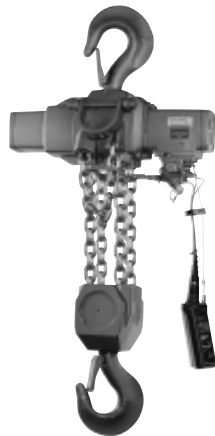




OPERATION MANUAL

(800) 878-7305 Rentals@RentLGH.com RentLGH.com

JDN OPERATION MANUAL AIR HOISTS **PROFi20Ti - 100Ti** MONORAIL HOISTS



J.D. NEUHAUS

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Please fill in here the Fabr.-No. of your JDN air hoist.

This manual edition 3/2004 covers the operation of the following JDN Air Hoists:

PROFI 20 Ti

Fabr.-No.

PROFI 25 Ti

Fabr.-No.

PROFI 37 Ti

Fabr.-No.

PROFI 50 Ti

Fabr.-No.

PROFI 100 Ti

Fabr.-No.

the following JDN Monorail Hoists (EH) only in connection with the Operation Manual "trolleys"

EH 20

Fabr.-No.

EH 25

Fabr.-No.

EH 37

Fabr.-No.

EH 50

Fabr.-No.

EH 75

Fabr.-No.

EH 100

Fabr.-No.

and the following JDN Ultra-Low Monorail Hoists (UH) only in connection with the Operation Manual "trolleys"

UH 05

Fabr.-No.

UH 1

Fabr.-No.

UH 2

Fabr.-No.

UH 4

Fabr.-No.

UH 6

Fabr.-No.

UH 8

Fabr.-No.

UH 12

Fabr.-No.

UH 75

Fabr.-No.

UH 100

Fabr.-No.

Before operating any hoist, carefully read the entire manual. For trolley mounted hoists refer to the manual **JDN Trolleys**.

CONTENTS

SAFETY INSTRUCTIONS

Organisational measures	5
Personnel safety	5
Preventing equipment damage	5

PRODUCT INFORMATION

The operation manual	6
Warnings and symbols	6
Identification	7
Operating mode	8
Explosion Protection	8
Emission	13
Intended use	13
Conditions of use	13
Certification	13

APPLICATION

Application areas	14
Suspension points	14
Energy requirements	14

TRANSPORTATION AND STORAGE

Transportation	15
Storage	15

SETTING UP

Unpacking	16
Mounting	16
Installing the hoist	16
Fastening the pendant control	17
Connecting the main air supply	18
Initial operating checks	19

OPERATION

Safety instructions	20
Operating materials	23
Controls	24
Chain	25
Load hook	26
Starting operation	26
Troubleshooting	27

MAINTENANCE

Care	28
Service unit	29
Checking the control elements	33
Testing the brake function	33
Testing the limit switch	33
Lubrication of the chain	34
Inspections and maintenance work	34
Maintenance list	35
Inspection list	35
Test dimensions	36

ACCESSORIES

Chain container	37
Filter silencer	38
Overload protection	39
Booster valve	41
Axial bearing	42

ANNEX

Technical data	42
Dimensions	42



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Please note!

Within the Federal Republic of Germany

operators of air hoists must observe the currently applicable

- ▶ UVV Winches, Lifting and Pulling Devices (BGV D8), and
- ▶ UVV Load carrying Devices Used with Lifting Equipment (VBG 9a),

and users of trolley mounted hoists must additionally comply with the currently applicable

- ▶ UVV Cranes (BGV D6).

Users must also initiate the prescribed tests (see also "Principle for the Testing of Cranes" BGG 905 (ZH1/27)).

In all other countries the user shall comply with local regulations as applicable.

Additional regulations may apply when incorporating air hoists into other installations or using air hoists in unusual conditions.



SAFETY INSTRUCTIONS

ORGANISATIONAL MEASURES

JDN Air Hoists / Monorail Hoists (in the following called JDN Air Hoists) are manufactured in accordance with the latest state of the art and accepted safety practice. Nonetheless, the use of an air hoist may be associated with the risk of injury or death of the user or of some third party, or with the risk of property damage, if safety rules are disregarded.

All personnel involved with the safe operation of the air hoist must carefully read and understand the operation manual, especially the present section dealing with safety. This is particularly important when personnel not normally working with air hoists are charged with maintenance, repair or other additional works.

The user is obliged to ensure that the air hoist is operated in a safe manner. The following measures are requested as a minimum:

- ▶ keep this manual readily available at the air hoist operating site,
- ▶ carry out training on air hoist operation on a regular basis,
- ▶ set up an inspection log and keep it up to date, and
- ▶ on a regular basis, check up on the personnel working with the air hoist to ensure that it is being used in a safe and proper manner.

PERSONNEL SAFETY

Ensure that only properly trained personnel are entrusted with the operation, maintenance and repair of the air hoist.

„Properly trained“ in the present case means that the operator has appropriate training and experience in working with air hoists and is sufficiently versed in occupational safety and accident prevention regulations to be able to determine whether or not it is safe to operate the air hoist.

- ▶ Follow the applicable regulations for the workplace in question.
- ▶ Observe all relevant accident prevention regulations, in particular BGV D8 (Winches, Lifting and Pulling Devices) and VBG 9a (Load-carrying Devices Used with Lifting Equipment).
- ▶ Ensure that you are properly informed about any hazardous materials you may be working with.
- ▶ Follow the safety instructions given in this manual.

PREVENTING EQUIPMENT DAMAGE

The user of JDN Air Hoists is responsible for ensuring that the inspection log delivered with the hoist is correctly used and kept up to date.

- ▶ Ensure that the scheduled maintenance is performed as prescribed.
- ▶ Do not use the air hoist for any other purpose than its intended design use.
- ▶ Ensure that the conditions of use as detailed below are met.



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PRODUCT INFORMATION

THE OPERATION MANUAL

The present manual is intended to help the operator to inform himself about JDN Air Hoists and how to use them properly.

This manual contains important information on the safe, proper, and economic operation of the JDN Air Hoists. By following this information the risk of safety hazards, repair costs and machinery downtime can be reduced and the useful lifetime of the air hoist can be extended.

Always keep the manual readily available at the location where the JDN Air Hoist is being used.

All persons charged with operating, maintaining, or repairing JDN Air Hoists must read and follow the instructions in this manual.

WARNINGS AND SYMBOLS

In this manual warnings about safety are classified in three categories:



DANGER!

Indicates that failure to follow these instructions can cause a hazard to life and limb. The symbol indicates the immediate danger of severe and possibly fatal injuries.



WARNING!

Indicates a situation that could become hazardous. Failure to follow the instructions could result in injuries.



CAUTION!

Indicates that failure to follow the instructions could cause property damage.



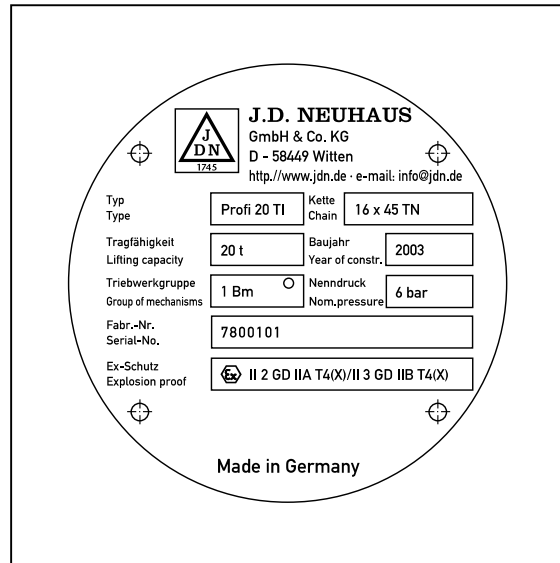
IDENTIFICATION

The nameplate fixed to the hoist cover identifies the type of JDN Air Hoist and gives important rating information.

If you have any questions concerning the operation of the air hoist which are not mentioned in this manual, please contact us at the following address:

J.D. NEUHAUS GMBH & CO. KG
 Windenstraße
 D - 58449 Witten-Heven

Phone +49 - 23 02 - 20 80
 Fax +49 - 23 02 - 20 82 86
<http://www.jdn.de>
 e-mail: info@jdn.de



Example of a nameplate fixed to the hoist cover

OPERATING MODE

JDN Air Hoists according to this operation manual are manufactured in accordance with the driving mechanism group 1 Bm/M3 (according FEM/ISO)¹⁾.

Hoists manufactured in series have a limited life time. After reaching the theoretical service time special tests have to be carried out (see the section entitled **Inspections and maintenance work**, page 34).

1) FEM: Fédération Européenne de la Manutention – European Materials Handling Federation

EXPLOSION PROTECTION

The basis for the following information is an expert statement by the DMT Gas & Fire Division on the use of JDN Hoists, Trolleys and Crane Systems in explosion-hazardous areas, based upon European Guideline 94/9/EC¹ ("ATEX 100a"). DMT is accredited with the testing of devices and protection systems for intended use in explosion-hazardous areas.

BASIC EXPLOSION PROTECTION OF THE STANDARD VERSIONS

Standard version JDN Air Hoists are category 2 devices (Guideline 94/9/EC, DIN EN 1127-1²⁾, for use in zone 1 and 2 for gases of explosion group IIA. (see also IEC 60079-12³ and IEC 60079-20⁴⁾). These devices are also suitable for use in zone 2, in the presence of gases of explosion group IIB, provided that the substances hydrogen sulphide and ethylene oxide can be excluded and additionally in zones 21 and 22 for dusts with glow temperatures above 210°C and ignition temperatures above 202°C, provided that no light metal or other impact-sensitive dusts are present. In zones 1 and 21, or in the presence of explosion class IIC substances hydrogen sulphide or ethylene oxide or light metal or other impact-sensitive dusts, friction and impacts in the working area of the chain must be excluded. These devices are designated by: $\text{II 2 GD IIA T4(X) / II 3 GD IIB T4(X)}$.

ADDITIONAL MARKING "X"

$\text{II 2 GD IIA T4(X) / II 3 GD IIB T4(X)}$ or

II 3 GD IIA T4(X) : This designation does not permit use in the presence of the extremely flammable substances hydrogen sulphide and ethylene oxide or in the presence of light metal or other impact-sensitive dusts, or in the presence of dusts with glow temperatures below 210°C and ignition temperatures below 202°C.

... IIC T6(X) : This designation permits use in the presence of carbon disulphide or other temperature class T6 substances only under special conditions, which have been agreed with the manufacturer and which are described in the crane documentation (Europe: in the inspection log) and which stipulate the maximum surface temperatures for the device.

GENERAL NOTE ON DESIGNATION

The highest possible respective designations for lifting equipment and driving units are usually replaced by a designation, which corresponds to the normal assembly of a compact complete device (trolley or crane system).

JDN HOISTS

"WITH INCREASED SPARK PROTECTION"


JDN Hoists in the "with increased spark protection" version (FS), fulfil further explosion protection requirements. With the exception of carbon disulphide, these can be used in the presence of all gases in zones 1 and 2, as well as in the case of dusts with glow temperatures above 210°C and ignition temperatures above 202°C and can be designated at most with II 2 GD IIC T4 for installation in a trolley, depending upon trolley version (see below), but also with II 2 GD IIB T4 . For further operating conditions, see Instructions for safe operation (Notes **D**) and **E**).

JDN HOISTS FOR USE IN THE PRESENCE OF TEMPERATURE CLASS T6 GASES OR EXTREMELY EXPLOSIVE DUSTS

Following separate tests, especially with regard to ambient temperatures and type of operation, use in the presence of carbon disulphide or dusts with particularly low glow or ignition temperatures may be possible with designation II 2 GD IIC T6(X) , which includes the additional marking "X" for special conditions (see Additional marking "X").

Please contact us with regard to these requirements.

USE IN MINING APPLICATIONS

Standard versions of JDN Air Hoists, Trolleys and Crane Systems may generally also be used for underground mining operations as well as for the associated surface facilities, which are hazardous due to firedamp and/or combustible dusts. These devices can be switched off in cases where an explosive atmosphere forms. They are equipped with protective measures offering a high degree of safety. The protective measures with which products of this category are equipped provide the necessary degree of safety for normal operation as well as operation under difficult conditions, in particular rough treatment and changing environmental influences. For other difficult conditions in addition to explosion protection prevailing with regard to the general handling of the devices in mining applications, special mining hoists are available from J.D.NEUHAUS. The maximum permissible temperature of 150°C in accordance with EN 13463-1⁵ in the case of coal dust atmospheres is not reached. For mining applications, the relevant designation for hoists, trolleys and crane systems is .

