KITO

OM-EQSZZZ-CEE-00

CE

Original Instruction

EQ Series Electric Chain Hoist (500kg to 1t)

Single phase dual speed inverter type

Owner's Manual

Suspended Type (hoist only) : EQS
Manual Trolley Type : EQSSP

To Customer

- **Thank you for purchasing KITO Electric Hoist (EQS).**
- **Operators and maintenance engineers are requested to read this manual. After reading, please keep this manual at hand for future use.**
- **This product is designed considering the environment protection. The product contains none of six hazardous substances specified by European RoHS Directives nor asbestos.**

Table of Contents

Introduction

This electric hoist EQS is designed and manufactured for the purpose to lift and lower a load within a normal work environment.
The manual trolley is designed and manufactured for the purpose to move the lifted load laterally with the combination with the electric hoist.
Movement of a load in a 3D direction such as up/down, forward/backward and right/left is also enabled by combining with a crane.

This Owner's Manual is intended for those operating the KITO electric hoist EQS and maintenance engineers (* pesonnel with expertise).
Other than this manual, Disassembly/Reassembly Manual is also available for the maintenance engineers. Assign the maintenance engineers and use these materials for inspection and repair. Please contact the nearest distributor or KITO for these materials.

* A person who has a thorough knowledge of the structure and rolls concerning Electric chain block and is recognized as an expert by an entity.

■Disclaimer

- KITO shall not be liable for any damage incurred thereof due to natural disaster such as fire, earth quake and thunderbolt, conduct by third party, accident, willful conduct or negligence by customer, erroneous use and other use exceeding the operational condition.
- KITO shall not be liable for any incidental damage due to the use or non-use of the product such as the loss of business profit, suspension of business and damage of the lifted load.
- KITO shall not be liable for any damage arising from negligence of the contents in the Owner's Manual and the use of the product exceeding the scope of its specification.
- KITO shall not be liable for any damage arising from the malfunction due to the combination of the product with other devices in which KITO is not concerned.
- KITO shall be indemnified from any loss of life, bodily injury and property damage due to the use of our product for which it has passed 10 years since its delivery.
- KITO shall not be liable to supply the spare parts for the product for which it has passed for 15 years since the discontinue of the product.

■Restriction on Use

- The product described herein is not designed or manufactured for transporting people. Do not use the product for that purpose.
- The product described herein is designed for the materials handling work such as lifting/lowering and traveling the load under ordinary operational condition. Do not use the product for the work other than materials handling work.
- Do not assemble the product into machinery not for materials handling, as a part of it.

■Operators

- Read carefully this Owner's Manual and the instruction manuals of related products, fully understand their contents, and the use and operate the product.
- Be sure to wear the proper clothing and protective equipment when using and operating the product.

■Laws and Standards

Carry out installation, inspections, operations, maintenance management in accordance with the laws and standards of the country and region where the product is used.
An application before installation or a test before beginning usage may be required. Furthermore, the tester may be required to have specific qualifications. Be sure to check the laws and standards of the corresponding country and region before using the product.

Safety Precautions

Improper use of electric chain hoist causes danger such as drop of lifted load. Read this Owner's Manual carefully before installation, operation and maintenance. Use the product after understanding the product knowledge, safety information and precautions.
This Owner's Manual classifies the safety information and precautions into three categories of "DANGER" "WARNING" and "CAUTION".
Also read the instruction manual of the device associated with electric chain hoist, and follow the described contents.

Description of Signal Words

⚠ **DANGER**	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Further, the event described in CAUTION may result in serious accident depending on the situation. Both DANGER and CAUTION describe important contents. Please follow the instruction.
After reading, please keep this manual at hand for future use by the user.

Description of Safety Symbols


Prohibited

Means "Prohibited" or "You must not do".
Prohibited action is shown in the circle or described near the circle.
This Owner's Manual uses ⃠ as the general prohibition.


Mandatory

Means "Mandatory Action" or "You must do".
Required action is shown in the circle or described near the circle.
This Owner's Manual uses ❗ as the general instruction.

■General Matters on Handling and Control

⚠ DANGER


Prohibited

- **This product shall not be disassembled and repaired by personnel other than maintenance engineers.**
  Other than this manual, Disassembly/Assembly Manual is provided for the maintenance engineers. Perform the disassembling and repair by the maintenance engineer in accordance with these materials for maintenance.
- **Do not modify the product and its accessories.**

Failure to comply with these instructions may result in death or serious injury.


Mandatory

- **Understand the contents of the Owner's Manual sufficiently. Then operate the Electric chain hoist.**
- **Warning label is affixed to each part of the product. Follow the instruction described in the warning label.**

Failure to comply with these instructions may result in death or serious injury.

⚠ CAUTION


Prohibited

- **Do not drag or drop the product when carrying.**

Otherwise it causes damage or flaw of the electric chain hoist, bodily injury or loss of property due to the drop of the lifted load.


Mandatory

- **When discarding the product, disassemble it not to be used and discard in accordance with the ordinances of local government or the rules specified by the business entity.**
  Ask the local government or the relevant section for the details.
  Refer to “Disassembly/Assembly Manual” for disassembling, or contact KITO.
  (This product uses oil. We prepare MSDS (Materials Safety Data Sheet) for the oil. Contact KITO for it.)
- **Carry out daily inspection by user.**
- **Carry out inspection (monthly, annual) by maintenance engineer.**
- **Keep the record of the inspection.**

Failure to comply with these instructions causes bodily injury or loss of property.

■General Matters on Handling of Dual Speed VFD Model

The Dual Speed Variable-Frequency Driver (hereinafter referred to as "VFD") model is controlled by VFD for important items related to safety such as operation, braking and emergency stop. Be sure to follow the safety precautions below as well as the above safety precautions.

⚠ DANGER


Prohibited

- **Do not reassemble the Dual Speed VFD model to contactor type.**
- **Do not change parameters.**
  When parameters need to be changed, ask distributor or KITO.
- **Do not carry out the work such as maintenance and inspection within 5 minutes after power off.**
  Wait for the completion of discharging of the capacitor inside the VFD and dual power converter (hereinafter referred to as "DPC").
- **Do not change the connection of the VFD and DPC.**
  When the wires were removed for any reason, connect them again correctly checking the wiring diagram inside the controller cover.
- **Do not carry out withstand voltage test and insulation resistance measurement of a circuit by megger while the VFD is connected.**
- **Do not turn off the power while operating.**
- **Never turn off the power when a load is suspended.**
  Never, under any circumstances, turn off the power when a load is suspended. Doing so will cause the load to be slightly lowered after the power is turned on again due to control system initial preparation.

Failure to comply with these instructions may result in death or serious injury and the damage of VFD and DPC.


Mandatory

- **USE KITO genuine VFD and DPC.**
  The VFD and DPC requires the special specification for KITO. Be sure to use genuine VFD and DPC.

Failure to comply with this instruction may result in death or serious injury.

Chapter 1

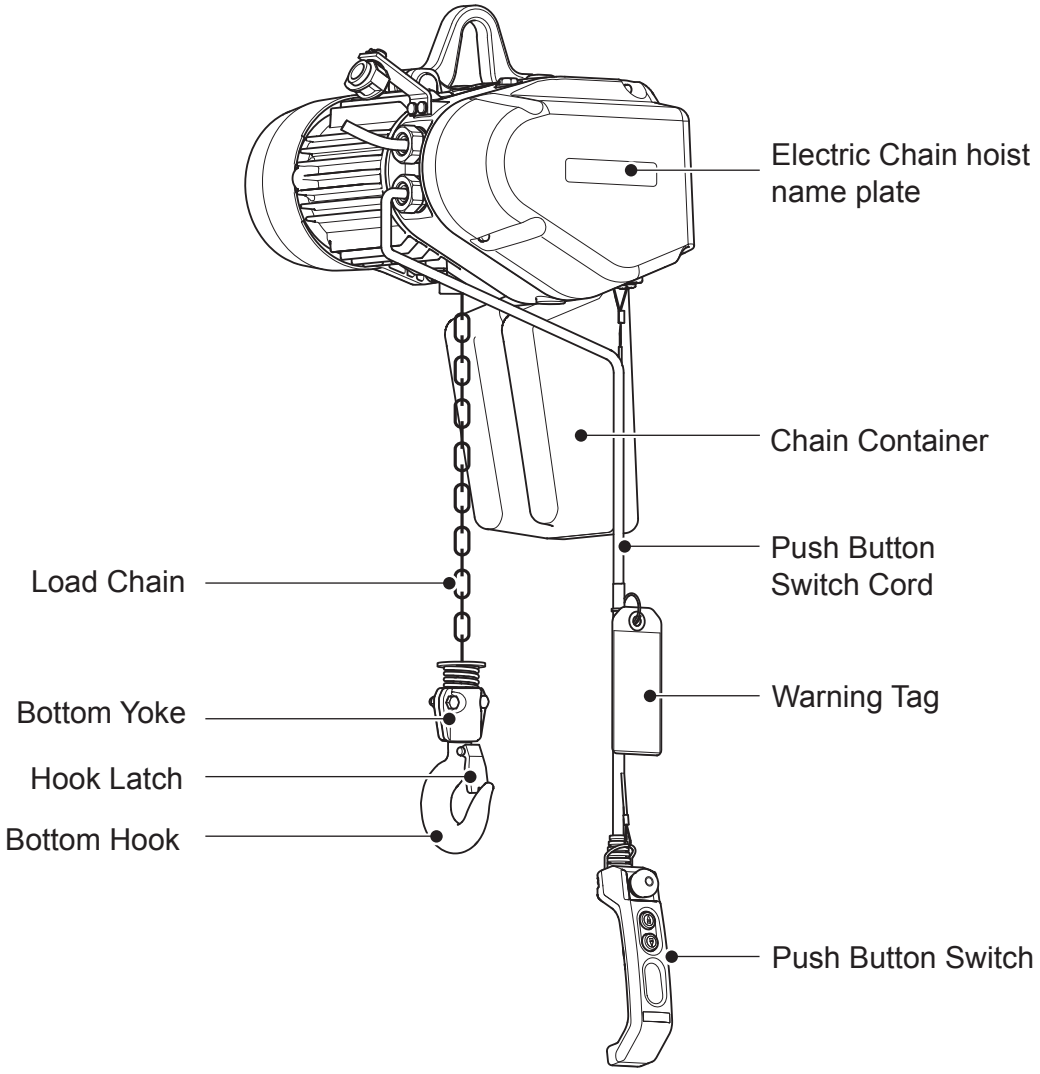
Handling the Product

This chapter describes mainly how to use, assemble and install, and the check after installation. It also describes the daily inspection items before use.

Type and Names of Each Part

■Hook Suspended Type (EQS)

● **Electric chain hoist dedicated for elevation**



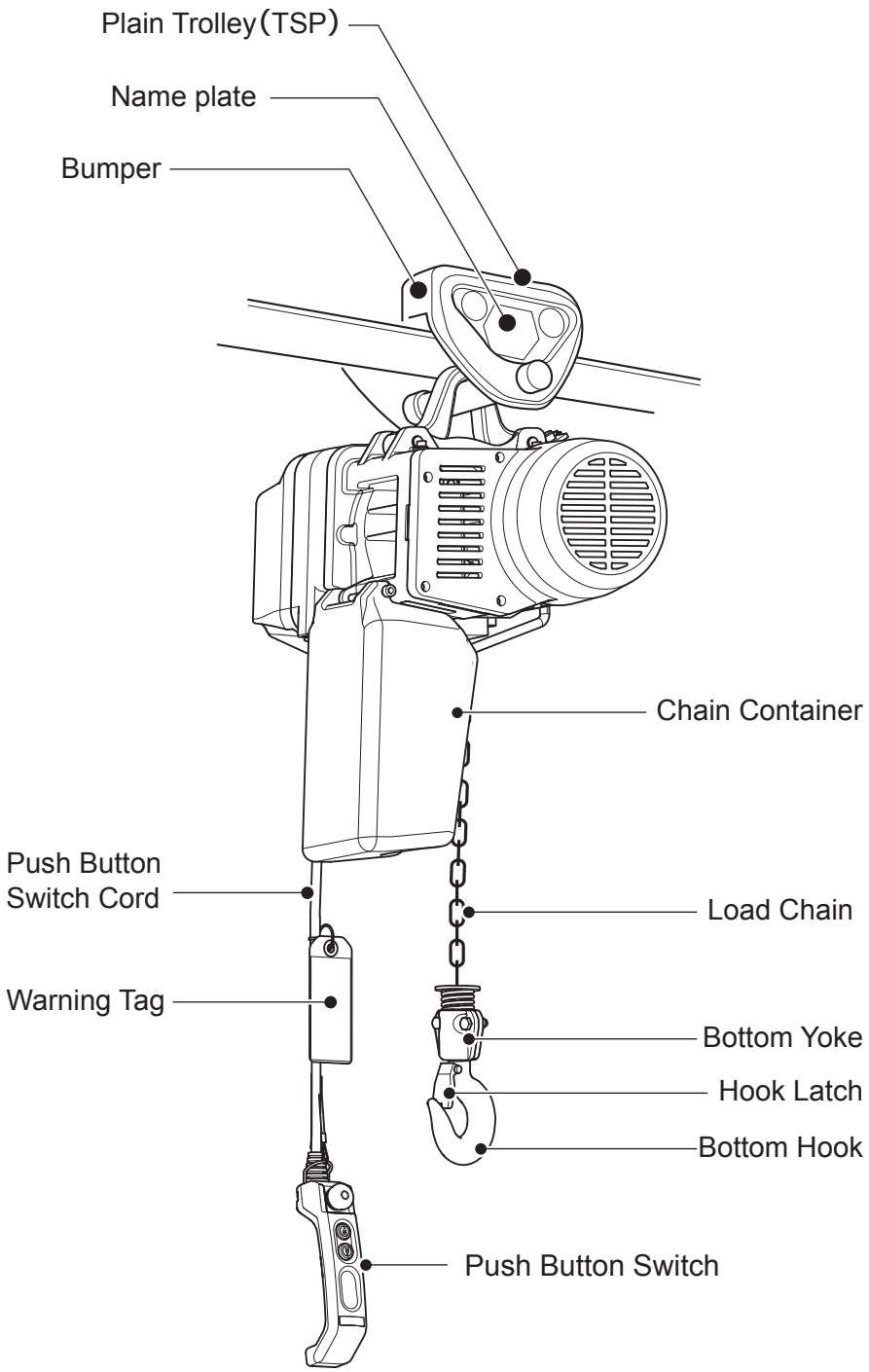
⚠ DANGER

Mandatory

- **Warning labels are affixed to each part other than above. Be sure to follow the instructions in the label.**
  Failure to comply with the contents of the label may result in death or serious injury.

■Manual Trolley Type (EQSSP)

- **The electric chain hoist equipped with the plain trolley (TSP) enabling lateral motion by moving the load manually. For light work.**



⚠ DANGER

Mandatory

- **Warning labels are affixed to each part other than above. Be sure to follow the instructions in the label.**
  Failure to comply with the contents of the label can result in serious bodily injury or death.

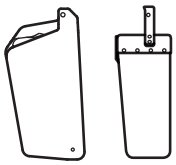
Opening the Package

■Checking the Product

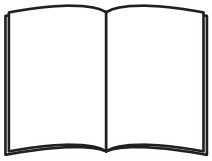
- **Make sure that the indication on the package and the product coincide with your order.**
- **Make sure that the product is not deformed and damaged due to the accident during transportation.**

■Parts packaged with the Electric Chain Hoist

Plastic or Canvas Chain Container

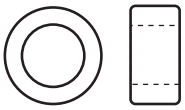


Manual



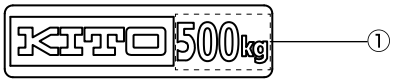
Load Chain Grease Tube

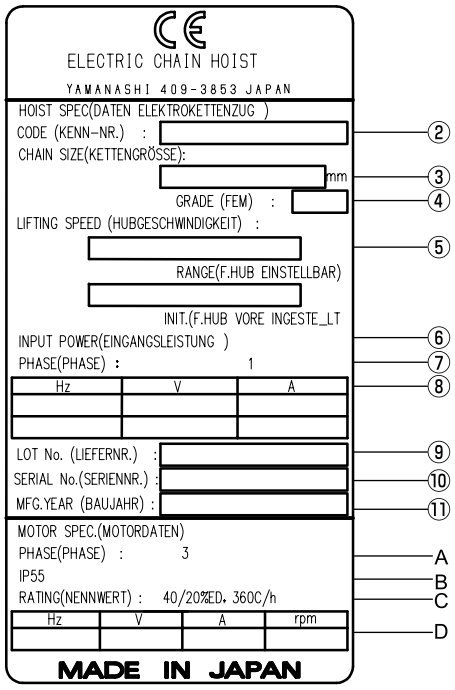
Thick Spacer L (for manual trolley) 2 pieces



■Nameplate and Product Model

■ Nameplate Indication of Electric Chain Hoist





Electric chain hoist specifications

1 [ ] · · · Capacity Ex. 500kg
The maximum mass of the load that can be imposed on the product. The mass of the hook is excluded.

2 CODE…Product model Ex. EQS005IS
A code to indicate the model No. of the product, capacity and lifting speed.

3 CHAIN SIZE...Load Chain size
Ex. DAT-5.6×15.7mm
The alphabet and the figures indicate the JIS grade, wire diameter and chain pitch respectively.

4 GRADE (FEM)…Ex. M5
The grade of an electric chain hoist specified by ISO standard. A guidepost of durability.

5 Lifting speed

6 INPUT POWER

7 Number of phase for input power source

8 Hz,V,A…Hoist specifications: Frequency, voltage, current

9 LOT No.
Manufacture No. to identify the time of manufacture and the quantity of a production unit.

10 SERIAL No.
Serial No. to indicate the manufacturing sequence of the product.

11 MGF. YEAR
Manufacturing date

Motor specifications

A Phase
Number of phase for motor power supply

B IP55.....Degrees of protection provided by enclosures
The first digit indicates the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects.
The second digit indicates the level of protection that the enclosure provides against harmful ingress of water.

C RATING
20/40%ED.....Intermittent rating
360C/h.....Number of starts per hour

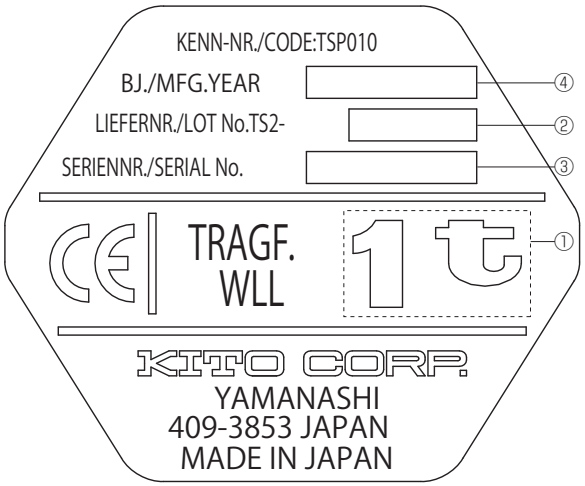
D HZ.....Frequency
V,HP,A.....voltage, current
rpm.....Revolutions per minute

(to be continued)

■ Code of EQS

Capacity	Body size	CODE
500kg	EQ-C	EQS005IS
1t	EQ-D	EQS010IS

■ Nameplate Indication of Manual Trolley



1 ⬚ · · · Capacity Ex. 1 t
The maximum mass of the load that can be imposed on the product. The mass of the hook is excluded.

2 LOT No.
Manufacture No. to identify the time of manufacture and the production lot.

3 SERIAL No.
Serial number to indicate the manufacturing sequence of the product.

4 MFG. YEAR · · · Manufacture year

(to be continued)

■Checking the Marks

⚠ DANGER

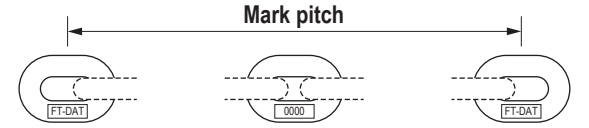
Mandatory

- **Be sure to check that the Load Chain has "FT-DAT" mark on it and the chain size is appropriate for the EQS model you are using. (See the following table.) The Load Chain of other models (such as model ES or ER) or different rating cannot be used.**

Use of the Load Chain of other model or other rating may result in death or serious injury due to the drop of the lifted load.

Code of EQ	Load Chain size: diameter (mm)	Mark pitch
EQS005IS	5.6	20 Links
EQS010IS	7.1	20 Links

The mark (FT-DAT) to indicate the model of the Load Chain is indicated on it at an equal spacing. Make sure that the Load Chain is of a chain size (wire diameter) appropriate for EQS referring to the table in the left.



Second mark
Front side : FT-DAT
Back side : H-23

First mark
Front side : Original Lot No. of the Load Chain (4 digits)
Back side : KITO

Second mark

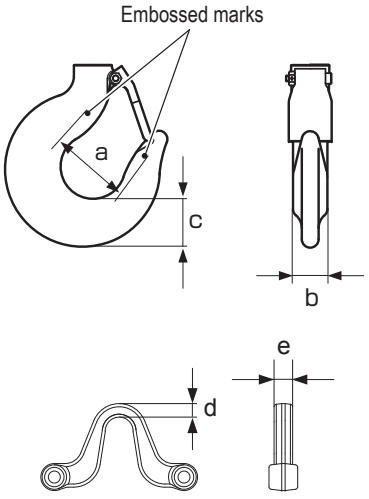
■Recording the Product No.

- Fill in the table in the right with product's Lot No., Serial No. (described in the product nameplate), date of purchase and the name of the sales shop where you purchased the product.
  * When requesting repair or ordering a chain hoist part, please inform us of these pieces of information together.

Item	Electric chain hoist	Manual trolley
Lot No.	EQ	TS2−
Serial No.		
Date of purchase		
Name of the sales shop		

■Recording the Initial Value

- When opening the package, fill in the table in the right with the opening dimension "a" between embossed marks on the Bottom Hook, the width of the hook "b", the thickness of the hook "c", the thickness of the Suspension Hook “d”, and the width “e”. (These values are used for checking. See (P54) for the inspection criteria.)



