



OPERATING & MAINTENANCE INSTRUCTION MANUAL WITH SPARE PART LIST

(Guarantee will be void if not used as instructed in this manual)



ALL PURPOSE CHAIN ELECTRIC HOIST

HC+

Capacity - 250 Kg to 5000 Kg

INDEX

| | |
|--|----|
| 1. Important Information and Warning | 4 |
| 2. Commissioning & Preventive Check List | 10 |
| 3. Getting to know the Chain Hoist | 15 |
| 4. Installing the Chain Hoist | 18 |
| 5. Commissioning and Operating Chain Hoist | 20 |
| 6. Inspecting and Servicing Chain Hoist | 21 |
| 7. Technical Data | 31 |
| 8. Spare Parts | 35 |
| 9. Spare Parts for Electricals | 47 |
| 10. Maintenance | 63 |



Important Information and Warnings

Terms and Summary

This manual provides important information for personnel involved with the installation, operation and maintenance of this product. Although you may be familiar with this or similar equipment, it is strongly recommended that you read this manual before installing, operating or maintaining the product.

Danger, Warning, Caution and Notice - Throughout this manual there are steps and procedures that can present hazardous situations. The following signal words are used to identify the degree or level of hazard seriousness.

DANGER :- Danger indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury, and property damage

WARNING :- Warning indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury, and property damage.

CAUTION :- Caution indicates a potentially hazardous situation which, if not avoided, may result minor or moderate injury or property damage.

NOTICE :- Notice is used to notify people of installation, operation, or maintenance information which is important but not directly hazard-related.

CAUTION

These general instructions deal with the normal installation, operation, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane, or configuration that uses this equipment. For systems using the equipment covered by this manual, the supplier and owner of the system are responsible for the system's compliance with all applicable industry standards, and with all applicable federal, state and local regulations/codes.

This manual includes instructions and parts information for a variety of trolley and hoist types. Therefore, all instructions and parts information may not apply to any one type or size of specific trolley or hoist. Disregard those portions of the instructions that do not apply.

Record your hoist and trolley's Product Code and Serial Number on the front cover of this manual for identification and future reference to avoid referring to the wrong manual for information or instructions on installation, operation, inspection, maintenance, or parts

Use only Indef authorized replacement parts in the service and maintenance of this trolley.



DANGER WARNING

HAZARDOUS VOLTAGES ARE PRESENT IN THE CONTROL BOX, OTHER ELECTRICAL COMPONENTS, AND CONNECTIONS BETWEEN THESE COMPONENTS.

Equipment described herein is not designed for and MUST NOT be used for lifting, supporting, or transporting people, or for lifting or supporting loads over people. Equipment described herein should not be used in conjunction with other equipment unless necessary and/or required safety devices applicable to the system, crane, or application are installed by the system designer, system manufacturer, crane manufacturer, installer, or user.

Modifications to upgrade, rerate, or otherwise alter this equipment shall be authorized only by the original equipment manufacturer. Failure to read and comply with any one of the limitations noted herein can result in serious bodily injury or death, and/or property damage. The angle between chain and plane perpendicular to the axis of the drum shall not exceed 5° (As per IS 6547 6.1.1.2).

Hoists shall not be operated unless the hoist unit is centered over the load, except when authorized by a qualified person who has determined that the components of the hoist and its mounting will not be overstressed. Should it be necessary to pick a load that is not centered under the hoist unit, precautions should be taken to control the swing of the load when it is picked clear of its support.



Information

This symbol indicates tips and useful information.



Warning Tag and Labels

The warning tag illustrated below in Figure is supplied with each hoist and trolley shipped from the factory. If the tag is not attached to the pendant cord for your hoist/trolley, order a tag from your dealer and fix it. Read and obey all warnings attached to this Hoist/Trolley. Tag is not shown in actual size.

WARNING

IMPROPER use of powered Hoist could result in death Or serious injury.

To avoid these hazards:

- ▶ ALWAYS read owner's manual and safety instructions.
- ▶ Do NOT lift more than rated load.
- ▶ Do NOT lift or transport loads over or near people.
- ▶ Do NOT use a hoist for lifting supporting or transporting people.
- ▶ Do NOT operate unless load is centered under hoist.
- ▶ Do NOT support a load on the tip of the hook
- ▶ Do NOT use a hoist if the hook latch is missing or broken.
- ▶ Do NOT remove or obscure the warning lables.
- ▶ Do NOT run the load chain or wire rope over a sharp edge.
- ▶ Do NOT use the load chain or wire rope as a sling.
- ▶ Do NOT operate beyond the travel limits of the hook or load block.
- ▶ Do NOT use a twisted, kinked, damaged, or stretched load chain or wire rope.
- ▶ Do NOT operate a wire rope hoist with a wire rope that is not properly seated in its groove.



CONDITIONS WHERE WARRANTY WILL BE VOID / NOT APPLICABLE

HHL does not provide reimbursement for maintenance and visit charges for items such as: brake adjustments, lubrication oil changes, or any other item or activity deemed solely by HHL to be maintenance related.

HHL will not be liable for damage or malfunction and consequently warranty resulting from:

- a. Lack of maintenance.
- b. Use of improper or insufficient lubricants
- c. Supply voltage high/low or insufficient.
- d. Environmental conditions (including but not limited to extreme temperatures, humidity and corrosive environments).
- e. Outdoor applications where HHL is not intimated and recommendations for protection from the elements are not followed.
- f. Misuse or abuse (including but not limited to overloading, shock loading, or side / angular lifting / pulling).
- g. Use of parts other than genuine HHL replacement parts.
- h. Improper repairs or maintenance.
- i. Modifications not approved by HHL.
- j. Improper handling of product after it leaves HHL factory.
- k. Fire, accidents, or acts of God or nature, including but not limited to floods, hurricanes and lightning.
- l. Any piece of equipment not supplied by Hercules Hoists Limited, is installed on products.
- m. Malfunction or damage caused by items added to Hercules Hoists Limited products, including but not limited to controls and control components.
- n. Relocation of hoist / equipment without proper installation and commissioning by HHL / ABP.
- o. Misalignment in existing / installed Crane rail and hoist monorail, improper existing power feed track.



Operational cause Note

Overhead crane & hoists are typically designed to lift objects vertically. The specific guide lines are mentioned in respective IS standard .

Sometimes, however, operators attempt to make a side pull or cross pull or use the hoist horizontally to lift an object that is not directly underneath it.

This can cause damage to hoist.

Probable failures/Risks:

- ▶ Side pulling can cause damage to various hoist parts – Load Chain Wheel, Chain Guide Roller, Chain Stripper, Hook and hook latch assembly, in electric Chain Hoists the load chain guide and chain stripper and in Wire Rope Hoists the rope drum, rope guide and the rope itself.
 - ▶ Additionally, it may place the operator and personnel working near the crane at risk for injury.
 - ▶ One of the main risks for an operator is load swing, which can damage the load or cause injury to the operator. In extreme cases, there might be a load drop.
 - ▶ A rope that has been worn by side pulls may also snap and lead to a loss in control of the load.
 - ▶ Cross pull or side pull may affect on monorail beam flanges, the beam web may deflect / distort, and beam flanges may wear causing uneven sides of beam.
- Preventing side pulls could lead to increases in both the safety and the lifetime of the components, customer should be educated at every interaction opportunity.
 - The unfortunate prevalence of cross pulling-related accidents and maintenance needs repeated replacement of parts like chain guider roller, chain stripper, hook latch assembly, rope guide related parts i.e set of rope guide ring, spring and rope guide joining bracket.

Operational Note:

- Please be aware that as a safety feature, this rope guide ring is designed to snap in the event of the wrong usage of the rope hoist. As per IS 3938-2005 the angular lifting / pulling of dead weight is not allowed in wire rope hoist. If any user puts the rope hoist to such an application, the rope guide ring will not allow to perform the lifting. The rope guide ring will break if the fleet angle is more than 5 Deg. including angle between point of lift and dead weight kept on floor.
- The specific instruction in Do’s and Don’ts is given hoist operating and maintenance manual. Those guidelines are based on past experience and safety standards of operation.
- The hoist in tandem application cannot be used because the load lifting speed and effort are not balanced in manual hoisting operation. Most important is load required to be centered under hoist and load line of trolley centre and hook seating diameter centre should match. The hoists are designed for lifting load vertically. This phenomenon is applicable for all hoisting equipment’s.

If hoist not used in proper way as mentioned above the warranty claims will not be accepted. Indicative list of parts not covered under warranty.



Indicative list of parts not covered under warranty:

| | |
|----|-------------------------------------|
| 1 | Hoist Motor Winding |
| 2 | Load Chain |
| 3 | Safety Latch assembly |
| 4 | Brake Disc – Hoist and Trolley |
| 5 | Brake Coil – Hoist and Trolley |
| 6 | Hoist and Cross Travel Limit Switch |
| 7 | Trolley Motor Winding |
| 8 | Pendent control |
| 9 | Relay and Fuse |
| 10 | Chain Guide |
| 11 | Chain Stripper |
| 12 | VFD / Inverter |
| 13 | Special Control Switch Gear |
| 14 | Control Transformer |

This can cause damage to hoist





COMMISSIONING CHECK LIST

1. I-Beam Flange width : Check actual width of beam, adjust washers to make equal running clearance on all trolley wheels.
2. Dimensional clearance : Ensure that enough clearance is available for hoist & trolley movement.
3. Power supply system : Ensure that 'T' section in case of trailing cable system or bus bar in case of Akapp system is parallel in both axis w.r.t. Beam in straight or curved path. Trolley pushers are designed correctly so that there is no pressure on trolley or current collector during travel.
4. Trolley Limit Switch (Optional) : Proper actuators are provided on beam for the stopping of CT.
5. Oil level & fasteners: Check levels are correct & all fasteners are correctly tightened.
6. Power supply Voltage : Check voltage in all 3 phases. R=Y=B= report under or over voltage.
7. Limit Switch : Check all limit switches like over hoisting, over lowering, right & left & emergency Check the direction of motions w.r.t. Pendant buttons change phase sequence if required. This is very important safety requirement.
8. Sufficiency of lift : Set the bottom Limit switch so that hook touches the floor & no further Loosening of chain takes place. Set the top limit switch so that safe headroom is maintained between hoist body and lower block.
9. Angular Loading : Check that equipment is not subjected to angular loading. Ensure that equipment is installed at proper place proper hook approaches are used to prevent this.
10. Overloading, Extra heavy duty : Observe there is no overloading and excessive use of hoist.
11. Counter weight assembly : Ensure that counter weights are correctly assembled for balancing of trolley bolts are properly locked & tightened.
12. Noise level : Observed that there is no abnormal noise in Hoist and travel motion.
13. Oiling : Apply oil to the chain for full length. Ensure free movement.
14. Name plate data: Note hoist, motor nos. & record them on Instruction manual for future use.
15. Instruction Manual: Read instruction manual of each product carefully & act accordingly.
16. Abnormal factors : Excessive dust, temp, humidity, chemical fumes, leakages etc. Report them.
17. Brake setting : Ensure that brake operation is not sluggish & load is not slipping. This is to certify that equipment is commissioned on and found satisfactory for use.



COMMISSIONING CHECKLIST (CEH)

1. I-Beam Flange width : Check actual width of beam, adjust washers to make equal running clearance on all trolley wheels.
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PREVENTIVE MAINTANANCE CHECK LIST OF CRITICAL ITEMS

| Sr. No. | Description | Daily | Weekly | Monthly | Every Three Months |
|---------|---------------------------------|-------|--------|---------|--------------------|
| 1. | Hoist Brake Slippage | | Yes | | |
| 2. | Hoist Chain Wear - Visible | Yes | | | |
| 3. | Up Down limit switch operation | Yes | | | |
| 4. | Oil level of gear boxes | | | Yes | |
| 5. | Chain oiling | | | | Yes |
| 6. | Hoist motor brake air gap | | | Yes | |
| 7. | Limit switches (Hoist, Trolley) | | Yes | | |
| 8. | Panel loose wire, contactors | | | Yes | |
| 9. | Trolley wheel for wear | | | | Yes |
| 10. | Chain guides & bolts | | | | Yes |
| 11. | Gear / pinions | | | | Yes |
| 12. | Coupling motor / gearbox side | | | | Yes |
| 13. | Trolley, Hoist Fasteners | | | Yes | |
| 14. | Chain End stop / Bolt | | | | Yes |
| 15. | Cleaning of all exposed parts | | | Yes | |

Note:

Above period is based on average use Frequency of checking can be changed based on actual observation. Please refer manual for more information.



2. Safety Instructions

2.1 Symbols



Safety at work

This symbol marks all information on safety at work where risks to life and limb are entailed.



Warning of electric voltage

Covers such as hoods and caps which are marked with this symbol may only be opened by instructed personnel and after the equipment has been disconnected.



Warning of suspended load

It is forbidden for persons to stand under suspended loads. This entails risks to life and limb!



Safety in operation

Information marked with this symbol must be observed to avoid damage to the hoist or the goods transported.

In these operating instructions these symbols mark particularly important information on risks and safety in operation.

2.2 Use for intended purpose



- Chain hoists are intended solely for lifting freely movable loads. According to design, they are for stationery or mobile use.
- Do not carry out any alterations or modifications. Additional fitments must not prejudice safety.

Not allowed :

- Exceeding the safe working load.
- Transporting person.
- Pulling loads at an angle.
- Tearing loose pulling or towing loads.
- Manipulating the overload cut-off.
- Slack chain.



2.3 Safety-conscious operation



Our chain hoists are constructed according to the state of the art and equipped with an overload cut-off to prevent overloads. In spite of this dangers may arise due to incorrect use or use for an unintended purpose.

- Read the operating instructions before starting to work with the chain hoist.
- Observe the Duties of crane operator.
- Always work in a safety-conscious manner and avoid risks.
Before starting work find out where the EMERGENCY STOP facility is (usually in the control pendant - optional feature.)
- Do not use the emergency limit (final limit switch for highest and lowest hook position) as an operational limit.
- Report damage and defects to the chain hoist to the person responsible immediately. Do not use the chain hoist until the damage has been repaired.
- Do not remove information plates from the chain hoist. Replace illegible or damaged plates.

2.4 Organisational safety precautions



- Only direct persons to operate the hoist if they have been trained or instructed in its use. Observe the legal minimum age!
- At regular intervals, check that work is being carried out in a safety-conscious manner.
- Observe the intervals specified for periodic tests. File the test reports in the test log book.
- Store the operating instructions within easy reach where the chain hoist is operated.

2.5 General regulations



- Safety regulations and accident prevention regulations.
- National regulations.
- Regulations listed in the EC declaration of conformity.

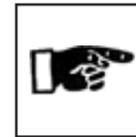


2.6 Installation, commissioning, maintenance and repairs



Installation, commissioning, maintenance and repairs may only be carried out by skilled personnel.

- Use only original spare parts for repairs, otherwise the guarantee will expire.
- Do not carry out any alterations or modifications.
- Additional fitments must not prejudice safety.



If the chain hoist is constantly operated outside and exposed to the elements, we recommend fitting a small roof or at least “parking” the chain hoist under a roof.

2.7 Guarantee

The guarantee expires if these operating instructions are not observed for installation, operation, inspection and maintenance.

2.8 Periodic tests



Hoists and cranes must be tested by a qualified person at least once a year. The results of the test must be recorded and filed in the test log book.

The remaining service life of the hoist according to FEM 9.755 is also established during this test. All tests must be initiated by the operator.

2.9 After Sales Service

With the purchase of this chain hoist you have decided on a high-quality piece of lifting equipment. Our after sales service will give you advice on its correct use. In order to preserve the safety and constant availability of your chain hoist we recommend concluding a maintenance contract according to which we undertake the recurrent tests for you.

Repairs will be carried out quickly and economically by our trained personnel

3.0 Getting to know the chain hoist

The chain hoist indef-HC+ is compact in its construction. It is suitable for a great variety of applications. The chain hoists HC2+, HC3+, HC4+, HC5+ and HC6+ are practically identical as regards construction and method of functioning. They differ only with regard to the permissible lifting capacities.

