HADEF®

GB

Installation, Operating and Maintenance Instructions

Load Balancing and Traversing Device

67/19 AT

stationary with suspension ring **ATS**

Rev.03 5.52.445.00.00.03

NOTICE!

The installation or mounting instructions for incomplete machines you'll find in chapter "Installation".

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Heinrich De Fries GmbH will be named HADEF in the following text.
Original operating- and maintenance instructions in German language.
Translation in other languages is made of the German original.
A copy may be requested in writing or is available for download on www.hadef.com
Subject to changes.

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1 Information

The products meet European Union requirements, in particular the valided EU Machine Directive.

The entire company works acc. to a certified quality assurance system as per ISO 9001.

The production of components at our work is subject to strict, intermediate checks.

After assembly, each product is subject to a final test with overload.

For the operation of hoists, the national accident prevention regulations apply in Germany, amongst others.

The stated performance of the devices and meeting any warranty claims require adherence to all instructions in this manual.

Before delivery, all products are packed properly. Check the goods after receipt for any damage caused during transport. Report any damage immediately to the forwarding agent.

This manual allows a safe and efficiently use of equipment. Images of this manual are for a principle understanding and can be different from the real design.

NOTICE!

We refer to the prescribed equipment tests before initial start-up, before putting back into operation and the regular periodic inspections.

In other countries any additional national regulations must be observed.

1.1 Indications to determine the used part of the theoretical usage life.

For motor driven units.

The equipment (rope hoists, chain hoists, winches as well as crane hoisting units) are classified in drive groups (duty classification) according to their intended mode of operation, running times and load collectives and dimensioned according to the requirements derived from these.

They are thus only designed for a limited period of use with regard to the overall dimensioning and certification.

After the total period of use as elapsed, measures must be taken where parts are checked and exchanged as per indication by the manufacturer. After that a new maximum usage period is determined. See also the valued accident prevention regulations, “winches, lifting and pulling devices”.

NOTICE!
Commitment A general overhaul may only be performed by HADEF or by a specialized company, authorized by HADEF!

2 Safety

2.1 Warning notice and symbols

Warnings and notice are shown as follows in these instructions:

DANGER!	This means that there is a high risk that leads, if it is not avoided, to death or severe injury.
WARNING!	This means that there is a risk that could lead, if it is not avoided, to death or severe injury.
CAUTION!	This means that there is little risk that could lead, if it is not avoided, to slight injury or damage to the device or its surrounding.
NOTICE!	Gives advice for use and other useful information.
	Danger from electricity.
EX	Danger from explosive area.

2.2 Duty of care of the owner

DANGER!
Failure to follow the instructions of this manual can lead to unpredictable hazards. For any resulting damage or personal injury, HADEF assumes no liability.

The unit was designed and built following a risk analysis and careful selection of the harmonized standards that are to be complied with, as well as other technical specifications. It therefore represents state-of-the-art technology and provides the highest degree of safety.

Our delivery includes the hoist supplied beginning at its suspension and ending at the load hook and if supplied with control, the control line/hose that leads to the hoist. Further operating material, tools, load attaching devices as well as main energy supply lines must be assembled according to the valid rules and regulations. For explosion-proof equipment, all these parts must be approved for use in area prone to explosion, or they must be suitable for use in area prone to explosion. The owner is responsible for this.

However, in everyday operation this degree of safety can only be achieved if all measures required are taken. It falls within the duty of care of the owner/user of the devices to plan these measures and to check that they are being complied with.

Complete the operating and installation instructions by any instructions (regarding supervision or notifications)that are important for the special kind of use of the equipment, i.e. regarding organization of work, work flow and human resources.

In particular, the owner/user must ensure that:

- The unit is only used appropriately.
- The device is only operated in a fault-free, fully functional condition, and the safety components, in particular, are checked regularly to ensure that it is functioning properly.

- The required personal protective equipment for the operators, service and repair personnel is available and is used.
- The operating instructions are always available at the location where the equipment is used and that they are legible and complete.
- The unit is only operated, serviced and repaired by qualified and authorized personnel.
- This personnel is regularly trained in all applicable matters regarding safety at work and environmental protection, and that they are familiar with the operating manual and, in particular, the safety instructions it contains.
- Any safety and warning signs on the devices are not removed and remain legible.
- customers equipment at site must comply with currently applicable ATEX-regulations

WARNING!

It is not allowed to make constructive changes of the equipment!

2.3 Requirements for the operating personnel

The units may only be operated by qualified persons that are appropriately trained and that are familiar with it. They must have their employer's authorization for operation of the units.

Before starting work, the operating personnel must have read the operating and installation instructions, especially the chapter "Safety Instructions".

This is especially important for operating personnel that rarely uses the equipment, i.e. for installation or maintenance work.

DANGER!

In order to avoid severe injury, please pay attention to the following when using the equipment:

- Use protective clothes/equipment.
- Do not wear long hair hanging down open.
- Do not wear rings or other jewelry.
- Do not wear clothes that are too big/wide.
- Do not reach into ropes, chains, drive parts or other moving parts with your hands

2.4 Appropriate use

The appropriate use of the hoists is vertical traversing and horizontal balancing of non-guided loads.

WARNING!

Maximum lifting speed of the receiving hoist/crane max. 10m/min!

Traversing operation only permitted when the receiving hoist/crane is at a standstill!

The permitted safe working load of the devices must not be exceeded! An exception can be made during the load test before initial operation, carried out by a licensed qualified person.