Dimensions when the package was opened

Bottom Hook	Dimension a	mm
	Dimension b	mm
	Dimension c	mm
Suspension Eye	Dimension d	mm
	Dimension e	mm

Product Specification and Operational Environment

The operational environment of the electric chain hoist and motorized trolley is as follows:

■Standard Specification

Intermittent ratings : EQ series (100 % of the capacity): Dual speed VFD model (high speed/low speed) — 40/20 % ED(120/240 rev/h)
Grade : ISO-M5 or M4, FEM-2 pr ASME-H4
Protection : Hoist IP55, Push button IP65
Operation ..... Push button switch operation / 3-Push Button Switch set for Dual Speed VFD Model(hoist only type) and Manual trolley type
Power supply method ..... Power supply through cabtyre cable
Color ..... Body: KITO Metallic gray, Controller Cover and Fan Cover: KITO Yellow(Equivalent to Munsell 7.2 YR 6.5/14.5)
Noise level : EQS, dual speed VFD model 80dB or less (A scale: measured at 1 m away from the Electric chain hoist)
Braking capacity : 150% of the capacity or more
Other ..... Power Cable length 5 m/10 m (Standard)

Product category			Motor		Operating Voltage
Voltage / Frequency	Number of phases	Model	Voltage category	Motor Insulation Class	
110V / 50Hz 220~240V / 50Hz	Single phase	Dual Speed VFD Model	230V	B	DC24V

NOTE

- **Operate the electric chain hoist with the rated voltage.**
- **Do not use the electric chain hoist exceeding the intermittent ratings and the short time ratings.**

* Grade 1

Capacity	Code	GRADE		
		ISO	ASME	FEM
500kg	EQS005IS	M6	H4	3m
1t	EQS010IS	M5	H4	2m

ISO

Loading status	Total operating hour h					
	800	1600	3200	6300	12500	25000
Light	—	—	—	—	M5	M6
Medium	—	—	—	M5	M6	—
Heavy	—	—	M5	M6	—	—
Ultra heavy	—	M5	M6	—	—	—

*** Rate of loading**

Light : A case where the capacity is rarely applied. Usually the hoist is used with a light load.
Medium : A case where the capacity is applied considerably frequently. Usually the hoist is used with a medium load.
Heavy : A case where the capacity is applied considerably frequently. Usually the hoist is used with a heavy load.
Ultra heavy : A case where the capacity is applied constantly.

(to be continued)

- **ASME HST**

Hoist duty class	Typical areas of application	Operation time ratings at K=0.65			
		Uniformly distributed work periods		Infrequent work periods	
		Max. on time, min / hr	Max. No. starts / hr	Max. on time from cold start, min	Max. No. of starts
H2	Light machine shop fabricating, service,and maintenance; loads and utilization randomly distributed; capacitys infrequently handled.	7.6 (12.5%)	75	15	100
H3	General machine shop fabricating, assembly, storage, and warehousing; loads and utilization randomly distributed.	15 (25%)	150	30	200
H4	High volume handing in steel warehouses, machine shops, fabricationg plants and mills, and foundries; manual or automatic cycling operations in heat treating and plating; loads at or near capacity frequently handled.	30 (50%)	300	30	300

FEM

Comparison of ISO rating and FEM rating

1 Dm	1 Cm	1 Bm	1 Am	2 m	3 m	4 m	5 m
M1	M2	M3	M4	M5	M6	M7	M8

Condition of the load	Rate of loading	Rating of the operating hours								
		V0.06	V0.02	V0.25	V0.5	V1	V2	V3	V4	V5
		T0	T1	T2	T3	T4	T5	T6	T7	T8
		Average operating hours per day (hour)								
		≤0.12	≤0.25	≤0.5	≤1	≤2	≤4	≤8	≤16	>16
1 L1	K≤0.50	-	-	1Dm	1Cm	1Bm	1Am	2m	3m	4m
2 L2	0.50<K≤0.50	-	1Dm	1Cm	1Bm	1Am	2m	3m	4m	5m
3 L3	0.63<K≤0.80	1Dm	1Cm	1Bm	1Am	2m	3m	4m	5m	-
4 L4	0.80<K≤1.00	1Cm	1Bm	1Am	2m	3m	4m	5m	-	-

Rating code is FEM9.551
(Design rules of hoisting equipment for every series: classification rating of internal structure)

Rating of the operating hours		Average operating hours per day (hour)	Total operating hours
V0.06	T0	≤0.12	200
V0.12	T1	≤0.25	400
V0.25	T2	≤0.5	800
V0.5	T3	≤1	1,600
V1	T4	≤2	3,200
V2	T5	≤4	6,300
V3	T6	≤8	12,500
V4	T7	≤16	25,000
V5	T8	>16	50,000

■Operational Environment

Ambient temperature : -20°C — +40°C

Ambient humidity : 85 % or less (no condensation)
Explosion-proof construction : Not applicable to the work environment with explosive gases or explosive vapor
Non-conforming environment : A place with organic solvent or volatile powder, and a place with a plenty of powder and dust of general substances
: A place with considerable amount of acids and salts

NOTE

As a general rule, use the product indoors. When installing the electric chain hoist outdoors or to the place where the hoist is exposed to direct rain, wind and snow, shade the hoist with roof to protect it from rain, wind and snow.

How to Use

KITO Model EQS Electric Chain Hoist is a dual speed VFD and a single speed model. For the three phase power Single speed model, such products are provided that can travel/traverse when combined with a trolley or a crane. Their push button switches for operation differ in the size and the operating method. Check the product model of the hoist and use it properly.

⚠ DANGER

Prohibited

- **Do not use the Hook without a Hook Latch or damaged Hook.**
- **Do not use the Load Chain with heavy elongation, abrasion or deformation.**
- **Do not cut, extend, or weld the Load Chain.**
- **Do not use the Load Chain with the Bottom Hook without smooth motion.**
- **Do not use the Load Chain when its brake does not function securely even without load, or when the stopping distance is too long.**
- **Do not use the product if it moves oppositely to the direction indicated on the push button switch.**

Failure to comply with these instructions may result in death or serious injury.

Mandatory

- **Carry out daily inspection before operation.**
  (When any abnormality was found during inspection, turn off the power, indicate “FAILURE" and ask the maintenance engineer for repair.)
- **Check the slinging devices for no abnormality.**
  Failure to comply with these instructions may result in death or serious injury.

⚠ CAUTION

Prohibited

- **Do not use the product with an illegible nameplate or warning label affixed to the body size.**
- **Do not install a chain above the specified lifting height.**

Failure to this instruction may result in the injury or the property damage.

Mandatory

- **When using the product for the first time, affix the labels indicating East, West, North and South on the push button switches.**
- **Check the contents of the work and make sure that the electric chain hoist has proper performance for the load and lift.**
- **Check the contents of the work and operate the electric chain hoist at a place enabling to look out the operating area without hindrance.**
- **When looking out the operating area is difficult, arrange the monitor near the place for safety.**
- **Operate the electric chain hoist at a place with firm foothold without danger of falling, stumbling, slipping or over turning.**
- **Before moving the load, warn all the surrounding people.**
- **Even if the crane or the electric chain hoist is permanently installed and used for the same purpose repeatedly, check the contents of the work and make sure that the work does not exceed the capacity on each occasion.**
- **Appoint the maintenance engineer or competent personnel among the qualified personnel for operation of cranes and electric chain hoists. Indicate the name of the personnel on a place with legibility.**
- **The maintenance engineers shall check the result of daily inspection.**
- **When informed of abnormality of the electric chain hoist, the maintenance engineers shall take immediately any necessary measures such as prohibition of use and repair.**
- **When carrying out inspection and repair, secure the environment for safe work without electric shock and falling.**

Failure to comply with these instructions may result in bodily injury or property damage.

(to be continued)

■Daily Inspection of Electric Chain Hoist (EQS)

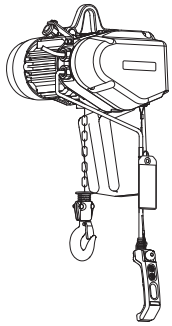
⚠ DANGER

Mandatory

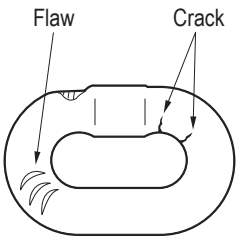
- **Carry out daily inspection before use.**
  (When any abnormality was found during inspection, turn off the power, indicate “FAILURE" and ask the maintenance engineer for repair.)

Neglecting to carry out daily inspection may result in death or serious injury.

■Appearance

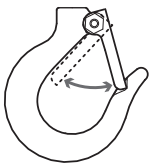
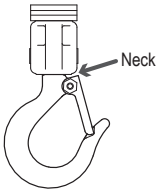
Item	Check method	Criteria	When failed
Indication of Nameplates and Labels	• Check visually.	• No peel off. Indication can be seen clearly.	Carry out cleaning, repair or replace with new nameplate or label. When replacing with a new nameplate or label is required, please inform KITO of the description in “Recording of the Product No." (14) such as Lot No. and Serial No.
Deformation and damage of main unit and each part	• Check visually. 	• No apparent deformation, damage, flaw and crack	Replace the parts with deformation, damage, flaw or crack.
Controller cover	• Check visually.	• No apparent deformation, damage, flaw and crack	Replace the Controller cover. Be sure to check the “Electrical Equipment” section (65) regarding the yearly inspection.
Loosened or fallen off bolts, nuts and split pins	• Check visually or using tools.	• Bolts, nuts and split pins are fastened securely. **⚠ DANGER** Mandatory • **Even fallen off of a bolt causes for the body size to drop. Be sure to check.** Fallen off of a bolt may result in death or serious injury.	Fasten bolts, nuts and split pins securely.

■ Load Chain

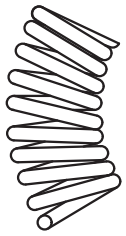
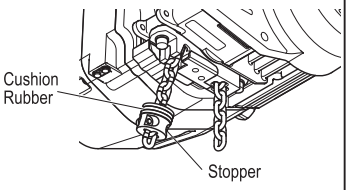
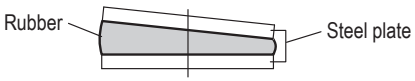
Item	Check method	Criteria	When failed
Elongation of Pitch	• Check visually	• No apparent elongation	Refer to Load Chain (53)of Chapter 2, Frequent inspection.
Abrasion of Wire Diameter	• Check visually	• No apparent abrasion	Refer to Load Chain (53) of Chapter 2, Frequent inspection.
Deformation, Flaw, Entanglement	• Check visually  • Check visually for no foreign matter such as attached sputter.	• No deep notch • No deformation such as twist • No attached sputter • No entanglement • No crack	Replace the Load Chain.
Rust, Corrosion	• Check visually	• No apparent rust and corrosion	Replace the Load Chain.
Lubrication	• Check visually	• To be oiled adequately	Apply oil.
Mark	• Check visually	• Check the mark pitch and the indication. (Refer to “Checking the Marks" (14).)	Replace the Load Chain.

(to be continued)

■ Suspension Hook, Bottom Hook

Item	Check method	Criteria	When failed
Opening of the Hook	• Check visually	• No apparent opening of the Hook	Carry out the inspection item of Suspension Hook and Bottom Hook (54) of Frequent inspection.
Abrasion	• Check visually	• No apparent abrasion	Carry out the inspection item of Suspension Hook and Bottom Hook (54) of Frequent inspection.
Deformation, Flaw, Corrosion	• Check visually	• No apparent deformation, flaw and corrosion	Carry out the inspection item of Suspension Hook and Bottom Hook (54) of Frequent inspection.
Hook Latch 	• Check visually and check the movement of the Hook Latch.	• The Hook Latch is mounted securely inside the Hook opening. • No deformation. The Hook Latch moves smoothly. **⚠ DANGER** Prohibited • **Do not use the Hook without the Hook Latch.** Use of the Hook without the Hook Latch may result in death or serious injury.	Replace the Hook Latch.
Hook movement (Rotation) 	• Check visually and rotate the Hook by hand. 	• No apparent gap between the Bottom Yoke and the shank (at the neck). • The Bottom Yoke rotates in both directions equally. • The Bottom Yoke rotates smoothly.	Replace the Hook.
Bottom Yoke	• Check visually	• No loosened bolt or nut	Attach the Bottom Hook to the Load Chain securely.

■ Peripheral parts of the main unit

Item	Check method	Criteria	When failed
Chain Spring	• Check visually 	• No apparent shrinkage or compression	Carry out the inspection item of Chain Spring (61) of Periodic inspection.
Cushion Rubber	• Check visually 	• No apparent shrinkage or compression • No peal off, crack of deformation of rubber 	Replace the Cushion Rubber.

■ Push Button Switch

Item	Check method	Criteria	When failed
Switch set	• Check visually	• No deformation, damage and no loosened screw • Label indication of the push button switch can be seen clearly.	Clean and repair the label or replace with a new label. Affix the label securely.

(to be continued)

■ Function and Performance

- Check the following item with no load.

Item	Check method	Criteria	When failed
Operational Check	• Press the push button and check each operation.	• The Load Chain can be wound smoothly. • The Electric chain hoist moves in the same direction as that of the push button operation. • When the operation is stopped, the motor stops immediately. • When the Emergency Stop Button is pressed, all hoist motions stop. • When operating other push button while the Emergency Stop Button is pressed, the hoist does not start operation. • When canceling the Emergency Stop Button, the hoist operates normally.	Refer to Chapter 3 “Guidance on Troubleshooting" (74) to (75).
Brake	• Press the push button and check the operation of the Brake.	• When stopping the operation, the Brake is applied immediately and the Bottom Hook shall stop immediately. (Guideline: The travel of the Load Chain is within 2 to 3 links.)	Carry out the inspection in accordance with the items in Chapter 2 “Periodic inspection" Brake (62).
Limit Switch	• Press the push button and check the operation of the Limit Switch.	• When the hoist is operated to the upper or lower limit, the motor automatically stops.	Replace the Limit Switch. Disassemble the actuator of the Limit Switch to clean.
Check for no Abnormal Sound	• Press the push button and check the operation. **NOTE** **Sound is also an important check point. Always be careful for the noise of the electric chain hoist.**	• No abnormal sounds and vibrations	Replace the abnormal part. Apply oil on the Load Chain.
		• No popping sound from the Load Chain.	Check the Load Chain. (Refer to 19)

■Daily Inspection of Manual Trolley (EQSSP)

■ Appearance

Item	Check method	Criteria	When failed
Indication of Nameplates and Labels	• Check visually	• No peel off. Indication can be seen clearly.	Clean and repair the label or replace with a new label.
Deformation and damage of each part	• Check visually	• No apparent deformation and corrosion • No apparent deformation on the Frame	Replace the deformed or damaged part.
Loosened or fallen off bolts, nuts and split pins	• Check visually or using tools.	• Bolts, nuts and split pins are fastened securely. **⚠ DANGER** Mandatory • **Even a drop off of a split pin may cause of drop of the main unit. Be sure to check it.** Drop off of split pin may result in death or serious injury.	Fasten bolts, nuts and split pins securely.

■ Function and Performance

- Check the following item with no load.

Item	Check method	Criteria	When failed
Operational Check	• Check the traveling motion of the electric chain hoist by moving it manually.	• To travel smoothly. No meandering and vibration.	Carry out Chapter 2 "Periodic inspection".

(to be continued)

■How to Operate the Push Button Switches

⚠ DANGER

Mandatory

When starting operation of the hoist after stopping the hoist by pushing the Emergency Stop Button, be sure to confirm there are no hazards around the workplace before releasing the lock of the Emergency Stop Button and starting operation.

Failure to comply with this instruction may result in death or serious injury.

⚠ CAUTION

Prohibited

- **Do not hang the Push Button Switch Cord on other object, or pull the cord strongly.**
- **Do not use the Push Button Switch if its button does not operate smoothly.**
- **Do not bundle or tie the cord for the adjustment of its length.**

Failure to comply with this instruction causes bodily injury or loss of property.

Mandatory

- **When taking hand off the Push Button Switch after operation, do not throw it. Be careful not to hit other worker with the Push Button Switch.**

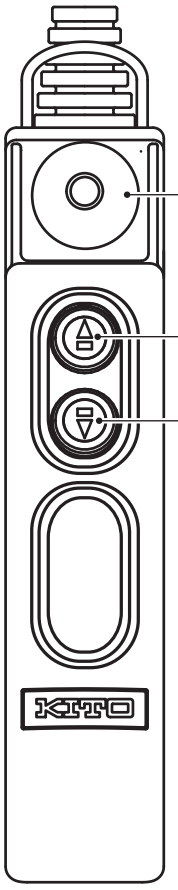
Failure to comply with this instruction causes bodily injury or loss of property.

NOTE

If the Electric chain hoist is tripped due to overheat of the VFD, the VFD cannot be reset soon after the trip. Reset the VFD after a while.
Decompression protection circuit operates when the power is shut down due to power outage, etc.
In this case, Electric Chain Hoist does not operate even when the Push Button Switch is pressed after the power supply is recovered.
To release the halt condition, press the emergency button and reset it.

■3-Push Button Switch Set

3-Push Button Switch Set is equipped with a lock type emergency stop button (VFD reset button) and lift/lower push buttons. Two-step push button switch is mounted as Lift/lower push button switches in accordance with the specification of dual speed VFD specification. Refer to the operation method of the corresponding specification.



● **Emergency Stop Button (VFD Reset Button)**

1) Press the Emergency Stop Button ◎ deeply when carrying out an emergency stop or VFD reset.
   - The button is locked at the pressed end.
2) Pull or turn the Emergency Stop Button ◎ clockwise to cancel the lock.
   - Press-locked button returns to the original position.

* Do not pull or turn the Emergency Stop Button ◎ hard or excessively.
* When the electric chain hoist is not used, press the Emergency Stop Button ◎ deeply to the end.

● **Operation Button**

● **Lift/Lower Button**

1) Press ⏏ button to lift the load.
2) When lifting the load at high speed, press the ⏏ button further to the end.
   - The electric chain hoist stops when the button is released.

1) Press ⏏ button to lower the load.
2) When lowering the load at high speed, press the ⏏ button further to the end.
   - The electric chain hoist stops when the button is released.

■Operation

■ General

⚠ DANGER

Prohibited

- **Do not operate the electric chain hoist in an environment with flammable or explosive gas.**
  The electric chain hoist is not designed as explosion proof specification.
- **Do not use the electric chain hoist exceeding the ratings (intermittent rating) of the lifting motor and the maximum start-up frequency.**
- **Do not use the electric chain hoist by the voltage other than the rated voltage.**
- **Do not use the Emergency Stop Button for ordinary stop operation.**
- **Do not expose the Load Chain to sparks from welding.**
- **Do not contact welding rods or electrodes with the Load Chain.**
- **Do not use the Load Chain as the earth for welding work. (Fig. A)**

A

Failure to comply with these instructions may result in death or serious injury.

Mandatory

- **Follow the operating environment and conditions for the electric chain hoist.**

Failure to comply with this instruction may result in death or serious injury.

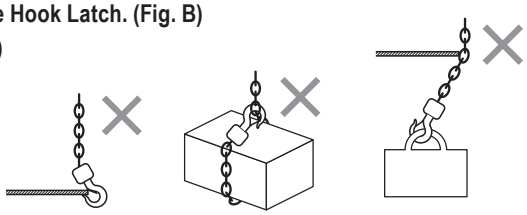
■ Slinging

⚠ DANGER

Prohibited

- **Do not apply a load to the tip of the Bottom Hook or the Hook Latch. (Fig. B)**
- **Do not bind a load with the Load Chain directly. (Fig. C)**
- **Do not operate the Load Chain while it is in contact with any sharp edges. (Fig. D)**

Failure to comply with these instructions may result in death or serious injury.



B C D

Mandatory

- **Use the sling appropriate for the weight and shape of a load.**
  Inappropriate slinging may result in danger such as drop of a lifted load.
- **Carry out the slinging with equal load on slinging devices for stable lifting of a load.**
- **Attach the slinging devices securely to a load.**
- **Attach the slinging devices to the Bottom Hook correctly.**

Failure to comply with these instructions may result in death or serious injury.

(to be continued)

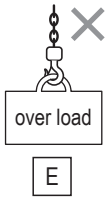
■ Lifting/Lowering

⚠ DANGER

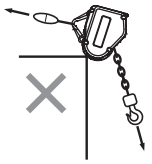
Prohibited

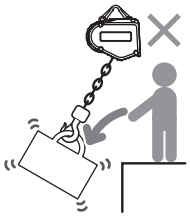
- **Do not lift more than the capacity. (Fig. E)**
  The capacity is indicated in the nameplate.
- **Do not operate the electric chain hoist exceeding the lifting height.**
- **Do not dare to lift the structure or any other object supposed to be difficult to lift.**
- **Do not lift a load at no-load side of the Load Chain.**
- **Do not stop the electric chain hoist with the limit switch (over winding prevention device).**
- **Do not use the electric chain hoist when the Friction Clutch (overload prevention device) is operated to stop winding.**
- **Do not lift or lower excessively.**
  - Do not remove the Chain Spring to operate the limit switch by hitting the body size with the Bottom Hook. If such stop operation is repeated, it may result in breaking of the Load Chain.
  - Do not hit the body size with the End Stopper of the Load Chain to cause the operation of the Friction Clutch. If such operation is repeated, it may result in breaking of the Load Chain.
- **Do not use the main unit as a fulcrum. (Fig. F)**
- **Do not swing the lifted load.**
- **Do not wind the slack Load Chain with a load in one action to avoid exposing the Load Chain to shock.**
  Stop lifting when the Load Chain is stretched tight. Then lift slowly.
- **Do not carry out reverse operation while lifting/lowering a load.**
  When reversing the motion, stop the electric chain hoist and then reverse the motion.
- **Do not carry out excessively frequent inching.**
- **Do not carry out plugging.**
  When reversing the motion, stop the electric chain hoist and then reverse the motion.
- **When lifting off a load from a pallet, lift the load to avoid exposing to shock, such as the load falling. (Fig. G)**
- **Do not cause the load to come into contact with the Load Chain.**
- **Do not rotate a lifted load. Use the device for rotation.**
- **Do not carry out the welding or cutting work on a lifted load.**
- **Do not repair or disassemble a lifted load.**
  When repairing or disassembling an electric chain hoist, ensure that the product is placed down on the floor and that only maintenance engineers maintain the electric chain hoist.
- **Do not enter beneath a lifted load.**
- **Do not hit the Chain Container with a load or slinging devices.**
  Otherwise the Load Chain in the Chain Container falls out of the bucket to cause injury.
- **Do not leave from the operating position while a load is lifted. Watch the lifted load.**

Failure to comply with these instructions may result in death or serious injury.



E

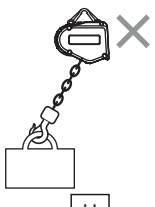

F


G

Mandatory

- **When the limit switch (over winding prevention device) is operated, stop the lifting work immediately and lower the load.**
- **Move the electric chain hoist right above the load and then lift the load. (Do not lift the load in an inclined direction.) (Fig. H)**

Failure to comply with these instructions may result in death or serious injury.


H

⚠ CAUTION

Prohibited

- **Do not use the Friction Clutch to measure the weight of a load.**

The use of the Friction Clutch other than intended purpose may result in injury or property damage.

Mandatory

- **When carrying a lifted load using a lifting magnet or a vacuum chuck, lower the height of the lifted load as low as possible.**
- **When lifting a load with two electric chain hoists, use the electric chain hoist with the rated lifting capacity of a single hoist exceeding the load.**
- **When lifting a load with two electric chain hoists, use the electric chain hoists of the same model and capacity and operate the respective electric chain hoist to keep the load lifted or lowered horizontal.**

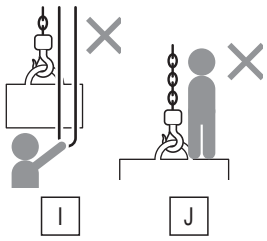
Failure to comply with this instruction causes bodily injury or loss of property.

