Yellow	Rd: Red
Gn/Ye: Green & Yellow	Wh: White
EM: Emergency stop	Bn: Brown
UP: UP	Gy: Gray
DN: Down	Or: Orange
	Be: Blue

Remark:

Hoist operation type - single speed
Power supply - 3Ph 220V 60Hz



Parts No	S/P name
1	T1 Transformer
2	F1 Fuse
3	B11 Electric brake
4	G11 Rectifier
5	M11 Hoist motor
6	K~ Contactor
7	X~ Plug/ Socket/ Connector
8	TP1 Motor thermal Protector
9	LS11 Up limit switch
10	LS12 Low limit switch

Remark:

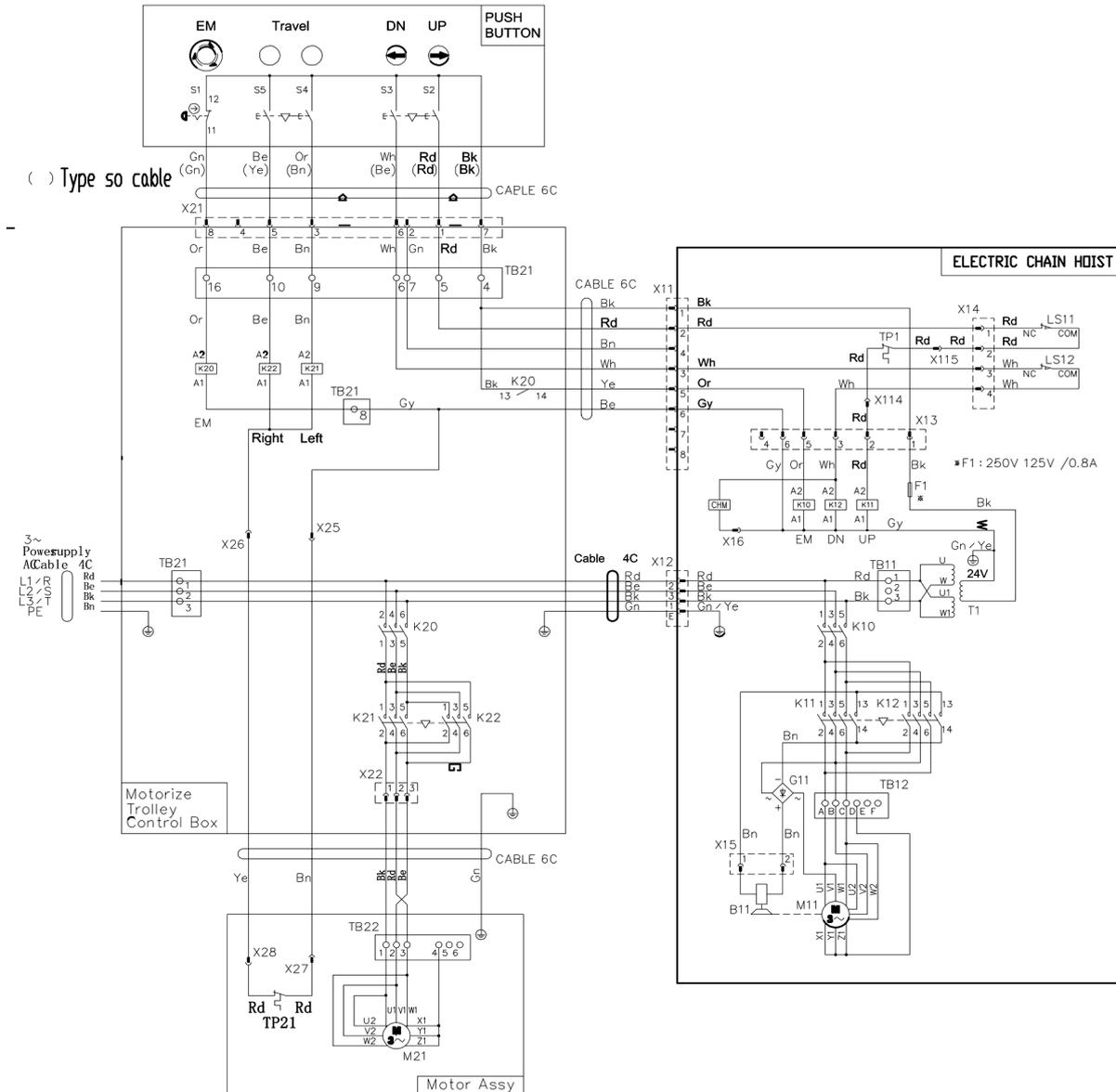
Hoist Operation type:

- 1 speed Hoist + 1 speed Trolley

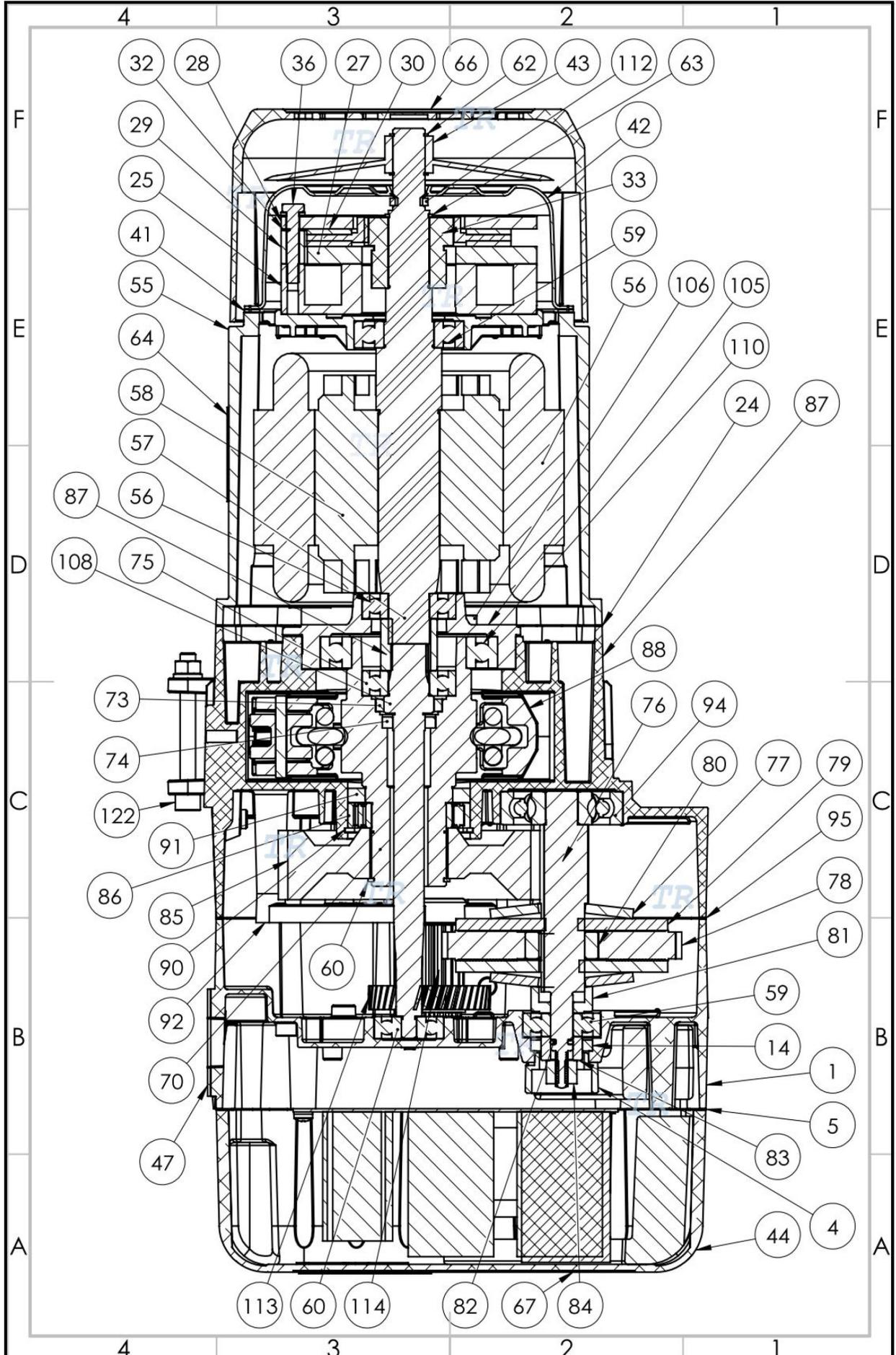
Power supply: 3Ph 220V 60Hz

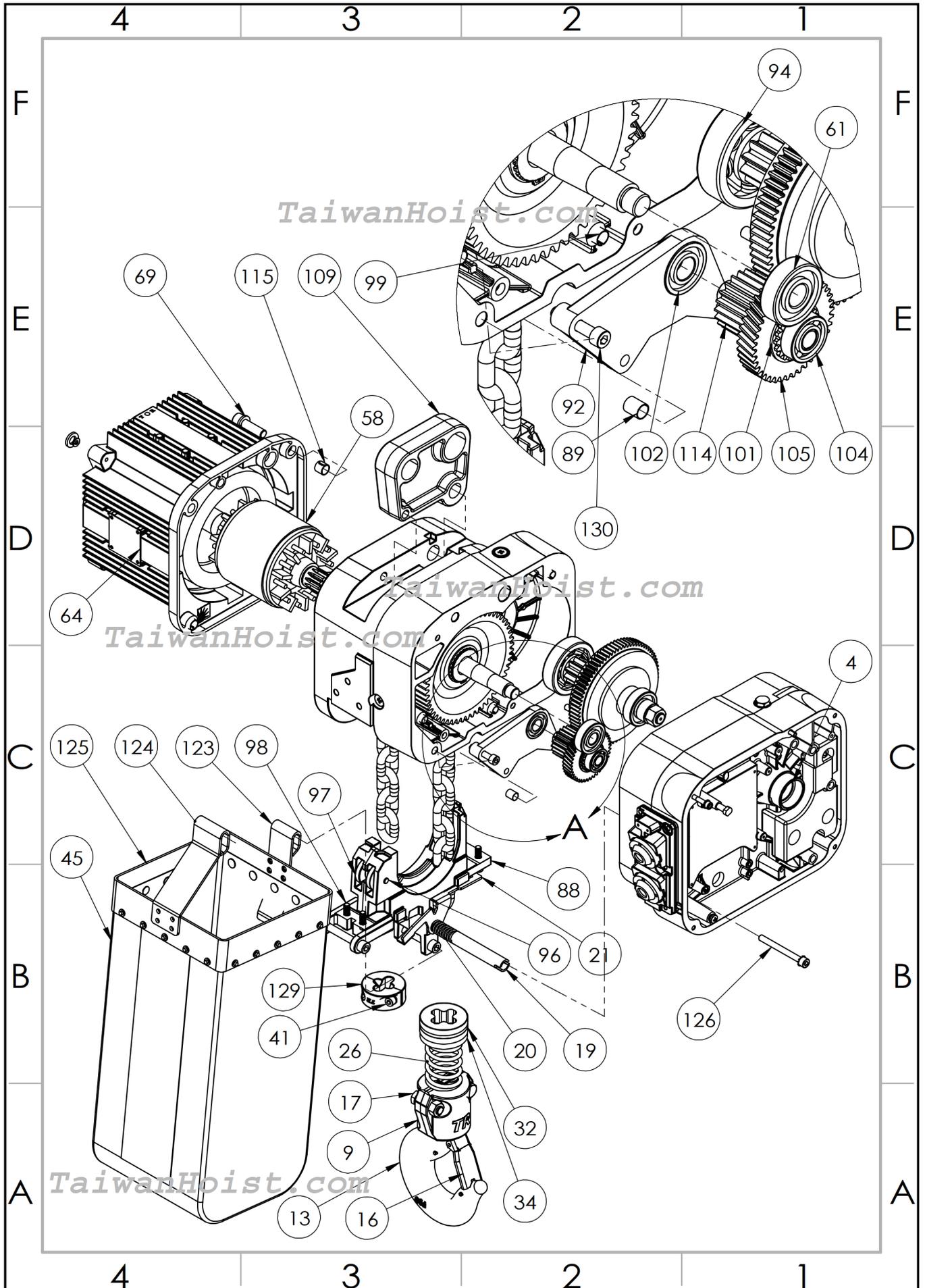
Abbreviation	
Gn: Green	BK: Black
Ye: Yellow	Rd: Red
GN/Ye: Green & Yellow	Wh: White
	Bn: Brown
EM: Emergency stop	Gy: Gray
UP: UP	Or: Orange
DN: Down	Be: Blue

