Document Number: 9200163
Revision: 1v7

Kinesys Apex Hoist 500

Operating & Maintenance Manual
[ORIGINAL]

A variable speed electric chain hoist

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Glossary

The following glossary terms relate to the Apex system specifically as well as the automation industry generally.

Dead end

In relation to electric chain hoists, this is the end of the load chain that does not bear any load. In the case of the Apex Hoist, this end is permanently attached to the bracket on the side of the hoist during operation.

Dead man's handle (DMH)

See "Enabling switch".

Double-reeved

In relation to electric chain hoists, a design that incorporates a load chain that goes around a sprocket wheel inside the main body and then goes around a second sprocket wheel inside the chain hook assembly. After passing through the chain hook assembly, the end is secured inside the main body. This design allows for double the load capacity compared to single-reeved designs but also halves the maximum lifting speed. Synonyms: Double-fall.

Duty cycle

The ratio of running time to running time + period of rest. Synonyms: Duty rate.

Emergency limit

See "Ultimate limit".

Enabling switch

A device that requires continuous input from the user in order to initiate and maintain movement. Once released, movement of the selected channels will stop. This can be in the form of a button, bar or handle, depending on the design of the machinery. Synonyms: Dead man's handle (DMH), Hold-to-run (HTR).

Entertainment Load Limit (ELL)

According to EN 17206, the maximum load that an item of equipment is designed to raise, lower, or sustain.

Hold-to-run (HTR)

See "Enabling switch".

Hook block

An assembly that consists of the hook mechanism, to which loads are attached, a rubber buffer and the casings and fasteners that hold the hook in position on the end of the load chain. Double-reeved hook blocks are significantly larger in order to house a sprocket wheel and bearing mechanism.

Initial limit

The position, in either direction, where the hoist will cause a controlled stop of movement, as programmed by the limit switches during manufacture. Movement beyond this limit is unlikely to cause damage to the equipment. In the Apex Hoist, this limit is known as the "operational" limit, and is displayed as such on the Limits PCB. Synonyms: Operational limit.

Lift limiter

A device assembled to the dead end of the load chain that prevents the chain from passing fully through the hoist. In reality, the chain should never reach this point during normal operation as it would have to overcome both sets of limits. Synonyms: Chain stop.

Limit

The extent of travel allowed for a hoist in either direction, determined by the hoist manufacturer and set during manufacture. According to EN 17206, two types of limit must be programmed into the device to achieve the maximum safety standard: "initial" (sometimes known as "operational") and "ultimate" (sometimes known as "emergency").

Limits PCB

A device located on the inside of the hoist that contains switches for bypassing limits and LEDs that illuminate when limits have been struck. This is needed for some maintenance operations such as removing and installing load chains.

Load chain

A chain designed specifically to withstand the static and dynamic forces experienced during the lifetime of a hoist. In many cases, this gets shortened to just "chain".

Operational limit

See "Initial limit".

SIL 3

(Safety Integrity Level) - the highest level of risk reduction for machinery, according to EN 62061. The Apex system conforms to this standard when used in conjunction with a venue-wide emergency stop system, such as Mentor.

Single-reeved

In relation to electric chain hoists, a design that incorporates a single line of load chain that goes around a sprocket wheel inside the main body and lifts the attached load via the chain hook assembly. Synonyms: Single-fall.

Ultimate limit

The position, in either direction, where the hoist will cause an immediate stop to movement should the initial limits fail, as programmed by the limit switches during manufacture. Movement beyond this limit may cause damage to the equipment. During normal operation, movement should never reach the ultimate limits, but they are required as a redundancy system in order to achieve the maximum safety level. Synonyms: Emergency limit.

1. Introduction

1.1 Product description

The Apex Hoist 500 is a variable speed electric chain hoist with a maximum load capacity of 500 kg and a maximum lifting speed of 500 mm/s. The compatible drive used for controlling the Apex Hoist 500 is the Apex Drive. The Apex family of products is compatible with both Kinesys and TAIT software packages, such as Vector, K2, Navigator, and iQ.

Key features of the Apex Hoist 500 include silent dual brakes, a built-in load cell, ultra-smooth movement and braking, precision speed control, and data monitoring. These features, combined with high safety standards and its rugged design, allow the hoist to be used in a variety of automation and live event situations.

Data that can be monitored include run time, maximum load, maximum temperature, and number of brake operations. This data allows users to ensure the hoist is not over-exerted, that regulatory requirements are met, and that maintenance schedules are kept precisely, thus prolonging the life of the equipment.

The Apex system is designed to meet the industry's most rigorous safety standards, and complies with EN 17206 Use Cases 3 and 4.

1.2 Scope and purpose

This manual describes the key features, means of operation and maintenance operations of the Apex Hoist 500.

The equipment described in this manual may only be operated by personnel qualified to do so. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with this and associated equipment.

Qualified personnel must have training as well as experience in the field of lifting and rigging operations in the entertainment industry. They must possess an excellent knowledge of the relevant work safety regulations, directives, and general accepted rules of lifting techniques, which enables them to decide whether the lifting equipment is in a safe working condition or not.

No responsibility is taken by the manufacturer for damage or operating trouble due to:

- Improper operation
- Operator errors
- Unauthorized modifications to the equipment

1.3 Model part numbers

This manual applies to the following hoist model:

Kinesys part number range	Hoist model
ACH-01-0050-XX	Apex Hoist 500

Note: The last two digits in the Kinesys part number ("XX" above) refer to the height of lift (HOL) of the load chain. 24 m is the standard HOL (e.g. ACH-01-0050-24).

The Apex Hoist 500 is compatible with the following models of Apex Drive controller:

Kinesys part number	Drive model
APM-34-0010 / 0030	Apex Drive 208V
APM-43-0010	Apex Drive 400V
APM-24-1010	Apex Drive v2 208 V
APM-44-1010	Apex Drive v2 400V
APM-24-1110	Apex Drive v2 NAV 208V
APM-44-1110	Apex Drive v2 NAV 400V
APM-54-1110	Apex Drive v2 NAV 480V

The rated voltage of the Apex Hoist 500 must match that of the connected Apex Drive. However, a 480V Apex Drive can also be used to power 400V Apex Hoists.

1.4 Support requests

For technical support on this product, please use the following contact details:

support@taittowers.com
Tel: +44(0) 20 8481 9850

To resolve your support request as quickly as possible, please provide the following information, if available, when contacting Kinesys:

- Site name, address, machine location details and your contact details.
- As much detail as possible on the behaviour observed, including any unusual changes in behaviour that are different from normal operation and any environmental conditions that may be a factor (e.g. fluctuations in temperature and water damage).
- Details on the behaviour that should have been expected.
- The exact steps required that produce the issue.
- Any solutions to fix the issue that you have already tried.
- Any workarounds that you have found.
- Equipment item numbers and serial numbers, such as those displayed on the identification plates/labels.
- Version numbers of any software being used.
- Any screen shots, photographs or videos of the issue.

2. Safety information

The following symbols are used to indicate specific items which require special attention by the user:

	**Warning: Instructions which relate to safety**
	**Warning: Instructions which relate to safety where there is a particular risk of electric shock**
	**Warning: Instructions which relate to safety where there is a particular overhead risk**
	**Danger: Prohibited actions which are forbidden under all circumstances**
	**Additional important information**

2.1 Safety regulations

The following regulations serve as the basis for assembly, installation, certification and maintenance of electric chain hoists within the area of the European community. For countries other than those mentioned, local legislation and directives may apply in addition to or in place of the European regulations as stated in this manual.

The manufacturer's guarantee depends on the consideration of these regulations and the operating instructions.

European regulations

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

BGV accident prevention regulations (Germany only)

DGUV Vorschrift 3 (BGV A1)	Principles of accident prevention
DGUV Vorschrift 3 (BGV A3)	Electrical facilities and equipment
DGUV Vorschrift 52 (BGV D6)	Accident prevention regulation for use in crane systems
DGUV Vorschrift 54 (BGV D8)	Accident prevention regulation for electric winches, lifting and pulling equipment
DGUV Regel 100-500 (BGR 500)	Hoisting accessories
DGUV Grundsatz 309-001 (BGG 905)	Principles for crane inspections

Harmonized regulations

EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 14492-2	Cranes - Power driven winches and hoists
EN 818-7	Short link chain for lifting purposes; Fine tolerance hoist chain, Grade T
EN ISO 13849-1 & 2 / BS EN 62061	Safety of machinery - Safety-related parts of control systems; General principles for design
EN 60034-1	Rotating electrical machines; Rating and performance
EN 60034-5	Rotating electrical machines; Degrees of protection provided by the integral design of rotating electrical machines
EN 60204-1	Electrical equipment of machines, General requirements
EN 60204-32	Electrical equipment of machines; Requirements for hoisting machines
EN 60529	Degrees of protection provided by enclosures (IP-Code)
EN 60947-1	Low-voltage switchgear and control gear
EN 61000-6-2	Electromagnetic compatibility; Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility; Emission standard for industrial environments
EN 82079-1	Preparation of instructions for use - Structuring, content and presentation

European regulations

EN 17206	Machinery for stages and other production areas; Safety requirements and inspections

Regulations and technical specifications

FEM 9.511:1986	Rules for the design of series lifting equipment; Classification of mechanisms
FEM 9.683:1995	Series lifting equipment; Selection of hoisting and travelling motors
FEM 9.751:1998	Series lifting equipment; Power driven series hoist mechanisms; Safety
FEM 9.755:1993	Serial hoist units; Measures for achieving safe working periods

2.2 Safety warnings

IF IN DOUBT ABOUT ANY ASPECT OF MOVING OBJECTS, ALWAYS SEEK PROFESSIONAL ADVICE BEFORE OPERATION.

Make sure this Operating & Maintenance Manual is always kept in a complete and fully readable condition and that it is always accessible to all operators of the equipment.

Prohibitions of operation

- **Do not use the hoist to carry people. It is strictly prohibited unless a specific risk assessment by a qualified person states otherwise and a rescue plan has been drafted by a qualified person.**
- **Do not install the hoist or do maintenance to the hoist in an area that is accessible to children or other unqualified persons.**
- **Do not use the hoist in an aggressive environment. An aggressive environment is defined as an environment which contains hazardous substances that may degrade the load bearing capacity of the hoist.**
- **Do not attach a load to the hoist of more than the ELL of 500 kg.**
- **Do not use the load chain to sling loads - the chain hook is the only permitted method of load attachment.**
- **Do not use a load chain that is longer than that stated on the chain bag.**
- **Do not turn the load chain over any edges or surfaces - always make sure the load chain is unobstructed during movement.**
- **If the hoist is being used at a height that is reachable at ground level, do not touch the hoist at the chain entry position. Make sure proper safety measures are in place to avoid the risk of crushing or entanglement.**
- **Do not use the hoist if it does not appear to be in 100% working order.**
- **Do not modify or attempt to repair the hoist in any way other than those described in the maintenance procedures within this manual.**

Safety precautions before operation

- **Do a full risk assessment of the location where the hoist and its connected control devices are intended to be used.**
- **Hoists and their loads must only be attached from suitable scaffolds, approved working platforms, or similar safe working positions.**
- **Make sure a qualified rigging specialist has assessed that the structure where the hoist will be installed can safely withstand the weight of the hoist and its attached load.**
- **Do not start movement operations until a qualified person has inspected the hoist and all other connected equipment, and confirmed that is in 100% working order.**
- **Software-independent means of stopping movement must be provided, including a**

hardware emergency stop system that is compliant with all local regulations (e.g. Mentor).