HC2+ / HC3+

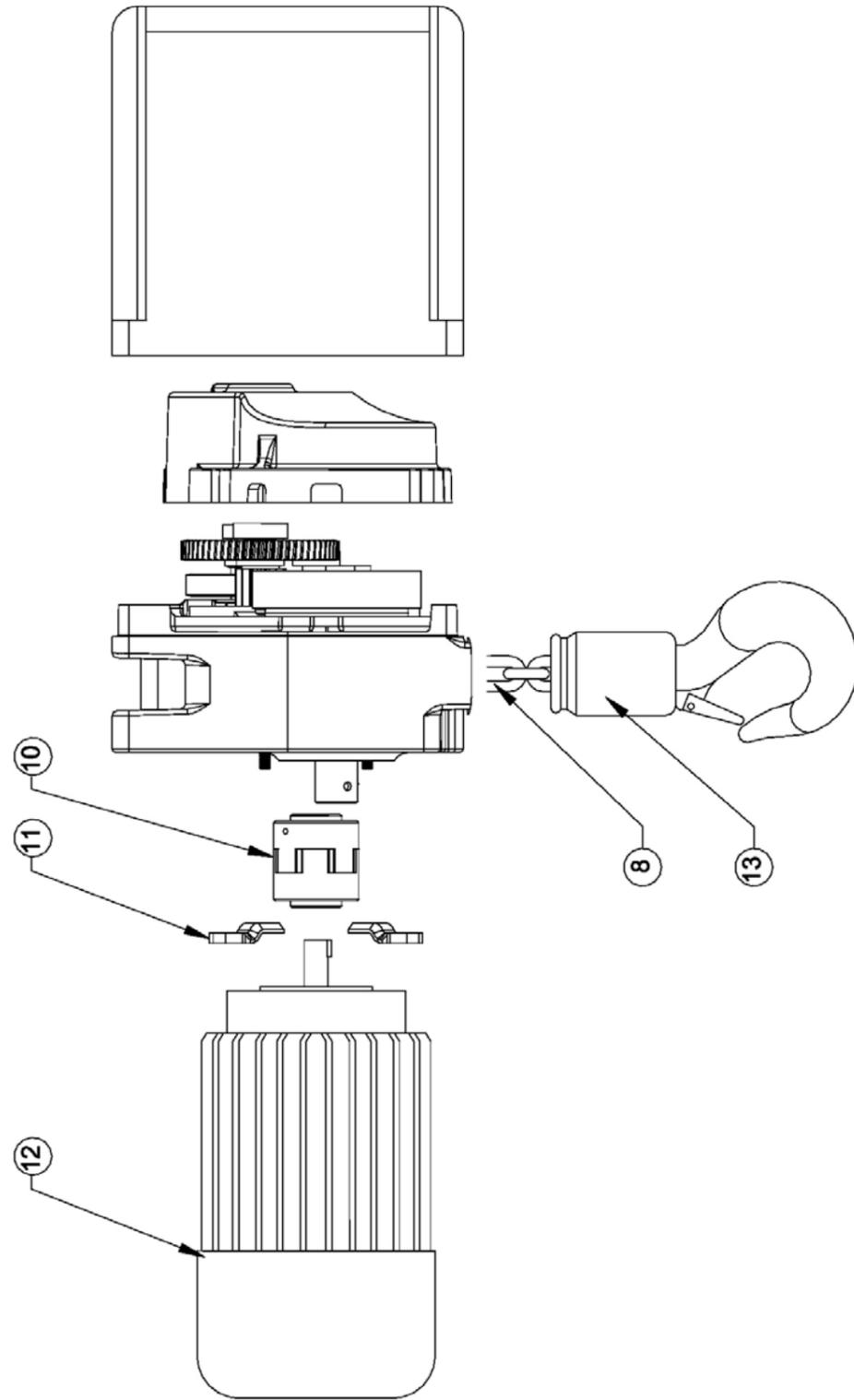


Figure 1



HC4+ / HC5+ / HC6+

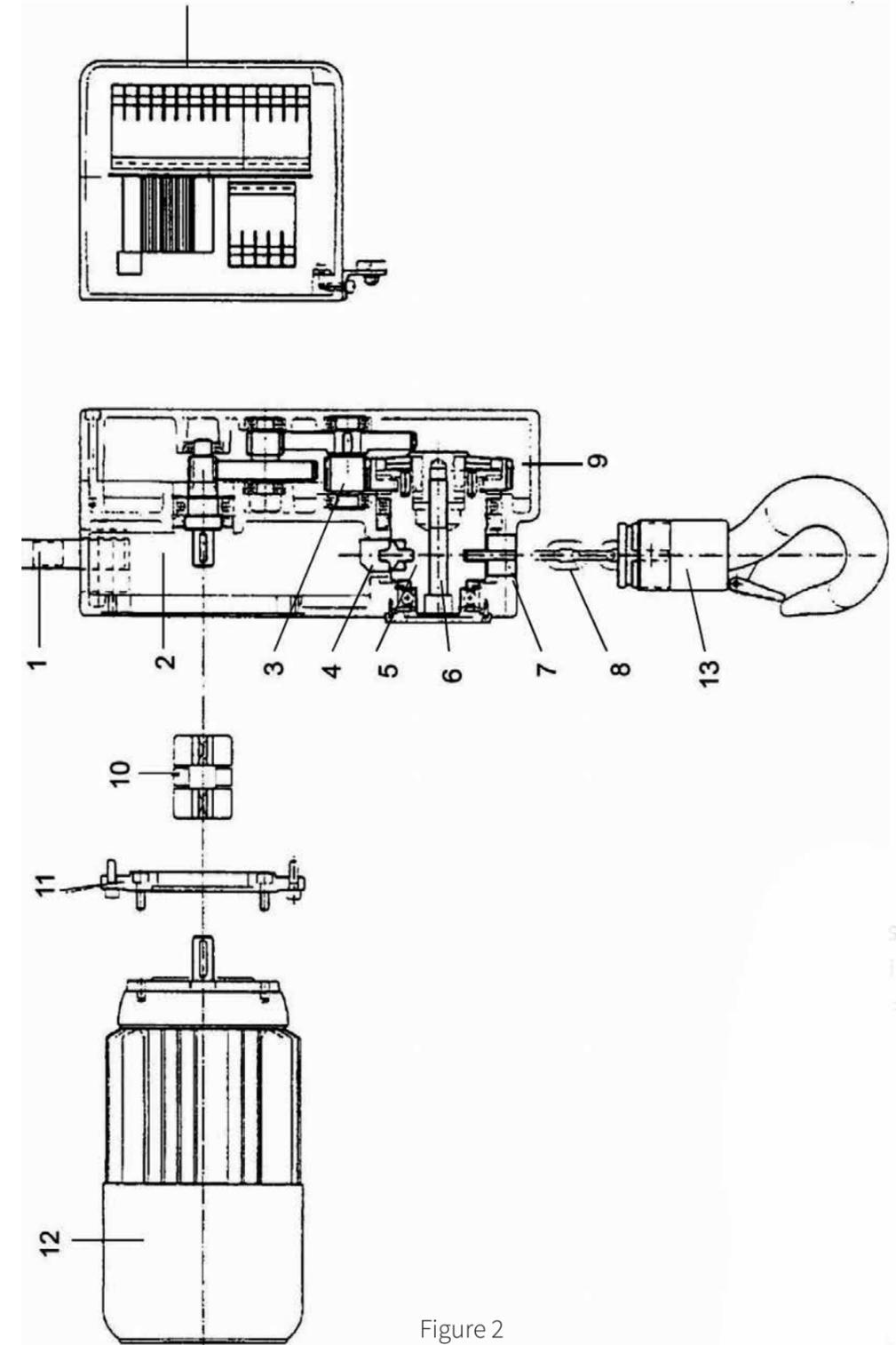


Figure 2



4.0 Installing the chain hoist

4.1 Scope of supply

Unpack the electric chain hoist and check the supply. The scope of supply is dependant upon the chain hoist version ordered (see order acknowledgement and delivery note).

4.2 Standard version

- Chain hoist with load chain and controls.
- Chain box.
- Operating instructions with declaration of conformity, circuit diagrams.
- If ordered, trolley.

4.3 Mechanical installation

For ease of installation, suspend the chain hoist at eye level.

4.3.1 Installing the chain box

Fig. # 2 shows the positions of the fixing bolts.

- Chain stopper is on the penultimate link of the unattached chain end.
- Fit chain box.

4.3.2 Hook block

Check the attachment of the bottom hook block. The bottom hook block is firmly bolted to the chain, the hook rotates (# 3).

4.3.3 Preparation of chain hoist with trolley

For fixed installations use normally the middle hole in the suspension bracket.

Be aware that the support dimension and material are in congruence with the load and the supports distance.

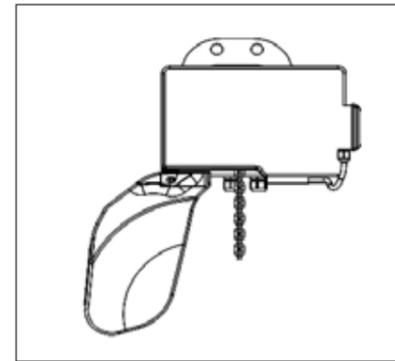
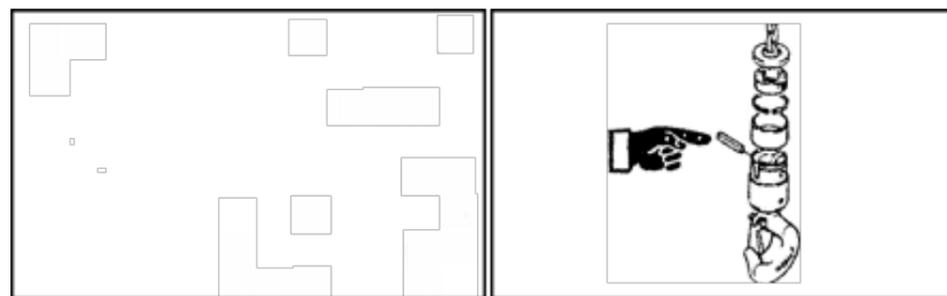


Figure 3

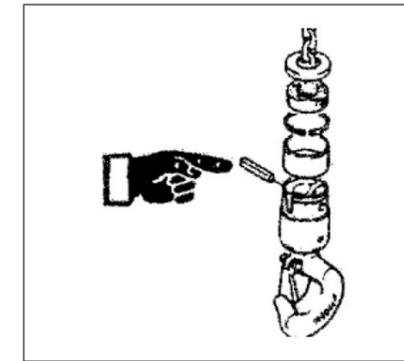


Figure 4

4.3.4 Preparation of chain hoist with trolley

- Clean running surfaces of runway and wheels. They must be free of dirt, oil and paint.
- Adjust play of wheel flanges 1-2mm each side. To do so, move spacing washers from the outside to the inside. The number of spacing washers mounted inside on the right and left hand sides may not differ by more than one.
- Secure the nut with the spring washer.

The chain hoist must always be suspended from the centre of the trolley.

4.3.5 INSTALLATION ON CHAIN HOIST

- **ATTACH TROLLEY TO CHAIN HOIST AS SHOWN IN FIG. # 4**

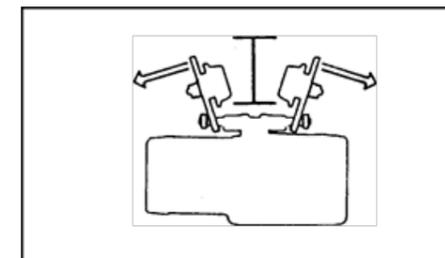


Figure 5

| capacity kg. | type | speed |
|--------------|------------|-------|
| 250 | HC2 025 NH | 8 |
| | HC2 025 DH | 8/2.6 |
| 500 | HC2 050 NL | 4 |
| | HC2 050 DL | 4/1.3 |
| | HC3 050 NH | 8 |
| | HC3 050 DH | 8/2.6 |

| capacity kg. | type | speed |
|--------------|------------|-------|
| 1000 | HC3 100 NL | 4 |
| | HC3 100 DL | 4/1.3 |
| | HC4 100 NH | 8 |
| | HC4 100 DH | 8/2.6 |
| 2000 | HC4 200 NL | 4 |
| | HC4 200 DL | 4/1.3 |
| | HC4 200 NH | 8 |
| | HC4 200DH | 8/2.6 |
| 2500 | HC4 250 NL | 4 |
| | HC4 250 DL | 4/1.3 |
| 3000 | HC5 300 NL | 4 |
| | HC5 300 DL | 4/1.3 |



4.4 Electrical connection



The chain hoist may only be connected up by a skilled electrician.

4.4.1 Connection to mains

- Check that the mains voltage corresponds to that given on the rating plate.
- Connect cable according to circuit diagram.

4.4.2 Check direction of motion lifting / lowering

- Briefly press control buttons for lifting and lowering. The direction of motion of the load hook must correspond to the symbols/descriptions on the control buttons.
If the load hook moves in the wrong direction, 2 phases of the supply cable must be interchanged.
- Fit end cover and fix carefully.

4.4.3 Decommissioning

- Cut power to chain hoist at main isolator.
- Disconnect electrical connections.
- Remove chain hoist:
 - dismantle trolley;
 - unhook chain hoist.
- Clean chain hoist and oil thinly.

5.0 Commissioning and Operating chain hoist

5.1 Commissioning

The chain hoist was tested in the manufacturer's works in accordance with the Machine Directive. Commissioning must be carried out by a qualified person. The following tests must be carried out.

- Chain hoist completed with the correct original accessories supplied.
- Check that all electrical equipment has been correctly selected and is present.
- Electrical connection.
- Check tightness of bolt connections.
- Check trolley. Running surfaces and flanges are free of dirt, oil and paint. The wheel gearing is greased. Buffers and end stops are fitted and undamaged.



- Check oil level.
- Check load chain. The load chain is clean and oiled.



- Check chain anchorage. The chain stopper is firmly attached.
- Check slipping clutch.(Over load clutch) To do so, run the chain hoist carefully into the top and bottom hook positions. Let clutch slip for a few seconds only (max 3 set). The chain stays in place, the motor continues to turn giving slipping noise from gear box.
- While checking Top / Bottom most position, see that hoist selected is of correct lift i.e. after hook touches ground level / top level enough chain (min. 300 mm.) remains loose above end Stopper/ Hook Block. (Fig. - 5)
- Check brake. To do so, attach nominal load. Lift load approx 20cm and stop chain hoist. The load must not move downwards. Then run the hoist briefly downwards and stop the load. Slipping of load up to 10cm are normal.
- Confirmation that commissioning has been duly carried out in the test book in section Confirmation of commissioning.
- Chain hoist in conjunction with a crane system are subjected to a test load before commissioning.

5.2 Duties of crane operator

- The operator must ensure that :
 - the load is securely attached (the chain is a supporting element and not a fixing element);
 - no one is in the danger area of the moving load.
- The operator must be able to see the whole working area. If this is not the case :
 - have someone who can see the whole working area guide the crane operator;
 - use a chain hoist with an operational limit.
- If slack chain occurs (sagging chain), tighten the chain before starting to lift (if possible with slow speed)

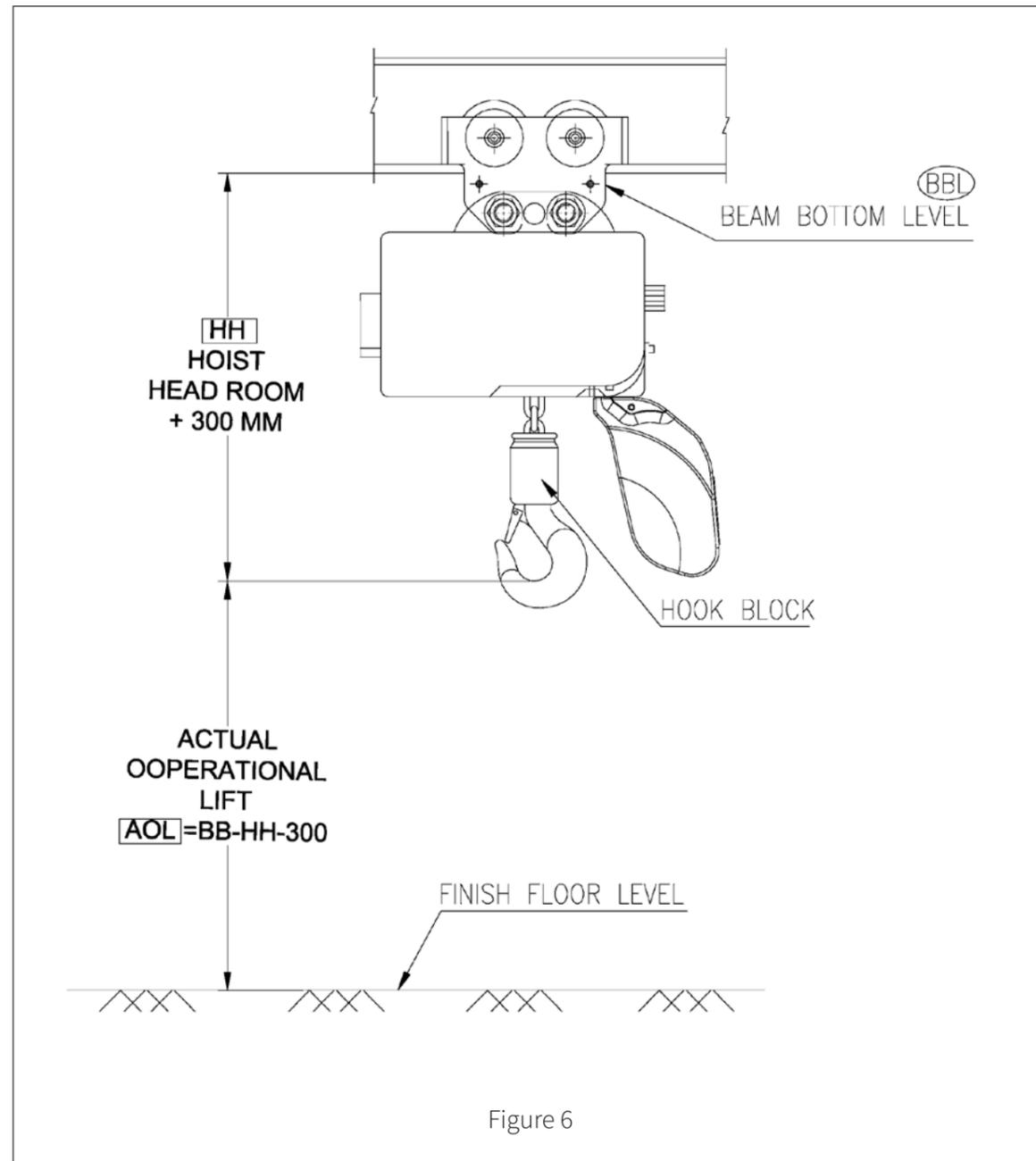


Figure 6



5.3 Operation of motion functions



Operation is described here. Do not use inching operation or press several buttons simultaneously.

Moving

Press button on control pendant. The directions of motion are shown by suitable symbols.

1st-step

Fast motions are activated in single speed hoist & slow motions are activated in cases of 2 speed hoist (optional)

2nd-step

Fast motions are activated by 2nd-step for 2 speed hoist (optional)

Emergency stop (Optional feature)

Press EMERGENCY STOP button. The load hook stands still immediately, the trolley stops. All functions are inoperative.

6.0 Inspecting and servicing chain hoist

6.1 Maintenance intervals

The maintenance intervals given are suited to a chain hoist used in mechanism group 1 Am. If the hoist is classified in a different mechanism group according to FEM 9511 the intervals given must be adapted on the basis of the following table:

| ISO Classification | M3 | M4 | M5 | M6 | M7 |
|--------------------|-----|-----|----|----|----|
| FEM Classification | 1Bm | 1Am | 2m | 3m | 4m |
| Dividing Factor | 1 | 1 | 2 | 4 | 8 |

Example

Check chain anchorage.

Mechanism group 1 Am: every 12 weeks.

Mechanism 2m : every 6 weeks.

Frequency for 1 Am

$$\frac{\text{Frequency for 1 Am}}{\text{Dividing Factor}} = 12 = 6 \text{ weeks. \& etc.}$$



Daily

Check brake function

Attach safe working load. Lift load approx. 20 cm and stop chain hoist. The load must not move downwards. Then brief downwards run, stop load by releasing switch. Slippage of load- up to 10 cm are normal.

Check load chain

If wear is visible at joints, see chapter Checking load chain.

Check slipping clutch

Run chain hoist into top and bottom final position. The chain stops, the motor continues to turn giving some slipping noise from gear box. Allow the clutch to slip for max 3 seconds only (see chapter Adjusting slipping clutch).

Every three months

Check chain anchorage

The chain stopper is screwed tight.

Bottom hook block

Check load hook, casing and chain pulley for wear, damage, deformation. See hoist data sheet for permissible hook opening.

Load chain

Clean and oil.

Annually

Check Grease level thickness

Check bolt connections

See Checking bolt connections.

Check trolley

Running surfaces and flanges are free of dirt, oil and paint. Buffers and end stops are undamaged.

Wheel gearing

Grease.



Check load hook, suspension bracket

If deformation or cracks are visible, replace load hook or suspension eye immediately.

Check slipping clutch

Attach nominal load and lift approx. 20 cm. The slipping clutch must not be activated. If necessary, set slipping clutch to 1.25 times nominal load (see Adjusting slipping clutch).

Measure brake lifting path

See Adjusting brake.

Every 5 year

Gearing Grease

Change Grease

6.2 Maintenance work

Regular maintenance increases the safety and extends the service life of the chain hoist. Maintenance work on the chain hoist may only be carried out by skilled personnel. Maintenance work beyond that described in this section may only be carried out by the manufacturer or his trained service personnel. Use only original spare parts for repairs.

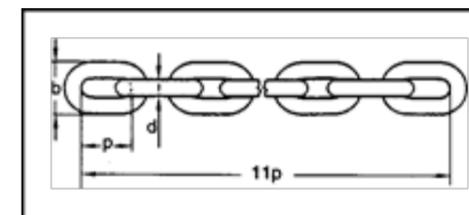


Figure 7

| hoist | Ød mm | p mm | 11p mm | b mm |
|----------|-------|------|--------|------|
| HC2+ | 6 | 18 | 198 | 20,2 |
| HC3+ | 7 | 21 | 231 | 23,6 |
| HC4/5/6+ | 10 | 28 | 308 | 34 |

6.3 Checking load chain

- Run chain hoist under load. If load cracking noises can be heard, check chain, load chain wheel and if present chain pulleys for wear.
- Check joints of chain for wear.
- Check chain dimensions, measure the length of the chain over 11 links. The chain dimensions in mm may not exceed the values given in the following table.

If the chain exhibits wear, or if the limit dimensions are not observed, it must be replaced immediately (see Replacing load chain).

6.4 Checking bolt connections

- Check all bolt connections for tightness.
 - Tighten bolt connections up to M12 with a torque spanner.
 - Tighten larger bolt connections duly by hand.



6.5 Replacing load chain

Use only original chains in the quality prescribed.



- Lower chain hoist to shortly above the lowest point.
- Remove bottom hook block.
- Remove chain stopper.
- Run chain out of chain hoist.

- Hang new chain in pull-in device.
- Push pull-in device into the chain guide on the load side.