- Defective devices and load suspension devices must not be used until they have been repaired! Only original spare parts must be used. Non-compliance will result in any warranty claims becoming void.
- Liability and warranty will become void if unauthorized modifications of the units are made by the user!
- The permissible ambient temperature when operating the devices:

Type of drive	Device classification for	
	not explosive atmosphere	Explosive atmosphere according to ATEX)*)**
Manually driven	-20°C/+50°C	-20°C/+40°C
Motor driven	-20°C/+40°C	-20°C/+40°C

) * At an atmospheric pressure range from 0.8bar to 1.1bar and an oxygen content of approx. 21%

) ** Devices of this category have been specially modified and labeled by the manufacturer

DANGER!

The ambient temperature range must not be exceeded!

NOTICE!

If the units are not used as intended, safe operation is not guaranteed.

The operator alone is responsible for all personal injury and damage to property resulting from improper use.

2.5 Basic safety measures

- Observe installation-, operation and maintenance instruction.
- Take notice of caution notes at units and in the manual
- Observe safety distances.
- Take care for a free view on the load.
- Only use the hoists appropriately.
- The equipment is to be used exclusively for movement of goods. Under no circumstances my persons be moved.
- Never load the devices beyond their working load limit.
- Pay attention to the accident prevention regulations (UVV).
- Should the hoist be used outside of Germany, please pay attention to the national regulations that apply.
- Supporting structures and load-attached devices used in conjunction with this equipment must provide an adequate safety factor to handle the rated load plus the weight of the equipment. In case of doubt, consult a structural engineer.
- If the equipment has not been used for a period of time, carry out visual checks of all main components such as chains, load hooks etc. and replace any damaged parts with new, original spare parts before putting the equipment back into operation!
- Do not use a hoist that is defective, pay attention to any abnormal noise it makes during operation.
- Stop working immediately in case of disturbances and remedy failures.
- Any damage and faults must be reported to a responsible supervisor immediately.
- If the unit is put into motion, any persons in the immediate vicinity must be informed by calling to them!
- Please pay attention to the regulations for load carrying devices UVV for both positive and non-positive methods of attaching loads.
- The lifting tackle or the load must be securely attached to the hook and be seated at the bottom of the hook.
- The safety catch of hooks must be closed.
- When charged, the housing may not be in contact somewhere.
- Stop lowering the load when the bottom block or the load is being set down or is prevented from being lowered further.
- The loose chain end may not be charged or locked.
- The load chain must not be twisted.
- Twisted chains must be aligned before attaching the load.
- The correct alignment of the chain links can be seen from the weld seams.
- The chain links must always be aligned in one direction.
- Do not bounce the load or hook against something.
- Check brakes daily before commencing work.
- The devices are not suitable for continuous operation. The duty cycles of the motors (see the technical data chapter) as well as the remaining life time of the equipment in accordance with FEM group and usage (see calculation of remaining safe working period) must be observed.

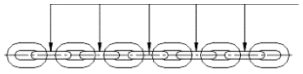


Illustration 1

WARNING!

The following is not allowed:

- to lift another load than the nominal safe working load
- to manipulate the sliding clutch if units are equipped with
- The use of elongated or damaged chains or wire ropes. Replace them immediately by new, original parts.
- Never loop the load chain around a load nor place or pull the chain over edges.
- Never repair damaged load hooks (e.g. by hammering), but replace them by original hooks.

3 Transport and Storage

CAUTION!

Transport may only be done by qualified personnel. No liability for any damage resulting from improper transport or improper storage.

3.1 Transport

The devices are checked and if so adequately packed before delivery.

- Do not throw or drop the equipment.
- Use adequate means of transport.

Transport and means of transport must be suitable for the local conditions.

3.2 Safety device for transport

NOTICE!

Should a safety device for transport exist, please remove it before commissioning.

3.3 Storage

- Store the equipment at a clean and dry place.
- Protect the equipment against dirt, humidity and damage by an appropriate cover.
- Protect hooks, wire ropes, chains and brakes against corrosion.

4 Description

4.1 Areas of application

The devices must be as far as possible installed in a covered room.

If they are used in the open, protect the units against the effects of weather such as rain, hail, snow, direct sunshine, dust, etc. - we recommend to use a cover in parking position. If the device is set up in a continuously humid environment with strong temperature fluctuations, the correct functionings are endangered by the forming of condensation.

During longer downtimes of motor-operated units, the brake may reduce the function by corrosion.

NOTICE!

Use only in the intended atmosphere with a humidity of up to 100%, but not under water!

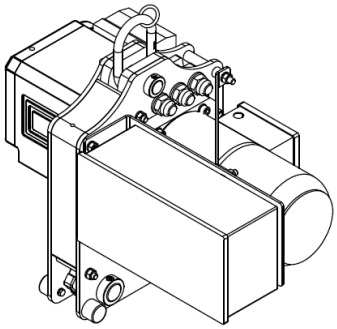
DANGER!

In particular, use is not permitted:

- for tearing loose fixed loads, dragging of loads as well as diagonal pulling
- for pulling against a fixed point without additional safety and/or measuring equipment against exceeding the nominal load
- in potentially explosive atmospheres, unless the equipment has been modified for this purpose and this is shown on special type plates it carries for this purpose.
- in reactor containments
- for transporting persons
- for holding lifted loads
- for scenic use
- when persons are under suspended loads

4.2 Desing

HADEF levelling and traversing devices are equipped with a suspension ring for stationary use.