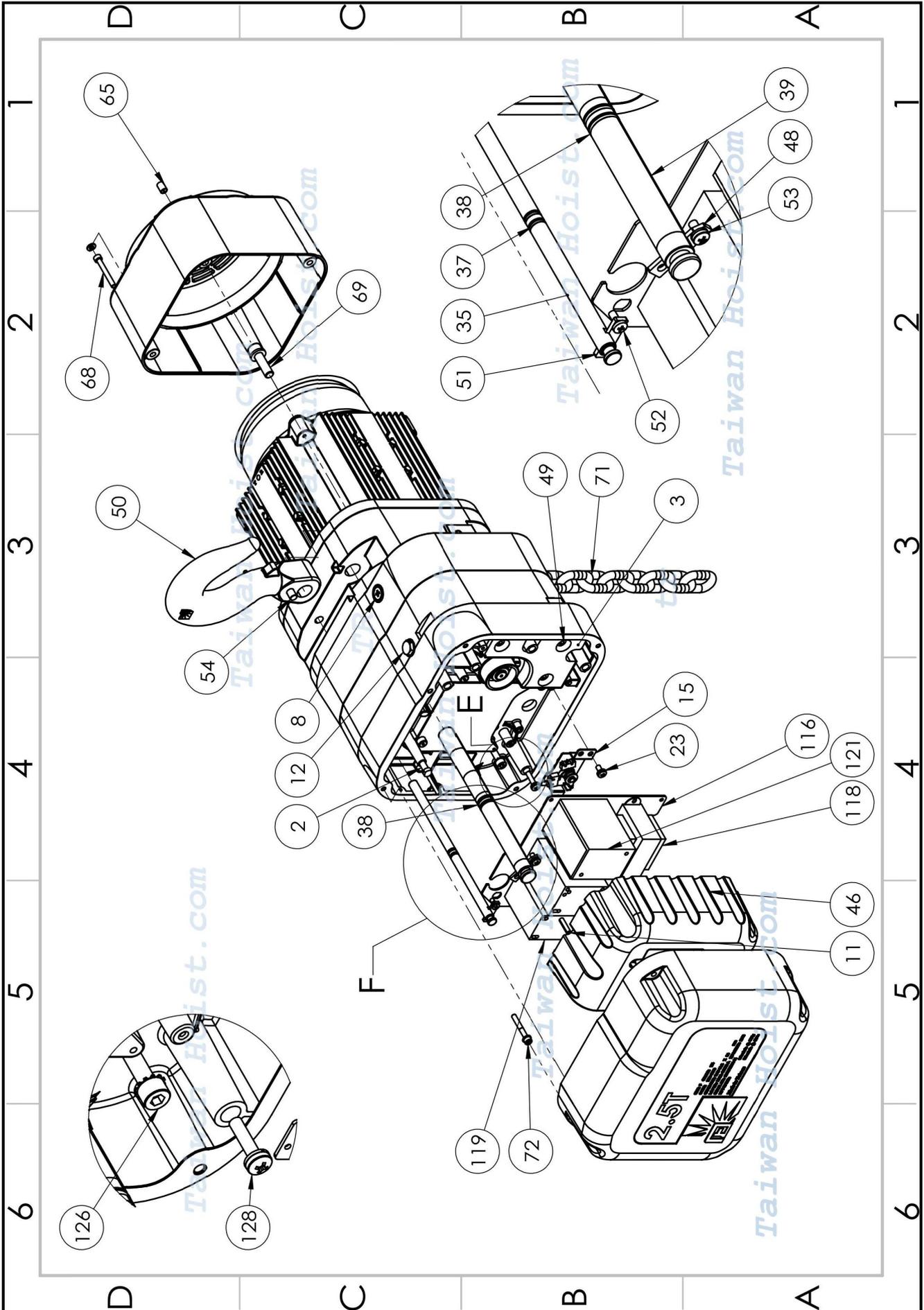
Parts No	S/P name
1	T1 Transformer
2	F1 Fuse
3	B11 Electric brake
4	G11 Rectifier
5	M11 Hoist motor
6	M21 Trolley motor
7	K~ Contactor
8	X~ Plug/ Socket/ Connector
9	TP~ Motor thermal Protector
10	LS11 Up limit switch
11	LS12 Low limit switch
12	TB~ Terminal



