

OPERATING INSTRUCTIONS


STAR LIFTKET | Electric Chain Hoists




Please do not use the hoist until all operators have carefully read this manual and have signed the form on the last page.


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Original operating instructions

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1 Safety advice

1.1 Advice for the use of electric chain hoists

Electric chain hoists are designed to lift and to lower loads vertically and to travel horizontally with those lifted loads (with trolleys). Every other mode of use is prohibited and at the operator's own risk. Prohibited operations (see topic 0) are especially life threatening.

Please ask the producer about any special mode of use in advance.

Using the hoist to carry people is strictly prohibited!

The modern design of the electric chain hoists guarantees safety and economic use.

The patented safety clutch system is located between the motor and brake. This enables the brake to hold the load without any power transmitted by the clutch. The brake acts directly on the load via the gearbox by using form-fit elements only. The friction clutch does not transmit any load while the brake is on.

Before first use please make sure that all electrical wires are connected safely, that all wires are not damaged and that the equipment can be switched off with a main switch. It is the responsibility of the operator to make sure that all suspension points of the hoist are calculated to safely withstand the dynamic forces caused by the lifting equipment.

The chain hoist can be used once it is safely suspended and the outgoing chain can leave the hoist safely in the relevant direction. Therefore, the container for the dead end of the chain outside the hoist must be big enough to allow the chain to come out. If not, the chain can be trapped inside the hoist and can break the casing of the hoist.



For use of the hoist in an aggressive environment – please consult the producer

The following safety advice is issued for both the maintenance and the operation of the hoist and for most standard uses. It may not necessarily cover all situations. If you are in any doubt, please contact your dealer. This manual will tell you how to safely operate the hoist and how to handle its suspension or its loads. It is compulsory to take care of the following safety advice. It may not be complete for each mode of use; please ask the producer or your local service partner if any questions remain. You should keep this manual clean, complete and in legible condition.

Neither the manufacturer nor the dealer accepts responsibility for any damage or lack of functionality due to the following:

- Carrying out inappropriate operations for an electric chain hoist
- Product modification without the express authorization of the manufacturer
- Inappropriate operation of the hoist
- Operational errors
- Failure to use the product as instructed in the manual



1.2 European regulations

The basis for the assembly, first use, certification and maintenance of electric chain hoists are within Germany and within the area of the European community, the following regulations, and all recommendations of this manual. Local legislation and directives for different countries may apply in addition to the regulations as stated in this manual (German/European). Please pay particular attention to the rules for the prevention of accidents and the statutory regulations.

European regulations	
2006/42/EG	EC-Machine directive
2014/30/EG	EC-Directive relating to electromagnetic compatibility
2014/35/EG	EC-electrical equipment designed for use within certain voltage limits

Accident prevention regulations (DGUV)	
DGUV Vorschrift 1 (BGV A1:2009)	Principles of prevention
DGUV Vorschrift 3 (BGV A3:2005)	Electrical facilities and equipment
DGUV Vorschrift 52 (BGV D6:2000)	Cranes
DGUV Vorschrift 54 (BGV D8:1997)	Electric winches, lifting and pulling equipment
DGUV Regel 100-500 (BGR 500-2.8:2008)	Hoisting accessories
DGUV Grundsatz 309-001 (BGG 905:2004)	Checking of cranes

Harmonized regulations	
DIN EN ISO 12100:2010	Safety of machinery
DIN EN 14492-2:2006+A1:2009	Cranes - Power driven winches and hoists
DIN EN 818-7:2002+A1:2008	Short link chain for lifting purposes; Fine tolerance hoist chain, Grade T
DIN EN ISO 13849-1:2008	Safety of machinery - Safety-related parts of control systems; General principles for design
DIN EN 60034-1:2010	Rotating electrical machines; Rating and performance
DIN EN 60034-5:2001+A1:2007	Rotating electrical machines; Degrees of protection provided by the integral design of rotating electrical machines
DIN EN 60204-1:2006	Electrical equipment of machines; General requirements
DIN EN 60204-32:2008	Electrical equipment of machines; Requirements for hoisting machines
DIN EN 60529:1991+A1:2000 +A2:2013	Degrees of protection provided by enclosures (IP-Code)
DIN EN 60947-1:2007+A1:2011	Low-voltage switchgear and control gear
DIN EN 61000-6-2:2005	Electromagnetic compatibility, Immunity for industrial environments
DIN EN 61000-6-3:2007+A1:2011	Electromagnetic compatibility, Emission standard for residential, commercial and light-industrial environments
DIN EN 61000-6-4:2007+A1:2011	Electromagnetic compatibility, Emission standard for industrial environments
DIN EN 82079:2013	Preparation of for use, structuring, content and presentation

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

The producer's guarantee depends on the adherence to these regulations and all of this manual.

Please pay attention to chapter 6 especially!

Other national regulations are valid for countries outside of the European community.

Maintenance work for hoisting equipment has to be carried out by trained and authorised professionals only. The main switch must be switched off beforehand.



Authorised people must have theoretical training as well as experience in the field of cranes and hoists. They must have excellent know-how of the special regulations and must be able to decide whether the lifting equipment is in safe working condition or not.

They must fill in the forms of any maintenance work, repair work or test (for example: maintenance work on brake or clutch).

The hoist is allowed only to be used by people who have complete knowledge of this manual; the manual should always be available, showing who has signed the form on its rear cover.

1.3 Spare parts

Only original spare parts must be used; the producer's guarantee is given for those spare parts only.

The producer cannot be held responsible for failures and breakdowns caused by use of unoriginal or incorrect spare parts.

2 Technical overview

2.1 Assembly options

The simple building block system makes it easy to convert the electric chain hoists. This allows the choice of single or double – fall versions, stationary or mobile with push or electric trolleys, and the installation of greater hoisting and operating heights.

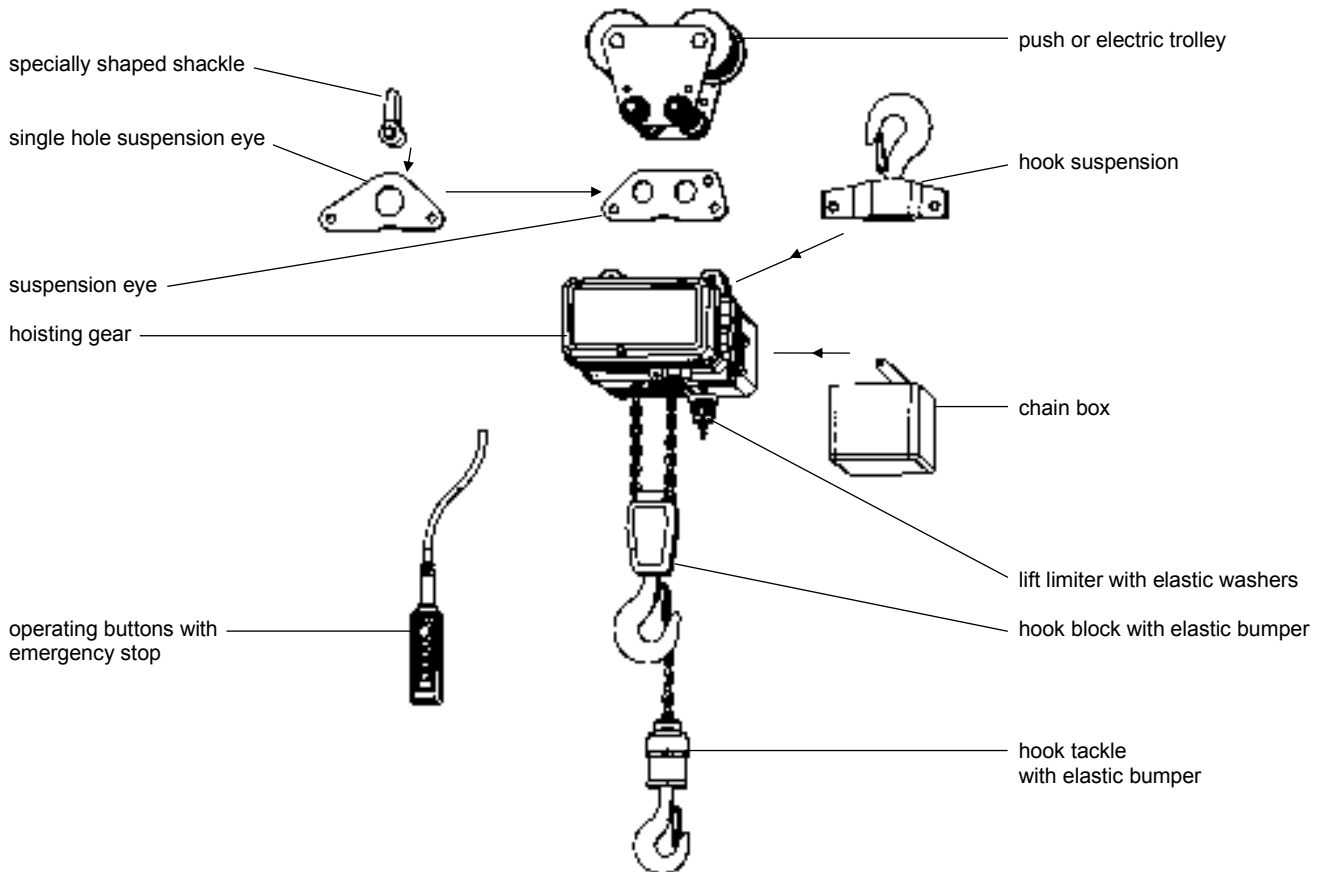


Figure 1: Assembly options

2.2 Explanation of type designation

Example: version 031 / 51 type 250 / 1 - 8 / 2

version 03 1 / 51

Model- Number
 Index for number of lifting speeds
 0 – lifting gear with one lifting speed
 1 – lifting gear with two lifting speeds
 index of number of hoist body