MATERIALS FOR FRICTION AND IMPACT HAZARDS

The combination of particular material pairs results in an increased ignition hazard. This does not apply to corrosion-resistant steel or cast iron against aluminium, magnesium or corresponding alloys. It applies in particular to the presence of rust or of rust film. Rust (also rust film) formation is possible, especially on the chain and on the load hook, at the friction points. In zones 1 and 21, but also in zone 2 for gases of explosion group IIC, hydrogen sulphide and ethylene oxide, as well as in zone 22 for light metal and other impact-sensitive dusts, the following generally applies: For the intended use of hoists it must be ensured, that no rust is present at the above-mentioned friction points and that material combinations of the above-named light metals with steel (exception: stainless steel) are not used in the working area of the hoists, at potential friction, impact or sliding points. It is thus possible to exclude sparking due to mechanical influences with these material combinations.

COMPRESSED AIR HOSES

In zone 1, compressed air hoses must have a sufficiently low surface resistance of less than 10⁹ Ω, in order to prevent electrostatic ignition hazards. Otherwise (resistance >10⁹ Ω), for explosion groups I, IIA and IIB

the hoses must be $\varnothing \leq 30$ mm and for explosion group IIC $\varnothing \leq 20$ mm, or proof must be provided that they cannot become dangerously charged.

ACETYLENE AND COPPER

When operating JDN products in explosion-hazardous areas, in which an acetylene-containing atmosphere can occur, it must be ensured that copper-plated parts are kept dry, in order to exclude the possibility of oxidation of the metallic copper and the formation of a watery phase, which is capable of reacting with acetylene and which can result in an explosion hazard.

EARTHING

Electrostatic ignition hazards can be prevented by means of safe earthing. In zones 1 and 21, earthing of the hoists is required. This must be achieved via the load hook or the load eyes, if the lifting equipment is connected to correspondingly earthed parts (earth leakage resistance less than 10⁶ Ω). This also applies to operation with trolleys or cranes. Their tracks must be earthed on site. Running wheels and rail surfaces must never be painted, as this can result in unacceptably high earth leakage resistance values.

Earthing of the load hook is via the chain (see also "**Load chain**" below).

Loads must be earthed during transportation. A separate earth is required, for example, when using non-conducting sling gear.

LOAD CHAIN

In order to prevent mechanical sparking in zones 1 and 21, but also in zone 2 for gases of explosion group IIC, hydrogen sulphide and ethylene oxide as well as in zone 22 for light metal or other impact-sensitive dusts or material combinations of light metal and steel, the chain and the load must always be moved in such a way, that sliding and/or frictional contact with other plant or components is excluded.

In order to guarantee the required degree of earthing, rusty chains must no longer be used in zones 1 and 21. As, depending upon the degree of corrosion, the leakage capability of the chain may be impaired to a level that is no longer adequate.

EXPLOSION GROUPS AND TEMPERATURE CLASSES OF THE MOST IMPORTANT GASSES AND VAPOURS (-SELECTION-)
(according to DIN VDE 0165⁶, Redeker⁸, Nabert, Schön⁷, IEC 60079-12³ and IEC 60079-20⁴)

Ex group	Temperature class					
	T1	T2	T3	T4	T5	T6
	Ignition temperature					
	> 450°C	450-300°C	300-200°C	200-135°C	135-100°C	100-85°C
Maximum permissible surface temperature of operating facilities						
	450°C	300°C	200°C	135°C	100°C	85°C
II A	Acetone Ammonia Aniline Benzol Chlorobenzene 1,2-Dichlorobenzene Acetic acid Ethane Ethyl acetate (Ethyl bromide) Ethyl chloride (Carbon monoxide) o-Cresol Methane Methyl acetate Methyl alcohol*1 Methyl bromide Methyl chloride Methylene chloride Naphthaline (Nitrobenzene) Phenol Propane Toluene o-Xylene	(Ethyl alcohol) (Ethylene glycol) i-Amyl acetate n-Butane n-Butyl alcohol 1-Butylene 1,2-Dichloroethane Di-i-Propyl ether Natural gas Acetic anhydride n-Propyl acetate (n-Propyl alcohol) i-Propyl alcohol Vinyl chloride	n-Amyl alcohol Benzene (petrol) Diesel Fuel oil n-Hexane jet fuels	Acetaldehyde		
II B	Hydrocyanic acid (Ethyl bromide) (carbon monoxide) (Nitrobenzene) Town gas	Butadiene-1,3 Dioxane-1,4 Divinyl ether (Ethyl alcohol) Ethylene (Ethylene glycol) **Ethylene oxide Isoprene (n-Propyl alcohol)	Dimethylether **Hydrogen sulfide	Ethyl ether Ether Anaesthetic ether Diethyl ether		
II C	**Hydrogen	**Acetylene				**Carbon disulphide

(): The measured values for the substances placed in brackets are close to the limit of the next group of class when classified in the explosion groups or temperature classes. For this reason, they have been included in both.

** : Extremely flammable substances (cf. additional marking "X")

*1 (Methanol = Methyl alcohol)



DECISION CRITERIA FOR SELECTING THE CORRECT JDN HOISTS IN EXPLOSION-HAZARDOUS AREAS

Explosion groups of gases and vapours (cf. Explosion groups and temperature classes of the most important gasses and vapours)	Zone	Version*1			Operation*2		
II A	2	A					
	1	A			D		
II B (X) except hydrogen sulphide, ethylene oxide (particularly flammable)	2	A					
	1	A	FS		D		
II B	2	A	FS		D	E	
	1	A	FS		D	E	
II C / T4	2	A	FS		D	E	
	1	A	FS	FSR	D	E	
II C / T6(X)	2	A	FS		D	E	T
	1	A	FS	FSR	D	E	T
Explosion-hazardous dusts	Zone	Version*1			Operation*2		
Normal industrial dusts	22	A					
	21	A			D		
Light-metal or impact-sensitive dusts	22	A	FS		D		
	21	A	FS		D		

***1: Features:**

A: The chain is made of zinc-plated steel; metal controls are conductively connected to the hoist. This is part of the standard equipment. For technological reasons, a zinc-plated version of chain size 31.5 x 90 is not available. This is only used for the extremely slow-running chain drives of large hoists, so that the sliding velocity for potential friction points between the chain and the surroundings remains well below 1 m/s.

FS: Hoists "with increased spark protection":
Copper-plated load hook and bottom block with brass safety catch.

FSR: Driving units "with increased spark protection":
Running wheels for trolleys and cranes are bronzed or are made of bronze.

***2: Notes for safe operation:**

D : Ignition hazards are not to be expected if hoists or cranes are used in the normal manner. Friction and impacts in the working area of the chain, not resulting from intended use of the hoist or crane and which result in sparking, must be excluded. This applies in particular to use in conjunction with light metals or light metal alloys. (exception: stainless steel)

E : A gas-free or spark-free environment must be ensured in the working area. This means, for example, that the chain, the bottom block and the load hook must be prevented from swinging against surrounding objects or that a gas-free environment must be ensured.

T : Ambient temperature and the type of operation must be examined separately. Equipment surface temperatures are dependent upon the type of operation and the ambient temperature. Therefore, separate testing is required for materials of the temperature classes T5 and T6. A maximum ambient temperature of 40°C is a pre-condition for the specification of temperature class (see also EN 50014⁹).

**TEMPERATURE LIMIT FOR
EXPLOSION-HAZARDOUS DUSTS**

In areas which are explosion-hazardous due to combustible dusts, the surface temperature must not exceed two-thirds of the ignition temperature in °C of the dust/air mixture. The temperatures of surfaces on which hazardous deposits of combustible dusts can be formed, must not exceed the glow temperature of the relevant dust minus 75°K. Greater safety margins are required if thickness of the dust layer exceeds 5 mm.

The corresponding surface temperatures can be derived from the lowest values for glow and ignition temperatures of dusts specified in the HVBG/BIA Report 12/97⁹ "Combustion and explosion characteristics of dusts":

Synthetic rubber, soot-containing:

Glow temperature $220^{\circ}\text{C} - 75^{\circ}\text{C} = 145^{\circ}\text{C}$
max. permissible
surface temperature

Stearic acid:

Ignition temperature $190^{\circ}\text{C} \times 2/3 = 126^{\circ}\text{C}$
max. permissible
surface temperature.

**PLEASE ALSO OBSERVE YOUR
CORRESPONDING NATIONAL REGULATIONS.**

-
- 1 Richtlinie 94/9/EG des Europäischen Parlamentes und des Rates vom 23. März 1994 zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen
 - 2 DIN EN 1127-1: Explosionsfähige Atmosphären - Explosionsschutz, Teil 1: Grundlagen und Methodik, 1997-10.
 - 3 IEC 60079-12: Electrical apparatus for explosive gas atmospheres, Part 12: Classification of mixtures of gases and vapours with air according to their maximum experimental safe gaps and minimum igniting currents, 1978.
 - 4 IEC 60079-20: Electrical apparatus for explosive gas atmospheres, Part 20: Data for flammable gases and vapours, relating to the use of electric apparatus, 1996-10.
 - 5 EN 13463-1: Nichtelektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen - Teil 1: Grundlegende Methodik und Anforderungen
 - 6 DIN VDE 0165: Errichten elektrischer Anlagen in explosionsgefährdeten Bereichen, 1991
 - 7 Nabert, Schön: Sicherheitstechnische Kennzahlen brennbarer Gase und Dämpfe 2. Auflage, 1978
 - 8 Redeker, Schön: 6. Nachtrag zu Sicherheitstechnische Kennzahlen brennbarer Gase und Dämpfe, 1990
 - 9 DIN EN 50014 (VDE 0170/0171 Teil 1): 2000-02
Elektrische Betriebsmittel für explosionsgefährdete Bereiche: Allgemeine Bestimmungen
 - 10 HVBG/BIA-Report 12/97: Hauptverband der Deutschen Berufsgenossenschaften/Berufsgenossenschaftliches Institut für Arbeitssicherheit

EMISSION

The sound emission figures are shown in table **Technical data**, page 43.

The sound pressure level at the measuring surface at 1 m distance from the machine surface was determined acc. to DIN 45635, Part 20 with an air pressure acc. to our instructions. The reduction of the sound level under indoor conditions is approx. 3 dB (A) per each doubled distance.

When in operation – due to motor lubrication – small amounts of lubricating oil are discharged with the exhaust air into the ambient atmosphere.

When using a filter silencer (see the section entitled **Overload protection**, page 40) the oil emission can be avoided. Additionally the sound emission will be reduced.

INTENDED USE

JDN Air Hoists are designed for lifting and lowering loads within the specified load-carrying capacities, with a vertically-arranged chain. In exceptional circumstances, the lifting of personnel-carrying equipment is also permitted. Please also observe the individual national regulations. In combination with trolleys, JDN Air Hoists are also suitable for the floorless horizontal movement of loads.

Any other use shall be deemed improper. Such improper use is at the customer's own risk, and the company J.D. NEUHAUS GMBH & CO. KG shall not be liable for any resulting damages.

Please also see **Safety Instructions**, page 21.

CONDITIONS OF USE

The JDN Air Hoists are sturdy and require very little maintenance. They are suitable for use in locations subject to explosion hazards, as well as locations exposed to soot, dust, humidity and extreme temperatures between -20°C and approximately +70°C. Permitted chain and hook temperatures: -40°C up to +150°C.



WARNING!

When touching metallic hand controls being colder than 0°C frostbites of the skin may occur within a few seconds, at temperatures above 55°C burnings may occur. Protective measures: use suitable safety gloves.

CE-CERTIFICATION

Every JDN Air Hoist is issued with a works certificate.



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TEMPERATURE LIMITS FOR EXPLOSION-HAZARDOUS DUSTS

In areas which are explosion-hazardous due to combustible dusts, the surface temperature must not exceed two-thirds of the ignition temperature in °C of the dust/air mixture. The temperatures of surfaces on which hazardous deposits of combustible dusts can be formed, must not exceed the glow temperature of the relevant dust minus 75K. Greater safety margins are required if the thickness of the dust layer exceeds 5 mm.

