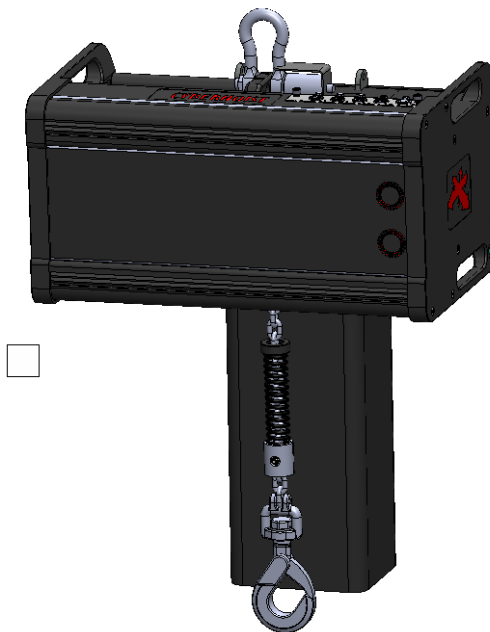


USER MANUAL

XLNT Advanced Technologies

XLNT CyberHoist II™

CH 528



Declaration of Conformity



Manufacturer's name:

XLNT Advanced Technologies BV

Address:
Proostwetering 50
3543 AH Utrecht
The Netherlands

Declares that the products CyberHoist II™ and C-Hoist™:

Type codes:

CyberHoist II™: CH-528

Complies with the following EC Directives:

- Machine Directives 2006/95/63/EC and 2006/42/EC
- "EMC" Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

Applied harmonized standards, in particular:

- EN/ISO 12100-2 Safety of machinery general design principals
- EN/ISO 14121-1 Safety of machinery risk assessment
- EN 14492-2 Power driven winches & hoists
- EN 60204-1 Safety of electric equipment of machines general
- EN60204-32 Safety of electric equipment of hoisting machines
- EN 60947 part 4 and 5 Low-voltage switchgear
- EN 61131 part 1 and 2 Programmable controllers
- EN 61508 part 1 to 7 Functional safety of EEPs systems
- EN 61000-6 part 2 and 4 Electromagnetic compatibility EMC
- EN13849 part 1 and 2 Safety of machinery related to control systems
- EN61800-5-1 and EN61800-5-2 drives
- EN 818 - Chain Quality, choice criteria and technical requirements
- EN 1677-3 Self locking lifting hooks for hoists

Technical standards and specifications complied with, in particular:

- DIN 56950 - 2011 Machines for Entertainment applications
- EN 60034-1 Rotating electrical machines
- FEM 9511 Classification of mechanisms
- FEM 9.755 - operating periods for serial built lifting mechanisms (S.W.P.)
- FEM 9683 Lifting motors
- FEM 9.751 - Motorized lifting mechanisms: safety
- BGV-C1, former VBG-70

Dated: 25-10-2014

M.A. van der Wel

Contents

Declaration of Conformity	2
XLNT Advanced Technologies BV	2
Read this first!	6
Preface	
About this manual	
References	12
Chapter 1: Introduction.....	13
1.1 About the XLNT CyberHoist II™	13
1.2 Lifting applications	13
1.2.1 Overhead lifting.....	13
1.2.2 Lifting persons and performer flying.....	13
1.2.3 Outdoor use.....	14
1.2.4 Mounting position	14
1.3 Operating.....	15
1.4 Schematic system over view.....	16
Chapter 2: Technical description	17
2.1 Mechanical concept	17
2.2 Brakes	18
2.2.1 Maintenance	19
2.3 Chain	19
2.3.1 Chain specifications	20
2.3.1.1 Measuring wear on the chain	21
2.4 Hook	23
2.4.1 Hook specifications	24
2.4.1.1 Measuring wear on the Hook	24
Chapter 3: Functioning.....	25
Chapter 4: Safety.....	27
4.1 Risk assessment	27
4.2 Outdoor use	27
4.3 Lifting persons and flying performers.....	27
4.4 Risks due to the scenic movements	28
4.5 Power down when not in use	28
4.6 Risk due to dynamic effects.....	28
Chapter 5: Storage, transport and reception.....	29
5.1 General handling.....	29
5.2 Storage	29
5.3 Transport.....	29
5.4 Reception.....	29
5.5 Included items.....	29
Chapter 6: Installation and dismantling.....	30
6.1 Mounting:	30
6.2 Powering up the system.....	31
6.3 Procedure for un-mounting.....	33

6.4 Manual operations with pickle	33
Chapter 7: Operating Conditions	34
Chapter 8: Maintenance and inspection	35
8.1 Prior to each use	35
8.2 After frequent use or use under special circumstances	35
8.3 During long periods of use	36
8.4 Periodical inspection	36
8.5 Safe working period	38
8.6 Long term storage	38
Chapter 9: Decommissioning	39
Chapter 10: List of hazards	43
Contact Information	44
Figure 1 Mounting positions	14
Figure 2 Typical set-up of an XLNT CyberMotion™ touring set with Performance console	15
Figure 3 Assemblies	17
Figure 4 Brake	18
Figure 5 Brakes	18
Figure 6	
Figure 7 Measuring wear on the chain	21
Figure 8 Chain	
Figure 9 Fixing the hook in three steps	25
Figure 10 Object	26
Figure 11 Connectors	31
Figure 12 Adjustment nuts	37
Table 1 XLNT CyberHoist II™ versions: loading, speeds and classifications	13
Table 2 XLNT C-Hoist™ versions: loading, speeds and classifications.	Fout! Bladwijzer niet gedefinieerd.
Table 3 Chain specifications	20
Table 4 Hook specifications	24
Table 5 Points of inspection	36

GENERAL

Copyright

XLNT Advanced Technology BV Reserves All Rights - 2014

Modifications

Information and specifications in this document are subject to change without notice. XLNT Advanced Technology BV assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

Trademarks

XLNT Advanced Technology BV and CyberMotion™ system logo's are registered trademarks of XLNT Advanced Technology BV and are defined as:

MotionCue3D™ - operating console

CyberHoist II™ - chain hoist

C-Winch™ - rope winch

C-Trolley™ & C-Track™ - track and trolley system

C-Power™ - power distribution system

All other brand names and product names used in this book are trademarks, registered trademarks, or trade names of their corresponding holders.

EMC Information

This equipment has been tested and found to comply with "EMC" Directive 2004/108/EC. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

Product Modification Warning

XLNT CyberMotion™ system products are designed and manufactured to meet International safety regulations. Product modifications of any kind could affect safety seriously and may cause non-compliance to relevant safety standards. XLNT Advanced Technologies cannot be held responsible for any product modification made others without XLNT Advanced Technologies written permission.

Third Party Acknowledgements

- EtherCON is a registered product of Neutrik AG, Liechtenstein, see www.neutrik.com
-

Warranty Information

Unless otherwise stated, XLNT CyberMotion™ system products are covered by a one year warranty against hidden defects and / or design failures. The warranty covers free replacement of defected parts in our workshop at Utrecht – Holland. Warranty doesn't cover cost of transportation back and forth, unless communicated otherwards.

Warranty period commences on the date of product shipment.

When returning a product for repair under suspected Warranty, is necessary to obtain a Return Material Authorization (RMA) number from XLNT Advanced Technologies service desk. It is up to XLNT Advanced Technologies as to whether or not the unit is covered by warranty. Any product returned to XLNT Advanced Technologies shall be packaged in a suitable manner, with RMA identification and send free of charge to XLNT Advanced Technologies – Proostwetering 50 - Utrecht – The Netherlands.

Sender should insure the shipment at his cost. XLNT Advanced Technology cannot be held liable for any freight damage claims. All shipping cost are to be borne by the sender Under no circumstances will freight collect shipments be accepted



Repair or replacement as provided under Warranty, is the exclusive remedy for the owner of the product. XLNT Advanced Technologies makes no Warranties, express or implied, with respect to any product and XLNT Advanced Technologies specifically disclaims any Warranty of merchantability or fitness for a particular purpose.

XLNT Advanced Technologies shall not be liable for any direct or indirect or consequential damage, lost turnover or profits, sustained or incurred in relation with any of its products or caused by its product defects or the partial or total failure of any of its product regardless of the form, circumstances of action. XLNT Advanced Technologies shall not be liable whether in contract, tort, negligence, strict liability or otherwise and whether or not such damage was foreseen or unforeseen.

Warning signs and notes

The following type of message functions are distinguishable as a tip or reminder:

NOTE:

Points of Attention



TIP:

Valuable advises of us



**WARNING!**

Issues with potential danger or damage

**DANGER!**

Safety related issues with eventual severe consequences

Read this first!

It is extremely important to read ALL safety information and instructions provided in this manual and any accompanying documentation before installing and operating the products described herein.

- Read *Chapter 4: Safety* before planning and rigging a show, it contains specific guidance for safe installing and use of XLNT CyberHoist II™ (also referred to as the “hoist” or the “apparatus”).
- XLNT CyberHoist II™ are only to be installed and operated by competent persons. For competence requirements, see Preface.
- XLNT Cyberhoist II™ shall be used in conjunction with C-Power power infrastructure only, this to ensure system safety at SIL3 level.
- Read all cautions and warnings before installation and use of this product.
- Keep this instruction manual for future reference
- This unit contains user and strictly non user serviceable parts.
- Do not open the hoist. Doing so will void warranty and might present a risk, including injury and/or death. Servicing must be performed by personnel qualified by the manufacturer only. Servicing is required when the apparatus has been damaged in any way, such as: power supply cord or plug damage, power outage or short circuit, if liquid has been spilled or has fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, has been dropped, or when it is due for periodic inspection and/or servicing.
- This unit is designed for indoor use only. Do not use this unit outdoors or in a wet or damp environment or near water.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that produce heat.
- This unit is not designed for residential use.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- XLNT CyberHoist II™ must not be used under ambient temperature conditions below +5 and + °40 C.
- Do not defeat the safety purpose of the polarized or grounding-type plug. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cable from being walked on, dented, punctured, pinched or damaged in any other way, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. If damaged in any way, replace the power cable.
- Unplug this apparatus during lightning storms or when unused for extended periods of time.