- **Make sure all emergency stop buttons and enabling switches in the system have been tested and are functioning correctly.**
- **Make sure all operators know the locations of the emergency stop buttons and enabling switches in the system.**
- **Make sure the load chain is fully lubricated along its entire length before initial operation.**
- **Make sure the load is always placed vertically underneath the hoist. Do not turn the load chain over any edges or surfaces.**
- **Make sure the load is properly seated in the chain hook.**
- **Make sure the load is attached safely and distributed evenly onto the hoist. Consult an expert or trained specialist if in doubt.**
- **Make sure the load is unobstructed and will not come into contact with other static or moving objects during movement.**
- **Make sure the load is always visible to the operator where possible. If this is not possible, make sure the operator has reliable communication with a person who can clearly see the load.**
- **Make sure all persons in the hazard zone underneath the hoist are aware of the potential for movement.**

Safety instructions during operation

- **If you notice any unexpected or dangerous hoist movement during operation, press the appropriate stop button (either on the connected Apex Drive or on a venue-wide safety controller) to bring all movement to an immediate stop. Note that not all stop buttons in the system necessarily stop the movement of a particular hoist. Alternatively, if an enabling switch is used in the system, then release the enabling switch.**
- **Where emergency stop buttons are used which do not cover the entire installation, familiarise yourself with the operation span of each emergency stop device prior to operating any equipment**
- **If an enabling switch is used in your system to initiate movement of the hoist, be aware that releasing it may cause movement to stop abruptly.**
- **After a stop button has been pressed, the reason for its actuation must be found, and all possible failures in the system removed by trained personnel. The stop button must then be reset before continuing operation. Note that the stop button reset procedure may be different for different devices - refer to individual product manuals for more details.**

Safety instructions during maintenance

- **Maintenance and repairs to the hoist must only be carried out by competent and trained personnel.**
- **Only use original Kinesys parts when replacing components, including all fixings such as nuts, washers and screws.**

- **Do not modify or attempt to repair the hoist in any way other than those described in the maintenance procedures within this manual. If a hoist needs repair work done beyond what is described in this manual, contact Kinesys to arrange a repair.**
- **Always disconnect the power and remove the load when carrying out maintenance procedures, unless instructed otherwise in this manual.**
- **Make sure the maintenance area is secure before carrying out maintenance work.**

2.3 Visible damage

If any damage or breakages are detected during operation or during hoist tests, do not operate the hoist until it has been repaired and a qualified person has checked and approved it.

2.4 Spare parts

Only original fixing components, spare parts, and accessories listed in the manufacturer's spare parts catalog are acceptable for use. The manufacturer's guarantee is given for those spare parts only. The manufacturer cannot be held responsible for any damages due to the use of non-original parts or accessories.

Warning! Use the original 7x22 mm chain of the manufacturer only. Different sized chains are not permitted. The original chain meets the stress and service life standards required for this hoist.

2.5 Operating environment

The Apex Hoist 500 is designed for indoor use only and to work in ambient temperatures between 5°C and 40°C (41°F and 104°F). The humidity of the environment must not exceed 90%.

The storage temperature range of the Apex Hoist 500 extends to between -20°C and 80°C (-4°F and 175°F).

The ingress protection rating for the Apex Hoist 500 is IP55 (protected from low water jets from any direction; limited ingress protection).

2.6 Handling and storage

Condensation

The Apex Hoist 500 is designed for indoor use only. If the product has been exposed to temperature fluctuations, for example during transport, there may be a risk of condensation which may result in damage. Do not connect the Apex Hoist 500 to a power source immediately. Leave the unit disconnected until it has reached a safe temperature

Shocks

Do not shake, knock or drop the Apex Hoist 500. Avoid excessive force when installing and operating the product.

Handling

Do not lift the Apex Hoist 500 by any of its cables or connectors as this may cause damage to the unit and/or the cables; use the transportation handles instead.

Packaging

Where possible, use the original packaging to transport the Apex Hoist 500. Alternatively, a purpose-made flight case may be used (available separately).

3. Product overview

3.1 Standard "Motor Up" configuration

In the majority of automation systems and day-to-day usage, the Apex Hoist 500 will be used in a "Motor Up" configuration where the chain hook is positioned beneath the main body and used for lifting and lowering an attached load.

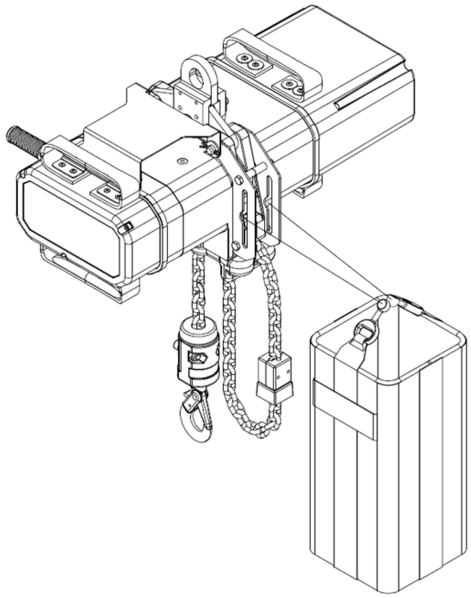

Figure 1. Standard "Motor Up" configuration

3.2 Inverted "Motor Down" configuration

In some situations, the hoist may be used in “Motor Down” mode, where the chain hook is positioned above the main body and the hoist moves up and down its own chain.

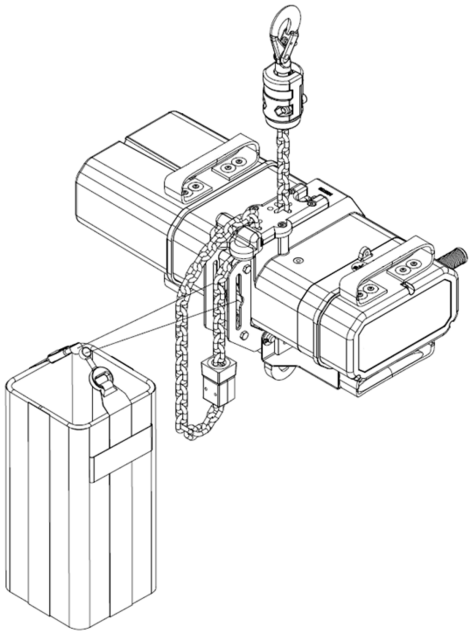

Figure 2. Inverted "Motor Down" configuration

3.3 External hoist features

Some of the key components on the exterior of the Apex Hoist 500 are outlined below.

Note: A shortened load chain is shown for illustration purposes.

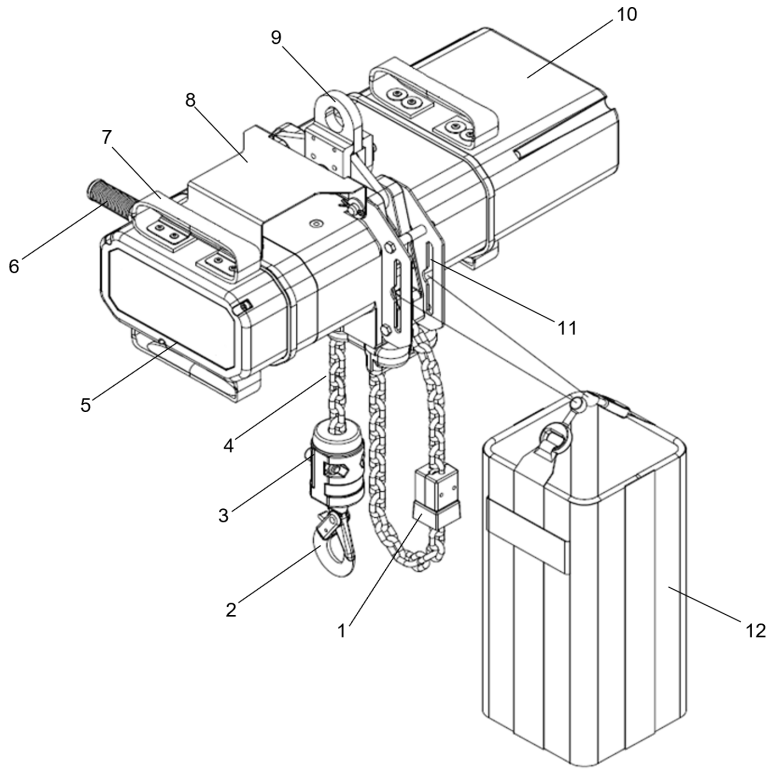

Figure 3. External hoist features

Item #	Description	Notes
1	Lift limiter	Attached to the dead end of the chain - prevents the entire load chain from exiting the hoist
2	Chain hook	Load attachment point - latch lock design
3	Hook block	Holds the chain hook in position on the end of the load chain
4	Load chain	Dimensions 7x22 mm - length specified on order
5	Electronics end cover	Can be removed to access the DIP switch for changing the hoist voltage or resetting the encoder
6	Cable tail	Power and data connection to Apex Drive - built into the hoist and not removable
7	Carry handles (x4)	The correct and safest way to lift the hoist manually
8	Load cell protector	
9	Suspension eye	Used for attaching the hoist to other structures
10	Brake end cover	Can be removed to access brakes and limit switches for maintenance
11	Chain bag attachment bracket	Attachment point for the chain bag - no other fixings required
12	Chain bag	Used for storing chain that has passed through the main body of the hoist - the maximum capacity is shown on the bag label

3.4 Hoist end covers

For some maintenance procedures, the end covers of the hoist must be removed. In this manual, the two end covers are referred to as the "brake end cover" and "electronics end cover". The brake end cover can be easily identified as the longer of the two end covers.

To remove either end cover, unscrew and remove the screws and washers and carefully slide the cover away from the hoist. The brake end cover has four screws/washers and the electronics end cover has three screws/washers.

When re-installing the end covers, ensure that wires do not become trapped and that the the M8 screws are fully tightened to approximately 30 Nm.

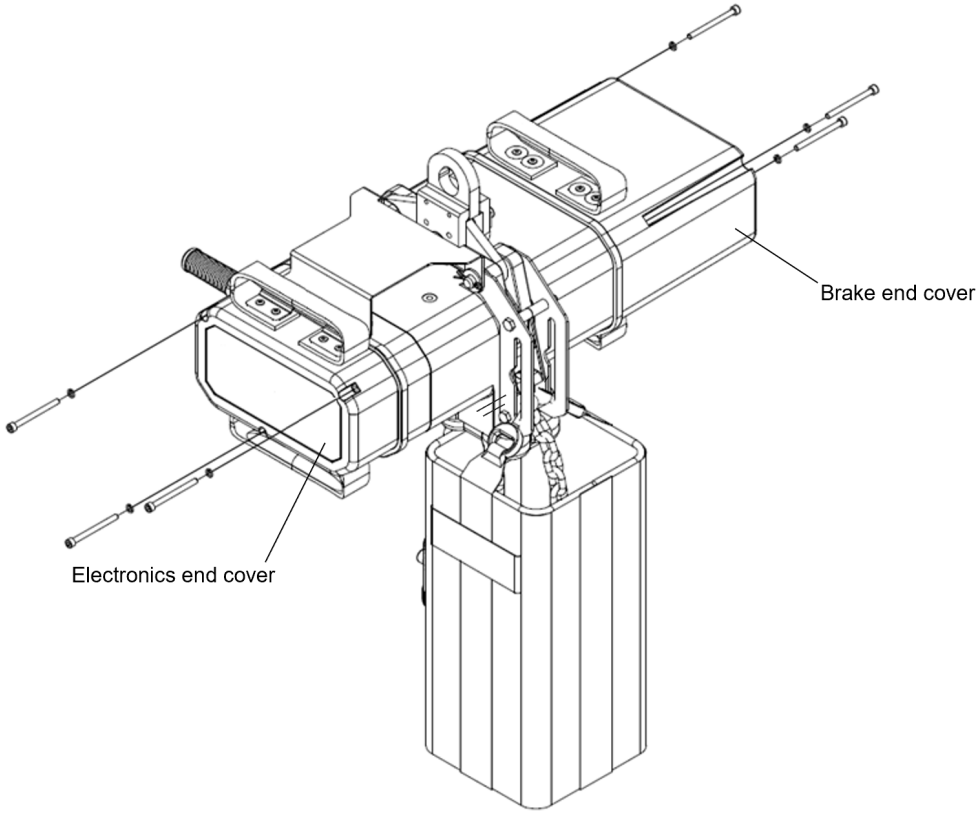

Figure 4. Hoist end covers

3.5 Internal hoist components

Warning! Do not disassemble the hoist down to motor level. The following figure is for illustration purposes only.