The corresponding surface temperatures can be derived from the lowest values for glow and ignition temperatures of dusts specified in the HVBG/BIA Report 12/97¹⁰ "Combustion and explosion characteristics of dusts":

Synthetic rubber, soot-containing:

Glow temperature $220^{\circ}\text{C} - 75^{\circ}\text{C} = 145^{\circ}\text{C}$ max.
permissible surface temperature

Stearic acid:

Ignition temperature $190^{\circ}\text{C} \times 2/3 = 126^{\circ}\text{C}$ max.
permissible surface temperature

PLEASE ALSO OBSERVE YOUR CORRESPONDING NATIONAL REGULATIONS.

- ¹ Guideline 94/9/EC of the European Parliament and the Council dated 23rd March 1994 on the adaptation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres
- ² DIN EN 1127-1: Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology, 1997-10
- ³ IEC 60079-12: Electrical apparatus for explosive gas atmospheres, Part 12: Classification of mixtures of gases and vapours with air according to their maximum experimental safe gaps and minimum igniting currents, 1978
- ⁴ IEC 60079-20: Electrical apparatus for explosive gas atmospheres, Part 20: Data for flammable gases and vapours relating to the use of electric apparatus, 1996-10
- ⁵ EN 13463-1: Non-electrical devices intended for use in explosive areas - part 1: Basic methodology and requirements, 07/2009
- ⁶ DIN VDE 0165: Installation of electrical systems in areas with explosion hazard, 1991
- ⁷ Redeker, Schön: 6. Supplement to safety-related characteristic values for flammable gases and vapours, 1990
- ⁸ Nabert, Schön: Safety-related characteristic values for flammable gases and vapours, 2nd edition, 1978
- ⁹ DIN EN 50014 (VDE 0170/0171 part 1): 2000-02
Electrical apparatus for use in explosion hazardous areas: General provisions
- ¹⁰ HVBG/BIA report 12/97: Central association of German employer's liability associations/trade association institute for industrial safety

TRANSPORTATION AND STORAGE

TRANSPORTATION

**DANGER!**

Do not throw or drop your JDN Air Hoist.

Make sure that load hook, chain loops and control hoses do not hang down.

Control hoses and switches must not be damaged when handling JDN Air Hoists.

- Danger of incorrect functioning!

STORAGE

Store your JDN Air Hoist in a clean and dry place.

Take care that the control elements and control hoses cannot be damaged.

Protect the connection for the air intake hose against damage or intake of dirt or foreign bodies.

In case of longer periods of non operation protect your JDN Air Hoist including chain and load hook against corrosion. To protect the motor against corrosion inject conservating oil into the air supply hose after the last use (see the section entitled **Operating materials**, page 24), then run your JDN Air Hoist for a short period.

After longer periods of non operation clean the motor by pouring about 30 cm³ of petroleum into the air hose and then run your JDN Air Hoist for approximately half a minute. Then, straight away, pour a little lubricating oil into the air hose - further lubrication is carried out by the service unit.



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SETTING UP

UNPACKING



WARNING!

Be careful when unpacking the hoist. Observe the weight (see **Technical Data**, page 43)



CAUTION!

Take care to prevent twisting the control hoses which could lead to incorrect functioning of the hoist.

- ▶ Keep the hoist documentation in the appropriate place provided at site.
- ▶ Carefully lift the hoist out of the carton (if existing).
- ▶ Recycle packaging materials in accordance with local regulations.

MOUNTING

The JDN Air Hoists are generally delivered in fully-assembled condition.

If not, then proceed to the sections entitled

- ▶ **Fastening the pendant control** (page 18)
- ▶ **Connecting the rope control** (page 19)
- ▶ **Chain container** (page 38)

THE CHAIN MUST BE LUBRICATED BEFORE STARTING OPERATION (SEE PAGE 35).

INSTALLING THE HOIST



DANGER! RISK OF INJURY!

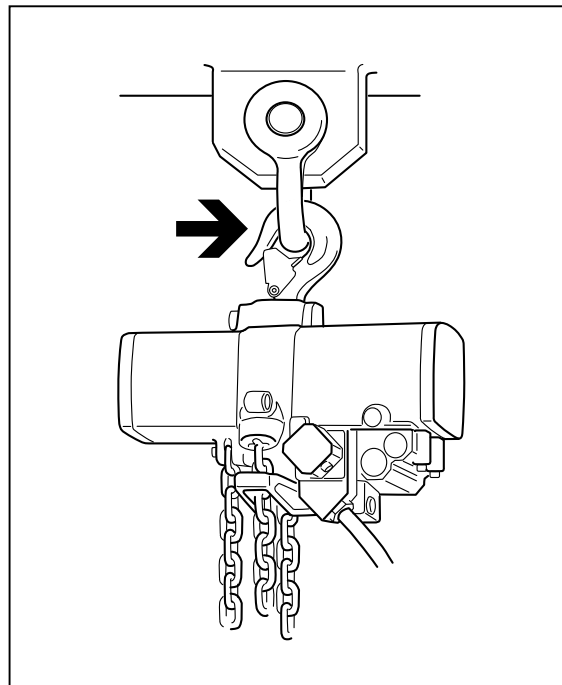
The JDN Air Hoists must be installed by suitably trained personnel. An incorrectly installed hoist can lead to serious injuries.



DANGER!

The points from which the JDN Air Hoist is suspended must be capable of withstanding the forces that may be expected to arise.

- ▶ Set up a suitable working platform.
- ▶ Suspend the hoist to the stationary point or to the trolley, using the provided hook or eye.
- ▶ Ensure that the hook safety latch snaps back into position.



Suspend the hoist using the provided hook or eye



FASTENING THE PENDANT CONTROL

FASTENING THE COMPLETE PENDANT CONTROL TO THE HOIST

FI control:

- ▶ First, fasten the hose carrier by unscrewing the cap screw and screwing on the hose carrier.

E, F and HT controls:

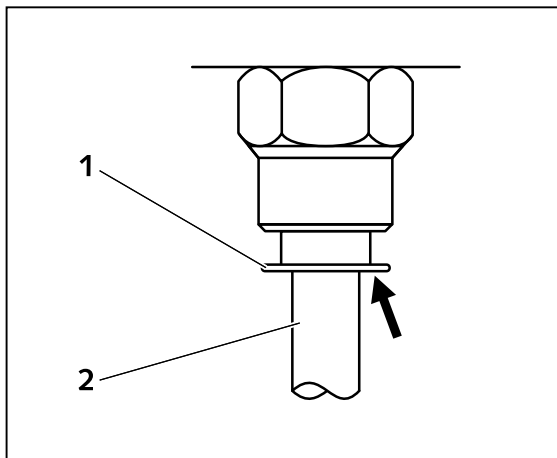
- ▶ Hang up the loop of the wire rope into the existing ring bolt.

CONNECTING THE CONTROL HOSES

For your help short hose pieces have been put into the plug-in connexion the colours of which correspond to those of the hoses to be connected enabling you to connect the hoses one after the other.

REMOVING THE HOSE PIECES

- ▶ Press down the locking ring 1 with a suitable tool (for example screw driver), pulling out the hose piece 2 at the same time.



Plug-in connection



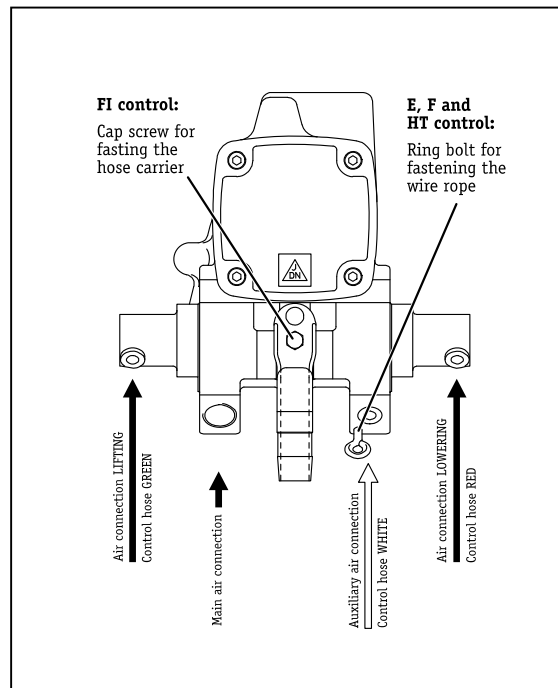
CAUTION!

Please take care that the hose is not bent when plugging in.

- ▶ Put the end of the corresponding hose into the hole of the corresponding plug-in connection.
- ▶ Press the hose down to the limit making sure that the hose is not bent.
- ▶ Please check the proper connection by pulling at the hose.

In case air is coming out of the connections during operation please try to press down the corresponding hose even deeper.

HOW TO ESTABLISH THE PLUG-IN CONNECTION

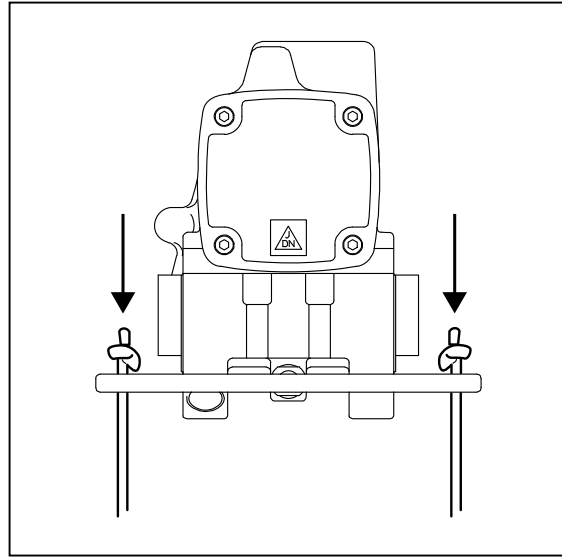


Motor side of hoist



CONNECTING THE ROPE CONTROL

- ▶ Tie the ends of the control rope to the two ends of the control lever.
- ▶ Thread the UP rope into green wood pin so that the pin's tapered end points up.
- ▶ Thread the DOWN rope into yellow wood pin so that the pin's tapered end points down.
- ▶ Thread the rope through the wooden grip in such a way that the arrows on the grip correspond to the direction of hook travel.



Rope control, motor side

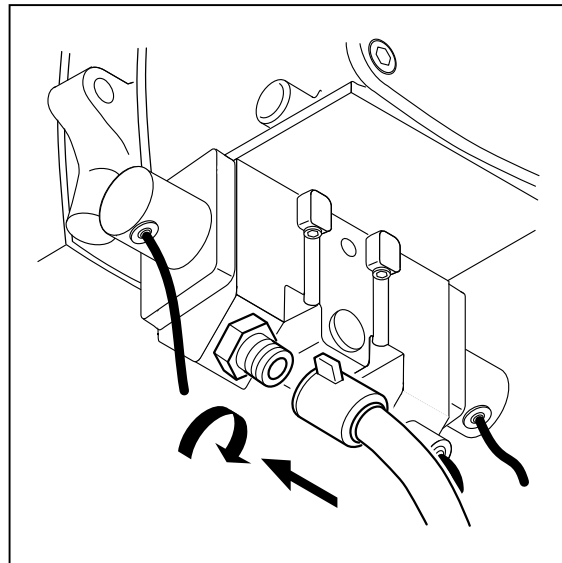
CONNECTING THE MAIN AIR SUPPLY



CAUTION!

When operating a hoist with service unit, the unit should be not more than 5 m away from the hoist.

- ▶ Inspect the air connector and clean it if required.
- ▶ Blow through the air hose with compressed air to remove any debris that may have lodged there.
- ▶ Plug the main air supply hose into the hoist-side fitting and secure it by tightening down the union nut.



Plug the main air supply hose in and secure it with the union nut.

INITIAL OPERATING CHECKS

Prior to initial use the hoist and supporting structure must be checked by a qualified person. Hoists in trolleys, monorail hoists and ultra-low monorail hoists have to be checked by an authorised person. Checking must also be carried out after any major modification. The object of such testing is to determine that the lifting equipment is correctly installed and ready for operation.

TESTING THE BRAKE

The correct functioning of the brake must be tested before starting to use the hoist. Proceed as follows:

- ▶ Operate the hoist with no load, alternating between lifting and lowering.

The chain must stop running immediately after releasing a control button.



DANGER!

If you notice that the chain running does not stop immediately stop using the hoist at once! The hoist must be repaired before any further use.