ER3 Type Explosion Chart 3-1



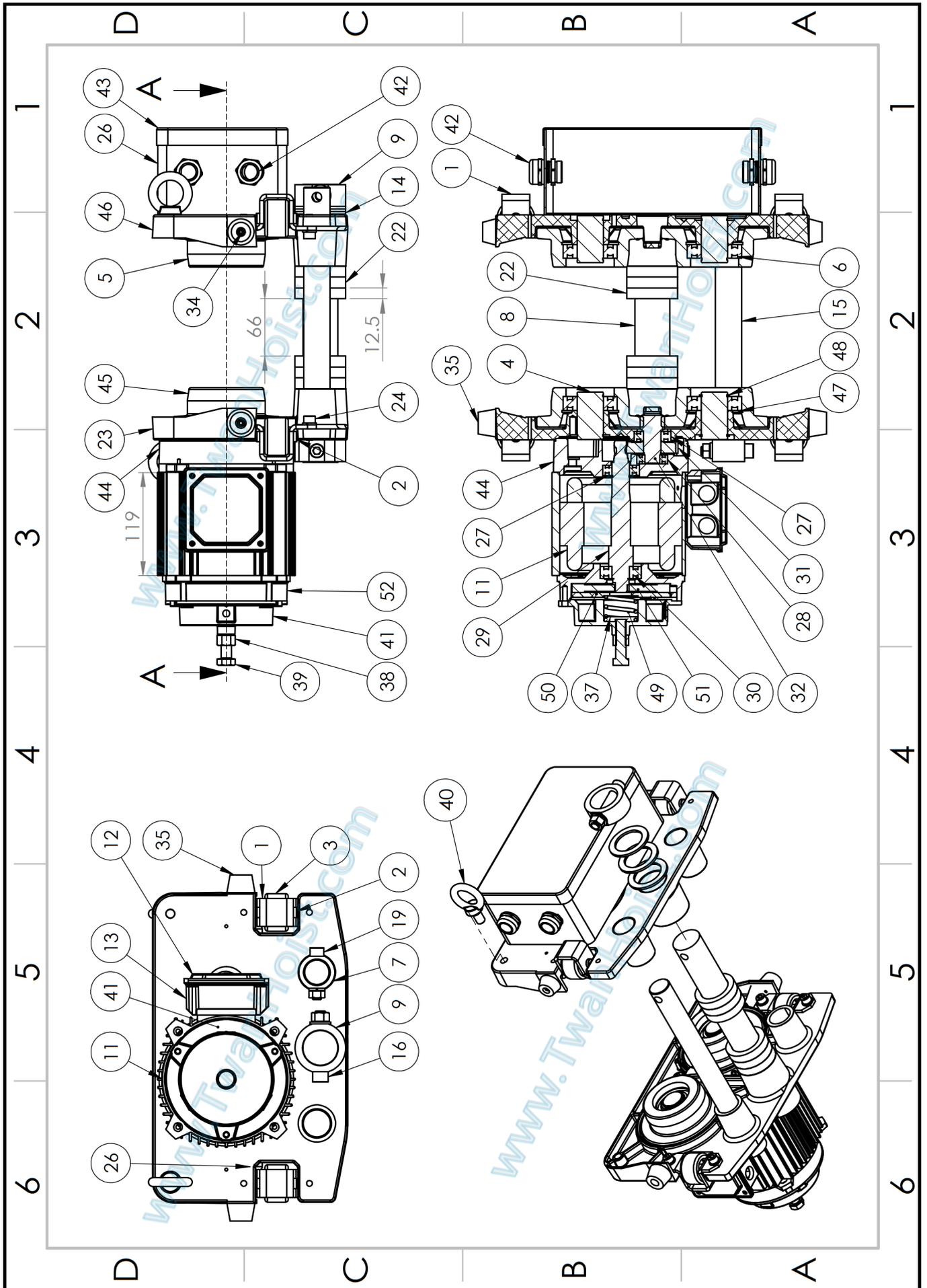




No.	Part Name	Specification	Q'Ty	No.	Part Name	Specification	Q'Ty
1	Gear box		1	23	Cross bolt + spring washer	M6-12L	3
2	Electrical board suspension bolt		1	24	Motor packing		1
2	Electrical box weight		1	25	Brake coil holder		1
4	Clutch nut cover		1	26	Lower hook spring		1
5	Electrical box packing		1	27	Brake plate		1
6				28	Brake floor		1
7				29	Brake spacer		3
8	Oil plug	M12	2	30	Brake order		1
9	Lower hook		2	31	Rubber crash pad		2
10				32	Rubber crash pad		6
11	Cotter pin	d3-25L	1	33	Brake teeth		1
12	Oil plug	M16	1	34	Chain anti-collision iron piece		2
13	Lower hook F		1	35	Hanger - large	d12	1
14	Oil seal	TC-30X42X7	1	36	Brake fixing bolt spring washer	M8-45L	6
15	Limit switch group		1	37	O ring	d=9x1.6	2
16	Safety stop + stop spring		2	38	O ring	d=18x2.2	2
17	Hex bolt + spring washer	M12-40L	2	39	Hanger - large	D22	1
18	Limit rod F		1	40	Hexagon socket bolt spring washer	M8-25L	2
19	Limit rod spring		1	41	Brake back cover gasket		1
20	Limit rocker		1	42	Brake back cover		1
21				43	fan	OD 185	1
22				44	Electrical box cover		1

No.	Part Name	Specification	Q'Ty	No.	Part Name	Specification	Q'Ty