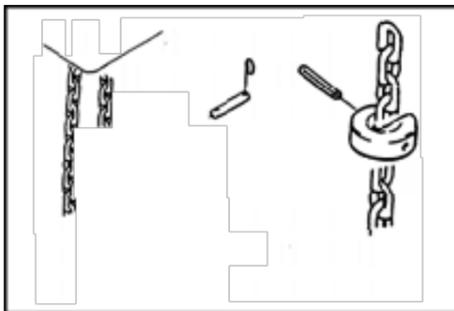


Figure 8

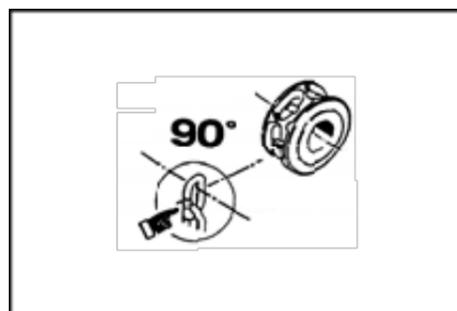


Figure 8

- Pull in chain using inching operation and at the same time pushing the chain.
- Refit chain stopper, chain box, bottom hook block.
- Grease / oil new chain.

The welds of the vertical chain links must point to the outside (fig. # 8).

6.6 Adjusting brake

Adjustment of the braking torque

The braking torque is proportional to the compression of the spring 2, which may be altered by handling the nuts 3, unscrewing to reduce and screwing to increase (fig. # 9).

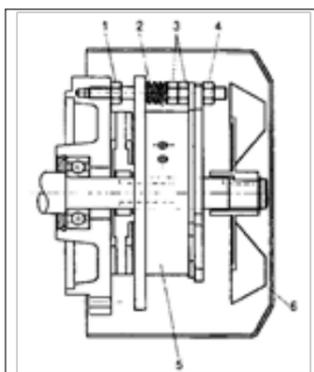


Figure 10

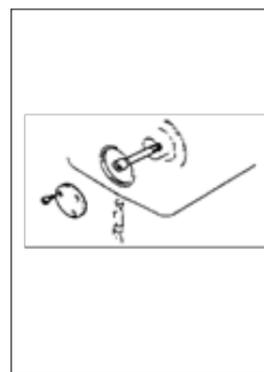


Figure 11

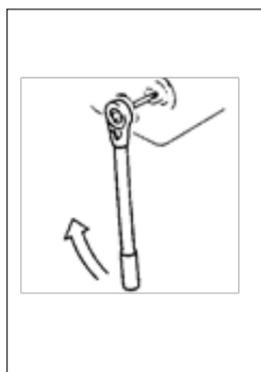


Figure 12



Air Gap Adjustment for the brake clearance

The brake clearance (i.e. the distance between the two cores of the electromagnet and of the mobile anchor) should be 0,1 ? 0,3 mm wide. Check periodically the clearance because the wear and tear of the brake disc will cause it to increase more and more.

6.7 Adjusting slipping clutch

- Attach 1.1 times nominal load to chain hoist.
- Lever off end cover with a screwdriver (fig. # 10).
- Adjust slipping clutch at the adjusting screw (fig. # 11). Turning to the right = reaction forces increases.

Turning to the left = reaction force decreases.

- Adjust slipping clutch until the load attached is just lifted.

If the slipping clutch can no longer be adjusted, the brake / slipping clutch unit must be replaced. Turn the adjusting screw gradually. On no account tighten it so far that the cup springs form a solid block; the clutch / brake lining could be damaged by the increased pressure of the clutch disc at its junction with the brake pinion.



Danger of injury !

Remove Allen key from setscrew before switching motor on. It could be flung away when the motor accelerates.

- Activate the lifting function, the attached load must just be lifted.
- Secure the setting of the slipping clutch, tighten nut.
- Fit screw cap.

6.8 Grease change

Give grease quantity to be filled & its specifications.

6.9 Replacing Gear Box



Gear must be replaced only by the manufacturer or his authorized partners.



6.10 General overhaul

(Safe Working Period overhaul)



800 hours apply as theoretical full load lifetime for chain hoists classified in mechanism group 1 Am to FEM 9511. If full load lifetime is expired then, the chain hoist must be overhauled by the manufacturer.

Components being in the power flux may only be overhauled by the manufacturer or his authorised partners.

6.11 Fault finding

What is to be done if...?

6.11.1 Chain hoist does not work

Chain hoist is switched off. Switch on.

Temperature control (if existent) has reacted. Allow to cool off.

Emergency stop activated. Release emergency stop.

Fuse triggered. Fit new fuse or switch on automatic circuit breaker.

Power supply interrupted.

Reconnect power supply.

6.11.2 Heavy loads can no longer be lifted

Overload. Reduce load.

Slipping clutch is incorrectly set or worn. Adjust slipping clutch if nominal load is no longer lifted (see Adjusting slipping clutch).

6.11.3 Slippage of load more than 10 cm

Brake lining worn. Adjust brake, if necessary replace brake disc.

6.11.4 Direction of motion does not correspond to symbols on control pendant

Power supply wrongly connected. Interchange 2 phases of power supply.

6.11.5 Loud noises when loads are lifted or lowered

Chain worn. Replace load chain (see Replacing load chain). Load chain wheel or chain guide worn.

Replace load chain wheel or chain guide (contact after-sales service).

Chain drive elements not lubricated.

Lubricate chain drive elements.

Grease level should be of 0.2 mm.



| Sr. No. | Model | Motor | Speed | Motor | Flange Drg.No. Please | Coupling Drg.No. check make | Spacer Drg.No. | Motor motor behind coup. | Remarks key to be cut by |
|---------|-------|-------|--------|---------------|-----------------------|-----------------------------|----------------|--------------------------|--------------------------|
| 3 | HC2+ | 71 | Single | XMRB169000COL | UGCA703126A | UFCA003125A | 2.5mm | NA | DIA14 ID |
| 4 | HC2+ | 80 | Double | XMRB169000COL | UGCA703126A | UFCA003125A | 2.5mm | NA | DIA14 ID |
| 5 | HC3+ | 80 | Single | XMRB171000COL | UGCA703126A | UGCA003125A | NA | NA | -- |
| 6 | HC3+ | 90 | Double | XMRB171000COL | UGCA703126A | UGCA003125A | NA | NA | -- |
| 7 | HC4+ | 90 | Single | XMRB167000COL | UHCA703026B | UHCA003025A | 8.5mm | 13mm | DIA24 ID |
| 8 | HC4+ | 100 | Single | XMRB173000COL | UHCA703026B | UHCA003025A | 8.5mm | 13mm | DIA28 ID |
| 9 | HC4+ | 100 | Double | XMRB167000COL | UHCA703026B | UHCA003025A | 8.5mm | 13mm | DIA28 ID |
| 10 | HC5+ | 100 | Single | XMRP255000COL | UHCB703026B | UHCB003025A | 8.5mm | 13mm | DIA28 ID |
| 11 | HC5+ | 112 | Double | XMRP255000COL | UHCB703026B | UHCB003025A | 8.5mm | 13mm | DIA28 ID |
| 12 | HC6+ | 112 | Single | XMRP257000COL | UHCB703026B | UHCB003025A | 8.5mm | 13mm | DIA28 ID |
| 13 | HC6+ | 112 | Double | XMRP257000COL | UHCB703026B | UHCB003025A | 8.5mm | 13mm | DIA28 ID |

Air Gap Adjustment for the brake clearance

NOTE :

- 2.5mm thick spacer with key way to be assembled on motor shaft behind coupling in HC-2+ as per Drg.No. UFCM833551A
- 8.5mm thick spacer with key way to be assembled on motor shaft behind coupling in HC-4+ as per Drg. No. UHCM833551A
- 8.5mm thick spacer with key way to be assembled on motor shaft behind coupling in HC-5+ & HC-6+ as per Drg. No. UHCM833553A
- Motor shaft Key to be cut half in height for 13mm length in HC4/HC5/HC6 hoist as per Drg.No. UHCM823552A



COEL BRAKE MOTORS SPARE PARTS LIST

| KW/RPM | SINGLE SPEED/ DOUBLE SPEED | FRAME | PROD. | CODE NO P.NO6 | ELECTROMAGNET | BRACK DISK P.NO.12 | DRAW ROD KIT P.NO. 18 | TER BOX P.NP.21 | TERMINAL BORD P.NO.24 | B14/B5 FLANGE P.NO.32/30 |
|--------------------|-------------------------------|--------------|-------|------------------|---------------|-----------------------|--------------------------|--------------------|--------------------------|-----------------------------|
| 0.55/1500 | Single Speed | F71C4 | HC2+ | XMRB169000COL | XMRB169006A | XMRB169012A | XMRB169018A | XMRB169021A | XMRB169024A | XMRB169032A |
| 0.9/1500 | Single Speed | F80B4 | HC3+ | XMRB171000COL | XMRB172006A | XMRB172012A | XMRB171018A | XMRB169021A | XMRB169024A | XMRB173032A |
| 1.84/1500 | Single Speed | F90LB4 | HC4+ | XMRB167000COL | XMRB172006A | XMRB172012A | XMRB167018A | XMRB167021A | XMRB169024A | XMRB167032A |
| 2.0/1500 | Single Speed | F100LA4 | HC4+ | XMRB173000COL | XMRB172006A | XMRB172012A | XMRB173018A | XMRB167021A | XMRB169024A | XMRB174032A |
| 3.5/1500 | Single Speed | F100LB4 | HC5+ | XMRB255000COL | XMRB172006A | XMRB172012A | XMRB172018A | XMRB167021A | XMRB169024A | XMRB174032A |
| 4.5/1500 | Single Speed | F112MB4 | HC6+ | XMRB257000COL | XMRP256006A | XMRP256012A | XMRP256018A | XMRB167021A | XMRP256024A | XMRB256032A |
| 0.55/1500-0.18/500 | Double Speed | FDA80/C4/12 | HC2+ | XMRB169000COL | XMRB171006A | XMRB172012A | XMRB153018A | XMRB169021B | XMRB169024A | XMRB153032A |
| 0.85/1500-0.3/500 | Double Speed | FDA90LA4/12 | HC3+ | XMRB171000COL | XMRB172006A | XMRB172012A | XMRB172018A | XMRB172021B | XMRB169024A | XMRB172032A |
| 1.7/1500-0.6/500 | Double Speed | FDA100MB4/12 | HC4+ | XMRB167000COL | XMRB172006A | XMRB172012A | XMRB174018A | XMRB172021B | XMRB169024A | XMRB174032A |
| 2.5/1500-0.8/500 | Double Speed | FDA112MB4/12 | HC4+ | XMRB173000COL | XMRP256006A | XMRP256012A | XMRP256018A | XMRB172021B | XMRP256024A | XMRP256032A |
| 3.5/1500-1.2/500 | Double Speed | FDA112MB4/12 | HC5+ | XMRB255000COL | XMRP256006A | XMRP256012A | XMRP256018A | XMRB172021B | XMRP256024A | XMRP256032A |
| 4.5/1500-1.5/500 | Double Speed | FDA112MB4/12 | HC6+ | XMRB257000COL | XMRP256006A | XMRP256012A | XMRB256018A | XMRB172021B | XMRP256024A | XMRP256032A |



7.0 Technical data

Hoist standard electric motors

7.1 Cooling

Motors are air-cooled by means of external surface ventilation (IC 01.41). Standard motors have radial flow fan allowing fully reversible rotation. Reference standards are IEC 34-6.

7.2 Bearings

Motors are equipped with ball bearings both at driving end (1) and non driving (2) end.

7.3 Lubrication

Motor bearings have life-time lubrication. The standard grease is a lithium based one.

| bearing size | 1 | 2 |
|--------------|---------|---------|
| Frame 63 | 6202 2Z | 6202 2Z |
| Frame 71 | 6203 2Z | 6004 2Z |
| Frame 80 | 6204 2Z | 6204 2Z |
| Frame 90 | 6205 2Z | 6205 2Z |
| Frame 100 | 6206 2Z | 6205 2Z |
| Frame 112 | 6207 2Z | 6207 2Z |

7.4 Insulation

The components of the insulation system were selected so as to ensure good protection against chemically aggressive gases, vapours, dust, oil and air humidity. All materials used for insulating the winding and winding ends correspond to insulating classes F.

7.5 Brake

Fail safe electro-magnetic A.C.Brake is fitted on non-driving end of motor.



7.6 Chain

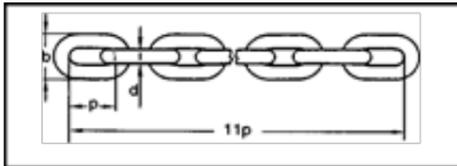


Figure 13

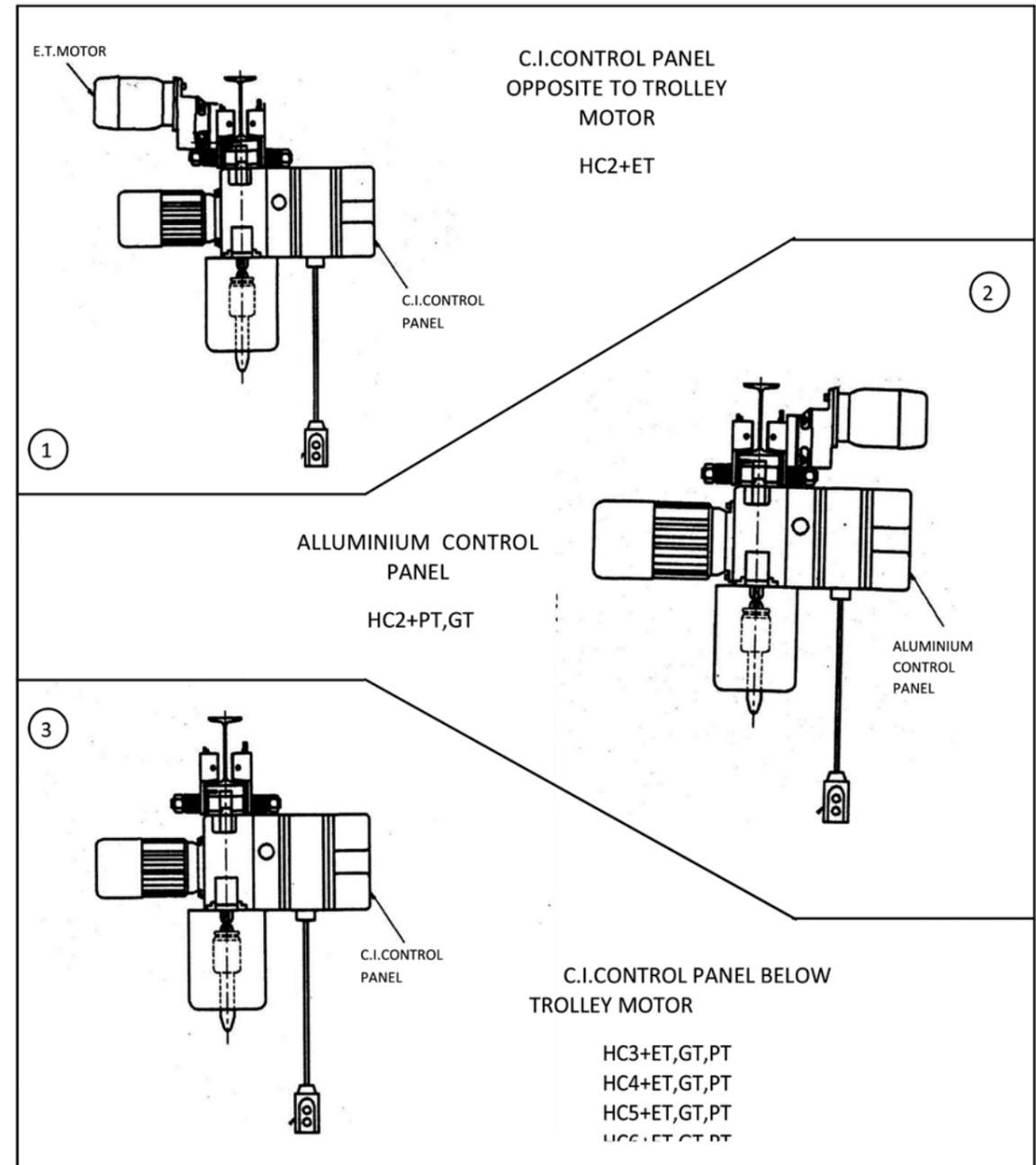
| hoist | Ød mm | p mm | 11p mm | b mm | weight kg/m | capacity kg | test load kN | minimum breaking load kN |
|----------|-------|------|--------|------|-------------|-------------|--------------|--------------------------|
| HC2+ | 6 | 18 | 198 | 20,2 | 0,80 | 700 | 28 | 45 |
| HC3+ | 7 | 21 | 231 | 23,6 | 1,1 | 1 000 | 40 | 60 |
| HC4/5/6+ | 10 | 28 | 308 | 34 | 2,2 | 2 000 | 80 | 125 |

7.7 Lubricants

| FLubrication Point | Qty. | Grease | Grease |
|--------------------|-------------|--------------------------|----------------------|
| Hoist Gear Box | HC2+ | 30 gm. | Kluberplex AG 11-462 |
| | HC3+ | 50 gm. | |
| | HC4+ | 80 gm. | |
| | HC5+ | 80 gm. | |
| | HC6+ | 80 gm. | |
| Chain | as required | Any medium viscosity oil | |