Disclaimer

All rights reserved. Although the information in this manual has been compiled with care, individual units or parts of it may vary in size, ratings and functionality from what is included in this manual. XLNT disclaims any liability for damage, losses or other consequences suffered or incurred in connection with the use of the hoists and the measurements, data or information contained in this manual. XLNT may change this product without prior notice.

**WARNING!**

All types of XLNT CyberHoist II™ contain electrical parts that work with 3-phase up to 750v DC; only qualified service personnel is allowed to open this device; severe injury or even death may occur when handled incorrectly

Preface

About this manual

The aim of this user manual is to instruct the XLNT CyberMotion™ product user in setting up, programming, editing and running a Show with use of the XLNT Cyberhoist™ II. Background information is given with respect to applicable codes and standards as well as recommendation's in terms of installation and utilisation of XLNT Cyberhoist™ II actuators and XLNT MotionCue3D™ operating system.

For installing and mounting individual XLNT Cyberhoist™ II actuators, we refer to the corresponding XLNT Cyberhoist™ II actuator User Manual. This manual is not intended to be a free guide to service or repairs by non authorized individuals. Only authorized XLNT service technicians are allowed to service or repair XLNT Cyberhoist™ II actuators.

For operating the XLNT CyberHoist II™, setting up and programming of a show etc., we refer to the "XLNT Advanced Technologies: MotionCue3D User Manual".



NOTE:

The user should thoroughly read this manual and familiarize himself with all safety information and instructions provided. He also should read the manual of the MotionCue3D™ operating desk and familiarize himself with all specific safety aspects noted. Moreover the user should also take good notice of complementary safety issues that may come across as a result of using / operating XLNT

The user should comply with local health and safety related codes and regulations regarding lifting, overhead lifting and overhead suspension.

If the user is of the impression that this manual has left questions unanswered or if directions provided within this manual are unclear, the user must consult his local dealer or XLNT Advanced Technologies directly. Safe and correct usage of all XLNT CyberMotion™ products is the sole responsibility of the user. XLNT Advanced Technologies disclaims liability for any damage or loss (or any other consequences) resulting from human errors while using its products. This manual must be kept for future reference.

Competence requirements of the user

XLNT CyberMotion™ products shall only be installed and operated by competent persons. Proven competence is achieved only after successful completion of the dedicated MotionCue3D™ operating system training provided at XLNT training facility and given by an XLNT trainer.

The level of competence depends on the level of training the trainee participated in and is certified and registered for.

Training is compulsory as to manufacturer's instruction in order to provide proof of system understanding and proper fulfilment of all first level programming and operating actions.

This manual is not intended for service or repair of XLNT CyberHoist II™ or XLNT C-Hoist™; only authorized XLNT service mechanics are allowed to service or repair XLNT CyberHoist II™. The opening or repair of the hoists by non-authorized persons may pose a risk, including but not limited to damage to the apparatus, self or others, injury and even death.

XLNT Advanced Technologies disclaims any liability for damage, losses or other consequences suffered or incurred in connection to the use of XLNT CyberHoist II™ .



WARNING!

With respect to the above, it is the system owner's responsibility to see to it that users of his CyberMotion™ system are certified by XLNT. It is the owners obligation to prevent any kind of use by non certified individuals.

XLNT cannot be held responsible for any incident or damage whatsoever directly or indirectly caused by a non certified persons actions.

Rigging planning

International health and safety codes require a proper 'lifting plan' when lifting loads with more than one device. This is the case when using two or more CyberMotion actuators to make 'scenic movements' with any kind of objects, truss constructions etc. This plan must specify, loads per suspension point, calculations and measurements regarding the object gravity point, loads of added constructions to be lifted, loads on lifting means and loads on the supporting construction, both static as well as dynamic . The intended (choreographic) ways of movement must be outlined (special positions, order, and speed) in order to calculate all these loads. Moreover, a proper Risk Assessment and Evaluation must be made with conclusions towards actions to be taken.

Slinging methods on truss and construction beams, and mounting of electric chain hoists in general are essential elements. The optimum object behavior is very much related to the precision that is given to the XLNT CyberMotion™ actuators mounting position towards the points of attachment on the object.

Safety concerning scenic movements of loads during shows, lifting objects in low light conditions and the ability to deal effectively with external disruptions to the show environment, for example: work-pressure and persons moving around and below the load.

Installation of electrical equipment such as network switches, computers, power-supplies and power-supply systems.

Applicable codes

For applicable codes and standards see CE declaration of conformity on the first page of this manual.

Other documentation

For further information and instructions on operating and control of XLNT CyberMotion™ actuators we refer to the corresponding XLNT Advanced Technologies manuals for actuators and power distribution systems.

Used symbols and typographical signs

For numbering instructions, this manual uses a digit followed by a brace. Each paragraph starts a new sequencing.

Competence requirements of the user

XLNT CyberHoist II™ must only be installed and operated by competent persons. Competent persons must have proven skill sets that include, but are not limited to, the following subjects:

Operating training, compulsory as to manufacturer's instruction, to provide proof of system understanding and proper fulfillment of all first-level programming and operating actions.

Rigging planning - International Health and Safety laws require a proper 'lifting plan' when lifting loads with more than one device, see list with references below. This is the case when using two or more hoists to make 'scenic movements' with all kind of loads, truss constructions etc. In this plan calculations or measurements must be elaborated regarding the loads and constructions to be lifted, loads on lifting means and loads on the supporting construction, both static as well as dynamic. The intended (choreographic) ways of movement must be outlined (special positions, order, speed) in order to calculate all these loads.

Moreover, a proper Risk Assessment and Evaluation must be made.

Slinging methods on truss and construction beams, and mounting of electric chain hoists in general. The proper functioning of the XLNT CyberHoist II™ system stands or falls with the precision with which the hoists are mounted: this should exactly match the CAD file that is generated for the show.

Safety concerning scenic movements of loads during shows, lifting objects in low light conditions and the ability to deal effectively with external disruptions to the show environment, like work-pressure and persons moving around and below the load.

Installation of electrical equipment like network switches, computers, power-supplies and power-supply systems.

Other documentation

For information and instructions on operating and control of XLNT CyberHoist II™ we refer to the "XLNT Advanced Technologies: MotionCue3D User Manual". For information and instruction on servicing CHII we refer to the manual: "XLNT Advanced Technologies: XLNT CyberHoist II™ Service Manual".

References

XLNT CyberHoist II™ are registered products of XLNT Advanced Technologies.

XLNT MotionCue3D is a registered product of XLNT Advanced Technologies.

XLNT DataMotion Ethernet switches are registered products of XLNT Advanced Technologies.

XLNT C-Power power distro is a registered product of XLNT Advanced Technologies.

EtherCon is a registered product of Neutrik AG, Liechtenstein, see www.neutrik.com

Harting is a registered product of the Harting Technology Group, see www.harting.com

Chapter 1: Introduction

1.1 About the XLNT CyberHoist II™

XLNT CyberHoist II™ are electrical chain hoists, designed for the entertainment industry. XLNT CyberHoist II™ can be grouped to lift individual objects, and to perform 'scenic movements' during a show. These objects can be trusses or truss constructions that carry luminaries, pieces of scenery, video equipment etc. The way hoists are operated is largely dictated by the 'design' and 'directions' given by one or more 'artistic persons' in a 'show', be that theatre, pop concerts, events, etc.

The XLNT CyberHoist II™ range consists of two capacities. The integrated drive is multi voltage and ready to be connected to any three-phase power supply between 200 and 440 V +/- 10% at 50 or 60Hz. The hoists are provided with a load sensor shaft for under and overload detection. Brakes are equipped with air gap detection.

CyberHoist II™ TYPE	Capacity kg / lbs		FEM class	Liftingspeed m/min	Liftingspeed m/min	Fall	Chain size mm/inch	AC Motor kW/hp	Duty factor %	Main dimensions lenght x width x height mm/inch			Weight kg/lbs	Chain p/m kg/lbs
CH 528	500	1012	2m	0-28	0-92	1	7x21/0.28x0.83	3/4	60	636/25	367/14.4	330/13	96/201*	1,1/2.2
*May be subject to change														

Table 1: XLNT CyberHoist II™ versions: loading, speeds and classifications

Duty factor in % = (time Up + time Down / time Up + rest + time Down + rest) x 100%

1.2 Lifting applications

In other industries, lifting overhead or in the direct vicinity of persons, is not allowed or strongly discouraged. In the entertainment industry however, one cannot imagine any show without luminaries, video projectors or sound cabinets lifted above people. This equipment is generally lifted with the use of aluminum truss and electric chain hoists, hanging immobile, without power or control present to avoid possible hazards. This is also known as 'overhead suspension'.

Sometimes the design of the show requires moving objects, some moving box trusses with luminaries, or just a backdrop truss that needs to move up and down for change-over's. This is where the XLNT CyberHoist II™ comes in...! Some remarks considering the design and intended use of XLNT CyberHoist II™ are necessary however:

1.2.1 Overhead lifting

XLNT CyberHoist II™ versions (see table 1) are designed in line with CE Machine Directives for twice the SWL load indicated on the hoist. This complies with EU standards and code of practices allowing lifting overhead or in the direct vicinity of persons, be that personnel, performers or public. Possible hazards that come with these lifting applications are addressed in Chapter 4: Safety. We strongly advise the user to read that Chapter thoroughly.

1.2.2 Lifting persons and performer flying

XLNT CyberHoist II™ have an overall design safety factor of at least eight (8). Thus the system thus complies with all major accepted standards for the use of lifting people and Performer Flying ('moving performers for an artistic performance'), although that use has not been included in the scope of the European Machine Directive.

As this and other applications of our products are the sole responsibility of the user, the manufacturer strongly recommends only doing this with extensive knowledge about and experience in lifting people and Performer Flying.

Since individual situations in the use of equipment for lifting people and Performer Flying cannot be foreseen by the manufacturer, only the user can and will be responsible for any of these applications.

Our products may only be used first and foremost in accordance to any local and/or applicable law and secondarily as intended by the manufacturer and as described in this user manual. **The manufacturer cannot be held liable** in any way for the type of usage chosen and applied by the user.

If the user has any question about the intended use, they have the responsibility to consult the manufacturer before use.