45	Chain bag F		1	67	Nameplate		1
46	Electrical cover - counterweight		1	68	Hexagon socket head bolt + spring washer	M6-50L	4
47	Electrical box side cover is tight		1	69	Hexagon socket head bolt + spring washer	M12-40L	4
48	Hanger keyboard - large		1	70	Guide wheel		1
49	Hexagon socket bolt + spring washer	M8-25L	3	71	Chain		
50	Hook		1	72	Hexagon socket head bolt + spring washer	M6-45L	4
51	Hanger keyboard - small		1	73	Oil seal	TC-35X45X8	1
52	Cross bolt + spring washer	M5-12L	2	74	Oil seal	SC-25X37X7	1
53	Cross bolt + spring washer	M6-12L	2	75	Bearing - Japan	6206ZZ	1
54	Hook positioning pin	D10-L63	1	76	Three small teeth		1
55	Motor housing		1	77	Disc spring		2
56	Ball Bearings - Japan	6206ZZ	1	78	Two large teeth		1
57	Motor shaft		1	79	Clutch pressure plate		2
58	Motor turn		1	80	Clutch bushing		1
59	Bearing - Japan	6304ZZ	1	81	Disc nut cover		1
60	Shaft ring	S50	1	82			1
61	Bearing - Japan	6303ZZ	1	83	Clutch oil seal sleeve		1
62	Shaft ring	S25	2	84	Clutch lock nut		1
63	Shaft ring	S30	1	85	Three large teeth		1
64	Motor nameplate		1	86	Ball Bearing / Roller Bearing NU1010	6010ZZ	1
65	Spring pin	D9	2	87	F main body		1
66	Fan cover F		1	88	Lower chain guide		1