CHECKING THE DIRECTION OF OPERATION

- ▶ Check that the load hook moves up and down in accordance with the markings on the hoist controls.

CHECKING THE OVERRUN PROTECTION

- ▶ Lift the load hook with no load until it almost reaches the upper end.
- ▶ Carefully lift it still further until the hook or the chain stop strikes the overrun switch.

The lifting operation must stop when the control lever has reached its central position.



DANGER!

In case the hoisting movement is not stopped with the control lever in its central position and the control lever blocks in the down position, stop using the hoist at once! The hoist must be repaired before any further use.

CHECKING THE EMERGENCY STOP SWITCH

- ▶ Actuate lifting process and press down red emergency stop switch whilst lever is still pressed down. Lifting process must come to a halt immediately. Release emergency stop switch.
- ▶ Actuate lowering process and press down red emergency stop switch whilst lever is still pressed down. Lowering process must come to a halt immediately. Release emergency stop switch.



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OPERATION

SAFETY INSTRUCTIONS

FOLLOW THESE RULES FOR SAFE HOIST OPERATION

Whenever you operate a hoist, you are responsible for your own safety and the safety of your fellow workers.

- ▶ Only persons duly authorised by the management shall operate the hoist.
- ▶ Before beginning to use the JDN Air Hoist you should inform yourself thoroughly about the correct method of operation. Read this manual carefully and carry out the indicated procedures on the hoist step by step.
- ▶ Report any malfunctioning to your safety representative at once, so that it can be corrected.
- ▶ Follow the instructions issued by the responsible accident prevention authorities (in Germany, these instructions are known as UVV's and are issued by the trade associations).

As a prerequisite for proper use the instructions in the operation manual must be observed and the recommended inspection and maintenance procedures must be carried out.

Hoists have to be checked by trained staff at least once a year or after a service time of 160 hours (see the section entitled **Inspections and maintenance work**, page 34).

In addition to the annual inspection by an expert JDN Air Hoists should be checked according to the service and inspection lists (see the sections entitled **Maintenance list and Inspection list**, page 35).

For example JDN Air Hoists may not be used in the following areas:

- ▶ critical surroundings in atomic plants.
- ▶ above acid baths or similar plants with aggressive substances.
- ▶ in areas where organic acids can be found.
- ▶ operating the hoist whilst lying on the floor or moving loads horizontally.

On the following pages some important points for the safe operation of your JDN Air Hoist are listed. They should help you to avoid hazards.

Improper use includes but is not limited to any and all of the following:

- ▶ exceeding the rated load capacity
- ▶ hoisting loads at a non-vertical angle (Oblique Lifting)

Definition of Oblique Lifting

Oblique lifting means the deviation from the vertical position of the load chain and the hoist at rectilinear course of the power line between the point of application of the load at the hook and the suspension at the supporting structure.



Oblique Lifting

Under special safety precautions and considering the corresponding situation at site JDN Air Hoists can be used for oblique lifting whereby the use of a chain container is not allowed as the chain may fall out or form knots. Hoist mounted trolleys are not allowed for oblique lifting. Please contact us in case of application.

- ▶ dragging or pulling loads or trying to dislodge stuck loads.
- ▶ load the hook at its tip.
- ▶ catching a falling load.
- ▶ using the hoist for transporting people.

- ▶ hoisting by tipping the control buttons or levers over longer lifting distances.
- ▶ reversing the hoist while it is in motion.
- ▶ deliberately ramming the end stop switch.

For the safety of all personnel it is vital to follow the instructions given below whenever operating a JDN Air Hoist.

- ▶ Never touch a running chain.
- ▶ Never allow any person to stay under a raised/suspended load.
- ▶ When hooking loads observe appropriate regulations.
- ▶ Make sure that the operating place is without any danger for the operator due to suspension or load.
- ▶ Start carefully when lifting loads.
- ▶ Never try to correct a fault or damage while the hoist is under load.
- ▶ Never operate the hoist whilst lying on the floor or move loads horizontally.
- ▶ Never run to end positions under normal working conditions.
- ▶ Never use bent, open or twisted hooks.
Hoist to repair, never straighten, change hook.
- ▶ Never use stiff moving hook at the chain. Inspection.
- ▶ Never use stiff moving hook in the housing without load. Inspection.
- ▶ Never load hook on the tip, only on deepest part of hook saddle.
- ▶ Never lock hook at connecting point.
- ▶ Never anneal the hook.
- ▶ Never block operating elements.
- ▶ Never use stiff operating elements. Repair shop.
- ▶ Operate JDN Air Hoists only with original JDN controls.
- ▶ Uncontrollable external power influences (e.g. through hydrocylinder, falling loads) are not permitted.¹
- ▶ Use only suitable and approved harness, do not jam hook at the fixing point of the harness.
- ▶ Never use the hoist chain for wrapping around a load to be lifted.
- ▶ Position the load vertically under the hoist before lifting. The chain should be hanging straight down.
- ▶ Never allow a load to drop into the harness.
- ▶ Before lifting a load, ensure that it does not exceed the rated capacity of the hoist including the weight of the load and the harness.
- ▶ Do not take up the load at full speed if the chain is initially slack.
- ▶ Ensure that the load is in a stable position when lifting or lowering it down to avoid accidents caused by a toppling or falling load.
- ▶ Never use the hoist in an attempt to dislodge a load that has become stuck.
- ▶ Never lift more than one load at a time.
- ▶ Never allow the chain to be bent.
- ▶ Save the load in case of loss of energy.
- ▶ Do not join or mend hoist chain.
- ▶ Exchange deformed load hook.
- ▶ Repair damaged hook safety latch.
- ▶ Repair tight hook bearing.
- ▶ Do not bend or squeeze control hoses.
- ▶ Loose screws must be fastened by repair shop.
- ▶ Shut off air supply before taking off air hoses.
- ▶ Do not exceed allowed quantity of chain in the chain container.
- ▶ When working without chain container avoid dangers caused by the idle chain: falling down, interlocking, striking (see section **Chain Container**, page 38).
- ▶ Repair hoist in case of a too long braking distance.
- ▶ Check blocked chain for damages.
- ▶ Check chain for damage if hoist blocks in switched on position.
- ▶ In case of lifting a load with several hoists avoid overloading by wrong load distribution.
Avoid unacceptable load distribution.
- ▶ Choose safe place of control.
- ▶ Do not exceed operating pressure.
- ▶ Put in order twisted chain (capsized bottom block).
- ▶ Do not work with damaged or worn or rusty chain.
- ▶ Do not work with chain pulled rigid, bent or extended chain.
- ▶ Do not use the load chain as a sling for suspension.
- ▶ It is not permitted to connect or repair hoist chains (e.g. with bolts, emergency links or otherwise).
- ▶ Remove chain accumulated in front of chain intake.
- ▶ Do not bend the chain.
- ▶ Admissible temperature range for chain and hook:
-40°C up to +150°C, permitted heat bearing capacity of the body of the air hoist max. 90 °C, permitted ambient temperature: -20°C up to +70°C.
- ▶ Never touch metallic hand controls being colder than 0°C or warmer than 43°C without using suitable safety gloves.



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- ▶ Do not carry out any modifications on the air hoist.
- ▶ It is not allowed to use other than JDN components with JDN Air Hoists because of the dangers connected therewith.
- ▶ Only use original JDN spare parts. When using foreign components and/or carrying out changes by non authorised persons J.D. Neuhaus GmbH & Co. KG does not undertake any responsibility.
- ▶ If the air supply is cut protect area around the load until power is restored.
- ▶ Turn off the compressed air before detaching the air hoist from the compressed air system.
- ▶ Do not start a double or multiple fall chain hoist when the bottom block is still supported.



DANGER!

Make sure that the load hook can be lowered up to the floor at all operating conditions of the air hoist in order to avoid that a load is lowered to its lowest position without reaching the floor. Danger of overloading.

In case of using hoists in extremely difficult conditions the user has to work out a directive on the basis of this Operation Manual understandable for and in the language of the operator. In this directive regulations for the safe operation are stipulated considering the special conditions at site.

In addition, it is essential to follow all instructions given in the sections entitled **Intended use and Conditions of use**, page 14.

JDN Air Hoists are equipped with round steel chains as load chains. When in use section 5 of DIN 685 should be observed.

Extract: "At the instigation of the operator chains in use should be checked and tested at regular intervals by a responsible expert" (see the section entitled **Inspection list**, page 36).



OPERATING MATERIALS**FOR MOTOR LUBRICATION:**

- ▶ lubricating oil "D" (pneumatic oil), DIN 51502, kinematic viscosity approx. 32 mm²/s (cST) at 40 °C (ISO VG 32, DIN 51519).

Additives: Anticorrosive, wear protection and cleaning

If surrounding temperatures are 0 °C or below and according to the humidity of the pressurised air an anti-freeze additive to the lubricating oil or pneumatic oil with anti-freeze additive for the appropriate temperatures is recommended.

**WARNING!**

Oil and grease may cause skin irritation.
Wear protective gloves at all times.

**CAUTION!**

Risk of motor damage! Never mix synthetic oil with mineral oil as the physical and thermal properties may be adversely affected.

If a service unit is in use no synthetic lubricants should be used at all. Do not use alcohol-based products for anti-icing protection.

FOR MOTOR PRESERVATION:

- ▶ Use a non resinous and non sticking conserving oil.
The preservation protection duration should be in accordance with the intended period of non operation.

FOR LUBRICATION OF BEARINGS AND GEAR:

- ▶ Roller bearing grease, lithium saponified, walk penetration 265–295 (0.1 mm). Dropping point: 190 °C.

Operable temperature range: -30 °C to +130 °C, ground oil viscosity at 40 °C 190 mm²/s, DIN 51502, additives: anticorrosive and ageing protection.

FOR MOTOR CLEANING:

- ▶ Pure petroleum.

FOR CHAIN LUBRICATION:

- ▶ Motor oil, kinematic viscosity approx. 150 mm²/s (cST) at 40 °C.

If the environmental conditions at the working site are such that they induce wear please consult the manufacturer about the appropriate motor and chain lubricant.



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CONTROLS

JDN Air Hoists are operated by:

Control	sensitive		emergency stop switch alternatively	
	yes	no	yes	no
E control		x	x	
F control	x ¹⁾ <small>Option</small>	x	x	
HT control		x	x	
FI control	x ¹⁾		x	
Cord control	x			X

¹⁾ Up to 20 t lifting capacity

The operating elements (push buttons, lever) return automatically to zero position when released.

The emergency stop function is operated by pressing the red stop button, immediately stopping all operations of the hoist and trolley. Movement of the load hook is also stopped. By simply releasing the emergency stop button the emergency stop function is reset.



E control



F control



HT control



FI control



Cord control

CHAIN**RULES FOR RUNNING IN HOIST CHAINS
BEFORE CARRYING OUT THE OVERLOAD TEST****CAUTION!**

In case this information should not be observed you damage the high tensile chain in your hoist/lifting gear already during testing prior to initial use for which the manufacturer does not undertake any liability.

Hoisting chains with a load capacity of over 25 metric tons have to be run in before carrying out the overload test so that they can withstand the high surface pressure at the contact points of the chain links (in the joints).

For preparing the test with overload the following prerequisites have to be fulfilled:

1. The chain has to be carefully lubricated in the joints. Please observe the relevant information in the Operation Manual.
2. The chain has to be loaded five times by lifting and lowering with approximately 50% the nominal load thus sufficiently increasing the load bearing capacity of the joints.
3. Especially the part of the chain which will be tested with overload has to be carefully lubricated once again.

Only now the overload test can be carried out.

**DANGER!**

Extreme corrosions (pitting corrosion) heavily reduces the resistance against vibrations of chains. **Danger of cracks!** Hydrogen induced brittleness with following stress corrosion cracking due to corroding media (as for example sea water) can occur at high tensile steels (as for example at the chain). **Danger of cracks!**

So-called recombination poisons as for example hydrogen sulphide, cyanides, arsenic compounds and rhodanides favour this procedure.

Furthermore dangers arise due to rusty chains when using chain containers as the chain may fall out of the box when piling up.

Apart from that rusty chains increase wear.

Protect the chain against corrosion.

Before operation ensure that the chain of your JDN Air Hoist is in perfect condition.

- ▶ Order any twisted chain.
- ▶ Ensure that the chain can run straight so that blocking of the chain intake at the mid section is avoided.