Please also see additional user guidance in Chapter 4: Safety.

1.2.3 Outdoor use

XLNT CyberHoist II™ are not intended for unprotected outdoor use. However, the manufacturer recognizes the market's wish to use XLNT CyberHoist II™ in outdoor stages, commonly used by touring bands, at pop-festivals etc. The manufacturer discourages the use of XLNT CyberHoist II™ in these and other unprotected outdoor situations, but some information and guidance is given in Chapter 4: Safety, with which the user can make his own plan how to use the XLNT CyberHoist II™ in the safest possible way.

Since individual outdoor situations are impossible to foresee by the manufacturer, in any way for electrical or mechanical malfunctioning or breakdown, nor for the consequences thereof including, but not limited to, severe injury or death as a result of such use.

1.2.4 Mounting position

XLNT CyberHoist II™ are versatile devices that could be positioned with motor up as well as with motor down (optional). However, for XLNT CyberHoist II™, we only recommend the use of inverted position (motor down), up to half speed. In all cases see to it that the chain bag is properly positioned and chain flow not disturbed.



Figure 1: Mounting positions



WARNING!

To use XLNT Cyberhoist II™ in Inverted Position the optional available external chain guide needs to be fitted on the upper corner above the chain bag. This is required to assure a proper chain flow in to chain bag. Without this guide the chain may drop aside of the bag which may have severe consequences in terms of damage of equipment or even people underneath.

1.3 Operating

XLNT CyberHoist II™ are multi-voltage and shall be powered via CyberMotion™ C-Power™ distro and infra structure to 3-phase power supply within the range of between 200 and 440 V +/- 10% at 50 or 60Hz at Ambient temperature: +5 up to +40°C.

When during transport or storage the equipment has been subject to lower temperatures than +5°C, it is recommended to allow the equipment to acclimatize before to putting it in service.



WARNING!

Use of C-Power™ distro and corresponding infrastructure is compulsory to provide system safety at SIL3 level. XLNT™ cannot be liable for any E-Stop failures or other consequences whenever alternative power arrangements have been used instead.

In order to operate a XLNT CyberHoist II™ it is necessary to connect one of the MotionCue3D operating platforms: MotionCue3D performance desk, with the Ethernet port of the first hoist which will act as the master. Additional hoists are to be connected either in daisy chain using the Real-time Ethernet ports, or in-star via an additional switch. For further details see the manual of the operating system.

Moreover, for set-up and service purposes, XLNT CyberHoist II™ could be operated as a standalone using the dedicated handheld button box.

For further operating details see the MotionCue3D users manual.

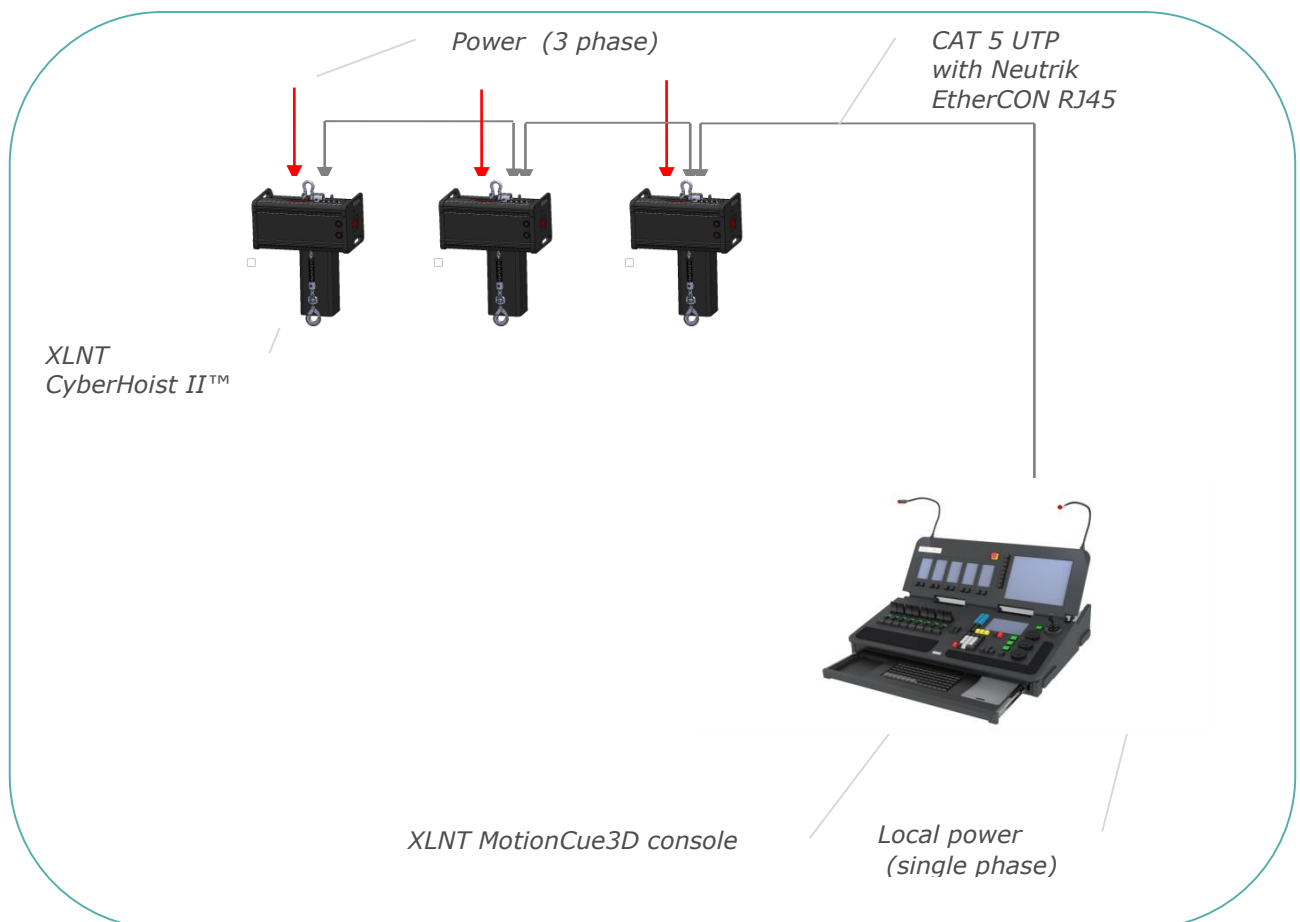


Figure 2: Typical set-up of an XLNT CyberMotion™ touring set with Performance console

1.4 Schematic system over view

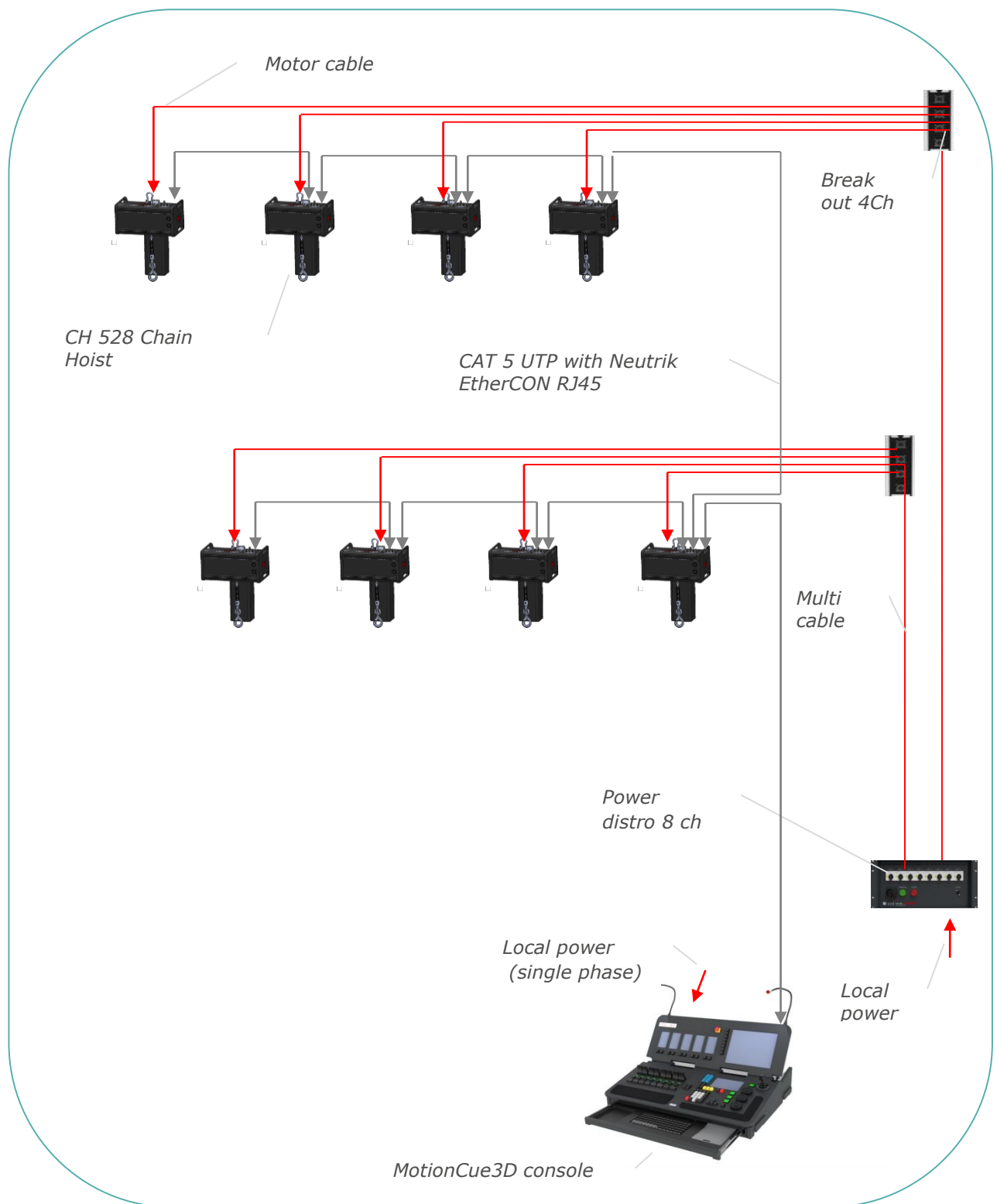


Figure 3: Typical set-up of an XLNT CyberMotion™ touring set with Performance console

Chapter 2: Technical description

2.1 Mechanical concept

The technical concept of both XLNT CyberHoist II™ are alike and following assemblies could be identified as per Figure 3 below.

