



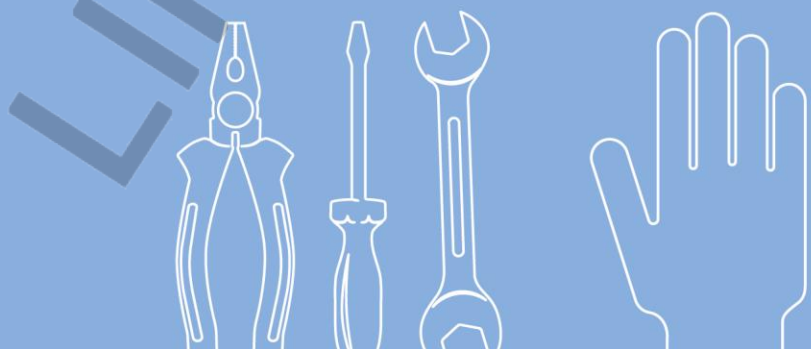
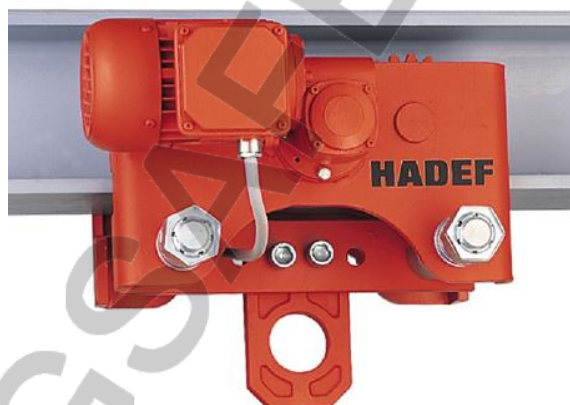
# Installation, Operating and Maintenance Instructions

## Monorail Trolley

### 20/94 AF

as monorail push travel trolley  
as monorail hand geared trolley  
as monorail electric trolley  
as monorail pneumatic trolley

AFR  
AFH  
AFE  
AFP




**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](http://www.hadef.com)

Subject to changes.

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## 1 Information

The products meet European Union requirements, in particular the validated 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 efficient 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.


## 2 Safety


### 2.1 Warning notice and symbols

Warnings and notice are shown as follows in these instructions:

 <b>DANGER!</b>	This means that there is a high risk that leads, if it is not avoided, to death or severe injury.
--	---

 <b>WARNING!</b>	This means that there is a risk that could lead, if it is not avoided, to death or severe injury.
---	---

 <b>CAUTION!</b>	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.
---	--

 <b>NOTICE!</b>	Gives advice for use and other useful information.
--	--



Danger from electricity.



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

Horizontal movement on beams up to the maximum rated load.

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 <sup>)</sup> <sup>**</sup>
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.
- Motor drive is prohibited.

### 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:

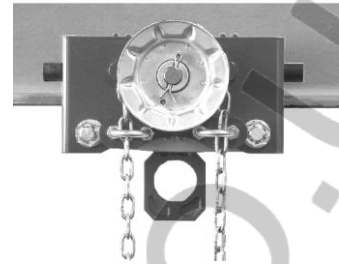
- in potentially explosive atmospheres, unless the equipment has been modified for this purpose and this is shown on special type plates it carries for this purpose.
- in reactor containments
- for transporting persons
- for holding lifted loads
- for scenic use
- when persons are under suspended loads

## 4.2 Design

HADEF trolleys with 2 load bolts.



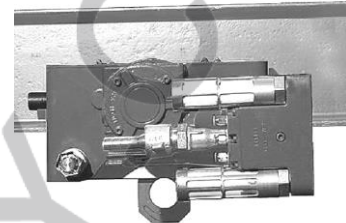
Type 20/94 AFR, with push travel trolley



Type 20/94 AFH, with hand geared trolley



Type 20/94 AFE, with electric trolley



Type 20/94 AFP, with pneumatic trolley

## 4.3 Functions

Push travel trolley:

The trolley is moved by pushing the load.

Hand geared trolley:

Hand geared trolleys are moved by pulling one of the two stands of the endless hand chain.

