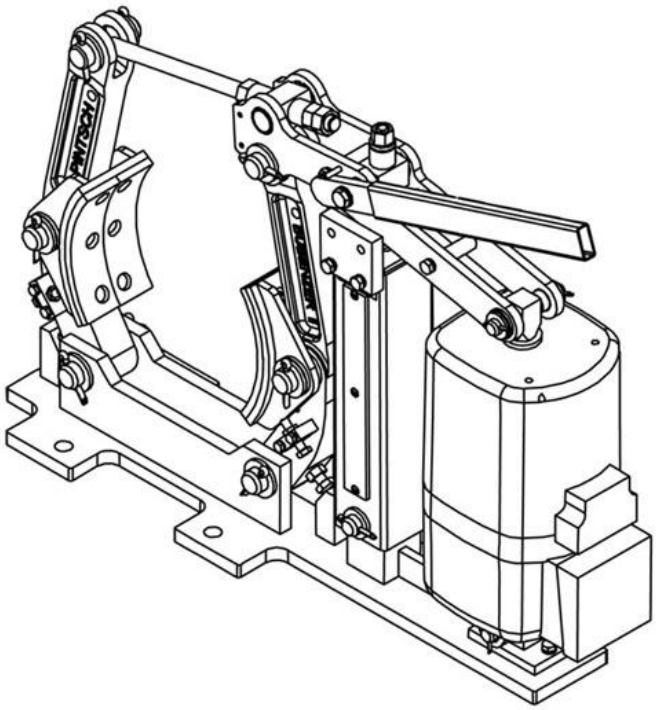
Operating Manual
Drum Brake EBA 6” – 16’’
Original Operating Manual



DELLNER BUBENZER Germany GmbH
Friedrichshüttenstr. 1
57548 KIRCHEN-WEHBACH
GERMANY

PHONE +49 2741 9488 0
FAX +49 2741 9488 44
EMAIL info@dellnerbubenzer.com

www.dellnerbubenzer.com

1 Table of Contents

2 About This Operating Manual

This chapter contains notes and information that will make it easier for you to use this operating manual. If you have any questions, please contact:

DELLNER BUBENZER Germany GmbH
Friedrichshüttenstr. 1
57548 KIRCHEN-WEHBACH
GERMANY
Tel.: +49-2741 - 9488 – 0
Fax: +49-2741 - 9488 - 44
E-Mail: info@dellnerbubenzer.com
Internet: www.dellnerbubenzer.com

or the branch or service dealer responsible for you.

2.1 Introduction

This manual is intended to make it easier to become familiar with the product and to use its intended applications.

The operating manual contains important information on how to operate the product safely, properly and economically. Observing them helps:

- to avoid dangers,
- reduce repair costs and downtime,
- increase the reliability and lifetime of the product.

The operating manual must always be available at the place of use of the product.

The operator must name the location of the operating manual and make it accessible to any person entrusted with working with or on the product. The operating manual must be read and applied by any person who is involved in working with or on the product, e.g:

- commissioning (assembly, alignment, adjustment),
- maintenance (inspection, maintenance, replacement of spare parts, recommissioning),
- decommissioning (disassembly, disposal).

In addition to the operating manual and the binding accident prevention regulations applicable in the country and place of use, the recognised technical regulations for safe and professional work must also be observed, as well as the operating manual of the system into which this product has been installed.

If you have any questions after studying the operating manual, your local branch office will be glad to answer them.

You will make it easier for us to answer the questions if you can provide us with information on the type designation of the product and the serial number.

In the interest of continuous improvement, changes are made at certain intervals, which may not have been taken into account when these operating instructions went to print.

This operating manual is not subject to revision by DELLNER BUBENZER Germany GmbH. Changes to this operating manual can be made without further notice.

2.2 Signs and Symbols Used in This Operating Manual

To enable you to quickly find the relevant information, this operating manual uses visual orientation in the form of symbols and special text markings. Text elements with different information content are marked as follows.

Symbol	Definition
☑ Switched on	Prerequisite for action, this must be fulfilled in order to be able to carry out the further action steps. The prerequisite for action always precedes the first action step.
1 Turn...	Steps in a sequence of actions are numbered.
▷ The spring engages.	Result, stands at the end of a sequence of actions if the goal is reached after all action steps.
▶ Please note...	Actions in warning notices to aviod a hazard.

Table 1: Signs and symbols

2.3 General Notes

This operating manual have been prepared to the best of our knowledge. It is intended to familiarise the operator, the user and the repair personnel with the structure, function, operation and maintenance as well as with the safety-relevant conditions. Furthermore, the manual is intended to ensure that trained and qualified personnel can operate and maintain the product in accordance with its intended use.

However, the manual cannot cover all conceivable conditions at the place of use. If you have any questions about the product or this operating and maintenance manual, please contact the manufacturer.

Please quote the complete type designation and serial number (see type plate) with all inquiries and spare parts orders.

2.4 Warranty and Limitation of Liability

The warranty and the warranty period depend on the respective contractual relationship. Warranty and liability claims are generally excluded if they are due to one or more of the following causes.

- Improper use of the product.
- Improper handling, commissioning, operation and maintenance of the product by the operator.
- Failure to observe the information in these operating and maintenance manual regarding transport, installation, commissioning, operation and maintenance of the product.
- Improperly performed repairs.
- Lack of monitoring of components subject to wear.
- Disasters, foreign body impact and force majeure.
- Structural changes to the product without the agreement or consent of DELLNER BUBENZER Germany GmbH.

The information in this operating and maintenance manual has been carefully checked. Nevertheless, no liability for errors can be accepted.

All technical information, data and instructions for the operation and maintenance of the product contained in this operating manual correspond to the latest status at the time of printing and are provided to the best of our knowledge, taking into account our previous experience and knowledge. Illustrations may differ from the original.

We do not accept any liability for damage and operating faults caused by operating errors, non-observance of this operating manual or improper repairs. We expressly point out that only original spare parts and original accessories have been tested and approved by us.

For damages resulting from the use of non-original spare parts and accessories, any liability is excluded. Any unauthorized conversions and changes to the product are not permitted for safety reasons and exclude liability for any resulting damage from.