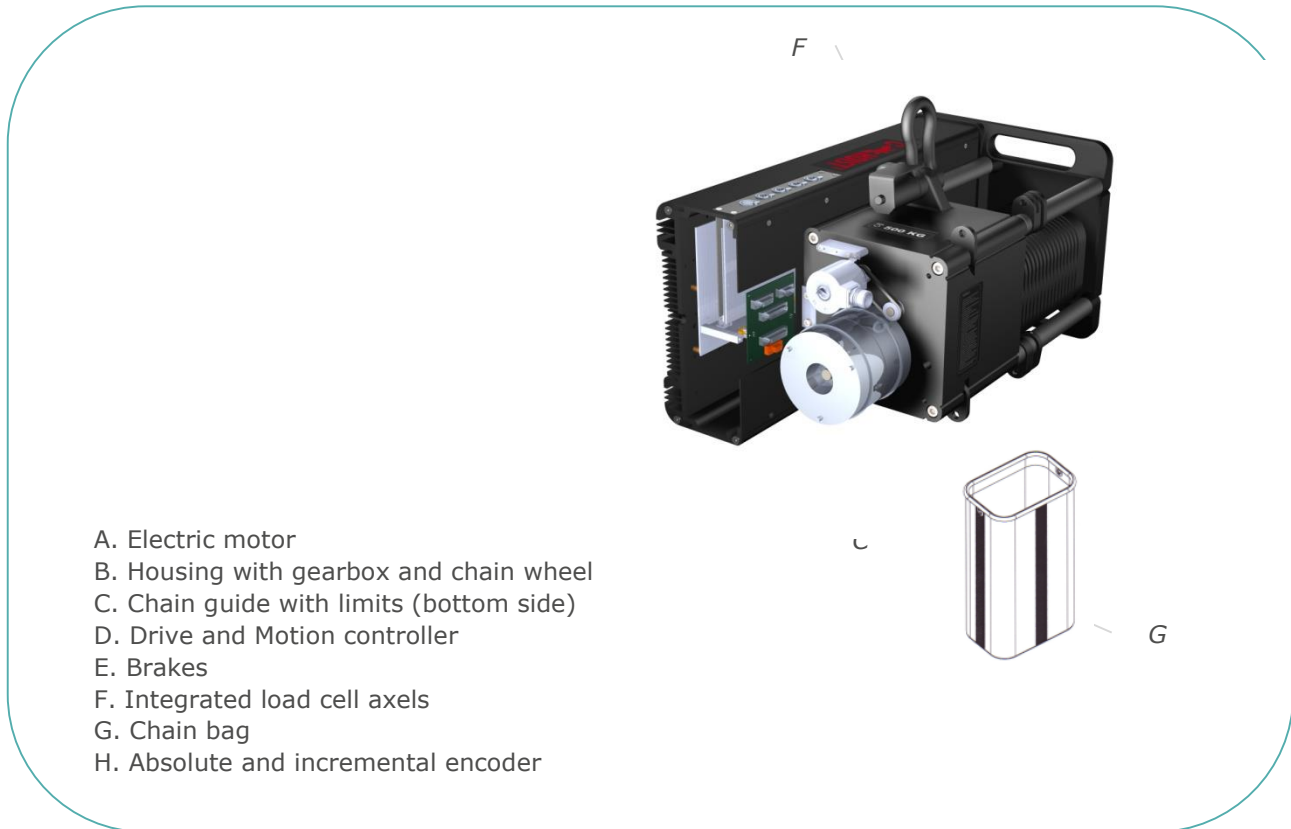


Figure 4: Assemblies

NOTE:

The hoist parameters are stored on a memory chip card that is part of the hoist body. Whenever the drive (D) has to be replaced the data is automatically loaded in to the new drive memory and tuned



WARNING!

Only qualified and trained technicians are allowed to dismantle and or replace parts or assemblies

!.

2.2 Brakes

In the XLNT CyberHoist II™ concept, braking is achieved through electronic speed regulation from and to through zero speed. Developed braking energy during speed reduction, is fed back in to the power network using regenerative power management. Therefore the mechanical brakes are to be considered as holding brakes (brakes that do not implement friction work in regular operation but merely secure a position reached). In case of an emergency, however, it may also perform a braking function. In their standard design, brakes of FDD series are generally “holding brakes” with emergency-stop features

Operating time: 100%

Ambient temperature: -10 to +40°C

The electromagnetically released spring-pressure brakes of the FDD series are fail-safe brakes.

This means that the braking torque is generated by means of spring force in closed-loop operation and revoked by magnetic force.

During braking, through the axially movable armature disk (item 2), the incorporated pressure springs (item 4, Illustration 1) press the rotor (item 3) which is radial positively connected with the machine shaft against the counter-friction surface (intermediate flange (item 8), friction plate (item 7) or motor flange). The two-sided friction, between the linings of the rotor and the armature disk and/or the counter-friction surface, produces the braking torque.

During release, a magnetic force is produced through applying a direct voltage at the magnet body (item 1) via the field winding. This magnetic force draws the armature disk (item 2) to the magnetic body and the brake rotor is released.

Owing to design, braking and releasing operation take place in a technically separated manner with the two mechanically connected individual brakes (brake 1, brake 2, This is why braking operation is safeguarded even if one brake completely fails (redundant system).

During manual releasing, the armature disks are mechanically pulled against the magnet bodies by slewing the manual releasing brackets (item 5, with screwed-in manual releasing lever (item 5.1)) and thus the rotors are released. This enables you to release the brake, for example, even if there is a power failure.



Figure 5: Brakes

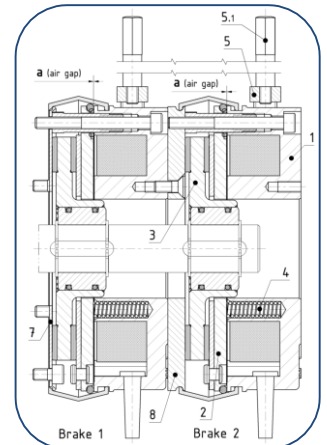


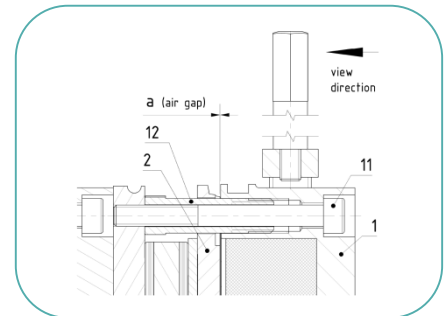
Figure 6: Brakes section

2.2.1 Maintenance

The spring-applied brake is nearly maintenance-free. However, when the maximum air gap (maximum: $0.4 + 0.15$ mm) is reached, a readjustment (new adjustment) of the air gap will be required for a safe functioning and operation of the brake. Keep the brake clean and dry and free of any contaminants such as dust, grease etc.

Readjusting the air gap:

- Viewing in direction of the brake (see illustration on right) loosen the three fastening screws (item 11) by turning them half a rotation counter-clockwise.
- Turn the hollow screws (item 12) into the magnet body by also turning them counter clockwise.
- Turn the fastening screws (item 11) (clockwise) into the (motor) flange until the nominal air gap (to be measured with feeling gauges 0.35mm) exists at three positions on the circumference.
- Reset the hollow screws (item 12), i.e. turn them out of the magnet body (clockwise) until a firm contact with the counter-friction surface is reached.
- Tighten the fastening screws (item 11) with the tightening torque 25 Nm.
- Subsequently control the air gap between housing (item 1) and armature disk (item 2), if necessary, carry out a readjustment



WARNING!

The brake should be tested after each air gap correction. See 8.4 Periodical inspection on how to proceed

2.3 Chain

The chain is the most essential and at the same time most vulnerable component of the hoist. It has been selected in accordance to its duty. Only use chains that are certified and fully compliant to the specifications below.

The lifetime and thus the safe working period of a chain depends on the maintenance discipline.

NOTE:

Keep the chain clean and slightly lubricated at all times.



NOTE:

The "slack fall chain stop" is a safety component, not a functional one. Keep sufficient distance between stop and hoist body at all times and avoid collision



WARNING!

The end of the chain is provided with a chain stopper, this is a safety component. The stop is fitted at about 60 cm from the chain end to lead the chain in to the chain bucket in a proper way. The chain end must be securely fitted on the chain end fitting located at the hoist body



2.3.1 Chain specifications

	CyberHoist II
	500 kg - 0.5 t
Lift chain	Standard
Size	7 x 21 mm
Class	DAT
Quality	RTS
Diameter (D)	7.0 +0.1/-0.3 mm
Pitch (t)	21.0 +0.3/-0.15 mm
Control length (11xt)	231.0 +0.7/-0.4 mm
Diameter (D2)	max. 7.5 mm
Maximum breaking stress	800 N/mm ²
Hardened surface	580 or 700 HV
Hardening depth	0.04 d +/- 0.01d
Breaking load	61,6 kN
Total breaking elongation	>10% min.
Hardened surface	500 - 650 HV 10
Nominal working load, 1 fall	1000 kg / 1 t
Maximum working stress	125 N/mm ²
Maximum working load at Fem 2m	980 kg
Surface harding thickness	0.28 to 0.07 mm
Standard	EN 818-7
Weight per meter	1.06 kg

Table 2: Chain specifications

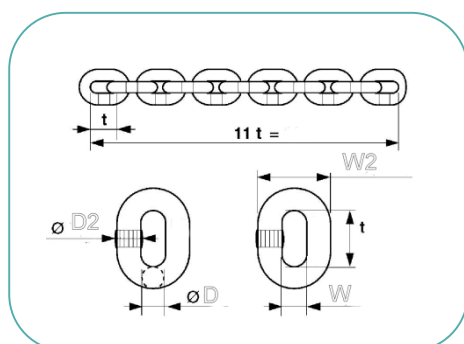


Figure 7: Chain specifications

2.3.1.1 Measuring wear on the chain

The chain must be replaced if the average wire diameter D has been reduced due to wear by more than 10% of the nominal thickness at some point on the chain link.