02 – size of hoist body I with chain 4×12
 03 – size of hoist body I with chain 5.2×15
 05 – size of hoist body II with chain 5.2×15
 07 – size of hoist body II with chain 7.2×21
 09 – size of hoist body III with chain 9×27
 11 – size of hoist body III with chain 11.3×31

type 250 / 1 - 8 / 2

slow lifting speed [m/min]
 main lifting speed [m/min]
 number of falls
 capacity [kg]

2.3 Sectional view

No.	Designation	No.	Designation
1	Cap for control	10	Pinion 1
2	Control	11	Load chain
3	Cap for fan	12	Suspension eye
4	Fan	13	Sprocket wheel
5	Motor pinion shaft	14	Gear cover
6	Stator	15	Cap for gear cover
7	Rotor	16	Terminal block board for power supply, pendant control and motorized trolley
8	Clutch unit	17	Brake unit
9	Hoist body	18	Double fall hook

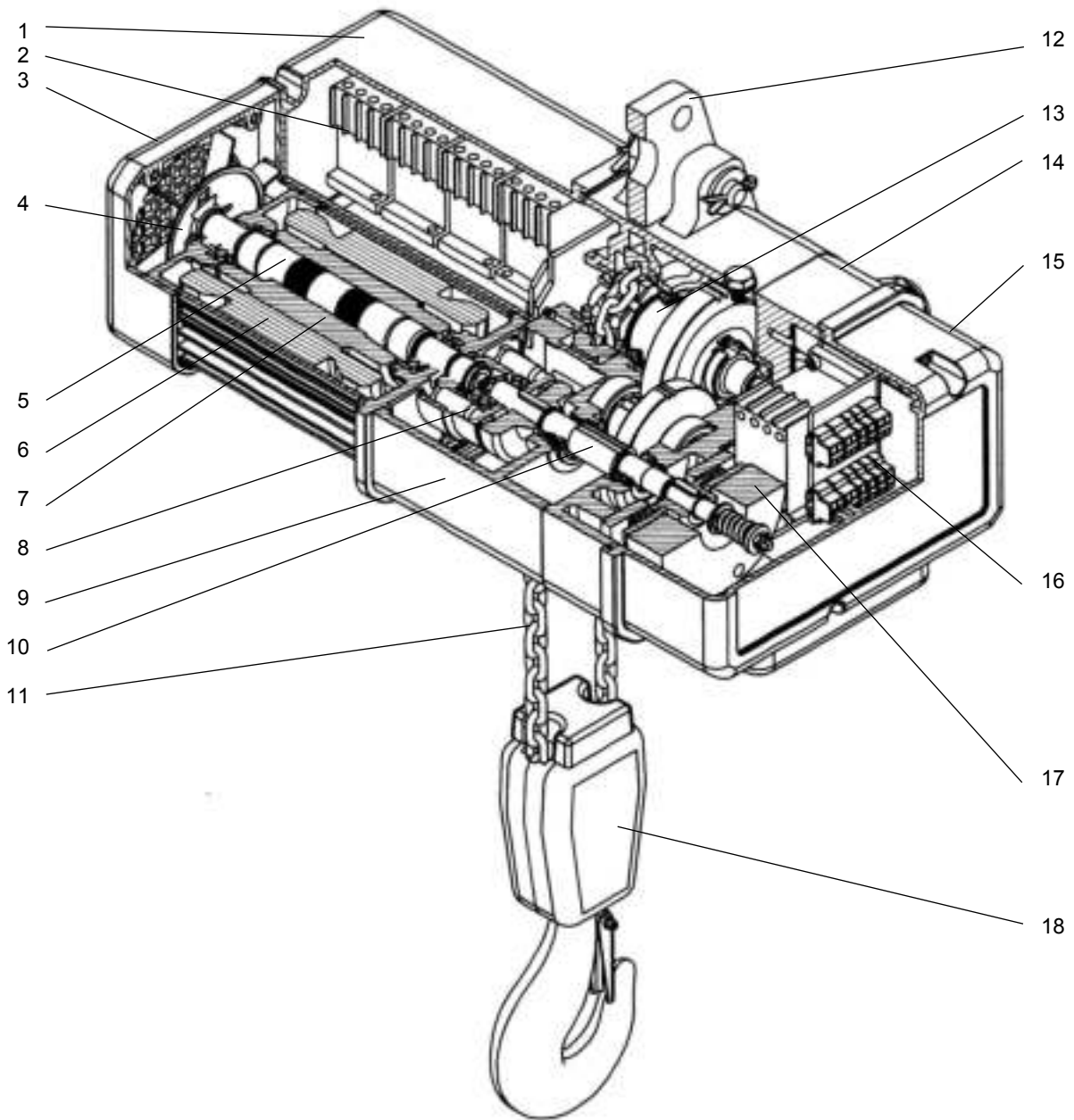


Figure 2: Sectional view

2.4 Illustration of the load chain configuration

Use manufacturer's original parts only, as these meet the high stress and service life standards required.

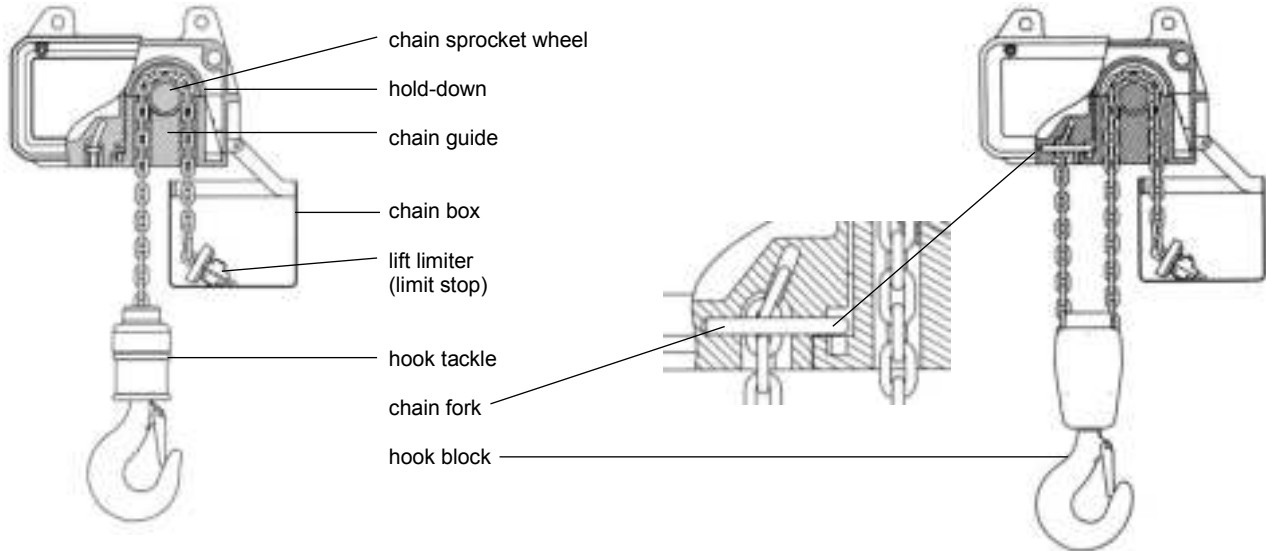


Figure 3: 3.1 Single fall version

3.2 Double fall version

3 Assembly

Assembly work should only be carried out by a trained specialist in accordance with DGUV V54 (BGV D8), §24.

3.1 Mechanical assembly

3.1.1 Hook tackle

The hook tackle is used to attach loads for hoists in the single-fall version.