We shall be liable for errors or omissions, to the exclusion of further claims, within the scope of the warranty obligations entered into in the main contract. Claims for damages, no matter on what legal grounds such claims are derived, are excluded.

3 Safety

3.1 Warning Signs Used

The main objective of the safety instructions is to prevent personal injury. Safety instructions in this operating manual are identified by symbols. The safety advice is introduced by signal words which indicate the severity of the danger.

DANGER!

This combination of warning sign and signal word indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

This combination of warning sign and signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

This combination of warning sign and signal word indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

ATTENTION!

If this signal word is ignored, the product may be damaged. Personal injury is not to be expected with this signal word, therefore an additional warning sign is omitted here.

NOTE!

This symbol highlights useful tips, recommendations and information for efficient and trouble-free operation. Notes do not describe a dangerous or harmful situation.

3.2 Special Warning Signs

Special warning signs are used to draw attention to specific dangers. The following is an overview of all warning signs used in these operating instructions.

GENERAL WARNING SIGN!

Warning sign to warn of a danger. Only used in combination with a signal word describing the danger and a description of the danger.

WARNING OF ELECTRICAL VOLTAGE!

The warning sign warns of dangerous electrical voltage.

WARNING OF HOT SURFACE!

This warning sign is used to alert people to hot surfaces that can cause skin burns.

WARNING OF AUTOMATIC START!

This warning sign indicates that a system/machine can start automatically.

WARNING OF HAND INJURY!

The sign is intended to draw attention to the fact that persons may injure their hands and should therefore protect themselves from injury.

WARNING OF SUSPENDED LOAD!

In the case of suspended loads, there is a risk that persons may be hit by falling loads / parts of these loads, be hit by moving suspended loads or run into moving or non-moving suspended loads. Persons should ensure that they are not hit by suspended loads/parts of this load or run into suspended loads..

WARNING OF FALLING OBJECTS!

If this warning sign is used, there is a danger that components, tools or materials may fall from scaffolding, work surfaces or structures. It should also draw the attention of persons to the area above.

DANGER TO THE ENVIRONMENT!

Danger to the environment, especially to water. If substances (oils, hydraulic fluid, ...) get into the environment, they may change the condition of water, soil or air, climate, plants or micro-organisms in such a way that they may cause danger to the environment immediately or later. Observe the environmental protection regulations.

3.3 Personal Protective Equipment

The necessary personal protective equipment, or that required by regulations, must be provided by the operator. The wearing of personal protective equipment is mandatory, depending on the activity to be performed. The necessity of protective equipment is made clear to you in the form of mandatory signs. Your employer will provide you with all the necessary information for using and providing your personal protective equipment. He will also provide you with information on the protection class to be observed for your protective equipment.

Mandatory signs serve to prevent accidents and prescribe a certain behaviour according to BGV A8.

The following table shows some mandatory symbols according to DIN EN ISO 7010 and a short description of the symbols shown.

Observe operating instructions!

Before you work on the machine, you must read and understand the operating manual!

Use ear protection!

Ear protection is designed to protect the hearing from loud noises and prevent acoustic trauma.

Use eye protection!

Eye protection is designed to protect the eyes from harmful influences such as chemicals, dust, splinters or weather conditions!

Use foot protection!

Depending on the safety category, safety footwear consists of a puncture-resistant sole which protects the soles of the feet from penetration by nails and other sharp objects, and a protective toecap which protects toes from injuries caused by falling objects, machines or the equivalent.

Use hand protection!

Protective gloves protect the hand against mechanical, thermal, chemical, biological and electrical hazards. The protective glove also protects your hands from radiation hazards.

Use head protection!

The head protection, also called helmet, is a stable, protective headgear against mechanical impacts..

Disconnect before maintenance or repair!

For safety reasons, when working on electrical equipment above a certain operating voltage, it must always be disconnected, i.e. the system must be disconnected from the power supply. It can be switched off by operating main switches, removing fuses properly, pulling out plug connections or, in high-voltage systems, by using disconnectors provided for this purpose. If the working person does not disconnect the system himself but an employee in a control center does, work may only be started when the disconnection has been confirmed verbally or in writing.

3.4 General Warnings

The product may only be operated as described in section *4.2 Description and Intended Use*. The safety of your product depends on regular, careful inspection and maintenance! Read the operating instructions carefully before commissioning. In case of any obscurities, please contact our customer service.

e-Mail: info@dellnerbubenzer.com

If you have any queries, please always quote the part number and year of manufacture of the product (type plate).

Giving us this information will help us to provide you with the correct information or spare parts required.

3.5 Notes and Obligations for the Operator

The operating manual is an essential part of the product. If, for example, the product is passed on as part of a system, the operating instructions must be forwarded to the operator of this system. The operator must ensure that this operating manual is always available to the user!

In order to protect the operating personnel against health hazards and to ensure the operational capability of the product, the operator is obliged to provide instruction in the safe and proper operation, maintenance and proper operation of the product. In this context, supervisory and reporting obligations and special operational features must be observed!

For technical information on DELLNER BUBENZER Germany GmbH products and their correct application, please contact our customer service.

DELLNER BUBENZER Germany GmbH
Friedrichshüttenstr. 1
57548 KIRCHEN-WEHBACH
GERMANY

Tel.: +49-2741 9488 0
Fax: +49-2741 - 9488 -44
E-Mail: info@dellnerbubenzer.com
Internet: www.dellnerbubenzer.com

3.6 Requirements for Operating and Maintenance Personnel

The various tasks described in this manual requires different demands on the qualifications of the persons entrusted with these tasks.

WARNING!

Danger in case of inadequate qualification of persons!

Inadequate qualified persons cannot understand the risks involved in handling the product and expose themselves and others to the risk of serious or fatal injury.

- ► All work may only be carried out by qualified persons.
- ► Keep unqualified persons away from the work area.

Qualified personnel are Persons who are familiar with the installation, assembly, commissioning and operation of the product. They are suitably qualified for their work.

Authorized personnel is qualified personnel who are familiar with a clearly defined task from the operator of the product.