■ Traverse / Travel

⚠ DANGER

Prohibited

- **Do not operate the electric chain hoist underneath the load or transport a load over people. (Fig. I)**
- **Do not operate the electric chain hoist when any person is in the area where the lifted load moves.**
- **Do not allow people to enter into the area where a lifted load moves.**
- **Do not ride on a lifted load and do not use the electric chain hoist to support, lift, or transport people. (Fig. J)**
- **Do not operate or move the electric chain hoist while going backward with a load kept lifted.**
  Operate the electric chain hoist while looking forward from the back of a load and going ahead.



Failure to comply with these instructions may result in death or serious injury.

⚠ CAUTION

Prohibited

- **Do not impede the lifted load with other structure or wiring.**

Failure to comply with this instruction causes bodily injury or loss of property.

■ In Abnormality or Failure

⚠ DANGER

Mandatory

- **If the electric chain hoist is damaged or abnormal noise or vibration occurs, stop the operation immediately.**
- **If the electric chain hoist moves in the direction opposite to the indication on the Push Button Switch, stop the operation immediately.**
- **When the twist, entanglement, crack, deformation, attachment of foreign matters or abnormal engagement of the Load Chain and the Gear is observed, stop the operation immediately.**
- **When any abnormality is observed during the operation, indicate "FAILURE" and contact with the maintenance engineers.**
- **When the power is interrupted, secure safety and contact with the maintenance engineers.**

Failure to comply with these instructions may result in death or serious injury.

(to be continued)

■Speed Change of Dual Speed for EQS Model

You can change the high/low speed of the dual speed for EQS model by changing the VFD parameter.

⚠ DANGER

Prohibited

- **Do not modify the Dual Speed VFD Model into a single speed model, or the single speed model into a Dual Speed VFD Model.**
- **Only maintenance engineers or the personnel with expertise are allow to set or change the parameters.** Wrong parameter settings may result in danger such as defective operation and drop of lifted load. Please contact your nearest service shop or KITO for consultation.

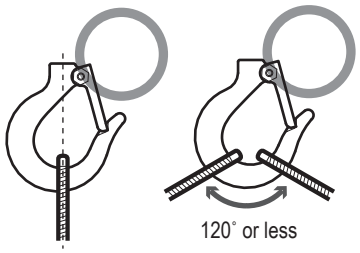
Failure to comply with these instructions may result in death or serious injury.

Mandatory

- **When changing the parameter, set it correctly referring to the VFD Manual.**
- **Parameter change requires energizing. Do not touch the energized part.**

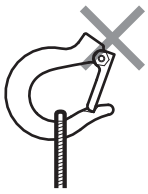
Failure to comply with these instructions may result in death or serious injury.

■How to Sling the Load Properly

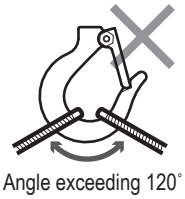


Sling the load at the extended line of the hook shaft.

Do not carry out dangerous hooking as shown below.

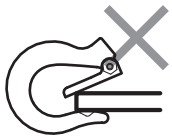


Improper hooking position of the lifted load or the sling



Angle too wide

Unable closing of the Hook Latch



Hooking of the load at the tip of the Hook

■Precautions After Work

⚠ DANGER


Prohibited

Do not leave a lifted load unattended for an extended period.

Failure to comply with these instructions causes bodily injury or loss of property.

⚠ CAUTION


Prohibited

- **Do not store the electric chain hoist at a state of over lifting or over lowering.**

Failure to comply with these instructions causes bodily injury or loss of property.


Mandatory

- **Store the electric chain hoist with power off.**
- **Indicate "FAILURE" on the electric chain hoist that needs repair not to be used.**
- **Wipe off dust and waterdrop, apply oil at the neck of the Hook and the Load Chain and store the hoist.**
- **Remove the stain, attached foreign matter and waterdrop from the parts such as the Limit Switch and the Chain Container that is scratched by the Load Chain and stored it.**
- **When the electric chain hoist is installed outdoor, cover it with rain cover or roof after application of rust proof process.**

Failure to comply with these instructions causes bodily injury or loss of property.

NOTE

- **Clean the push button switches always not to allow the dust, sands and oil attach.**
- **When storing the electric chain hoist for a long period, it is effective to prevent rusting to operate it at a certain period without load.**
- **When putting the electric chain hoist on a floor, remove the Chain Container. Otherwise the Chain Container may deform or be damaged.**
- **When not using the electric chain hoist, wind up the Bottom Hook to the height not to hinder persons passing by or other work.**
- **Decide the place to store the electric chain hoist in advance. It is recommended to hang the push button cable on the pillar.**

■Setting Up the No-Load High-Speed Function

The EQ Series Electric Chain Hoist provides the no-load high-speed function. When you enable this function, operation is automatically switched to 1.3 times faster than high-speed during high-speed operation if a load is between no-load and 30% of rated load.
This function is set to enable in the factory-preset mode.

■Enabling/Disabling the No-Load High-Speed Function

To enable or disable the no-load high-speed function setting, use push button switches.

● To enable the no-load high-speed function

1. **Perform lowering operation to activate the lower limit switch.**
2. **Press the emergency stop button.**
3. **Press and hold the first row of the lowering button (low-speed) for 5 seconds or more.**
4. **Release the emergency stop button.**

● To disable the no-load high-speed function

1. **Perform lowering operation to activate the lower limit switch.**
2. **Press the emergency stop button.**
3. **Press and hold the second row of the lowering button (high-speed) for 5 seconds or more.**
4. **Release the emergency stop button.**

⚠ DANGER


Prohibited

Do not wind the slack Load Chain with a load in one action to avoid exposing the Load Chain to shock.

Stop lifting when the Load Chain is stretched tight. Then lift slowly.

(to be continued)

⚠ CAUTION

Mandatory

When you use the no-load high-speed function for the first time and when you set it to enabled, confirm that operation is automatically switched to1.3 times speed during high-speed operation.

Failure to comply with these instructions may result in bodily injury or property damage.

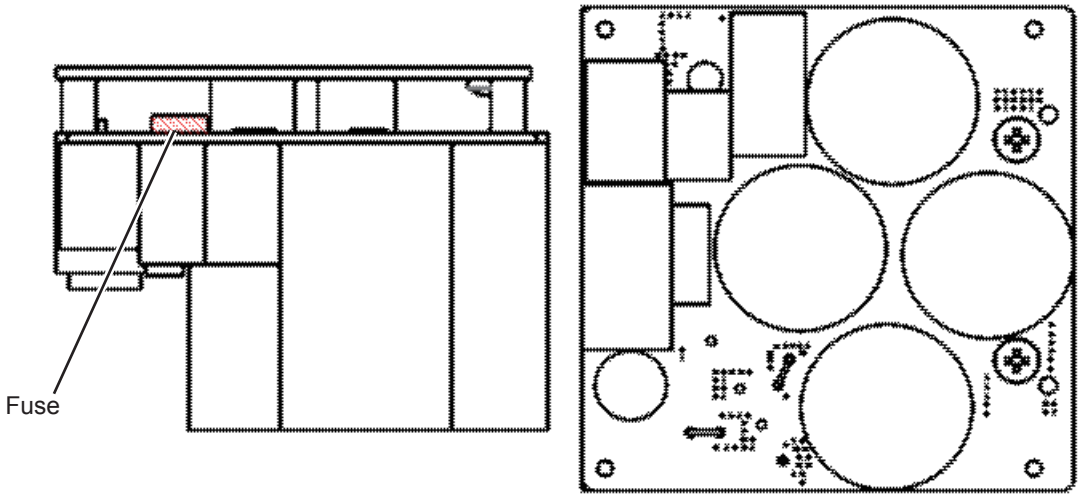
■Switching the DPC voltage

⚠ DANGER

Mandatory

If the fuse may have been damaged, completely disconnect the power and leave it for five minutes or longer. Then, remove the DPC and use a tester or the like to perform a continuity test on both fuse terminals.

Refer to the figure below for the fuse position.

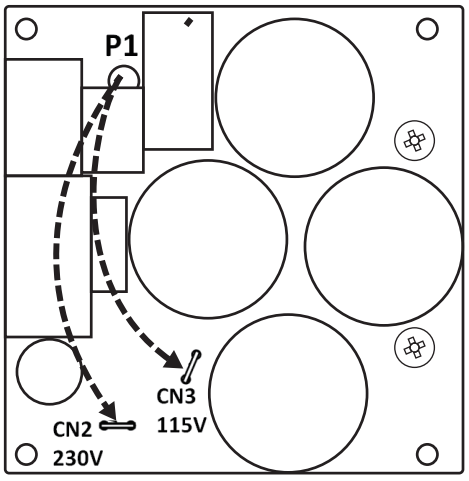


⚠ CAUTION

Mandatory

Refer to the figure below and check that the switch Faston terminal on the DPC panel match is connected to CN2 (230 V).

If the switch Faston terminal is not connected to 230 V, it will damage the fuse.



For 110V: CN3 115V
For 220-240V: CN2 230V

- **Do not touch the DPC while the electric chain hoist's power is ON.**
- **Do not use the DPC for other purpose of use.**

Work Flow of Assembling and Installation

The contents of the work to assemble and install the product by the maintenance engineers and installer are described from this page and after. To eliminate the redo work and for effective assembling and installation, please check the following work flow first and then start assembling and installation work.

Model Check

- **Suspended Type (hoist only)** — EQS
- **Trolley Type** — Manual Trolley Type — EQSSP

Assembling

Assembling Parts to Electric Chain Hoist (P32)

- ■Preparation
- ■Mounting the Chain Container
- ■Lubrication on the Load Chain
- ■Checking gear oil

Combination with the Manual Trolley (P36)

- ■Part replacement of the electric chain hoist
- ■Checking the rail width of the manual trolley
- ■Checking the number and position of adjusting spacers
- ■Combination of the electric chain hoist and the manual trolley

Checking Power and Power Cables (P39)

- ■Checking the power
  - • Checking the breaker ratings
- ■Checking the Power Cable
  - • Permissible cable length and size

Connecting Cables
Suspended Model (hoist only) (P40)

- ■500kg to 1t
  - • Connecting the Power Cable
  - • Connecting Push Button Switch Set Cord

Connecting Cables
Manual Trolley Type (P40)

- ■500kg to 1t
  - • Connecting the Power Cable
  - • Connecting the Push Button Switch Cord

Installation

Installation of Suspended Type (hoist only) (P42)

- ■Connecting Power Cable to the power
- ■Checking installation method and place

Installation of Trolley Combined Model (P43)

- ■Connecting Power Cable to the power
- ■Mounting the Hoist to the Travel Rail
- ■Mounting the Stopper
- ■Power Cable Layout for Manual trolley type
  - • Case for cable hanger
  - • Case for T-shape/angle type hanger

Check after Installation

Checking and Carrying Out "Check Items" (P46)

Carrying Out Operational Check (P46)

Assembling

⚠ DANGER

Prohibited

- **Only maintenance engineers or the personnel with expertise are allowed to assemble and disassemble the electric chain hoist.**

Assembling or disassembling of the electric chain hoist may result in death or serious injury.

■Assembling Parts to Electric Chain Hoist

■ Preparation for Assembling

- Hang the electric chain hoist body size to facilitate the mounting of the Chain Container.
- Check that the stopper and the cushion rubber are mounted at the link third from the no load side of the Load Chain (the end without the Bottom Hook).

■ Mounting the Chain Container

The Chain Container is made of plastic. (Canvas container is available as an option.)

⚠ DANGER

Mandatory

- **The each type of Chain Container has the capacity to store the specific amount of the Load Chain. Use correct capacity of the Chain Container.**
  When storing the Load Chain of which amount exceeds the capacity of the Chain Container, it may result in death or serious injury due to the flow over of the Load Chain from the Chain Container or defective operation of the electric chain hoist.
  Improper combination of the Chain Container and the electric chain hoist is very dangerous because of the possibility of drop of the Chain Container.
  The seal to indicate the capacity and lifting height is attached on the Chain Container. Check it before use.
- **If the Chain Container is not assembled correctly, it may result in death or serious injury due to a drop of the Chain Container or Load Chain, and malfunction of the Electric Chain Hoist.**
  Refer to the assembling instruction on the page 32 **and assemble the Chain Container correctly.**

Failure to comply with these instructions causes bodily injury or loss of property.

⚠ CAUTION

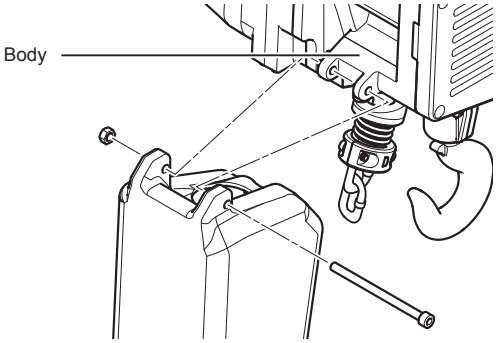
Mandatory

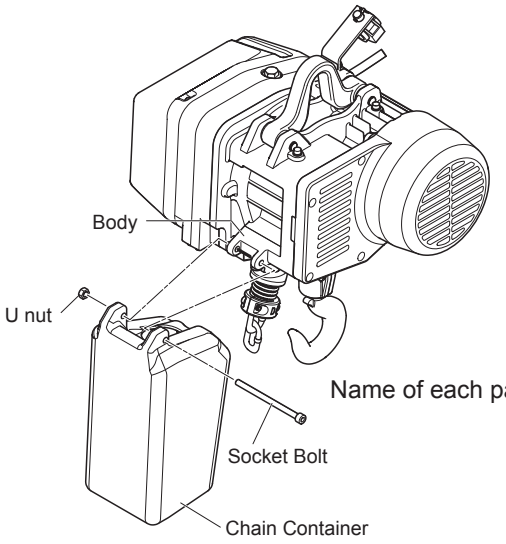
- **When storing the Load Chain into the Chain Container, put the chain end with no-load side first and then store the rest of the Load Chain.**

Failure to comply with these instructions causes bodily injury or loss of property.

● **Assembling the Chain Container**

1) Pass a Socket Bolt through all holes of the Chain Container, the Body and the Chain Container, in this order to mount the Chain Container.

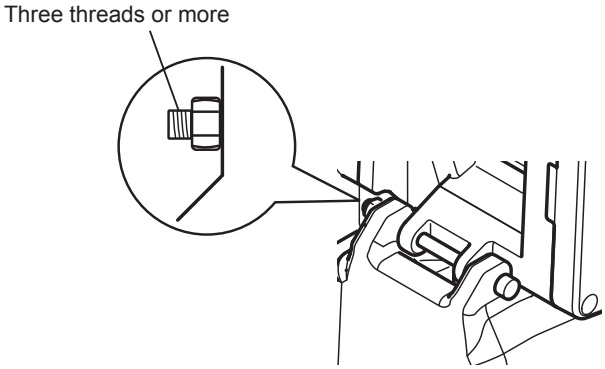


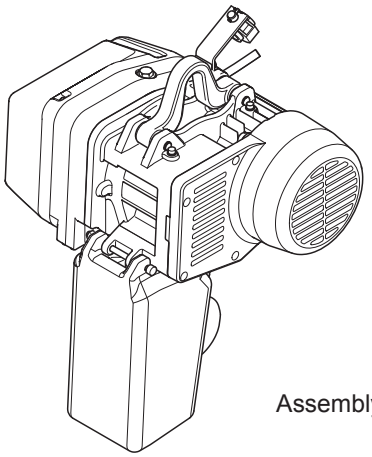


Name of each part

2) Screw the U nut into the Socket bolt and tighten it securely.

- The Socket Bolt must protrude from the end face of the nut by three threads or more.





Assembly figure

(to be continued)

■ Oiling the Load Chain

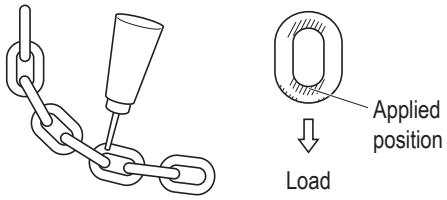
⚠ DANGER

Mandatory

- **Be sure to apply lubricant on the Load Chain. Do not carry out oiling work in the place near the fire or arc.**

Otherwise it will result in fire.

- Remove dust and waterdrops attached on the Load Chain and then apply lubricant. Application of lubricant influences on the life of the Load Chain considerably. Apply the lubricant sufficiently. Use the following genuine lubricant.
  - Epinoc Grease AP (N)0 (Nippon Oil Corporation)
  - Consistency No.0 (Industrial general lithium grease)



- Release all loads from the Load Chain and apply the lubricant all over the Load Chain.
  After application of the lubricant lift/lower the electric chain hoist without load to spread the lubricant on the Load Chain.

■ Gear Oil

Inside of the Gear Case is filled with gear oil at the shipping. The level of the oil filled with specified amount comes to the height of the inspection hole. Check the oil level visually.

⚠ DANGER

Mandatory

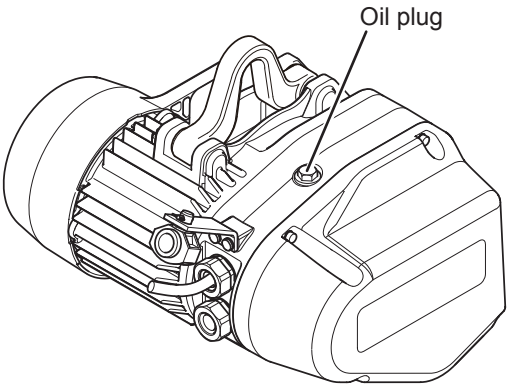
- **Use genuine gear oil.**

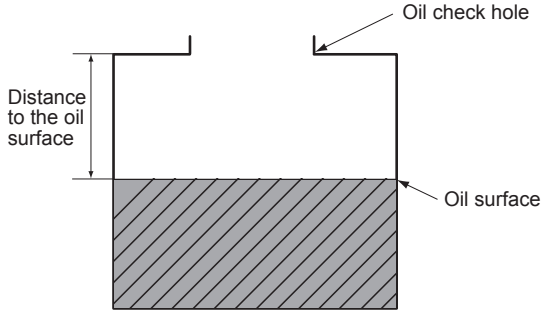
Use of the gear oil other than the genuine oil (including mixed use) will result in death or serious injury due to the drop of the lifted load.

● **Checking the Gear Oil Amount**

1) Remove the Oil Plug on the upper Main Body

2) Insert the check bar from the Oil check hole to check the oil level. (The normal distance between the hole and the oil level is between 107 to 111 mm for the body size D, and 101 to 105 mm for the body size C.)





■Combination with the Trolley

* You do not have to read the contents below if you use the hoist as Hook Suspension Model. Go to "Checking Power and Power Cable" (P39).

⚠ DANGER

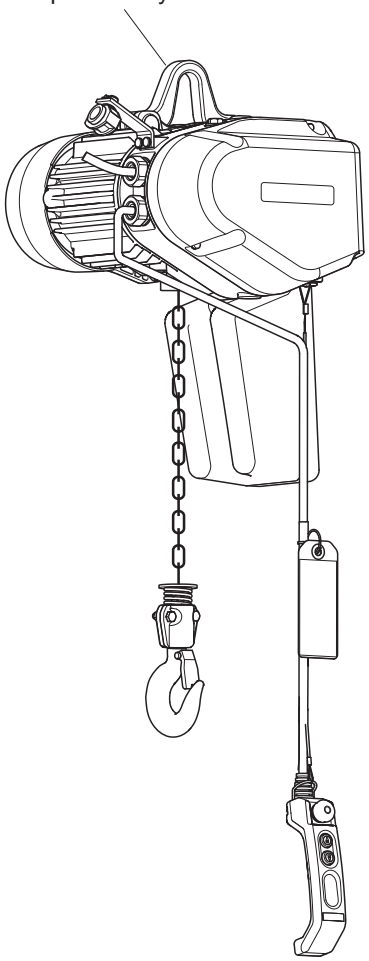
Mandatory

- **Adjust the rail width during assembling and install.**
- **Be careful for the Power Cable and Push Button Switch Set Cord are not pulled off or entangled within the area of traveling area.**

Failure to comply with these instructions may result in death or serious injury.

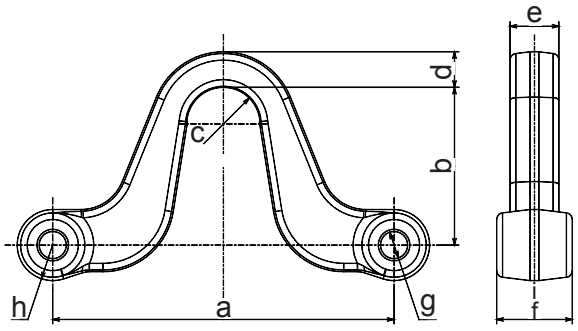
Hoist itself, or combination with KITO EQ trolley or a trolley for some light cranes.

Suspension Eye



Part name	Usage	Part code 500kg	Part code 1t
Suspension Eye	Hoist itself, or combination with KITO EQ trolley or a trolley for some light cranes.	EQ1CI9001	EQ1DI9001

■Dimensions of Suspension Eye



Code	Part code	a	b	c	d	e	f	g	h
EQS005IS	EQ1CI9001	139.6	67.5	16.5	8	16	33	Ø12.2	16
EQS010IS	EQ1DI9001	153.6	71	16.5	12.3	22	34		

(to be continued)

■ Combination with the Manual Trolley

■ Checking the Number of the Assembled Adjusting Spacers and Their Positions (for Manual Trolley)

When installing a trolley to the beam, the length of the Suspension Shaft (width between frames) must be adjusted in accordance with the rail width.Wrong number of wrong position of Spacers may result in the drop of the electric chain hoist. Insert the correct number of Spacers with correct ratings and for rail width at the correct position, referring to the following table.