### NOTICE!

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

## 4.4 Important components

- Wheels

Machined wheels with maintenance-free roller bearings. Profiled wheel surfaces for the use on all standard beams with inclined and parallel flanges.

- Side plates

Made of steel plate with integrated wheel fracture supports.

- load bars

Device with 2 load bolts. Different bolt lengths are available for different beam flange widths.

- Motors

Type E - Standard three-phase motor

Type P - Pneumatic motor, 6 bar

- Control

Type E - control by pendant control switch for direct control or low voltage control

Type P - control by precision direct control or indirect control

## 5 Technical data

Capacity	load bar size for beam flange width from - to		output		current
	1 N mm	2N mm	AFE kW	AFP kW	AFE A
500kg	50-146	147-302	--	--	--
1t	50-179	180-310	0,06/0,25	0,75	0,45/0,8
2t	66-185	186-310	0,06/0,25	0,75	0,45/0,8
2,5t	66-185	186-310	0,06/0,25	0,75	0,45/0,8
3,2t	74-196	197-310	0,06/0,25	0,75	0,45/0,8
4t	74-196	197-310	0,06/0,25	0,75	0,45/0,8
5t	74-192	193-310	0,1/0,42	0,75	0,8/1,25
6,3t	119-215	216-312	0,1/0,42	0,75	0,8/1,25
7,5t	119-215	216-312	0,1/0,42	0,75	0,8/1,25
10t	119-215	216-312	0,1/0,42	0,75	0,8/1,25
12t	119-215	216-312	0,1/0,42	0,75	0,8/1,25
15t	160-310	---	2x 0,18/0,55	2x 0,75	2x 1,3/1,5
20t	160-310	---	2x 0,18/0,75	2x 0,75	2x 1,3/1,5
25t	160-310	---	2x 0,25/1	2x 0,75	2x 1,4/2,7

Travel speed:  
electric trolley 16/4 m/min  
pneumatic trolley 8 m/min

Operating pressure:  
pneumatic trolley 6 bar  
air consumption per motor 1,2m<sup>3</sup>/min

		kg													
		500kg	1t	2t	2,5t	3,2t	4t	5t	6,3t	7,5t	10t	12t	15t	20t	25t
AFR	N1	8	13	29	29	58	58	71	159	--	--	--	--	--	--
	N2	10	14	31	31	62	62	73	164	--	--	--	--	--	--
AFH*	N1	9	17	34	34	64	64	76	165	165	165	165	**	**	**
	N2	11	18	36	36	68	68	80	170	170	170	170	**	**	**
AFE	N1	--	28	43	43	73	73	85	174	174	174	174	**	**	**
	N2	--	29	46	46	77	77	88	178	178	178	178	**	**	**
AFP	N1	--	39	55	55	84	84	97	186	186	186	186	**	**	**
	N2	--	40	58	58	89	89	100	190	190	190	190	**	**	**

\*without hand chain, \*\*on request

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

The assembly and installation depends on the local environment. The hoist must be suspended in a way that it can position itself freely.

### 6.1 Trolley

For assembly on a beam a travel limit must be placed at either end of the track.

This must be attached so that any elastic limitation buffer or the trolley wheels are driven against them in their end position when moving.

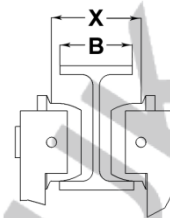
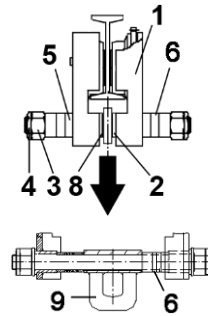
Generally, additional lifting gear (e.g. fork lift, lifting platforms) will be required for the assembly. These must take the weight of the devices securely.