Qualified electrician (in accordance with IEC 364) is a person who, on the basis of their technical training, knowledge and experience as well as knowledge of the relevant standards, can assess the work assigned to them and recognize possible hazards.

3.7 Warning of Residual Risks

- Risk of hydraulic fluid leaking under high pressure if hydraulic hoses and connections are damaged or not properly connected.
- Risk of crushing in the area of the brake pad, brake disc and housing when releasing and closing the brake.
- Risk of crushing and collision when transporting the product.
- Risk of self-closing due to unexpected loss of pressure or power failure when the brake is released.
- Risk of burns on the brake disc and brake pad due to the heat generated by braking processes.
- Brake dusts that are harmful to the respiratory tract during braking.
- Risk of bursting pressurised components and hoses if the maximum permissible pressure is exceeded.

4 Description of the Brake

NOTE!

This manual is valid for the standard EBA brakes with the type numbers:

- EBA 6” - 8-00200500.00001,
- EBA 8” - 8-00200500.00002,
- EBA 10” - 8-00200500.00003,
- EBA 13” - 8-00200500.00004,
- EBA 16” - 8-00200500.00005!

4.1 Views

Brake

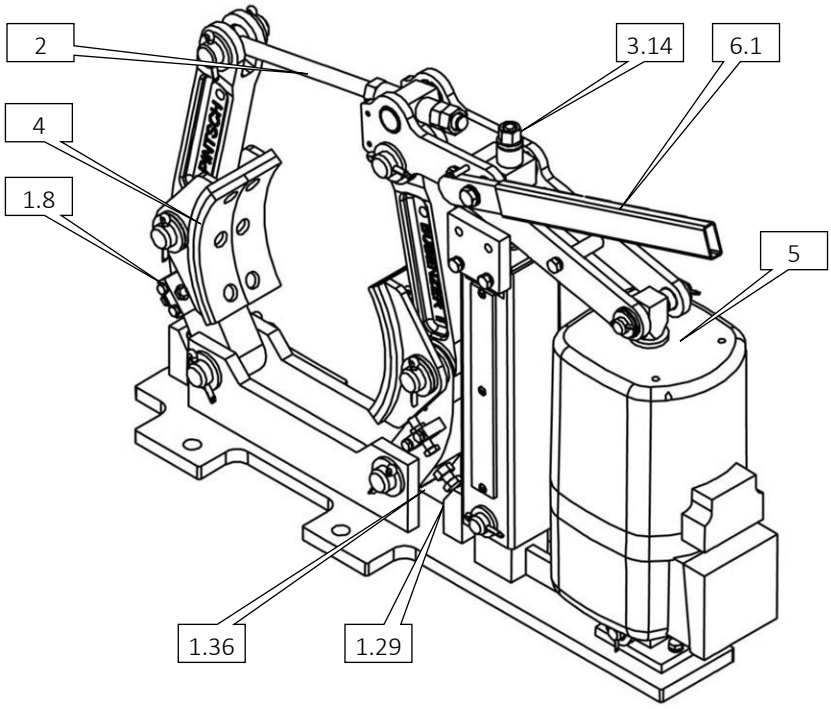


Figure 1: Detail overview brake

Manual wear control

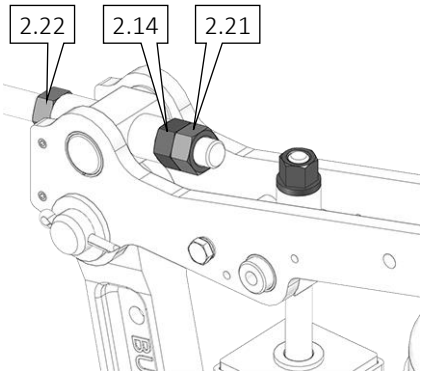


Figure 2: Manual wear control

Pos.	Part	Pos.	Part
1.8	Thrust piece	2.22	Lock nut
1.29	Stop screws	3	Spring unit
1.36	Lock nuts	3.14	Adjusting nut - Torque
2	AWC	4	Brake pad carrier with brake pad
2.14	Adjusting nut – reserve stroke	5	Thruster
2.21	Lock nut	6.1	Manual release lever

Table 2: Overview brake

4.2 Description and Intended Use

NOTE!

Depending on the size of the brake differences in the construction can occur. In case this has influences on the handling it is pointed out. Else only one size is depicted!

The drum brakes of the DELLNER BUBENZER EBA-series are meant exclusively for the conditions specified in the order. The brake is designed as a holding brake and emergency brake. It is designed for dynamic braking within the limits given in Section *4.4*. The brake may be mounted upright or – equipped with suitable guide rollers – lying on its side. The brake is not suitable for use in areas with explosion hazards and is not certified according to ATEX!

The brake is released electro hydraulically by a thruster and is actuated (closed) by spring force. In case of an emergency-stop or a power failure the brake closes automatically. A manual release lever allows to release the brake manually e.g. in case of a power failure. Braking distance and braking time are designed for the designated use but may vary depending upon the circumstances (e.g. load, direction of movement). The braking torque can be adjusted continuously by means of an adjustment nut. The brake is equipped with non-asbestos organic brake pads. The wear has to be compensated manually.

The product is built according to the state of the art and the recognised safety regulations. However, its use may cause danger to life and limb of the user or third persons or damage to the machine and other material assets. The product may only be used for its intended purpose in accordance with the operating instructions and the attached documents. All information and safety regulations in the operating manual must be observed.

The operator must provide personal protective equipment, which must be used by personnel.

The prescribed maintenance work must be carried out regularly.

No changes, additions or modifications may be made to the product without the manufacturer's approval.

NOTE!

Any other use and any modification to the brake is prohibited! Non-observance of the intended use and the regulations endangers human life and leads to the loss of any warranty by the manufacturer!

Function	
Release:	By electrohydraulic thruster
Close:	By spring force (fail safe installation)
Braking torque	Adjustable
Wear compensation	Manual wear compensation with main spindle
Centring	Manual centring
Manual release	Manual release lever
Sensors	Release control Close control Manual release control
Brake pads	Organic

Table 3: Functions

4.3 Improper Use and Reasonably Foreseeable Misuse

Any use that is not described in the section *4.2 Description and Intended Use*, or that goes further, is defined as improper use and reasonably foreseeable misuse. The manufacturer is not liable for any damage resulting from this. Some examples are listed below.