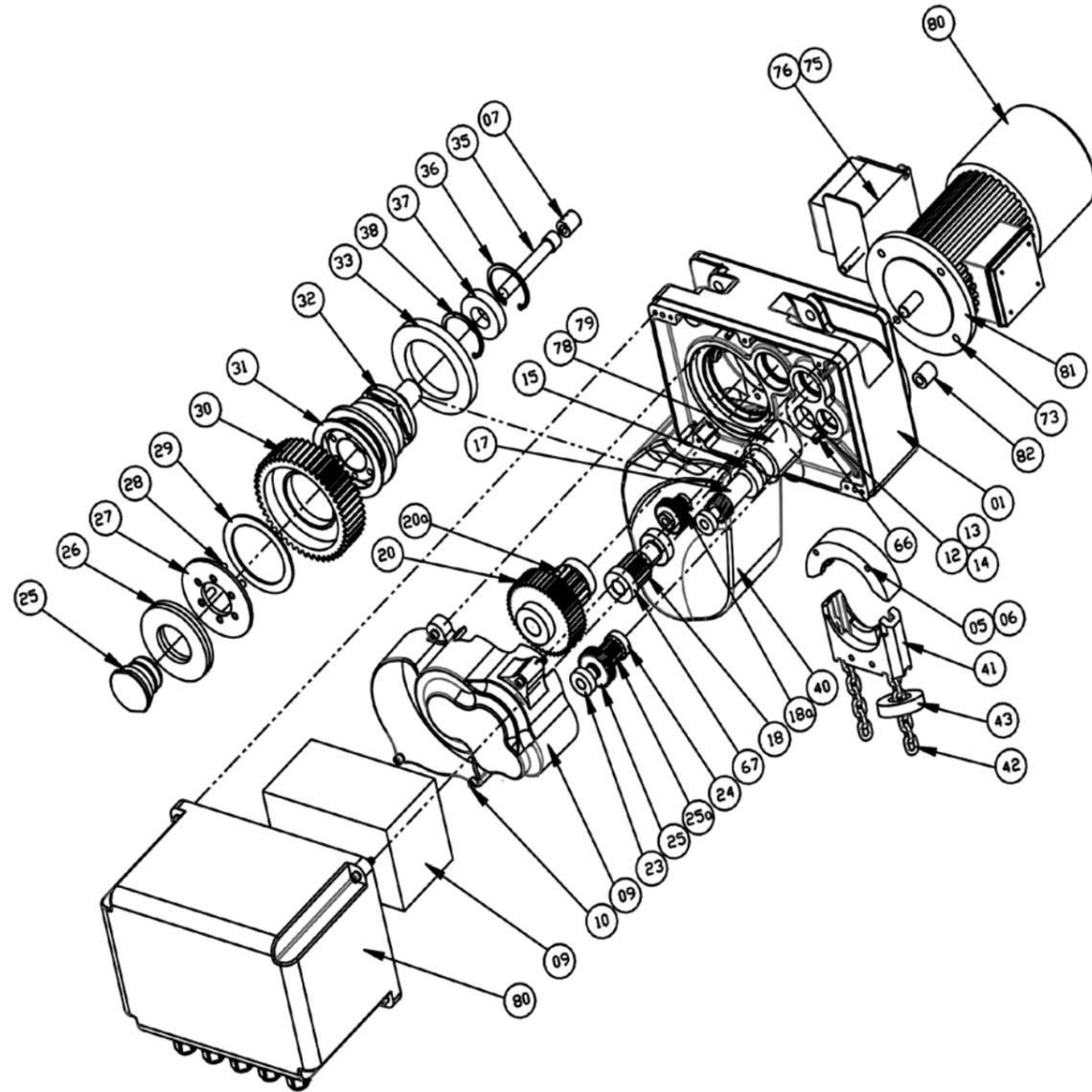


HC+ HOIST BALANCING ARRANGEMENT ON TROLLEE





INDEF HC+ ASSEMBLY



Spare Parts

| Part Description No. | Qty. | Drawing Number | | |
|---------------------------------------|------|----------------|--------------|--------------|
| | | HC2+ | HC3+ | HC4/HC5/HC6+ |
| 01 Main Gear Box Body | 1 | UFCM043105B | UGCM043105B | UHCM043205B |
| 03 Allen Screw | 2 | ASFM05010000 | ASFM05012000 | ASFM05012000 |
| 05 Chain Guide | 1 | UFCM973013A | UGCM973013A | UHCM973013A |
| 06 Allen Screw | 6 | ASHM06055000 | ASHM08060000 | ASHM08070000 |
| 07 Spacer | 2 | UFCM653014A | UGCM653114A | UHCM653014A |
| 08 Allen Screw | 2 | ASFM06060000 | ASFM06070000 | ASHM08100000 |
| 09 Gear Box cover | 1 | UFCM043106B | UGCM043106B | UHCM043106B |
| 10 Allen Screw | 4 | ASHM06055000 | ASFM06060000 | ASHM08100000 |
| 11 Dowel Pin | 2 | DP0500160000 | DP0500160000 | DP0800200000 |
| 12 Ball Bearing | 3 | BBR060010000 | BBR060020000 | BBR062020000 |
| 13 External Circlip | 3 | EXCRA0200000 | EXCRA0250000 | EXCRA0250000 |
| 14 Internal Circlip | 4 | INCRB0420000 | INCRB0520000 | INCRB0520000 |
| 15 Ball Bearing | 1 | BBR060040000 | BBR062050000 | BBR062050000 |
| 17 Main Shaft (HIGH SPEED) | 1 | UFCH813024B | UGCG813124A | UHCH813022C |
| 17 Main Shaft (LOW SPEED) | 1 | UFCG813022B | UGCG813124A | UHCG813022C |
| 25 1st Back Gear Wheel | 1 | UFCH813018B | UGCH813018B | UHCH813021B |
| 25 1st Back Gear Wheel (LOW SPEED) | 1 | UFCG813018B | UGCG813018B | UHCG813021C |
| 25a 1st Back Gear Pinion (HIGH SPEED) | 1 | - | UGCH813017B | UHCG813020C |
| 18 2nd Back Gear Wheel | 1 | UFCG813017B | UGCG813017B | UHCG813019C |
| 18a 2nd Back Gear Pinion | 1 | UFCG813016B | UGCG813016B | UHCG813018C |
| 20 3rd Back Gear Wheel | 1 | - | - | UHCG813017C |
| 20a 3rd Back Gear Pinion | 1 | - | - | UHCG813016C |
| 23 Ball Bearing 607 | 3 | BBR060020000 | BBR060040000 | BBR062060000 |
| 24 Ball Bearing 607 | 3 | BBR060020000 | BBR060040000 | BBR062060000 |
| 25 Clutch Plug | 1 | UFCM823008B | UGCM823008B | UHCM823008C |
| 26 Disc Spring Washer | 2 | DCW360071004 | DCW900046005 | DCW125640008 |
| 27 Pressure Pad | 1 | UFCM653009A | UGCM653009A | UHCM653009A |



| Part Description No. | Qty. | Drawing Number | | |
|-----------------------------|------|----------------|---------------|---------------|
| | | HC2+ | HC3+ | HC4/HC5/HC6+ |
| 28 Dowel Spring Pin | 4 | DSP060016000 | DSP080020000 | DSP100030000 |
| 29 Friction Disc | 2 | UFCM143011A | UGCM143011A | UHCM143011A |
| 30 Bull Gear Assy | 1 | UFCM003015B | UGCM003015B | UHCM003015B |
| 31 Friction Disc | 2 | UFCM143011A | UGCM143011A | UHCM143011A |
| 32 Load chain wheel | 1 | UFCM823078B | UGCM823078B | UHCM823078B |
| 33 Ball Bearing | 1 | BBR618130000 | BBR618160000 | BBR016020000 |
| 81 Motor Flange | 1 | UGCA703126A | UGCA703126A | UHCA703026B |
| 82 Spacer (Motor Shaft) | 1 | UFCA833551A | UGCM833551A | UHCM833551A |
| 35 Allen Screw | 1 | ASHM12080000 | ASHM14090000 | ASHM16110000 |
| 36 Internal Circlip | 4 | INCRB0550000 | INCRB0620000 | INCRB0720000 |
| 37 Ball Bearing | 1 | BBR06006ZZ00 | BBR06007ZZ00 | BBR06207ZZ00 |
| 38 Internal Circlip | 4 | INCRB0550000 | INCRB0620000 | INCRB0720000 |
| 39 External Circlip | 3 | EXCRA0300000 | EXCRA0350000 | EXCRA0350000 |
| 40 Chain collector | 1 | UECM213481A | UECM213481A | URCM213481A |
| 41 Chain Stripper | 1 | UFCM133112A | UGCM133112A | UHCM133112A |
| 42 Chain (state length) | - | CHAGS0601808 | CHAGS0702108 | CHAGS1002808 |
| 43 Stopper | 1 | UFCM653039A | UGCM653039A | UHCM653039A |
| 44 Dowel Spring Pin | 1 | DSP040020000 | DSP050045000 | DSP050045000 |
| 66 Key | 1 | KB0500500180 | KB0600600250 | KB0600600250 |
| 67 Ball Bearing | 1 | BBR060010000 | BBR060020000 | BBR062050000 |
| 69 Allen Screw | 4 | ASFM03010000 | ASFM05012000 | ASFM05012000 |
| 73 Hex Bolt | 4 | UECM193046A | UGCM193046A | UHCM193046A |
| 80 Motor (Single Speed) | 1 | XMRB169000COL | XMRB171000COL | XMRB167000COL |
| 80 Motor (Double Speed) | 1 | XMRB153000COL | XMRB172000COL | XMRB174000COL |
| 75 Rotary L. Switch Bracket | 1 | UECM133382A | UECM133382A | UHCM133082A |
| 76 Rotary Limit Switch | 1 | XMIS000029A | XMIS000029A | XMIG000064A |
| 77 Dowel Pin 4 x 20 | 1 | DSP040020000 | DSP040020000 | DSP040020000 |
| 78/79 Coupling | 1 | UFCA003125A | UGCA003125A | UHCA003025A |



Upper Hook Suspension

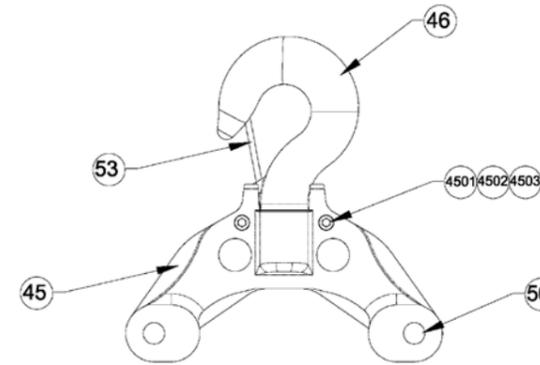


Figure 14

| Part No. | Description | Qty. | HC2+ | HC3+ | HC4+ |
|----------|----------------------------|------|--------------|--------------|--------------|
| | Upper Block Complete Assy. | 1 | 2410501P | 1430501P | 1440402P |
| 45 | Hook suspension | 2 | UECU013145A | UGCU013145A | UHCU013045A |
| 46 | Top Hook with safety latch | 1 | UECU002046A | CAAS003130A | CIEU001051A |
| 53 | Safety Catch complete | 1 | UECU003053A | CAAS113321A | CMBU003053A |
| 50 | Pin for upper block | 2 | UFCM823050B | UGCM823050B | UHCM823050B |
| 4501 | MS Hex Bolt | 2 | HBMM06030046 | HBMM06030046 | HBMM06030046 |
| 4502 | Hex Nut | 2 | HNMM00600000 | HNMM00600000 | HNMM00600000 |
| 4503 | Flat Spring Washer | 2 | FLSPWB060000 | FLSPWB060000 | FLSPWB060000 |

| Part No. | Description | Qty. | Drawing Number HC5+ | HC6+ |
|----------|-----------------------------|------|---------------------|--------------|
| | Upper Block Complete Assy. | 11 | 1450401P | 1520401P |
| 45 | Hook suspension | 2 | UQCU013045A | UQCU013045A |
| 46 | Top Hook with safety latch | 1 | CIEU001051A | URCU002046A |
| 50 | Pin for upper block | 2 | UHCM823050B | UHCM823050B |
| 53 | Safety Catch Assy. complete | 1 | CMDU003053A | CCBS113126A |
| 4501 | MS Hex Bolt | 2 | HBMM06030046 | HBMM06030046 |
| 4502 | Hex Nut | 2 | HNMM00600000 | HNMM00600000 |
| 4503 | Flat Spring Washer | 2 | FLSPWB060000 | FLSPWB060000 |



Hoist View (HC2+/HC3+/HC4+)

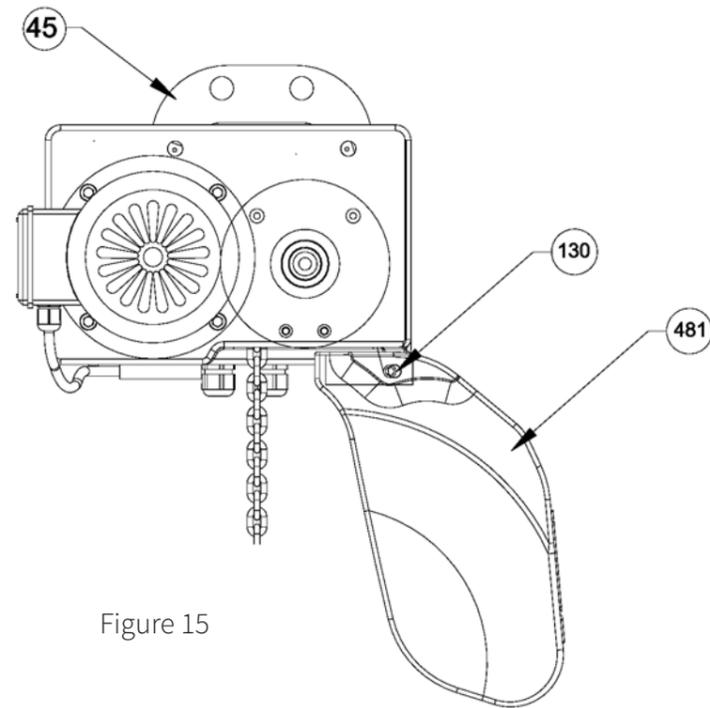


Figure 15

| Part No. | Description | Qty. | HC2+ | HC3+ | HC4+ |
|----------|-------------------------|------|-------------|-------------|-------------|
| 45 | Suspension Plate | 2 | UFCU653041A | UGCU653041A | UHDU653045A |
| 130 | Pin For Chain Collector | 4 | UECM653030A | UECM653030A | UHCM653130A |
| 481 | Chain collector | 8 | UECM213481A | UECM213481A | URCM213481A |



Hoist View (HC5+/HC6+)

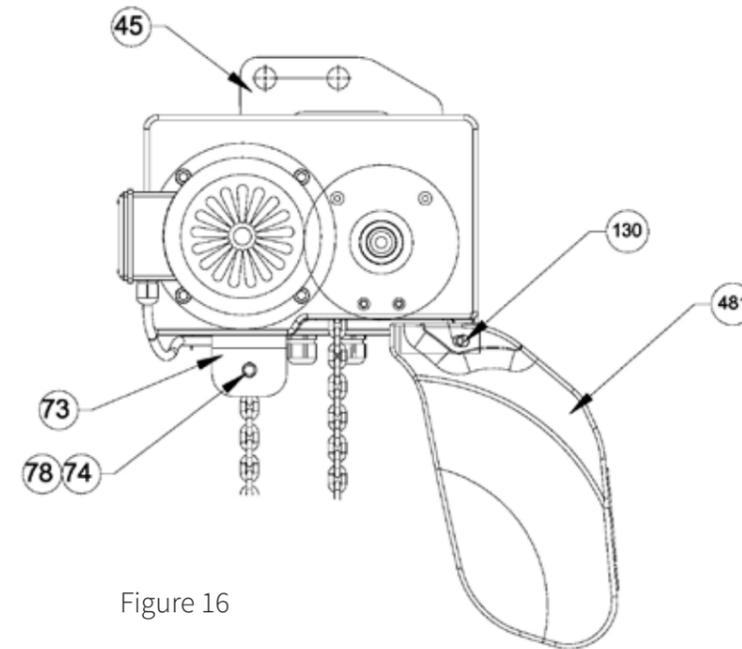


Figure 16

| Part No. | Description | Qty. | HC5+/HC6+ |
|----------|--------------------------|------|--------------|
| 45 | Suspension Plate | 2 | UHDU653045A |
| 73 | Chain End Suspension | 1 | UQCU1863073A |
| 74 | Chain End Suspension Pin | 2 | UQCU203076B |
| 78 | Plain Washer | 4 | PLW1702803SZ |
| 130 | Pin For Chain Collector | 4 | UHCM653130A |
| 481 | Chain collector | 8 | URCM213481A |



‘C’ Arm Hoist View (HC5+/HC6+)

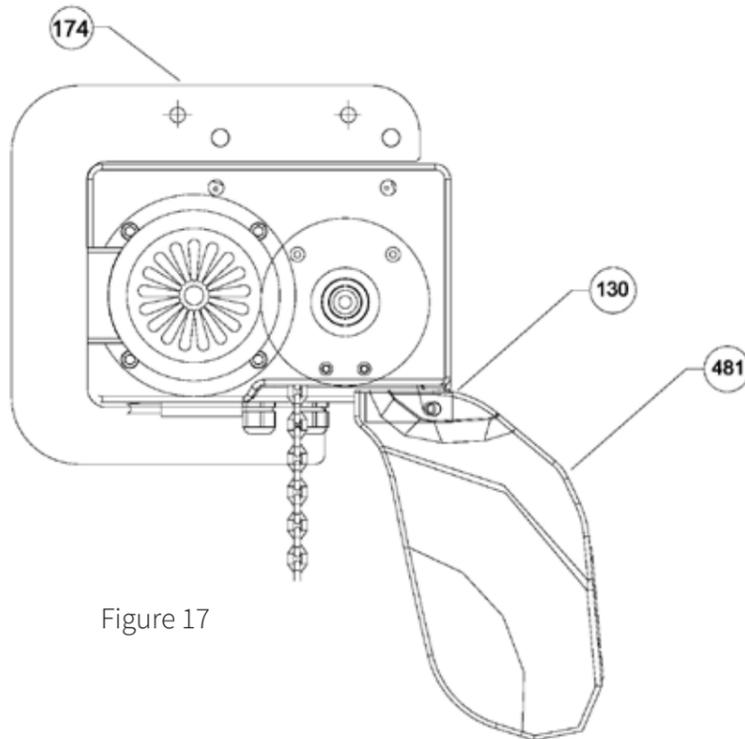


Figure 17

| Part No. | Description | Qty. | HC5+/HC6+ |
|----------|-------------------------|------|-------------|
| 174 | Hoist Suspension Arm | 1 | UHCU133174A |
| 130 | Pin For Chain Collector | 4 | UHCM653130A |
| 481 | Chain collector | 8 | URCM213481A |



Lower Block Assembly (HC2+/HC3+/HC4+)

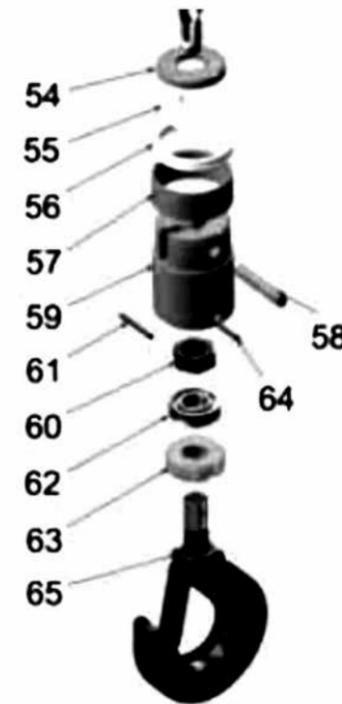


Figure 18

| Part No. | Description | Qty. | Drawing Number | | |
|----------|------------------------------|------|----------------|--------------|---------------|
| | | | HC2+ | HC3+ | HC4+ |
| | Lower Block Complete Assy. | 1 | 1420601P | 1430601AP | 1440602P |
| 54 | Washer | 2 | UFBL653036A | UGBL653036A | UHBL653036A |
| 55 | Washer | 2 | UFBL183037A | UGBL183037A | UHBL183037A |
| 56 | Snap Ring | 1 | SR0450000000 | SR0500000000 | SR0650000000 |
| 57 | Sleeve | 1 | UFBL653035A | UGBL873035A | UHBL653035A |
| 58 | Lower Block Pin | 1 | UFBL203038B | UGBL203038A | UHBL203038C |
| 59 | Lower Block Body | 1 | UFBL823033A | UGBL823033A | UHBL823033A |
| 60 | Hex nut | 1 | HNMM01600000 | HNMM02000000 | HNMM024F0000 |
| 61 | Dowel Spring | 1 | DSP040025000 | DSP040030000 | DSP040030000 |
| 62 | Thrust Bearing | 1 | BTB511030000 | BTB511040000 | BTB521050000 |
| 63 | Nut | 1 | UFBL823034A | UGBL823034A | UHBL823034A |
| 64 | Grub Screw | 1 | GSFM06008000 | GSFM06008000 | GSFM080010000 |
| 65 | Lower hook with safety latch | 1 | UFBL003320A | UGBL003032A | UHBL003320A |



Lower Block Assembly (HC5+/HC6+)