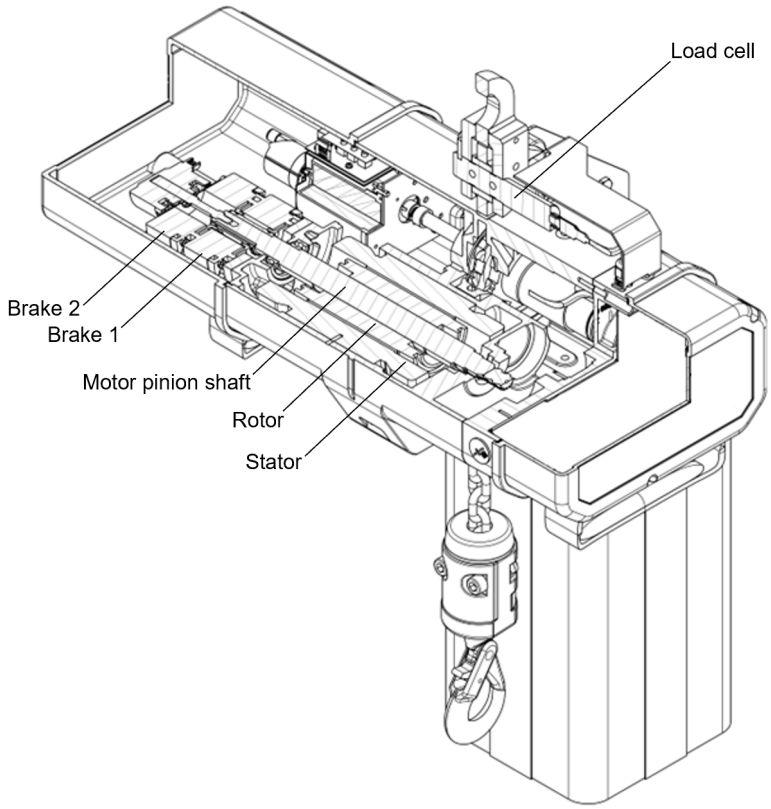

Figure 5. Internal hoist components

3.6 Brake end components

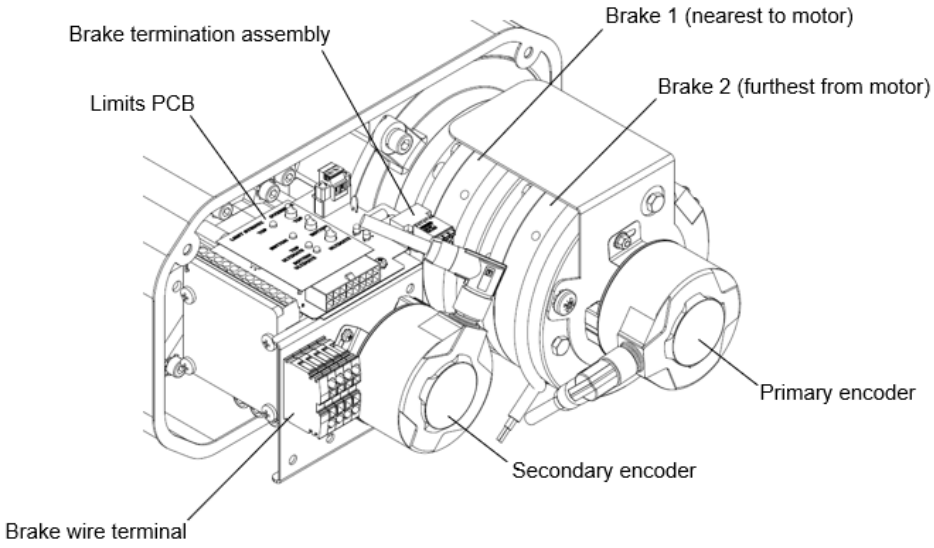

Figure 6. Brake end components

3.7 Load chain mechanism and components

Note: A shortened load chain is shown for illustration purposes.

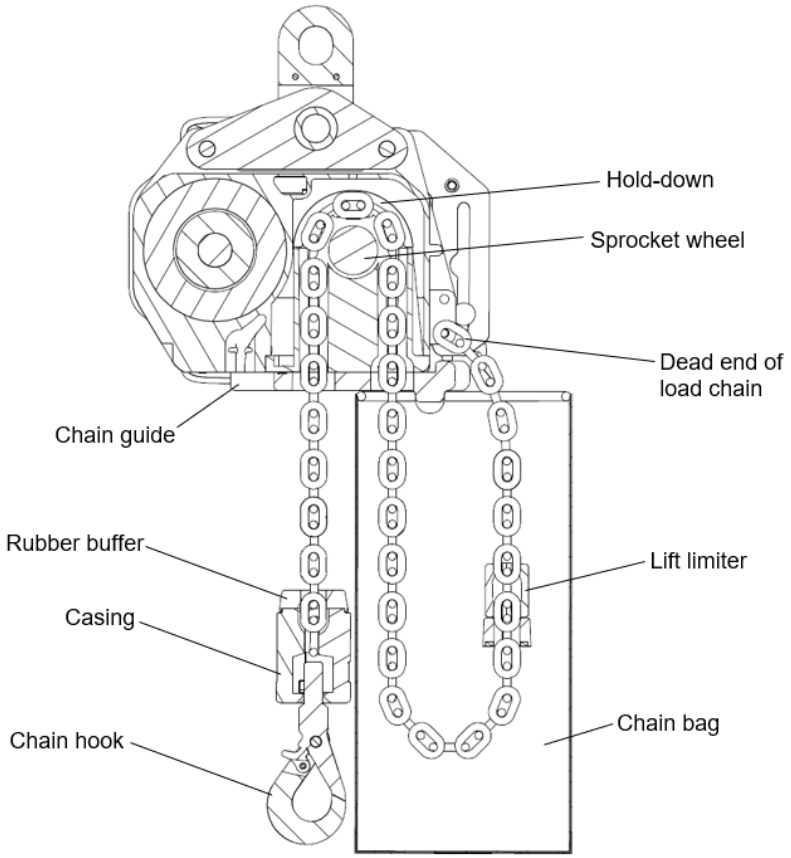

Figure 7. Load chain mechanism and components

3.7.1 Chain bag

The chain bag attaches to the bracket on the side of the hoist without the need for any other fixings. The "Flip" design allows it to be used in both "Motor Up" and "Motor Down" configurations.

The chain dimensions and capacity are shown on the side of the chain bag.

Warning! Make sure the chain bag is big enough for the length of chain and do not overfill the chain bag. The chain must fill less than 50% of the chain bag when the hook is fully retracted. There must not be any possibility for the chain to spill due to a lack of chain bag capacity.

3.7.2 Chain hook assembly

The chain hook is designed specifically for the 7x22 mm load chain used on this hoist and is held in position using two casings that match the shape of the pressure disk. The casings hold the pressure disk in position along with the last link of the load chain. The two casings are held together using two hex head screws and two self locking nuts. The rubber buffer prevents damage should the chain hook assembly come into contact with the hoist body.

The latch lock mechanism is a safety measure that prevents loads from inadvertently opening the chain hook. Using this design, the only way the chain hook can open is by a person intentionally pushing the latch.

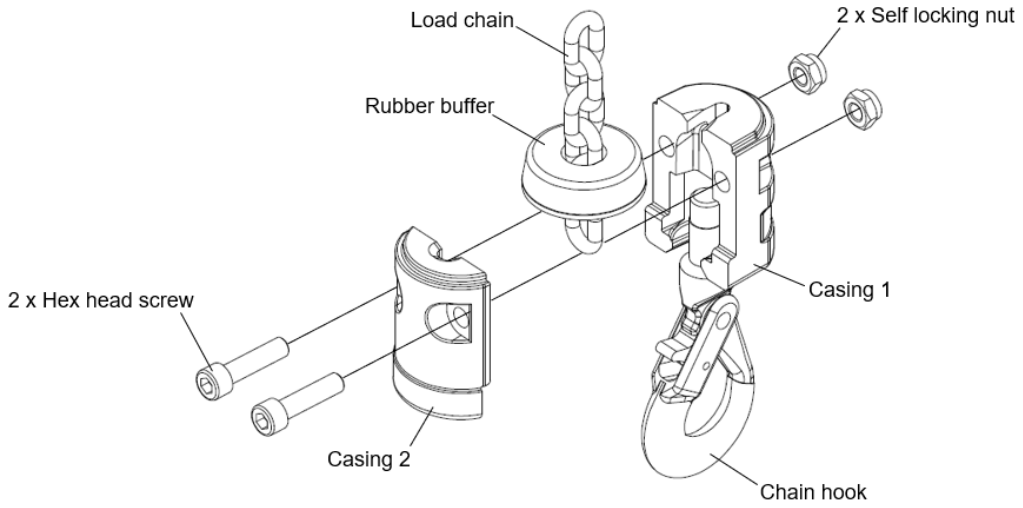

Figure 8. Chain hook assembly components

3.8 Voltage and hoist information

The Apex Hoist 500 can be configured to run on a supply voltage of either 208V or 400V. 400V Apex Hoists may also be operated using 480V Apex Drives. The hoist voltage can be found in a number of locations:

- Voltage label on top of hoist
- Voltage label on Harting connector
- Serial label on top of hoist

If required, the supply voltage of the Apex Hoist 500 can be changed to 400V or 208V by adjusting the wire terminal and DIP switch configuration at the electronics end. For more details, refer to section 7.10

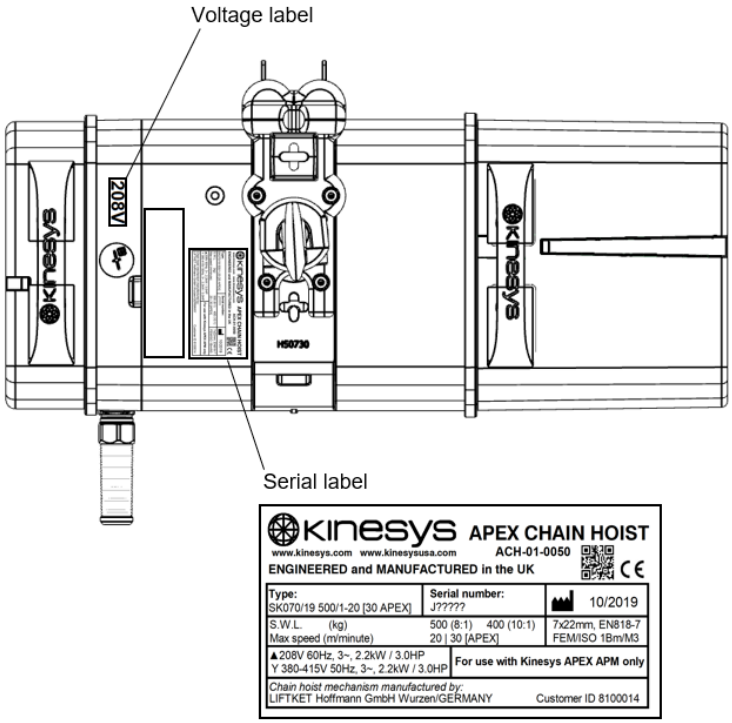

Figure 9. Voltage label and Serial label

3.9 Duty cycle of an electric chain hoist

The duty cycle is limited by the permissible degree of heat in the lifting motor and other electrical components.

The allowable running time is dependent on the lifting height, lifting speed and the load.

The Apex system monitors the operating conditions of the hoist and logs usage, enabling the service life to be maximized. This active control allows the hoist to be operated safely within its limits as the control will provide warnings when a cooling interval is required.

4. Installation

Warning! Observe all safety instructions listed in section 2.2 before installation of the hoist.

Warning! The electrical installation must be carried out by suitably qualified personnel. The equipment must first be disconnected from the mains power supply and secured against unauthorized application of mains power.

4.1 Connecting the hoist to Apex Drive

The Apex Hoist 500 may be configured for a nominal 400V or 208V mains supply. This is normally factory set to match the supplied Apex Drive controller. 400V Apex Hoists may also be operated using 480V Apex Drives. Apex Drive controllers are available in 208V, 400V and 480V factory configurations.

The hoist power and data cable must be connected to the Harting connector on the rear panel of the Apex Drive. The connection to the Apex Drive is made using a Harting modular connector with two locking levers.

When installing, check the orientation of the connector and socket - the connector can only be inserted one way. To prevent accidental disconnection, make sure both locking levers are secured after making the connection.