- Operation of the brake if the prescribed maintenance intervals are not observed or not carried out.
- Operation of the brake with defects due to improper commissioning or improper transport (loose or incorrectly tightened screws, incorrect alignment or adjustment, leaks, inadmissible equipment, damaged or defective components, pads not ran in, contaminated pads or brake disc).
- Operation of the brake outdoors without a protective enclosure.
- Operation of the brake at temperatures below -20 °C or above +70 °C.
- Operation of the brake in environments with aggressive chemical substances.
- Operation of the brake with worn brake pads.
- Operation of the brake with other than the original DELLNER BUBENZER spare/wear parts.
- Using the brake as a ladder.
- The opening of pressurised systems (hydraulic, pneumatic, delivery pipe, etc.) is prohibited. Before opening, the pressure must be released or the entire system must be relieved.
- The brake is not approved for use in potentially explosive atmospheres (unless otherwise stated).

- The brake is not suitable for use in liquid media.

No unsuitable or unsafe lifting gear, slings or other means of support may be used during transport.

Loading with non-approved materials and accessories and exceeding the maximum permissible total weight of the lifting gear is prohibited.

No maintenance work may be carried out with the hydraulic power unit switched on or with the brake unsecured. The product must be set up in a sufficiently secure manner and secured against unauthorised or accidental operation. Other necessary safety measures depend on the type of maintenance and are the responsibility of the authorised specialist personnel.

No unsuitable tools or tools that are not safe for operation or work may be used.

If it is necessary to dismantle safety devices for maintenance work, these may only be dismantled for the duration of the work. Immediately after completion of the maintenance work, the safety devices must be completely reassembled and checked for proper functioning.

4.4 Technical Data

NOTE!

Depending on the size of the brake differences in the construction can occur. In case this has influences on the handling it is pointed out. Else only one size is depicted!

Technical data for steel brake drums	With organic brake pads
Maximum running speed	30 m/s
Maximum braking time	5 sec.
Maximum permissible inertia temperature at the brake disc (frequent stop braking and permanent braking)	150 °C
Maximum permissible limit temperature at equilibrium during braking (frequent stop braking)	200 °C
Maximum permissible limit temperature of the surface during braking (onetime emergency stop braking)	300 °C

Table 4: Technical data steel brake drum

ATTENTION!

The maximum permissible limit temperatures of 300°C must not be exceeded in no case. After reaching the limit temperatures, the brake drums must be cooled down sufficiently until a safety operation of the system can be guaranteed!

The temperature has a significant influence on the coefficient of friction. With increasing temperatures, the coefficient of friction and thus the braking torque decreases. At temperatures above 200 °C, the coefficient of friction may drop by up to 50%.

Technical data general	EBA 8“
Brake drum diameter	8’’
Maximum braking torque	118 Nm (87lbft)
Minimum braking torque	59 Nm (43 lbft)
Maximum braking torque 80° rotated	100 Nm (74 lbft)
Minimum braking torque 80° rotated	50 Nm (37 lbft)

Table 5: Technical data EBA

4.5 Delivery Condition and Storage

CAUTION!

Risk of injury from heavy components!

Due to its weight, the brake may only be transported with suitable lifting devices. Always use proper lifting devices and transport the brake according to this picture!

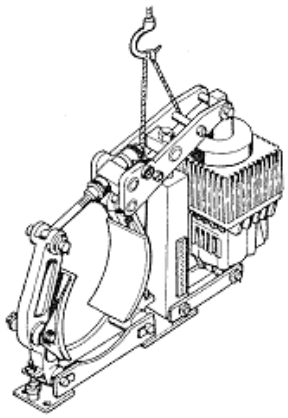


Figure 3: lifting

The brake is shipped ready to mount. The braking torque has been tested by the supplier and the AWC has been adjusted (if ordered). The setting of the braking torque and the equal brake pad lift off as well as the running in of the brake pads can only be done, when the brake is mounted.

The brake is delivered without mounting devices.

Storage

If the disc brake is not mounted immediately after delivery:

- connections must be protected with screw plugs,
- fill the cylinder with the intended operating fluid,
- store and transport the brake dust- and waterproof with a drying agent until use,
- protect the brake against external damage during the entire storage period!

Do not contaminate the following parts with paint when painting them again:

- friction surfaces of the brake disc,
- brake pads,
- pistons and seals,
- guide surfaces,
- electrical components,
- signs and stickers.

5 Mounting

DANGER!

Danger to life due to uncontrolled restart!

Sudden starting of the drive during work endangers the lives of maintenance and service personnel!

- ► Before starting any work, secure the drive against movement of any kind.
- ► Make sure that nobody can be injured by starting the actuators.
- ► Only switch on the actuators when there is no danger.

CAUTION!

Risk of injury from closing brakes.

Releasing and closing the brake can lead to serious injuries to body parts!

- ► Make sure that nobody is located in the danger zone of the brake during operation!

5.1 Preparation

Before mounting the brake check:

- radial and axial runout of the brake drum,
- cleanliness and perfect condition of the brake drum,
- the brake drum and brake pads must be free of preservatives (e.g. tectyl), rust, grease and other contaminants,
- position of the mounting holes,
- flatness and cleanliness of the mounting surface,
- cleanliness of the brake pads.

5.2 Mounting and Aligning the Brake

NOTE!

For the safe use, the drum brake type DELLNER BUBENZER EBN has to be centered to the brake drum! Heed the following instructions!