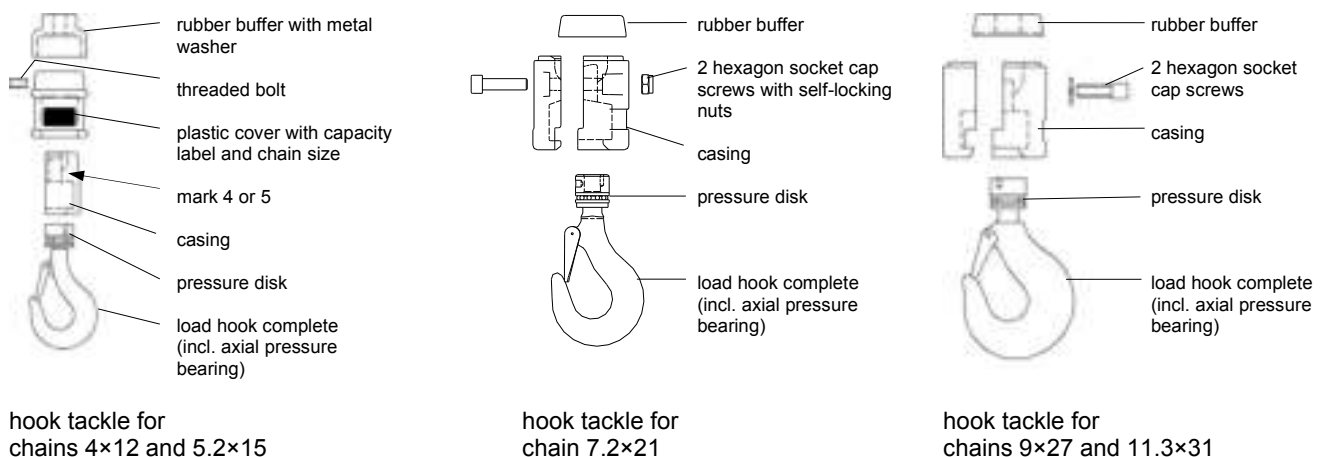


Figure 4: Details of the hook tackle

During maintenance work the condition of the load hook must be checked (wear and centre punch spacing). For the 4×12 mm and 5.2×15 mm hook tackles the plastic cover must be checked additionally and changed if worn. Furthermore, the condition of the pin, which secures the hook nut, the pressure bearing and the safety latch must be checked at regular intervals. If required, the axial bearing has to be cleaned and greased.

Tighten the connection screws with the following torque for the assembly of the hook tackles:

Hook tackle description	Max. load capacity [kg]	Dimension of screws	Quantity	Tightening torque [Nm]
Hook tackle for chain 4×12	250	-	-	-
Hook tackle for chain 5.2×15	500	-	-	-
Hook tackle for chain 7.2×21	1000	M10×40 DIN 912	2	35
Hook tackle for chain 9×27	1600	M12×30 DIN 912	2	50
Hook tackle for chain 11.3×31	3200	M12×35 DIN 912	2	50

Table 1: Connection screws with torques for hook tackles

3.1.2 Hook block

The hook block is used to attach the load in the double fall version.

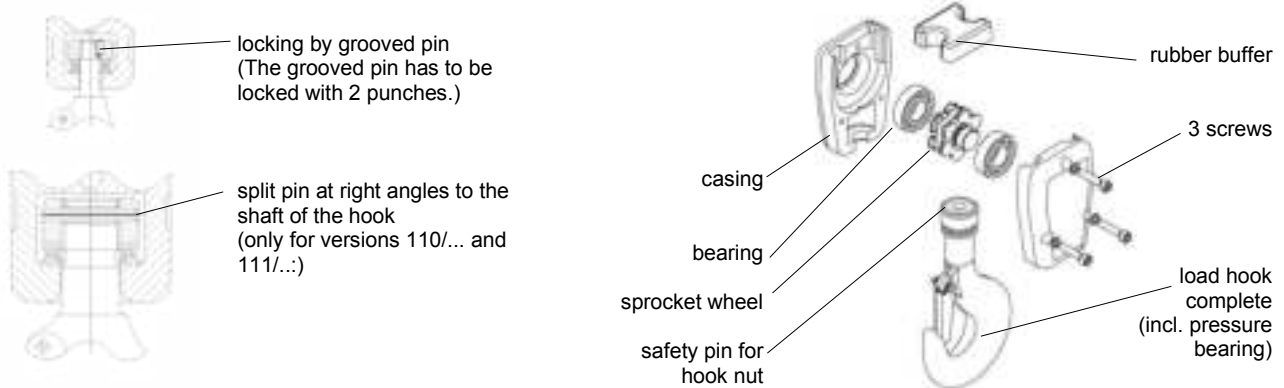


Figure 5: Details of the hook block

The condition of all of the parts must be checked (according to 3.1.1) during all maintenance work.

Tighten the connection screws with the following torque for the assembly of the hook blocks:

Hook block description	Max. load capacity [kg]	Dimension of screws	Quantity	Tightening torque [Nm]
Hook block for chain 4×12	500	M6×40 DIN 912	2/1	10/6
Hook block for chain 5.2×15	1000	M6×40 DIN 912	2/1	10/6
Hook block for chain 7.2×21	2000	M8×50 DIN 912	2/1	20/10
Hook block for chain 9×27	3200	M10×50 DIN 912	2/1	35/20*
Hook block for chain 11.3×31	6300	M12×60 DIN 912	3	35

* The tightening torque of the screw near the rubber buffer is reduced.
This one screw has to be inserted into the threaded bore hole with LOOC® tide.

Table 2: Connection screws with torques for hook blocks

3.1.3 Stationary suspended hoists - basic version -

Caution! Do not use other bolts than the original suspensions bolts. In particular, do not use screws to connect the electric chain hoist to its suspension elements.



3.1.3.1 Suspension with suspension eye

Assembly: The suspension eye section, which forms part of the standard delivery, must be inserted into the specially provided suspension holes on the electric chain hoist and pinned into place with the two bolts. Use washers with the lock bolts and secure the position with split pins.

Caution! The hole for the tandem trolley on the suspension eye must be on the chain box side.

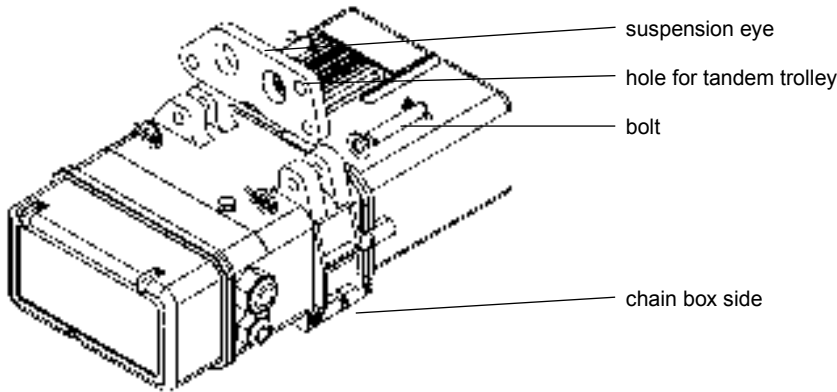


Figure 6: Suspension with suspension eye

3.1.3.2 Suspension with single hole eye

Assembly When changing from single fall use to double fall use, you must reverse the direction of the single hole suspension eye. The hole should be positioned directly above the load hook.

Caution! The relevant symbol on the suspension eye has to show either the single or the double fall hook on the chain box side.

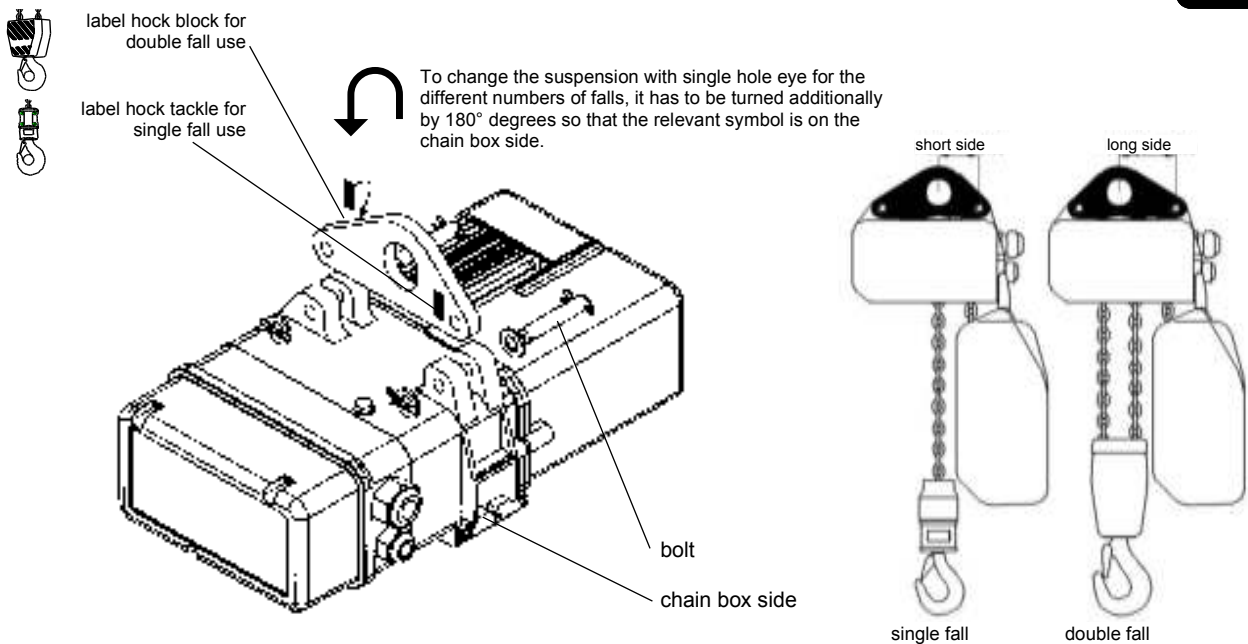


Figure 7: Suspension with single hole eye

3.1.3.3 Suspension with hook suspension

Assembly: The hook suspension included in the delivery as an option must be pinned to the casting with two pins and secured with washers and split pins.