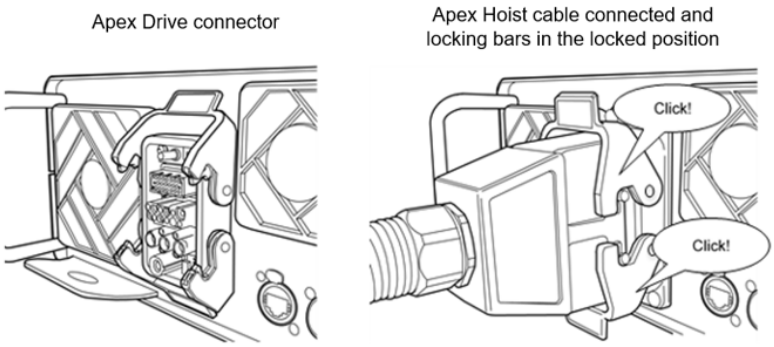

Figure 10. Apex Drive connection

4.2 Chain bag installation

Make sure the chain bag has enough capacity for the length of load chain - the chain dimension and bag capacity are shown on the chain bag label.

1. Use the Apex Drive in Local mode and run the chain DOWN until the lower initial limit is reached. This means the shortest length of chain possible (without bypassing limits) is visible at the dead end.

2. Attach the chain bag to the bracket by sliding the connectors into the slots - no other fixings are necessary.
3. Use the Apex Drive in Local mode and run the chain UP to its upper initial limit so that the chain passes through the hoist and into the bag. Make sure there are no twists or knots in the chain as it enters the bag.
4. Make sure that the chain fills less than 50% of the bag when the chain has reached its upper initial limit.

4.2.1 Oversized load chains

If the total chain weight is more than 25 kg, the strain of the chain bag must be relieved with a special textile strap. This must be provided by the end-user as the installation conditions are unknown.

5. Operation

The load chain must be properly lubricated before initial operation and at regular 3 month intervals thereafter - refer to section 8 for details.

5.1 Hoist control methods

Movement of the hoist can be initiated in different ways:

- Simple up and down commands can be initiated using the front panel buttons and of the Apex Drive when used in Local mode, or a remote hand-held controller / pendant.
- More complex sequences of moves and cues can be programmed using Kinesys or TAIT software as part of an automation console.

This manual covers the operation and maintenance of the Apex Hoist 500 only. For more details on the different methods of control within the Apex system, refer to the Apex Drive manual as well as the relevant console manuals.

5.2 Safety advice

Safety warnings during operation

- **If you notice any unexpected or dangerous hoist movement during operation, press the appropriate stop button (either on the connected Apex Drive or on a venue-wide safety controller) to bring all movement to an immediate stop. Note that not all stop buttons in the system necessarily stop the movement of a particular hoist. Alternatively, if an enabling switch is used in the system, then release the enabling switch.**
- **Where emergency stop buttons are used which do not cover the entire installation, familiarise yourself with the operation span of each emergency stop device prior to operating any equipment**
- **If an enabling switch is used in your system to initiate movement of the hoist, be aware that releasing it may cause movement to stop abruptly.**
- **After a stop button has been pressed, the reason for its actuation must be found, and all possible failures in the system removed by trained personnel. The stop button must then be reset before continuing operation. Note that the stop button reset procedure may be different for different devices - refer to individual product manuals for more details.**

5.3 Hoist limits

Four different limits are programmed into the hoist during manufacture using the integrated Stromag limit switch box. Limits are safety features designed to stop movement of the hoist in different ways when the chain has reached certain positions.

Limits are always set in terms of number of whole links between the main body and either the chain hook assembly (on the load-bearing end) or the lift limiter (on the dead end).

If the load chain needs to be replaced, the operating and ultimate limits must be reset using the limit switches - refer to section 7.8 for details.

The hoist limits are as follows:

Limit	No. of chain links
Operating UP (BO/UO)	22 between hook and hoist body
Ultimate / Emergency UP (NO/UE)	8 between hook and hoist body
Operating DOWN (BU/LO)	22 between lift limiter and hoist body
Ultimate / Emergency DOWN (NU/LE)	8 between lift limiter and hoist body

5.3.1 Hoist limit definitions

Limit	Meaning
Operating	Movement will stop and the hoist may be moved in the opposite direction away from the limit using standard controls.
Ultimate / Emergency	Movement will stop. Further movement is not possible until the limit switch is bypassed. This can only be done using the bypass switches on the Limits PCB.
UP	Relates to the distance between the rubber buffer of the chain hook assembly and hoist body.
DOWN	Relates to the distance between the rubber buffer of the lift limiter and hoist body.

5.4 Dynamic forces during stopping operations

Suspending a load on a hoist results in higher dynamic forces on the suspended load and the supporting structure than would be the case with a static load. The expected dynamic forces during normal operation and in the event of a system fault must be considered in the design of the suspended load and the supporting structure, and in the overall mechanical calculations for the hoist system.

- The maximum allowable deceleration during normal operation (CAT 1) is 1000 mm/s^2 (including deceleration during an emergency stop).
- The resultant dynamic force at full load (500 kg) for a CAT 1 stop is 5405 N.
- The force multiplier for a CAT 1 stop (difference between the static and dynamic load) is 1.1.

A CAT 0 (immediate) stop will occur following a power failure, system fault or a violation of safety conditions. This results in higher dynamic forces than during normal operation.

- The resultant dynamic force at full load (500 kg) for a CAT 0 stop is 9740 N.
- The force multiplier for a CAT 0 stop is 1.98.

6. Inspection

6.1 Regular inspection schedule

The following minimum intervals are recommended for hoist inspections. However, these may be shortened if the hoist is subject to adverse operating conditions on a regular basis such as high duty cycles or extreme temperature environments.

	Minimum inspection interval		
Check	**Weekly**	**Quarterly**	**Yearly**
Visual inspection of the hoist's general condition (wear, deformation, cracks, rusting)	X		
Functional check of the double brake		X	
Functional check of the brake circuits		X	
Functional check of the limit switches		X	
Visual inspection of the load chain		X	
Visual inspection of rubber buffers (hook block and lift limiter)		X	
Visual inspection of the chain hook		X	
Functional check of the load cell		X	
Visual inspection on the condition of the chain bag (particularly wear of the textile material)		X	
Inspection of the brake air gap			X
Visual inspection of all screws			X
Visual inspection of the chain guide			X
Visual inspection of the hoist cable tail			X

6.2 Functional check of the double brake

1. Attach a nominal load to the hoist.
2. Raise the load to a suitable height where the brake behaviour can be observed during lowering.
3. Run the load downwards and then stop movement, either by releasing the button / enabling switch or pressing the emergency stop button. Make sure the load stops smoothly without any unexpected noise and that the length of travel after stopping does not exceed two chain link lengths.

6.3 Functional check of the brake circuits

This functional check ensures that each brake operates independently and can hold the attached load if the other fails.

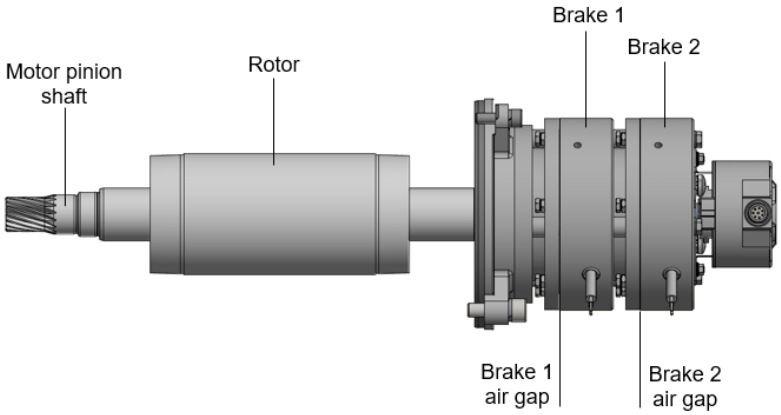

Figure 11. Motor and brake assembly

Note: the following procedure requires the use of Apex Monitor software. Contact Kinesys for details.

1. Attach a nominal load to the hoist.

Inspection of brake circuit 1 (brake closest to the motor):

2. Energize brake circuits 1 and 2 and raise the load to a suitable height using the Apex Drive in manual mode.
3. De-energize brake circuit 1 and inspect the stopping distance. Make sure the load stops smoothly without any unexpected noise. Also make sure that the length of travel after de-energizing does not exceed two chain link lengths.
4. De-energize brake circuit 2.

Inspection of brake circuit 2 (brake furthest from the motor):

1. Energize brake circuits 1 and 2 and raise the load to a suitable height using the Apex Drive in manual mode.
2. De-energize brake circuit 2 and inspect the stopping distance. Make sure the load stops smoothly without any unexpected noise. Also make sure that the length of travel after de-energising does not exceed two chain link lengths.
3. De-energize brake circuit 1.

6.4 Inspection of the brake air gap

Warning! Under normal circumstances, the brake microswitch gap should not be adjusted from the factory settings. Consult Kinesys before making any changes.

The double brake assembly is designed for long term usage and under normal circumstances the air gap should not deviate from the correct value and should not need to be changed.

The air gap between the armature disk and coil carrier should always be 0.5 mm ± 0.2. This is the factory setting and ensures correct functionality of the brakes when energised and de-energised.

To inspect the air gap, insert a range of feeler gauges into the air gap on both brake 1 and brake 2. Insert the feeler gauges at different points around the circumference of each brake. Make sure the air gap is within the permissible range of 0.5 mm ± 0.2.

If the air gap is outside the permissible range, contact Kinesys to arrange repair or to have a new brake assembly sent. For instructions on how to replace the brake assembly, refer to section 7.9.

6.5 Visual inspection of the load chain

Regular checking of the load chain is compulsory in order to prevent accidents. The load chain must be inspected before first operation and approximately every 200 operating hours or 10,000 load cycles thereafter under normal conditions.

Check every link in the load chain, particularly at their points of contact, for wear, cracks, deformation and other damage.

If certain sections of the load chain are subject more stresses than others (such as the section that passes regularly through the sprocket wheel) then pay particular attention to those sections during inspection.

6.5.1 Inspection of load chain deformation

The load chain must be replaced if:

- The thickness of any link has reduced by 10% or more.
- An individual chain link has elongated by 5% or more.
- A section of eleven chain links has elongated by 2% or more.

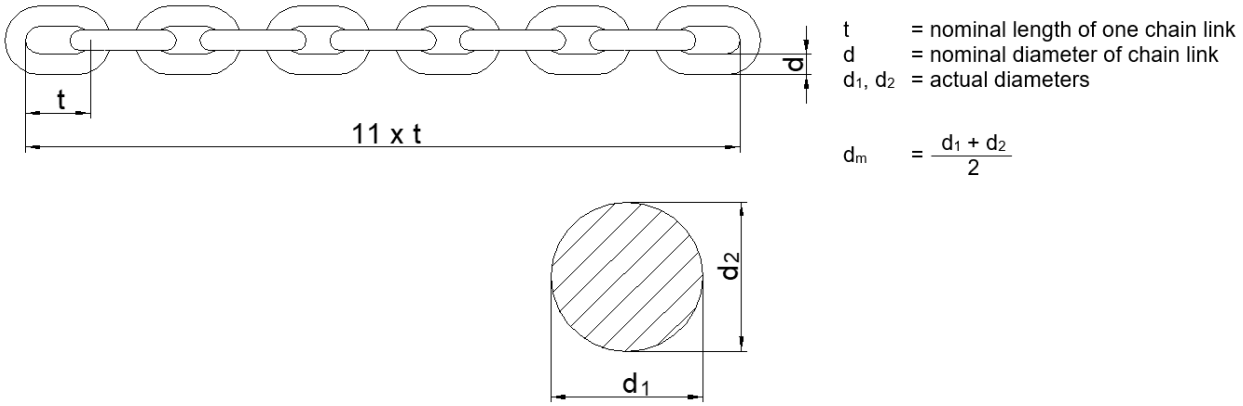

Figure 12. Load chain dimensions

Chain link dimension	Symbol	Value (mm)
Nominal diameter	d	7
Minimum allowable wear diameter	d_m	6.3
Nominal length of one link	t	22
Maximum allowable elongated length of one link	t_{max}	23.1

Chain link dimension	Symbol	Value (mm)
Nominal length of eleven links	11 x t	242
Maximum allowable elongated length of eleven links	$(11 \times t)_{max}$	246.8

To replace the load chain, refer to section 7.5.