1 Completely release brake spring: Rotate nut (3.14) counter clockwise.

2 Loosen lock-nuts (1.36) on both levers.

3 Loosen stop-screws (1.29) on both levers.

4 Loosen lock nuts (2.21) and (2.22).

5 Rotate nut (2.14) counter clockwise.

6 Brake releases.

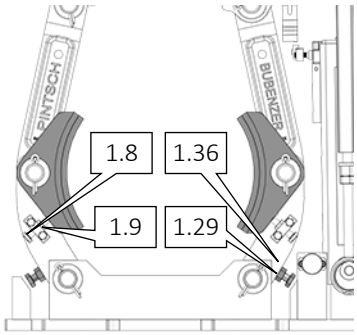


Figure 4

7 Mount brake onto brake drum according to drawing (also refer to data sheet in the appendix).

8 Screw bolts (Class 8.8) into the base but don’t tighten them yet.

9 Use shims to adjust differences in height if necessary.

10 Bolts and shims are not included in our scope of supply.

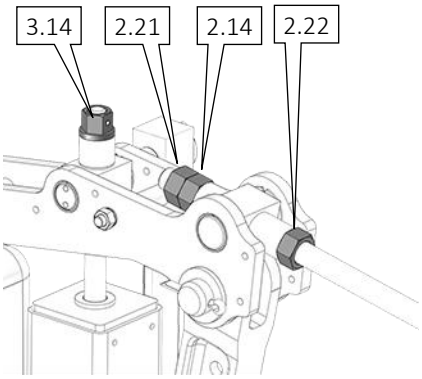


Figure 5

The brake levers and the brake shoes are movable. The brake pads would have full contact on the brake drum, even when the brake is not aligned correctly. But in this case the brake pads wouldn’t be loaded equally. Thus one pad would heat up more and wear faster.

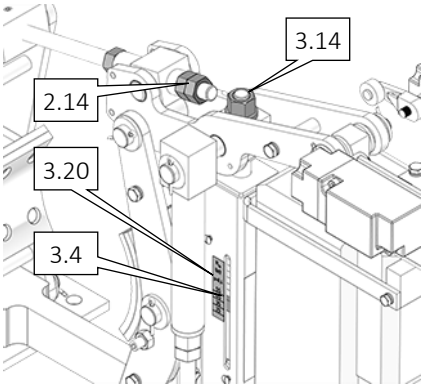


Figure 6

11 The coupling (K) is centred to the brake drum. The two pins (1.4) are centred to the brake. The brake can be aligned with these reference points that are easily accessible.

12 Close brake manually:

13 Rotate nut (3.14) clockwise until the upper edge (3.4) of the torque indicator shows about 1/3 of the nominal braking torque (3.20) (see *Figure 6*).

14 Close brake by turning nut (2.14) clockwise.

15 Both brake pads have to have full contact on the brake drum

16 Attach a perpendicular (L) to the coupling (K). When the base is even and clean a right angle may also be used.

17 Hold a ruler (M) horizontally to the inner side of the corresponding bolt (1.4).

18 Now read L1 where the perpendicular meets the ruler.

19 Repeat these steps at the other side for L2.

Attention: Check the chamfer of the bolt. Don’t hold the ruler to the chamfer at one side and on the other side to the outer diameter of the bolt.

L1 and L2 must not differ more than 2 mm!

20 If necessary move brake.

Attention: The brake has to be completely released!

21 Repeat measurements.

22 Make sure, both braking shoes have full contact on the brake drum.

23 Tighten the Mounting bolts with a torque-wrench to the necessary tightening torque (refer to. appendix).

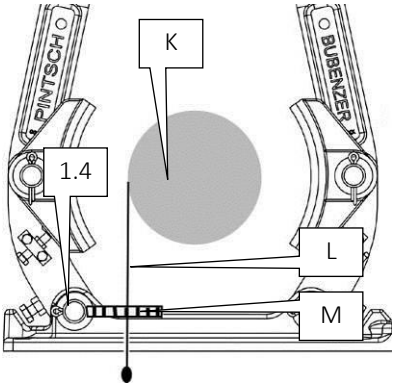


Figure 7

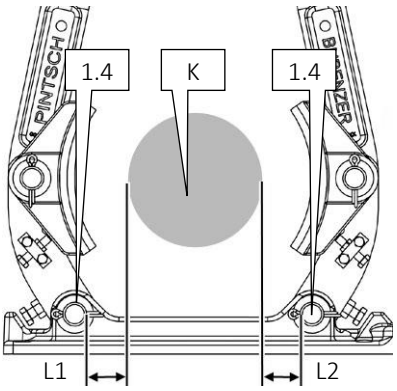


Figure 8

5.3 Electrical Connection of the Brake

DANGER!

Danger to life from electric current!

There is a danger to life by electric shock when touching live parts. Damage to the insulation or individual components can be life-threatening.

- ► Electrical work may only be carried out by qualified electricians.
- ► If the insulation is damaged, switch off the power supply immediately and arrange for repair.
- ► Before starting work on active parts of electrical systems and equipment, ensure that they are de-energized. Observe the safety rules:
  - unlock,
  - secure against reconnection,
  - establish voltage-free operation,
  - earth and short.
- ► Never bypass or disable fuses. Observe the correct current rating when replacing fuses.
- ► Keep moisture away from live parts. This can lead to short circuits..

1 Connect thruster (5) at terminal box (5.8) according to supplier’s data.

2 Please refer to the manual for the thruster, included in this documentation-package.

3 Refer to the type plate for the electrical data.

4 The sensors are described in the data sheets, included in this set of documents

5 Use only original cable glands, else the terminal box might not be sealed correctly.

6 Connections have to be flexible, as the brake must move freely.

7 Tighten cable connections.

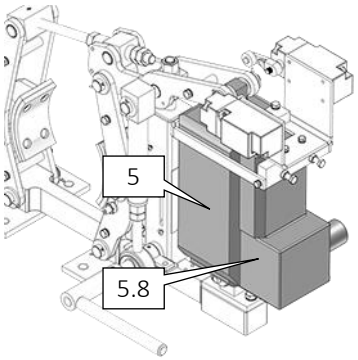


Figure 9

6 Settings

6.1 Set Equal Air Gap

NOTE!

When the brake pad wear is compensated, the centering must also be re-set, or the brake may lean to one side. Check the adjusting screws regularly. Reset if necessary!

The brake levers are centered by adjusting bolts which are set by lock-nuts.