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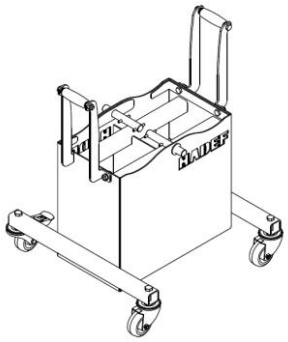


Transport box for 67/19 AT (optional)

4.3 Functions

The lifting gear are moved by pressing the buttons on the control switch. The spring-pressure brake installed in the electric motor of the lifting gear prevents the independent moving of the load after the push button has been released.

NOTICE!

The best protection against functional failures in case of extreme environmental impact is the regular use of the equipment.

If the hoist is not used very often, we recommend to carry out a test run at least once a week and to switch on the motor several times during this test run.

In our experience, this will prevent the brake from sticking.

4.4 Important components

NOTICE!

The proven quality components of the AK series are installed in all units

4.4.1 Motor

Electric motor

4.4.2 Gear

Stirnradgetriebe bzw. Planetengetriebe der AK-Serie

4.4.3 Control

Control switch with emergency stop

Assignment of the control options

	Kind of Control		
	low voltage control	Radio control*	Frequency control*
AT4-10	X	X	X

*Optional

4.4.4 Rotation direction/ Phase sequence relay

Protection against wrong net connection

4.4.5 Overload protection

through electric lifting force limiter

Illustration 2

4.4.6 Operating hours counter

to accumulate measurements of operating hours, the time the unit has been in operation.

Illustration 3

4.4.7 Gear limit switch

as limit switch and for switching off during operational approach of the highest and lowest hook position

Illustration 4

4.4.8 Load chain

nach EN 818-7-T in Sondergüte according to EN 818-7-T in special grade

4.4.9 Load hooks

ball bearing hooks with hook safety device

4.4.10 Transport box, mobile (optional)

for setting down the unit with the chain when not in use.

The balancer and traverser are fixed to the transport box by means of bolts.

The transport box including the balancer and traverser can be transported together with the crane. A suspension ring is provided on the unit for this purpose.

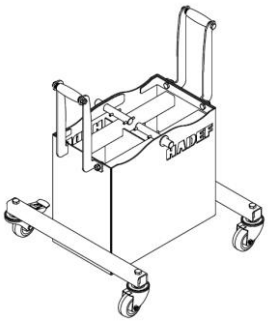


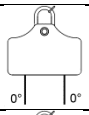
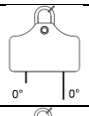
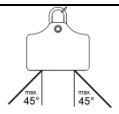
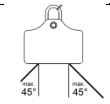
Illustration 5

4.4.11 Overheat protection electric motor (Only for contactor control)

Default	Optional
PTO*	PTC**

*thermocouple **PTC thermistor with tripping device

5 Technical data

Type				AT4	AT6	AT8	AT9	AT10
Total load capacity, max.			kg	500	1000	2000	5000	10000
Load capacity with symmetrical load distribution max. with deflection angle	∢ 0°		kg	250/250	500/500	1000/1000	2500/2500	5000/5000
Load capacity with asymmetrical load distribution max. with deflection angle	∢ 0°		kg	10/490	10/990	10/1990	10/4990	10/9990
Load capacity with symmetrical load distribution max. with deflection angle	∢ 45°		kg	250/250	500/500	1000/1000	2500/2500	5000/5000
Load capacity with asymmetrical load distribution max. with deflection angle	∢ 45°		kg	150/350	300/700	600/1400	1500/3500	300/7000
	Drive unit			AK4	AK6	AK8	AK9	AK10
	FEM 9.511 / ISO4301			3m/M6	3m/M6	3m/M6	3m/M6	3m/M6
	Chain		mm	5x15	7x21	11,3x31	16x45	23,5x66
	Useful length chain		m	2	2	3	3	5
	Total length of the chain		m	4,5	4,5	6,5	6,5	10,5
	Adjustment speed approx.		m/min	9,4/2,3	8,0/2,0	8,0/2,0	5,4/1,35	5,8/1,4
	Motor power		kW	0,75/0,18	1,5/0,37	4/1,1	5,5/1,4	12/2,5
	Operating mode S3		%ED	40/25	40/25	40/25	40/25	40/25
	Power consumption		A	2,4/1,1	4,1/2,1	10/6	12,5/6,4	28/9
	Noise level at 1m distance (tolerance +2 dB(A))		dB(A)	60	67	70	75	75
	RUD suspension ring type VAKO		mm	110x60x13	110x60x16	135x75x18	160x90x22	340x180x32
	Weight ~		kg	*)	*)	235	*)	*)
	Weight transport box ~		kg	*)	*)	30	*)	*)

*) This information was not available at the time of printing.

HADEF chain hoists AK+AP+AT 4-10 are fitted with high-quality load chains. These chains meet all technical requirements as per EN 818-7-T.

Type AK+AP+AT	chain
4	5 x 15
6	7 x 21
7	9 x 27
8	11,3 x 31
9	16 x 45
10	23,5x66

3-phase current motor 400V/50Hz - IP55 – F – max. 1000 m above sea level.

Order-related Special data, refer to the motor nameplate.

6 Installation

6.1 Stationary suspension ATS

The units are supplied with a suspension ring as standard.