6.6 Visual inspection of the hook block

Inspect the hook block for the following conditions:

- Excessive damage, corrosion or rusting to the chain hook or casings
- Excessive damage or wear to the rubber buffer
- The latch lock mechanism is deformed or not closing fully

To replace the hook block, refer to section 7.2.

6.7 Visual inspection of the lift limiter

Inspect the lift limiter must be replaced if any of the following conditions are found:

- Excessive damage, corrosion or rusting
- Excessive damage or wear to the rubber buffer

To replace the lift limiter, refer to section 7.3.

6.8 Functional check of the load cell

Attach a load of known mass to the hoist and run the chain upwards so that the load is fully suspended on the chain hook. Make sure the value displayed on the automation software or console matches the nominal mass of the load.

If the load cell fails the inspection, contact Kinesys to arrange a repair.

7. Maintenance

This section explains how to replace certain components of the hoist as well as other important maintenance procedures.

Safety warnings during maintenance

- **Maintenance and repairs to the hoist must only be carried out be competent and trained personnel.**
- **Only use original Kinesys parts when replacing components, including all fixings such as nuts, washers and screws.**
- **Do not modify or attempt to repair the hoist in any way other than those described in the maintenance procedures within this manual. If a hoist needs repair work done beyond what is described in this manual, contact Kinesys or your supplier to arrange a repair.**
- **Always disconnect the power and remove the load when carrying out maintenance procedures, unless instructed otherwise in this manual.**
- **Make sure the maintenance area is secure before carrying out maintenance work.**

7.1 Replacement of the chain bag

Make sure the chain bag has enough capacity for the new length of load chain - the chain dimension and bag capacity are shown on the chain bag label.

1. Use the Apex Drive in Local mode and run the chain DOWN until the lower initial limit is reached. This means the shortest length of chain possible (without bypassing limits) is visible at the dead end.
2. Remove the old chain bag by removing the connectors from the slots of the bracket.
3. Attach the chain bag to the bracket by sliding the connectors into the slots - no other fixings are necessary.
4. Use the Apex Drive in Local mode and run the chain UP to its upper initial limit so that the chain passes through the hoist and into the bag. Make sure there are no twists or knots in the chain as it enters the bag.
5. Make sure that the chain fills less than 50% of the bag when the chain has reached its upper initial limit.

7.2 Replacement of the hook block and chain hook

The hook block must be replaced if any of the following conditions are found:

- Excessive damage, corrosion or rusting to the chain hook or casings
- Excessive damage or wear to the rubber buffer
- The latch lock mechanism is deformed or not closing fully

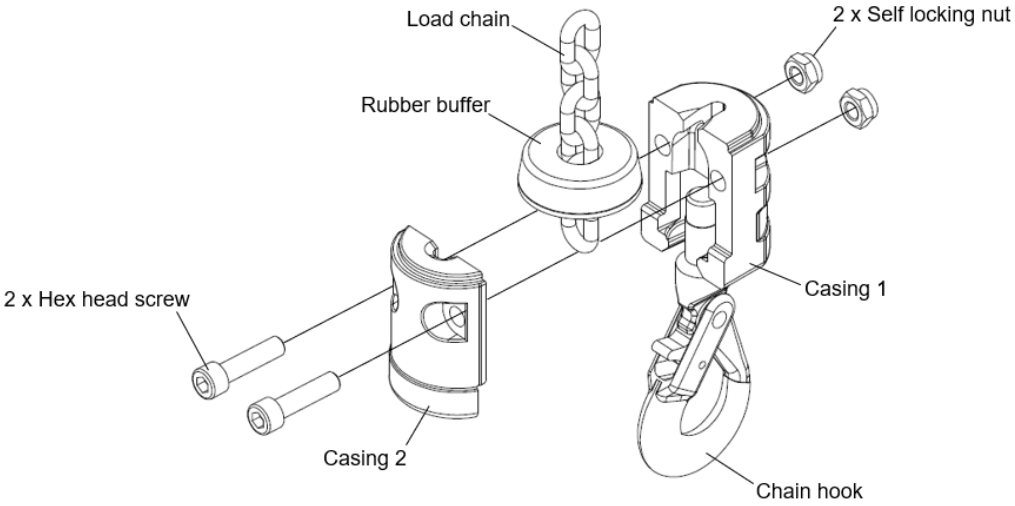

Figure 13. Chain hook replacement

7.2.1 Removal

1. Remove the two nuts and two screws that hold the two casings together.
2. Separate the two casings and remove them from the chain, along with the chain hook.
3. Slide the rubber buffer off the chain.

7.2.2 Installation

1. Slide the rubber buffer onto the chain.
2. Position the top of the chain hook into the recess of one of the casings, making sure the hook is in the correct orientation.
3. Bring the two casings together over the last link of the chain so that the link fits securely into the recess of each casing.
4. Push the rubber buffer into the top of the two casings and make sure it is secure.
5. Secure the two casings using the two new hex-head screws and nuts. Apply a torque load of 35 Nm.

7.3 Replacement of the lift limiter

The lift limiter must be replaced if any of the following conditions are found:

- Excessive damage, corrosion or rusting
- Excessive damage or wear to the rubber buffer

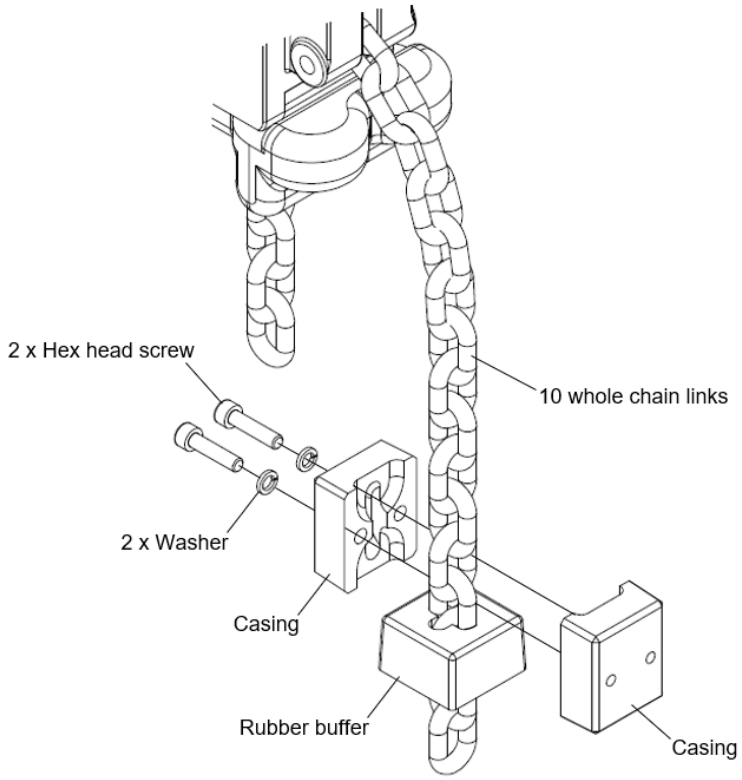

Figure 14. lift limiter replacement

7.3.1 Removal

1. Remove the two screws and washers that hold the two casings together.
2. Separate the two casings and remove them from the chain.
3. Slide the rubber buffer off the chain.

7.3.2 Installation

1. Separate the components of the new lift limiter assembly.
2. Slide the rubber buffer onto the chain.
3. Bring the two casings together over the chain so that the link fits securely into the recess of each casing. **Important** - there must be 10 full chain links visible at the dead end once the lift limiter is installed.
4. Push the rubber buffer into the top of the casings so it is secure.
5. Secure the two casings using the two screws and nuts. Apply a torque load of 35 Nm.

7.4 Removal/installation of the chain dead end

Warning! The dead end of the load chain must always be attached to the bracket during operation. In the unlikely event of the load chain falling out of the bag, this prevents the lift limiter from causing injury.

Note: A shortened load chain is shown for illustration purposes.

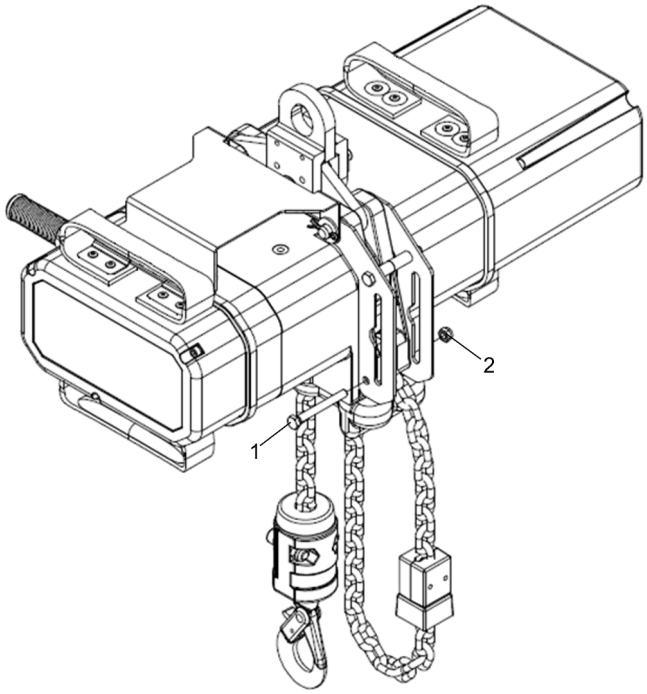

Figure 15. Chain end attachment

7.4.1 Removal

1. Unscrew the hex head screw and nut that hold the chain link to the bottom of the bracket. Remove the chain link.

7.4.2 Installation

1. Align the final chain link with the attachment holes in the bottom of the attachment bracket.
2. Install the hex head screw and nut through the attachment holes and chain link, making sure the chain link is able to fully rotate. Apply a torque load of 30 Nm.

7.5 Replacement of the load chain

The load chain must be replaced if it fails any of the inspection criteria listed in section 6.5

7.5.1 Accessing the limits PCB

The load chain replacement procedure requires running the chain beyond its operating and ultimate limits. This can be done by using the limits override switches, located at the brake end of the hoist. When a limit is struck, the appropriate LED on the limits PCB will illuminate.

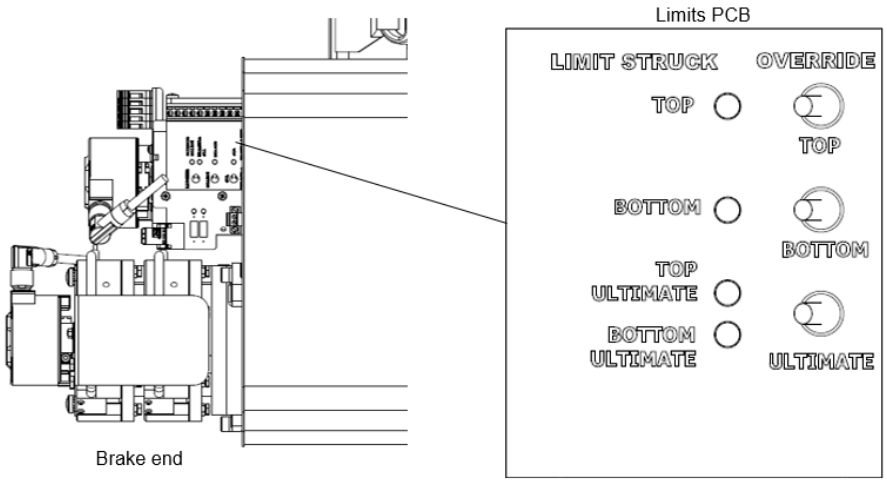

Figure 16. Limits PCB location

7.5.2 Removal

1. Remove the chain bag from the hoist.
2. Remove the lift limiter from the end of the chain (refer to section 7.3.1).
3. Remove the dead end of the load chain from the bracket (refer to section 7.4.1).
4. Remove the chain hook from the end of the chain (refer to section 7.2.1
5. Run the chain in the UP direction using the Apex Drive in manual mode. Once the upper operating limit is reached (22 links), the hoist will stop running and the limits must be overridden in order to continue.
6. Gain access to the limits PCB by removing the brake end cover. Switch the Apex Drive to override mode and operate both the "Top" and "Ultimate" switches. Continue to run the chain in the UP direction until it has fully passed through the body of the hoist.