No.	Part Name	Specification	Q'Ty	No.	Part Name	Specification	Q'Ty
89	Spring pin	D11	2	113	a large tooth		1
90	Hole buckle	R80	1	114	Two small teeth		1
91	Oil seal	TC-58X80X9	1	115	Spring pin	D15	2
92	Bearing housing		1	116	Electrical board F		1
94	Ball bearing - no shell	6405	1	118	Electrical board F		1
95	Gear box is tight		1	119	Main electromagnetic switch		1
96	Small roller axle	d8-52L	1	120			
97	Small wheel F		2	121	Electromagnetic contactor		1
98	Hexagon socket bolt + spring washer	M8-30L	4	122	Hexagon socket head cap + nut + spring washer	M10-90L	1
99	Spring pin	D11	2	123	Chain bag iron piece A		
100	a large tooth		1	124	Chain bag iron piece B		
101	Shaft ring	S40	1	125	Chain bag box		
102	Ball bearing	6203ZZ	1	126	Hexagon socket bolt + serrated gasket	M8-85L	1
103	Hook plate		1	127			
104	Ball bearing	6202ZZ	1	128	Cross bolt + spring washer	M6-25L	1
105	Motor bearing		1	129	Chain end stop F		2
106	Hexagon socket head cap + nut + spring washer	M6-20L	3	130	Hexagon socket bolt + spring washer	M8-40L	3
107							
108	a small tooth		1				
109	Motor coupling		1				
110	Ball bearing	6015ZZ					
112	V-type shaft seal	VA-22	1				



MOTOR TROLLEY Parts List

No.	Part Name	Specification	Q'Ty	No.	Part Name	Specification	Q'Ty
1	Pulley side guide wheel plate - V3	Option-Turning	4	27	Bearing	6004zz	2
2	Side guide wheel axle Ver.2	Option-Turning	4	28	Bearing	6003zz	1
3	Side guide wheelV3	Option-Turning	4	29	MT Motor shaft		1
4	Wheel axle		4	30	Bearing	6204zz	1
5	Wheel - toothless		4	31	5MT A large tooth		1
6	SKF-6206-12,SI,NC,12_68	6206zz	4	32	ER3-MT Output tooth		1
7	Small fixed casing	ID=31mm	1	33	RB-25X19X15		2
8	Pulley big boom	D=40mm	1	34	JIS B 1176 M4 x 12 (12)- -N		1
9	Large fixing sleeve		2	35	Buffer rubber		2
10	NCS-E Assembly		1	36	JIS B 1176 M5 x 12 (12)- -N		1
11	Motor housing +Wire loop		1	37	MT Brake spring washer		1
12	Junction box (small)		1	38	Thin nut	M12	1
13	Junction box (small) seat		1	39	Brake adjustment bolt	M12-45L	1
14	Large spacer-3	OD=58,ID=41,T=3mm	4	40	Ring	Option	2
15	Pulley small boom		1	41	Brake coil + seat		1
16	Hex Bolts	M12-70L(36)	2	42	Waterproof connector	Option	4
17	Nut	M12	2	43	Electrical box cover		1
18	N		2	44	Reducer base		1
19	Hex Bolts	M10-50L(35)	1	45	Wheel-Toothed		
20	N		1	46	Block board-Electrical box side		1
21	Nut	M10	1	47	Hole buckle	R62	4
22	Large spacer casing-12.5	OD=58,ID=41,T=12.5mm	6	48	Shaft ring	S32	8
23	Block board-Motor side		1	49	MT Brake spring		1
24	Hexagon socket head bolt	M8-20L	8	50	MT Brake plate		1
25	JIS B 1251 No.2 8		8	51	MT Brake to order		1
26	Electrical box base		1	52	MT Motor back cover		1