AT4-10

Stationary version with suspension ring for hooking into a crane hook

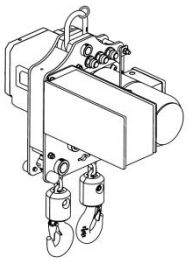


Bild 6

Transport box (optional)

The levelling and traversing unit is placed on the transport box and secured by means of a plug pin

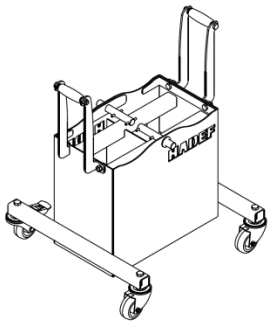
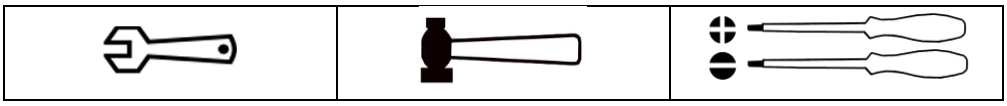


Bild 7

6.2 Tools



7 Control

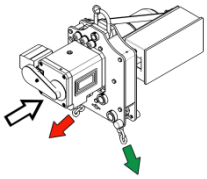
The unit may only be operated by qualified and instructed persons. They must be authorised by the entrepreneur to operate the unit. The entrepreneur must ensure that the operating instructions are available on the unit and accessible to the operating personnel.

Control buttons

Control symbols shown are for optical information only and can vary depending on the control module.

Pendant control - movement right/left

(note direction of wiev⇗)



1 EMERGENCY STOP
2 Reset
3 Movement right (slow-fast)
4 Movement left (slow-fast)

Illustration 8

Push button functions (E)

Relieved push button = stand still
push button half pushed = slow speed
push button pushed completely = fast speed

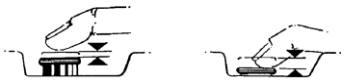


Illustration 9

Red Emergency-Stop button

button pushed = stand still
turn the button clockwise = free functions

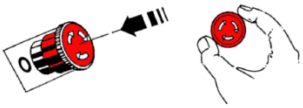


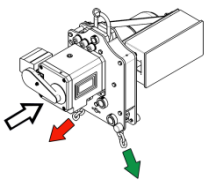
Illustration 10

NOTICE!

Lockable Emergency-Stop buttons must first be opened with the key before unlocking!

Radio control

(note direction of view⇗)



1 EMERGENCY STOP
2 Start
3 Start
4 Reset (after overload)
5 Movement right (slow-fast)
6 Movement left (slow-fast)

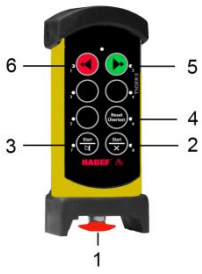


Illustration 11

To start, press buttons (2+3) simultaneously for ~ 3 seconds.
To move the chain to the right or left, press button (5 or 6).
After the overload protection has been activated, the reset button (4) must be pressed for ~ 2 seconds until the LED display in the control box goes out again.

8 Operation

The following, important points must be observed when operating the equipment:

- Read the safety instructions.
- Never load the devices beyond their working load limit.
- When changing the motor turning direction, allow the motor to come to a standstill first.
- The prescribed maintenance intervals must be adhered to.
- Observe the duty cycle, i.e. intermittent operation S3-40% ED (as per VDE 0530) means that in a period of 10 minutes the motor can operate – no matter the height of the load – for 4 minutes. It is therefore irrelevant whether the 4 minutes are continuous (i.e., in case of very high lifting heights) or are made in intervals.
- The lifting tackle or the load must be securely attached to the hook and be seated at the bottom of the hook. The safety catch must always be closed.

DANGER!

In particular, use is not permitted:

- for tearing loose fixed loads, dragging of loads as well as diagonal pulling
- for pulling against a fixed point without additional safety and/or measuring equipment against exceeding the nominal load
- in potentially explosive atmospheres, unless the equipment has been modified for this purpose and this is shown on special type plates it carries for this purpose.
- in reactor containments
- for transporting persons
- for holding lifted loads
- for scenic use
- when persons are under suspended loads

NOTICE!

The overload is set at the factory according to the specifications in the test book. During operation, the nominal load of the unit must not be exceeded!

9 Commissioning

9.1 General

The operator of the unit is responsible for the entire system.

According to the Ordinance on Industrial Safety and Health, a hazard analysis must be carried out by the operator.

Observe the respective national standards, regulations and directives of the responsible bodies at the place of operation.

9.2 Power supply

9.2.1 Mains connection

Hoist motor technical data can be found it in the "Technical data" chapter.

The following tables show the assignment of the fuses.

- Select connection cross-sections as per VDE 0100.
- Put sleeves on the ends of the cables.
- Insert the connection cable into the connection plug without strain.
- Secure lines as per VDE 0100.

9.2.2 Control line connection

Pendant with cable and plug-in connection. Plug-in before use.

Any changes of the power supply cable must only be effected by qualified personnel.

9.2.3 Power connection of the brake

The low-maintenance D.C. spring-pressure brakes are connected at the factory according to the wiring diagram.

9.2.4 Wiring diagram

Wiring diagrams are situated in the terminal box or can be requested from HADEF by metioning of serial number.

9.2.5 Assignment recommendation of line cross-sections and fuses

Assignment of line cross-sections and fuses must be done acc. to VDE0100.

For total motor output add all motor output data. The technical data of the motors are found in chapter „Technical Data“ resp.on the motor name plates.

Motor output up to	Fuse Slow-blow	Start up-/ Nominal current	Line cross section (mm²) for line length L (m)		
kW	A	Ia / In	L < 50	50 < L < 100	100 < L < 150
1,1	10	3-7- times	1,5	2,5	4
2,2	16				
4	20		2,5	4	6
5,5	35		4		10
12	50		6	10	

NOTICE!