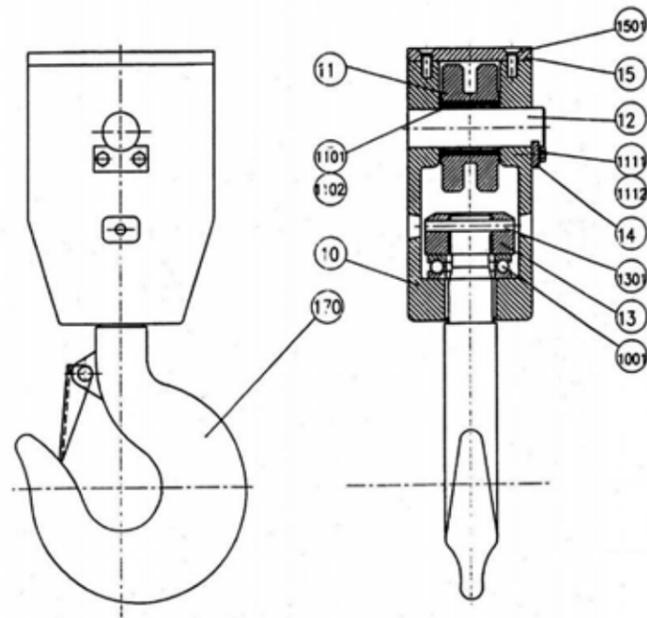


Figure 19

| Part No. | Description | Qty. | Drawing Number | |
|----------|------------------------------|------|----------------|--------------|
| | | | HC5+ | HC6+ |
| | Lower Block Complete Assy. | 1 | 1450603P | 1520602P |
| 10 | Lower Block Body | 1 | UQCL133010A | URCL133010A |
| 11 | Load Chain Wheel | 1 | UQCL823011A | UQCL823011A |
| 12 | Wheel Axle | 1 | UQCL823012A | UQCL823012A |
| 13 | Hook Nut | 1 | UQCL733013A | URCL733013A |
| 14 | Locking plate | 1 | UQCL853014A | UQCL853014A |
| 15 | Lower Block Cover | 1 | UQCL043015A | UQCL043015A |
| 170 | Lower Hook With Latch Assly. | 1 | UQCL003170A | UBCK003170A |
| 1001 | Thrust Bearing | 1 | BTB513060000 | BTB512080000 |
| 1101 | Needle Roller Bearing | 3 | HK3516000000 | HK3516000000 |
| 1102 | Inner Ring LR | 3 | IRLR30351650 | IRLR30351650 |
| 1111 | HT Hex Bolt | 2 | HBHM06016088 | HBHM06016088 |
| 1112 | Flat Spring Washer | 2 | FLSPWBO60000 | FLSPWBO60000 |
| 1301 | Dowel Spring Pin | 1 | DSP050050000 | DSP060075000 |
| 1501 | Counter Sunk Screw | 2 | KSFMO8020000 | KSFMO8020000 |



SPARE PARTS FOR TROLLEY MOTOR BRAKE

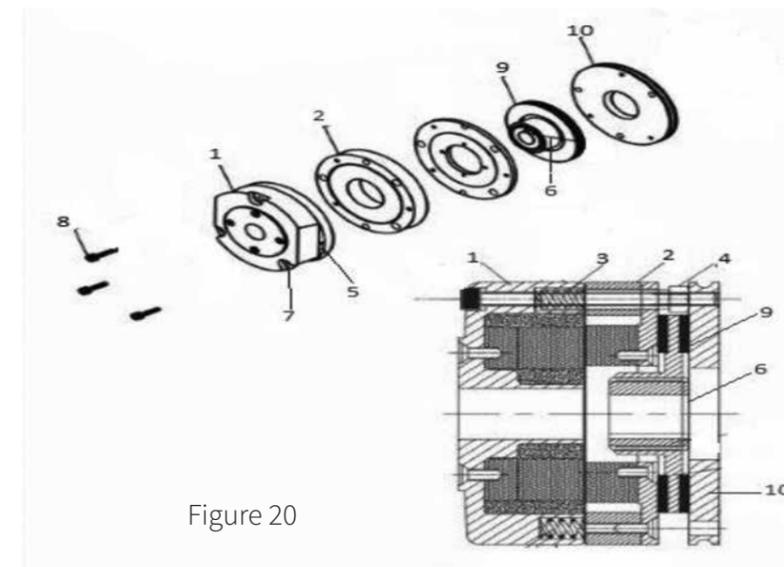


Figure 20

BRAKE COMPONENTS

| PART NO. | PART CODE | DESCRIPTION |
|----------|---------------|--|
| | XBAP0050SYT | MAIN BRAKE |
| 1 | XBAP01610SSYT | STATOR |
| 2 | | ARMATURE ASSEMBLY |
| 3 | | TUBULAR SPRING EACH SET |
| 4 | XBAP87210SSYT | MOUNTING FLANGE ASSLY |
| 6 | | BRAKE DISC & BRAKE LINER (ROTOR / GEAR HUB) |
| 10 | XBAP00510SYT | MOUNTING FLANGE |



PARE PARTS FOR TROLLEY MOTOR WITH BRAKE (OPTIONAL)

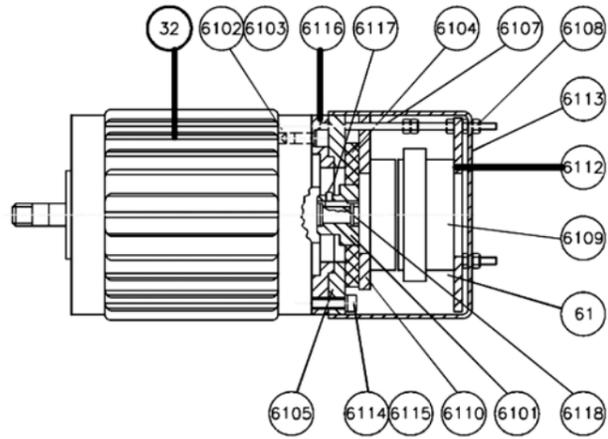


Figure 21

| Part No. | Description | Code No. | Qty. |
|----------|--------------------------|--------------|------|
| 32 | Motor | XMRPO28000A | 1 |
| 61 | Brake Complete | XBAP0050PTA | 1 |
| 6101 | Brake Disc Bush | XBAP0058PTA | 1 |
| 6102 | Allen Screw M8*20 | ASFM08020000 | 4 |
| 6103 | Sq. Spring Washer for M8 | SQSPWB080000 | 4 |
| 6104 | Brake Liner Disc | XBAP0051PTA | 1 |
| 6105 | Brake Plate | XBAP0052PTA | 1 |
| 6107 | Load Spring | XBAP0053PTA | 3 |
| 6108 | Hex. Nut M8 | HNMM00800000 | 15 |
| 6109 | Brake Coil | XBAP0054PTA | 1 |
| 6110 | Armature plate | XBAP0055PTA | 1 |
| 6112 | Magnet Plate | XBAP0056PTA | 1 |
| 6113 | Brake Cover | XBAP0057PTA | 1 |
| 6114 | Allen Screw M8*25 | ASFM08025000 | 3 |
| 6115 | Spring Washer B.8 | FLSPWB080000 | 3 |
| 6116 | Adaptor | XBAP0059PTA | 1 |
| 6117 | Grub Screw M6x10 | SLGSM0601000 | 1 |
| 6118 | Key 5*5*18 | KB0500500180 | 1 |



GEARED ROTARY LIMIT SWITCH

| HOIST MODEL | HC2+ | HC3+ | HC4+ | HC5+ | HC6+ |
|---------------------|----------------------------|-------------|-------------|-------------|-------------|
| Ht. of Lift in mtrs | Geared Rotary Limit Switch | | | | |
| 3 | XMIS000029A | XMIS000029A | XMIG000064A | XMIG000064A | XMIG000064A |
| 6 | XMIS000029A | XMIS000029A | XMIG000064A | XMIG000064A | XMIG000064A |
| 9 | XMIS000029A | XMIS000029A | XMIG000064A | XMIG000064A | XMIG000064A |
| 12 | XMIS000029A | XMIS000029A | XMIG000064A | XMIT000071A | XMIT000071A |
| 15 | XMIS000029A | XMIS000029A | XMIG000064A | XMIT000071A | XMIT000071A |
| 18 | XMIS000029A | XMIS000029A | XMIG000064A | XMIT000071A | XMIT000071A |
| 21 | XMIS000029A | XMIS000029A | XMIG000064A | XMIT000071A | XMIT000071A |
| 24 | XMIS000027A | XMIS000029A | XMIG000065A | XMIG000066A | XMIG000066A |
| 27 | XMIS000027A | XMIS000029A | XMIG000065A | XMIG000066A | XMIG000066A |
| 30 | XMIS000027A | XMIS000027A | XMIG000065A | XMIG000066A | XMIG000066A |
| 33 | XMIS000027A | XMIS000029A | XMIG000065A | XMIG000066A | XMIG000066A |
| 36 | XMIS000027A | XMIS000027A | XMIG000065A | XMIG000066A | XMIG000066A |
| 39 | XMIS000028A | XMIS000027A | XMIG000065A | XMIG000066A | XMIG000066A |
| 42 | XMIS000028A | XMIS000027A | XMIG000065A | XMIG000066A | XMIG000066A |



GEARED TROLLEY (HC2+/HC3+/HC4+/HC5+)

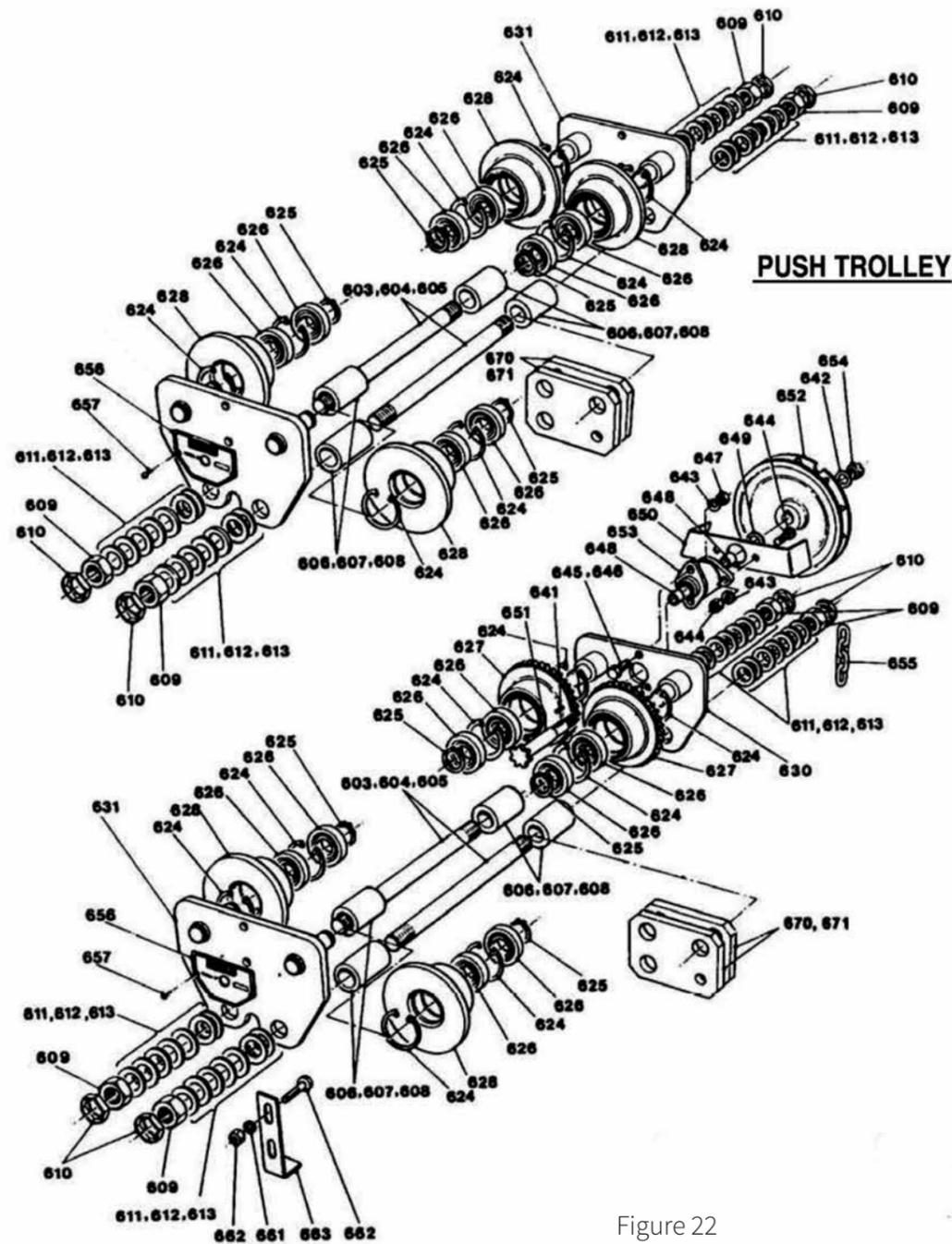


Figure 22

4. TROLLEY SPARE PARTS (PUSH / HARD GEARED TYPE)

| Part No. | Description | Qty | Drawing Number | | | |
|----------|-------------------------|-----|------------------|--------------|--------------|-------------|
| | | | Capacity in Kgs. | 500 | 1000 | 3000 |
| 603 | Cross bolt | 2 | (Range 1) | RAAM833203A | RCAM833201A | REAM833201A |
| | | | (Range 2) | RAB833301A | RCBA833301A | REBM833301A |
| | | | (Range 3) | RADM833401A | RCDM833401A | REDM833401A |
| 606 | Distance Tube | 4 | Range 1 | RACM873204A | RCDM873204A | REAM873204A |
| | | | Range 2 | RACM873204A | RCDM873204A | REAM873204A |
| | | | Range 3 | RACM873204A | RCDM873204A | REAM873204A |
| 609 | Nut | 4 | HNMM0160000Z | HNMM0200000Z | HNMM0240000Z | |
| 610 | Spring Washer | 4 | FLSPWB160000 | FLSPWB200000 | FLSPWB240000 | |
| 611 | Adjusting Washer | * | RACM833205A | RCCM833205A | RECM833205A | |
| 624 | Cir clip, (Internal) | 4 | INCRB0350000 | INCRB0420000 | INCRB0520000 | |
| 625 | Cir clip (External) | 4 | EXCRA0170000 | EXCRA0250000 | EXCRA0250000 | |
| 626 | Ball Bearing | 4 | BBR06003RS00 | BBR06004RS00 | BBR06205RS00 | |
| 627 | Geared Runner | 2 | - | RDCM003108A | RFCM003108A | |
| 628 | Ungeared Runner | 2/4 | RACM823104A | RCCM823104A | RECM823104A | |
| 630 | Geared Side Plate | 1 | - | RDCM002010A | RFCM002010A | |
| 631 | Push Trolley Side Plate | 2 | RACM002001A | RCCM002001A | RECM002001A | |
| | Ungeared Side Plate | 1 | - | RDCM002001A | RFCM002001A | |
| 641 | Parallel Key | 1 | - | RBCT823907A | RBCT823907A | |
| 642 | Washer 1 | - | RBCT833905A | RBCT833905A | - | |
| 643 | Spring Washer | 4 | - | FLSPWB080000 | FLSPWB80000 | |
| 644 | Bolt and Nut | 2 | - | HNMM0080000Z | HNMM0080000Z | |
| | | | - | HBHM08025088 | HBHM08025088 | |
| 645 | Bolt and Nut | 2 | - | HNMM0080000Z | HNMM0080000Z | |
| | | | - | HBHM08025088 | HBHM08025088 | |
| 648 | Bronze Bush | 2 | - | RBCT063906A | RBCT063906A | |
| 649 | Traverse Shaft Washer | 1 | - | RBCT833912A | RBCT833912A | |
| 650 | Hand Chain Guard | 1 | - | RBCT313904A | RBCT313904A | |
| 651 | Traverse Shaft | 1 | - | RBCT823903A | RBCT823903A | |
| 652 | Hand Chain Wheel | 1 | - | RBCT013901A | RBCT013901A | |
| 653 | Traverse Sleeve | 1 | - | RBCT043902A | RBCT043902A | |
| 654 | Binx Nut | 1 | - | HNB0120000Z | HNB0120000Z | |
| 655 | Hand Chain (2B-600) | 11g | CHMH05022500 | CHMH05022500 | CHMH05022500 | |
| | | | RACH173008 | RCCH173008A | RECH173008A | |
| 656 | Geared Trolley | 1 | - | RDCH173008A | RFCH173008A | |
| 661 | Spring Washer | 2 | - | FLSPWB080000 | FLSPWB080000 | |
| 662 | Bolt and Nut | 2 | - | HNMM0080000Z | HNMM0080000Z | |
| | | | - | HBHM08035088 | HBHM08035088 | |
| 663 | Anti Tip Stop | 1 | - | RDCM313019A | RDCM313019A | |
| 670 | Suspension Plate | 1 | RACH053009B | RCCH053009A | RECH053009A | |
| 675 | Cross Bolt | 2 | RAAM833203A | RCAM833201A | REAM833201B | |
| 676 | Nut | 2 | HNMM0160000Z | HNMM0200000Z | HNMM0240000Z | |
| 677 | Spring Washer | 2 | FLSPWB160000 | FLSPWB200000 | FLSPWB240000 | |
| 678 | Adjusting Washer | 6 | RACM833205A | RCCM833205A | RECM833205A | |
| 680 | Distance Tube | 4 | RACM873204A | RCDM873204A | REAM873204A | |
| 681 | Adaptor plate | 2 | RADM313403A | RCDM313403A | REDM313403A | |
| 682 | Distance Tube/piece | 2 | RACM873204A | RCDM873204A | REDM873204A | |

B = Bottom of girder to floor dimension.
 * Quantity varies with capacity and track width.