The chain has to be checked in regular intervals (see the section entitled **Inspection list**, page 36)

In case of any of the following defects:

- ▶ Extended chain links
- ▶ Bent chain links
- ▶ Externally damaged links
- ▶ Chain pulled rigid
- ▶ Severe wear in the link joints
- ▶ Corrosion scars

the JDN Air Hoist must be sent for overhaul immediately (see the section entitled **Test dimensions**, page 37).

The chain must be lubricated when not under load (see the section entitled **Lubrication of the chain**, page 35).

Appropriate lubricants see the section entitled **Operating materials**, page 24.

The lubrication intervals depend on the daily running time.

Increased wear can occur due to aggressive environmental influences.

- ▶ Shorten maintenance intervals.

For safety reasons please note that the chain may not be

- ▶ used as a sling round the load for suspension.
- ▶ handled while running.
- ▶ run at an angle so that the links can be bent on entry.
- ▶ repaired or attached to other hoist chains (e.g. with bolts, emergency links or otherwise).

The allowed chain temperature range is from -40 °C to +150 °C.

If you use a chain container the permitted filling capacity may not be exceeded (see the section entitled **Chain container**, page 38).



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LOAD HOOK

Check the throat width “a” and the height “h” of the load hook of the JDN Air Hoist in use at least once a year (see the section entitled **Test dimensions**, page 37).

Load hooks may not be

- ▶ Loaded on the tip
- ▶ Straightened
- ▶ Annealed

If the hook is bent the JDN Air Hoist should be sent for inspection.

The allowed load hook temperature range is from -40°C to +150°C.

STARTING OPERATION

JDN Air Hoists including their supporting structure are to be checked by trained staff prior to being placed in service.

In case JDN Hoists are mounted by the user into trolleys or cranes, these powered cranes have to be checked by trained staff prior to being placed in service or prior to being placed in service again after a substantial modification.

For preparation of the compressed air JDN Air Hoists must be operated with an air service unit.

The air service unit must not be more than 10 m away from the hoist.

The air service unit is supplied without the oil. Oiler and regulator are already preset.

For filling the oiler, see the sections entitled **Operating materials**, page 24, and **Service unit**, page 30.

Lubrication of the chain by the client before initial use is especially important (see the sections entitled **Lubrication of the chain**, page 35, and **Operating materials**, page 24).

A well ordered running-in of the chain is a must for a proper functioning of the JDN Air Hoist. Before every operation, please check that the chain is not twisted or the bottom block – if applicable – has not been flipped through the chain falls. Order the chain if necessary.

Observe all appropriate regulations when attaching the load!

Before every operation and after longer idle periods action should be taken in the following order:

1. Check power requirements (air pressure and air consumption see the section entitled **Technical data**, page 43) and the setting of the regulator in the service unit.
2. Check the oil level in the oiler of the service unit and if necessary replenish (see the section entitled **Service unit**, page 30).
3. Lubricate the chain if necessary.
4. Blow through the air hose before connecting.
5. Connect air supply hose (for size of hose and air connection screw see the section entitled **Technical data**, page 43).
6. Test the brake function and – at the same time – the control unit and the limit switch (see the section entitled **Testing the limit switch**, page 34).

Switch the JDN Air Hoist (without load) for short periods alternatively to raise and lower. When the control element is released the chain should not continue to run.

If the chain continues to run and/or the operating element does not automatically return to the zero position, your JDN Air Hoist must be sent for repair!

TROUBLESHOOTING

Symptom	Remedy
motor has too little power or stops	<ul style="list-style-type: none">- check air pressure, increase if necessary- check diameter of air hose (see the section entitled Technical data, page 43)- check hose for free passage of air- check tightness of control hose connections and control hoses- check oil level- silencer plate clogged, wash out or change.

All other problems must be corrected by maintenance repairs.



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MAINTENANCE

If maintenance measures exceed care and servicing please contact the manufacturer.

With regard to the qualification of maintenance personnel see the section entitled **Safety instructions**, page 5.

CARE

If your JDN Air Hoist is not suspended, connected or installed stationary but frequently changing working place – especially in contaminated or humid surroundings – ensure that for periods of non operation it is stored in a clean and dry place (see the section entitled **Storage**, page 16).



SERVICE UNIT



CAUTION!

When operating a hoist with service unit, the unit should be installed within 5 m of the hoist.

The service unit for air hoists PROFI 20 TI up to PROFI 50 TI consists of the two components filter-regulator and lubricator. The service unit for air hoists PROFI 100 TI as well as for the monorail hoists consists of the three components filter, regulator and lubricator.

VERSION OF TWO COMPONENTS

Inspecting and adjusting the filter-regulator

The filter regulator is preset in the factory at an operating pressure of 5,4 bar (operating pressure with running motor). If the pressure gauge shows a different reading you should first check the accuracy of the gauge. If the gauge is in order, then re-adjust the filter-regulator with running motor with rated load. A faultless adjustment is only reached at a pressure upstream the service unit of at least 7 bar.

- ▶ Lift the adjusting knob.
- ▶ Turn the regulator knob until the pressure gauge shows 5,4 bar operating pressure. Turn clockwise to increase the pressure or counter-clockwise to decrease it.
- ▶ Latch the adjusting knob by pressing it down.

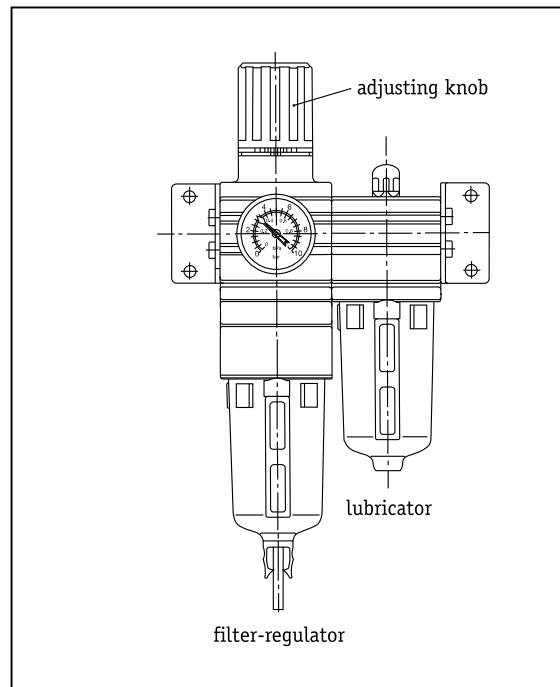
Alternatively you can set the filter regulator to 6 bar with halted motor which will require a pressure of at least 7 bar upstream the service unit.

- ▶ Relieve all pressure from the air line behind the service unit and close it again.
- ▶ Turn the adjusting knob counter-clockwise to detension the adjusting spring.
- ▶ Turn the adjusting knob until the pressure gauge shows a pressure of 6 bar. Turn clockwise to increase the pressure or counter-clockwise to decrease it.
- ▶ Latch the adjusting knob by pressing it down.

If the operating pressure does not reach 5,4 bar despite a sufficiently high pressure upstream the service unit then the cross section of the air feeding hose is too small!



Version of two components filter-regulator and lubricator



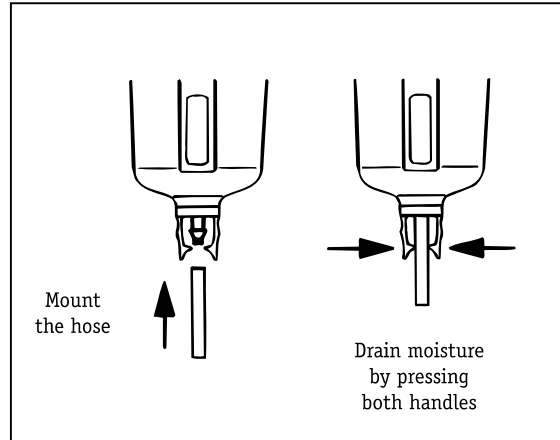
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Draining the moisture

In the course of time moisture is gathered in the receptacle of the filter-regulator which has to be drained in regular intervals. Please proceed as follows:

- ▶ Check the water level visible through the sight glass in the receptacle. The water level may not reach the separating disc.
- ▶ Mount the enclosed drain hose (instead of this a soft PVC-hose of a diameter of 8 x 1 of corresponding length may be used).
- ▶ Collect the drained water and dispose it in a suitable manner as it may contain oil.



Draining the moisture

Cleaning the filter element

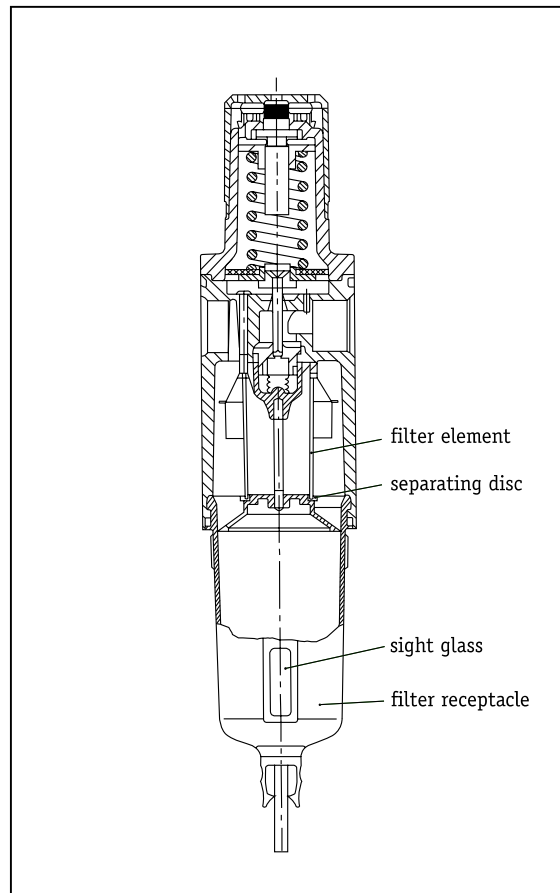


CAUTION!

Do not use any alcohols for cleaning the service unit! Alcohol may damage parts of the service unit. Transparent parts may only be cleaned with soap.

The filter element must be cleaned yearly as follows:

- ▶ Drain the water.
- ▶ Shut off the compressed air supply, carefully relieve any remaining pressure.
- ▶ Unlock the receptacle of the filter-regulator, turn it to the left until it stops and remove it.
- ▶ Unscrew the separating disc. The filter element is loosely positioned on the centre of the separating disc.
- ▶ Clean the filter element with soap water and blow through it firmly.
- ▶ Remount the clean filter element and tighten the separating screw.
- ▶ Put receptacle of the filter regulator back into the housing and turn it to the right. The receptacle locks by itself.



Version of two components filter-regulator and lubricator

Filling and adjusting the lubricator

The function of the lubricator is to ensure that the air supplied to the hoist receives a constant and precisely metered quantity of oil. It is very important to check the lubricator regularly as the vane motor could be damaged in case of insufficient lubrication. The lubricator can be replenished even when it is under pressure.

- ▶ Check the oil level through the sight glass of the receptacle. The oil level may not fall short of the minimum marking!
- ▶ Unscrew the oil filling plug.
- ▶ Fill the lubricator with oil up to the maximum marking and replace the oil filling plug.
- ▶ Check the oil dripping rate through the sight glass with running motor.
- ▶ Turn the oil throttle screw with a screw driver until reaching the required number of oil drops per minute. Turn clockwise to reduce the dripping rate, counter-clockwise to increase it.