(Unit: piece)

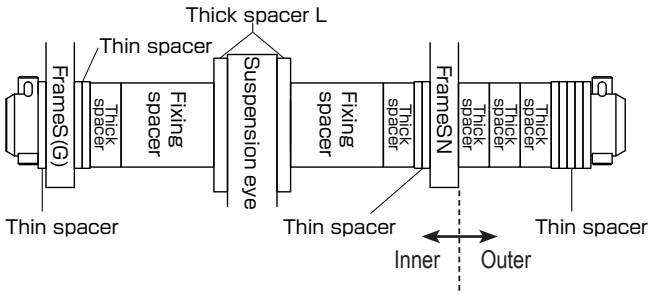
Capacity / Plain Trolley	Parts Name		Rail width (mm)																		
			50	58	66	74	82	90	91	98	106	113	119	125	131	137	143	144	149	155	163
500kg	Thin spacer	Inner	2+3	4+4	1+1	2+4	3+4	1+1	1+1	2+2	3+4	4+5	1+2	2+3	3+4	0+1	1+2	1+2	2+3	3+4	4+5
		Outer	7	4	10	7	5	10	10	8	5	3	9	7	5	11	9	9	7	5	3
	Thick spacer	Inner	0+0	0+0	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+4	4+4
		Outer	8	8	6	6	6	4	4	4	4	4	2	2	2	0	0	0	0	0	0
	Thick spacer L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixing spacer (25)	Inner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1t	Thin spacer	Inner	-	3+4	0+1	2+2	3+3	0+1	0+1	1+2	3+3	4+4	1+1	2+2	3+3	0+0	1+1	1+1	2+2	3+3	4+4
		Outer	-	4	10	7	5	10	10	8	5	3	9	7	5	11	9	9	7	5	3
	Thick spacer	Inner	-	0+0	1+1	1+1	1+1	2+2	2+2	2+2	2+2	2+2	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+4	4+4
		Outer	-	8	6	6	6	4	4	4	4	4	2	2	2	0	0	0	0	0	0
	Thick spacer L	Inner	-	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixing spacer (38)	Inner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Capacity / Plain Trolley	Parts Name		Rail width (mm)												
			170	178	185	200	201	204	210	220	240	260	280	300	305
500kg	Thin spacer	Inner	0+0	1+1	2+2	0+1	1+1	1+2	2+2	4+4	3+3	2+2	1+2	4+5	2+5
		Outer	9	7	5	8	7	6	5	1	3	5	6	0	2
	Thick spacer	Inner	3+3	3+3	3+3	4+4	4+4	4+4	4+4	4+4	5+5	6+6	7+7	7+7	8+7
		Outer	9	9	9	7	7	7	7	7	5	3	1	1	0
	Thick spacer L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixing spacer (25)	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
1t	Thin spacer	Inner	0+0	1+1	2+2	0+1	1+1	1+2	2+2	4+4	3+3	2+2	1+2	4+5	2+5
		Outer	9	7	5	8	7	6	5	1	3	5	6	0	2
	Thick spacer	Inner	2+2	2+2	2+2	3+3	3+3	3+3	3+3	3+3	4+4	5+5	6+6	6+6	7+6
		Outer	9	9	9	7	7	7	7	7	5	3	1	1	0
	Thick spacer L	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1
		Outer	0	0	0	0	0	0	0	0	0	0	0	0	0
	Fixing spacer (38)	Inner	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1	1+1

* Description for spacers;
For example, "0+1"
0: the number of spacers on the frame G side.
1: the number of spacers on the frame S side.

Rail width of 58 – 163 (mm): Normal suspension shaft;
Rail width of 164 – 305 (mm): Wide-frange suspension shaft (optional);

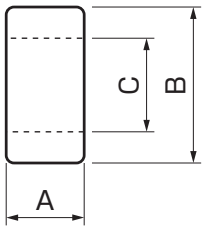
For I beam



■ Length of Adjusting Spacer

(Unit: mm)

PT		500kg	1t
Thin spacer	A	3.2	3.2
	B	31	35
	C	22.5	25.5
Thick spacer	A	12.5	12.5
	B	29.4	34
	C	23	27.6
Thick spacer L	A	5.5	3.2
	B	42.7	54
	C	22.7	26
Fixing spacer	A	81.5	80.5
	B	29.4	34
	C	23	27.6
Suspension shaft diameter		22	25



Thin spacer/Thick spacer/Thick spacer L/Fixing spacer

(to be continued)

■ Combination of the Electric Chain Hoist and the Manual Trolley

⚠ DANGER

Mandatory

- **Use new split pins. After insertion, bend the pin securely at its both ends.**

Use of old split pins may result in death or serious injury due to drop.

● **500kg to 1t**

1) After setting the Suspension Shaft with Spacers, insert it into Frame S and fix it with a Shaft Stopper Pin and a Split Pin.

- Insert the Shaft Stopper Pin in the direction that the split pin comes to the right when viewed from the side of the Frame S.
- Open the both ends of the Split Pin by 70˚ or more.

2) Set the Suspension Shaft with a Thick Spacer, Fixing Spacer, etc.

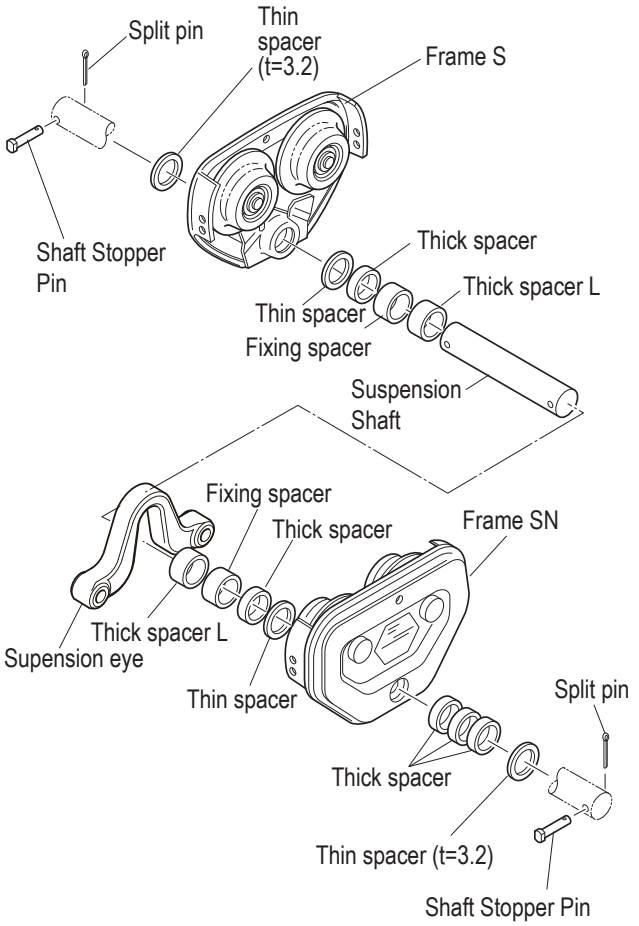
3) Passes it through the string the Suspension Eye.

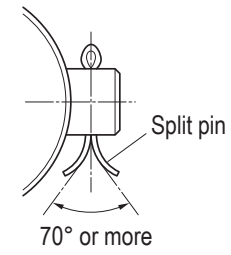
4) Set the Suspension Shaft with another Thick Spacer and Fixing Spacer. Then insert the Suspension Shaft into the Frame SN.

- Adjust the Spacers in accordance with the rail width. (Refer to “Checking the Number of the Assembled Adjusting Spacers and Their Positions" (P36) for the number of Spacers.)

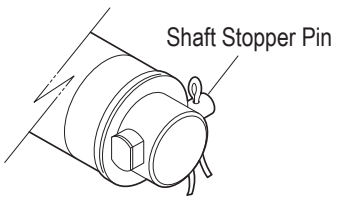
5) Set the Suspension Shaft with a Thick Spacer. Fix it with a Shaft Stopper Pin and a split pin.

- Insert the Shaft Stopper Pin in the direction that the split pin comes to the right when viewed from the front side of the Frame SN.
- Open the both ends of the Split Pin by 70˚ or more.





Bending the split pin



Orientation of Shaft Stopper Pin

■Checking Power and Power Cable

■ Checking the Power

⚠ DANGER


Mandatory

- **Check that the rating of the breaker satisfies the specification required by the electric chain hoist.**
- **Check that the source voltage satisfies the rated voltage of the electric chain hoist.**

Failure to comply with this instruction may result in death or serious injury.

Suspended Type: EQS

Code	Capacity of fuse and circuit breaker (A)	
	110V	220V~240V
EQS005IS	20	15
EQS010IS	30	20

■ Checking the Power Cable

⚠ CAUTION


Prohibited

- **Do not use the cable other than the cable attached to the main unit or optional Power Cable.**

Failure to comply with this instruction causes bodily injury or loss of property.


Mandatory

- **Satisfy the maximum permissible length and core cross section of the Power Cable.**

Failure to comply with this instruction causes bodily injury or loss of property.

Refer to the following table for the permissible length and the size of the standard Power Cable.
When using the cable of the size other than those described in the table, decide the cable length using the following formula.

$$\text{Permissible length (m)} = \frac{1000}{A} \times \frac{\text{Cross section of one core (mm}^2\text{)} \times \text{Rated voltage (V)} \times 0.02}{\text{Rated current (A)}}$$

The value for A in the chart above is: Three phase: 30.8, Single phase: 35.6.

Suspended Type:EQS
Manual Trolley Type:EQSSP

EQS Code	Speed Type	Phase	Voltage(V)	Wire size(mm^2)			
				1.25	2.0	3.5	5.5
	Hoist			Permissible length(m)			
EQS005IS	Dual	1	110V	-	8	14	22
			220V~240V	17	27	48	76
EQS010IS	Dual		110V	-	-	10	16
			220V~240V	13	21	36	57

(to be continued)

■Connecting Cables

NOTE

- **When clamping a connector, do not use tools. Be sure to clamp it by hand.**
  Excessive tightening of a connector may result in the damage or breakage f plastic thread part.
- **To prevent wire breakage and unintentional removal of a connector, tie the protection wire attached to the Push Button Switch Cord to the main unit of the electric chain hoist or the trolley.**
  Be sure to tie the cord with the body size or the trolley to prevent the wire breakage and removal of connector when the cord is pulled strongly.
- **Be sure to turn off the power when carrying out the repair work of wire breakage or removal of the connector.**

■Suspended model (hoist only) and Manual Trolley Type

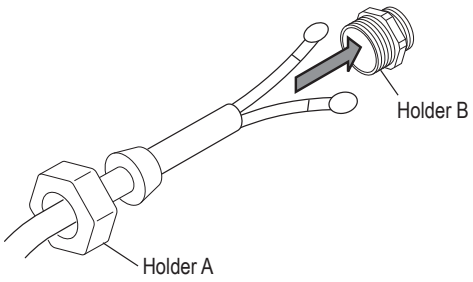
■500kg to 1t

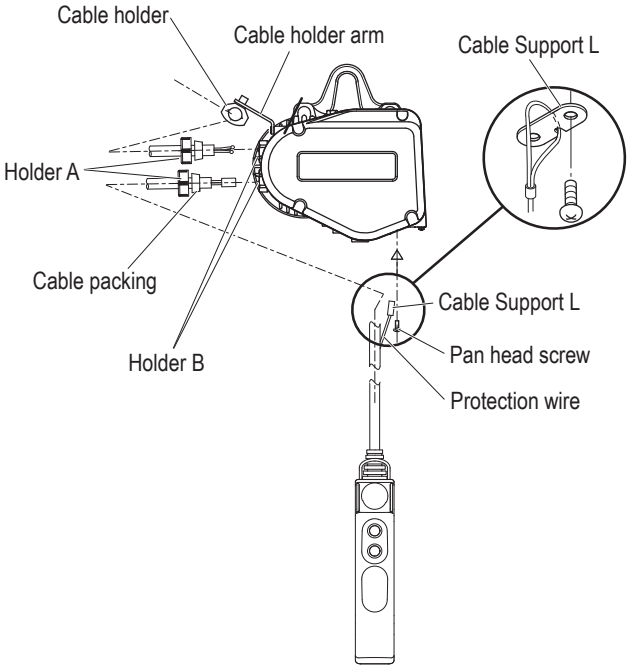
● **Connecting the Power Cable**

1) Insert the Power Cable Holder A to the Holder B and tighten it securely.

2) Fix the Power Cable using cable holder with a slack.

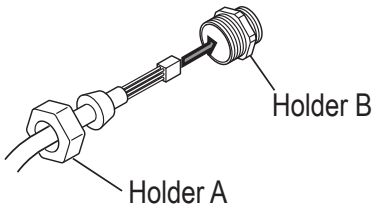
3) Connect the Power Cable to the NF (Noise filter) terminals.
• Refer to the connection diagram on the Controller cover and connect wires correctly





● **Connecting the Push Button Switch Cord**

1) Insert the Push Button Cord Holder A to the Holder B and tighten it securely



2) Pass the Cable Support L into the ring at the end of the Protection Wire. Put the Protection Wire in the notch of the Cable Support L.
Then fix the Cable Support L to the body size (at the bottom face of the Gear Case).

3) Insert the Push Button Connector (white) to the connector (white) on the right of HBB board inside the VFD.
• Refer to the connection diagram on the Controller cover and connect wires correctly

⚠ DANGER

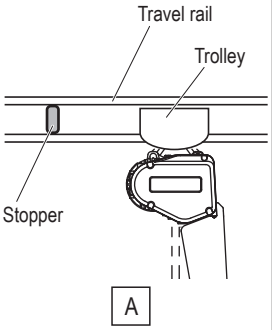
Prohibited

- **Do not install the electric chain hoist at a place exposed to rain or water always or the place different from the Operational Environment (P16).**
- **Do not install the electric chain hoist in the motion space of other trolley or any other moving equipment (facility).**
- **Do not use the electric chain hoist contacting with other object, or being fixed.**

Failure to comply with these instructions may result in death or serious injury.

Mandatory

- **Installation (removal) of the electric chain hoist must be carried out by special installer or by personnel with expertise.**
  Consult with the sales shop or KITO for installation, or consign the installation work to special installer or personnel with expertise.
- **When installing or removing the electric chain hoist, follow the instructions in Owner's Manual.**
- **Carry out the work for grounding (earthing) and installation of earth leakage breaker.**
  These work must be carried out by an electric work specialist.
- **When the installation is completed, carry out "Check after Installation". (See P46)**
- **Connect the power after all installation works have been completed and just before the operation check.**
- **Mount the stopper at the both ends of the travel rail for trolley. <Fig. A>**
- **Make sure that the strength of the structure is sufficient to install the electric chain hoist.**
- **Carry out the installation work after securing the stable hoothold.**
- **Before building the electric chain host into part of your own travel device without using the standard trolley, contact us for information on precautions.**



Failure to comply with these instructions may result in death or serious injury.

⚠ CAUTION

Mandatory

- **Connect the Power Cable to the power of rated voltage.**

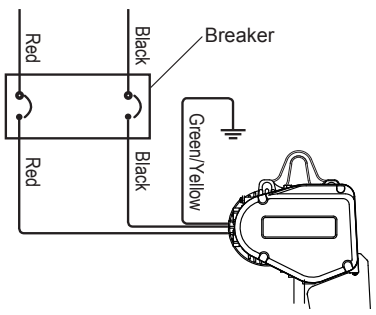
Failure to comply with this instruction causes bodily injury or loss of property.

■Connecting Power and Power Cable

When connecting the Power Cable to the power, connect the cable in accordance with the following instructions.

- Connect the electric chain hoist to the power through a breaker.
- Connect the electric chain hoist in the correct phase.
- Earth wire is a green colored covered cable with yellow line. Carry out Class D earthing work.
- Use correct breaker and Power Cable referring to Checking Power and Power Cable (P39) for the breaker capacity, Power Cable length and its size.

Single phase



(to be continued)

■Installing the Hook Suspended Type (hoist only)

■Checking Installation Method and Place

⚠ DANGER


Mandatory

- When using an electric chain hoist suspended (as a single unit) without combination with a trolley, make sure that the Hook Latch of the Top Hook closes securely.
- Install the electric chain hoist so that the Top Hook and body can swing freely. (Make sure not to restrain the Top Hook and body when in use.)
- The diameter of the Suspension Shaft hooked by Suspension Eye should be thinner than 31mm or less. Refer to the Suspension dimension (P35)
- Do not install and use the electric chain hoist upside down.

Failure to comply with these instructions may result in death or serious injury.

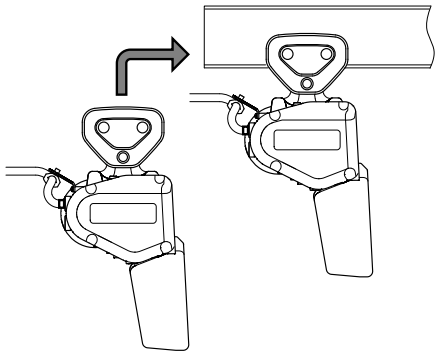
■Installing the Trolley Combined Model

■Mounting the Hoist to the Travel Rail

1) Make sure that the dimensions of the Trolley Frame satisfy the size of the rail to which the trolley is installed.

2) Make sure that the rail is set to a level.

3) Install the electric chain hoist combined with the trolley to the rail from its one end



● **When the gap between the rail end and the wall of the housing is scarce**

⚠ CAUTION

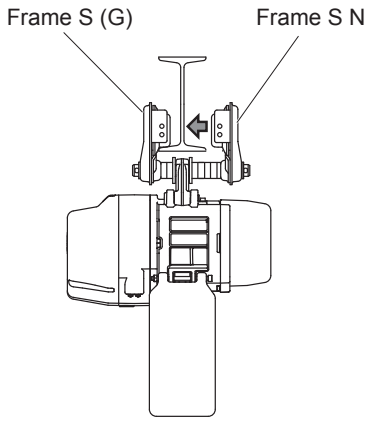
Mandatory

- **Securely support the electric chain hoist Mode EQS not to tilt.**

Failure to comply with this instruction causes bodily injury or loss of property.

1) Set the wheel at Frame S (G) side of the Trolley Frame on the running face of the Travel Rail. Then push the Frame SN into the Frame S (G).

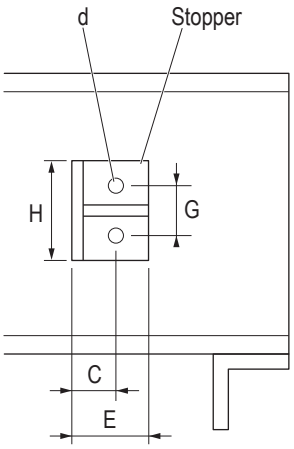
2) Insert the Shaft Stopper Pin into the Hole of the Suspension Shaft. Then mount a split pin securely.

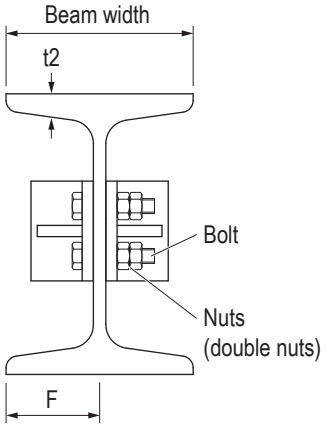


(to be continued)

■ Mounting the Stopper

Be sure to mount the stoppers at the both ends of the rail to prevent drop.
Decide the mounting position in accordance to the size of the wheel.
When the customer wants to make the stopper by oneself, refer to the following figures.





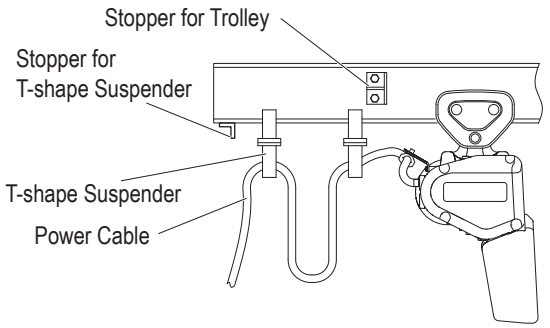
(Unit: mm)

Capacity	~1t			
Beam width	100	125	150	175
Material dimensions	L-50x50x6	L-50x50x6	L-65x65x8	L-75x75x9
H	80	80	80	80
E	50	50	65	75
F	40	50	65	75
G	50	50	50	50
C	30	30	35	40
d	ϕ14	ϕ14	ϕ14	ϕ14
Bolt size	M12x50x50	M12x55x55	M12x55x55	M12x60x60

● **When using T-shape Suspender**

Install the additional stopper for T-shape Suspender at the end of one rail.

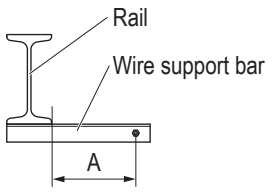
*Not to install a cable hanger pusher to a manual trolley.



■ Power Cable Layout for Manual trolley type

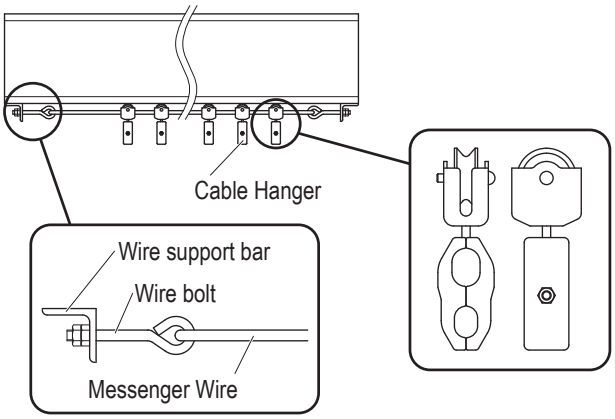
- In the standard specification the Suspender is provided. T-shape Suspender and angle type Suspender are also available as optional parts. T-shape Suspender can be applicable to curved rail, however, the application method differs depending on the condition such as radius of curvature. In such case, contact KITO.

1) Mount the wire support bar at the both ends of the rail.

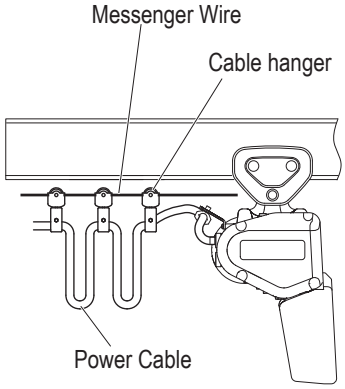


2) Tie the Messenger Wire passed through the Cable Hanger to the Wire Support Bar with two Wire Bolts.

- The recommended mounting interval of the Cable Hangers is 1.5 m to 2 m.
- Use steel wire of 3 to 6 mm in diameter for the Messenger Wire.



3) Fix the Power Cable to the Cable Hanger.



(to be continued)

Check after Installation

Wrong assembling or installation causes death or serious injury. To prevent such danger check the following.

■ Check items

Make sure that the following are satisfied:

- No bolt, nut nor split pin is lost. Tightening and assembling are completed.
- Protection Wire for Push Button Switch Cord is securely tied to accept and endure the force instead of Push Button Switch Cord when the Push Button Switch Set is drawn.
- The Power Cable is fixed to the Cable Support.
- Source voltage is the rated voltage
- Grounding Wire (earth wire) is connected securely.

● When using with a Trolley

Check the following:

- The electric chain hoist and the trolley are combined correctly.
- The stoppers for trolley are securely mounted to Travel Rail where the Trolley travels.
- The surface of Travel Rail is not attached with paint or oil. (The surface of the Travel Rail must be basis metal. Do not paint.) There is no obstacle for the trolley to travel. The Travel Rail is set to a level.

■ Operational Check

Carry out the operational check in accordance with Daily inspection (P18).

Chapter 2

Inspection

This chapter describes frequent inspection items and periodic inspection items. Refer to Chapter 1 for the “Handling the Product”. Inspection is the first step of safety. Carry out daily inspection, frequent inspection and periodic check.

Table of Contents

●**Reference**
Daily inspection is described in Chapter 1 “How to Use the Product”. Refer to the following daily inspection items and their relevant pages.

Safety Precautions

■General Matters related to Inspection

⚠ DANGER


Prohibited

- **Do not use the part exceeding the service limit or criteria and the parts other than genuine part for KITO electric chain hoist.**
  Even if the part is genuine KITO part, it cannot be used for other model. Refer to Disassembly/Assembly Manual (Annex) for the correct use of the part.
- **Do not adjust or disassemble the Brake or Friction Clutch.**
- **Do not adjust the set nut.**
- **Do not carry out the inspection of electric chain hoist with a lifted load.**
- **Do not use the electric chain hoist removing the chain spring and the stopper.**
- **Turn off the main power when carrying out the inspection.**

Failure to comply with these instructions may result in death or serious injury.