Caution! When changing from single fall use to double fall use, do not forget to reverse the direction of the suspension hook; the hook should be positioned directly above the load hook. The relevant label on the suspension hook must be on the chain box side.

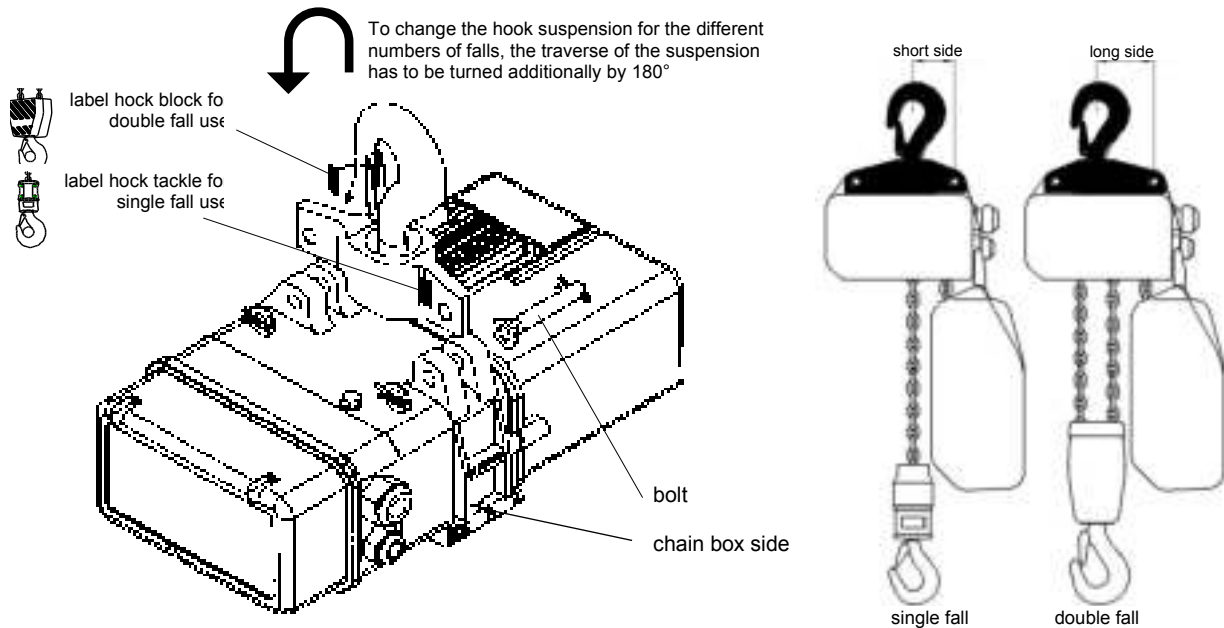


Figure 8: Suspension with hook suspension

3.1.4 Gear ventilation

Having completed the assembly, the split washer must be placed under the oil filler plug (top side of casing) to avoid oil leakage due to high pressure inside the gearbox.

Attention! For outdoor use, for use as mobile hoist (MB) and for inverted use, high air humidity and big differences in temperatures the use of the serrated washer is **not recommended**. The gear box is than sealed by plain washers on top and bottom oil filling screws.



Figure 9: Oil filler plug

3.1.5 Chain box

3.1.5.1 Mounting the chain box



Plastic chain box

Canvas chain box

Flip bag

Figure 10: Types of chain boxes

The following chain boxes are made of plastic:

Chain dimension [mm×mm]	Max. filling quantity [m]	Type of chain box
4×12	12	4/12 5/8 7/5
5,2×15	8	
7,2×21	5	
4×12	16	4/16 5/10 7/8
5,2×15	10	
7,2×21	8	

Table 3: Plastic chain box

All chain boxes with bigger capacity are made from canvas material.

The chain box is mounted with screw and self-locking nut. The self-locking nut has to be securely screwed. The self-locking nut has to be replaced after repeated use when the nylon becomes noticeably worn.

Caution! Ensure that the chain box is sufficient for the amount of chain you are using. The chain dimension and capacity is shown on the chain box.

Insert the chain end with lift limiter and its rubber buffer loosely into the chain box. After running the entire chain length through the hoist into the chain box, check that the box is not overloaded. **Do not overload the chain box.**



3.1.5.2 Oversize chain box

If the chain weight is more than 25 kg, the strain of the chain box must be relieved with a special textile strap. When fitting the chain box to the suspension, the customer must correctly adjust its position using the ratchet strap with a load of approx. 10 kg inside the bag.

The suspension point of this strap for a stationary suspended hoist has to be provided by the buyer (Figure 11), as the prevailing conditions are unknown. If the hoist is fitted to a trolley, the producer will provide a tandem trolley to fit the chain box strainer strap (Figure 12).

Make sure that the strainer strap is tightened in accordance with this manual and inspected at regular intervals and corrected if necessary.

Please use the edge protectors at the suspension points (see Figure 11 and Figure 12).



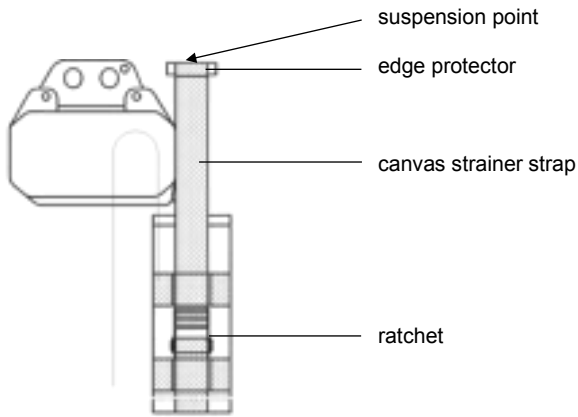


Figure 11: Stationary suspended electric chain hoist
The suspension point for the strainer strap has to be provided by the user.

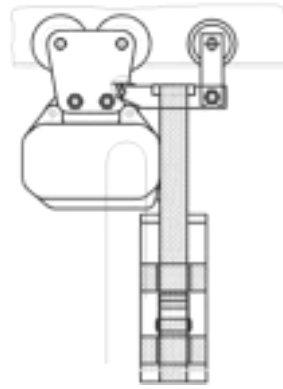


Figure 12: Electric chain hoist with chain box suspended at the tandem trolley. (Not suitable for curved beams. In special cases ask the producer).

Caution!
Not suitable for single bolt trolleys

The end of the strainer strap must be fixed and tightened with the strainer strap and the ratchet.

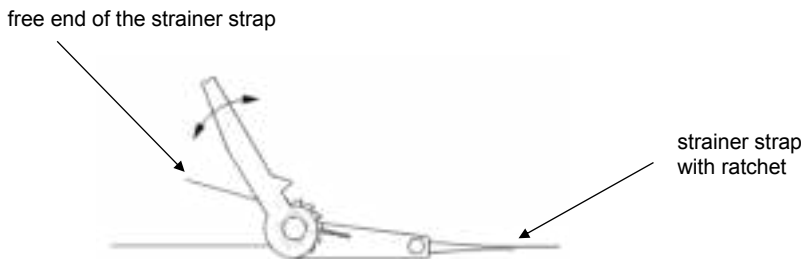


Figure 13: Scheme of the fixed strainer strap

3.1.6 Assembling the load chain without the pre-assembled piece of chain - single fall version -

1. Push the pull-in wire (special tool) into and through the chain guide cross plate (Figure 14-A) until the wire hook is pushed out on the opposite side.
2. Starting with the flat chain link (Figure 14-A): when feeding the chain into the hoist, ensure that the first link is aligned parallel to the ends (hence at right angles to the sides).
3. Move the chain in by inching the pendant (Figure 14-B).
4. Put the rubber buffer on the chain and assemble the load hook (Figure 14-C).
5. Lower the load hook to leave 50 cm of the dead end of the load chain on the dead end side.
6. Attach the rubber buffer for the lift limiter onto the remaining dead end of chain.
7. Attach the lift limiter onto the 3rd link of the dead end (Figure 14-D).
8. Assemble the chain box according to 3.1.5.1.
9. Allow the chain to run into the chain box and lubricate the entire length of the chain

Let the dead end of chain run into the chain box by pressing the up button and using the hoist motor to prevent knots inside the chain box. Allow filling of the chain box only by running the chain through the hoist by using the motor. To prevent knots inside the chain box, do not put the chain in the box directly.