Oil dripping rates (lifting with no load):

For UH 05, UH 1 and UH 2:

2 drops each per minute

For PROFI 20 TI, EH 20, UH 4, UH 6, UH 8 and UH 12:

10 drops each per minute

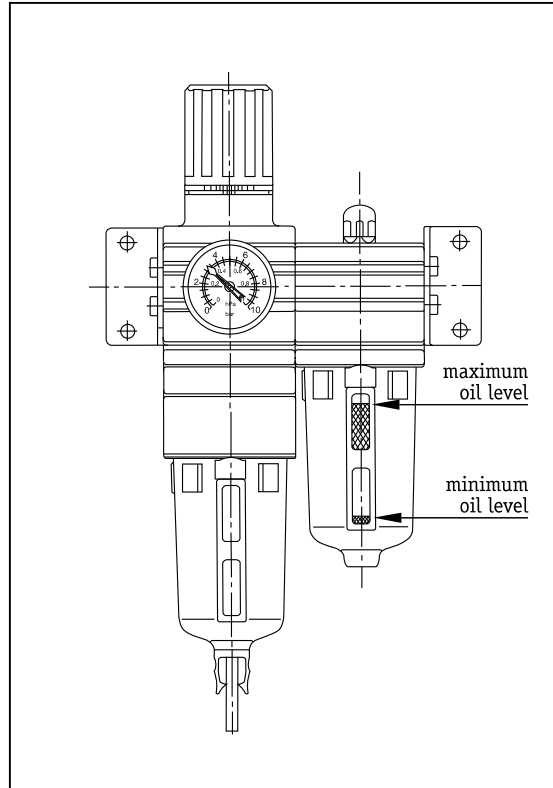
For PROFI 25 TI, 37 TI and 50 TI:

15 drops each per minute

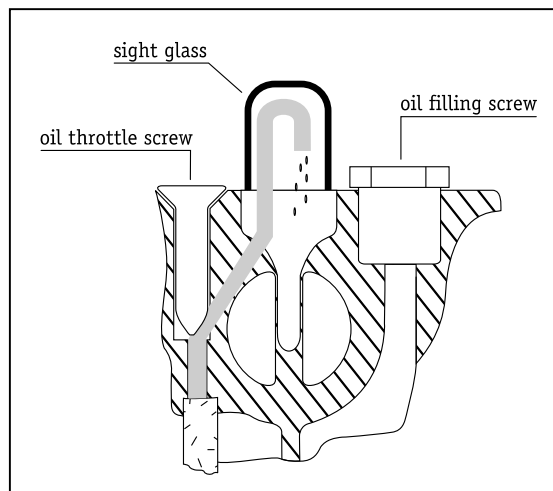


CAUTION!

It is not allowed to fill the lubricator with synthetic oils. It may neither be connected to an air system fed by a compressor which is lubricated with synthetic oils.



Check the oil level and replenish if necessary



Checking and adjusting the oil dripping rate through sight glass



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CONTROLS

JDN Air Hoists can be equipped with a variety of control devices. They are all suitable for use in explosion-hazardous areas.

All control switches return to the zero position when released.

CONTROL VALVE ON MOTOR

Air control (E-, F-, FI-control) with MS

Control valve with upstream main-stream valve

The control valve consists of:

- 1. Main-stream valve
- 2. Direction control valve as rotary valve
- 3. Positioner (pneumatic actuation)

The main-stream valve lies upstream from the rotary valve. If no control pressure is present, this valve is closed and the rotary valve is depressurised. If control pressure is applied from the hand control, the valve opens and releases the main stream.

If the red EMERGENCY STOP button on the hand control is pressed, all control lines are depressurised and the main-stream valve is closed.

The rotary valve positioner is mechanically connected to the rotary valve drive.
The positioner is actuated by the control air.

Air control (E-, F-, FI-control)

Control valve without upstream main-stream valve

The control valve consists of:

- 1. Direction control valve as rotary valve
- 2. Positioner (pneumatic actuation)

The rotary valve positioner is mechanically connected to the rotary valve drive.

The positioner is actuated by the control air.

Rope control

Control valve without upstream main-stream valve

The control valve consists of:

- 1. Direction control valve as rotary valve
- 2. Positioner

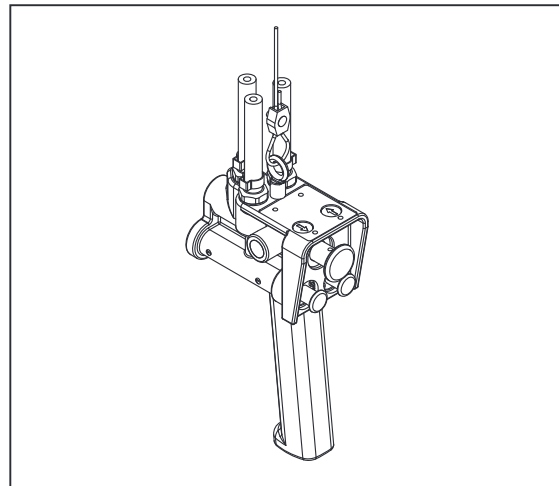
The rotary valve positioner is mechanically connected to the rotary valve drive.

For the purpose of actuation, the rotary valve is directly connected to the control lever.

E-CONTROL

With E-control, lifting and lowering movements can be controlled via two pushbuttons. The direction of movement of the load hook is marked on the upper side of the valve housing, above the pushbuttons.

- ▶ Lift: Press the right pushbutton.
- ▶ Lower: Press the left pushbutton.



E-control with EMERGENCY STOP button

Filling and adjusting the lubricator

See description **Version of two components**.

The lubricator can be replenished under pressure.

- ▶ Check the oil level through the sight glass of the receptacle. The oil level may not fall short of the minimum marking!
- ▶ Unscrew the oil filling plug.
- ▶ Replenish the lubricator with oil up to the maximum marking and replace the oil filling plug.
- ▶ Check the oil dripping rate through the sight glass with running motor.
- ▶ Adjust the oil dripping rate by turning the adjusting knob until reaching the required number of drops per minute. Turn clockwise to reduce the dripping rate, counter-clockwise to increase it.

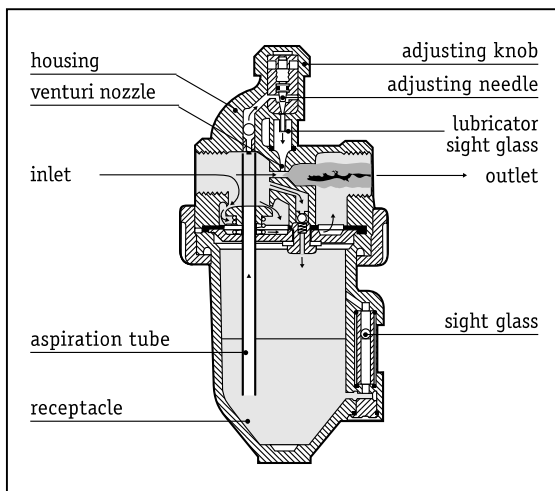
Oil dripping rates (lifting with no load):

For EH 25 up to EH 50:

15 drops each per minute

For PROFI 100 TI, EH 75, EH 100,
UH 75 and UH 100:

25 drops each per minute



Lubricator

CHECKING THE CONTROL ELEMENTS

The control elements of your JDN Air Hoist must return automatically to the off position when they are released.

Check once a day whether the control elements work smoothly.

TESTING THE BRAKE

The correct functioning of the brake must be tested as follows:

- ▶ Operate the hoist with no load, alternating between lifting and lowering.

When you release a control element it must not be visibly noticed that the chain slows down.



DANGER!

If you notice that the chain does not stop running immediately, stop using the hoist at once! The hoist must be repaired before any further use.

Due to physical reasons the stopping distance cannot reach the value zero but during this function test it must not be visibly noticed the chain slows down.

TESTING THE LIMIT SWITCH

Move the hooks in succession into the upper and lower end position. Stop just before the end positions are reached and carefully (e.g. by pressing the control elements several times) move the hook into the end position.

The movement of the chain must be automatically interrupted by switching off the motor when the control lever has reached the center position, or when the limit switches for lifting and lowering are actuated by the contours of the bottom block or the idle chain end.



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LUBRICATION OF THE CHAIN

The links of the chain of your JDN Air Hoist must be lubricated in unloaded position.

- ▶ Place the chain in an appropriate container.
- ▶ Spray the chain with so much car oil that it is completely covered with an oil film (see the section entitled **Operating materials**, page 24).
- ▶ If there is no container available for carrying out lubrication the chain can be lubricated while it is hanging. Ensure that the links are completely coated with oil (e. g. by moving).

You can get from JDN a high duty lubricator in a sprayer which sticks well to the chain and does not drop after the solvent has evaporated, article No. 12066 (sprayer 400 ml).

For operation in areas with high corrosion potential, e.g. in the off-shore sector, the chain can be largely protected against corrosion by the use of special lubricants.

These types of lubricants are characterised by weathering resistance, water insolubility, good adhesion properties etc. Re-lubrication intervals must be stipulated in accordance with the loading.

Please contact us, if required.

INSPECTIONS AND MAINTENANCE WORK

Hoists are classified into groups and designed according to their planned operating method according FEM/ISO. The daily running time and the load collective determine the classification (1 Bm/M3). The theoretical service time is 1600 hours in the load collective 2, corresponding to 400 hours of full load.

Whereby it is supposed that the distance for lifting and lowering is more or less the same.

The life time of hoists used mainly for lowering purposes (approx. 75% of the duty cycle) would be reduced because of the higher lowering speed in the range of 50% to 100% of the nominal load.

Therefore, the determined portion of the theoretical operating time must be multiplied by a factor of f_v . The factor f_v has the value 1 at 50% nominal load linearly ascending to 1,5 at 100% nominal load (P = percentage of nominal load).

$$f_v = 1 + 0,5 \frac{P - 50}{50} \quad (\text{for } P > 50\%)$$

In order to obtain safe working periods the client has to check at each inspection whether the theoretical service time has been reached. This has to be documented at least once a year in the check book which contains an example of how to calculate the actual service time.

When the theoretical service time is reached a general overhaul has to be carried out. Local (national) safety regulations detail the precise method to be used for calculating and recording the actual service time. It is the customer's responsibility to initiate the overhaul which must be recorded in the check book. For information on the general overhaul consult the manufacturer.

It is only when the assumption for the group classification is in accordance with the practical operation of the hoist that a safe working period corresponds to the theoretical service time. Any deviation between the actual working time and the theoretical service time increases or decreases the safe working period.

Apart from the daily inspection all inspection procedures require removing the hoist from its operating position.

- ▶ Release all pressure from the air lines.
- ▶ Set up a suitable working platform.
- ▶ Disconnect the air supply and control hoses from the hoist.
- ▶ Take the hoist out and remove it to a location suitable for conducting the work required.



WARNING!

Every time repairs have been carried out the setting up checks must be done on the hoist.

MAINTENANCE LIST

No.	Measures to be taken	Frequency	see the section entitled
1	Check oil level for motor lubrication	daily	Service unit , page 30
2	Check control elements	daily	Checking the control elements , page 34
3	Test brake function	daily	Testing the brake function , page 34
4	Test limit switch	daily	Testing the limit switch , page 34
5	Lubricate the chain	in case of need	Operating materials , page 24, and Lubrication of the chain , page 35
6	Check emergency stop	daily	Controls , page 25
7	Check buffers of the emergency stop device (if there is no end switch)	daily	

All these measures are described in the section entitled **Service Unit**, page 29.

INSPECTION LIST

The mentioned frequencies refer to normal operation (see the section entitled **Operating mode**, page 8).

The frequencies have to be increased in dependence on higher stress.

No.	Measures to be taken	Frequency
1	Check chain	every three months at least
2	Check chain sprocket and chain guide	at every chain change
3	Check wear on brakes	every 250 hours*
4	Check all screw and bolt connections	every 250 hours*
5	Check seating and condition of load hook and eye (load and suspension sections)	every 250 hours*
6	Check motor	every 250 hours*
7	Check gears and change lubrication	every 800 hours**
8	Check shaft coupling	every 800 hours**
9	Check load coupling	every 800 hours**
10	Check control	daily
11	Check service unit	yearly
12	Check silencer	yearly
13	Check overload protection	yearly
14	Check and lubricate the axial bearing of the hooks and the bearing of the sprocket wheels	yearly
15	Change buffers of the emergency stop device	at least every 5 years
16	Check air connections for damages	yearly
17	In Offshore and similar corrosive applications the chain has to be exchanged on a regular basis	at least after 5 years

* at least yearly ** at least after 5 years

TEST DIMENSIONS

Note: When checking the extent of wear, the wear which will occur in the period until the next examination must be taken into consideration.

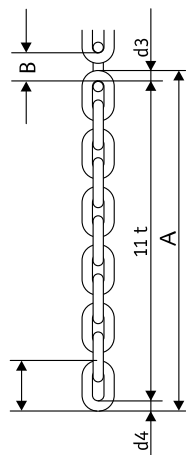
The chain sprocket should be exchanged at the same time when exchanging the chain, as otherwise the new chain will be subject to increased wear. Each chain change has to be documented in the check book.