Mandatory

- **Be sure to carry out the frequent and periodic inspection.**
- **Periodic inspection of the electric chain block must be performed by maintenance engineer.**
- **When oiling the Friction Clutch, use KITO genuine oil (manufacturer specified oil).**
- **When using oils such as gear oil and grease, avoid places with fire or sparks.**
- **Put the electric chain hoist on the floor or work bench when performing the repair and disassembling of the electric chain hoist.**
- **Even if each component of the electric chain hoist does not exceed the service limit, replace the part exceeding the total operating hours derived from the grade indicated on the electric chain hoist and the load factor.**
- **Do not use the electric chain hoist when any abnormality was observed during the inspection. Indicate "FAILURE" on the hoist and contact with maintenance engineer or KITO for repair.**
- **After completion of the inspection (frequent, periodic), perform the functional check and make sure that the electric chain hoist operates correctly.**
- **When performing the functional check, be sure to perform the capacity test after no load test.**

Failure to comply with these instructions may result in death or serious injury.

⚠ CAUTION


Mandatory

- **Indicate "CHECKING" when performing the inspection.**
  When a crane is operated erroneously during the inspection, it may result in the accident such as fall-off of parts and tools and downfall.
- **Wear protection equipment such as protection goggles and gloves depending on the work contents.**
  Otherwise it may result in the injury due to scattered oil or sharp edge of a part.
- **Pay attention to work method, work procedure and work posture.**
  If the product or the part is heavy, your hand is caught or your waist is hurt.
  Especially be careful for the work on an unstable scaffold such as the work at high lifted place using stepladder.
- **Wear helmet and safety belt when carrying the high lift work.**
  Otherwise it may result in injury or downfall accident.
- **Remove the oil attached to the product or spilt on the floor.**
  Otherwise it may result in injury due to drop of the product or overturning.
- **Keep the work area clean when disassembling the product.**
  Assembling or mixing the part other than genuine part may result in the damage of the product or the accident due to defective operation.

NOTE

- When performing the frequent inspection, carry out the daily inspection at the same time.
- When performing the periodic inspection, carry out the frequent inspection and the daily inspection at the same time.
- When detecting any abnormality during inspection due to erroneous use, instruct the operator and user for correct use of the electric chain hoist.

  Ex. (1) The flaw on the Chain Guide hit with the Chain (Cause: lifting incline)

  (2) The deformation of the Chain Spring (Cause: excessive use of the limit switch)

Frequent Inspection

■General Matters on Frequent Inspection

⚠ DANGER


Mandatory

- **After completion of the frequent inspection, perform the functional check and make sure that the electric chain hoist operates correctly.**

Neglecting to perform the functional check may result in death or serious injury.

■General Matters on Handling of Dual Speed VFD Model

The Dual Speed VFD model is controlled by VFD for important items related to safety such as operation, braking and emergency stop. Be sure to follow the safety precautions below as well as the above safety precautions.

⚠ DANGER


Prohibited

- **Do not reassemble the Dual Speed VFD model to contactor type.**
- **Do not change parameters.**
  When parameters need to be changed, ask distributor or KITO.
- **Do not carry out the work such as maintenance and inspection within 5 minutes after power off.**
  Wait for the completion of discharging of the capacitor inside the VFD and DPC.
- **Do not change the connection of the VFD and DPC.**
  When the wires were removed for any reason, connect them again correctly checking the wiring diagram inside the controller cover.
- **Do not carry out withstand voltage test and insulation resistance measurement of a circuit by megger while the VFD is connected.**
- **Do not turn off the power while operating.**
- **Never turn off the power when a load is suspended.**
  Never, under any circumstances, turn off the power when a load is suspended. Doing so will cause the load to be slightly lowered after the power is turned on again due to control system initial preparation.

Failure to comply with these instructions may result in death or serious injury and the damage of VFD and DPC.


Mandatory

- **USE KITO genuine VFD and DPC.**
  The VFD and DPC requires the special specification for KITO. Be sure to use genuine VFD and DPC.

Failure to comply with this instruction may result in death or serious injury.

NOTE

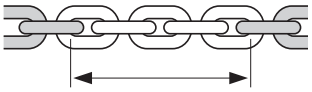
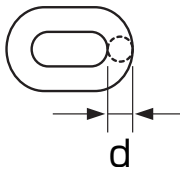
When performing the frequent inspection, carry out the daily inspection at the same time.

- Check the electric chain hoist as installed, standing on the floor.

■Electric Chain Hoist (EQS) Frequent Inspection

■ Load Chain

- Check the Load Chain after removing the stain on the chain.
- Use the needle head caliper (point caliper) to measure the sum of pitches and wire diameter.
- Apply oil on the Load Chain after inspection.
- Application of lubricant influences on the life of the Load Chain considerably. Use the KITO genuine lubricant or equivalent (industrial lithium grease: consistency No.0)
- Release all loads from the Load Chain. Apply the lubricant to the linking portion of the Load Chain that engages the Load Sheave and the linking portion of the Load Chain.
- After application of the lubricant, lift/lower the electric chain hoist without load to spread the lubricant on the Load Chain.

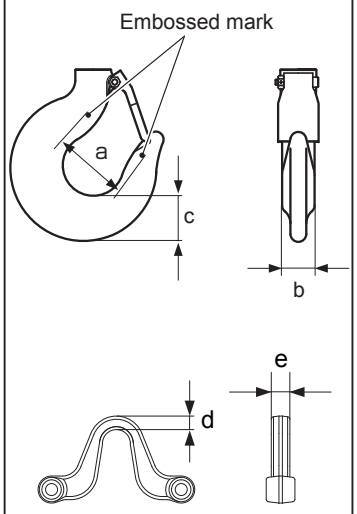
Item	Check method	Criteria	When failed
Elongation of Pitch	• Measure the elongation of pitch with point caliper. (Measure the sum of pitches of 5 links)  Sum of pitches of 5 links	**NOTE** **Check the engaging point of the Load Sheave especially carefully.** • The limit value of the following “Sum of pitches of five links” must not be exceeded.	Replace the Load Chain.
Abrasion of wire diameter	• Measure the wire diameter (d) with point caliper.  d	• The limit value of the following “Wire diameter of the Load Chain” must not be exceeded. **NOTE** **When the abrasion of the Load Chain is observed, be sure to check the abrasion of the Load Sheave also. (Refer to “Periodic Inspection”, “Load Sheave” (P64).)**	Replace the Load Chain.

Load Chain Pitch and Wire Diameter for Each Capacity

Code	Capacity	Load Chain diameter (mm)	Sum of 5 Links (mm)		Load Chain diameter (mm)	
			Do not exceed the limit		Do not fall under the limit	
			Standard	Limit	Standard	Limit
EQS005IS	500kg	ϕ5.6	79	81.5	5.6	5.1
EQS010IS	1t	ϕ7.1	100	103	7.1	6.4

(to be continued)

■ Suspension Eye, Bottom Hook

<table>
<tr><th>Item</th><th>Check method</th><th>Criteria</th><th>When failed</th></tr>
<tr>
<td>Opening and Abrasion of the Hook</td>
<td>
• Check visually and measure with vernier caliper.


</td>
<td>
⚠ CAUTION
Mandatory
• Compare the dimensions of a, b and c with those at purchasing. Check that they are within the criteria.
The use of the Hooks with these dimensions exceeding the criteria may result in bodily injury or property damage.
<table>
<tr><th colspan="2">Measured value (mm)</th><th>Limit value</th></tr>
<tr><td rowspan="3">Hook</td><td>Dimension a</td><td>Not to exceed the dimension at purchasing</td></tr>
<tr><td>Dimension b</td><td rowspan="4">Abrasion not to exceed 5%</td></tr>
<tr><td>Dimension c</td></tr>
<tr><td rowspan="2">Suspension Eye</td><td>Dimension d</td></tr>
<tr><td>Dimension e</td></tr>
</table>
• Following tables shows the nominal standard values. Please be aware that these values include tolerance because of forging.
<table>
<tr><th rowspan="3">Code</th><th rowspan="3">Capacity</th><th colspan="6">Bottom Hook</th><th colspan="4">Suspension Eye</th></tr>
<tr><th colspan="2">Dimension a (mm)</th><th colspan="2">Dimension b (mm)</th><th colspan="2">Dimension c (mm)</th><th colspan="2">Dimension d (mm)</th><th colspan="2">Dimension e (mm)</th></tr>
<tr><th>Standard</th><th>Standard</th><th>Limit value</th><th>Standard</th><th>Limit value</th><th>Standard</th><th>Limit value</th><th>Standard</th><th>Limit value</th></tr>
<tr><td>EQS005IS</td><td>500kg</td><td>45.0</td><td>17.5</td><td>16.6</td><td>23.5</td><td>22.3</td><td>8.0</td><td>7.6</td><td>16.0</td><td>15.2</td></tr>
<tr><td>EQS010IS</td><td>1t</td><td>50.0</td><td>22.5</td><td>21.4</td><td>31.0</td><td>29.5</td><td>12.3</td><td>11.7</td><td>22.0</td><td>20.9</td></tr>
</table>
</td>
<td>Replace the Hook and suspension hook.</td>
</tr>
<tr>
<td>Deformation, Flaw, Corrosion
  </td>
<td>• Check visually.</td>
<td>
• No deformation such as bend or twist
• No deep cut
• No loosened bolt or not, or their fall off
• No considerable corrosion
• No attachment of foreign matter such as sputter
</td>
<td>Replace the Hook.</td>
</tr>
</table>

■ Peripheral parts of the Body size

● Use check stand to check the electric chain hoist from the close point.

Item	Check method	Criteria	When failed
Chain Container	• Check visually.	• To be mounted to the body size securely • No damage, tear, abrasion or deformation • Check no foreign matter inside the Chain Container. * Especially be careful when the electric chain hoist is used outdoor. • Make sure that the lift of the Load Chain is smaller than the capacity of the Chain Container. **⚠ DANGER**  Prohibited • **Do not use the torn Chain Container.** Otherwise it may result in death or serious injury due to drop of the Load Chain.  Mandatory • **Use the Chain Container with the capacity larger than the lift of the Load Chain.** Otherwise it may result in death or serious injury due to drop of the Load Chain.	Replace the Chain Container. Discard the foreign matter in the Chain Container. Replace the Chain Container with the adequate Chain Container referring to “Mounting the Chain Container” (P32).

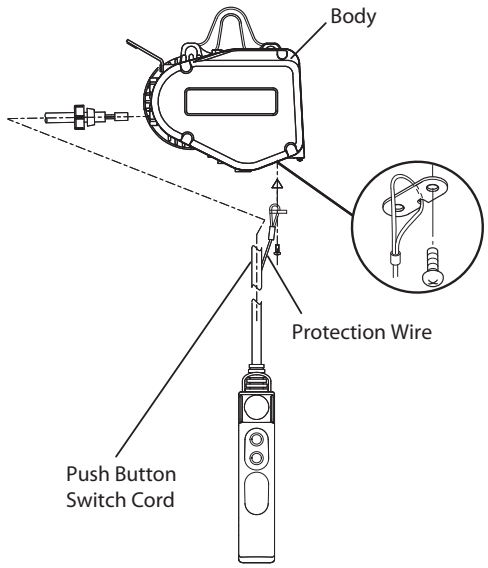
■ Brake

Item	Check method	Criteria	When failed
Number of start	• Check the number of start with the CH Meter.	• The number of start must be less than one million times. * Estimate the time to reach at one million times.	Perform the inspection in accordance with “Displaying the numbers of start and the operating hours” (P71).

(to be continued)

■ Push Button Switch

Item	Check method	Criteria	When failed
Push Button Switch Body size	• Check visually and by operation.	• No damage, deformation and loosened bolt. • Push Button Switches can be operated smoothly. • Emergency Stop Button can be operated and cancelled.	Replace the Push Button Switch.
Push Button Switch Cord	• Check visually.	• Push Button Switch Cord is securely connected. • The Protection Wire is tied with the body size so that Push Button Switch Cord is not strained directly even if the Push Button Switch is pulled.	Tie the Push Button Switch Cord and the Protection Wire to the body size properly.
		• To have no damage	Replace the Push Button Switch Cord.



■ Power Supply

Item	Check method	Criteria	When failed
Power Cable	• Check visually.	• Power Cable to have enough length. • To have no damage • To be connected securely	Replace the Power Cable.

■ Function and Performance

- Check the following item with no load.

Item	Check method	Criteria	When failed
Abnormal Noise	• Check the noise of gear, motor and the Load Chain during operation with no load. **NOTE** **Sound is also an important check point. Always be careful for the noise of the electric chain hoist.**	• To sound no irregular rotating noise • To sound no howling of motor and scraping sound of the Brake • To sound no abnormal noise	Replace the abnormal part.
		• To sound no popping sound from the Load Chain	Check the Load Chain. (Refer to (P53)

■Manual Trolley (TSP) Frequent Inspection

■ Appearance

Item	Check method	Criteria	When failed
Combination	• Shake the manual trolley to check.	• The electric chain block shakes lightly to right and left.	Combine the electric chain hoist and the manual trolley securely.
Travel Rail	• Check visually.	• To have no considerable deformation and damage	Check items in accordance with “Travel Rail” described in Chapter 2 “Periodic Inspection”.(P67)
Oiling (to the gears of wheel)	• Check visually.	• To be oiled adequately	Apply oil to gears.

Periodic Inspection

■General Matters on Periodic Inspection

⚠ DANGER


Mandatory

- **Put the electric chain hoist on the floor or work bench when inspecting the electric chain hoist.**
- **After completion of the periodic inspection, perform the functional check and make sure that the electric chain hoist operates correctly.**
  · Wear insulating gloves when measuring voltage.
  · When measuring the electric characteristics (insulation resistance, but except voltage measurement), turn off the power.

Failure to comply above instructions may result in death or serious injury.

NOTE

When performing the periodic inspection, carry out the daily inspection at the same time.

● Disassemble the electric chain hoist and check that it is assembled correctly without abnormal parts.

■General Matters on Handling of Dual Speed VFD Model

The Dual Speed VFD model is controlled by VFD for important items related to safety such as operation, braking and emergency stop. Be sure to follow the safety precautions below as well as the above safety precautions.

⚠ DANGER


Prohibited

- **Do not reassemble the Dual Speed VFD model to contactor type.**
- **Do not change parameters.**
  When parameters need to be changed, ask distributor or KITO.
- **Do not carry out the work such as maintenance and inspection within 5 minutes after power off.**
  Wait for the completion of discharging of the capacitor inside the VFD and DPC.
- **Do not change the connection of the VFD and DPC.**
  When the wires were removed for any reason, connect them again correctly checking the wiring diagram inside the controller cover.
- **Do not carry out withstand voltage test and insulation resistance measurement of a circuit by megger while the VFD is connected.**
- **Do not turn off the power while operating.**
- **Never turn off the power when a load is suspended.**
  Never, under any circumstances, turn off the power when a load is suspended. Doing so will cause the load to be slightly lowered after the power is turned on again due to control system initial preparation.

Failure to comply with these instructions may result in death or serious injury and the damage of VFD and DPC.


Mandatory

- **USE KITO genuine VFD and DPC.**
  The VFD and DPC requires the special specification for KITO. Be sure to use genuine VFD and DPC.

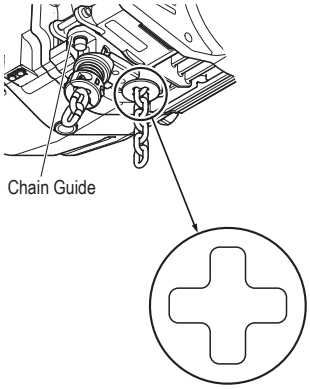
Failure to comply with this instruction may result in death or serious injury.

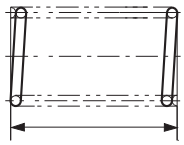
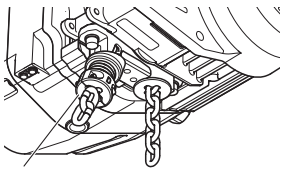
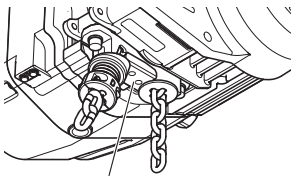
■Electric Chain Hoist (EQS) Periodic Inspection

■ Suspension Eye, Bottom Hook

Item	Check method	Criteria	When failed
Number of start	• Check the number of start with the CH Meter. (Other than single speed models)	• Number of start must not exceed the guidelines for replacement.	Replace the Suspension Eye, suspension hook and Bottom Hook.

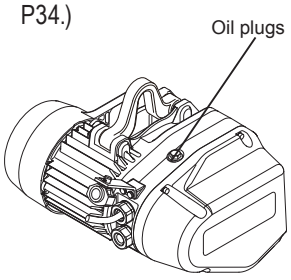
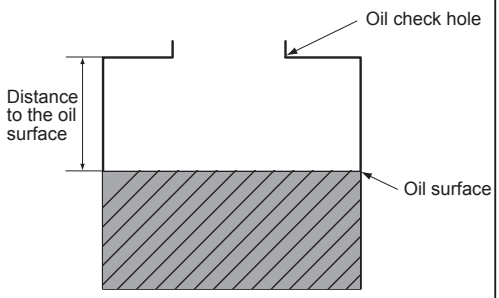
■ Peripheral parts of the Body size

Item	Check method	Criteria	When failed
Chain Guide	• Check visually.  	• To have no apparent abrasion, deformation and damage • To have no flaw due to hitting by the Load Chain **⚠ CAUTION** Mandatory • **The flaw due to hitting is caused by wrong use such as lifting a load in an inclined direction. If the abrasion is observed on the Chain Guide, the Load Chain may be worn also. Refer to the item of Load Chain Abrasion and check the abrasion.** Neglecting the check of the Load Chain abrasion may result in bodily injury or property damage.	Replace the Chain Guide.

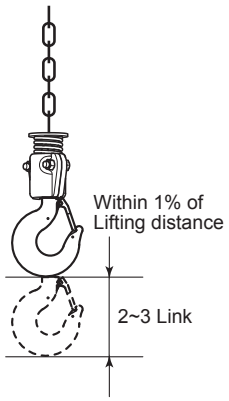
<table>
<tr><th>Item</th><th>Check method</th><th>Criteria</th><th>When failed</th></tr>
<tr><td>Chain Spring</td><td>• Check visually and measure the dimensions.
 
 
Dimensional standard</td><td>• Check visually to have no apparent setting (deformation).
⚠ CAUTION
Mandatory
• The deformation of the Chain Spring is caused by excessive use of the Friction Clutch and the Limit Switch. Operate the electric chain hoist properly.
Otherwise it may result in bodily injury or property damage.
Service Limit of Chain Spring for Capacity (Do not fall short of the limit value.)
<table><tr><th rowspan="2">Code</th><th rowspan="2">Capacity</th><th colspan="2">Length of Chain Spring (mm)</th></tr><tr><th>Standard</th><th>Limit value</th></tr><tr><td>EQS005IS</td><td>500kg</td><td>29</td><td>26.5</td></tr><tr><td>EQS010IS</td><td>1t</td><td>26.5</td><td>24</td></tr></table></td><td>Replace the Chain Spring.</td></tr>
<tr><td>Stopper</td><td>• Check visually.
 
Stopper</td><td>• The stopper must be attached securely at the third link from the no load end of the Load Chain.</td><td>Attach the Stopper at the third link.</td></tr>
<tr><td>Limit Switch Cover</td><td>• Check visually.</td><td>• To have no deformation, damage and abrasion
• To have no stain
 
Limit Switch Cover</td><td>Replace the Limit Switch Cover. Disassemble the Limit Switch Cover and clean it.</td></tr>
</table>

Periodic Inspection

■ Oil

Item	Check method	Criteria	When failed
Oil Leakage	• Check visually.	• To have no leakage of gear oil from packings, oil seals or oil plugs.	Replace the Packing and the Oil Seal.
Oil amount and stain	• Check the oil level from the oil check hole. (The position of the oil check hole depends on the model. See P34.)  • Check the VFD for the operating hours	Gear oil is filled sufficiently (The distance between the hole and the oil level is between 107 to 111mm for the body size D, and 101 to 105 mm for the body size C.)  • Gear oil has viscosity but not stained. • Refer to “Guidelines and Precautions on Gear Oil Change Cycle” for the replacement of oil. (P69)	Replace the Oil.

■ Brake

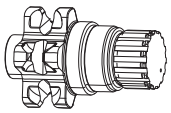
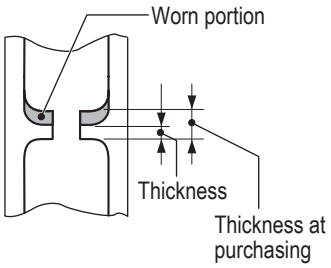
Item	Check method	Criteria	When failed
Brake	• Lift and lower the electric chain hoist for 20 to 30 cm with a capacity and then stop it. 	• When stopping the operation, the Brake must be applied immediately and the motor must stop. • Elevating : Stop distance must be 1 % or less of the lifting distance.	Disassemble the Brake to check whether the brake is assembled correctly without abnormal part.

■ Driving Mechanism

Item	Check method	Criteria	When failed
Bearing	• Check for any strange noises. • Check the operating hours with the CH Meter. (Refer to P71 .)	• Sounds no strange noise during lifting/ lowering operation with no load. • The operating hours must not exceed the guidelines for replacement. (Refer to Guidelines on Bearing Replacement (P70).)	Replace the Bearing.
Load Gear, Gear 2, Gear 3, Motor Shaft	• Check for any strange noises. • Check the operating hours using the CH Meter. (Refer to P71 .)	• To have no apparent abrasion • To have no damage • Operating hours not to exceed the guidelines for replacement (Refer to “Guidelines on Gear Parts Replacement” (P70).)	• Replace the Gear. • Replace the Motor Shaft. • Replace the oil at the same time.
Friction Clutch	• Check for any strange noises. • Check the operating hours using the CH Meter. (Refer to P71 .)	• Sounds no strange noise during lifting/ lowering operation with no load. **⚠ DANGER** Prohibited • **Do not adjust or disassemble the Friction Clutch.** Adjusting and disassembling the Friction Clutch may result in death or serious injury. • Operating hours not to exceed the guidelines for replacement (Refer to “Guidelines on Gear Parts Replacement” (P70).)	Replace the Friction Clutch.

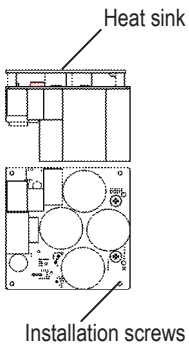
(to be continued)

Periodic Inspection

<table>
<tr><th>Item</th><th>Check method</th><th>Criteria</th><th>When failed</th></tr>
<tr>
<td>Abrasion and flaw of the Load Sheave
  </td>
<td>• Check for any popping sounds.
• Check the operating hours using the CH Meter.</td>
<td>• To have no apparent abrasion, deformation and damage
• To have neither abrasion of the sheave pocket nor the run-on flaw on the crest.
NOTE
If the abrasion is observed on the Load Sheave, the Load Chain may be worn also. Refer to the item of Load Chain Abrasion and check the abrasion.
• Service limit of the Load Sheave (Do not fall under the limit)
<table>
<tr><th rowspan="2">Model</th><th rowspan="2">Capacity</th><th colspan="2">Thickness(mm)</th></tr>
<tr><th>Standard</th><th>Limit</th></tr>
<tr><td>EQS005IS</td><td>500kg</td><td>3.4</td><td>2.3</td></tr>
<tr><td>EQS010IS</td><td>1t</td><td>5</td><td>3.3</td></tr>
</table>
• Check the thickness using a slide gauge.
 