ELECTRIC TROLLEY (HC2+/HC3+/HC4+/HC5+)

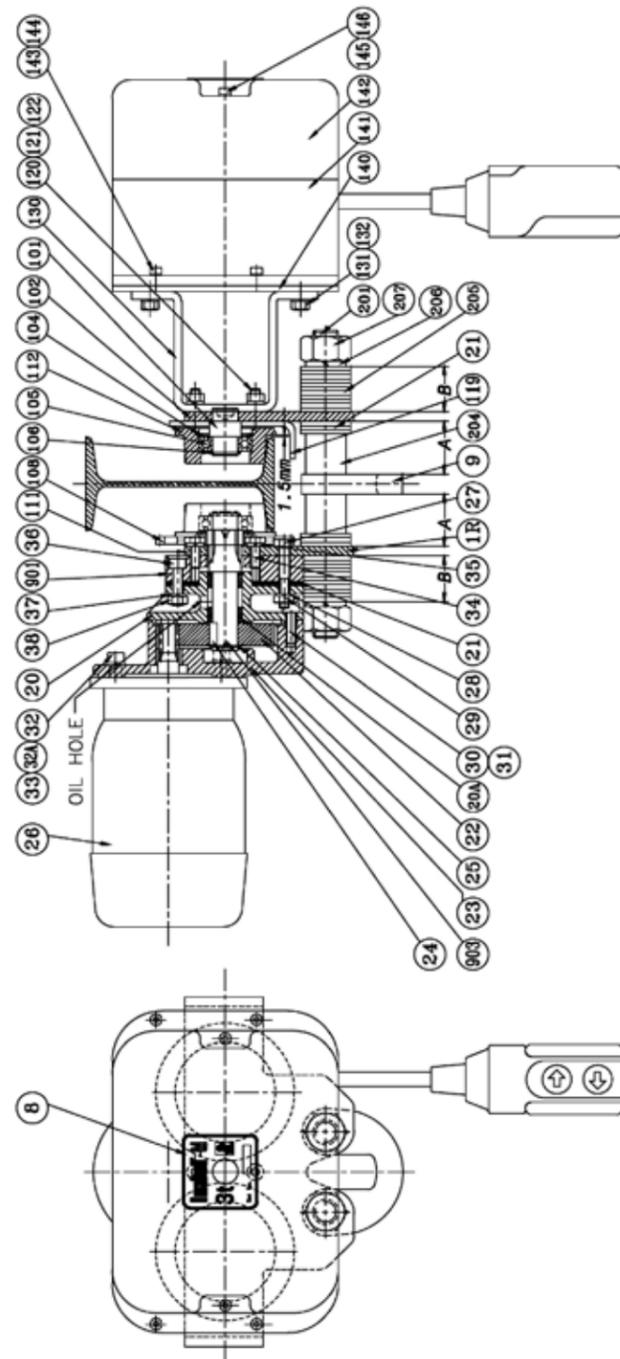


Figure 23

5. SPARE PARTS FOR ELECTRIC TROLLEY

| Part No. | Description | Qty | Drawing Number | |
|----------|-------------------------|-----|----------------|---------------|
| | | | 1000 | 3000 |
| 1R | Side plate with pins | 1 | RDCM002001A | RFCM002001A |
| 10R | Side plate with pins | 1 | RGCM002010A | RHCM002010A |
| 104 | Runner (Plain) | 2 | RCCM823104B | RECM823104B |
| 105 | Bearing | 2 | BBR06004RS00 | BBR06205RS00 |
| 106 | Circlip | 2 | EXCRA0200000 | EXCRA0250000 |
| 119 | Anti tipping stoppeared | 1 | RDCM313019A | RDCM313019A |
| 120 | Bolt | 2 | HBHM08035088 | HBHM08035088 |
| 121 | Nut | 2 | HNMM0800000Z | HNMM0800000Z |
| 122 | Washer | 2 | FLSPWB080000 | FLSPWB080000 |
| 112 | Circlip | 2 | INCRB04200000 | INCRB05200000 |
| 108 | Geared Runner | 2 | RDCM003108A | RFCM003108A |
| 109 | Bearing | 2 | BBR06004RS00 | BBR06205RS00 |
| 110 | Circlip | 2 | EXCRA0200000 | EXCRA0250000 |
| 112 | Circlip | 2 | INCRB04200000 | INCRB05200000 |
| 901 | Adaptor Plate | 1 | RGCT053901A | RGCT053901A |
| 903 | Pinion | 1 | RGCT813903C | RGCT813903C |
| 20 | Bearing Block | 1 | MCCM023020A | MCCM023020A |
| 20A | Bush | 2 | MCCM033020A | MCCM033020A |
| 21 | Spacer | 2 | MBCM113021A | ----- |
| 22 | Gear Wheel | 1 | PACF813031A | PACF813031A |
| 23 | Gear Box Housing | 1 | MCCM023023A | MCCM023023A |
| 26 | Motor (10mpm) | 1 | XMRP039000REM | XMRP039000REM |
| 24 | Key | 1 | K00600600180 | K00600600180 |
| 25 | Circlip | 1 | EXCRA0200000 | EXCRA0200000 |
| 27 | Bolt | 2 | HBHM08025088 | HBHM08025088 |
| 28 | Washer | 3 | FLSPWB080000 | FLSPWB080000 |
| 29 | Nut | 3 | HNMM0800000 | HNMM0800000 |
| 30 | Bolt | 4 | HBMM08025046 | HBMM08025046 |
| 31 | Washer | 4 | FLSPWB080000 | FLSPWB080000 |
| 32 | Screw | 2 | ASFM08025000 | ASFM08025000 |
| 32A | Bolt | 2 | HBHM08025088 | HBHM08025088 |
| 33 | Washer | 4 | FLSPWB080000 | FLSPWB080000 |
| 34 | Bolt | 2 | HBHM08020088 | HBHM08020088 |
| 35 | Washer | 2 | FSLPWB080000 | FLSPWB080000 |
| 36 | Bolt | 1 | HBHM08025088 | HBHM08025088 |
| 37 | Washer | 1 | FLSPWB080000 | FLSPWB080000 |
| 38 | Nut | 1 | HNMM00800000 | HNMM00800000 |
| 130 | Bracket | | RGCM132131A | RGCM132131A |
| 131 | Bolt | 2 | HBMM08012046 | HBMM08012046 |
| 132 | Spacer | 2 | FLSPWB080000 | FLSPWB080000 |
| 140 | Counter Plate | 1 | UECE653003A | UECE653003A |
| 141 | Panel Housing | 1 | UECE043001A | UECE043001A |
| 142 | Panel Cover | 1 | UECE043002A | UECE043002A |
| 143 | Screw | 4 | ASFM05012000 | ASFM05012000 |
| 144 | Washer | 4 | FLSPWB050000 | FLSPWB050000 |
| 145 | Screw | 2 | ASHM06080000 | ASHM06080000 |
| 146 | Washer | 2 | FLSPWB060000 | FLSPWB060000 |

* optional speed



INDEF M ET SPARE FOR RANGE 1

| PART NO | DESCRIPTION | DRAWING NO 1000 KG | QTY | DRAWING NO 3000 KG | QTY |
|---------|-----------------|--------------------|-----|--------------------|-----|
| 201 | CROSS NUT | RCAM833201A | 2 | REAM833201B | 2 |
| 204 | DISTANCE TUBE | RCDM873204A | 4 | REAM873204A | 4 |
| 205 | WASHER | RCCM833205A | 72 | RECM833205A | 56 |
| 206 | WASHER | FLSPWB200000 | 4 | FLSPWB240000 | 4 |
| 207 | NUT | HNMM020000YZ | 4 | HNMM024000YZ | 4 |
| 9 | HOOK SUSPENSION | RCCH053009B | 1 | RECH053009B | 1 |

INDEF M ET SPARE FOR RANGE 2

| PART NO | DESCRIPTION | DRAWING NO 1000 KG | QTY | DRAWING NO 3000 KG | QTY |
|---------|-----------------|--------------------|-----|--------------------|-----|
| 201 | CROSS NUT | RCDM833401A | 2 | REBM833301A | 2 |
| 204 | DISTANCE TUBE | RCDM873204A | 8 | REAM873204A | 8 |
| 205 | WASHER | RCCM833205A | 80 | RECM833205A | 52 |
| 206 | WASHER | FLSPWB200000 | 4 | FLSPWB240000 | 4 |
| 207 | NUT | HNMM020000YZ | 4 | HNMM024000YZ | 4 |
| 9 | HOOK SUSPENSION | RCCH053009B | 1 | RECH053009B | 1 |

INDEF M ET SPARE FOR RANGE 3

| PART NO | DESCRIPTION | DRAWING NO 1000 KG | QTY | DRAWING NO 3000 KG | QTY |
|---------|-----------------|--------------------|-----|--------------------|-----|
| 201 | CROSS NUT | RCDM833401A | 2 | REDM833401A | 2 |
| 201A | CROSS NUT | RCDM833405A | 2 | REDM833402A | 2 |
| 204 | DISTANCE TUBE | RCDM873204A | 8 | REAM873204A | 8 |
| 204A | DISTANCE TUBE | RCDM873404A | 2 | REDM873204A | 2 |
| 205 | WASHER | RCCM833205A | 128 | RECM833205A | 84 |
| 206 | WASHER | FLSPWB200000 | 8 | FLSPWB240000 | 8 |
| 207 | NUT | HNMM020000YZ | 8 | HNMM024000YZ | 8 |
| 9 | HOOK SUSPENSION | RCCH053009B | 1 | RECH053009B | 1 |
| 9A | HOOK SUSPENSION | | | REDM313403A | 1 |



ET TROLLEY & SPARE PARTS (HC6+)

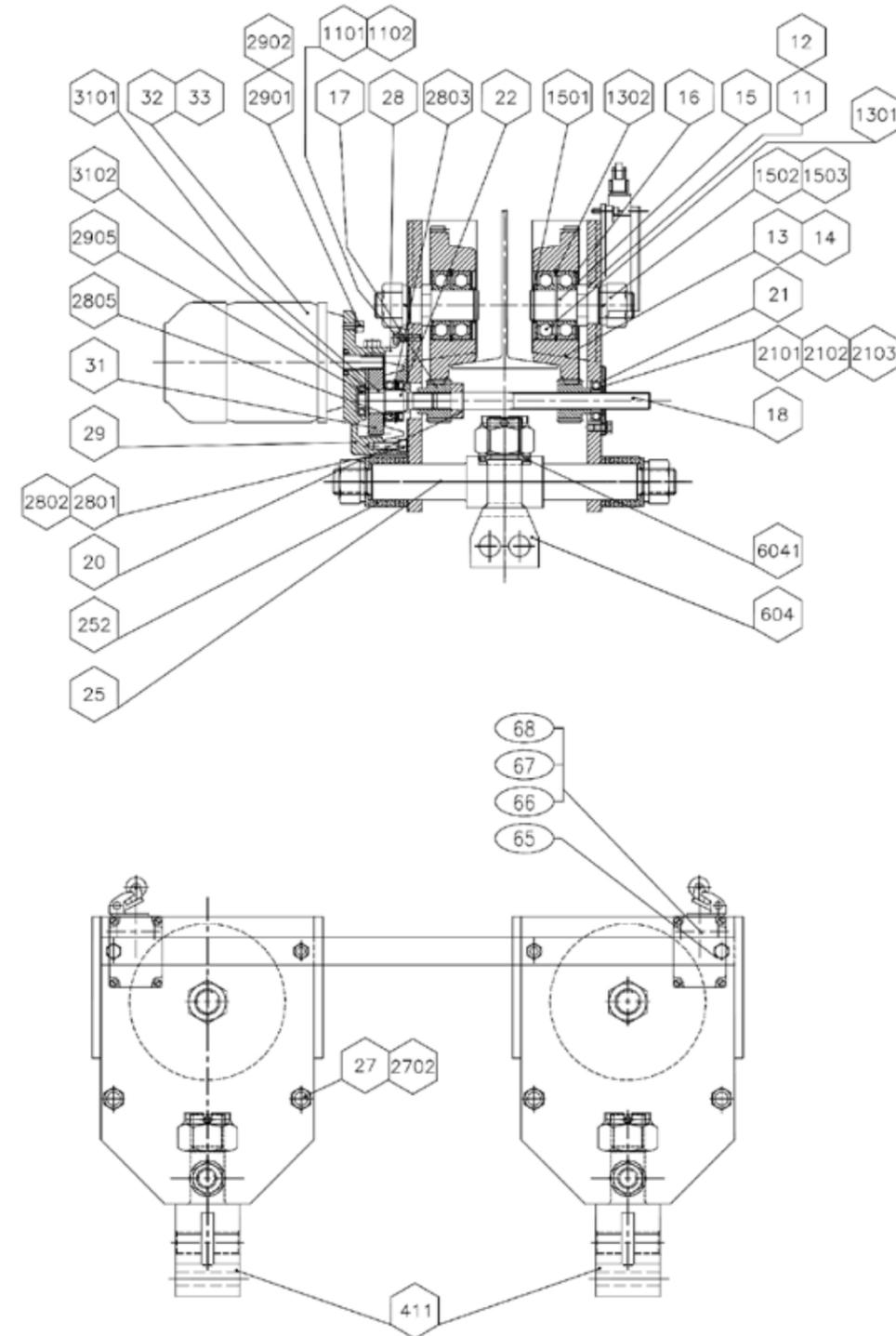
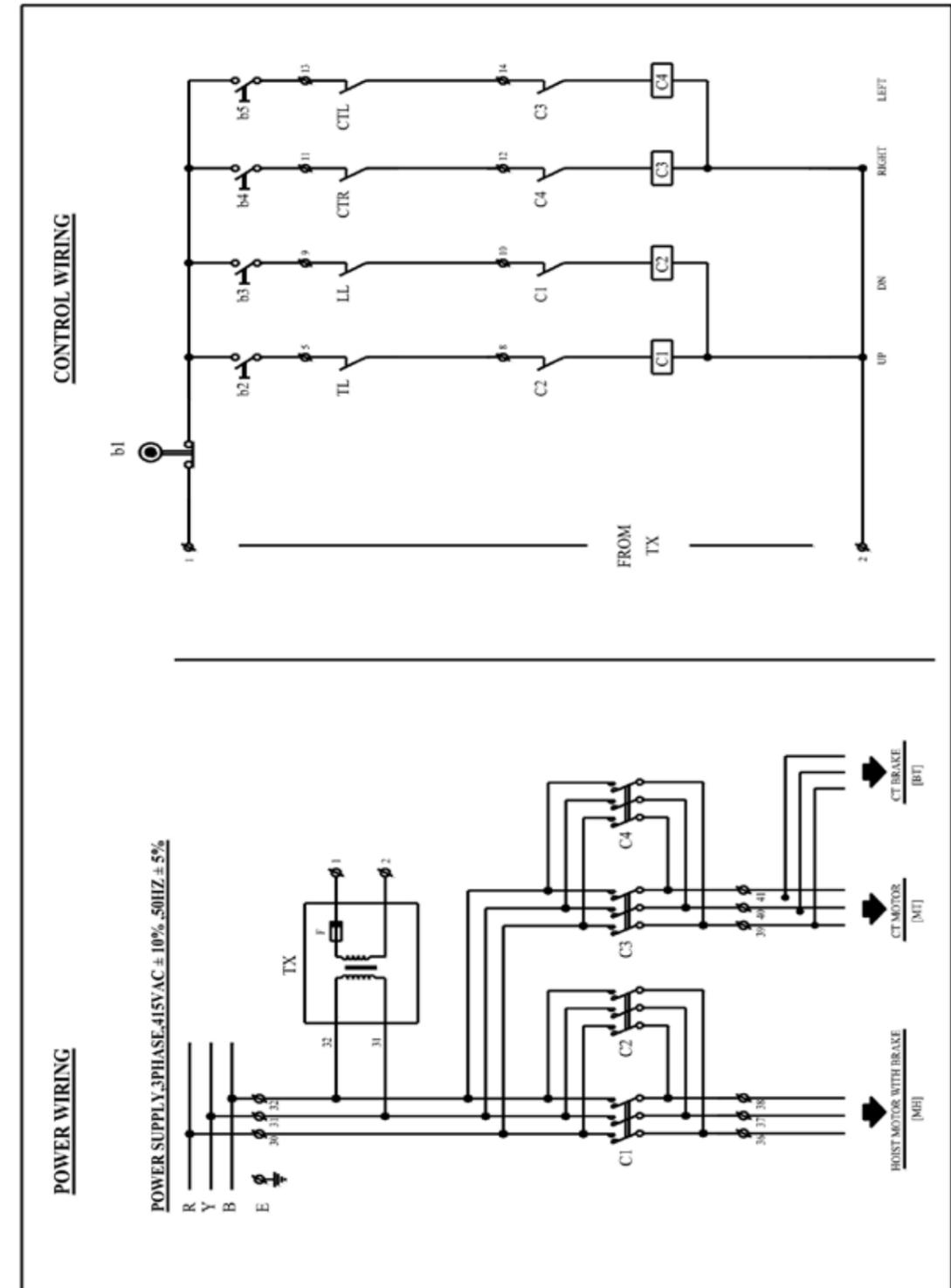


Figure 24



| Part No | Item Code | Description | Qty |
|---------|---------------|----------------------------|-----|
| 411 | URCM133411A | HOIST SUSPENSION | 02 |
| 68 | FLSPWB050000 | WASHER | 04 |
| 67 | ASFM05016000 | ALLEN SCREW | 04 |
| 66 | XLSP009000A | LIMIT SWITCH | 02 |
| 65 | PACF133650A | LIMIT SWITCH PLATE | 01 |
| 65 | PACF133651A | LIMIT SWITCH PLATE | 01 |
| 6041 | BTB511080000 | THRUST BEARING | 02 |
| 604 | PGCF863604A | HOIST SUSPENSION | 02 |
| 33 | XBAPO050PTA | TROLLEY BRAKE | 01 |
| 32 | XMRP028000A | MOTOR TESC | 01 |
| 3102 | EXCRA0200000 | EXTERNAL CIRCLIP A 20 | 01 |
| 3101 | KB0600600180 | KEY BER 6 x 6 x 18 | 01 |
| 31 | PACF813031B | GEAR | 01 |
| 2905 | BBR060030000 | BALL BEARING 6003 | 01 |
| 2902 | FLSPWB080000 | FLAT SPRING WASHER | 04 |
| 2901 | ASFM08025000 | ALLEN SCREW M8 x 25 | 04 |
| 2805 | BR0600500000 | BALL BEARING 6005 | 01 |
| 2803 | INCRB04700000 | INTERNAL CIRCLIP B 47 | 01 |
| 2802 | SQSPW080000 | SQUARE SPRING WASHER B8 | 04 |
| 2801 | ASFM08030000 | ALLEN SCREW | 04 |
| 29 | PACF023029B | GEAR BOX HOUSING | 01 |
| 28 | PACF013028B | GEAR BOX COVER | 01 |
| 2702 | FLSPWB160000 | FLAT SPRING WASHER B16 | 04 |
| 27 | PCCF833027A | DISTANCE BOLT | 04 |
| 252 | PCCF113252A | WASHER | 48 |
| 25 | PBCN053064A | LOAD AXLE | 02 |
| 22 | PACF813022C | DRIVE SHAFT | 01 |
| 2103 | FLSPWB080000 | FLAT SPRING WASHER | 03 |
| 2102 | HBHM08016088 | MS HEX BOLT M8 x 16 | 03 |
| 2101 | BBR06003ZZ00 | BALL BEARING 6003ZZ | 01 |
| 1503 | FLSPWB30000 | FLAT SPRING WASHER B30 | 04 |
| 1502 | PACF113023A | SPACER | 04 |
| 1501 | EXCRA0350000 | EXTERNAL CIRCLIP A 35 | 04 |
| 1302 | INCRB0800000 | INTERNAL CIRCLIP B 80 | 04 |
| 1301 | BBR063070000 | BALL BEARING 6307 | 08 |
| 1102 | FLSPWB080000 | FLAT SPRING WASHER B8 | 04 |
| 1101 | PACF193112A | MODIFIED HT HEX BOLT M8*30 | 04 |
| 21 | PACF833021B | BEARING HOUSING | 01 |
| 20 | PACF833020B | CLAMPING WASHER | 01 |
| 18 | PBCF823018C | PINION SHAFT | 01 |
| 17 | PACF823017C | WHEEL PINION (SQ.HOLE) | 02 |
| 16 | PBCF113016A | BEARING COVER | 08 |
| 15 | PBCF823015A | WHEEL AXLE | 04 |
| 14 | PBCG013014A | PLAIN WHEEL | 02 |
| 13 | PBCG013013A | GEAR WHEEL | 02 |
| 12 | PBCF133010B | PLAIN WHEEL SIDE PLATE | 02 |
| 11 | PBCF133001B | GEAR WHEEL SIDE PLATE | 02 |

SINGLE SPEED





ELECTRICAL SPARE PARTS FOR HC2/HC3 SINGLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP501000A | M S Enclosure including base plate suitable for HC2+/HC3+ | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1 |
| XPBP0001HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC2/HC3 SINGLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|--|-----|
| XCPP502000A | M S Enclosure including base plate suitable for HC2+/HC3+ Single Speed With ET | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 2 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0003HHL | Indef Make 5 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed, Right/Left Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC4 SINGLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0521TMA | Schneider Make Contactor 12A/24VAC Cat No LC1D12 B7 | 2 |
| XPBP0001HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed) | 1 |



ELECTRICAL SPARE PARTS FOR HC4 SINGLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|--|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0521TMA | Schneider Make Contactor 12A/24VAC Cat No LC1D12 B7 | 2 |
| XACP0620SMA | Schneider Make Contactor 9A/24VAC Cat No LC1D09 B7 | 2 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0003HHL | Indef Make 5 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed, Right/Left Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC5 SINGLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0630SMA | Schneider Make Contactor 18A/24VAC Cat No LC1D18 B7 | 2 |
| XPBP0001HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC5 SINGLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|--|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0630SMA | Schneider Make Contactor 18A/24VAC Cat No LC1D18 B7 | 2 |
| XACP0620SMA | Schneider Make Contactor 9A/24VAC Cat No LC1D09 B7 | 2 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0003HHL | Indef Make 5 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed, Right/Left Single Speed) | 1 |