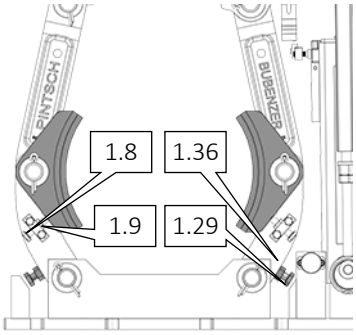


Figure 10

The centering of the brake levers is done with the brake completely released!

1 Release the brake by energizing the thruster.

2 Loosen lock-nuts (1.36) on both levers.

3 Turn stop-screw (1.29) until the space between brake pads and brake drum surface is equal on both sides.

4 Tighten both lock-nuts (1.36).

5 Loosen lock-nuts (1.9).

6 Set equal air gap over the complete length of the brake shoe with adjusting screws (1.8).

7 Tighten both lock-nuts (1.9).

8 Release and close the brake.

9 Readjust, if necessary

6.2 Set Braking Torque

NOTE!

When the brake pad wear is compensated, the centering must also be re-set, or the brake may lean to one side. Check the adjusting screws regularly. Reset if necessary!

The typeplate displays the maximum torque (Data provided by DELLNER BUBENZER) and – on customers demand – the set/necessary braking torque (Data provided by installation manufacturer).

Note: Older brakes show only the maximum braking torque on the typeplate!

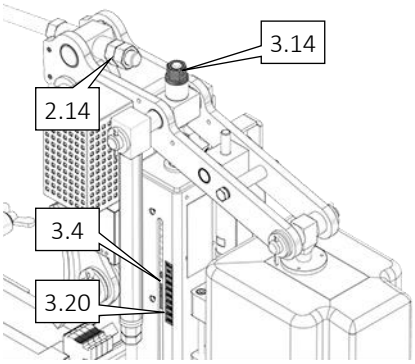


Figure 11

1 Turn adjusting nut (3.14) clockwise until the upper edge of the indicator block (3.20) shows the necessary torque on the scale (3.4).

2 Actuate brake several times to check the setting.

3 Reset if necessary.

Note: The permissible minimum braking torque is 50% of the rated maximum braking torque.

6.3 Set Reserve Stroke

CAUTION!

Unsafe operation due to incorrectly set reserve stroke!

With a reserve stroke of less than $S_{1\ min}$ can lead to a brake failure! Always check and if necessary reset brake! Mortal danger!

1 Measure S1 (see *Figure 13*) with brake closed.

2 Loosen lock nuts (2.21) and (2.22).

Increase reserve stroke

3 Turn Nut (2.14) clockwise until the piston rod of the thruster (see *Figure 12*) has reached the necessary value S = S_1 (see *Table 6: Reserve stroke*) while the brake is closed.

4 Release and close the brake.

5 Check S = S_1 and reset, if necessary.

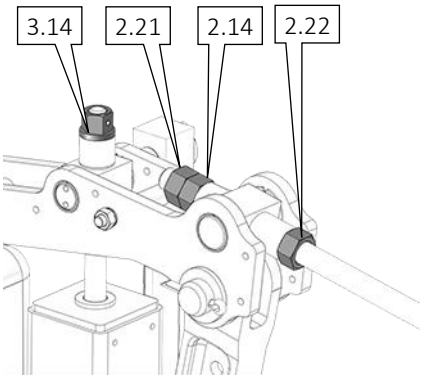


Figure 12

Decrease reserve stroke

6 Turn until the piston rod of the thruster (see *Figure 13*) has reached the necessary value S = S_1 (see *Table 6: Reserve stroke*) while the brake is closed.

7 Release and close the brake.

8 Check S = S_1 and reset, if necessary.

9 Retighten lock nuts (2.21) and (2.22).

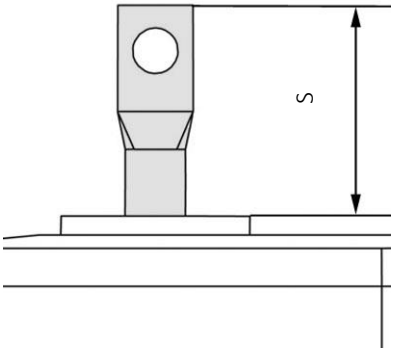


Figure 13

Thruster-type	S = S_0 = Piston rod in lowest pos.		S = S_1= Brake closed 10 mm reserve stroke		S = S_2= Brake released	
	[in]	[mm]	[in]	[mm]	[in]	[mm]
Ed 12/4	1.18 in	30 mm	1.57 in	40 mm	2.76 in	70 mm
Ed 23/5	1.49 in	38 mm	1.89 in	48 mm	3.46 in	88 mm
Ed 30/5	1.93 in	49 mm	2.32 in	59 mm	3.90 in	99 mm
Ed 50/6	2.13 in	54 mm	2.52 in	64 mm	4.49 in	114 mm
Ed 80/6	2.13 in	54 mm	2.52 in	64 mm	4.49 in	114 mm
Ed 121/6	5.71 in	145 mm	6.10 in	155 mm	8.07 in	205 mm
Ed 201/6	5.71 in	145 mm	6.10 in	155 mm	8.07 in	205 mm
Ed 301/6	5.71 in	145 mm	6.10 in	155 mm	8.07 in	205 mm

Table 6: Reserve stroke

Tolerance S_1	+ 3 mm/+0,12 in - 1 mm/-0,04 in

6.4 Cover (optional)

The brake can be equipped with a protective cover.

1 Mount the cover acc. to assembly drawing.

2 Make sure the closure head is closed and safely latched.

3 It can be either dismounted in one piece or split (see *Figure 15*).

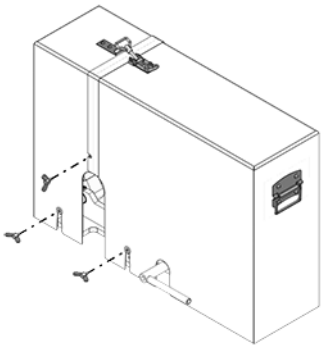


Figure 14

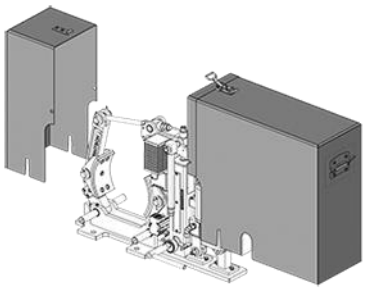


Figure 15

6.5 Running In of the Brake Pads and Brake Drum

WARNING!