</td>
<td>Replace the Load Sheave.</td>
</tr>
</table>

■ Electrical Equipment

Item	Check method	Criteria	When failed
Electrical Parts	• Remove the Controller Cover and check the electrical parts visually. • Check the number of start with the CH Meter. (Refer to P71 .)	• To have no damaged or burnt part. • To have no loosened bolt. Electrical parts must be mounted securely.	Replace the damaged or burnt electrical part. Mount the electrical part securely.
Wiring		• Wiring must be fixed to the Electrical Parts securely. • Connectors must be inserted securely. • To have no wire breakage and burning	Connect wirings securely. Replace the wiring with new wiring, referring to Chapter 3 Guidance on Troubleshooting. (P74 ,P95)
Contamination and attachment of foreign matter		• To have not waterdrop or foreign matter.	Remove the foreign matter.
VFD	• Check the parts with service life (see VFD Manual.) * Contact KITO for the manual	• Electrolytic capacitor: 3000 hours (depending on the use)	Replace the VFD.
DPC	Check visually or using tools. 	• Make sure that the 8 installation screws for fastening the DPC heat sink to the base plate are not loose. *Check also all the electrical components other than the DPC to make sure the screws there are not loose and that the wiring is properly connected. • Make sure to check the Faston (P30).	Fasten bolts.
		• Remove the DPC and place it on a flat surface to make sure that the heat sink is not bent.	Replace the DPC.

■ Electric Characteristics Measurement

Item	Check method	Criteria	When failed
Source Voltage	• Measure the voltage with a circuit tester.	• The source voltage of the rated voltage ± 10 % at the receiving terminal must be supplied when operating with the capacity. **⚠ DANGER** Mandatory • **Be careful of electric shock when measuring the voltage.** Electric shock may result in death or serious injury.	Supply proper voltage.

(to be continued)

Periodic Inspection

Item	Check method	Criteria	When failed
Insulation Resistance	• Measure the insulation resistance with megger. (Resistance between energized and non-energized parts ··· Each phase of R(L1), S(L2) and T(L3) and the earth wire)	• Insulation resistance must be 5 MΩ or higher. **⚠ DANGER** Mandatory • **Turn off the power when measuring the insulation resistance.** Measuring the insulation resistance without turning off the power may result in death or serious injury.	Replace the Body size.
Grounding Resistance	• Measure the grounding resistance with earth-resistance meter.	• Grounding resistance 100Ω or less **⚠ DANGER** Mandatory • **Turn off the power when measuring the grounding resistance.** Measuring the grounding resistance without turning off the power may result in death or serious injury due to electric shock.	Make a grounding correctly.

■ Function and Performance

⚠ DANGER

Mandatory

• **After completion of the inspection of each part, perform the operational check for correct operation.**

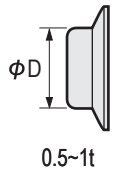
Neglecting to perform the operational check may result in death or serious injury.

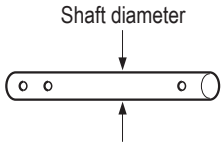
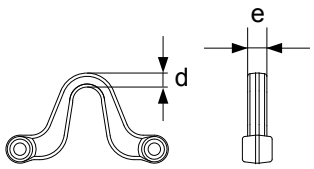
● Perform the following inspections with capacity.

Item	Check method	Criteria	When failed
Operational Check	• Perform the daily inspection items with capacity. (Refer to “Daily inspection Items”. (P18))	**⚠ DANGER** Mandatory • **Be sure to perform the capacity test after completion of the no-load test.** Performing the capacity test without prior no-load test may result in death or serious injury. • Refer to “Daily inspection Items”. (P18)	Disassemble the electric chain hoist to check whether it is assembled correctly and has no abnormal part.
Brake	• Operate the electric chain hoist with a capacity and then stop it.	• When stopping the operation, the Brake must be applied immediately and the motor must stop. Up/Down: Stop distance must be 1 % or less of the traveling distance for one minute.	Disassemble the Brake to check whether it is assembled correctly and has no abnormal part.

■Manual Trolley (TSP) Periodic Inspection

■ Body size Components

<table>
<tr><th>Item</th><th>Check method</th><th>Criteria</th><th>When failed</th></tr>
<tr><td>Wheel</td><td>• Check visually.
• Measure dimension D with vernier caliper.
 

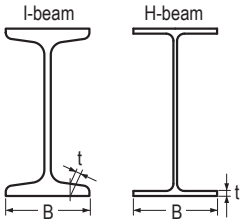
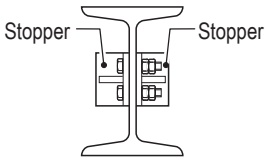
• Measure the outer diameter with vernier caliper.</td><td>• To have no considerable deformation and damage
• Abrasion Limit of Wheel (Do not fall under the limit.)
<table>
<tr><th rowspan="2">Capacity</th><th rowspan="2">Beam</th><th colspan="2">D (mm)</th><th colspan="2">Flange thickness (mm)</th></tr>
<tr><th>Standard</th><th>Limit</th><th>Standard</th><th>Limit</th></tr>
<tr><td rowspan="2">500kg</td><td>H-beam</td><td rowspan="2">60</td><td>58.5</td><td rowspan="4" colspan="2">To have no considerable damage or crack at the flange.</td></tr>
<tr><td>I-beam</td><td>To have no considerable damage or crack on the contact surface</td></tr>
<tr><td rowspan="2">1t</td><td>H-beam</td><td rowspan="2">71</td><td>69.5</td></tr>
<tr><td>I-beam</td><td>To have no considerable damage or crack on the contact surface</td></tr>
</table></td><td>Replace the Wheel.</td></tr>
<tr><td>Lifting Shaft</td><td>• Check visually.
• Measure the shaft diameter with vernier caliper.
 
</td><td>• To have no considerable deformation and abrasion
• The shaft with obvious deformation reaches at the service limit.
• Abrasion limit of the shaft and the hole is 5 % of its diameter respectively.</td><td>Replace the Lifting Shaft.</td></tr>
<tr><td>Suspension Eye</td><td>• Check visually and measure with vernier caliper.
 
</td><td>
<table>
<tr><th colspan="2">Measured value (mm)</th><th>Limit value</th></tr>
<tr><td rowspan="2">Suspension Eye</td><td>Dimension d</td><td rowspan="2">Abrasion not to exceed 5%</td></tr>
<tr><td>Dimension e</td></tr>
</table>
• Following tables shows the nominal standard values. Please be aware that these values include tolerance because of forging.
Guidelines on the Hook and Suspension Eye (refer to P69) or its criteria
<table>
<tr><th rowspan="3">Code</th><th rowspan="3">Capacity</th><th colspan="4">Suspension Eye</th></tr>
<tr><th colspan="2">Dimension d (mm)</th><th colspan="2">Dimension e (mm)</th></tr>
<tr><th>Standard</th><th>Limit value</th><th>Standard</th><th>Limit value</th></tr>
<tr><td>EQS005IS</td><td>500kg</td><td>8.0</td><td>7.6</td><td>16.0</td><td>15.2</td></tr>
<tr><td>EQS010IS</td><td>1t</td><td>12.3</td><td>11.7</td><td>22.0</td><td>20.9</td></tr>
</table></td><td>• Replace the Suspension Eye.</td></tr>
</table>

■ Travel Rail

Item	Check method	Criteria	When failed
Rail Surface	• Check visually.	• To have no attachment of paint, oil and foreign matter. • To have no dust and powder due to abrasion	Clean the Travel Rail.

(to be continued)

Periodic Inspection

Item	Check method	Criteria	When failed
Deformation and Abrasion	• Check the deformation and abrasion visually and measure them with vernier caliper. 	• To have no deformation of beam flange such as twist and shear drop • To have no exceeding abrasion of rail surface • Service limit of B: up to 95 % of the dimension at purchasing • Service limit of t up to 90 % of the dimension at purchasing	Replace or repair the Travel Rail.
Rail Mounting Bolt	• Check visually.	• To have no loosened bolt or fall-off	Tighten the bolts securely.
Stopper	• Check visually. 	• The stoppers must be mounted at the both ends of the Travel Rail securely.	Tighten the Stoppers.

■ Function and Performance

⚠ DANGER

Mandatory

• **After completion of the inspection of each part, perform the operational check for correct operation.**

Neglecting to perform the operational check may result in death or serious injury.

● Perform the following inspections with capacity.

Item	Check method	Criteria	When failed
Operational Check	• Perform the daily inspection items with capacity. (Refer to Daily inspection Items. (P23)	**⚠ DANGER** Mandatory • **Be sure to perform the capacity test after completion of the no-load test.** Performing the capacity test without prior no-load test may result in death or serious injury. • Refer to “Daily Inspection Items”. (P23)	Disassemble the electric chain hoist to check whether it is assembled correctly and has no abnormal part.
Abnormal Noise	• To make the electric chain hoist travel with a capacity	• To have no irregular rotating sound	Disassemble the electric chain hoist to check whether it is assembled correctly and has no abnormal part.

Guidelines for Parts Replacement based on Indication of CH Meter

When performing the inspection, check the number of start and operating hours and utilize them for operation status control and maintenance control.
Check the number of start and operating hours with the indicator of the VFD by the maintenance engineer in accordance with the separate “VFD Manual” and P67 of this manual.

■Guidelines and Precautions on Gear Oil Change Cycle

Change the gear oil in accordance with the rate of loading and the operating hours.

- Change the oil at every five years even if the operating hours do not reach at the following hours.

Rate of loading \ Operating hour for gear oil change		Every 120 hrs	Every 240 hrs	Every 360 hrs
Light	A case where the capacity is rarely applied. Usually the hoist is used with a light load.			○
Medium	A case where the capacity is applied considerably frequently. Usually the hoist is used with a medium load.		○	
Heavy	A case where the capacity is applied considerably frequently. Usually the hoist is used with a heavy load.	○		
Ultra heavy	A case where the capacity is applied constantly.	○		

⚠ CAUTION

Mandatory

- **Use of wrong gear oil may result in the drop of the lifted load. Be sure to use the designated gear oil.**

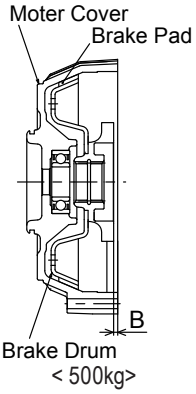
Gear oil kind and amount for main unit

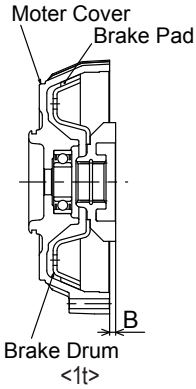
Code	Amount gear oil(ml)	Oil
EQS005IS	510	KITO genuine product
EQS010IS	840	KITO genuine product

■Guidelines for Checking Brake

- When the number of start reaches 1 million times, check the dimension of B and execute the counteraction in the table below depending on the condition.
- When the number of start reaches 2 million times, replace the brake drum, motor cover, brake spring and pull rotor spring no matter what condition the B dimension is.

Condition of B dimension	Action
When it reaches the critical limit	Replace the brake drum, motor cover, brake spring and pull rotor spring.
When it reaches near end of the critical limit rather than the intermediate point between standard and critical limit.	From that time on, check the B condition every hundred thousand times of use till it reaches to the critical limit.
When it reaches near end of the standard rather than the intermediate point between standard and critical limit.	Check the B condition every two hundred thousand times of use.





Abrasion of Brake pad when using Brake

Code	Capacity	Speed	B dimension (mm)		Criteria
			Standard	Critical limit	
EQS005IS	500kg	Dual	3	3.5	Not to exceed
EQS010IS	1t		4	3.5	Not to fall below

■Guidelines on Gear Parts Replacement (Load Gear, Friction clutch with Gear 2, Gear 3)

Operating hours to replace parts / Body size grade	Every 800 hours	Every 1600 hours	Every 3200 hours
M5, 2m, H4	–	Parts replacement	–
M6, 3m	–	–	Parts replacement

■Guidelines on Motor Shaft (with Rotor) Replacement

Operating hours to replace parts / Body size grade	Every 400 hours	Every 800 hours	Every 1600 hours	Every 3200 hours
M5, 2m, H4	–	Apply grease on spline	Parts replacement	–
M6, 3m	–	Apply grease on spline	–	Parts replacement

* Grease needs to be applied on spline part every 800, 1600 and 2400 hours.

■Guidelines on Bearing Replacement

Operating hours to replace parts / Body size grade	Every 800 hours	Every 1600 hours	Every 3200 hours
M5, 2m, H4	–	Parts replacement	–
M6, 3m	–	–	Parts replacement

■Guidelines on Hook, Yoke and Suspension Eye Replacement

Replace the Hook, Yoke and Suspension Eye in accordance with the rate of loading and the number of start in the following table.

Number of start to replace parts / Rate of loading		Every million times	Every 1.5 million times	Every 2 million times
Light	A case where the capacity is rarely applied. Usually the hoist is used with a light load.			○
Medium	A case where the capacity is applied considerably frequently. Usually the hoist is used with a medium load.		○	
Heavy	A case where the capacity is applied considerably frequently. Usually the hoist is used with a heavy load.	○		
Ultra heavy	A case where the capacity is applied constantly.	○		

Check of Operating Hours and Number of Start (CH Meter)

⚠ CAUTION

This section is extracted from the VFD Manual.For details on operation, etc, refer to the separate VFD Manual.

■Start Times/Operating Hour Display Device

The numbers of start of the upper level and lower level are separately displayed on the LED operator.
Calculate the numbers of start from the display.

■The display contents of the number of start and operating hours

The numbers of start of the upper level and lower level are separately displayed as shown below.

No.	Name	Content
U7-01	Number of start (upper)	The sum of the lifting/lowering of 1,000 times is displayed as 1 unit. The maximum of 10,000 units is displayed. This indicates 10,000 × 1,000=10,000,000 times.
U7-02	Number of start (lower)	The sum of the lifting/lowering is displayed as 1 unit. The maximum of 999 units is displayed. Once it counts 1,000 times, the value of U7-01 (upper) is counted as +1 while U7-02 (lower) goes back to 0.
U7-03	Operating hours	The operating hours are displayed by the hour. The maximum of 65,535 hours is displayed.

Note: The maximum value which is displayable does not indicate the expiry of service life.

■Displaying of the numbers of start and operating hours

To display the numbers of start and operating hours on the LED operator, follow the procedure below.
The following is the example of displaying the operating hours.

Ex.) Refer to the below for the display as taking an example of U7-03 (Operating time).

Operating Procedure

1. Turn the power on.
2. Press ∧ till the monitor screen is displayed.
3. Press ENTER to display the Parameter setting screen, and press ESC.
4. Press ∧ or ∨ to display U7-01.
5. Press RESET, ∧, or ∨ and set to U7-03 (operating hours)
6. Press ENTER to display the current value.
7. To finish monitoring and resume operation, hold ESC down till the screen returns to the initial screen.

LED Display

Initial screen

Parameter setting screen

75 hours

(to be continued)

■ Calculating the number of start

Calculate the numbers of start of the upper level and lower level from the display.

The following is the calculation example.

Example: When “81” is displayed on U7-01 and “567” is displayed on U7-02

The number of start of lowering = 81 × 1,000 + 567 is 81,567 times.

■ Converting the operating hours

When “122” is displayed on U7-03, the operating hours are 122.

Chapter 3

Troubleshooting

This chapter describes the main failure cause and inspection items based on the fault conditions. The repair work (and maintenance work as well) of the electric chain hoist is accompanied with disassembling/assembling work. Refer to the separate “Disassembling/Assembling Manual” for the correct work.

Guidance on Troubleshooting

■Guidance on Troubleshooting

Following table is the summary of the main failure causes based on the failure conditions and their inspection items. Refer to the page of each item for the check method, treatment and the details of countermeasure.

Conditions		Main fault contents	Check item	Reference page
Unable to restart the VFD by resetting with emergency stop (the case when the VFD cannot be reset even after cool down)		Those related to VFD	Check the error code of VFD referring to “VFD Manual”.	“VFD Manual” (annex)
Electric chain hoist does not operate without load	Sounds no brake operating sound	Improper source voltage	Power	78
		Breakage and burning of control circuit Faulty electrical part	Circuit breaker	78
			Power Cable	79
			Internal wiring	81
			HBB Board	84
			VFD	84
			Upper/Lower Limit Switch	82
			Push Button Switch	83
		Breakage and burning of power circuit Failure of motor or brake	Motor	83
			Internal wiring	81
		VFD trip due to motor overheat (electronic thermal relay)	VFD	84
		VFD overheat	VFD	84
	Sounds brake operating sound	Breakage of driving part Sticking of Bearing	Gears	90
			Bearing	91
Electric chain hoist operates without load	Does not operate with a load (Motor sounds howling)	Overload (Clutch activated)	Friction Clutch	85
	Operates slowly with a load	Voltage drop	Power Cable	79
	Electric chain hoist operates in low speed mode, but does not operate in high speed mode or operates slowly.	Low source voltage	Power	78
		Voltage drop	Power Cable	79
	Does not operate in lowering or in low speed mode.	Faulty Braking Resistor	Braking Resistor	84
Operates differently from the indication of the Push Button Switch.	Operates differently from the indication of the Push Button Switch (operates in the opposite direction)	Negative phase connection of motor lead wires	Motor	83
		Wrong connection	Internal wiring	81
			Push Button Switch	83
	Does not operate when operating any one of the Push Button Switch	Breakage of control circuit	Internal wiring	81
			Push Button Switch	83
		Faulty electrical part	VFD	84
			HBB Board	84
			Upper/Lower Limit Switch	82

Conditions			Main fault contents	Check item	Reference page
Does not stop normally	Too long (or short) stopping distance		Abrasion of brake lining	Brake	81
	Does not stop at the upper/lower limit.		Negative phase connection of motor lead wires	Power Cable	79
			Wrong connection	Internal wiring	81
				Push Button Switch	83
Abnormal noise	Popping sound		Abrasion of the Load Chain Abrasion of the Load Sheave	Load Chain	88
				Load Sheave	90
	Sounds strange operating sound		Abrasion or breakage of Gear Deterioration of Bearing	Gears	90
				Bearing	91
	Brake noise	Sounds when applied (scraping noise)	Dragging	Brake	81
		Sounds when released	Abrasion of brake lining	Brake	81
	Sounds at curved rail (friction noise)		Mechanical interference of the rail and the wheel	Traveling motion of the Trolley	91
Unable to travel	Manual Trolley		Slipping wheel	Traveling motion of the Trolley	91
			Inclined rail		
			Pulling a load in an inclined direction (floating wheel)		
Serpentine motion Sounds strange noise	Manual Trolley		Mechanical interference of the rail and the wheel	Traveling motion of the Trolley	91
			Wrong adjustment of spacer		
			Uneven abrasion of the wheel		
			Deformation of the wheel		
			Deterioration of Bearing		
			Deformation and abrasion of the rail		
			Deterioration of the Bearing		
Hook and those related to Hook			Deformation	Hook	86 87
Load Chain and those related to Load Chain			Abrasion, elongation, twist	Load Chain	88
Electric shock when touching the body size and Push Button Switch			Improper grounding, breakage of earth wire	Electric shock	85

Safety Precautions

■General Matters on Failure Cause and Countermeasure

⚠ DANGER


Prohibited

- **Do not disassemble or repair the electric chain hoist by the personnel other than maintenance engineer.**
  "Disassembling/Assembling Manual" and "Parts List" are provided separately for the maintenance. Disassembling and repair must be performed by the maintenance engineer in accordance with these materials for maintenance.

Failure to comply with this content may result in death or serious injury.


Mandatory

- **When replacing the part, be sure to use the genuine part for KITO electric chain hoist EQS and EQSSP.**
  Even if the part is the KITO genuine part, the part for different model may not be used. Use the correct part in accordance with separate "Disassembling/Assembling Manual".
- **When any abnormality is observed during the repair (maintenance) of the electric chain hoist, survey the cause by the maintenance engineer and carry out the repair.**
- **Be sure to keep the following when repairing the electric chain hoist:**
  - **Be sure to turn off the power.**
  - **Be sure to indicate "CHECKING".**
  - **Carry out the repair without lifting a load.**
- **Be sure to pay attention to the change of the operating sound of electric chain hoist and trolley.**
  The change of operating sound is an important factor to judge the failure.

Failure to comply with this content may result in death or serious injury.

⚠ CAUTION


Prohibited

- **Only use the manufacturer's genuine push button switch device.**

■General Matters on Handling of Dual Speed VFD Model

The Dual Speed VFD model is controlled by VFD for important items related to safety such as operation, braking and emergency stop. Be sure to follow the safety precautions below as well as the above safety precautions.

⚠ DANGER

Prohibited

- **Do not reassemble the Dual Speed VFD model to contactor type.**
- **Do not change parameters.**
  When parameters need to be changed, ask distributor or KITO.
- **Do not carry out the work such as maintenance and inspection within 5 minutes after power off.**
  Wait for the completion of discharging of the capacitor inside the VFD and DPC.
- **Fan Cover becomes very hot during operation. Do not touch it.**
- **Do not touch the Fan Cover within 30 minutes after the operation.**
- **Do not change the connection of the VFD and DPC.**
  When the wires were removed for any reason, connect them again correctly checking the wiring diagram inside the controller cover.
- **Do not carry out withstand voltage test and insulation resistance measurement of a circuit by megger while the VFD is connected.**
- **Do not turn off the power while operating.**
- **Never turn off the power when a load is suspended.**
  Never, under any circumstances, turn off the power when a load is suspended. Doing so will cause the load to be slightly lowered after the power is turned on again due to control system initial preparation.

Failure to comply with these instructions may result in death or serious injury and the damage of VFD and DPC.

Mandatory

- **USE KITO genuine VFD and DPC.**
  The VFD and DPC requires the special specification for KITO. Be sure to use genuine VFD and DPC.

Failure to comply with this instruction may result in death or serious injury.

⚠ CAUTION

Prohibited

- **Do not connect the three phrase power supply to the inverter with power supplied to the DPC primary side.**

Otherwise it causes damage or flaw of the electric chain hoist, bodily injury or loss of property due to the drop of the lifted load.

Mandatory

- **Check that the power supply (three phase, single phase) is not mistaken before connecting it.**
- **Check visually to make sure there is no poor connection with the terminals or disconnections due to the wire getting caught in the controller cover.**

Failure to comply with this content may result in death or serious injury.

Troubleshooting

Power

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Improper source voltage	Measure the voltage of each phase at power receiving terminal. If the source voltage is improper, check the power receiving facility. **⚠ DANGER** Mandatory • **Be careful about electric shock when checking the power.** Careless power check may result in death or serious injury due to electric shock.	Faulty power receiving facility	Check the power receiving facility regularly.