The values listed in the table refer to 400V/50 Hz three-phase current and are recommendations.

The exact determination of the supply line must be carried out on site by a specialist.

Alternating current design

Motor output	Fuse Slow-blow	Start up-/ Nominal current	Line cross section (mm²) for line length L (m)		
kW	A	Ia / In	L < 50	50 < L < 100	100 < L < 150
0,55	10	3-7fach	1,5	-	-
2,2	16		2,5		

NOTICE!

The values listed in the table refer to 230V/50 Hz alternating current current and are recommendations.

The exact determination of the supply line must be carried out on site by a specialist.

9.3 Gear

NOTICE!

For transport, some gear types are fitted with a plug screw. Replace the plug screw by a ventilation screw (attached) before putting the unit into operation.

9.4 Load chain

- Before commissioning the load chain must be aligned and oiled.
- Move safety note and fixing wire away from the chain.

CAUTION!

Do not use grease for lubrication of load chain.

Without lubrication, manufacturer's warranty and/or liability will be void.

NOTICE!

Continuous, thorough lubrication will increase the life of the chain considerably.

10 Safety check

Before putting into service initially or when putting back into service, it must be checked whether:

- All fastening screws (if existent), socket pins, flap socket and safety devices are tightened and secured.
- The oil levels in the gear boxes are sufficient.
- All movements of the load comply with the symbols on the control switch.
- The chains are correctly placed, oiled and in good condition.

11 Functional test

11.1 Checks before the initial start-up

Traversing unit

- Chains must not be twisted.
- Lubricate chain with gear oil or suitable chain lubricant before first load.

11.2 Function test

Drive unit

Observe the viewing direction! ⇗

First check the function of the "right⇘ - eft ⇙ " without load.

The buttons for "Right⇘ - Left⇙" must correspond to the symbols on the control switch.

If the directions of movement do not correspond to the symbols on the control switch when the buttons are actuated, two phases of the mains cable must be reversed.

Check the function of the limit switches by operating them manually. Carefully approach the end position and readjust if necessary.

Check the function of the brake with load. The load must be held after releasing the control buttons.

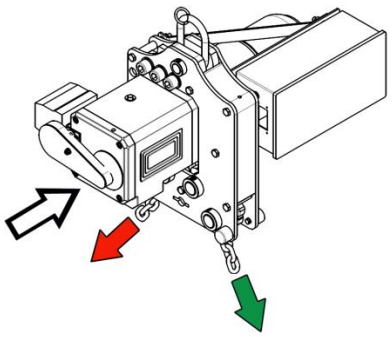


Illustration 12

NOTICE!

The limit switch function will only work if the movement direction of the load (lifting - lowering) corresponds to the push buttons of the control switch.

12 Maintenance

12.1 General

All monitoring, servicing and maintenance operations are to ensure correct functioning of the equipment; they must be effected with utmost care.

- Only “qualified persons” may do this work.
- Servicing and maintenance work must only be done when the hoist is not loaded.
- Records must be kept of all test results and measures taken.

12.2 Monitoring

The monitoring and servicing intervals stated are valid for operation under normal conditions and single-shift operation. In case of severe operating conditions (e.g. frequent operation with full load) or special environmental conditions (e.g., heat, dust, etc.), the intervals must be shortened correspondingly

12.3 Replacing the load chain

VORSICHT!

If there is any visible damage and when the conditions for replacement are reached (i.e. one or several dimensions in the table have been reached, there is corrosion or elongation), the chain must be replaced.

When replacing the chain, also check the chain wheels.

Procedure:

- Only insert new chains in an unloaded state.
- Remove the load hooks from the chain and hook a laterally open chain link into it..
- A chain link which is open at the side, can easily be produced by grinding out a small piece. The opening must have the same thickness as the chain link.

Illustration 13

- Hang a new original chain (same size and oiled) in the side opened chain link and insert it.

NOTICE!

The weld seam of the chain must be on the outside.

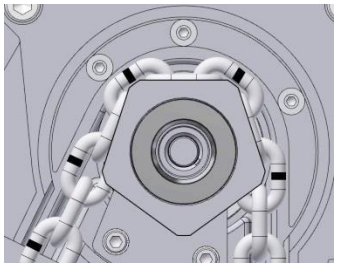


Illustration 14

- Make sure the chain is not installed twisted.
- Make sure the chain links are aligned in one direction.
- Assemble the load hooks to the chain.

12.4 Brake motor AK 4-8

Brake: 180 V DC

Chain hoist Type	Nominal brake moment (Nm)	Nominal air gap (mm)	air gap max. (mm)	Rotor strength min. (mm)
AK 4	10	0,2	0,8	5,5
AK 6	20	0,3	0,8	7,5
AK 7	28	0,3	0,9	9,5
AK 8	28	0,3	0,9	9,5

12.5 Brake motor AK 9-10

Brake: 180 V DC

Chain hoist Type	Nominal brake moment (Nm)	Nominal air gap SLü (mm)	air gap max. (mm)	Rotor strength min. (mm)
AK 9-10	32	0,3	0,7	8,0

12.5.1 Assembling the brake

1 Insert the retaining ring (1) into the shaft slot.
2 Insert the feather key (2) into the motor shaft.
3 Fix hub (3) with retaining ring (1).
4 Assemble the friction plate (4) if existent.
5 Push the rotor (5) onto the hub (3).
6 Lock the magnet body with the 3 fastening screws (6).
7 Set air gap “a” (refer to “adjusting the air gap”)
8 Assemble the dust-protection ring (7) if existent.