The average wire diameter $d_m = (d_1 + d_2):2 \leq 0.9d$, whereby the average wire diameter d_m is calculated from two individual values d_1 and d_2 measured rotated through 90° with respect to each other.

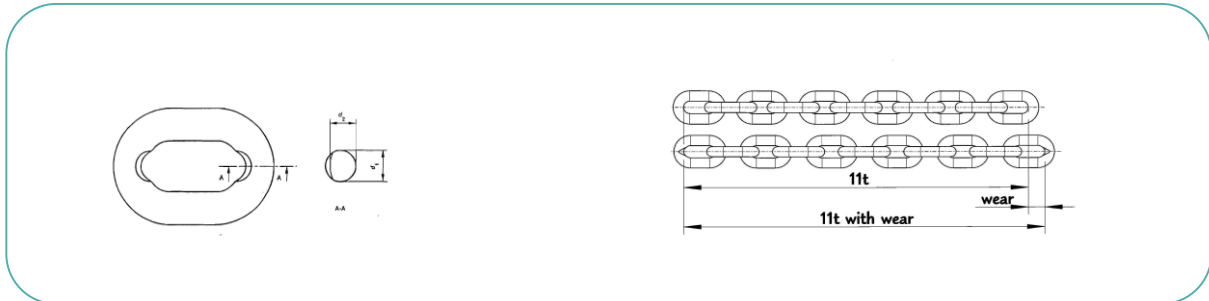


Figure 8: Measuring wear on the chain

The chain must be replaced if a single chain link is permanently expanded or if the inner pitch t of the individual link has increased in size by more than 5% as a result of wear. The chain must also be replaced if the inner pitch $11t$ has increased in size by more than 2% along a measuring section of 11 chain links.



NOTE:

As the information above shows, one should take into account that, although tolerances are still within the manufacturer's specification, elongation of the chain inherent to use may cause differences in chain length. As a consequence, system repetitive accuracy among two or more hoists may not be achievable under all circumstances. The effective difference in chain length is not necessarily proportional to the total chain length. Correction on excessive differences is limited, so contact the XLNT CyberMotion service centre in your area for possible options

2.3.1.2 Chain replacement

Whenever chain needs to be replaced, either due to damage, wear or incase a longer lift is required, it is essential to follow the replacement procedure as described hereunder.



NOTE:

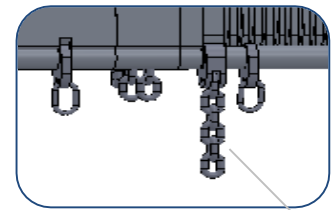
Chain of the Cyberhoist II hoist cannot be removed nor inserted manually with use of the yellow pickle.

For such operation the use of the operating console is a necessity.

Replacement procedures via the console require special authorization to open the Maintenance section in the Support mode of the software.

Removal preparations by authorized person only:

- Connect the hoist with the desk
- Position the hook at 1 meter from the hoist body
- Remove the hook (see section 2.4.1.2) and the compression spring
- Remove the chain bag and place it under the hoist
- Release the slack end of the chain from its fitting
- Remove the chain stopper and the spring
- Run the hoist carefully upwards at slow speed until the chain fully falls down in the bag. Avoid the chain to touch the work floor this to protect it against dust and dirt.



Slack chain end fitting



WARNING!

The replacement of a chain should be done by an authorized technician only. Besides the authorization to enter the Maintenance section, it also requires a special tool to enter the chain.

Entering chain without this tool may damage the internal chain guides with substantial repair costs as a consequence.

Fitting of a new chain by authorized person only:

- Prepare the new chain at correct length
- Position the special plastic chain insertion tool at the slack chain side of the hoist body and start the motion down at lowest possible speed until you feel the chain tool is taken by the chain wheel.
- Place the first link of the chain over hook at the end of the chain tool with the link weld to the outside.
- Follow the instructions on the display of the console
- Place the compression spring over the chain and mount the hook (see section 2.4.1.2)



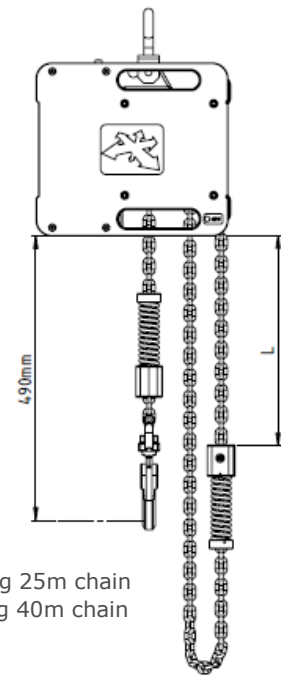
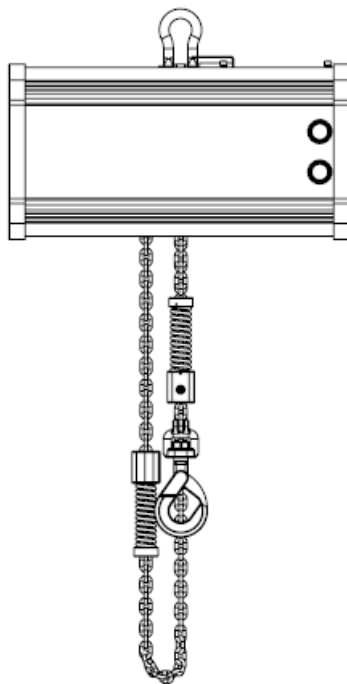
WARNING!

This action must be undertaken by an authorized and competent person only. The authorization includes access to the maintenance mode on the operating desk that will guide the person step by step through the procedure to follow.

- f. See to it that the locking pins are securely mounted
- g. Run the chain through the hoist following the instructions on the display
- h. Mount the chain stopper with its buffer spring at approx. 50 cm from the chain end
- i. Fit the slack chain end without any twists on the clamp at the hoist body and mount the chain bag.
- j. Continue to follow the instructions on the display
- k. When the procedure is completed, the hoist is ready for use.

NOTE:

Don't run the hoist when there is no chain inside as it will disturb the absolute encoder position in relation to the hook. Should this happen, contact the XLNT CyberMotion™ service centre in your area to reposition the encoder



L = 500 for small chain bag 25m chain
L = 720 for large chain bag 40m chain

2.4 Hook

The hook, a safety hook, has been selected in accordance to its duty and functionality. Never use hooks other than traceable, certified ones fully compliant to the specifications below.



NOTE:

Keep the hook clean and properly maintained at all times. For further instructions see Chapter 8: Maintenance and inspection

2.4.1 Hook specifications

	CyberHoist II	
	500 kg - 0,5 t	
Hook	Standard	
Type	XLBA1R	
Hook opening (c)	43.8 mm	
Thickness (d)	23 mm	
Width outside (g)	90,5 mm	
Width (e)	27,5 mm	
For chain	7 - 8 mm	
Maximum working stress	800 N/mm ²	
Breaking load	80 kN	
Total breaking elongation	16%	
Working load limit	2,000 kg / 2 t	
Minimum breaking stress	933 N/mm ²	
Maximum working load at FEM 1 bm	2,000 kg	
Standard	EN 1677-3	
Weight	1.5 kg	

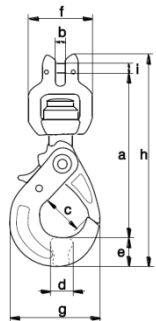


Table 3: Hook specifications

2.4.1.1 Measuring wear on the Hook

The hook must be replaced if the average width (e) has been reduced due to wear by more than 10% of the nominal thickness, or if the hook opening (c) has increased by more than 15 %.

The hook must be replaced if free and easy rotation of the hook towards the upper section is no longer possible.

2.4.1.2 Hook replacement - 1 fall hooks



WARNING!

This action must be undertaken by an authorized and competent person only.

- Connect the yellow pickle for manual operations, follow the procedure as described at section 6.4
- Lower the hook and remove the load if any
- Run the hoist until the hook is about 1meter from the hoist body
- Use a matching pin to drive both safety pins out and remove the load pin
- Position the new hook and enter the load pin (a), this pin fits in only one manner, related to the shape of the chain shackle. Never use force to enter the pin (b) !!
- Position and drive the two security pin's in position. Beware on one side the pin fits only in one manner, never use force to get it in (c).

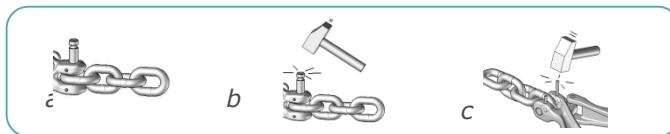


Figure 10: Fixing the hook in three steps

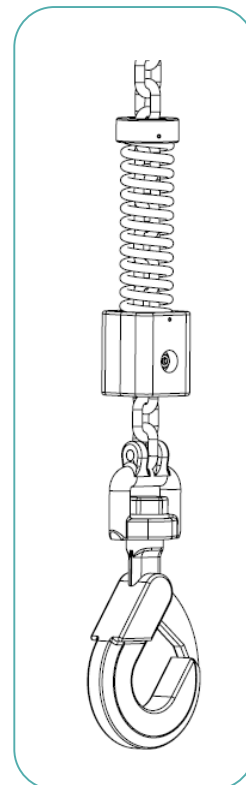


Figure 13: complete hook assembly

Chapter 3: Functioning

The purpose of a XLNT CyberHoist II™ system is to dynamically move objects in a predefined space.

The setting in which the system will normally be used is show related (e.g. concerts, theatre shows, television shows etc.) in spaces such as stadiums, theatres, outdoor venues etc.

An “object” can be any 3D construction, varying from, for example, a projection screen to a complete moving stage or platform. Object characteristics are only known to the user. Users can be but are not limited to rental companies, theatres etc. The manufacturer is unaware of form, mass and other characteristics of an object and cannot be held liable to any actions whatsoever related to the programming or construction of an object (or any other type of related activity).