### 6.2 Adjusting the gauge

The trolley can be adjusted to various beam flange widths. Adjustment to the relevant beam flange width "B" depends on the type and size and is to be made as follows:



- There are distance tubes (5) and/or washers (6) situated on the load bars (2) of the trolley.
- Dimension "X" is set by placing washers (6) from the outer to the inner side ("X" increases) or from the inner to the outer side ("X" decreases).
- Washers (6) and rubber discs (depended on type) leave a distance for the load hook. It is important that the load hangs in the middle under the beam so that the two side plates are equally loaded.
- The suspension eye (9) (if existent) for bigger load bolts must still be swivelling after it has been secured.
- Tighten the hexagon nut (3) and safety nuts (4) again.
- Check correct flange width "B" and dimension "X". Adjustment must be repeated if necessary.



- 1 side plates
- 2 load bars
- 3 hexagon nut
- 4 safety nuts
- 5 distance tubes
- 6 washers
- 7 ---
- 8 rubber disc (depended on type)
- 9 suspension eye

### 6.3 Installation on the beam

- 1 Tighten the hexagon nut (3) and safety nuts (4).
- 2 Push on the trolley at the face of the beam flange.
- 3 If this is not possible, the trolley can also be mounted on the beam from below.
- 4 Therefore, remove the hexagon nut (3) and the safety nut (4) on the side without gear.
- 5 Pull apart the side plates (1) as far until it is possible to push the trolley onto the beam flange from below. Afterwards, push the trolley together to correct gauge.
- 6 Secure the washers (6) and distance tubes (5) by tightening the hexagon nuts (3) and the safety nuts (4).

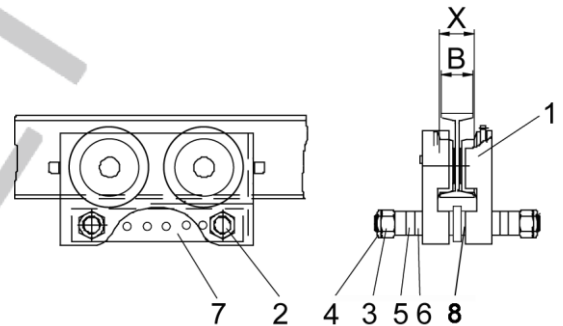


Illustration 1

#### 6.3.1 Bolt securing with collar

Securing the load bolts with set collars (1) and safety screws (3).

- In order to adjust the beam flange width dismantle the safety screws (3) at one trolley side.
- After adjustment of dimension "X" and installation on the beam, install the safety screws (3) again and secure them with a nut (4).
- When pulling apart the side plates, the trolley drive shaft will also be moved.
- To do this, loosen the safety screws at the stern tube bearing and secure them again after the side plates have been pushed together.

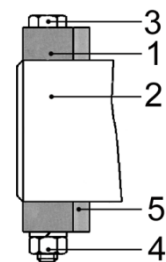


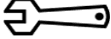
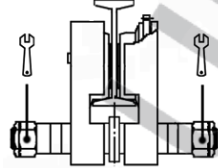
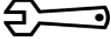
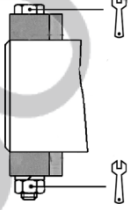





Illustration 2

- 1 set collar
- 2 load bar
- 3 safety screw
- 4 hexagon nut
- 5 washer

### CAUTION!

The distance "X" between the wheel flanges of the trolley wheels must be for trolleys up to 3,2 t: 2-3 mm (1-1,5 mm each side) bigger and for trolleys from 4 t up: 3-5 mm (1,5-2,5 mm each side) bigger than the flange width "B" of the beam

## 6.4 Tools

Capacity	Size	Tool	Use	
0,5t 1t to 2t to 3,2t to 6,3t to 10t	SW27 SW36 SW46 SW55 SW60 SW75		Load bar	
12,5t to 60t	SW22 SW24		Load bar with fixing ring	
	diff.		 	

## 7 Control

Only people that are familiar with the operation of the lifting devices and cranes may be entrusted with their operation. They must be authorized by the employer for the operation of the equipment. The employer must ensure that the operating instructions are available near the equipment and that they are accessible for the operating personnel.

Monorail push travel trolleys are moved by pushing the load.

Monorail hand geared trolleys are moved by pulling the hand chain.