9Electric connection

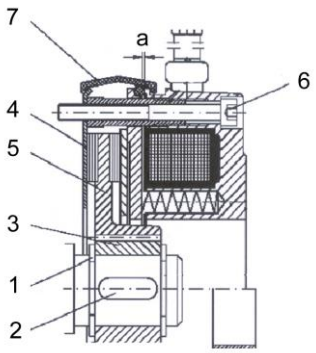


Illustration 15

12.5.2 Disassembly of the brake

Disassembly is performed in reverse order to the assembly.

12.5.3 Adjusting the air gap

View "X" on the brake.

1 Loosen the locking screws (6) by half a turn.
2 Turn the cap screws (8) into the magnetic body (9) anti-clockwise.
3 By turning the locking screws (6) clockwise, move the magnetic body (9) towards the anchor plate (10) using a feeler gauge until nominal air gap “a” is reached (see table).
4 Unscrew the cap screws (8) from the magnetic body clockwise.
5 Tighten the locking screws (6).
6 Check the air gap again and re-adjust if necessary.

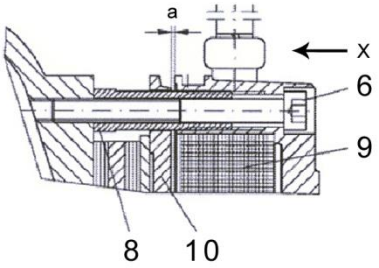


Illustration 16

12.6 Overload protection

If the unit does not move the permissible load, the overload protection must be readjusted. This may only be done by a service company authorised by the manufacturer!

DANGER!

The factory setting of the overload protection is secured by sealing. Any change will invalidate the warranty. If maintenance is required, contact a service company authorised by the manufacturer.

DANGER!

The overload protection serves exclusively to protect against damage to the device due to overloading when moving loads. Its function must not be integrated into the operational work process!

12.6.1 Electronic load limitation

12.6.2 Limitation active in both directions of movement!

Illustration 17

The power consumption of the motor is measured when moving a load by means of adjustable active power meters. The setting is made via separate relays for the main and fine speed. The power consumption of the motor is load-dependent and increases with increasing load. If the set value is exceeded, the relay reacts immediately and switches off the motor via corresponding switching elements. This is signalled by an LED display in the switch box.

After the overload protection has responded, the reset button must be pressed for approx. 2 seconds until the LED display goes out again.

The load must be reduced to the nominal load before moving the motor again!

13 Inspection

All test conditions and results shall be recorded in the test book.

13.1 General Overhaul

The valid national accident prevention regulations and the measures for achieving "safe operating periods (S.W.P.)" according to FEM9.755 must be observed.

Accordingly, the operator must take the equipment out of service or subject it to a general overhaul at the end of the "theoretical service life D".

Conditions for continued operation must be specified.

The operator must ensure that the conditions for continued operation are met.

13.2 Periodic checks

Independently from the regulations of the individual countries, lifting devices must be checked at least yearly by a qualified person or licensed qualified person regarding its functional safety.

13.2.1 Components to be checked

The following must be checked:

- Dimensions of chain, load hook, bolts, brake linings.
  These are to be compared with the table dimensions
- Visual inspection for deformation, abrasion, cracks and corrosion.

13.2.2 Inspection intervals

	commissioning	daily checks	1st maintenance after 3 months	Inspection and maintenance every 3 months	Inspection and maintenance every 12 months	Inspection and maintenance every 36/60 months
Inspection of the equipment by a qualified person (periodic inspection)					X	
screw connections	X				X	
Brake function - brake discs	X	X				
Overload protection by current cut-off	X				X	
Clean and oil the chain	X	X*)	X	X		
Chain, elongation + wear				X		
Hooks, cracks + deformation					X	
Bearing chain pulleys, check + lubricate					X	
Gearbox, oil change						X*)
*) see chapter "Maintenance						

WARNING!

If one or several of the dimensions fall below or exceed the dimensions in the table, or if cracks or corrosion are found, the parts must be replaced with original spare parts.

13.3 Checking the load chain

CAUTION!

The load chain must be tested over its entire length!

The measure of the load chain must be carried out especially in the areas which are subject to the highest wear. Through the lifting movement, these are the contact points of the chain with sprocket wheel and deflection pulleys.

acc. DIN 685-part 5

L11 = pitch increase over 11 chain links

L1 = pitch increase over 1 chain link

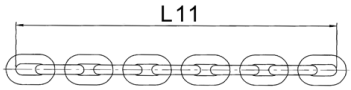


Illustration 18

dm= detected link diameter (d1+d2)/2

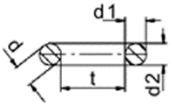


Illustration 19

Chain dimensions

Dimension	Chain dimension					
mm	5x15	7x21	9x27	11,3x31	16x45	23,5x66
L11	171,4	238,8	300,8	348,1	505,6	743,0
L1	16,0	22,4	28,1	32,7	47,4	69,5
dm	4,6	6,5	8,2	10,2	14,4	21,2

WARNING!

When the dimensions listed in the table are reached due to wear or deformation, the chain must be replaced!