In order to avoid accidents the operator must always clearly define that roll and pitch are to be excluded. If he doesn't, the system will validate such action whenever the operator mistakenly programs a roll or pitch.

Objects are moved by high-precision computer-controlled “intelligent” actuators such as XLNT CyberHoist II™. These actuators are “aware” of their role in the movement of an object through the use of a software model which runs inside each actuator. Also, they are “aware” of other actuators operating within the same object. Through the software model, objects are “aware” of their position in the predefined space.

Programming the movement of objects is realized through the use of dedicated software (MotionCue3D) in which the complete 3D movement of objects is programmed and commands are sent to the objects. The computers in the actuators receive the object's 3D commands and transform these to the necessary movement of the actuators.

An object can consist of multiple sub-objects which together form one large object e.g. the body of a bird (the object) with separate movable wings (the sub-objects). An actuator is only controlled directly during start-up, load-in/load-out and in case of maintenance. For these purposes a handheld operating tool is available that can be connected straight in to the drive unit.

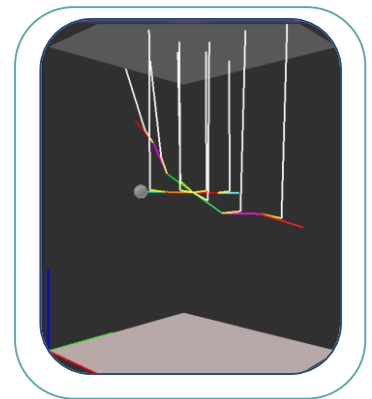


Figure 7 Object



WARNING!

Manual operations by means of the yellow pickle, must be undertaken by a competent person only.

In this mode, the system doesn't consider the relative Up/Down positions, the under load detection nor the synchronism among actuators. Pickle mode therefore should be used for individual hoist only.

Chapter 4: Safety

4.1 Risk assessment

The user must make a risk assessment, based on all plans drawn up for the particular show to establish actuators. The result of this assessment is the guideline for the selection of matching actuators and must reflect the manufacturer's specifications. Although other parties involved might focus on other topics, the user of the XLNT CyberHoist II™ must use his rigging plan as a basis for his part of the risk assessment. International standards as well as local laws and regulations must be compiled within the process of the risk assessment.

4.2 Outdoor use

As stated in *Chapter 1: Introduction*, the XLNT CyberHoist II™ are not intended for unprotected outdoor use. However, if the user decides to take the responsibility and accepts the consequences of outdoor use, the following information and directions may help to avoid malfunction.



NOTE:

This information and guidance is not extensive, and certainly not enough to have all risks covered. Unprotected outdoor use is the user's own responsibility and at the user's own risk, including any cause of events resulting from mechanical or electrical malfunctioning or breakdown of one or more XLNT CyberHoist II™ or a combination of equipment which includes one or more of these.

Heat radiation:

XLNT CyberHoist II™ and attached electronics produce heat that is radiated to the environment by means of its surface.



NOTE:

Do not block the natural air flow around the XLNT CyberHoist II™ and never put a protective (tight) cover around the hoist to protect it from rain etc. Never place heat sources like fan exhausts, heaters or luminaries etc. in the vicinity of a XLNT CyberHoist II™. The unit will overheat and shut itself down!

4.3 Lifting persons and flying performers

As stated in *1.2.2 Lifting persons and performer flying*, XLNT CyberHoist II™ are designed to use for lifting persons or flying performers. However the following information and directions may help to avoid unwanted incidents.



NOTE:

This information and guidance is not extensive, and certainly not enough to have all risks covered. Flying of persons or performer flying is completely the user's own responsibility and at his/her own risk.

As stated in *4.1 Risk assessment*, a risk assessment must be made for every event or show. When lifting persons or flying performers, special attention must be given to:

- risks related to the persons or performers being moved
- risks related to the equipment used to do so
- fall protection that might be used
- possibilities of evacuation of the persons or performers that are lifted or flown in case of emergency, malfunctioning of equipment etc.
- providing information about these persons or performers to emergency services, and possibly laying down a protocol with these services in case of emergency
- providing adequate means of communication with emergency instructions

4.4 Risks due to the scenic movements

Scenic movements generate extra hazards, e.g. during shows. This probably means they occur in low light situations, where the user's view is blocked by scenery or blinded by lights. The risk assessment must elaborate on how to deal with hazards that may arise in a particular show.

The user must have visual contact at all times with all objects. Continuous visual contact may be accomplished by the user alone, or with "spotting colleagues" at different corners of the stage, and by staying in contact with each other, possibly with an emergency stop or Dead Man's Handle in their hand. Infrared camera's can also help the user to maintain visual contact with the moving objects.

4.5 Power down when not in use

Only competent persons, such as those described in *1.3 Operating*, are permitted to operate XLNT CyberHoist II™. To prevent unauthorized operation, when not in use or in the operator's absence:

- the hoists must be "de-initialized" or be cut off from their power source.

4.6 Risk due to dynamic effects

Acceleration, deceleration, use of E-stop or Dead Man's Handle, manipulations that create a changeover of gravity point or swing etc. are all elements that may generate dynamics in the system. The structure above, from which actuators are suspended, usually trusses, may contribute to this phenomena due to their flexibility.

Particularly in cases of concentrated point load patterns as well as in cases of heavy loads, dynamic effects generated by multiple actuators should be taken in to account when evaluating the impact of all individual lifting points as well as the combined impact effects on the structure above.

Chapter 5: Storage, transport and reception

5.1 General handling

To avoid damage to the interior electronics, handle XLNT CyberHoist II™ with care and always travel flight cases on wheels. Never stack more than two flight cases with XLNT CyberHoist II™ on top of each other.



WARNING!

A full flight case weights up to 160 kg (320 lbs). It is therefore preferable to use a forklift to stack and un-stack the cases. In case you need to do this often, call in enough colleagues; pay attention to your body position while lifting and lowering (straight back, bend your knees etc.) to avoid serious injury to your back. Wear safety shoes to avoid injuring your feet by the flight case. Wear gloves to avoid injuries to your hands.

5.2 Storage

XLNT CyberHoist II™ can be stored in the cases supplied by the manufacturer. For regular storage and for transport the following conditions must be maintained:

- Temperature: between +5 to 40 °C / +41 to 104 °F.
- Humidity: between 10 - 70%, the environment may not be subject to condensation.
- Dust: as long as your XLNT CyberHoist II™ is properly packed in e.g. a flight case, there are no special conditions concerning dust. For long term storage, see *Chapter 8: Maintenance and inspection*.

5.3 Transport

Avoid transportation of XLNT CyberHoist II™ in other means in flight cases and positioned on it's wheels. The flight cases should preferably not being "tipped". It is advised to use original flight cases from your XLNT dealer.

For transport conditions, see *5.2 Storage*.

5.4 Reception

When receiving a newly purchased XLNT CyberHoist II™, the user must carry out the following, prior to first use:

Inspect the product on the exterior for possible damage caused during transportation. In case there is any damage, immediately contact your XLNT dealer.

Inspect the type label on the XLNT CyberHoist II™ for:

- Correct type of hoist
- If the adapted power supply fits in the range between 200 and 440 V +/- 10% at 50 or 60Hz

Register the following in your logbooks for every XLNT CyberHoist II™:

- Date of first use,
- Type
- The serial number that is stated on the type label on the XLNT CyberHoist II™

5.5 Included items

In the box you received from your XLNT dealer you should find the following items:

- XLNT CyberHoist II™
- XLNT CyberHoist II™ user manual (this manual)
- Declaration of conformity (II-A) by XLNT, included in this manual

In case a manual is missing, you can download it at www.xlnt.com, or file a request at your local XLNT dealer. Mention the serial number(s) of the hoist(s) involved in all correspondence.

Chapter 6: Installation and dismantling

6.1 Mounting:



NOTE:

All equipment and cables must be subject to a visual inspection before installation, in order to avoid problems later on! See *Chapter 8: Maintenance and inspection*.

In the procedure described here, we assume you have already provided for the proper rigging and fixing of the hoists and that you are ready to take them out of their flight cases and install them. In these instructions the term 'main grid' is used as analogy. It generally refers to 'supporting construction' on which or in which the hoists are suspended.

Please make yourself familiar with the specific information provided with the XLNT products, before you install and use them.

The easiest way of installing XLNT CyberHoist II™ is by suspending it from the main grid truss structure.



WARNING!

Beware the chain bag is hanging free straight under the hoist in it's natural position at all times. It may not be obstructed in any form or way. This otherwise may obstruct the chain flow in or out the bag. As such it may cause the chain to fall out of the chain bag unwanted, or create knots in the bag. Both events may result in severe damage of the hoist and / or cause injuries or fatalities among people underneath..



WARNING!

Beware the chain under no condition does touch the chain bag, any object, or structural element.

- a. Mount the XLNT CyberHoist II™ on or integrate it in the main grid.
- b. Put the power distribution cabinet ('distro') in place. Always ensure that you are able to reach it easily in case of emergency or technical problems.
- c. Power the XLNT CyberHoist II™ by using a break-out connected with the corresponding power distro. Only use power cables of sufficient sections and respect the maximum cable length as indicated.
- d. Attach the safety cable of the break-out to your main-grid, if applicable.
- e. Connect the power break-outs and, if applicable, the distro. Only use power cables of sufficient sections and respect the maximum cable length as indicated.
- f. With a suitable instrument, check the supplied power at your location: single phase as well as 3-phase power supply. For specifications and tolerances, see Annex 1. In case the supply voltage is not what it should be, contact the local responsible person, and wait before switching on the equipment until the correct voltage has been provided.
- g. Connect the distro to the local power supply. Use only power cables of sufficient sections and respect the maximum cable length as indicated.

**NOTE:**

XLNT CyberHoist II™ have a SIL3 network controlled Emergency-Stop circuit that, in case of activation, brings the hoist in to a safe state internally. In addition, the power distribution has a hard wired E-stop system provision. For custom solutions, contact your XLNT dealer for information

- h. Install additional Emergency-Stop switches if your Risk Assessment concludes that this is necessary.
- i. Connect the Ethercon data cable coming from the operating console with the corresponding Ethernet port on the XLNT CyberHoist II™. In case of multiple hoists, RT Ethernet data ports of the individual hoists are to be daisy linked.