Chain d x t	7 x 21	13 x 36	16 x 45	22 x 66	23.5 x 66	31.5 x 90
Dimension A max.	249.2	429.2	536	783.4	787.9	518.3*
11 x t inside	235.8	404.3	505.3	741.2	743	457.8*
Dimension B max.	22.1	37.9	47.4	69.5	69.5	93.8
Dimension C min.	6.3	11.7	14.4	19.8	21.2	28.35
Dimension D max.	36.1	63.9	79.3	113.3	116.4	157.6

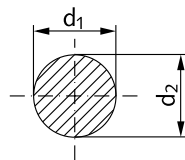
Dimensions in mm

* Measuring length referred to 5 x t

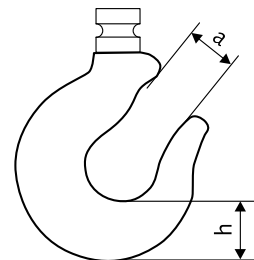
Type	Max. permissible dimension of throat width a ¹⁾	Min. permissible dimension of height h
UH 05, UH 1	31.5 mm	21.4 mm
UH 2	36.5 mm	28.5 mm
UH 4, UH 6	46.0 mm	41.3 mm
UH 8, UH 12	50.4 mm	58.9 mm
20 TI, 25 TI EH 20, EH 25,	83.4 mm	80.8 mm
37 TI, 50 TI, EH 37, EH 50,	110.2 mm	116.9 mm
100 TI, EH 75, EH 100, UH 75, UH 100	131.0 mm	152.0 mm



$$11 t = A - (d3+d4)$$



$$C = \frac{d_1 + d_2}{2}$$



1) With safety latch the plate thickness of the safety latch has to be subtracted from the max. permissible dimension a.

ACCESSORIES

CHAIN CONTAINER

Use only JDN chain containers with JDN Air Hoists. Other constructions could be a high safety risk.

Never exceed the permitted filling capacity for a chain container.

For chains in containers lubrication is of utmost importance for making full use of the bucket capacity. Rust on chains assist high piling up of the chain in the bucket and is therefore not allowed.

When the chain runs into the container it has to be observed that between lower edge of mid section and chain pile at least 5 chain links can hang without obstruction.

The chain may only pass into the container over the chain drive. Should it have fallen out of the container for example during transportation it must be completely extended at the load hook side and then returned into the container over the chain drive with running hoist.

In case a load is fastened directly under the load hook it has to be safeguarded that it cannot be driven against the chain container. If necessary a clamping sleeve has to be mounted on the chain above the load hook acting as an emergency stop at the control lever.



DANGER!

When operating JDN Air Hoists without a chain container it has to be made certain that the idle chain running up and down the chain sprocket (unloaded chain end) does not cause any risks for example by interlocking, striking or falling down.

Crash dangers may also arise when during the lifting process the idle chain at first settles on large surface loads or other surfaces above the transport level and then slides or falls down.



DANGER!

Do not exceed the admissible filling capacity! Danger of a chain drop!



DANGER!

When using a chain container the lubrication of the chain is of special importance to avoid the chain to fall out.



CAUTION!

The chain container must be protected against impacts from the load when lifting. Fit a chain stop to the chain if required.



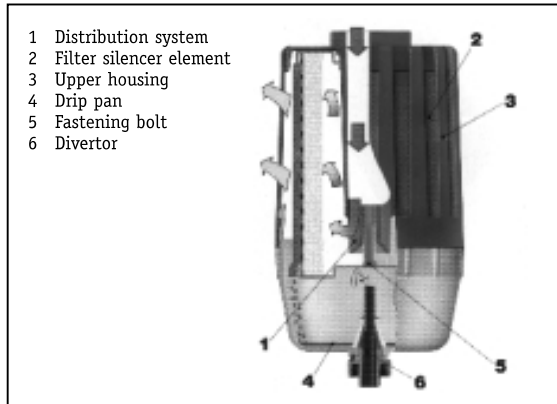
CAUTION!

Do not allow the chain to pile up in the chain container.



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FILTER SILENCER*Filter silencer*

- 1 Distribution system
- 2 Filter silencer element
- 3 Upper housing
- 4 Drip pan
- 5 Fastening bolt
- 6 Divertor

OPERATION

The function of the fine filter silencer takes place in three steps:

1. The oil containing exhaust air flows over the inlet into a conical distribution system (1) to flow uniformly against the filter element and reduce the flow rate.
2. When flowing through the filter element made of micro glass fibre the oil particles form larger drops – because of the “coalescing effect” – which are collected in the outer foam coating and can drop from there into the transparent drip pan (4).
The degree of efficiency achieved is > 99.99% of all oil particles according to the DOP Test.
3. The compressed air, which is now clean, can expand to ambient pressure. The reduced flow speed leads to a sound absorption of > 4 dB (A).
4. – Result: Clean and quiet ambient air.

As the structure of the filtering material (2) has a high hollow volume (approx. 90%) there is considerable retention of solid particles. Therefore the service life is correspondingly high and the pressure drop very low.

MAINTENANCE

Care must be taken that the filtered out oil or the emulsion which has accumulated in the drip pan, are drained. This should be carried out by turning the knob of the divertor (6) by 90° before the fluid level reaches the filter silencer element (2).

Depending on the amount of solid particles, the element needs to be replaced by a new one after approx. 2500 hours of operation with the filter silencer still mounted in the air line. The bottom tray fastened to the upper housing with 4 snap connections can be easily removed, the same as the element which is held in place by the fastening bolt (5).

OVERLOAD PROTECTION

JDN Air Hoists have the overload protection as a standard feature for the EU market. The overload protection automatically stops the lifting operation if the load reaches or is greater than the maximum setting. The shutoff setting is between 110% and 125% of the hoist's rated maximum load capacity.

When the overload protection has actuated only the "Down" motion can be initiated.

The overload protection can also respond to a load that weighs less than the shutoff setting. This may happen when with full speed and a slack chain a load is abruptly lifted. We therefore recommend to tighten the slack chain slowly before lifting the load.

If you wish to retrofit the overload protection to your air hoist consult the customer service of J.D. NEUHAUS GMBH & CO. KG.

OVERLOAD TESTING WITH PROFI 20 TI AND MONORAIL HOIST EH 20

When testing the hoist with overload without causing the hoist to shut-off the locking screw has to be removed.



DANGER!

After completing the overload test, always tighten the locking screw until it seats firmly.

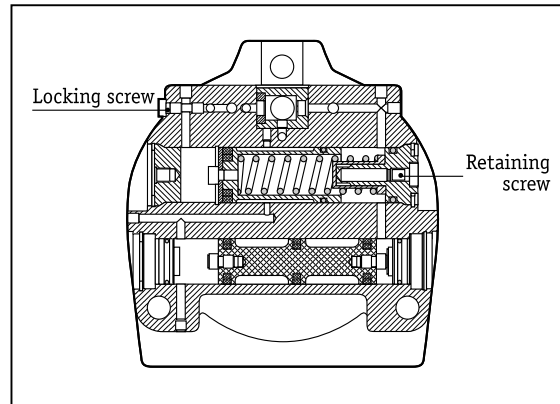
ADJUSTING THE OVERLOAD PROTECTION



DANGER!

If the overload protection is incorrectly adjusted the chain may break.

- ▶ Loosen the retaining screw in order to reach the threaded lug underneath it.
- ▶ Turn the threaded lug to adjust the overload protection setting. Turn the lug clockwise to increase the shutoff setting or counterclockwise to decrease the setting.
- ▶ Replace the retaining screw and tighten it down before testing the overload protection for correct functioning.



Overload protection (at the motor)



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OVERLOAD TESTING WITH PROFI 25 TI THROUGH PROFI 100 TI AND MONORAIL HOISTS EH 25 THROUGH EH 100

When testing the hoist with overload without causing the hoist to shut-off the locking screw has to be removed.



DANGER!

After completing the overload test, always tighten the locking screw until it seats firmly.

- ▶ Loosen the locking screw.
- ▶ Now the pressure balance piston is not activated at the "UP" side, and the overload protection is out of function.
- ▶ After completing the overload protection test tighten the locking screw until it seats firmly.

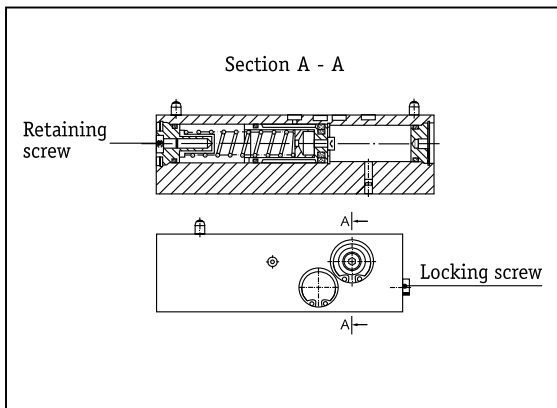
ADJUSTING THE OVERLOAD PROTECTION



DANGER!

If the overload protection is incorrectly adjusted the chain may break.

- ▶ Loosen the retaining screw in order to reach the threaded lug underneath it.
- ▶ Turn the threaded lug to adjust the overload protection setting. Turn the lug clockwise to increase the shutoff setting or counterclockwise to decrease the setting.
- ▶ Replace the retaining screw and tighten it down before testing the overload protection for correct functioning.



Overload protection (at the motor)

OVERLOAD TESTING WITH UH 05 THROUGH UH 2

When testing the hoist with overload without causing the hoist to shut-off the locking screw has to be removed.



DANGER!

After completing the overload test, always tighten the plug screw until it seats firmly.

- ▶ Loosen the plug screw.
- ▶ Now the pressure balance piston is not activated at the "UP" side, and the overload protection is out of function.
- ▶ After completing the overload protection test, tighten the plug screw until it seats firmly.

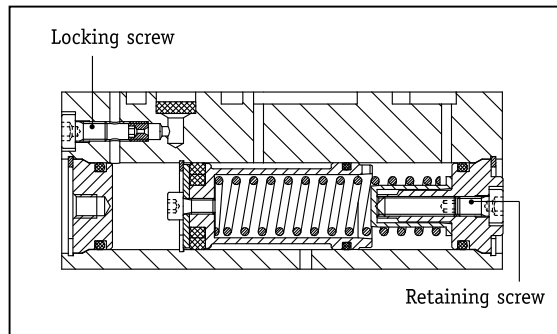
ADJUSTING THE OVERLOAD PROTECTION



DANGER!

If the overload protection is incorrectly adjusted the chain may break.

- ▶ Loosen the retaining screw in order to reach the threaded lug underneath it.
- ▶ Turn the threaded lug to adjust the overload protection. Turn the lug clockwise to increase the shutoff setting, or counterclockwise to decrease the setting.
- ▶ Replace the retaining screw and tighten it down before testing the overload protection for correct functioning.



*Overload Protection (at the motor)
Loosen the retaining screw to reach the threaded lug underneath it.*

OVERLOAD TESTING WITH UH 4 TROUGH UH 12

When testing the hoist with overload without causing the hoist to shut-off the locking screw has to be removed.



DANGER!

After completing the overload test, always tighten the plug screw until it seats firmly.

- ▶ Loosen the cover screw (1) at the housing
- ▶ Loosen the plug screw.
- ▶ Now the pressure balance piston is not activated at the „UP“ side, and the overload protection is out of function.
- ▶ After completing the overload protection test, tighten the plug screw until it seats firmly.
- ▶ Replace the cover screw (1) at the housing.

ADJUSTING THE OVERLOAD PROTECTION



DANGER!

If the overload protection is incorrectly adjusted the chain may break.

- ▶ Loosen the cover screw (2) at the housing.
- ▶ Loosen the retaining screw in order to reach the threaded lug underneath.
- ▶ Turn the threaded lug to adjust the overload protection. Turn the lug clockwise to increase the shutoff setting, or counterclockwise to decrease the setting.

- ▶ Replace the retaining screw and tighten it down before testing the overload protection for correct functioning.
- ▶ Replace the cover screw (2) at the housing.

BOOSTER VALVE

To shorten the reaction times of indirect controls (E, F, HT) where the control hose length is over 10 m, an additional valve is fitted on the motor.