Circuit breaker (Distribution panel)

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Breaker was tripped due to short circuit.	Replace or repair the short-circuited part.	Cable breakage, burning of electrical parts	Refer to each item of Power Cable, Motor and Internal Wiring.
	Breaker was tripped due to insufficient breaker capacity.	Check the breaker capacity. Replace it if the capacity is insufficient.	Wrong selection of breaker capacity	Use the breaker with proper capacity. (See P39 .)
	Breaker was tripped due to over current.	Check the cause of over current and take the necessary countermeasure. (Refer to each item of Power Cable, Motor, Brake and Internal Wiring.)	Over voltage, low voltage, over load	Refer to each item of Power Cable, Motor, and Internal Wiring.

Power Cable

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Wire breakage (more than two wires)	Check the conduction, flaw, crimping of terminals and soldering of plug. When any deficiency was observed, repair or replace the cable.	Excessive force applied on the cable	Support the cable with Cable Support Arm securely.
			Non use of shake proof cable	Use shake proof cable to the moving part.
			Twist of wire	Layout the wires without twisting.
			Cable was impeded by other facility.	Fix the cable not to be impeded by other facility.
	Wire burning (more than two wires)	Check the cable. Replace it if burnt.	Temperature rise due to insufficient cable capacity	Use the cable with proper capacity. (See P39 .)
			Cables are bundled.	Do not bundle wires.
	Insufficient insertion of plug	Insert the connector plug to the end of the receptacle. Tighten the coupling ring securely.	Insufficient insertion at the installation	Fix the connector plug to the receptacle securely.
			Loosening of the fixing thread due to impact or vibration	Use the electric chain hoist avoiding the large impact.
Slow start or unable to start	Insufficient cable capacity	Check the cable size for adequacy. Replace with the proper cable if the cable capacity is insufficient.	Voltage drop due to insufficient cable capacity	Use the cable with proper capacity. (See P39 .)
Electric chain hoist operates but unable to lift a load. (single phase status)	Breakage or burning of one wire only	Refer to the breakage and burning of above items.		

(to be continued)

Troubleshooting

Motor

Symptom	Cause	Remedy	Main factor	Countermeasure
Motor does not operate.	Motor coil burning (two or more phases)	Measure the coil resistance of each phase. Replace the motor when the resistance of all phases are infinity.	Over current due to over voltage or low voltage	Operate the electric chain hoist at the rated voltage.
			Over current due to over load	Operate the electric chain hoist with a load less than the capacity.
			Operation exceeding intermittent rating	Check the intermittent rating. Operate the electric chain hoist within these ratings.
			Excessive inching or plugging operation (consecutive impression of start rush current)	Do not perform excessive operation.
			Over current due to brake dragging	Refer to the items of Brake.
	Lead wire breakage (more than two lead wires)	Measure the coil resistance of each phase. Replace the motor when the resistance of all phases are infinity.	Lead wire damaged at assembling	Assemble with care.
			Vibration, impact	Use the electric chain hoist avoiding the impact.
Electric chain hoist operates but unable to lift a load. (single phase status)	Motor coil burning (only one phase)	Measure the coil resistance of each phase. Replace the motor when the resistance of all phases are infinity.	Layer short due to poor insulation of coil (between phases)	Be careful about the intrusion of foreign matter into the motor when assembling.
	Lead wire breakage (only in one lead wire)	Measure the coil resistance of each phase. Replace the motor when the resistance of all phases are infinity.	Lead wire damaged at assembling	Be careful not to have the lead wire caught when assembling.
			Vibration, impact	Use the electric chain hoist avoiding the impact.

Brake

Symptom	Cause	Remedy	Main factor	Countermeasure
Stops after traveling over 4 to 5 links after the operation is stopped. (Guideline: The travel of the Load Chain is within 2 to 3 links.)	Abrasion of brake lining	Check the manner of operation (excessive inching or frequent use). Carry out the inspection and use it correctly.	Excessive inching Frequent use	Check the electric chain hoist regularly. Use it correctly in accordance with the manual.
The load slides down when stopped	Defective function of the Friction	Check the place to use and friction function. Carry out the inspection and use it correctly.	Abrasion from habitual use for a long time Change in mechanical characteristics from leaving it for a long time	Use it correctly in accordance with the manual Pay attention to the place to use and the storage place.

Internal wiring

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Breakage of wire	Check the wire. Repair the wire if broken.	Vibration, impact	Use the electric chain hoist avoiding the impact.
			Lead wire damaged at assembling	Be careful not to have the lead wire caught when assembling.
		Check the terminal. Repair the terminal if it is broken.	Improper crimping	Use the proper crimping tool.
	Wrong wiring	Check the wiring in accordance with the wiring diagram. Correct the wiring if it is wrong.	Wrong wiring at assembling	Correct the wiring in accordance with the wiring diagram.
	Loosened terminal screw (results in heat generation to burn)	Tighten the loosened screws.	Insufficient tightening at assembling	Tighten screws securely.
			Vibration, impact	Use the electric chain hoist avoiding the impact.
	Incomplete connection of plug, connector and insertion terminal	Connect plug, connector and insertion terminal correctly if they are not connected securely. Tighten the lock ring of the connector plug securely.	Incomplete connection at assembling	Connect plug, connector and insertion terminal securely.

Troubleshooting

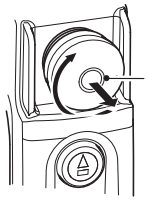
DPC

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate	Wrong wiring	Check the wiring in accordance with the wiring diagram. Connect the Faston terminal on the correct DPC panel.	Wrong wiring at assembling	Correct the wiring in accordance with the wiring diagram.
	Fuse blown out	Check the conduction of the fuse.	Burn out of the DPC	Replace the DPC.

Upper/Lower Limit Switch

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate. (Electromagnetic Contactor or VFD does not operate.)	Contact point fusing	Actuate the limit switch manually to check the conduction of the contact points. Replace the limit switch as a whole when no conduction.	Habitual use of the limit switch	Do not use the limit switch habitually.
	Breakage	Check the wiring. Repair or replace the limit switch as a whole if the limit switch has no conduction.	Vibration, impact	Use the electric chain hoist avoiding the impact.
	Defective return action of the moving part	Check the moving part of the limit switch is not stiff. If it is stiff, replace the limit switch as a whole.	Leaving the electric chain hoist for a long time at the upper/lower limit.	Do not leave the electric chain hoist at the upper/lower limit.
Electric chain hoist does not stop at the upper/lower limit.	Contact point welding	Actuate the limit switch manually to check the conduction of the contact points. Replace the limit switch as a whole when it does not turn off.	Habitual use of the limit switch	Do not use the limit switch habitually.
	Moving part rusted shut	Check the moving part of the limit switch is not stiff. If it is stiff, remove the rust or replace the stiff part.	No use for a long time, use in an environment with rich moisture	Check the electric chain hoist regularly.
	Wrong wiring	Check the wiring in accordance with the wiring diagram. Perform the wiring correctly. If the wiring of the limit switch is correct, the cause is in the negative phase connection. Change two wires of the power line.	Wrong wiring	Correct the wiring in accordance with the wiring diagram.

Push Button Switch

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Emergency Stop button is pressed to its end and locked.	When the Emergency Stop button is pressed and locked, pull the button forward or turn it clockwise to release the lock. 	Forgot releasing the Emergency Stop button	Read “How to Operate the Push Button Switches” (P24) and use the electric chain hoist.
	Faulty switch unit	Check the conduction of the contact points. Replace the Push Button Switch if it has no conduction.	Vibration, impact	Use the electric chain hoist avoiding the impact.
	Breakage inside the switch	Check that the Push Button Switch cord is connected with the switch unit correctly. Repair the cord if it has no conduction.	Vibration, impact	Use the electric chain hoist avoiding the impact.
	Loosened screw to fix the casing	Tighten the screw if loosened	Vibration, impact	Use the electric chain hoist avoiding the impact.
	Wire breakage of Push Button Switch Cord	Check the conduction of the Push Button Switch Cord. If it has no conduction, replace the cable, or the Push Button Switch Cord as a set.	Damage of cable cover	Operate the electric chain hoist not to impede with other facility.
			External force applied on the cable due to improper tying of the protection wire	Tie the protection wire securely. (See “Connecting Cables” (P40).)
The electric chain hoist does not operate as indicated.	Wrong wiring	Check the wiring in accordance with the wiring diagram. Perform the wiring correctly. If the wiring of the Push Button Switch is correct, the cause is in the negative phase connection. Change two wires of the power line.	Wrong wiring	Correct the wiring in accordance with the wiring diagram.
	Wrong affixing of N-E-S-W label	Affix the label in the correct direction.	Affixing the label in an improper direction	Affix the label correctly.
Electric chain hoist does not stop even if the Push Button is released.	Defective return action of the switch unit	Replace the Push Button Switch if it does not operate smoothly.	Vibration, impact	Use the electric chain hoist avoiding the impact.

(to be continued)

Troubleshooting

VFD

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Overload	Inverter stops due to Overload Limiter To resume operation, reset the VFD by pressing Emergency or Lower button.	Overload	Make sure that the load is within the rated load. The ambient temperature is below 0 degree in celsius, operate the chain hoist for a while with no load.
	VFD failure	Reset the VFD by pressing Emergency Stop button. It the VFD still does not operate, check it.	VFD failure	Check the error code indicated by VFD referring to the “VFD Manual”.
	Motor overheat	Stop by motor thermal relay function of the VFD. Motor resumes operation when the VFD is reset by pressing the Emergency Stop after cool down.	Operation exceeding intermittent rating	Check the intermittent rating. Use the electric chain hoist within these ratings.
	VFD overheat	Stop by overheat preventive function of the VFD. Motor resumes operation when the VFD is reset by pressing the Emergency Stop after cool down.	Operation exceeding intermittent rating	Check the intermittent rating. Use the electric chain hoist within these ratings.
	Expired service life of the VFD (capacitor)	Refer to the “VFD Manual”.	Operation exceeding intermittent rating	Check the intermittent rating. Use the electric chain hoist within these ratings.
The electric chain hoist operates in the direction different to the push button operation (negative phase).	Wrong connection of power line when wiring.	Change two wires of the Motor.	Wrong connection at assembling	Connect wires correctly.

DANGER


Prohibited

- **Do not change the connection at the Push Button Switch circuit.**

The change of circuit at the Push Button Switch circuit is very dangerous as the limit switch becomes not to function.

HBB Board

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Damaged circuit component	Press the Push Button to check if the main body operates. If it doesn’t operate, replace the HBB Board. * Be careful about electric shock when checking energizing.	Service life expiry or damage	Replace the HBB Board.
	Contact failure of connector	Check the conduction of the connector. Replace the connector if it has no conduction.	Defective assembling of the connector	Crimp and insert the connector pins securely.

Braking Resistor

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric chain hoist does not operate.	Resistor breakage	Measure the resistance of the resistor. Replace the resistor if the resistance is infinity.	Operation exceeding intermittent rating, over load	Use the electric chain hoist within the ratings.

Electric shock

Symptom	Cause	Remedy	Main factor	Countermeasure
Electric shock when touching the body size and Push Button Switch	Improper grounding	Measure the grounding resistance. If it exceeds 100 Ω, perform grounding work in accordance with the relevant laws and regulations.	Defective grounding work	Perform the grounding work securely.
			Contact failure of the grounding wire	Connect the grounding wire securely without loosened screw
			Breakage of grounding wire	Layout the grounding wire to avoid the stress applied on it. (See the item of Power Cable and Push Button Switch.)
	Attachment of waterdrop	Remove the waterdrop, dry the electric chain hoist and then use it.	Operation by wet hand	Do not operate the electric chain hoist by wet hand.

Friction Clutch

⚠ DANGER


Prohibited

- **Do not adjust/disassemble the Friction Clutch.**

Adjusting or disassembling the Friction Clutch may result in death or serious injury.

Symptom	Cause	Remedy	Main factor	Countermeasure
Unable to lift a load, or the load lowers after stop.	Clutch is activated (normal)	Lighten the load less than the rated load and use the electric chain hoist.	Over load	Use the electric chain hoist with a load less than the rated load.
	Abrasion of Clutch Disk	Replace the Friction Clutch.	Too many use of the Friction Clutch	Avoid the over load.
			Approaching service life limit	Do not use the body size exceeding the service limit.
	Change in mechanical characteristics of the Friction Clutch		Use of oil other than the designated oil	Use KITO genuine oil.
			Leaving the electric chain hoist for a long time without use	Pay attention to the place to use and the storage place.
	Temperature rise inside the gear box	Resume the operation after cool down. When it is still unable to lift a load, replace the Friction Clutch.	Use in a hot environment, or excessively frequent use	Avoid the use in a hot environment or excessively frequent use.

⚠ DANGER


Mandatory

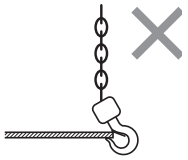
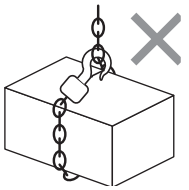
- **Use KITO genuine gear oil.**

Use of the oil other than KITO genuine oil may result in death or serious injury due to the drop of a lifted load.

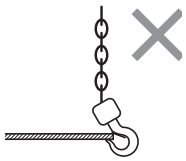
(to be continued)

Troubleshooting

Hook

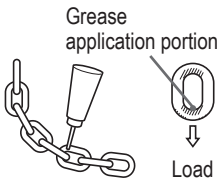
Symptom	Cause	Remedy	Main factor	Countermeasure
Widened Hook opening	Deformation of the Hook	Replace the Hook if the deformation exceeds the criteria. (See P54 .)	Over load	Use the electric chain hoist with a load less than the capacity.
			Earth lifting	Do not carry out earth lifting. Be careful not to impede the Hook with protruding object during lifting.
			Slinging a load at the tip of the Hook.  Lateral pulling of the Hook	Sling a load at the center of the Hook
			Improper slinging	Angle formed by two slings must be 120 degrees or less.  120 degrees or less
			Use of the sling with a size improper to the Hook	Use the proper sling.
Twisted hanging of the Hook			Use of the Hook with the Load Chain wound on a load 	Do not wind the Load Chain directly on a load.
Hook unable to swivel smoothly at the neck	Rusting shut or corrosion of Bearing	Swivel the Hook at the neck by hand. If it is difficult to swivel smoothly, overhaul or replace the Bearing.	Insufficient grease application, corrosion due to environment of use	Apply grease regularly. Use the sling to avoid the dipping of the Hook into chemicals.
	Damaged Bearing		Intrusion of dust	Be careful about the intrusion of foreign matter into the neck.

Hook (continued)

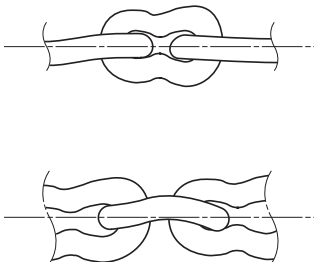
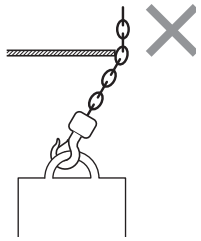
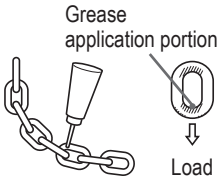
Symptom	Cause	Remedy	Main factor	Countermeasure
Hook Latch has come off	Deformation of the Hook	Replace the Hook if the deformation exceeds the criteria. (See P54 .)	Over load	Use the electric chain hoist with a load less than the capacity.
			Earth lifting	Do not carry out earth lifting. Be careful not to impede the Hook with protruding object during lifting.
			Use of the sling with a size improper to the Hook	Use the proper sling.
	Deformation and come-off of the Hook Latch	Replace the Hook Latch if it has come off or is deformed.	Sling put on the Hook Latch	Do not put the sling on the Hook Latch.
Hook bent at the neck (shank)	Deformation or damage of the Hook at its neck	Replace the Hook bent at the neck.	Lifting a load at the tip of the Hook  Lateral pulling of the Hook	Sling a load at the center of the Hook
Hook unable to swivel smoothly at the neck	Rusting shut or corrosion of Bearing	Swivel the Hook at the neck by hand. If it is difficult to swivel smoothly, overhaul or replace the Bearing.	Insufficient grease application, corrosion due to environment of use	Apply grease regularly. Use the sling to avoid the dipping of the Hook into chemicals.
	Damaged Bearing		Intrusion of dust	Be careful about the intrusion of foreign matter into the neck.

(to be continued)

Load Chain

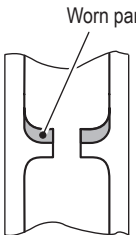
Symptom	Cause	Remedy	Main factor	Countermeasure
Twisted Load Chain	Load Chain is twisted inside the main body of the electric chain hoist.	Remove the Chain Guide and the Load Chain, and then reassemble them.	Improper assembling	Assemble the electric chain hoist correctly. (See Disassembling/ Assembling Manual)
Sudden activation of the Friction Clutch when lowering	Knot of the Load Chain due to entanglement in the Chain Container	Check the capacity of the Chain Container (with the nameplate on the Chain Container). If insufficient, replace the Chain Container with a larger capacity.	Insufficient capacity of the Chain Container	When installing the electric chain hoist, check the lift and the capacity of the Chain Container, and assemble them correctly.
Sounds the popping sound	Abrasion of the Load Chain links	Measure the abrasion of wire diameter. Replace the Load Chain if it reaches at the abrasion limit. (See P73)	Long hour operation without grease	Apply lubricant regularly. (See P34) 
			Excessive inching operation	Do not perform excessive operation.
			Over load	Use the electric chain hoist with a load less than the capacity.
			Pulling a load in an inclined direction	Do not pull a load in an inclined direction.
			Abrasion of Load Sheave	Refer to the item of Load Sheave.
	Elongation of pitch	Measure the sum of pitches of 5 links. Replace the Load Chain if this value exceeds the limit value. (See P65)	Over load	Use the electric chain hoist with a load less than the capacity.

Load Chain (continued)

Symptom	Cause	Remedy	Main factor	Countermeasure
Irregular noise	Flaw and deformation of the Load Chain surface	Replace the Load Chain with apparent flaw or deformation. 	Use of the Load Chain without canceling capsized state	When using multi fall model hoist, check that the Hook is not capsized before use.
			Use of the Load Chain as twisted	Assemble the electric chain hoist correctly. (See Disassembling/ Assembling Manual)
	Hit flaw on the Load Chain surface		Hit with other object strongly 	Use the electric chain hoist carefully paying attention not to impede with other object.
Surface losing lust and discolored	Rusting and corrosion	Remove rust and apply oil. Replace the Load Chain if the rust and corrosion is apparent.	Run-out of oil	Apply lubricant regularly. (See P31) 
			Use of electric chain hoist exposed to rain	Store the electric chain hoist indoor or under the roof when not using.
			Influence of sea water and chemicals	Contact KITO for the use in special environment in advance. Use the electric chain hoist correctly within the scope guaranteed by the manufacturer.
Breakage of the Load Chain	Expiry of the service life	Check the Load Chain and replace it if exceeded the criteria. (See P54)	Mechanical service life expiry	Handle the Load Chain correctly and perform the appropriate control including daily inspection and inspection.

(to be continued)

Load Sheave

Symptom	Cause	Remedy	Main factor	Countermeasure
Sounds popping sound	Abrasion of sheave pocket or flaw by the Load Chain out of mesh with the Sheave 	Measure the thickness of the crest. Replace the Sheave if the thickness is less than the criteria. (See P64) The Load Chain may be worn. Check also the Load Chain.	Long hour operation without grease, expiry of service life	Apply lubricant regularly. (See P34)
			Excessive inching operation	Do not perform excessive operation.
			Over load	Use the electric chain hoist with a load less than the capacity.
			Pulling a load in an inclined direction	Do not pull a load in an inclined direction.

Chain Guide

Symptom	Cause	Remedy	Main factor	Countermeasure
Swinging of a load became larger than when purchasing	Abrasion of cross guide	Measure the standard dimension. Replace the Chain Guide if the standard dimension exceeds the criteria. (See P60) The Load Chain may be worn. Check also the Load Chain.	Pulling a load in an inclined direction	Do not pull a load in an inclined direction.

Gears

Symptom	Cause	Remedy	Main factor	Countermeasure
Unable to lift a load.	Abrasion, Damage	Replace gear or joint if it is worn apparently or damaged	Long hour operation without oil	Keep the oil change cycle. (See P69)
Irregular motion	Partial abrasion or damage		Too many use of the Friction Clutch	Avoid the over load.
			Habitual use of Upper/ Lower Limit Switch	Do not use Upper/ Lower Limit Switch habitually.

⚠ DANGER

Mandatory

- **Use KITO genuine gear oil.**

Use of the oil other than KITO genuine oil may result in death or serious injury due to the drop of a lifted load.