**NOTE:**

For large groups of hoists it is recommended to split the system in different domains. See the system operating / software manual for details.

**NOTE:**

Only use CAT 5, CAT 5e or CAT 6 cabling
For distances up to 50m: use STP, FTP or SFTP
For distances from 50 - 95 m: use UTP cable

**TIP:**

While connecting cables to the your equipment in the main grid, always keep an extra 1.5 m length at both ends, so that you can move the equipment a little without having to redo the cabling

Power connector*Ethercon data connector*

Figure 12: Connectors

**WARNING!**

To avoid getting caught by the moving objects, electric cables should have enough slack, but not too much. Always tape the cabling alongside your slings, to prevent the cable from being pulled or torn connections in cabling, as they may loosen during use.

6.2 Powering up the system

When all above mentioned actions have been completed, the power supply is in place and E-stop station's wired, you can power up your system:

- Switch on the main power
- Check if additional data switches have power, either by the Ethercon cabling, or by a separate power cable. See "XLNT Data Motion User Manual" for explanation of all LED indicators.

You are now ready to use and control the hoists by using the console. For operating instructions and use of the MotionCue3D software, we refer to the XLNT MotionCue3D manuals.

6.3 Procedure for un-mounting

The following procedure describes the most convenient way of un-mounting an XLNT CyberHoist II™, and packing it for transport and later use:

- a. In manual mode, run the hook until its highest position (from the operating desk or by means of the handheld connected to the hoist).
- b. Shut off the power to the hoists Disconnect the network cable and the power cable from the hoist.
- c. Lower the hoist in the most convenient way and position it over its flight case.
- d. Gently place each hoist into its flight case using of a secondary lifting device.
- e. Close the flight case.

NOTE:

Never stack more than two flight cases on top of each other, to avoid tumbling down!
Always transport XLNT CyberHoist II™ cases 'on wheels': tipping or turning over the cases is not recommended!

6.4 Manual operations with pickle

The motion controller recognizes two input states, network mode and pickle mode. Selection of the mode is achieved automatically after a power cycle and connecting network or pickle. A power cycle is achieved by means of main power reset or disconnect /connect power plug on the hoist).

Each change from one mode to the other, a new power cycle is compulsory. Execute the procedure with network or pickle disconnected.

Pickle mode procedure:

1. Disconnect the network cable
2. Make a power cycle, (power Off/On) wait until LED's turn WHITE
3. Connect the pickle with E-stop button pulled out (turn and pull) and wait until LED's turn RED
4. Push the E-stop button In and wait until LED's turn BLUE
5. Pull the E-stop button out, LED's start to blink BLUE
6. Hoist is ready for use once the blinking in BLUE stops
7. Push the arrow button ↑ to go UP, LED's turn GREEN for as long as the motion goes
8. Push the arrow button ↓ to go Down, LED's turn RED for as long as the motion goes

After about 30 minutes of no action, the hoist will turn in the Power-Off mode. Proceed from 2) to activate the pickle again.

NOTE:

If an hoist is already in the pickle mode, proceed from 3) to activate the pickle again.

Chapter 7: Operating Conditions

As stated in *Chapter 1: Introduction*, XLNT CyberHoist II™ can be operated with a dedicated operating desk from the XLNT CyberMotion™ family running the XLNT MotionCue3D™ software or directly by means of a handheld plugged into the corresponding receptacle at the CyberHoist II™.

Environmental conditions for operation

The following conditions must be met when operating XLNT CyberHoist II™

Temperature: +5 - 40 °C / 41 - 104 °F

Humidity: 10 - 90 %, in a non-condensing environment

Dust: Avoid dusty environments: due to the forced cooling, dust is sucked into the inlet.

Although the inlet is equipped with a filter, dust will get into the cabinet itself and will stick around fans and parts on the inside, preventing it from cooling properly.

Condensation

After powering down the XLNT CyberHoist II™ they can be packed in their cases immediately.

When transporting a XLNT CyberHoist II™, always use a closed flight case on wheels.



NOTE:

When condensation has formed after powering down, e.g. during the night in between concerts, wait before powering up the hoists until condensation has evaporated.

Chapter 8: Maintenance and inspection

8.1 Prior to each use

The user must visually inspect the XLNT CyberHoist II™ prior to each use for defects, wear and tear and irregularities, and if needed take action. The term “each use” is defined as “each time a XLNT CyberHoist II™ is installed for one show, or consequent shows at one and the same location without altering the set-up of the hoists”.

The following points are important:

- Absence of the type label on the housing of the XLNT CyberHoist II™: when damaged or absent one should contact the XLNT service point for immediate replacement. Proper identification is a must before putting the device into service.
- Wear, tear and damage to the rope or rope outlets: this usually forecasts damage to the rope or pulley wheels.
- Wear, tear and damage to the rope when checking visually: if in any doubt, call in a competent person who can check if the rope ability to perform safely has been compromised; see specifications in the XLNT CyberHoist II™ Maintenance Manual.
- Damage to the housing: this indicates possible damage to the interior
- Suspension shackle, hoist attachment point: on damage, bending and presence of safety pin.
- Load-cell axels should be fastened, though freely movable; check for damages. Damaging a load-cell will almost always give it an offset.
- Check the connectors of your power cable for damage, and check the locking mechanism for correct functioning.
- Check the cable glands at the connector and the housing. These should be tight and the insulation should not have come out.
- Check hardware limit switches.



NOTE:

Only authorized service personnel are allowed to do repairs on the XLNT CyberHoist II™. Repairs must be logged.



WARNING!

The speed at which a XLNT CyberHoist II™ can run, in combination with the fact that luminaries in the vicinity might heat up the chain, may cause the lubrication to evaporate quickly. Too little or no lubrication causes excessive wear and tear of the chain. This can cause the chain to jam or even lead to failure. Any one or a combination of these factors may cause the load to fall down or collapse, at the risk of causing severe injury or damage to property

8.2 After frequent use or use under special circumstances

When a XLNT CyberHoist II™ is frequently used, e.g. because it's used a lot during a long show period, or when it's been used under especially harsh conditions, e.g. near salt water, it must be inspected by a competent XLNT service technician.

8.3 During long periods of use

When the hoists are used frequently over a longer period, a regular visual inspection by a competent person is necessary. Attention must be given to the following:

- Tightening of the bolted connections.
- Hook condition and their ability to rotate (see 2.4.1.1 *Measuring wear on the Hook*).
- Chain condition, lubrication and eventual wear (see 2.3.1.1 *Measuring wear on the chain*).
- Cabling on proper taping, slack etc.
- Connectors, their locking mechanisms, insulation, etc.

If a system with some hoists is used for a long period of time, e.g. when touring for a period longer than two months, it is necessary to plan some inspections during this period. The user must take care to stipulate a proper maintenance plan.

8.4 Periodical inspection

XLNT CyberHoist II™ maybe inspected and tested by competent XLNT service personnel only. Inspection intervals must be executed in accordance with local laws and regulations, but are not to exceed a maximum of 12 months between inspections. The findings of these inspections must be logged.

Points of inspection and terms are:

	Action	Interval min. once per year	Qualification of personnel
1	Normal brake operations	Daily	Operator
2	General inspection of the chain	Daily	Operator
3	General inspection of the hook	Daily	Operator
4	Over load and under load values	Daily	Operator
5	Detailed inspection , cleaning and lubrication of the chain	After each job	Qualified mechanic
6	Detailed inspection , cleaning and lubrication of the hook	After each job	Qualified mechanic
7	Over load triggering point	Annually	Qualified mechanic + Operator
8	Measuring wear on the chain, see criteria	Annually	Qualified mechanic
9	Measuring wear on the hooks, see criteria	Annually	Qualified mechanic
10	Checking of the screw tightening torques and checking for signs of damage mall function and corrosion	Annually	Qualified mechanic
11	Normal brake operations	Annually	Qualified mechanic + Operator
12	General inspection of the chain	Annually	Qualified mechanic
13	General inspection of the hook	Annually	Qualified mechanic
14	Over load and under load values	See indicator	Manufacturer

Table 4: Points of inspection

Service information with respect to above table:

1. The operator should be permanently aware of any abnormal noises or load behaviour when reaching Zero speed.
2. Chain must be clean and well lubricated at all times.
3. The hook must be able to rotate easily and open / close without any enforcement.
4. Operator should watch over the monitored load values.
5. Thorough visual inspection of the chain. Chain should look polished on all contact points, no severe surface damage of any kind may be observed.
6. Hook must be in good condition, no severe surface damage of any kind may be observed.
7. The correct trigger point of the load cell must be checked against a known load at 110% of the rated load. For renewed calibration consult a qualified operator.
8. Apply points 2) and 5). Check for deformations and wear. For acceptance criteria of the chain; see 2.3.1.1 *Measuring wear on the chain*.
9. Apply points 3) and 6). Check for deformations and wear. For acceptance criteria of the hook; see 2.4.1.1 *Measuring wear on the Hook*.

10. Check all bolt connections, condition of internal and external wiring and general appearance.
11. Check mechanical brake function of both brakes individually. For brake selection, and testing consult the qualified operator with access to the maintenance mode on the operating desk, which is required to apply this service.
 - Dynamic test:
apply test load of 110% go up and down at moderate speed and apply an E-stop. Load should come to a standstill within an acceptable distance.
 - Static test:
apply a static load of 125%, brake should not give any sign of slippage.

If slippage occurs, see Chapter 2.2.1 how to check and correct the brake air gap. After each correction, both tests must be repeated.

12. Check Over travel limits adjustment:

For over travel limits testing consult the qualified operator with access to the maintenance mode on the operating desk, which is required to apply this service.