7.5.3 Installation without existing load chain installed

This method should be used when there is no existing chain installed to the hoist.

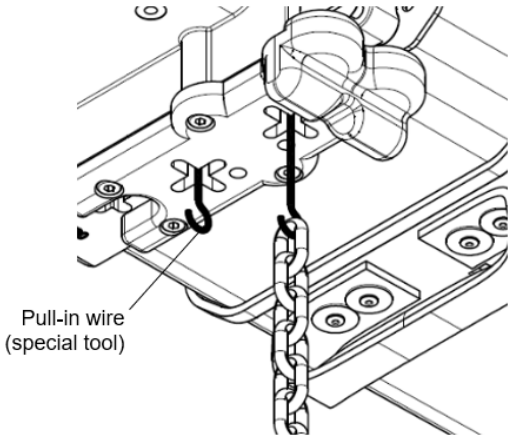

Figure 17. Inserting the pull-in wire

Required item - Pull-in wire (special tool)

1. Insert the pull-in wire through the chain guide cross plate. The hook must point towards the end of the hoist as shown in Figure 17. Push the pull-in wire until the hook on the other side of the chain guide cross plate is visible.
2. Attach the first link of the new chain to the hook that is nearest to the chain bag bracket.

The new load chain must be installed with the weld pattern on the outside of the sprocket wheel as shown in Figure 18.

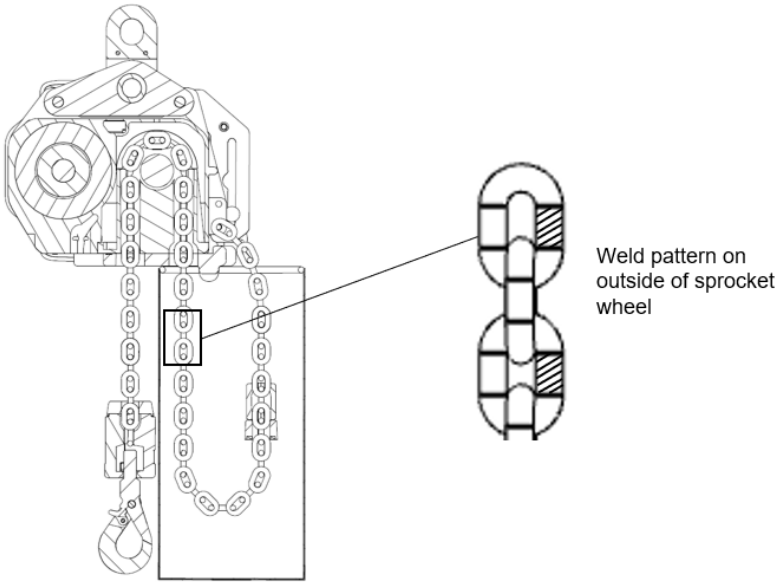

Figure 18. Chain link weld pattern position

1. Feed the chain through the hoist by moving the Apex Drive at low speed. Continue moving the pull-in wire until at least 0.5 m of chain has passed through the hoist.
2. Remove the pull-in wire from the end of the chain and install the chain hook to that end (refer to section 7.2.2.
3. Attach the lift limiter to the other end of the chain (refer to section 7.3.2).
4. Attach the hook block (refer to section 7.2.2.
5. Install the dead end of the load chain to the bracket (refer to section 7.4.2
6. Install the chain bag to the hoist.
7. Lubricate the load chain (refer to section 1.2).

The following steps are only required if the new load chain is a different length to the old load chain:

8. Set the zero position of the encoder (refer to section 7.8.
9. Set the top and bottom operating / ultimate limits (refer to section 7.

7.5.4 Replacement with existing load chain installed

This method should be used when an existing chain is already installed to the hoist.

Required item - Cut link (a single chain link with a gap)

1. Remove the chain from the chain bag.
2. Remove the lift limiter from the end of the chain (refer to section 7.3.1).
3. Remove the chain hook from the end of the chain (refer to section 7.2.1
4. Attach the cut link to the end of the chain where the chain hook was removed.
5. Attach the new load chain to the cut link.

The new load chain must be installed with the weld pattern on the outside of the sprocket wheel as shown in Figure 18.

6. Run the chain in the UP direction using the Apex Drive in manual mode. Once the upper operating limit is reached (22 links), the hoist will stop running and the limits must be overridden in order to continue.
7. Gain access to the limits PCB by removing the electronics end cover. Switch the Apex Drive to override mode and operate both the "Top" and "Ultimate" switches. Continue to run the chain in the UP direction until the cut link has passed through the body of the hoist.
8. Remove the old chain and cut link.
9. Continue to run the chain in the UP direction until at least 0.5 m of chain is visible on the dead end side.
10. Attach the lift limiter to the dead end of the chain (refer to 7.3.2.
11. Attach the hook block (refer to section 7.2.2.
12. Install the dead end of the load chain to the bracket (refer to section 7.4.2
13. Install the chain bag to the hoist.

14. Lubricate the new load chain (refer to section 1.2).
15. Set the zero position of the encoder (refer to section 7.8).
16. Set the top and bottom operating / ultimate limits (refer to section 1.7).

7.6 Replacement of the chain guide

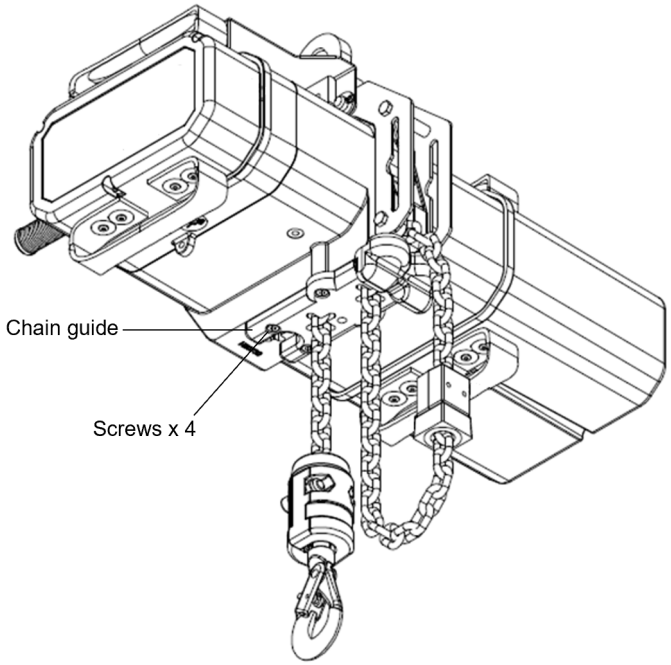

Figure 19. Chain guide replacement

1. Remove the load chain as described in section 7.5.2.
2. Loosen and remove the four screws that hold the chain guide to the bottom of the hoist.
3. Remove the chain guide.
4. Install the new chain guide by aligning the attachment holes and secure in position using the four screws.
5. Install the load chain as described in section 7.5.3.

7.7 Setting the encoder

When installing a new load chain, the encoder's zero position must be reset in order for the hoist's positional data to be recorded accurately.

This procedure requires a number of operations to be performed on the Apex Drive- refer to the relevant Apex Drive manual for details.

This procedure also requires accessing the encoder reset button, located at the electronics end of hoist.

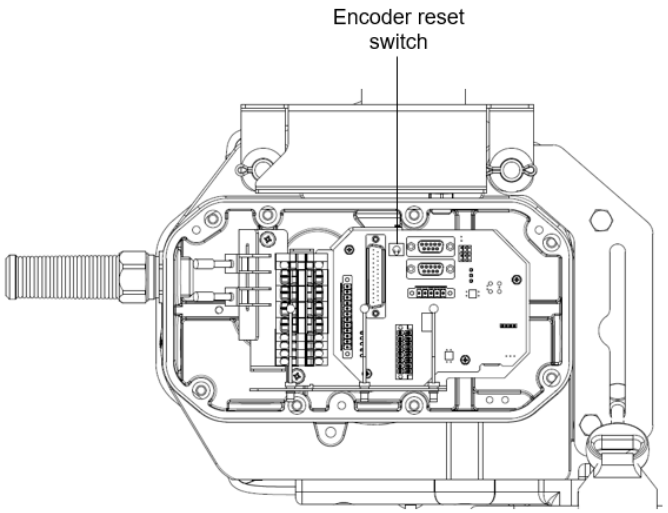

Figure 20. Encoder reset button location

1. A PMT file is must first be installed to the Apex Drive in order to bypass encoder monitoring. Contact Kinesys to obtain the correct version of the PMT file and security password. Once obtained, install the PMT file to the Apex Drive- refer to the Apex Drive manual for details.
2. Remove the brake end cover and electronics end cover to gain access to the limits switch and encoder reset button respectively.
3. Once the new PMT file is loaded, turn the Apex Drive to Override mode. Press the machine stop button on the drive and then release it. You will now have a maximum of 5 minutes to complete the next three steps. If 5 minutes pass, you must press and release the stop button again for another 5 minutes of movement.
4. Run the chain in the UP direction using the Apex Drive at a minimum speed. Operate the "Top" and "Ultimate" limit switches and continue to run the chain until the rubber buffer at the top of the hook block touches the body of the hoist.
5. Operate the reset button at the electronics end of the hoist. This action will reset the absolute encoder to a position of 100000 mm (100 m). Make sure this value is shown on the SPLC status screen on the Apex Drive.
6. Reload the original PMT file into the Apex Driveto re-enable correct functionality.
7. Refit the brake end cover and electronics end cover to the hoist.

7.8 Setting the limits

Warning! The limit switches have been factory set for compatibility with the Apex Drive. Do not use any limit values other than those listed in this manual.

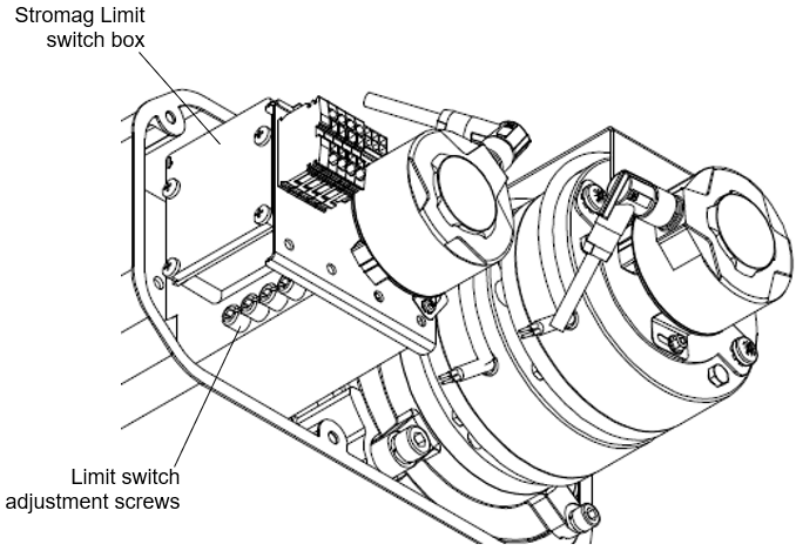

Figure 21. Limit switch box

1. Remove the brake end cover to gain access to the limit switch box.
2. Identify which of the four limits to set:

Limit	No. of chain links
Operating UP (BO/UO)	22 between hook and hoist body
Ultimate / Emergency UP (NO/UE)	8 between hook and hoist body
Operating DOWN (BU/LO)	22 between lift limiter and hoist body
Ultimate / Emergency DOWN (NU/LE)	8 between lift limiter and hoist body

3. Run the chain in the appropriate direction using the Apex Driveuntil the limit position is reached. If setting one of the ultimate limits, the operating limit must be bypassed first by operating the Top or Bottom switch on the limits PCB.
4. Once the chain has reached the correct position, use an Allen key to turn the appropriate adjustment screw on the limit switch box. Each limit and the direction to turn the adjustment screw is shown on the label on top of the limit switch box. Turn the adjustment until the cam touches the button - this can be detected by an audible click and the limit switch indicator illuminating.
5. Check each limit position by running the hoist in the opposite direction to the limit, and then running back at slow speed until the limit switch stops the hoist motion.
6. Once all four limits have been set, refit the brake end cover.

7.9 Replacement of the brake assembly

The double brake assembly must be replaced if either brake fails the functional test in section 6.2, the functional check of the brake circuit in 6.3, or the air gap check in section 6.