13.4 Checking the load hook

load Hook AT4 bis AT8

a1 = biggest hook mouth width

t1 = thickness of hook base

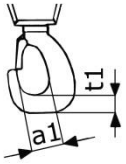


Illustration 20

load hook AT9 + AT10

X = biggest hook mouth width

Y = measurement from hook no. 6 up

H = thickness of hook base

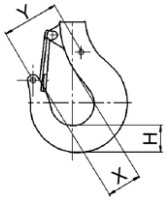


Illustration 21

Dimensions for load hook AT 4-8

Maß	Typ AT4		Typ AT6		Typ AT8	
a1 max.	37,5	43,5	43,5	60,0	--	--
t1 min.	17,1	20,9	20,9	27,6	--	--
Hook Nr.	--	--	--	--	1	1,6
X	--	--	--	--	40	45
H	--	--	--	--	40	48

Please fill in the measured values before commissioning:

Capacity	t
a1	mm
t1	mm
X	mm
H	mm

Dimensions for load hook AT 9-10

Dimen-sion	Capacity in t		
mm	5	6,3	10
Hook Nr.	1,6	1,6	4
X	45	45	56
Y	--	--	--
H	48	48	67

Please fill in the measured values before commissioning:

Capacity	t
X bzw. Y	mm
H	mm

CAUTION!

When the dimension of hook opening width is deformed more than 10% or when the dimension of the hook bottom thickness is fallen short of by 5% due to wear, the hook must be replaced.

13.5 Inspection – Gear – Oil level

Check oil level all 3 month.

	Locking screw(C)	Tool
AK 4 – AK 6	M10	SW8
AK 7 – AK 8	M12	SW10

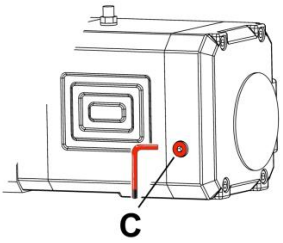
Solve the locking screw (C) a bit. (do not remove)
If oil drips out = level OK.
Tighten the screw.

If no oil drips out, carry out maintenance and oil change.
(see chapter maintenance)

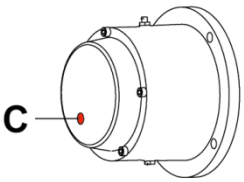
AK 9 - 10	Oil gauge glass (C)

Oil gauge glass half full = level OK
No oil observable = carry out maintenance and oil change.
(see chapter maintenance)

AK 4-8



AK9-10



14 Service

14.1 Load chain

Wear at the links is mainly due to insufficient maintenance of the chain.

To ensure optimal lubrication of the links, the chain must be lubricated at regular intervals, depending on usage.

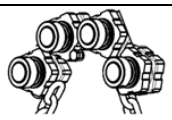
- Lubricate the chain with oil that creeps.
- Always lubricate the chain when it is not under load so that the oil can wet the links affected by wear. It is not sufficient to lubricate the chain from the outside, as this will not ensure the formation of a lubricating film within the links. The adjacent link points must always be lubricated to prevent excessive wear.
- If the same lifting operations are carried out constantly, the switching area from a lifting to a lowering movement must be given special attention.
- Thoroughly effected lubrication of the chain will prolong the life of the chain by approx. 20 times, compared to dry run with unlubricated chain.
- Wash dirty chain with petroleum or a similar cleaner, under no circumstances heat the chain.
- If there are environmental influences that foster wear, such as sand, a dry lubricant should be used, e.g. graphite powder.
- When lubricating the chain's condition of wear should be checked.

Use		**Recommendation**		**Interval**
Load chain		oil for example: FUCHS RENOLIN PG 220 or special chain lubricant Use **NO** grease!	0,2 l	3 month

CAUTION!

Do not use grease for lubrication of load chain.
Without lubrication, manufacturer's warranty and/or liability will be void.

14.2 Umlenkrollen

Use		**Recommendation**		**Interval**
Pulleys		FUCHS RENOLIN PG220	Acc. to demand	12 Month

14.3 Load hook

- Check bearings and pulleys yearly
- Clean and lubricate the bearings of hooks and pulleys with grease
- Slight bearings are maintenance free
- When bearings resp. slight bearings are worn of, change the complete pulley

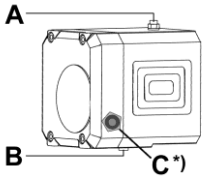
Use		Recommendation		Interval
Load hook bearing		FUCHS RENOLIN PG220	Acc. to demand	12 month

14.4 Gear

- Low maintenance
- Regular lubricant check required
- Lubricant change after 3 years
- Shortened maintenance intervals in case of increased dust or dirt load or continuous operation at maximum load
- Lubricant: synthetic, viscosity VG 220

A = Oil filler or breather plug
B = Oil drain plug
C = Oil level sight glass

AT4 – AT8



AT9+AT10

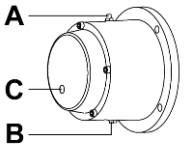
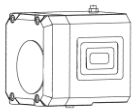
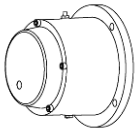
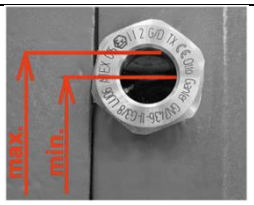


Illustration 22

Use		Recommendation		Interval
Spur gear		FUCHS RENOLIN PG 220	AT4 – 0,45 l AT6 – 1,00 l AT7 – 1,90 l AT8 – 1,90 l	Lubricant change 3 years
Planetary gear		FUCHS RENOLIN PG 220	AT9 = 0,35 l AT10 = 3 l	Lubricant change 3 years
Spur gear *) Planetary gear			Maximum fill level = gauge full filled Minimum fill level = gauge half filled	

*) only by explosion proof electrical equipment

14.5 Electric motor

For the motor it is sufficient to keep the cooling airways clean and monitor the roller bearing and its lubrication status.