ELECTRICAL SPARE PARTS FOR HC6 SINGLE SPEED WITH G.T./P.T

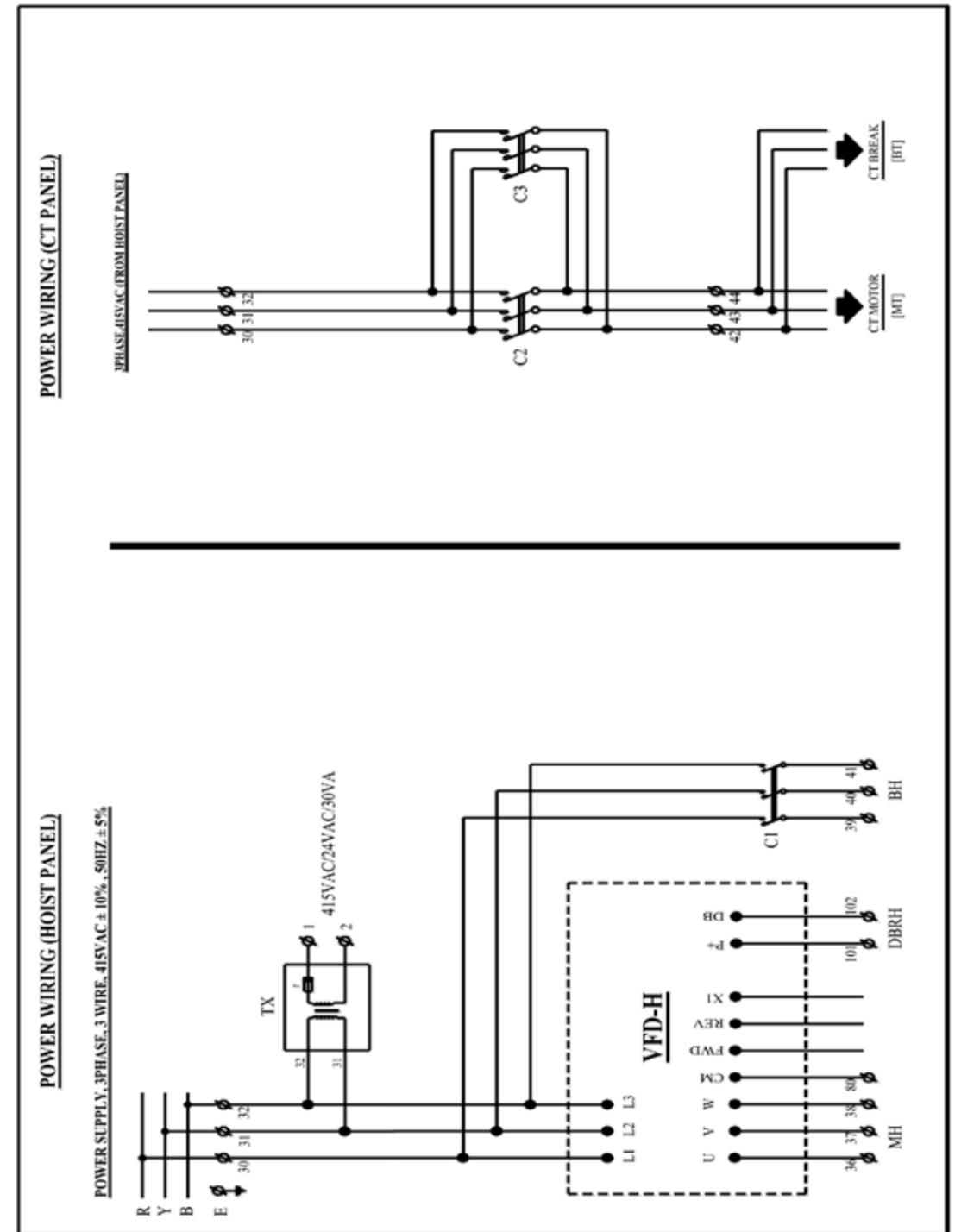
| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0771TMA | Schneider Make Contactor 25A/24VAC Cat No LC1D25 B7 | 2 |
| XPBP0001HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC6 SINGLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|--|-----|
| XCPP004000A | M S Enclosure including base plate suitable for HC4/HC5/HC6 | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XACP0771TMA | Schneider Make Contactor 25A/24VAC Cat No LC1D25 B7 | 2 |
| XACP0620SMA | Schneider Make Contactor 9A/24VAC Cat No LC1D09 B7 | 2 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0003HHL | Indef Make 5 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Single Speed, Right/Left Single Speed) | 1 |



DOUBLE SPEED





ELECTRICAL SPARE PARTS FOR HC2/HC3 DOUBLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP601000A | M S Enclosure including base plate suitable for HC2+/HC3+ | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0160FJI | Fuji Make 0.75KW 3 Phase AC Drive Cat No FRN0004C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XPBP0002HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Double Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC2/HC3 DOUBLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP601000A | M S Enclosure including base plate suitable for HC2+/HC3+ | 1 |
| XCPP010000A | M S Enclosure including base plate suitable for Single ET | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0160FJI | Fuji Make 0.75KW 3 Phase AC Drive Cat No FRN0004C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1 |



ELECTRICAL SPARE PARTS FOR HC4 DOUBLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP701000A | M S Enclosure including base plate suitable for HC4+/HC5+/HC6+ | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0110FJI | Fuji Make 2.2KW 3 Phase AC Drive Cat No FRN0007C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XPBP0002HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Double Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC4 DOUBLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP701000A | M S Enclosure including base plate suitable for HC4+/HC5+/HC6+ | 1 |
| XCPP010000A | M S Enclosure including base plate suitable for Single ET | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0110FJI | Fuji Make 2.2KW 3 Phase AC Drive Cat No FRN0007C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1 |

ELECTRICAL SPARE PARTS FOR HC5/HC6 DOUBLE SPEED WITH G.T./P.T

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP701000A | M S Enclosure including base plate suitable for HC4+/HC5+/HC6+ | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0030FJI | Fuji Make 3.7KW 3 Phase AC Drive Cat No FRN0011C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XPBP0002HHL | Indef Make 3 Way Pendant (Emergency Stop (Turn to Release), Hoist/Low Double Speed) | 1 |

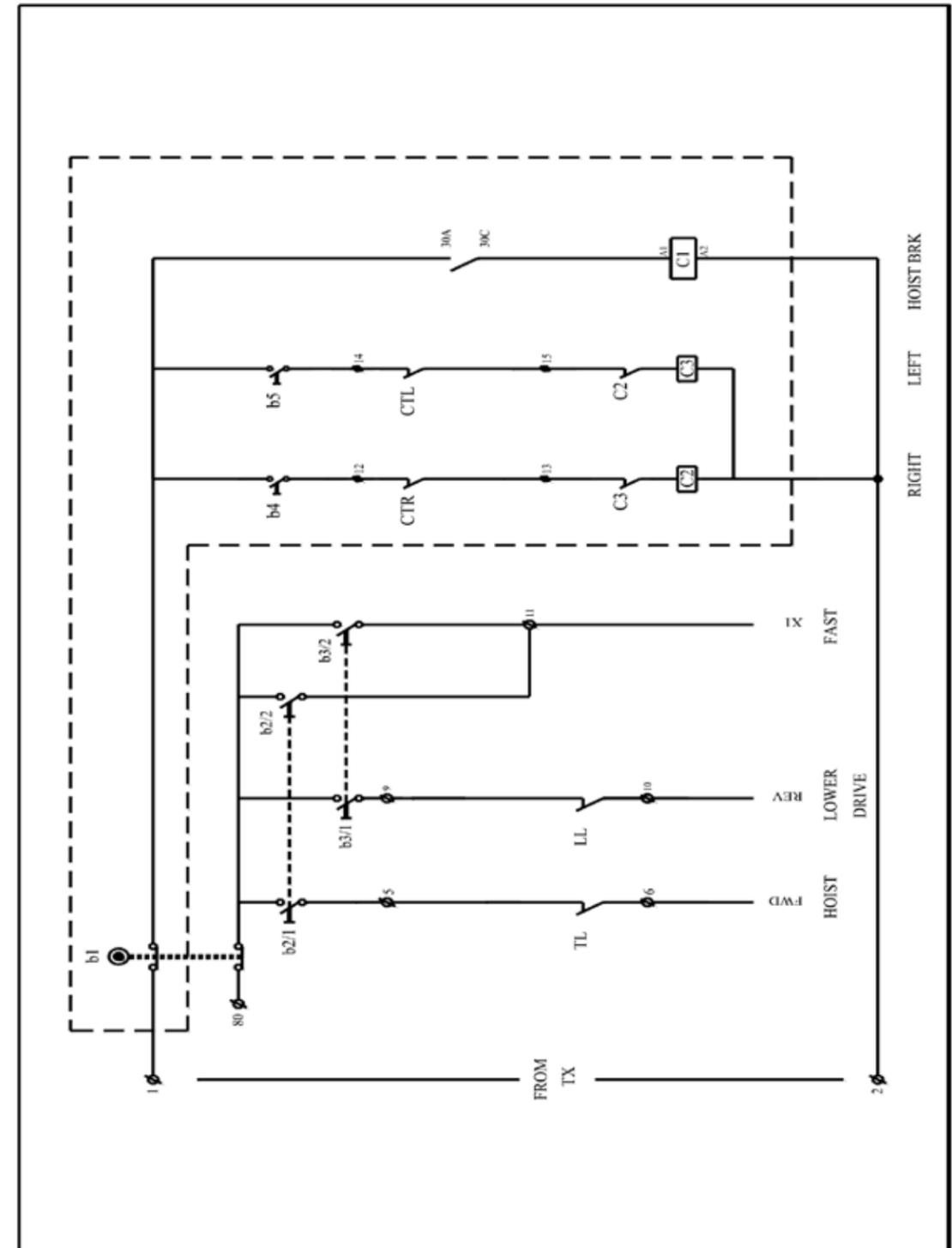


ELECTRICAL SPARE PARTS FOR HC5/HC6 DOUBLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|---|-----|
| XCPP701000A | M S Enclosure including base plate suitable for HC4+/HC5+/HC6+ | 1 |
| XCPP010000A | M S Enclosure including base plate suitable for Single ET | 1 |
| XCTP0010AVA | Control Transformer Primary 415VAC & Secondary 24VAC,30VA | 1 |
| XADS0030FJ | Fuji Make 3.7KW 3 Phase AC Drive Cat No FRN0011C2S-4A | 1 |
| XACP0590TMA | Schneider Make Contactor 6A/24VAC Cat No LC1K0601 B7 | 1 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1 |

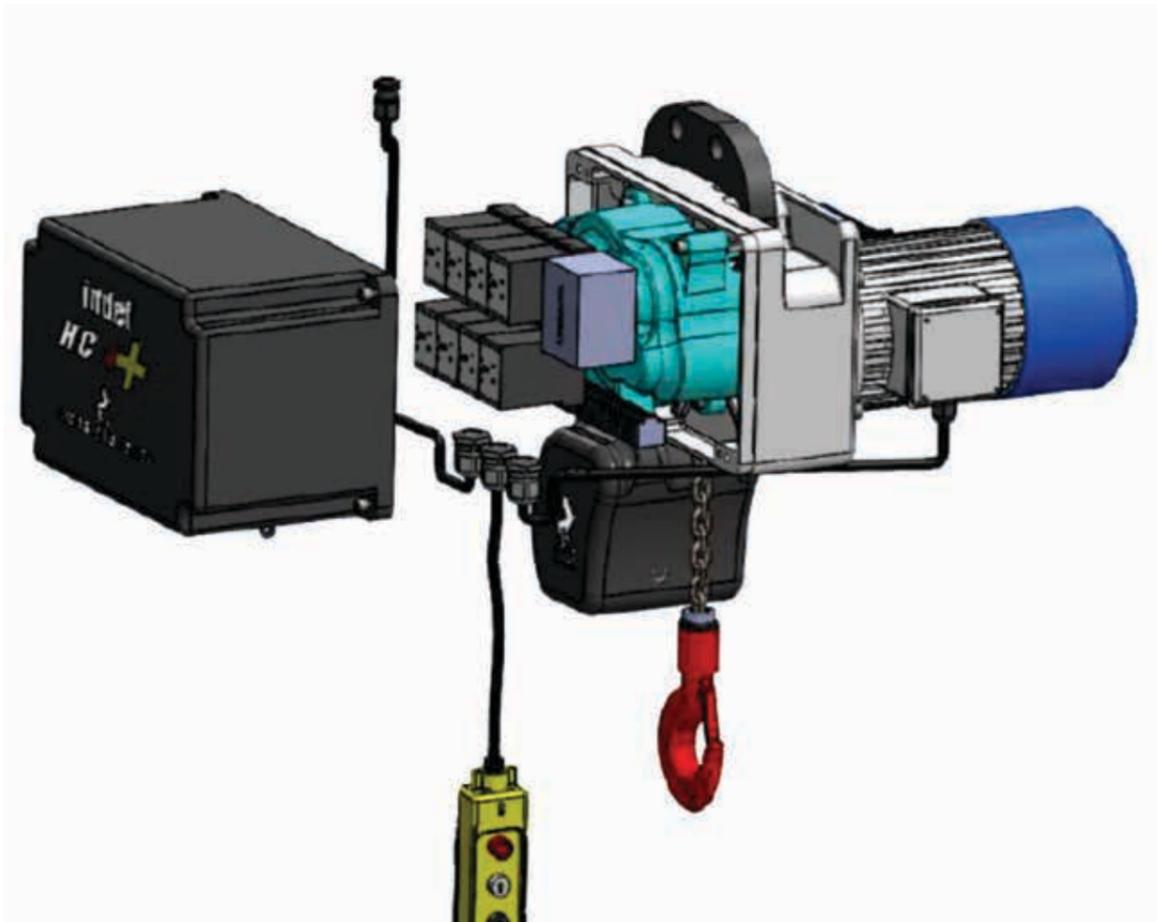


DOUBLE SPEED

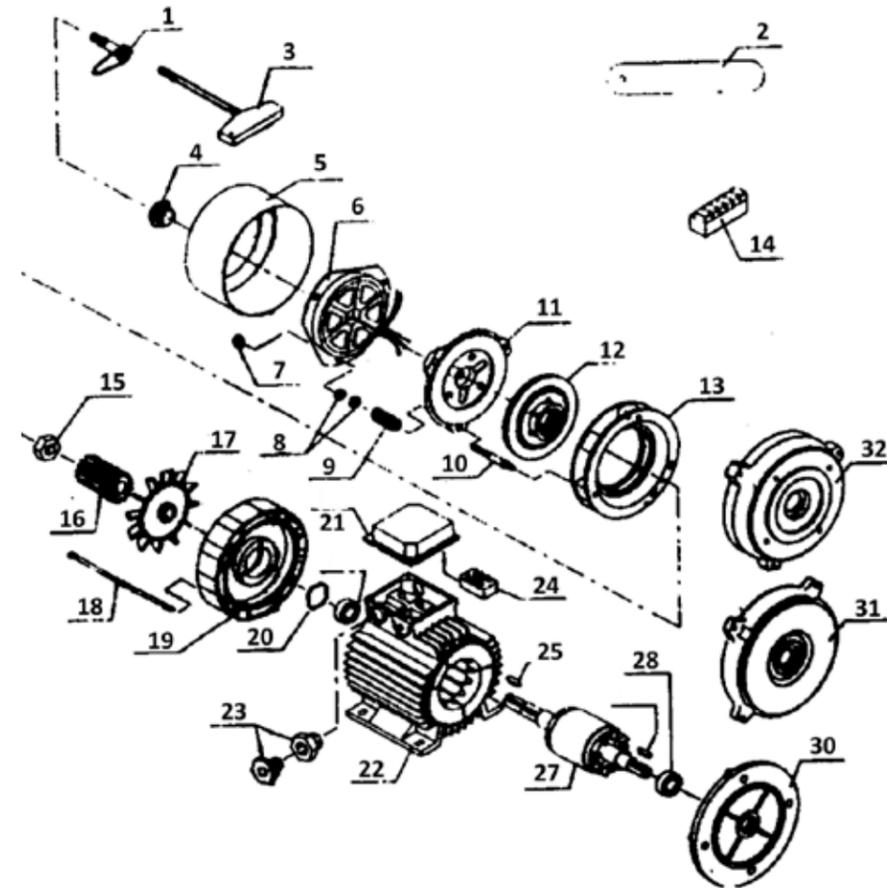




CONTROL CABLE



In case of order, always indicate reference number and motor type

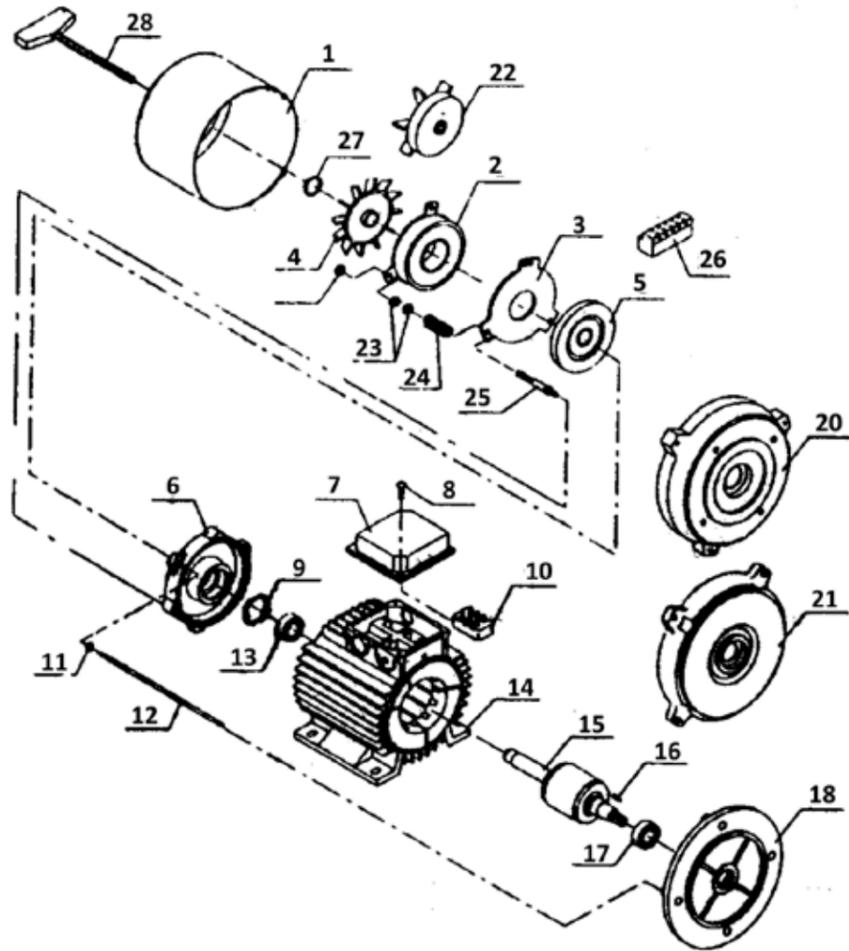


| | | | | | |
|----|--|----|-------------------------------------|----|----------------------|
| 1 | Manual release screw | 12 | Brake disk | 22 | Motor framework |
| 2 | 0.3 mm thickness gauge | 13 | Conveyor with friction track | 23 | Pipe union |
| 3 | Key for manual rotation | 14 | Rectifier (half or complete wave) | 24 | Terminal board |
| 4 | Cap locking screw | 15 | Seeger ring or gear locking ring | 25 | Brake side key |
| 5 | Brake protection cap | 16 | Toothed hub | 26 | Brake side bearing |
| 6 | Three-phase electromagnet (or D.C. monophas) | 17 | Fan | 27 | Rotor shaft group |
| 7 | Magnet locking nut | 18 | Drawrod with nuts | 28 | Control side bearing |
| 8 | Adjustment nuts | 19 | Brake side shield | 29 | Control side key |
| 9 | Brake spring | 20 | Compensation ring | 30 | B5 flange shield |
| 10 | Guide stud bolt | 21 | Single or double terminal board box | 31 | Front shield |
| 11 | Mobile anchor | | | 32 | B14 flange shield |