Risk of injury from hot surfaces!

The brake disc and brake pads are heated up during operation! Danger of burns! Allow brake and brake disc to cool down before starting work!

WARNING!

Risk of injury from slipping load!

With new pads/drums the full braking torque cannot yet be transmitted. Therefore the load can slip even when the brakes are closed.

ATTENTION!

To prevent damage to the brake, the brake must not be operated outside the specified technical limits. This also applies to the running in process.

ATTENTION!

The maximum permissible brake drum temperature must not be exceeded during all the running in processes described below. For this reason, the brake drum temperature must be checked at suitable intervals during the running in processes and, if necessary, braking times, cooling phases and number of consecutive braking operations must be adjusted in such a way that the max. permissible brake disc temperature is not exceeded!

NOTE!

To ensure that the brake pads are completely ran in, remove them for a visual inspection. Do not mix up brake pads when reinstalling them.

The running in of the brake pads is essential to insure an even contact pattern on the pad, which will avoid uneven loading of part of the surface and any resultant damage. The brake can be damaged when it is run in under unsuitable conditions! Do not exceed the following values during running in.

Technical data for running in	With organic brake pads
Maximum running speed	30 m/s
Maximum permissible brake disc temperature	150 °C
Maximum braking time (per braking)*	10 s

Table 7: Technical data for running in

* The maximum braking time depends on running speed, contact force/braking torque and temperature and therefore can only be understood as an approximate value.

During running in, the release stroke must be checked or readjusted after 25 to 30 braking operations at the latest.

- The braking torque achieved can be related to the current take-up of the electric motor.
- Running-in is completed as soon as the stopping distance at rated load and maximum speed is not reducing any further after repeated braking operations.
- During running in the reserve stroke has to be checked and – if necessary – reset after 25 – 30 braking cycles.

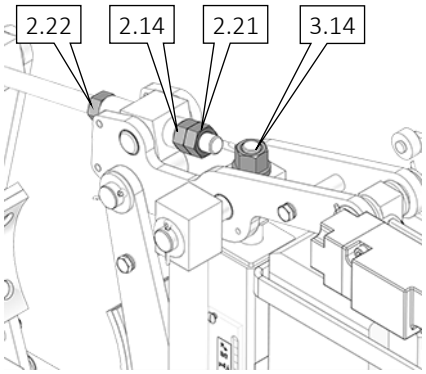


Figure 16

4 Set sensors release/close-control out of order.

5 Loosen lock nuts (2.21) and (2.22).

The running in process can be performed in 2 different ways. Running in against the closed brake is preferable to running in under load. Only if running in against the closed brake is not possible, the variant running in under load should be used.

6.5.1 Running in With Drive Motor Against the Closed Brake

- ATTENTION: Only perform the running in process empty. Never with a load attached or loaded!
- Do not exceed maximum braking time!

1 Set approx. 50% of the required braking torque by generating a counterpressure of approx. 40-50% of the nominal pressure via the hand pump on the hydraulic power unit.

2 Ensure that the brake is immediately depressurised in an emergency so that the full contact force is available!

3 Run the motor three times at HALF rated speed against the closed brake.

- The brakes must be operated from a safe place (no one must be in the area of moving parts such as the brake disc, brake, ropes, conveyor belt etc.)!

4 Wait about one minute between the running in processes to cool down.

5 Check the brake disc temperature at the friction surface between braking!

6 When reaching the max. permissible brake disc temperature, allow the brake disc to cool down to ambient temperature.

7 Repeat the procedure five times.

To check the contact pattern, remove the brake pads (see *0*

Replace Brake Pads). The contact pattern must be ≥ 70%.

NOTE!

If at least 70% of the brake pad surface is available as a friction surface, the pads can be remounted (do not mix up the pads!) and the running in process for this brake is finished for the time being (see load test). Otherwise remount the brake pads and continue the running in process.

NOTE!

After running in, the settings for the release stroke must be checked and readjusted if necessary, as they may have changed during running in! Carry out a final function test.

6.5.2 Running in Under Load

ATTENTION: Only perform the running in process empty. Never with a load attached or loaded!

8 Run the drive at approx. max. speed (hoists in lowering operation).

9 Perform approx. 10 to 15 emergency stop braking operations with maximum braking torque.

The brakes must be operated from a safe place (no one must be in the area of moving parts such as the brake disc, brake, ropes, conveyor belt etc.)!

10 Check brake disc temperature at the friction surface between braking operations!

11 When reaching the max. permissible brake disc temperature, allow the brake disc to cool down to ambient temperature.

12 To check the contact pattern, remove the brake pads (see point *0*

13 *Replace Brake* Pads). The contact pattern must be ≥ 70%.

NOTE!

If at least 70% of the brake pad surface is available as a friction surface, the pads can be remounted (do not mix up the pads!) and the running in process for this brake is finished for the time being (see load test). Otherwise remount the brake pads and continue the running in process.

NOTE!

After running in, the settings for the release stroke must be checked and readjusted if necessary, as they may have changed during running in! Carry out a final function test.

6.6 Final Function Test

WARNING!

Unsafe operation due to incorrectly set parameters.

To ensure safe operation of the brake, regular function tests must be carried out. Only in this way can faults be detected and eliminated. Otherwise, malfunctions or failure of the brake may occur. This can lead to dangerous situations which can result in serious injuries or even death.

- ► Always check the parameters and carry out a final function test after running in.
- ► Make sure that all parameters are set correctly.

Check	Section
Brake aligned correctly	5.2
Mounting bolts tightened	5.2
Equal air gaps at both brake pads	6.1
Brake torque correct	0
Reserve stroke correct	6.3
Lock nuts tightened	6.3
Stopping distance correct (Load test)	Refer to. corresponding regulations
Signals of sensors are correct	5.3/Refer to installations control system

Table 8: Function test

6.7 Load Test

WARNING!