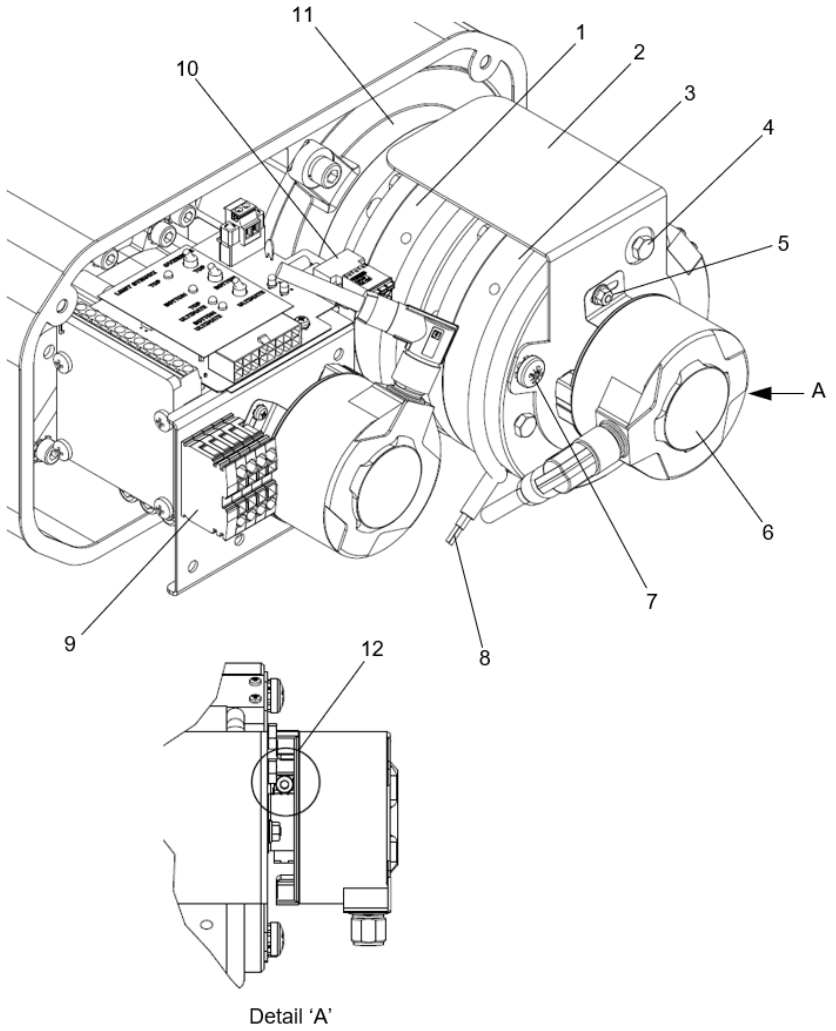

Figure 22. Brake assembly components

Item #	Description
1	Brake 1
2	Encoder bracket
3	Brake 2
4	M5 bolts
5	M3 lock nuts
6	Encoder
7	M6 screws
8	Brake supply wires
9	Brake wire terminal
10	Brake termination assembly
11	Base plate
12	Collet

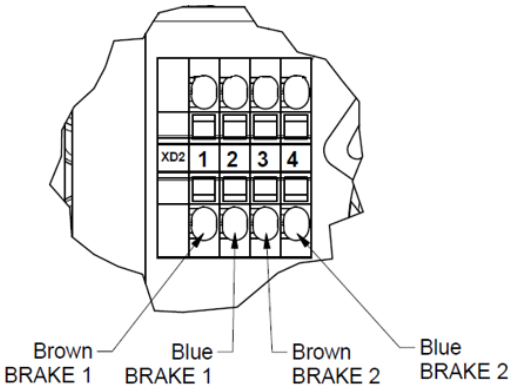

Figure 23. Brake wire terminal configuration

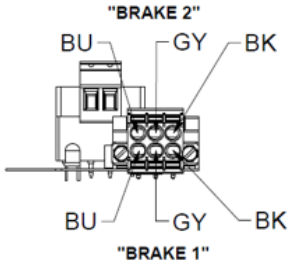

Figure 24. Brake sensor wiring configuration

7.9.1 Removal

Refer to the numbered items in Figure 22.

1. Use a flat head screwdriver to remove the brake sensor Phoenix connector from the brake termination assembly (10).
2. Use a T10 Torx screwdriver to remove the screw (12, Detail 'A') that attaches the encoder shaft collar to the main shaft - this can be found on the underside of the encoder (6). Remove the encoder shaft collar.

Note: The encoder bracket in the following steps is not included on some older models of Apex Hoist 500.

3. Remove the two M3 lock nuts (5) that attach the encoder (6) to the encoder bracket (2) and then remove the encoder. Keep the encoder, collar, and all removed fixings somewhere safe for re-assembly.
4. Remove the two M6 screws (7) and washers that attach the encoder bracket (2) to the end of the Brake 2 (3). Remove and keep the protective plate.
5. Remove the four brake supply wires (8) from the brake wire terminal (9).
6. Loosen the three 100 mm M5 bolts (4) and washers from the end of Brake 2 (3) and slide them out from the main assembly.
7. Remove Brake 2 (3) and its brake disc from the shaft.
8. Remove Brake 1 (1), the circlip and the Brake 1 disc from the shaft.
9. Remove and keep the three M4 screws that attach the base plate (11) to the hoist.
10. Remove the base plate.

7.9.2 Installation

Refer to the numbered items in Figure 22.

1. Install the base plate (11) to the body of the hoist with the three M4 screws. Torque the screws to 2.0 Nm.
2. Install the Brake 1 disc, circlip and Brake 1 (1) to the shaft.
3. Install the Brake 2 disc and Brake 2 (3) to the shaft.
4. Install the three 100 mm M5 bolts (4) and washers to the end of Brake 2 (3). Torque the bolts to 5.0 Nm.
5. Install the four brake supply wires (8) to theoriginal positions in the brake wire terminal (9). Refer to Figure 23 for details.
6. Install the encoder bracket (2) to the end of Brake 2 (3) with the two M6 screws (7) and washers. Torque the screws to 3.0 - 3.7 Nm.
7. Install the encoder (6) to the shaft and encoder bracket (2) with the two M3 lock nuts (5). Torque the nuts to 0.5 - 1.0 Nm.
8. Attach the encoder shaft collar to the underside of the encoder (6) with the removed screw (12, Detail 'A'). Torque the screw to 1.1 Nm.
9. Reconnect the brake sensor wires to the brake sensor Phoenix connector - refer to Figure 24 for wiring details.
10. Install the brake sensor Phoenix connector to the brake termination assembly (10).
11. Test the functionality of the brakes and the brake circuit in accordance with sections 6.2

Warning! Do not operate the hoist until the new brake assembly has been tested in accordance with sections 6.2 and 6.3.

7.10 Changing the hoist voltage

The hoist voltage is set at manufacture to either 208V or 400V. This can be changed by reconfiguring the wires located at the electronics end of the hoist. For operation with 480V Apex Drives, set the hoist voltage to 400V.

Warning! Before changing the hoist voltage, always isolate the hoist from the Apex Drive by disconnecting the Harting connector.

Note: The wiring and DIP switch configuration for each voltage can be found on the wiring detail label, located on the inside of the electronics end cover.

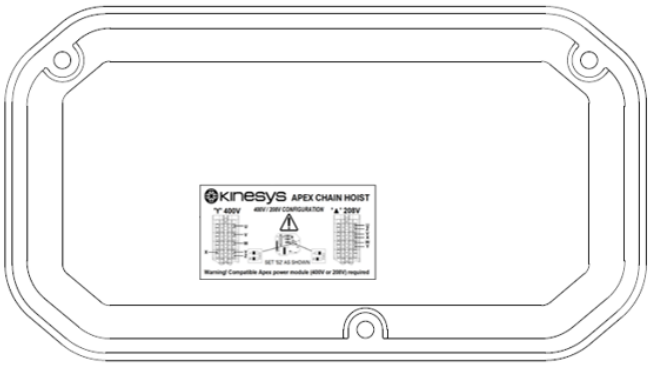

Figure 25. Wiring detail label

1. Remove the electronics end cover to gain access to the wire terminals and DIP switch.
2. Reposition the wires in the wire terminal as shown in Figure 26. Use a flat bladed screwdriver to release the spring clamp terminals and remove the ferruled wire. Push the ferruled wire into the new location, using a flat bladed screwdriver to release the terminal first.

   Note that only wires X, Y and Z must be repositioned. Each wire can be identified by its coloured pattern and a label showing the letter.

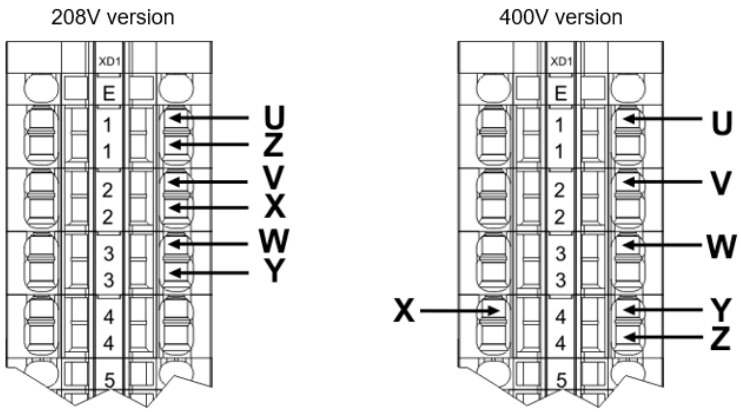

Figure 26. Wiring configurations for different voltages

3. Reposition the DIP switch a shown in Figure 27.

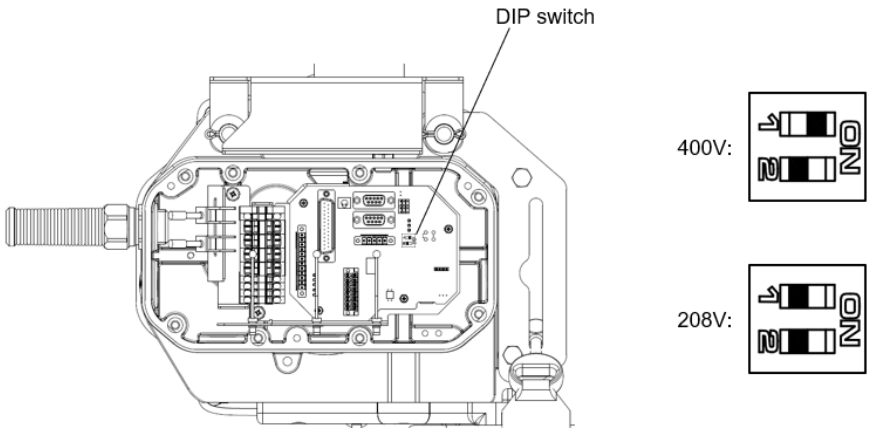

Figure 27. Voltage DIP switch

4. Refit the electronics end cover.
5. Replace the voltage label on the hoist and the Harting connector with a new label that shows the new voltage - contact Kinesys to obtain new labels and quote the part numbers listed in the table below.

Label type	Kinesys part number
Voltage label for hoist 208V	7694380
Voltage label for hoist 400V	7694395
Voltage label for Harting connector 208V	7694380
Voltage label for Harting connector 400V	7694395

8. Lubrication

8.1 Regular lubrication schedule

The following minimum intervals are recommended for lubrication procedures. However, these may be shortened if the hoist is subject to adverse operating conditions on a regular basis such as high duty cycles or extreme temperature environments.

	Minimum inspection interval	
Procedure	**Quarterly**	**Yearly**
Lubrication of the load chain	X	
Lubrication of the chain hook		X

8.2 Lubrication of the load chain

The load chain must be properly lubricated before initial operation and at regular 3 month intervals thereafter.

Lubricate the entire length of the load chain using a suitable lubricant. Lubricate the chain without a load attached.

8.2.1 Types of chain lubricant

The following lubricants are recommended for lubrication of the load chain, depending on environmental conditions.

The dry-film lubricant is recommended in environments that are more conducive to wear (e.g from sand, grit).