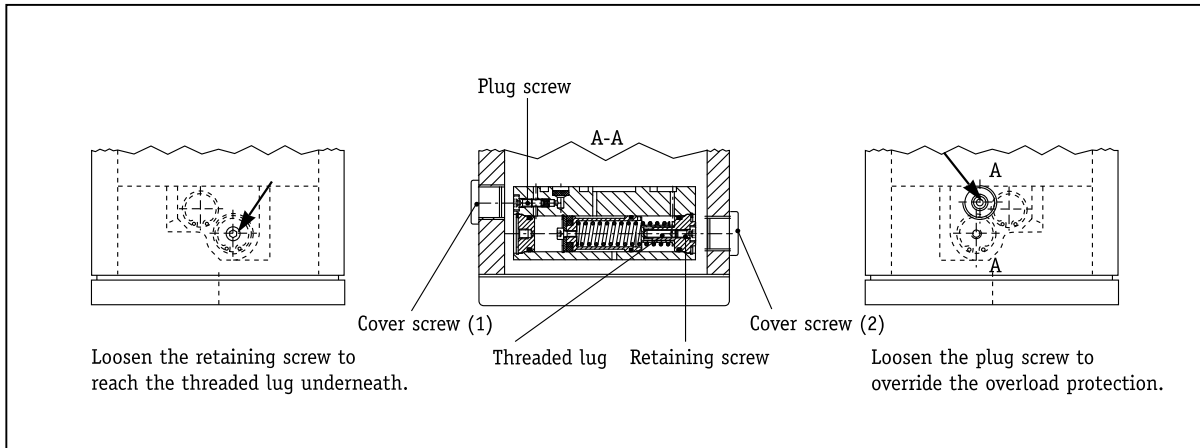
This also prevents a pressure drop in the control cylinder of the motor valve.

AXIAL BEARING

As standard the top hooks of JDN Air Hoists can only be turned around its longitudinal axle without load as there is no roller bearing in the housing.

In case the top hook has to be turned around smoothly under load an axial bearing with own housing can be mounted between hoist housing and top hook.

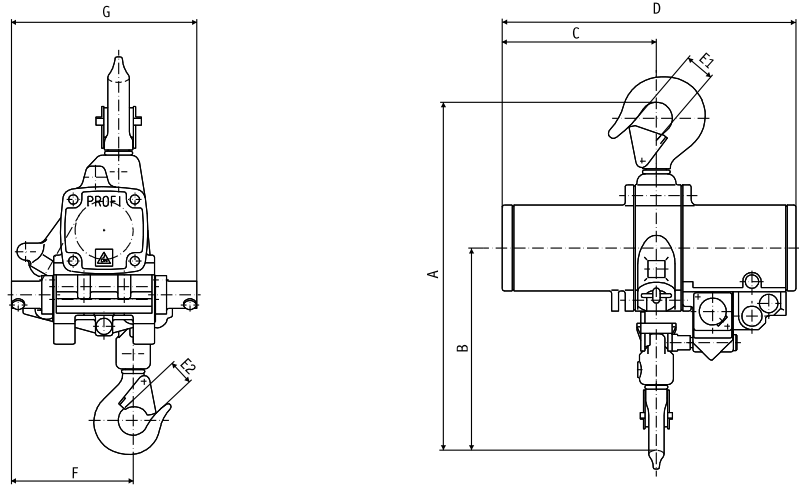
This additional device increases the headroom of JDN Air Hoists.



Overload protection (in the motor housing)

DIMENSIONS / TECHNICAL DATA

SPECIFICATIONS OF JDN AIR HOISTS **PROFI**



Type	20 TI	25 TI	37 TI	50 TI	100 TI
A min. headroom*	1090	1282	1466	1700	2200
B	708	948	935	1144	1475
C	390	393	377	475	705
D	768	839	807	1005	1417
E1	75	75	100	100	120
E2	75	75	100	100	120
F	250	466	518	310	440
G max. width	360	610	745	539	767

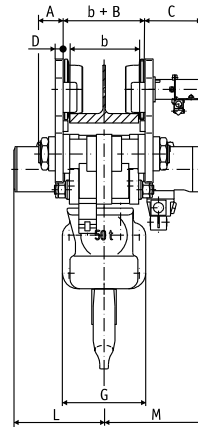
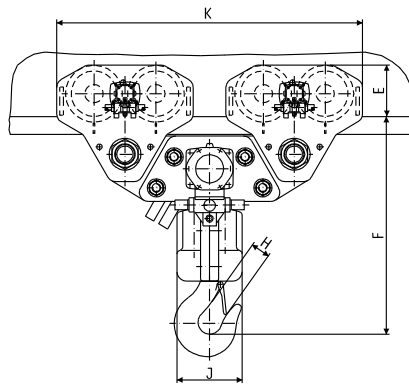
* Chain container increases the headroom

Dimensions in mm

Typ		20 TI	25 TI	37 TI	50 TI	100 TI	
Rated capacity	metric tons	20	25	37.5	50	100	
Number of chain falls		4	2	3	4	4	
Motor output	kw	2.5	6.0	6.0	6.0	10.0	
Air pressure	bar	6	6	6	6	6	
Lifting speed with rated load	m/min	0.5	1.1	0.65	0.45	0.35	
Lifting speed with no load	m/min	1.0	2.3	1.6	1.3	0.7	
Lowering speed with rated load	m/min	1.3	1.9	1.5	1.4	0.8	
Air consumption with rated load	m ³ /min	Lifting Lowering	2.9	5.5	5.5	5.5	11
			3.7	6.5	6.5	6.5	12
Air connection		G 3/4	G1	G1	G1	G1 1/2	
Hose dimensi (Ø inside/Ø outside)	mm	19/31	25/39	25/39	25/39	35/51	
Weight with standard lift rope control, without Δp	kg	285	498	880	855	2460	
Chain size	mm	16x45	22x66	22x66	22x66	31.5x90	
Weight of chain per metre	kg	5.8	10.8	10.8	10.8	21.3	
Standard lift	m	3	3	3	3	3	
Length of control with standard lift	m	2	2	2	2	2	
Sound level with rated load ¹ with standard silencer - Lifting	dB (A)	76	83	83	83	88	
Sound level with rated load ¹ with standard silencer - Lowering	dB (A)	82	83	83	83	89	

¹ measured in 1 m distance acc. to DIN 45635 part 20

SPECIFICATIONS OF JDN MONORAIL HOISTS



Type	EH 20	EH 25	EH 37	EH 50	EH 75	EH 100
A	130	146	100	125	100	125
B	68	70	68	68	68	68
C	287	277	287	292	287	292
D	35	25	35	40	35	40
E	220	198	220	283	220	283
F*	820	998	1070	1150	1480	1535
G	202	170	190	420	286	575
H	75	75	100	100	120	120
J	266	350	455	340	740	470
K	600	1185	1730	1680	3210	3130
L	367	377	379	462	640	762
M	325	434	430	560	655	750

* Chain container increases the headroom

Dimensions in mm

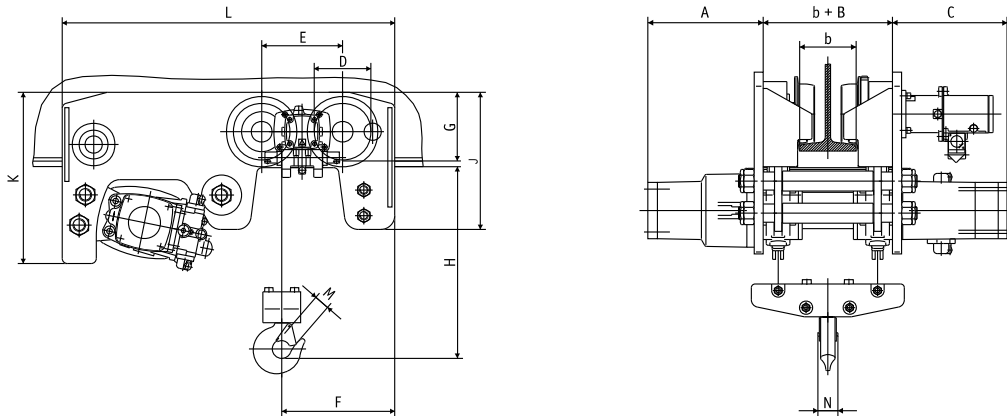
Type		EH 20	EH 25	EH 37	EH 50	EH 75	EH 100
Rated capacity	t	20	25	37.5	50	75	100
Number of chain falls		4	2	3	4	3	4
Motor output Trolley	kw	0.7	1.4	1.4	1.4	2.8	2.8
Motor output Hoist	kw	3.5	6	6	6	10	10
Air pressure	bar	6	6	6	6	6	6
Lifting speed with rated load	m/min	0.7	1.1	0.65	0.5	0.45	0.35
Lifting speed with no load	m/min	1.4	2.3	1.6	1.1	0.85	0.65
Lowering speed with rated load	m/min	1.6	1.9	1.5	0.9	1.0	0.75
Travelling speed with rated load	m/min	12	12	12	12	12	12
Travelling speed with no load	m/min	13.5	13.5	13.5	13.5	13.5	13.5
Air consumption Trolley	m ³ /min	1.3	2.6	2.6	2.6	5.2	5.2
Air consumption Hoist		4.0	5.5	5.5	5.5	11	11
Air connection		G 3/4	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2	G 1 1/2
Hose dimension (∅ inside/∅ outside)	mm	19/31	35/51	35/51	35/51	35/51	35/51
Weight with standard lift	kg	620	950	1450	1780	4000	5700
Chain size	mm	16 x 45	22 x 66	22 x 66	22 x 66	31.5 x 90	31.5 x 90
Weight of chain per metre	kg	5.8	10.8	10.8	10.8	21.3	21.3
Standard lift	m	3	3	3	3	3	3
Length of control with standard lift	m	2	2	2	2	2	2
Sound level with rated load ¹ with standard silencer - Lifting	dB (A)	80	83	83	83	88	88
Sound level with rated load ¹ with standard silencer - Lowering	dB (A)	84	83	83	83	89	89

¹ measured in 1 m distance acc. to DIN 45635 part 20

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SPECIFICATIONS OF JDN ULTRA-LOW MONORAIL HOISTS



Type	UH 05	UH 1	UH 2	UH 4	UH 6	UH 8	UH 12
A	155	155	155	246	317	246	317
B	140	140	140	200	200	200	200
C	252	252	252	315	315	315	315
D	84	84	84	165	165	165	165
E	136	136	136	236	236	236	236
F	182	182	148	330	330	270	270
G	114	114	114	197.5	197.5	197.5	197.5
H* min. 58 ≤ b ≤ 125	120	120	120				
H* min. 125 ≤ b ≤ 210	125	125	135				
H* min. 150 ≤ b ≤ 230				210	210	260	260
H* min. 210 ≤ b ≤ 310	130	130	140				
H* min. 230 ≤ b ≤ 310				220	220	235	235
J	257	257	257	400	400	400	400
K	339	339	339	500	500	500	500
L	625	625	625	970	970	970	970
M	26	26	30	30	40	40	42
N	38	38	53	53	55	55	76

* Chain container increases the headroom

Dimensions in mm

Type	UH 05	UH 1	UH 2	UH 4	UH 6	UH 8	UH 12
Rated capacity	t	0.5	1.0	2.0	4.0	6.0	12.0
Number of chain falls		2	2	4	2	2	4
Motor output	kw	1.0	1.0	1.0	2.5	2.5	2.5
Air pressure	bar	6	6	6	6	6	6
Lifting speed with rated load	m/min	10	5	2.5	2.2	1.5	0.7
Lifting speed with no load	m/min	24	12	6	4.4	3	1.4
Lowering speed with rated load	m/min	24	12	6	7.5	5.2	2.5
Air consumption Lifting -rated load- m ³ /min		1.4	1.4	1.4	2.9	2.9	2.9
Air consumption Lowering -rated load- m ³ /min		1.2	1.2	1.2	3.7	3.7	3.7
Air connection		G 1/2	G 1/2	G 1/2	G 3/4	G 3/4	G 3/4
Hose dimension (∅ inside/∅ outside)	mm	15/27	15/27	15/27	19/31	19/31	19/31
Weight with standard lift without control	kg	105	106	120	450	470	495
Chain size	mm	7x21	7x21	7x21	13x36	13x36	13x36
Weight of chain per metre	kg	1.1	1.1	1.1	3.8	3.8	3.8
Standard lift	m	3	3	3	3	3	3
Length of control with standard lift	m	2	2	2	2	2	2
Sound level with rated load ¹ with standard silencer - Lifting	dB (A)	75	75	75	76	76	76
Sound level with rated load ¹ with standard silencer - Lowering	dB (A)	80	80	80	82	82	82

¹ measured in 1 m distance acc. to DIN 45635 part 20





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