A high temperature fat must be used if the roller bearing is replaced.

⚠ CAUTION!

Brake linings and surfaces must always be clean and fat-free. Even very small amounts of dirt can reduce the braking moment considerably.

14.6 Lubricant selection

FUCHS	SHELL	ESSO	ARAL	MOBIL	TOTAL	CASTROL	KLÜBER
Renolin PG 220	Omala S4 WE 220	Glycolube 220	Degol GS 220	Glygoyle 30	CARTER SY 220	--	Klübersynth GH 6-220
Renolin PG 320	Omala S4 WE 320	Glygolube 320	Degol GS 320	Glygoyle 320	--	--	Klübersynth GH 6-320
Renolin PG 460	Omala S4 WE 460	Glygolube 460	Degol GS 460	Glygoyle 460	--	Alphasyn PG 460	Klübersynth GH 6-460
Renolit FEP2	Alvania EP2	Unirex EP2	--	Mobilux EP2	MULTIS EP2	--	--
Renolin B10 VG32	Tellus Oil 32	--	--	--	--	--	--
Stabylan 5006	--	--	--	--	--	Optimol Viscoleb 1500	Klüberoil 4UH 1-1500
Chain lubricant OKS 451							

14.7 Lubricant for food industry – selection (as option*)

	MOLYDUVAL	SHELL	MOBIL	CASTROL	KLÜBER
Gear	SYNTHOLUBE A 220 LM	Cassida Fluid GL 220	Glygoyle 220	Optimol GT 220	Klübersynth UH1 6-220
Driving gear	SYNTHOLUBE A 220 LM	Cassida Fluid GL 220	Glygoyle 320	Optimol GT 320	Klübersynth UH1 6-320
Load chain	--	--	Lubricant FM 100	Optimol Viscoleb 1500	--
Load hook Pulley Spur gear Pinion	--	FM Grease HD 2	Mobilegrease FM 222	--	--

* must be mentioned by order

15 Trouble

Please pay attention to the following in case of problems:

- Troubles with the equipment must only be repaired by qualified personnel.
- Secure the unit against unintended operation start.
- Put up a warning note indicating that the unit is not to be used.
- Secure the working area of moving parts of the unit.
- Please read the chapter "Safety instructions".

Notes on the repair of faults are found in the following table.

For the repair of failures please contact our service department.

⚠ CAUTION!

Trouble caused by wear or damage to parts such as wire ropes, chains, chain wheels, axes, bearings, brake parts, etc., must be remedied by replacing the parts with original spare parts.

16 Remedy

Problem	Cause	Remedy
Unit cannot be switched on	No main power	Check connection to mains supply
	Phase sequence not correct (with low voltage control)	Exchange 2 phases *(see waring note on the connection plug)*
	Voltage drop in the supply line > 10%	Ensure correct supply voltage
Hoist motor does not run	Fuse burnt out	Replace the fuse
	Defective switching unit in the control button switch	Replace the switching unit
	Interruption in the control cable	Check control cable and replace if necessary.
	Overheat protection has tripped*	Allow motor to cool down
	Defective coil - mechanic or electric overload	Motor must be repaired by a specialist
Hoist motor runs – chain does not move	Overload protection is activated - (with overload)	Reduce the load to nominal load
	Overload protection is activated - (with =< nominal load)	Check settings and adjust if necessary
	No or incorrect power transmission	Let the unit be repaired by en expert
	Blocking by transverse chain link	Check chain - lubricate if necessary
Motor hums and has high current consumption	Defective coil / Rotor is rubbing	Motor must be repaired by a specialist
	Brake does not release	See problem “Brake does not release” Check the connection of the brake acc. to the wiring diagram
Motor does not brake or has excessive afterrunning.	Switching error after intervention in the electric circuit	See problem “Brake does not release” Check the connection of the brake acc. to the wiring diagram
	Brake linings are worn or dirty	Brake lining carrier must be replaced completely
	Air gap is too large	Raadjust the air gap
Brake does not release	Brake rectifier defective	Replace the brake rectifier
	Brake current relay defective	Replace the brake current relay
	Brake coil is defective	Replace the brake coil
	Permissibe air gap is exceeded due to worn out brake lining	Readjust the air gap and replace the brake lining if necessary
Fuses burnt out or motor contactor is triggered	Short circuit in component	Eliminate the short circuit
	Motor has a short circuit in the body or windings	Have the fault rectified by a specialist
	Motor is switched incorrectly	Correct the switching
	Wrong type of fuse	Replace the fuse with correct one *(see table "Fuses")*

17 Decommissioning

WARNING!

It is essential that the following points are observed in order to prevent damage to the equipment or critical injury when the device is being decommissioned:

It is mandatory that all steps for decommissioning the machine are carried out in the indicated sequence:

- First secure the working area for decommissioning, leaving plenty of space.
- Read the chapter "Safety instructions".
- Disassembly is carried out in reverse order to the assembly.
- Please make sure that all operating material is disposed of in accordance with environmental regulations.

17.1 Temporary decommissioning

- Measures are as above.
- Also read the chapter “Transport and storage”.

17.2 Final decommissioning/disposal

- Measures are as above.
- After disassembly, ensure that the disposal of the equipment and any materials it contains is carried out in accordance with environmental regulations.

18 Additional documents

18.1 Electric wiring diagrams

Electric wiring diagrams are attached to the consignment or included in the terminal box.

Except for units supplied without control.

18.2 Radio control (as option)

Should the unit be fitted with radio control, a manual for radio control is attached to the consignment.