(to be continued)

Bearing

Symptom	Cause	Remedy	Main factor	Countermeasure
Unable to lift a load.	Sticking, Breakage	Replace the bearing.	Use under hot environment or excessively frequent use	Avoid using under hot environment or excessively frequent use
Strange noise	Deterioration	Replace the bearing.	Use under hot environment or excessively frequent use	Avoid using under hot environment or excessively frequent use

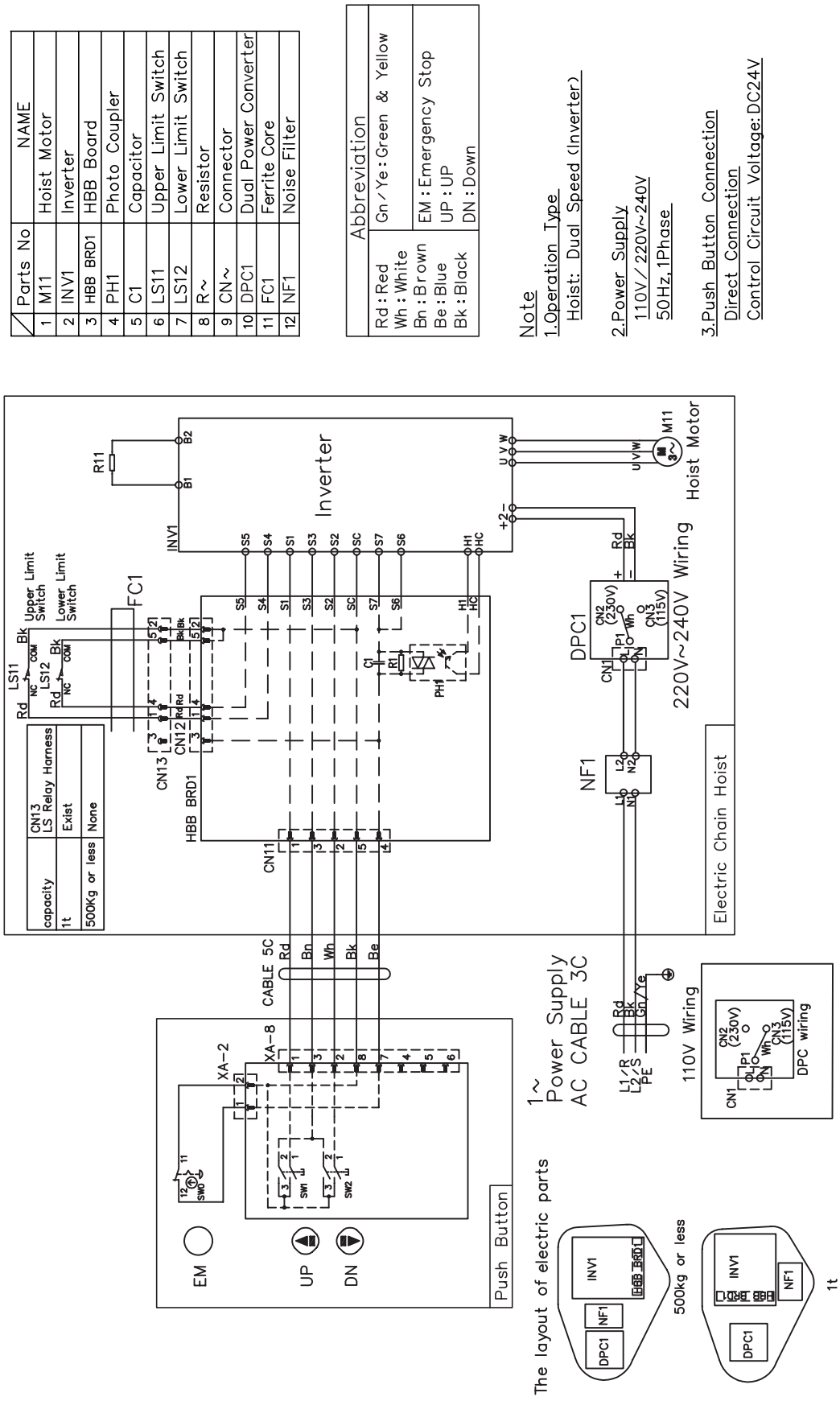
Traveling motion of the Trolley

Symptom	Cause	Remedy	Main factor	Countermeasure
Unable to travel due to slipping of wheel	Inclination of Travel Rail	Make sure that rail gradient is within 1 degree.	Improper installation of Travel Rail	Install the Travel Rail correctly.
Unable to travel due to slipping of wheel, or unable to travel in uniform motion	Oil attachment on running surface of the rail	Wipe off the attached foreign matter of the rail.	Use under the environment likely to attach foreign matter	Clean the Travel Rail regularly.
Sounds abrasion sound when running on a curved rail	Friction resistance between wheel and rail	Apply small amount of grease on the rail surface where noise generates.		
Unable to travel on the curved rail				
	Interference of the trolley and the curved rail	Make sure that the rail curvature is larger than the minimum turning radius. (See P36)	Use of the curved rail of curvature less than minimum turning radius	Do not use the curved rail of curvature less than minimum turning radius
Unable to travel due to wheel floating	Pulling a load in an inclined direction (floating wheel)	—	Operating method	Use the electric chain hoist correctly.
Wheel unable to rotate	Defective gear engagement	Remove the stain and foreign matter on the wheel and the gear.	Ambient conditions, environment	Check regularly.
Serpentine motion Strange noise	Wrong adjustment of spacer	Check the number of spacers and their assembled positions.	Incomplete checking	Assemble correctly.
	Uneven abrasion of the wheel	Check the abrasion of the wheel.	Traveling on curved rail or unevenness of running surface	Check regularly.
	Deformation of wheel	Check the distortion of wheel and damage of running surface.	Excessively frequent collision with stopper or unevenness of running surface	Replace the wheel Use the electric chain hoist correctly.
	Deterioration of wheel bearing	Check if rolling noise sounds when the wheel is rotating.	Expiry of service life	Replace the wheel bearing.
	Deformation and abrasion of the rail	Check the abrasion and deformation of the rail.	Over load or expiry of service life	Replace the rail. Use the electric chain hoist correctly.

Appendix

Wiring Diagram

■EQS Wiring Diagram (110V, 240V class)



Parts List

■Body, gear case, motor

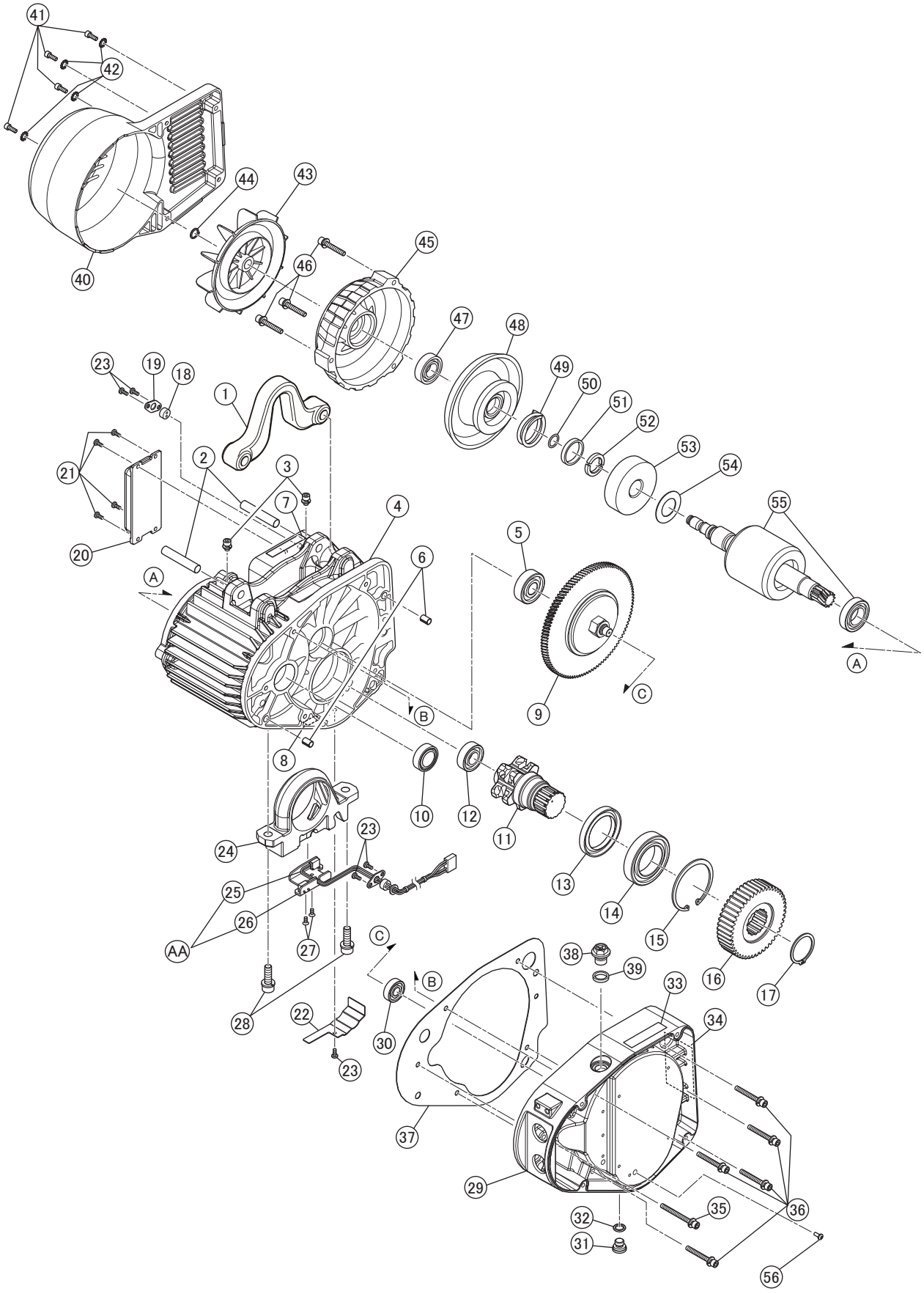


Figure #	Part Number	Part Name	Quantity per unit	Part Code		Remark
				EQS005IS	EQS010IS	
1	001	Suspension Eye	1	EQ1CI9001	EQ1DI9001	For KITO EQ trolley connection
2	121	Top pin	2	EQ1CI9121	EQ1DI9121	
3	033	Machine screw socket bolt	2	J1BG1-0601010	←	For Top pin
4	5501	Body with stator	1	EQ1BMC05I5A1	EQ1BMC10I5A1	
5	238	Ball bearing	1	J1GR000-06202	J1GR0A0-06303	
6	137	Set pin S	2	E6SE005S9120	←	
7	820	Warning sticker HW	1	ER2CI9807	←	
8	960	Name plate side E	1	ER1BS9960	←	
9	1223	Friction clutch complete set	1	EQ1CI1223	EQ1DI1223	
10	244	Oil seal	1	EQ1CI9244	EQ1DI9244	For Motor shaft
11	241	Load sheave	1	EQ1CI9241	EQ1DI9241	
12	242	Ball bearing	1	J1GR0C0-06005	J1GR0C0-06006	For Load sheave
13	245	Oil seal	1	EQ1CI9245	EQ1DI9245	For Load sheave
14	243	Ball bearing	1	J1GR0A0-06007	J1GR0A0-06009	For Load sheave
15	207	Snap ring	1	JISR000-00062	JISR000-00075	For Bearing (load side)
16	240	Load gear	1	EQ1CI9240	EQ1DI9240	
17	208	Snap ring	1	JISS000-00034	JISS000-00040	For Load gear
18	187	Packing	1	EQ1DI9187	←	
19	153	Cable holder	1	EQ1DI9153	←	
20	5505	Braking resistor assembly	1	INV705E16	INV715E16	
21	194	Machine screw with spring washer	2	J1AP2-4001010	×	For Braking resistor
			4	×	J1AP2-4001010	
22	151	Limit switch cord cover	1	EQ1CI9151	EQ1DI9151	
23	152	Machine screw with spring washer	5	J1AP2-4001010	←	For Limit switch cord cover, Cable holder
24	331	Chain guide	1	EQ1CI9331	EQ1DI9331	
(AA)	1333	Limit switch assembly	1	EQ1CI1333	EQ1DI1333	
25	1060	Limit switch complete set	1	EQ1DI1060	←	
26	333	Limit switch cover	1	EQ1CI9333	EQ1DI9333	
27	335	Machine screw	2	J1AL2-4001010	←	
28	165	Machine screw socket bolt	2	J1BG1-0802525	J1BG1-1003030	For Chain guide
29	110	Gear case	1	EQ1CI9110	EQ1DI9110	
30	239	Ball bearing	1	J1GR0A0-06200	J1GR0A0-06201	
31	133	Oil plug	1	E5FE003S9111	←	
32	136	Plug packing	1	E2YS005-9109	←	
33	810	Name plate OF	1	ER2CS9849	←	
34	815	Name plate SP	1	EQP1BMI10I9B6	←	
35	167	Machine screw socket bolt	1	J1BG1-0603030	←	For Gear case
36	162	Machine screw socket bolt	5	J1BG1-0605050	←	For Gear case
37	116	Packing G	1	EQ1CI9116	EQ1DI9116	
38	135	Oil plug B	1	WR2BS9135	←	
39	173	Eyebolt packing	1	E2YS005-9116	←	
40	107	Fan cover	1	EQ1CI9107	EQ1DI9107	
41	164	Socket bolt	4	J1BE1-0501414	←	For Fan cover
42	225	Toothed lock washer	4	J1WH012-10050	←	For Fan cover
43	108	Fan	1	ER2BS9108	ER2CS9108	
44	323	Snap ring	1	J1SS000-00013	←	
45	106	Motor cover	1	EQ1CI9106	EQ1DI9106	
46	163	Machine screw socket bolt	3	J1BG1-0605050	J1BG1-0604040	For Motor cover
47	209	Ball bearing	1	J1GR0C0-06203	J1GR0C0-06004	
48	5212	Brake drum assembly	1	EQ1CI5212	EQ1DI5212	
49	214	Brake spring	1	EQ1CI9214	EQ1DI9214	
50	324	O ring	1	J1OP011-00125	J1OP011-00160	
51	318	Collar	1	E5FE003S9506	E5FE005S9506	
52	317	Thrust disc	2	E5FE003S9505	E5FE005S9505	
53	503	Pull rotor	1	E5FE003S9503	E5FE005S9503	
54	316	Coned disc spring	1	E5FE003S9504	E5FE005S9504	
55	5502	Motor shaft with rotor	1	EQ1CI5502	EQ1DI5502	
56	195	Machine screw with spring washer	1	J1AP2-4001010	←	For earth wire

Pats List (continued)

■Electric, component and chain (For Dual Speed VFD Model)

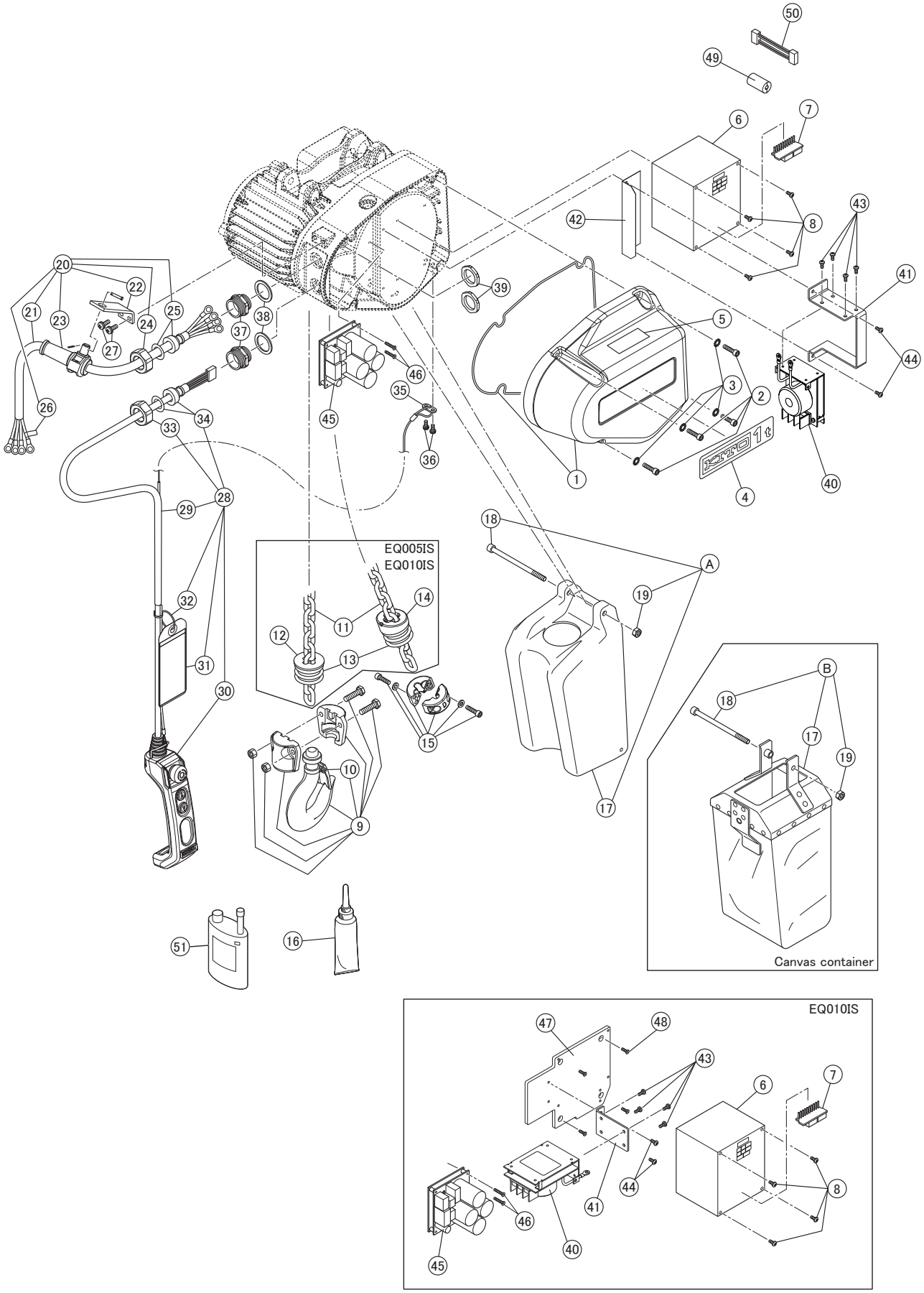


Figure #	Part Number	Part Name	Quantity per unit	Part Code		Remark
				EQS005IS	EQS010IS	
1	2104	Controller cover assembly	1	EQ1CI2104	EQ1DI2104	
2	161	Socket bolt	4	J1BE1-0602525	←	For Controller cover
3	224	Toothed lock washer	4	J1WH012-10060	←	For Controller cover
4	800	Name plate B	1	EQ1BUQ05I9A3	EQ1BUQ10I9A3	
5	935	Warning sticker E	1	EQP1DI9936	←	
6	1571	Inverter assembly	1	INV60FC47	INV615C51	
7	508	HBB board	1	ECP91KB22	←	
8	191	Machine screw with spring washer	2	J1AP2-4001010	×	
			4	×	J1AP2-4001010	
9	1011	Bottom hook complete set	1	EQ1CI1011	EQ1DI1011	
10	1002	Hook latch assembly	1	ER2CS1002	ER2DS1002	
11	874	Load chain	1	KAZN056W0000	KAZN071W0000	
12	054	Limiting plate	1	EQ1CI9054	EQ1DI9054	
13	051	Chain spring	2	EQ1CI9051	EQ1DI9051	
14	055	Spring guide	1	EQ1CI9055	EQ1DI9055	
15	1041	Stopper assembly	1	ER1CS1041	ER1DS1041	
16	1951	Lubricant tube assembly	1	ER2CS1951	←	
Ⓐ	1401	Chain container P complete set	1	EQ1CI1401	EQ1DI1401	Plastic container
17	401	Chain container P	1	EQ1CI9401	EQ1DI9401	
18	166	Socket bolt	1	J1BE1-0809028	J1BE1-0812028	For chain container
19	226	Lever nut	1	C2BA100-9074	←	For chain container
Ⓑ	1405	Chain container (15) complete set	1	EQ1CI1405	×	Canvas container
17	5405	Chain container (15) assembly	1	EQ1CI5405	×	
18	166	Socket bolt	1	J1BE1-0809028	×	For chain container
19	226	Lever nut	1	C2BA100-9074	×	For chain container
20	1521	Power supply cable assembly	1	ZLZH11AF1000	ZLZH11BF1000	
21	521	Cable	1	Z2CU402-0000	Z2CU403-0000	
22	541	Cable support arm	1	ER1BS9541	←	
23	1542	Cable support 14	1	E4YS005-2822	×	
		Cable support 16		×	M3ES010-1724	
24	569	Holder A	1	ECP5924AA	←	
25	574	Cable packing	1	ECP6914AA	ECP6916AA	
26	823	Name plate G	1	E6LE010S9806	←	
27	542	Machine screw with spring washer	2	J1AP2-6001616	←	For Cable support arm
28	1557	Push button cord EH complete set	1	ZLD0015F1000	←	
29	557	Cable	1	Z3CA500-0000	←	
30	1561	3 push button switch assembly	1	SWJ2200AA	←	
31	565	Warning tag PB	1	SWD9013AC	←	
32	566	Tag holder	1	E7SE003S9787	←	
33	569	Holder A	1	ECP5924AA	←	
34	574	Cable packing	1	ECP6910AA	←	
35	535	Cord support (wire stopper)	1	ER1BS9534	←	
36	536	Machine screw with spring washer	2	J1AP2-5001212	←	For Cord support
37	891	Holder B	2	ECP5924AB	←	
38	892	Holder packing	2	ECP5924AQ	←	
39	893	Holder nut	2	ECP5924AD	←	
40	101	Noise filter	1	ECP93NFBE	←	
41	103	Noise filter support	1	EQP1CI9103	EQP1DI9103	
42	780	Insulating sheet	1	EQP1CI9780	×	
43	192	Machine screw with spring washer	4	J1AP2-4000505	J1AP2-4000808	For Noise filter assembly
44	193	Machine screw with spring washer	2	J1AP2-4001010	×	For Noise filter support
		Machine screw with spring washer	2	×	J1AP2-4000808	For Noise filter support
45	1650	Dual Power Converter (DPC)	1	ECP91KB64	←	
46	197	Machine screw with spring washer	2	J1AP2-4001010	←	For Dual Power Converter (DPC)
47	441	Plate	1	×	EQP1DI9441	
48	254	Flat head screw	4	×	J1AL2-4001212	For Plate
49	647	Ferrite core	1	ECP99FC00	←	
50	648	LS relay harness	1	×	EQP1DI9648	
51	1855	Oil pot F	1	ER1BS1855	ER1CS1855	

WARRANTY

KITO Corporation (“KITO”) extends the following warranty to the original purchaser (“Purchaser”) of new products manufactured by KITO (KITO’s Products).

1) KITO warrants that KITO's Products, when shipped, shall be free from defects in workmanship and/or materials under normal use and service and KITO shall, at the election of KITO, repair or replace free of charge any parts or items which are proven to have said defects, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery and, if there is anything within a warranty period stated by your dealer from whom you purchased the products from the date of purchase of KITO's Products by Purchaser and provided, further, that defective parts or items shall be kept for examination by KITO or its authorized agents or returned to KITO's factory or authorized service center upon request by KITO.

2) KITO does not warrant components of products provided by other manufacturers. However to the extent possible, KITO will assign to Purchaser applicable warranties of such other manufacturers.

3) Except for the repair or replacement mentioned in (1) above which is KITO's sole liability and purchaser’s exclusive remedy under this warranty, KITO shall not be responsible for any other claims arising out of the purchase and use of KITO’s Products, regardless of whether Purchaser’s claims are based on breach of contract, tort or other theories, including claims for any damages whether direct, incidental or consequential.

4) This warranty is conditional upon the installation, maintenance and use of KITO’s Products pursuant to the product manuals prepared in accordance with content instructions by KITO. This warranty shall not apply to KITO’s Products which have been subject to negligence, misuse, abuse, misapplication or any improper use or combination or improper fittings, alignment or maintenance.

5) KITO shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of KITO’s Products for loss of operating time.

6) This warranty shall not apply to KITO’s Products which have been fitted with or repaired with parts, components or items not supplied or approved by KITO or which have been modified or altered.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES. EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

EC DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

We, **KITO Corporation,**
2000 Tsuijiarai, Showa-cho,
Nakakoma-gun, Yamanashi-ken, 409-3853, Japan

declare under our sole responsibility that the products:
Electric chain hoist EQ, model EQ
for use with or without the relevant trolley in capacity of 125kg to 1t to which this declaration relates is in conformity with the following EC directives and standards.

EC directives:

Machinery Directive	**2006/42/EC**
EMC Directive	**2014/30/EU**
Low Voltage Directive	**2014/35/EU**

Harmonized standards:

EN ISO 12100:2010	**Risk assessment and risk reduction**
EN 14492-2:2006+A1:2009	**Power driven hoists**
EN 818-7:2002+A1:2008	**Short link chain for lifting purposes**
EN ISO 13850:2008	**Emergency stop**
EN 60204-1:2006	**Electrical equipment of machines**
EN 61000-6-4:2007	**Electromagnetic compatibility (Emission)**
EN 61000-6-2:2005	**Electromagnetic compatibility (Immunity)**

National standards:

FEM 9.511:1986	**Classification of mechanisms**
FEM 9.683:1995	**Section of lifting and travel motors**

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