### Control buttons

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

Emergency stop



Illustration 3

Arrow keys = drive left / right



Illustration 4

System start (optional)



Illustration 5

### Push button functions (E)

Relieved push button = stand still

push button half pushed = slow speed

push button pushed completely = fast speed



Illustration 6

## Push button functions (P)

Relieved push button = stand still  
 push button pushed = respective movement



Illustration 7

Red Emergency-Stop button

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



Illustration 8

### **NOTICE!**

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

## 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.

### **DANGER!**

In particular, use is not permitted:

- 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

## 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.

### **NOTICE!**

Hoists up to 1000 kg capacity and without motor-driven trolleys of hoisting unit must be tested by a "qualified person" before putting into operation for the first time.

Hoists of 1000 kg capacity and up or with more than one motor-driven hoist movement; i.e. lifting and trolley movement, must be tested by a "licensed qualified person" before putting in operation.

An exception is "hoists ready for operation" acc. validated national regulations with EU-declaration of conformity.

#### **Definition "qualified person" (former expert)**

A "qualified person" has learned, due to occupational training and experience and the job that the person has done, the skills needed to tests the material for one's work.

## **Definition “licensed qualified person” (former approved expert)**

A “licensed qualified person” has, due through special occupational training, knowledge about testing of the material for one’s work and knows the national accident prevention regulations and other prescriptions and technical regulations. This person must test the material for one’s work regularly with regard to design and kind of use. The license will be given to qualified person by the approved supervision authorities (ZÜS).

## **9.2 Power supply**

### **9.2.1 Mains connection**

The technical dates of the motors are to be taken from the type plates.

The wiring diagram is situated in the terminal box.

- 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**

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

## **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.

## **11 Functional test**

### **11.1 Checks before the initial start-up**

#### **Trolley drive**

- The open-lying teeth of the trolley drive must be lubricated.

#### **Hand gear for hand geared trolley**

- Ensure correct fit of the hand chain; it must not be twisted and must hang freely.

### **11.2 Functional test**

#### **Trolleys**

Carefully move the trolley to the end positions and check the positions of the end stops.

## **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 Brake motor**

Electric driven trolleys from 15t are equipped with a brake motor

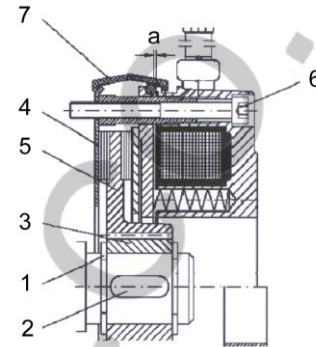
Connection voltage for the brake 400 VAC

Coil voltage: 180 VDC

trolley Capacity	Brake type	Nominal brake moment	Nominal air gap	air gap max.	friction lining thickness min.
t		Nm	mm	mm	mm
15-50	BFK 06	4	0,2	0,5	1,5

### 12.3.1 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.



9 Electric connection

Illustration 9

### 12.3.2 Disassembly of the brake

Disassembly is performed in reverse order to the assembly.

### 12.3.3 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.

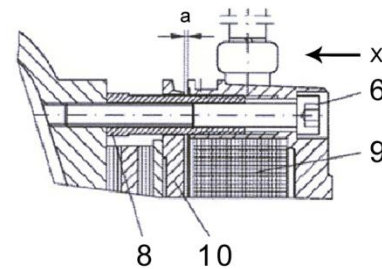


Illustration 10

## 13 Inspection

### 13.1 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.

	at commissioning	daily checks	1st maintenance after 3 months	Inspection Maintenance every 3 months	Inspection Maintenance every 12 months
check screw connections	X				X
check the bearings					X
check the trolley wheels					X
check lubrication of the driving pinion	X				X
buffers - check correct position and wear	X				X
electric motor* - check the brake lining					X
electric motor* - check the brake	X	X			
pneumatic motor*	X		X	X	
Have the equipment checked by an expert (periodic inspection)					X

\*as far as applicable

## 14 Service

### 14.1 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.

### 14.2 Pneumatic motor

The pneumatic motor must be lubricated continuously by a maintenance unit.

If not otherwise agreed, the maintenance unit must be installed by the customer.



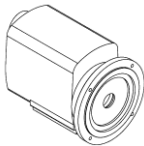
Should a maintenance unit be part of the consignment, the oiler must be filled with oil before the first start.