Supplier	Lubricant
Fuchs	Stabylan 2001
Fuchs	Stabylan 5006
Fuchs	CTP D 350
Fuchs	Renolit SO-GFB
Fuchs	Ceplattyn 300 (dry-film lubricant)
Klüber	Klüberoil 4UH 1-1500
Klüber	Klüberoil CA 1-460
Klüber	Microlube GB 00
Castrol	Optimol Viscogen KL300

8.3 Lubrication of the chain hook

Lubricate the anti-friction bearings of the chain hook after approximately 20,000 lifting cycles or at least once a year.

8.3.1 Types of chain hook lubricant

The following lubricants are recommended for lubrication of the chain hook.

Supplier	Lubricant
Fuchs	Renolit Duraplex EP2, EP3
Fuchs	Lagermeister LX EP2

8.4 Changing the gear oil

The gearbox is filled with the correct amount of oil at manufacture. Under normal circumstances, it is a lifetime lubrication and should not need changing.

The gear oil must be replaced in the following situations:

- During overhaul of the hoist
- If visible oil leakages are noticed
- If excessive breathing out is noticed at the air vent
- After each opening of the gearbox (not recommended)

Warning! Take extreme care when draining the oil - it will be extremely hot if the hoist has been used recently.

To change the gear oil, remove the oil draining screw on the bottom of the hoist and the oil filling screw on the side of the hoist as necessary.

Oil specification: Mineral oil; viscosity 220 mm^2/s at 40°C.

Amount of oil to be used: **350 ml**

The following gear oils are recommended for use with the hoist.

Supplier	Oil type
Fuchs	Renolin CLP 220
Fuchs	Geralin SF 220
Castrol	Alpha Zn 200
ESSO	EP 220
Mobil	Mobil gear 630
Shell	Omala 220
ELF	Reductelf SP 220
BP	XP 220 BP Energol GR
Exxon Mobil©	Mobilux EP2

9. Service & End of Life

In the event of a product being considered beyond economic repair it must be disposed of with care and in line with local legislation on disposal of Waste Electrical and Electronic Equipment (WEEE).

In Europe WEEE shall be disposed of in accordance with European Union Directive 2012/19/EU.

In most regions of the world, similar legislation exists to ensure that WEEE is handled separately to maximize reuse of materials and avoidance of landfill.

The parts must be disposed in accordance with the local laws of environment protection. Metals, rubber, plastics must be disposed or recycled separately.

10. Product specifications

Feature	Specification
Power supply	208V / 400V nominal - must match connected Apex Drive
Motor	3-phase induction motor, 50-60 Hz, standard CE marked Thermistor temperature sensing PT100 device
Connections	Multi-functional Harting connector
Controller	Apex Drive / Apex Drive v2 / Apex Drive v2 NAV
Limit switches	Four individually adjustable switches
Load cell	Integrated SIL3 load cell
Dimensions (H x W x L)	339 mm x 317 mm x 639 mm (13.3 in x 12.5 in x 25.1 in)
Weight (excluding chain)	80 kg (176.4 lbs)
Chain weight	1.1 kg/m
Chain size	7.2 x 21 mm
Entertainment Load Limit (ELL)	500 kg (1100 lbs)
Max lift speed	500 mm/s
Reeving options	Single-reeve only
Ingress Protection	IP55 (protected from low water jets from any direction; limited ingress protection)
Operational temperature	5°C and 40°C (41°F and 104°F)
Storage temperature	-20°C and 80°C (-4°F and 175°F)
Max noise level during lifting	78 dB
Max noise level during lowering	79-80 dB
Accessories supplied	Chain bag and support, BGV C1 approved Load chain (black finish), length specified on order Hook block, with latch lock mechanism Lift limiter

10.1 Product dimensions

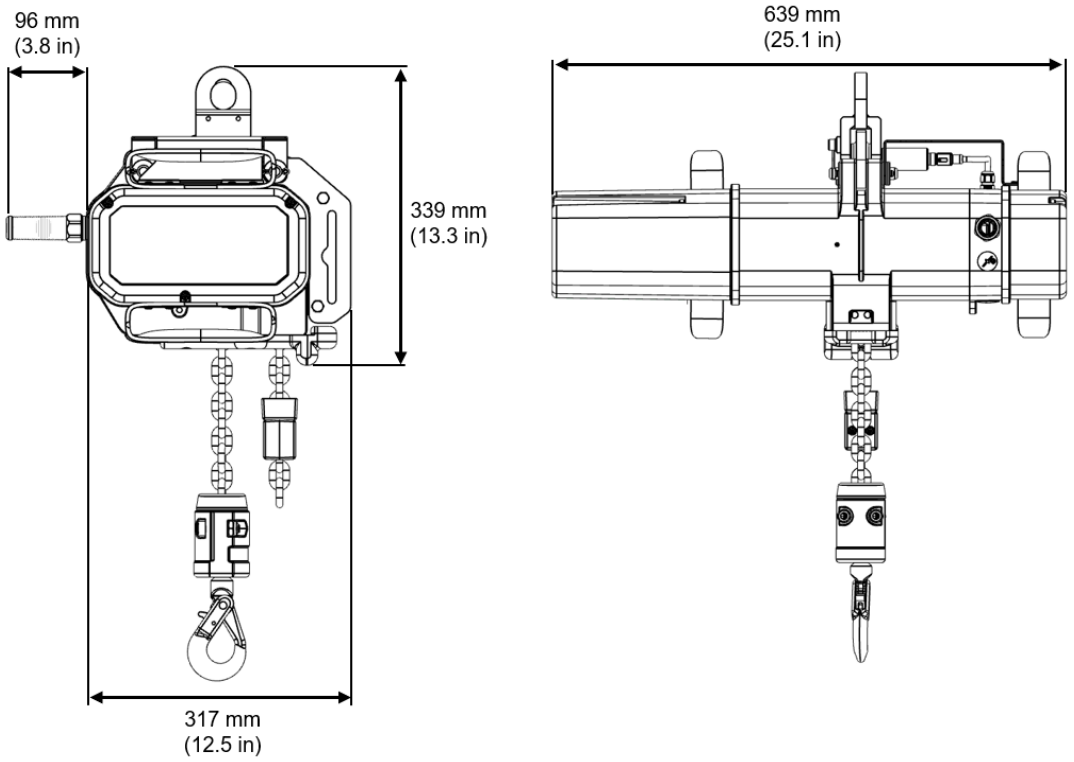

Figure 28. Product dimensions

10.2 Packaging

Where possible, use the original packaging to transport the Apex Hoist 500. The unit can be delivered in either a purpose built flight case of dimensions 786 mm x 596 mm x 584 mm and weight 38.4 kg, or a cardboard carton of dimensions 790 mm x 420 mm x 400 mm.

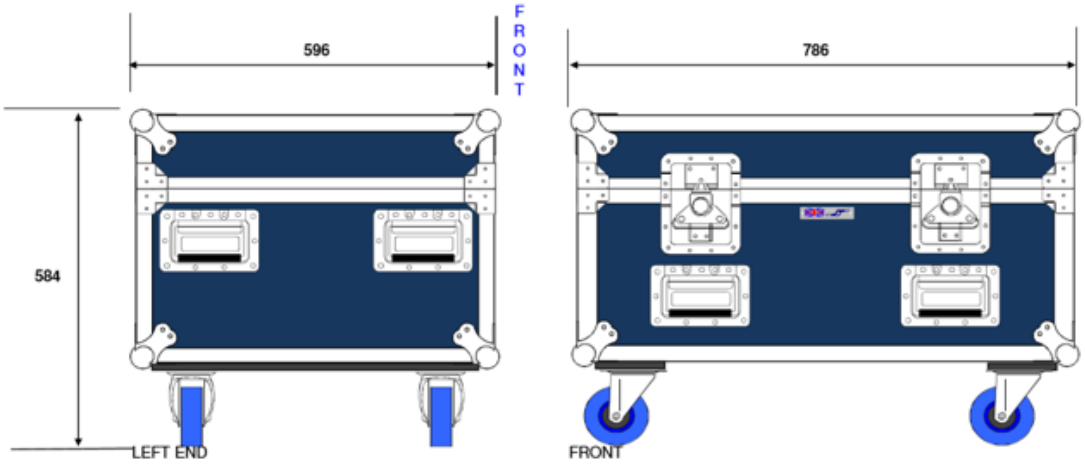

Figure 29. Flight case dimensions

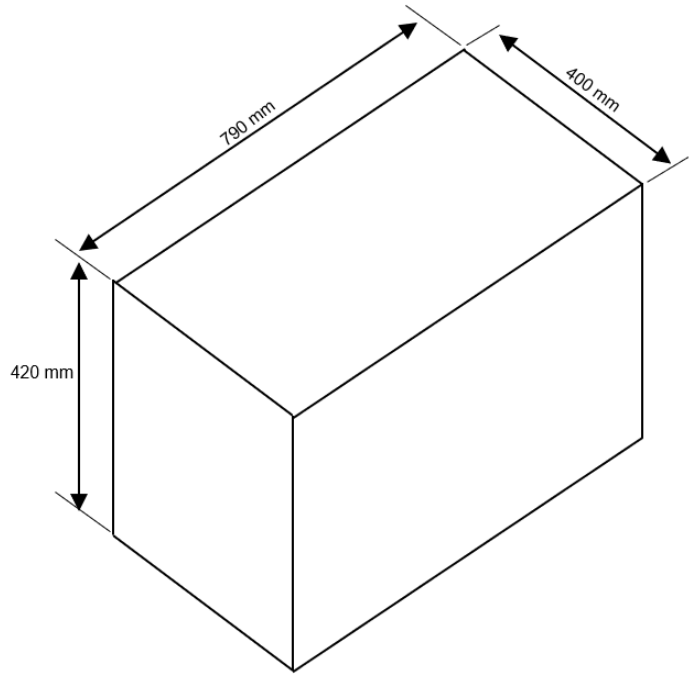

Figure 30. Cardboard carton dimensions

11. Declaration of Conformity

ORIGINAL

EC Declaration of Conformity

Manufacturer:	Kinesys Projects Limited
of the address:	Unit 2 Kempton Gate, Oldfield Road, Hampton, Middlesex, TW12 2AF, UK
in accordance with the following EC directives:	**Machinery Directive 2014/30/EU** **EMC Directive 2006/42/EC**
declares that the product:	**Kinesys Apex Hoist 500 Servo** (when used in conjunction with Kinesys Apex Drive APM-x3-0xxx, APM-x4-0xxx, or APM-x4-1xxx)
with part number:	**ACH-42-1050**

is in conformity with the applicable requirements of the following harmonised standards:

EN ISO 12100	**Safety of machinery. General principles for design. Risk assessment and risk reduction.**
EN 60204-32	**Safety of machinery. Electrical equipment of machines. Requirements for hoisting machines.**
EN 14492-2	**Cranes. Power driven winches and hoists. Power driven hoists**
EN 17206-1	**Entertainment technology – Machinery for stages and other production areas – Safety requirements and inspections**
EN 818-7	**Short link chain for lifting purposes. Safety. Fine tolerance hoist chain, Grade T (Types T, DAT and DT)**

and the following standards and technical specifications:

FEM 9.511	**Rules for the design of series lifting equipment. Classification of mechanisms**
FEM 9.751	**Power driven series hoist mechanisms, Safety**

The manufacturer hereby declares that the products named above have been designed to comply with the relevant sections of the above referenced standards. The units comply with all applicable essential requirements of the directives.

In the EU the party authorised to compile the technical file is:
TAIT Netherlands B.V.
Weesperplein 4a, 1018 XA Amsterdam, The Netherlands
In the UK the party authorised to compile the technical file is:
Kinesys Projects Ltd.
Unit 2 Kempton Gate, Oldfield Road, Hampton,
Middlesex, TW12 2AF, UK

Equipment referred to in this Declaration of Conformity was first manufactured in 2020.

D Weatherhead

D Weatherhead
Managing Director
Hampton, November 2024

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request and are also contained in the product manuals.

Kinesys Projects Ltd.
TAIT Technologies UK Ltd.
Unit 5 Langthwaite Road, Langthwaite Grange Ind Estate, South Kirkby, Pontefract, West Yorkshire, UK, WF9 3AP
Registered in England and Wales No. 02962782 +44 2082 086000 taittowers.com

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