- Select down and run the hook downwards until the buffer spring on the end stopper gently touches de chain guide. It should stop as soon as the spring intends to build-up pressure. Turning the adjustment nut close to the spring, clockwise will make the switch act sooner and turning the nut anti-clockwise will make it act later.
- The precise moment of switching could be noticed by listening to the clicking of the micro switch. Repeat the action if needed until the switch act in due time, means at minimum compression of the spring.
- Select Up to run the hoist in the opposite direction until the buffer spring on top of the hook gently touches de chain guide. It should stop as soon as the spring intends to build-up pressure. Turning the adjustment nut close to the spring, clockwise will make the switch act sooner and turning the nut anti-clockwise will make it act later.
- The precise moment of switching could be noticed by listening to the clicking of the micro switch. Repeat the action if needed until the switch act in due time, means at minimum compression of the spring.

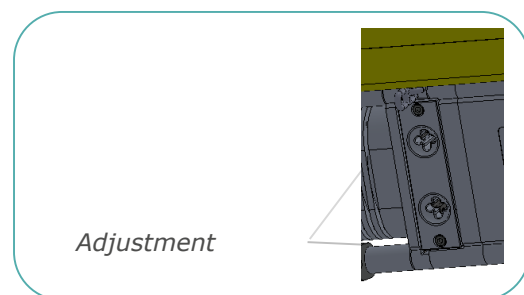


Figure 8 Adjustment nuts



NOTE:

the chain guide is fitted on pressure springs, this to enable it to trigger the safety switches behind it. It therefore is important to follow the instructions of limit switch adjustments made by the two nuts that are holding the chain guide.

Only authorized service personnel are allowed to do repairs on the XLNT CyberHoist ITM. Repairs must be logged.

8.5 Safe working period

XLNT CyberHoist II™ are optionally equipped with an operating and event monitor system that stores all data relevant on the chip that is part of the hoist body. The remaining service period until the general overhaul is calculated from the registered values. The outcome in remaining service hours or travel distance is listed in the parameter file. See operating manual.

Once the indicator shows a remaining elapse time of less than 5%, a warning will be given. When reaching the full period, the hoist must be returned to the manufacturer or his delegate for general overhaul and determination of a second SWP.

8.6 Long term storage

When you want to store your XLNT CyberHoist II™ for a long period, the following procedure must be followed:

- Make an entry in your maintenance logs when you take them out of service.
- During the storage period no inspections are necessary.
- During storage the environmental condition set in *Chapter 5: Storage, transport and reception* must be maintained.
- When putting the hoist into service again, an inspection and a test must be done by a competent XLNT serviceman. Findings of these inspections must be logged.

Chapter 9: Decommissioning

If case the equipment is taken out of service, e.g. because the product has reached its end of (economical) life, is damaged beyond repair or for any other reason, it must be sent back to your local supplier. They can take care of dismantling the item in an environmentally friendly manner. The hoist can also be offered to a company specialized in dismantling and recycling this type of electronic equipment.



WARNING

Never dump your equipment: XLNT CyberHoist II™ contain electrical parts and lubrication greases that are not environmentally friendly, and need special treatment in order to dispose of them in an environmentally safe way!

Chapter 10: List of hazards

No.	Hazards	Events, recommendation and references to relevant chapters of this document
1	Mechanical hazards due to:	
	a) shape	NA
	b) relative location	Apply local code of rigging practice
	c) mass and stability (potential energy of elements which may shift under effect of gravity)	x
	d) mass and velocity (kinetic energy of elements in controlled or uncontrolled motion)	controlled by drive / SAS - requirement
	e) inadequacy of mechanical strength of components	compliance to DIN56950 / BGV-C1
	f) elastic elements	spring
	g) liquid and gasses	NA
	h) effects of vacuum	NA
1.1	Crushing hazard	chain while load in motion - chain sliders if applied - spring on hook while in upper position - chain falling from chain bag - Ch. 6
1.2	Shearing hazard	NA
1.3	Cutting or severing hazard	NA
1.4	Entanglement hazard	knots in chain / due to use of chain sliders - Ch. 2.3 - 2.3.1.2 - 6
1.5	Drawing-in or trapping hazard	NA
1.6	Impact hazard	NA
1.7	Stabbing or puncture hazard	NA
1.8	Friction or abrasion hazard	NA
1.9	High pressure fluid injection or ejection hazard	NA
2	Electric hazards due to:	
2.1	Contact of persons with live parts (direct contact)	See C-Power users manual
2.2	Contact of persons with parts which become live under faulty conditions (indirect contact)	See C-Power users manual
2.3	Approach to live parts under high voltage	NA
2.4	Electrostatic phenomena	NA
2.5	Thermal radiation	Ch. 4.2
3	Thermal hazards, resulting in	
3.1	Burns, scalds and other injuries by a possible contact of persons with the object or materials with extreme high or low temperature	NA
3.2	Damage to health by hot or cold working environment	NA
4	Hazards generated by noise, resulting in	
4.1	Hearing loss (deafness) or other physiological disorder	NA
4.2	Interference with speed communication, acoustic signals etc.	NA
5	Hazards generated by vibrations	
5.1	Use of handheld machines	NA
5.2	Whole body vibrations	NA
6	Hazards generated by radiation	
6.1	Low frequencies, radio frequency radiation, micro waves	NA
6.2	Infrared, visible and ultraviolet light	NA
6.3	X and gamma rays	NA
6.4	Alpha, beta rays, electron or ion beams, neutrons	NA
6.5	Laser	NA

No.	Hazards	Events, recommendation and references to relevant chapters of this document
7	Hazards generated by material and substances processes or used by the machinery	
7.1	Hazards from contact with or inhalation of harmful fluids, gases, fumes and dusts	Ch. 2.2 - 8.4
7.2	Fire or explosion hazard	NA
7.3	Biologic or micro biological hazards	NA
8	Hazards generated by neglected ergonomic principals	N
8.1	Unhelthy postures or excessive effort	self weight Ch. 1.1
8.2	Inadequate considerations of hand-arm or foot anatomy	NA
8.3	Neglected use of personal protection equipment	aplicable rigging code of practis
8.4	Inadequate local lighting	NA
8.5	Mental overload and underload stress	See MotionCue users manual
8.6	Human error, human behavior	See MotionCue users manual
8.7	Inadequate design, location of manual controls	NA
8.8	Inadequate design or location of display's	NA
9	Combination of hazards	
10	Unexpected start-up, overrun / overspeed or any mal function	See Motion System requirements
10.1	Failure / disorder of the control system	See Motion System requirements
10.2	Restoration of energy supply after an interruption	manual action requirred
10.3	External influences on electrical equipment	See Motion System requirements
10.4	Other external influences, gravity, wind	Ch. 4.2
10.5	Erros in software	See Motion System requirements
10.6	Errors made by the operator (see also 8.6)	See Motion System requirements
11	Impossebility of stopping the machine in the best possible condition	Ch. 6.4 - see also C-Power user manual
12	Variations in the rotational speeds of tool	NA
13	Failure of power supply	See Motion System requirements
14	faillure of the control circuit	See Motion System requirements
15	Errors of lifting	Ch. 6.1 - adressed at training
16	Break-up during operation	See Motion System requirements
17	Falling or ejected objects or fluids	Ch. 2.3
18	Loss of stability / overturning	NA
19	Slip, trip and fall of persons	NA
Additional hazards, hazourdots situations and hazardous events due to mobility		
20	Relating to the travelling function	NA
20.1	Movement when starting the engine	NA
20.2	Movement without a driver at the drivers position	NA
20.3	Movement without all parts in a safe position	NA
20.4	Exsessive speed of pedestrian controlled machinery	NA
20.5	Exsessive ossiclationwhen moving	NA
20.6	Insufficient ability of machniery to be slowed down, stopped and imobilised	NA

No.	Hazards	Events, recommendation and references to relevant chapters of this document
21	Linked to the work position on the machine	
21.1	Fall of persons during access to the work position	aplicable rigging code of practis and adressed at training
21.2	Exhasut gassses/lack of oxigen at work position	NA
21.3	Fire	NA
21.4	Mechanical hazards at work position	aplicable rigging code of practis andadressed at training
21.5	Insufficient visibility from the work position	adressed at training
21.6	Inadequate lighting	NA
21.7	Inadequate seatig	NA
21.8	Noise at work position	adressed at training
21.9	Vibration at work position	NA
21.10	Insuficient means of evacuation	aplicable rigging code of practis
22	Due to controle system	
22.1	Inadequate location of manual controls	Ch. 6.4
22.2	Inadequate design of manual controls and mode of operation	Ch. 6.4
23	From handling the machine	NA
24	Due to powersource and transmission of power	
24.1	Hazards from the engine and the bateries	NA - the machine is multy voltage
24.2	Hazards of transmission of power between the machines	See C-Power users manual
24.3	Hazards from coupoing towing	NA
25	From/to third persons	NA
25.1	Unauthorised start-up or use	protected by user ID password
25.2	Drift of aprt away from its stopping position	See Motion System requirements
25.3	Lack of inadequacy of visual or acoustic warning means	NA
26	Insufficient instructions for the driver / operator	see MotionCue operating manual - adressed at training
Additional hazards, hazourdous situations and hazardous events due to lifting		
27	Mechanical hazards and hazards events	adressed at training
27.1	From load falls, collisions, machine tipping caused by:B103	adressed at training
27.1.1	Lack of stability	adressed at training
27.1.2	Uncontrolled loading, overloading, overtuning moments exeeded	See Motion System requirements
27.1.3	Uncontrolled amplitude of movements	See Motion System requirements
27.1.4	Inadequate holding devices / accessories	aplicable rigging code of practis
27.1.5	Collission of more than one machine	See Motion System requirements - adressed at training
27.2	From access of persons to load support	NA
27.3	From derailment	NA
27.4	Insufficient mecjanical strength of parts	DIN 56950-1 - coverd through SIL 3 requirements
27.5	From inadequate design of pulley's and rums	NA
27.6	From inadequate selection of chain, ropes and their inadequate integration into the machine	Ch. 2.3.1 and Ch. 2.4.1
27.7	From lowering the load under the control of friction brake	Ch. 2.2
27.8	From abnormal conditions of assenmbly / testing / use / maintenance	Ch. 6.4
27.9	From the effect of load on persons	NA

Contact Information

Main office

XLNT Advanced Technologies BV

Tel +31 30 247 9999

Fax +31 30 247 9998

sales@xlnt-at.com

www.xlnt-at.com

Visitor's Address:

Proostwetering 50
3543 AH Utrecht
The Netherlands