Description of spare parts for FK-FKL Series Hoist Motors

In case of order, always indicate reference number and motor type



| | | |
|------------------------------|------------------------|----------------------------|
| 1 Brake protection cap | 11 Drawrod locking nut | 21 Front shield |
| 2 Electromagnet | 12 Drawrod | 22 Heavy Fan |
| 3 Mobile anchor | 13 Rear Bearing | 23 Adjustment nuts |
| 4 Cooling Fan | 14 Motor framework | 24 Brake Spring |
| 5 Brake Disc | 15 Rotor shaft group | 25 Guide stud bolt |
| 6 Shield with friction track | 16 Control side key | 26 Rectifier |
| 7 Base cover | 17 Front bearing | 27 Nut |
| 8 Screws for base cover | 18 Flange B5 | 28 Key for manual rotation |
| 9 Compensation ring | 19 Block Magnet | 29 Brake side key |
| 10 Terminal board | 20 B14 Flnge shield | |



Motor Details and VFD details

| Item | HC+2 DS with VFD | HC+3 DS with VFD | HC+4 DS with VFD | HC+5 DS with VFD | HC+6 DS with VFD |
|--------------------------|------------------|------------------|------------------|------------------|------------------|
| Motor (KW) | 0.55KW | 0.90KW | 1.84KW | 3.50KW | 4.50KW |
| Motor (Current) | 1.7A | 2.5A | 4.3A | 6.4A | 8.2A |
| Drive (KW) | 0.75KW | 0.75KW | 2.2KW | 3.70KW | 3.70KW |
| Drive (Current) | 2.5A | 2.5A | 5.5A | 9.0A | 9.0A |
| Cat No | FRN0004C2S-4A | FRN0004C2S-4A | FRN0007C2S-4A | FRN0011C2S-4A | FRN0011C2S-4A |
| Braking Resistor Ratings | 200E/300W | 200E/300W | 160E/800W | 130E/1.5KW | 130E/1.5KW |

Quick reference table of alarm codes

| ALARM CODE | NAME | ALARM CODE | NAME |
|------------|---|-------------|--|
| OC1 | Overcurrent occurred during acceleration | L In | Input phase loss protection |
| OC2 | Overcurrent occurred during deceleration | OPL | Output phase loss protection |
| OC3 | Overcurrent occurred when running at a constant speed | OH1 | Overheat protection for heat sink |
| OU1 | Overvoltage occurs during the acceleration | OH2 | External alarm input |
| OU2 | Overvoltage occurs during the deceleration | dbH | Overheat protection for braking resistor |
| OU3 | Overvoltage occurs during running at constant speed | OL1 | Electronic thermal overload relay |
| LU | Undervoltage protection | OLU | Overload protection |



VFD Parameters

| Fundamental Functions F Group | | | Motor Parameters P Group | | |
|----------------------------------|---------------------------|-------------------------------|---|-----------------------|-----------------------------|
| Parameter | Description | Value | Parameter | Description | Value |
| F01 | Frequency Command 1 | 0 (Up/Dn Commands on Key Pad) | P02 | Rated Motor Power | Motor KW on Name Plate |
| F02 | Operation Method | 1 (Terminal Command Fwd/Rev) | P03 | Rated Motor Current | Motor Current on Name Plate |
| F03 | Maximum Frequency | 60 Hz | P04 | Auto Tuning | 0 (Disable) |
| F04 | Standard Motor Freq. | 50 Hz | P99 | Motor 1 Selection | 4 (Other Motors) |
| F05 | Rated Motor Voltage | 415VAC | | | |
| F06 | Maximum Output Voltage | 415VAC | Application Functions J Group | | |
| F07 | Acceleration Time | 1 Sec | J68 | Brake Release Current | 50% of FLC |
| F08 | Deceleration Time | 1 Sec | J69 | Brake Engage Freq. | 5 Hz (Minimum Freq) |
| F11 | Overload Current | 120% of FLC | J70 | Brake Engage Time. | 0.5 Sec |
| F12 | Maximum Current Hold Time | 5 Sec | J71 | Brake Release Freq. | 5 Hz (Minimum Freq) |
| F16 | Minimum frequency | 5 Hz | J72 | Brake Release Time | 0.20 Sec |
| F22 | DC Injection Time | 0.0 Sec | | | |
| F37 | Auto Torque Boost | 2 | High Performance Functions H Group | | |
| F39 | Stop Frequency | 1 | H03 | Factory Reset | 01 (Press Stop + Up/Dn) |
| F42 | Control Mode Selection | Vector Control 1 | H07 | Ramp Type | 0 Linear |
| | | | H11 | Stop Configuration | 0 Normal Deceleration |
| | | | | | |
| Control Functions C Group | | | Extension Terminal Functions E Group | | |
| Parameter | Description | Value | Parameter | Description | Value |
| C05 | Maximum Frequency | 50 Hz | E27 | Relay Function | 57 (Brake Signal) |
| | | | | | |
| | | | | | |
| | | | | | |

Sink / Source Shortlink shall be in Sink Place.



Motor Details and VFD details

| ALARM CODE | Possible Causes | What to Check and Suggested Measures |
|-------------|--|---|
| OC1,OC2,OC3 | The inverter output terminals were short-circuited. | Remove the part that short-circuited (including replacement of the wires, relay terminals and motor). |
| | Ground faults occurred at the inverter output terminals | Remove the part that short-circuited (including replacement of the wires, relay terminals and motor). |
| | Loads were too heavy | i) If the load is too heavy, decrease it or raise the inverter capacity. .ii) If there are any sudden changes, make the load variations smaller or raise the inverter capacity. lii) Enable instantaneous overcurrent limiting (H12 = 1). |
| | The value set for torque boost (F09) was too large. (F37 = 0, 1, 3, or 4) | Lower the value for torque boost (F09) if the motor is not going to stall. |
| | The acceleration/ deceleration time was too short. | i) Increase the acceleration/deceleration time (F07, F08, E10,E11, and H54). ii) Enable current limiting (F43). iii) Raise the inverter capacity. |
| OU1,OU2,OU3 | The power supply voltage was over the range of the inverter's specifications | Decrease the voltage to within that of the specifications |
| | The acceleration time was too short. | i) Increase the acceleration time (F07, E10, and H54). ii) Select the S-curve pattern (H07). iii) Consider the use of a braking resistor. |
| | The deceleration time was too short for the moment of inertia for load | i) Increase the deceleration time (F08, E11, and H54). ii) Enable automatic deceleration (H69=1). iii) Set the rated voltage (at base frequency) (F05) to 0 to improve braking ability. iv) Consider the use of a braking resistor. |
| | Loads were suddenly removed | Consider the use of a braking resistor |



| ALARM CODE | Possible Causes | What to Check and Suggested Measures |
|------------|---|--|
| | Braking load was too heavy | i) Set the rated voltage (at base frequency)(F05) to 0 to improve braking ability. ii) Consider the use of a braking resistor. |
| LU | An instantaneous power failure occurred | i) Reset the alarm. ii) If you want to restart running the motor by not treating this condition as an alarm, set F14 to "4" or "5," depending on the load. |
| | The power to the inverter was switched back on too soon (with F14 = 1) | Make the interval longer for re-power on. |
| | The power supply voltage did not reach the range of the inverter's specifications | Increase the voltage to within that of the specifications. |
| | Peripheral equipment for the power circuit malfunctioned, or the connection was incorrect | Replace any faulty peripheral equipment, or correct any incorrect connections |
| | Other loads were connected to the same power system and required a large current to start running to the extent that it caused a temporary voltage drop on the supply side. | Reconsider the power system configuration |
| | Inverter's inrush current caused the power voltage drop because power transformer capacity was insufficient. | Reconsider the capacity of the power transformer. |
| | Main circuit power input wires broken. | Repair or replace the wires. |
| | The terminal screws for the main circuit power input of the inverter were not tight enough. | Tighten the terminal screws screws to the recommended torque. |



| ALARM CODE | Possible Causes | What to Check and Suggested Measures |
|------------|---|---|
| LIn | Interphase unbalance rate of three-phase voltage was too large. | i) Connect an AC reactor (ACR) or a DC reactor (DCR) to lower the rate. ii) Raise the inverter capacity |
| | Overload cyclically occurred. | If the ripple is large, raise the inverter capacity. |
| | Single-phase voltage was inputted to the inverter instead of three-phase voltage input. | Obtain a new inverter that meets the power supply specifications. |
| OPL | Inverter output wires are broken. | Replace the output wires. |
| | Wire for motor winding are broken. | Replace the motor. |
| | The terminal screws for inverter output were not tight enough. | Tighten the terminal screws to the recommended torque. |
| | A single-phase motor has been connected. | Single-phase motors cannot be used. Note that the FRENIC-Mini only drives three-phase induction motors. |
| OH1 | Temperature around the inverter exceeded that of inverter specifications. | i) Lower the temperature around the the inverter (e.g., ventilate the enclosure well). ii) Lighten the load. |
| | Accumulated running time of the cooling fan exceeded the standard period for replacement, or the cooling fan malfunctioned. | Replace the cooling fan. |
| | Air vent is blocked. | i) Increase the clearance. ii) Clean the heat sink. |
| | Load was too heavy. | i) Lighten the load (e.g. lighten the load before the overload protection occurs using the overload early warning (E34). ii) Decrease the motor sound (carrier frequency) (F26). iii) Enable the overload protection control (H70). |
| OH2 | An alarm function of the external equipment was activated. | Remove the cause of the alarm that occurred. |



| ALARM CODE | Possible Causes | What to Check and Suggested Measures |
|------------|--|--|
| | Connection has been performed incorrectly. Incorrect settings. | Connect the wire for the alarm signal correctly. Correct the assignment. |
| dbH | Braking load was too heavy. | i) Lighten the braking load. ii) Reconsider the choice of the braking resistor in order to improve braking ability. Resetting the data of function codes F50 and F51 is also required. |
| | The deceleration time was too short. | i) Increase the deceleration time (F08, E11, and H54). ii) Reconsider the choice of the braking resistor in order to improve the braking ability. Resetting the data of function codes F50 and F51 is also required. |
| | Incorrect values have been set for the data of function codes F50 and F51. | Reconsider and change the data of function codes F50 and F51. |
| OL1 | Load was too heavy. | Lighten the load (e.g., lighten the load before overload occurs using the overload early warning (E34)). |
| | The acceleration/deceleration time was too short. | Increase the acceleration / deceleration time (F07, F08, E10, E11 and H54). |
| | The characteristics of electronic thermal did not match those of the motor overload. | i) Reconsider the data of function codes P99, F10 and F12. ii) Use an external thermal relay. |
| | Activation level for the electronic thermal relay was inadequate. | Reconsider and change the data of function code F11. |
| OLU | Air vent is blocked. | i) Increase the clearance. ii) Clean the heat sink. |
| | Load was too heavy. | i) Lighten the load (e.g. lighten the load before the overload protection occurs using the overload early warning (E34). |



| ALARM CODE | Possible Causes | What to Check and Suggested Measures |
|------------|---|--|
| | | ii) Decrease the motor sound (carrier frequency) (F26). iii) Enable the overload protection control (H70). |
| | The acceleration/deceleration time was too short. | Increase the acceleration/deceleration time (F07, F08, E10, E11 and H54). |

ELECTRICAL SPARE PARTS FOR HC2+/HC3+ DOUBLE SPEED WITHOUT ET

| Item Code | Description | Qty |
|-------------|--|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XPBE0002HHL | Indef (Giovenzana) Make 3 Way Pendant (Emergency Stop, Hoist/Low Double Speed) | 1.00 |
| XADS0160FJI | Fuji Make 0.75KW 3 Phase AC Drive Cat No FRN0004C2S-4A | 1.00 |



ELECTRICAL SPARE PARTS FOR HC2+/HC3+ DOUBLE SPEED WITHOUT ET

| Item Code | Description | Qty |
|-------------|---|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1.00 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1.00 |
| XADS0160FJI | Fuji Make 0.75KW 3 Phase AC Drive Cat No FRN0004C2S-4A | 1.00 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2.00 |

ELECTRICAL SPARE PARTS FOR HC4+ DOUBLE SPEED WITHOUT ET

| Item Code | Description | Qty |
|-------------|--|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XPBE0002HHL | Indef (Giovenzana) Make 3 Way Pendant (Emergency Stop, Hoist/Low Double Speed) | 1.00 |
| XADS0110FJI | Fuji Make 2.2KW 3 Phase AC Drive Cat No FRN0007C2S-4A | 1.00 |



ELECTRICAL SPARE PARTS FOR HC4+ DOUBLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|---|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1.00 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1.00 |
| XADS0110FJI | Fuji Make 2.2KW 3 Phase AC Drive Cat No FRN0007C2S-4A | 1.00 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2.00 |

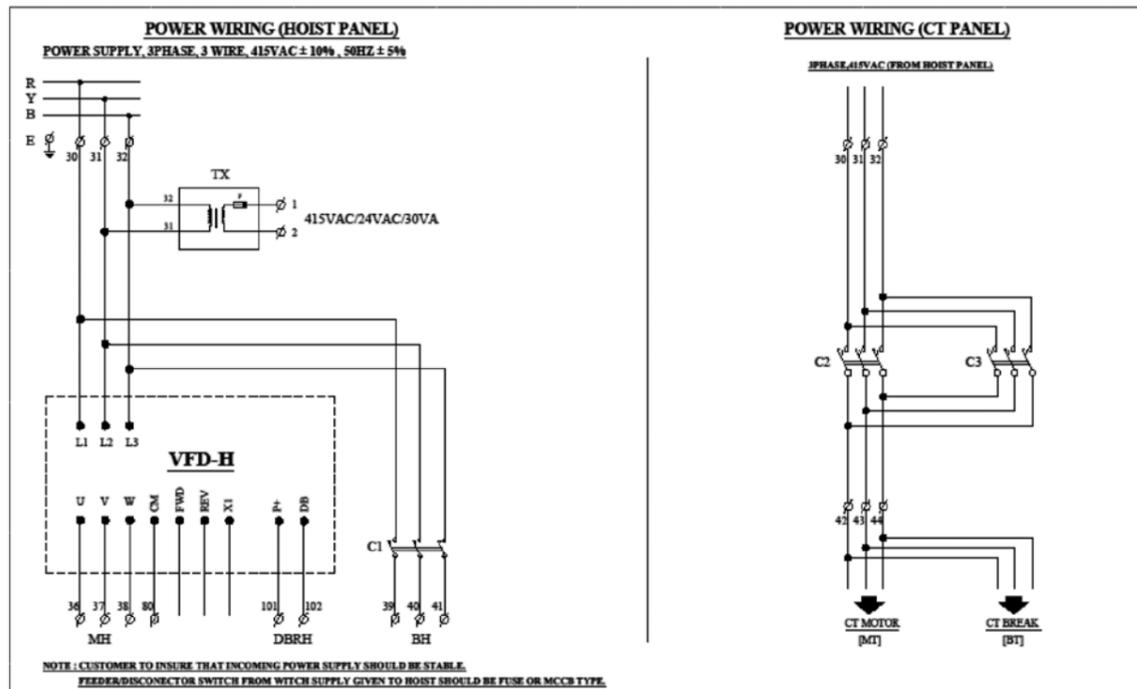
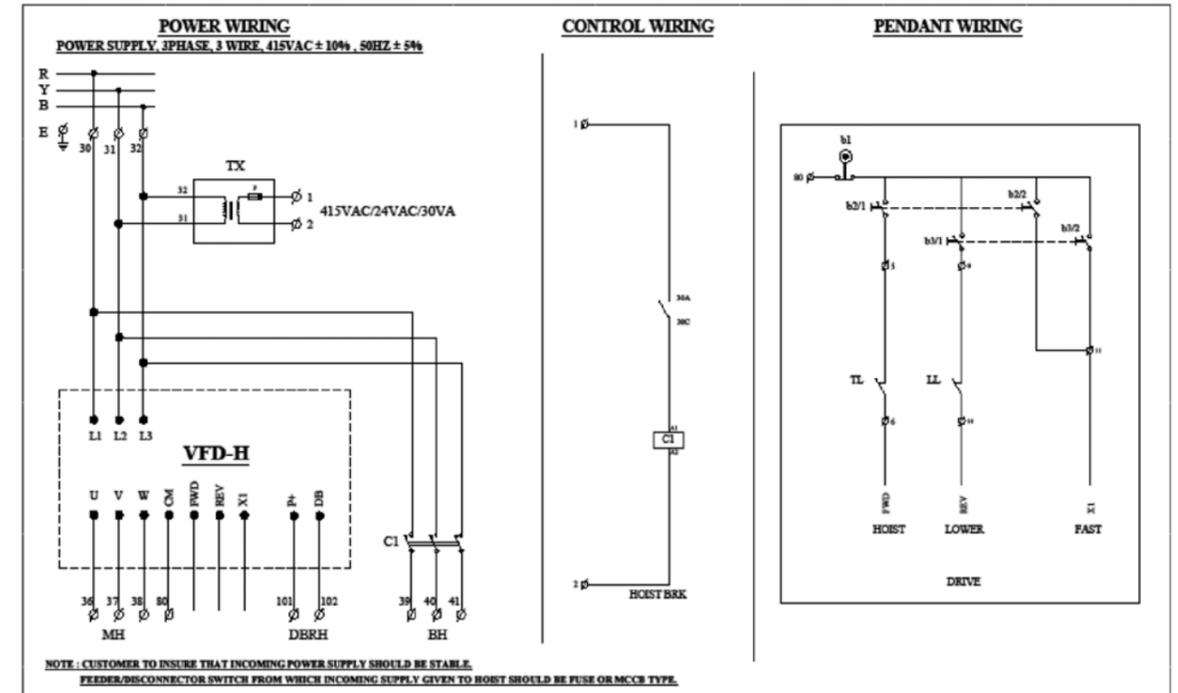
ELECTRICAL SPARE PARTS FOR HC5+/HC6+ DOUBLE SPEED WITHOUT ET

| Item Code | Description | Qty |
|-------------|---|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XPBE0002HHL | Indef (Giovenzana) Make 3 Way Pendant Emergency Stop, Hoist/Low Double Speed) | 1.00 |
| XADS0030FJI | Fuji Make 3.7KW 3 Phase AC Drive Cat No FRN0011C2S-4A | 1.00 |



ELECTRICAL SPARE PARTS FOR HC5+/HC6+ DOUBLE SPEED WITH ET

| Item Code | Description | Qty |
|-------------|---|------|
| XCTP0010AVA | Avetronics/Prince/Powerex Make Control Transformer 415V/24V,30VA | 1.00 |
| XACP0590TMA | SCHNEIDER MAKE CONTACTOR 6A/24V CAT NO LC1K0601 B7 | 1.00 |
| XACP0250TMA | Schneider Make Reversing Contactor 9A/24VAC Cat No LC2K0901 B7 | 1.00 |
| XPBP0116HHL | Indef Make 5 Way Pendant (Emergency Stop With 2 NC (Turn to Release),Hoist/Low Double Speed, Right/Left Single Speed) | 1.00 |
| XADS0030FJI | Fuji Make 3.7KW 3 Phase AC Drive Cat No FRN0011C2S-4A | 1.00 |
| XLSP0090SLZ | Indef Make Limit Switch in Oil Tight Housing, Normal Roller Lever 1NO+1NC, Normal Action, Rating 10A/500VAC | 2.00 |





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service@indef.com - ANYTIME

www.indef.com/service - ANYTIME

| Issue | OOO | Revision | R0 | Revision summary |
|------------|------------|---------------|----|------------------|
| Issue Date | 11.06.2020 | Revision Date | | |

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