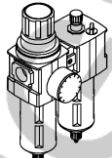
After longer periods of standstill, gummy oil or slight rust may lead to the fact that the motors do not start at once or do not perform well. In most cases, this problem can be resolved by adding a few cubic meters of cleaning oil or paraffin into the supply hose and carrying out a test run. Afterwards, fill the same quantity of oil into the hose and repeat the procedure to ensure that the oil is well distributed. The lubrication is then carried out by the oiler of the maintenance unit.

Recommendation:

Should longer periods of standstill be foreseen, insert some cm<sup>3</sup> of oil into the air supply hose after the last use of the unit and let the motor run shortly. This will prevent corrosion.

Lubricant: FUCHS Renolin B10 or a similar product.

Use		Recommendation		Interval
Pneumatic motor		FUCHS RENOLIN B10	0,1l	3 Monate

Use		Recommendation		Interval
Maintenance unit		FUCHS RENOLIN B10	0,1l	1 month

## 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*	Unit	Cause	Remedy
Unit cannot be switched on	Electric trolley	No main power	Check connection to mains supply
		Phase sequence not correct (with low voltage control)	Exchange 2 phases <i>(see wiring note at the plug)</i>
Motor runs in opposite direction	Electric trolley	Phase sequence / rotating field wrong (with three-phase direct control)	Exchange 2 phases <i>(see wiring note at the plug)</i>
Motor does not run	Electric trolley	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.
		Defect of capacitor (only for one-phase alternating current)	Replace the capacitor
		Overheat protection has tripped*	Allow engine to cool
	Defective coil - mechanic or electric overload	Motor must be repaired by a specialist <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>	
Motor runs – trolley does not move	Pneumatic trolley	Operation pressure / quantity of air is too low After prolonged standstill	Check connection to mains supply See maintenance - pneumatic motor
	Motor driven trolley	No or incorrect power transmission	Check driving pinion and repair if necessary, check condition of trolley wheels / contact to main beam surface and repair / adjust if necessary <b>If the unit is suitable for explosive atmospheres, please clarify with the manufacturer what to do!</b>
Motor hums and uses excessive current	Electric trolley	Defective coil	Motor must be repaired by a specialist <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Rotor is rubbing	Motor must be repaired by a specialist <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		(Optional) brake does not release	See problem "(Optional) brake does not release"
		Defect of capacitor (only for one-phase alternating current)	Replace the capacitor
		Defect of starter relay (only for one-phase alternating current)	Replace the starter relay
Phase failure (only three-phase direct control)	Find the cause and repair		
Motor does not brake or has excessive afterrunning.	Electric trolley	Switching error after intervention in the electric circuit	Check the electric connection of the brake acc. to the wiring diagram
	Motor driven trolley	Brake linings are worn or dirty.	Brake lining carrier must be changed completely <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Air gap is too large	Re-adjust the air gap <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
(Optional) brake does not release	Electric trolley	Brake rectifier defective	Replace the brake rectifier <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Brake current relay defective	Replace the brake current relay <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Brake coil is defective	Replace the brake coil <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Permissible air gap is exceeded due to worn out brake lining	Re-adjust the air gap and exchange the brake lining if necessary <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Power drop in the mains power line > 10%	Provide correct power supply voltage
	Pneumatic trolley	Operation pressure / quantity of air is too low	Check connection to mains supply
Fuses burnt out or motor contactor is triggered	Electric trolley	Short circuit in component	Eliminate the short circuit
		Motor has a short circuit in the body or windings	Correct the problem by a specialist <b>If the unit is suitable for explosive atmospheres, the motor must be returned to the manufacturer for repair!</b>
		Motor is switched incorrectly Wrong type of fuse	Correct the switching Replace the fuse with correct one
Trolley runs very slowly or not at all	All trolleys	Driving pinion dirty or blocked.	Clean the driving pinion and lubricate it, if necessary, exchange worn parts
	Hand geared trolley	Hand chain is twisted or blocked	Place the hand chain correctly

\*) as far as applicable

## 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.

### **18.3 Pneumatic connections diagram**

The pneumatic connections diagram is attached to the consignment.