* Lift limiter

The lift limiter is designed to prevent the dead end of chain from running out of the hoist. It is used as an emergency stop and cannot be used regularly as an operational lower limit switch.

If the lift limiter has a metal washer, then this should be mounted towards the electric chain hoist body.



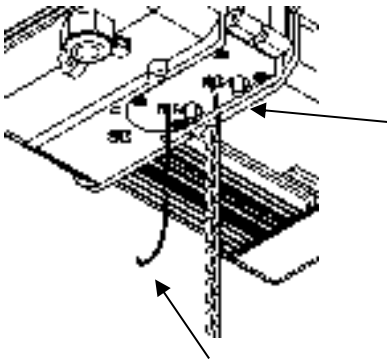


Figure 14 A

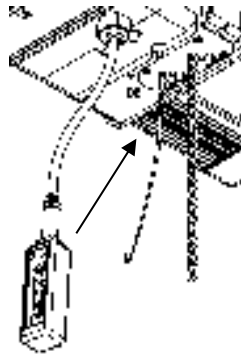


Figure 14 B

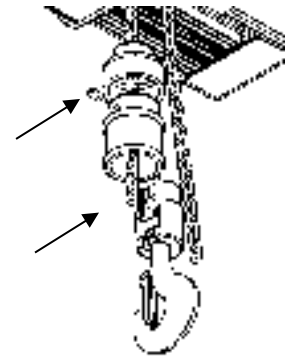


Figure 14 C

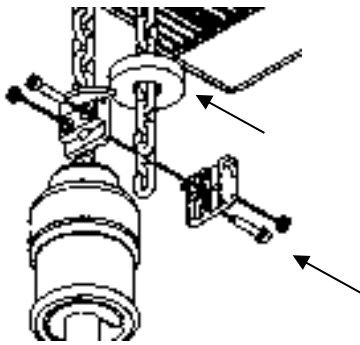


Figure 14 D

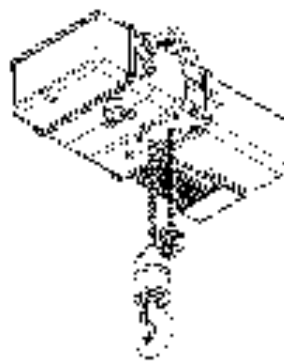


Figure 14 E

Figure 14: Assembling the load chain - single fall version

3.1.7 Assembling the load chain without the pre-assembled piece of chain – double fall version -

1. First insert the load chain into the hoist casing according to the version as described in 0. and 0.
2. Pull the chain through the hook block using the pull-in wire (special tool) (Figure 15-A).

Caution! Never allow the chain to be twisted between the chain outlet and the hook block! If the assembly (according to Figure 15-B or Figure 15-C) is not possible without a twisted chain, one chain link has to be cut and removed to allow correct assembly.
Do not turn or swivel the hook block around the horizontal axis between the two chain falls.



3. Loosen the four screws of the chain guide, take the chain guide out of the hoist (Figure 15-C) and pull the U-shaped fork back.
4. Pull the chain end from the hook up to the cross chain hole on the under casing of the hoist to the point where the first link protrudes inside the casing. (Figure 15-C) The fork should then be inserted into the hoist to capture this link (Figure 15-D). Pull hard on the chain to ensure that it is securely fixed.
5. Re-assemble the chain guide (Figure 15-E). Please note chapter 3.1.8!
6. Double-check that the chain is not twisted.
7. Lubricate entire length of chain.

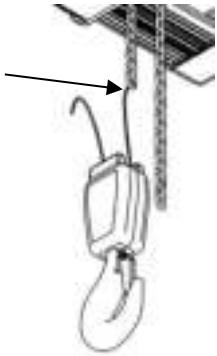


Figure 15-A



Figure 15-B

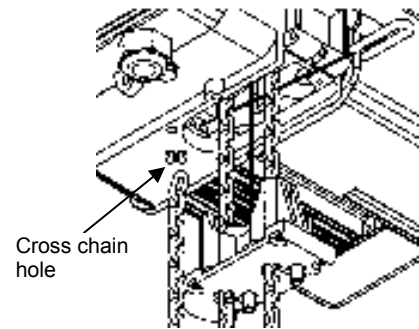


Figure 15-C

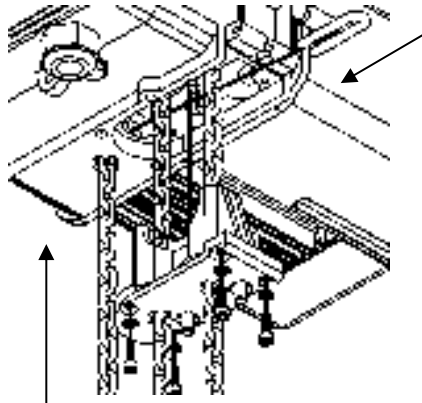


Figure 15-D

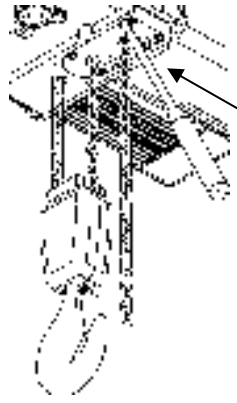


Figure 15-E

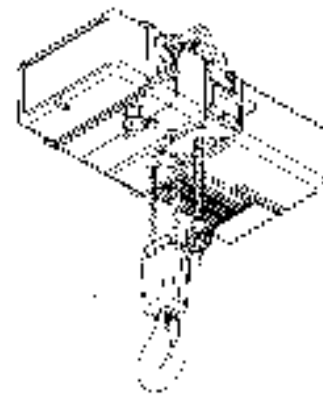


Figure 15-F

Figure 15: Assembling the load chain – double fall version

3.1.8 Replacing the load chain

The chain guide and the hold-down must also be changed when the load chain is being replaced.

1. Allow worn chain to move out.
2. Loosen screws (1).
3. Take out chain guide (2).
4. Press the hold down (3) out using a screwdriver.
5. Put a new hold down in by turning it through the groove over the sprocket wheel.
6. Push chain guide in and tighten the screws.
7. Fit new chain in single fall designs as described in the preceding section.

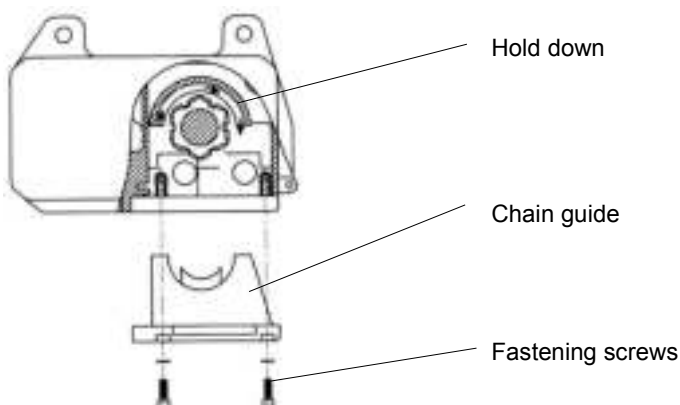


Figure 16: Replacing the load chain

Caution! The fastening screws for chain guides of the chain dimensions 9×27 and 11.3×31 must be screwed in by using locking paste during assembly. All components must be free of oil or grease in order to achieve optimal strength. For recommended locking pastes see chapter 11.5.



3.2 Electric connections

Electrical installation must comply with EN 60204-32 or relevant national regulations. After having completed the installation, checks must be executed in accordance with the European Regulation EN 60204-32, section 19 or national regulations. Details of the control can be seen in the wiring diagram. The electric installation complies with the currently valid EN 60204 part 32.



3.2.1 Mains power

The mains current supply (main incoming line conductor) must be able to be disconnected at all poles by means of a mains switch (in accordance with EN 60204-32 section 5.3). Work on the electrical installation may only be carried out by trained specialists and the equipment must first be disconnected from the mains power supply.

Fuses (slow blowing) at 400 V (3-phase) in front of main switch:

Fuse (slowly blowing)	Version
6 A	02../...; 03../...
10 A	05../...; 07../...; 09../...
16 A	091/57; 091/58; 11../...

Table 4: Fuses at 400 V

Check if the mains voltage complies with that specified on the type plate. Connect mains supply lines and control line in accordance with wiring diagram. The L1, L2, L3 and PE terminals for the main connection are located under the gear cap. Line 3 + PE (minimum cross section 1.5 mm²) are necessary for the connection.



After connecting, press the button for lifting. If the load moves downwards, interchange the L1 and L2 supply cores. The mains supply must be turned off! If the hoist is equipped with an emergency stop (according to EN 60204-32), it will be a red mushroom-shaped button on the pendant.



The cessation of the use of the hoist by the use of the emergency stop does not constitute the correct shutting down of the equipment.

The connection terminal for the control cable and the electric trolley are located under the gear cap.

The polarity of the supply network phases must be set for clockwise (right turning) rotation. If they are incorrectly set, the hoist will operate in reverse and will lift when the "Down" button on the control is pressed. Please ask your electrician to set the power supply correctly. The polarity of the supply network is correct if the hoist will lift the load upwards when the "Up" – button is pressed.

Fuses (slowly blowing) at 230 V (1-phase) in front of main switch:

Fuse (slowly blowing)	Version
6 A	030/01
10 A	050/01, 050/02
16 A	070/01, 070/02

Table 5: Fuses at 230 V

Check if the mains voltage complies with that specified on the type plate. Connect the mains supply lines and control line in accordance with the wiring diagram. The L1, N und PE terminals for the mains connection are located under the gear cap. Lines 2 + PE (minimum cross section 2.5 mm²) are necessary for the connection.



After connecting, press the button to lift. If the load moves downwards, interchange the Z1 and Z2 supply cores. Disconnect mains supply before! If the control unit is equipped with an emergency stop (EN 60204-32), you will find this button on your control pendant. In accordance with European regulations, the main switch must be installed in addition to the emergency stop and must be returned off after daily operation.



3.2.1.1 Direct control

Direct control means that the pendant is able to switch the full power.

Brake side

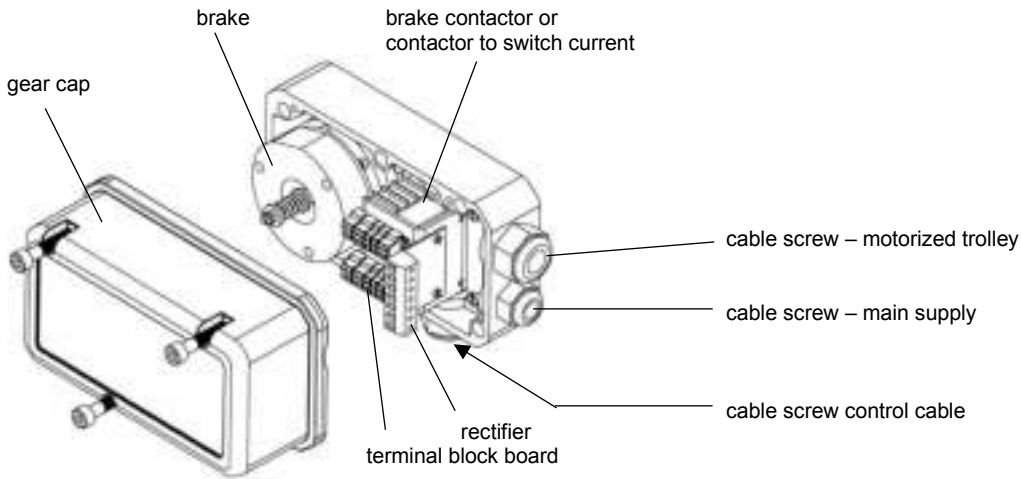


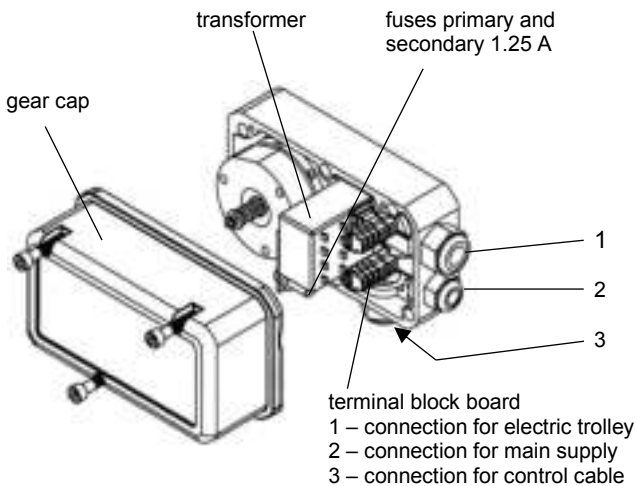
Figure 17: Direct control

3.2.1.2 Low voltage control 24 V

This mode of control is available as an option.

The contactors are easily accessible on a plate underneath the cap of electric control next to the lifting motor. On the same plate, you will find the optional limit switches. – See wiring diagram.

Brake side



Motor side

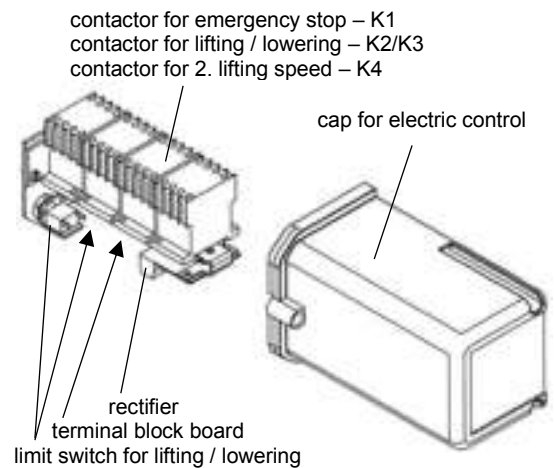


Figure 18: Low voltage control

The control occurs in the control circuit, which receives 24 volts through a safety transformer. Other secondary voltages are possible as well.

If the control is fitted out with an “emergency stop” in accordance with DIN EN 60204 part 32, a main contactor is also located under the motor side cap for control and the “emergency stop” button is fitted on the control pendant.

3.2.2 Electric limit switches for lift limitation

As an additional option, all electric chain hoists equipped with a low voltage control may be fitted with limit switches. (top and bottom limits).

These limit switches are operated by two buttons protruding out of the chain guide which can be activated either by the hook (top limit) or lift limiter (bottom position).

Caution! For the proper function of limits, the up/down directions at the pendant (see chapter 3.2.1) must be set correctly. Check the function for switching off by the limit switches for lifting and lowering.

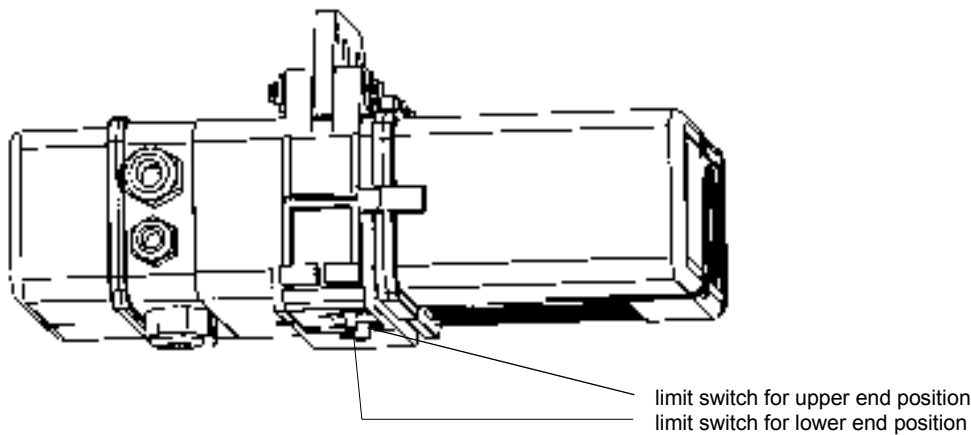


Figure 19: additional electric limit switches for low voltage

3.2.3 Voltages

The standard electric hoist supply is 400 volts, 3-phase 50 Hz. Different voltages and frequencies are available on request and are marked on the motor plate.

The electric chain hoists are suitable for operation with a voltage of 380 - 415 volts (3 phases). Other voltages are available on request.

3.2.4 Electric chain hoists for inverted use

Electric chain hoists can be delivered for inverted use. It is possible to convert the hoist to this mode of use after having bought it.
(The necessary parts can be supplied by the producer!)

In case of outdoor use protect the chain hoist from rainwater.
Check drain hole before outdoor use.

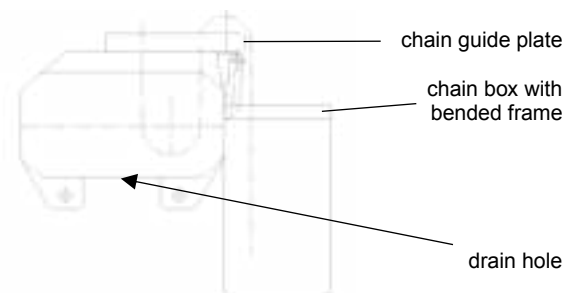


figure 20: electric chain hoist for inverted use

Caution! If the hoist is used in inverted use the chain leaving and entering the hoist must be kept tight at all times.

Non-compliance may result in chain jam in the chain guide and damage of the chain hoist and the chain itself.



4 Electric chain hoist with trolley

All trolleys are suitable for:

- flanges with small width in accordance with DIN 1025 and European regulations 24-62
- flanges with medium width in accordance with DIN 1025
- flanges with large width in accordance with DIN 1025



Elastic bumpers, stopping the trolley at about the centre of the running wheels, must be mounted as limit stops at each end of the track.

Additionally, the trolley can be fitted with an electric cross limit switch. Actuating bars at the travelling girder must be installed by user.

Trolley with max. carrying load [kg]	Radius of curves [m]
up to 1000	1
up to 3200	1.5
up to 6300	2

Table 6: Radius of curves

Run along curves

If the electric trolley has to run along curves, the trolley motor has to be assembled at the outer side of the curve at all times.

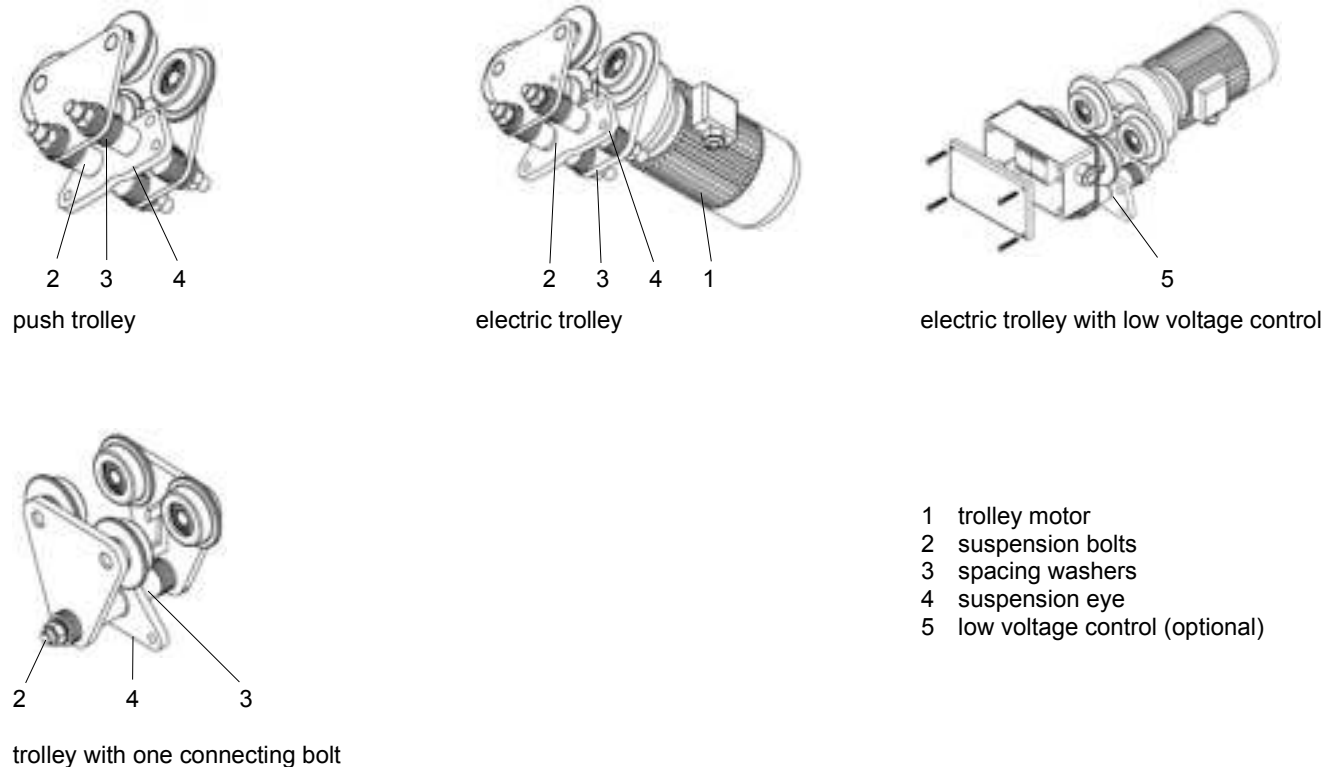


Figure 21: Trolleys

4.1 Mechanical assembly

4.1.1 Positioning the hoist underneath the trolley

Fit the suspension eye, which is included in delivery, onto the electric chain hoist as described in chapter 3.1.3.1. Please take care of the following assembly advice:

Direct control

Low voltage control

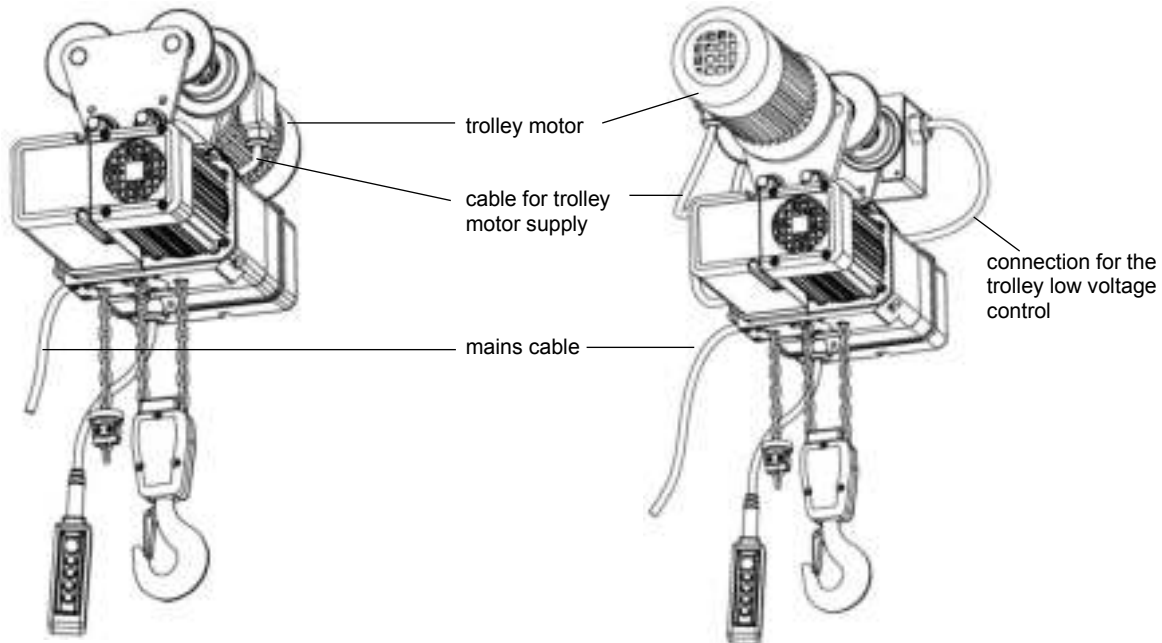


Figure 22: Positioning the hoist underneath the trolley

4.1.2 Assembly of a trolley with two connecting bolts

The two trolley connecting bolts are to be fixed to the lateral boards so as to allow a clearance of one to two millimetres between the running wheel flange and the girder flange.

The width is adjusted by inserting spacing washers **symmetrically**. The suspension eye is mounted between the spacing bushes on the trolley connecting bolts.



Tighten the nuts of the connecting bolts with a torque wrench.

Hexagon nuts	Tightening torque (Nm)
M16×1.5	75 Nm
M22×1.5	150 Nm
M36×1.5	560 Nm

Table 7: Tightening torques

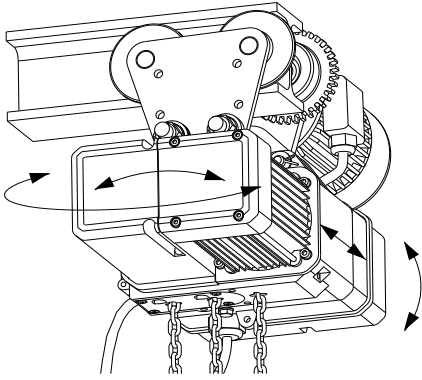


Figure 23: Flexibility between chain hoist and trolley

Caution! Movement in the directions shown by the arrows in Figure 23 must still be possible between the hoist and the trolley when assembly is complete.



4.1.3 Assembly of a trolley with one connecting bolt

The one trolley connecting bolt is to be fixed to the lateral boards so as to allow a clearance of one to two millimetres between the running wheel flange and the girder flange. The width is adjusted by inserting spacing washers **symmetrically**. Tighten the nuts of the connecting bolts with a torque wrench. Take care that the spacing bushes will not be braced! The relevant tightening torques are listed in Table 7.

4.2 Electric trolleys with counterweight

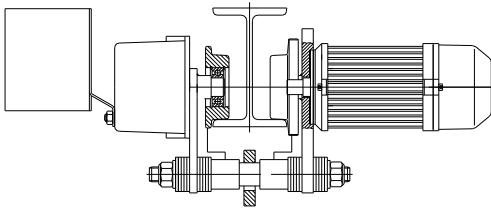


Figure 24: Counterweight for electric trolley

If electric trolleys, especially with double speed, are used on girders with a very small width, it may be necessary to provide a counterweight which prevents tipping up of the trolley. This unit can be retrofitted to each trolley. This kit does not influence any features of a standard trolley.

4.3 Electric connection of electric trolleys

Direct control

An electric cable which is clearly labelled and approx. 0.5 m long is located on the travel motor of the electric trolley for connecting to the electric chain hoist. The terminals are in the electric chain hoist casing. Connection should be carried out as shown in the wiring diagram.

The control pendant has push buttons for controlling the travel motion. The motorized trolley for fast and precision travelling speed has push buttons with two-step switching.

Low voltage control 24 V (option)

The contactors for switching the trolley motor are in a special contactor box. The contactor box must be assembled with two hexagon socket head cap screws M8x10 DIN 933 on the side-plate without the motor.

Connect the two leads protruding from the contactor box to the terminal section and to the trolley motor as shown in the wiring diagram. After electric connection, check that the electric chain hoist and trolley are working correctly.

4.4 Type designation for trolleys

Explanation of type designation for trolleys with two suspension bolts

	HF	N	/	500		
	EF	S1	/	1000	/	16
	EF	S2	/	2000	/	5+20
HF - push trolley	flange width			load capacity		travelling speed
EF - electric trolley	N, S1, S2			in kg		for electric trolleys

Explanation of type designation for trolleys with one suspension bolt

	EHF	N	/	1000		
	EEF	S1	/	1000	/	7,5+30
EHF - single bolt push trolley	girder width			load capacity		travelling speed
EEF - single bolt electric trolley	N, S1, S2			kg		m/min

5 Tests

Use of the electric chain hoist is possible in accordance with: Accident prevention regulations for

- Wind lasses, lifting and pulling equipment DGUV V54 (BGV D8)
- Cranes DGUV V52 (BGV D6)

The dynamic and static tests are accomplished according to EC Machinery Directive by manufacturer. The factory test is certified in the Inspection book.

The user of the chain hoist has to determine the test before initial operation and the regular tests.

Basically, the EC Machinery Directive point 4.1.3 'Fitness for purpose' applies here.



5.1 Test when used according to DGUV V54 (BGV D8) § 23

A trained specialist must test the equipment before starting operation for the first time and after extensive alterations.

5.2 Test when used according to DGUV V52 (BGV D6) § 25

An authorised person must test the cranes before starting operation for the first time and after extensive alterations. The electric chain hoists are type-approved.

5.3 Regular tests

- A trained specialist must test the equipment, cranes and supporting structures once a year. It may be necessary to carry out tests more often if the operating conditions are very harsh, for example, high percentage of use with full load, a dusty or aggressive environment, high duty rate, high number of operation cycles, etc.
- **Experts** for the inspection of cranes are the experts from the TÜV, the professional associations and the inspection experts in accordance with the Industrial Safety Ordinance.
- **Trained specialists** are highly qualified specialist personnel or the manufacturer's after-sales service personnel.

6 Directions and prohibitions for use

6.1 Directions for use

- The load may only be moved if it is slung securely, no person is standing near enough to be at risk and when the operator has received an all clear signal from the person slinging the load (DGUV V54 (BGV D8), § 29.1, para. 1).
- All electric chain hoists are suitable for an environment temperature of -20°C to $+40^{\circ}\text{C}$ as standard.
For use at higher environmental temperatures the duty rate must be reduced correspondingly.
- The standard protection class is IP 55.
- The motors are manufactured according to the requirement of Insulation Class F.
- Installation altitude $\leq 1000\text{m}$ above sea level.
- The load must be placed vertically under the electric hoist before lifting.
- The motion directions are indicated with symbols on the control buttons.
- Do not turn the chain over edges.
- Only the load, the hook block or the hook tackle may be pulled to move an electric chain hoist with push trolley horizontally.
- Consult the manufacturer or supplier if the hoist is to be used in an aggressive environment (for instance, in an acidic, alkaline or dusty environment or to transport inflammable or other dangerous loads).
- Do not lower the double fall hook if the chain gets slack.
- The chain leaving and entering the hoist in inverted use must be kept tight at all times.
- Repair work must be done only if mains supply is switched off and no load is suspended on the hook.
- After switching off the emergency stop, the reason for this failure must be found out by trained personnel and the hoist can only be used if all possible failures are removed.
- Lifting the load from the ground must be done at the lowest possible speed. Before doing this, the slack sling chains or ropes must be tightened carefully.
- Cranes in outdoor use require a roof for the park position.
- The S.W.L. of the trolley must be greater or equal to the S.W.L. shown on the load-hoisting accessory.
- The second chain fall must only be fitted with the fork supplied by the manufacturer.



6.2 Prohibitions for use

- **Inching mode**
- **Permanent run against the rubber buffers of the lowest and highest hook position (ultimate safety limit for emergency only)**
- **Transporting people**
- **Using the hoist while people are underneath the load**
- Starting initial operation before an expert or a trained specialist has inspected the equipment
- Moving loads heavier than the nominal load
- Pulling loads which are tilted or dragging loads
- Tearing off loads
- Removing the cover of vessels which are under vacuum
- Drop loads
- Lifting of submerged loads
- Moving a trolley by pulling the control pendant or the control cable, even if these are relieved of strain
- Carrying out repairs without disconnecting the current supply and without special knowledge
- Use of hoists with worn rubber elements or without a rubber washer on hook tackle, hook block or lift limiter
- Using the lifting chain to sling the loads
- Operation with a twisted chain caused by a swivelled hook block or wrongly mounted chain end
- Using the lifting chain, which is longer than the chain box capacity stated under the box (see chapter 3.1.5.2)
- Using the hoist with a higher duty rate as marked on the specification plate
- Using the hoist without having done the regular inspection
- Operation after S.W.P. is exceeded
- Fitting the second chain fall with a fork not supplied by the manufacturer
- When the hoist with trolley is used at girders, which are lower than or equal to 2.5 m above working platforms it is not allowed to grab onto the trolley travel girder. Touching the chain during operation is not allowed.



7 Maintenance

- Trained specialists must carry out all maintenance work.
- Maintenance Table 8 lists the parts and functions to be tested and the necessary maintenance work. Defects must be rectified immediately by a trained specialist. Defects must be reported immediately to the owner. The owner is responsible to get defects remedied by a trained specialist.
- Maintenance work may only be carried out if the electric chain hoist is not loaded and the main switch is switched off so that the power supply is disconnected.
- Shorten the periods between maintenance works in very harsh operating conditions, e.g. multi-shift operation, high number of switching actuation, poor environmental conditions, etc.



Checking for wear

- Check suspension hook and load hook for deformation (measure punch spacing) and cracks.
- The chain sprocket in the hook block must be replaced if the running surface is worn by about 1 mm.
- **Replace all rubber buffers if worn!**

7.1 Maintenance and checks

Please note chapter 1.2 !

If the hoist is working under hard conditions (two or three shifts, a high percentage of work with nominal load, in a dusty or high temperature environment), this maintenance work must be done more frequently.

	Check:		
	Daily	Every 3 months	Annually
Visual check of the entire equipment	•		
Function check of the brake of the lift limiter	•	•	
Check of the brake (point 7.2)			•
Maintenance or adjustment of the clutch			•
Wear of the load chain (point 7.4)		•	
Lubrication of the load chain		•	
Wear of the rubber elements (visual check)	•		
Lubrication of single and double fall hooks thrust bearings (point 11.3), check condition of the pin which prevent the hook nut from loosening and chisel punch marks			•
Check condition of safety latch	•		
Universal checks of all screws hold down, chain guide, twisted chain safety devices			• • •
Check of the condition and safe positioning of the chain bag and condition		•	
Check of the electric cable, power cable and pendant control			•
Check of the trolleys and wheels			•

Table 8: Test and maintenance work

The electric chain hoist is designed in accordance with FEM 9.511. According to FEM 9.755 the residual safe working period must be established and documented every year.

If the residual safe working period calculations are fully available, then the electric chain hoist must be subjected to a general overhaul when the theoretical safe working period (maximum safe working period) has been reached.

If the usage of the electric chain hoist is not certified, then pursuant to FEM 9.755 the general overhaul must be carried out not later than after 10 years.