Danger to Life!

To ensure safe operation of the brake, regular function tests must be carried out. Only in this way can faults be detected and eliminated. Otherwise, malfunctions or failure of the brake may occur. This can lead to dangerous situations which can result in serious injuries or even death.

- ► Perform regular function and performance tests on the brake.
- ► Make sure that all parameters are set correctly.

NOTE!

If the braking system is put into operation without a prescribed load test, there is no guarantee for safe braking!

NOTE!

Observe the applicable standards, laws and operator specifications. These may vary from country to country!

1 Perform static load test according to the requirements of the application.

2 Perform dynamic load tests according to the requirements of the application.

3 If the specified braking time / braking distance / holding power is not reached, repeat the running in process and check settings if necessary.

7 Operation

CAUTION!

Risk of injury from closing brakes.

Releasing and closing the brake can lead to serious injuries to body parts!

► Make sure that nobody is located in the danger zone of the brake during operation!

WARNING!

Danger of injury due to hot surfaces and due to the ejection of hot parts of the brake pad!

► Make sure that nobody is located in the danger zone of the brake during braking operations!

CAUTION!

Risk of draw-in and injury from moving, rotating parts!

► The danger zone of the brake must not be entered during operation of the system.

7.1 Normal Operation

During the braking the following effects may occur:

- There may be an increased noise emission due to the friction of the brake pads on the brake drum.
- There may be vibrations, e.g. due to bad alignment.
- Brake dust is emitted into the atmosphere.

The following states exist in normal operation:

Condition of the cylinder	Condition of the brake
Thruster not energized	Brake close
Thruster energized	Brake releases and remains released
Thruster is being switched off	Brake closes automatically
Power down, emergency off	Brake closes automatically

Table 9: Conditions in normal operation

7.2 Emergency-Stop and Loss of Power

After initiating an emergency stop or after a power loss the brake automatically closes by spring force.

7.3 Manual Operation

DANGER!

Danger to life from falling loads.

The high dead weight of the suspended load can cause the load to move uncontrolled and seriously injure people standing around if it is lowered too quickly.

- ► Release the brake SLOWLY so that any load attached to it cannot move in an uncontrolled manner.

DANGER!

Danger to life due to missing safety devices!

No safety devices are active when the brake is released manually.

- ► Before starting any work, secure the drive and equipment against movement of any kind!
- ► Always make sure, the manual release lever is put back to its original Position, before restarting the operation.

WARNING!

Risk of injury due to pinching.

The manual release lever is not suitable for keeping the brake release for maintenance work.

- ► If the brake has to be released manually in an emergency, take the help of a second employee who can control when the brake releases.
- ► Only use the manual release lever to release the brake slowly in an emergency.

NOTE!

When connecting/disconnecting the cylinder, oil may leak. Provide a proper container. Take care that the hydraulic fluids, lubricants and other used substances as well as oil-soiled parts are disposed environmental friendly and in compliance with the corresponding laws and regulations!

The manual release lever (6.1) is not part of the standard scope of supply. By means of the lever the brake may be released manually in case of an emergency-situation, e.g. to lower a load after an emergency stop.

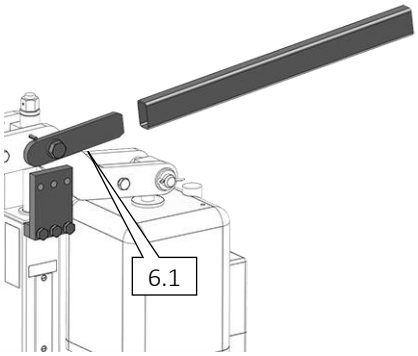


Figure 17

1 Always watch the load (2nd operator) so you don’t miss the point, where the brake releases.

2 With the standard execution (see *Figure 17*) an additional tube has to be mounted to the lever (scope of supply).

3 Pull the lever upwards SLOWLY to release the brake.

4 If the lever is released, before it has reached its locking position (completely released), the brake automatically closes. It is possible to provide the brake without a catch for the lever. Check scope of supply. By means of the lever the load can be released controlled.

5 After finishing all tasks:

6 Manually set brake again

7 Store extension lever safely in its proper place.

7.3.1 Manual Lowering of the Load

WARNING!

Danger to life due to brake failure

Incorrect manual lowering of the load may cause the brake disc temperature to rise extremely rapidly, resulting in thermal overload or breakage of the brake disc.

- ▶ It is imperative to make sure that the limit temperature is never exceeded during the manual lowering of the load.
- ▶ Stop the operation immediately if there is even the slightest doubt about the proper condition of the braking system or the safe practicability of manual load lowering. In this case, lower the load in another way, e.g. by a truck-mounted crane!

WARNING!

Danger to life from falling loads

Due to overload of the brake, the drive, or due to overheating of the brake components, the load may not be held by the brake.

- ▶ Immediately close the emergency stop brakes as soon as the service brakes, for whatever reason, cannot hold the load.
- ▶ Observe the maximum braking torque and the maximum holding force!

The following description gives recommendations how to manually operate service and emergency brakes in case of an emergency lowering process.

Please assure that the brakes have been sized according to the applicable relevant crane standards (FEM 1.001, DIN EN 13135, DIN EN 14492, …).

1 Make sure that all brakes can be operated safely without any interference for manual release lever operation. Operators should be in safe distance of rotating and moving parts.

2 A visual brake check needs to be performed (brake settings, damages, pollution of brake disc and brake pads) and the real operation may only be started, if the brake system is in an proper condition!

3 The brake drum temperature shall be measured in the friction zone by use of a contact thermometer before the lowering process is started. Do not start to lower the load until the brake disc temperature is below:

   - o 80 °C.

   Each brake must be operated by one person separately! Another person has to observe the load permanently!

4 Release the emergency brakes first.

   (*) For manual release levers with stop (locking position): Do never open the manual release lever to the locked position!

5 Release service brake (s) slightly until the drum is starting to turn.

☝ As soon as the brake drum is turning service brake(s) has/have to be closed. (*)

6 Measure the brake drum temperature in the friction zone after each lowering of the load.

☝ The maximum permissible brake disc temperature is:

- 150 °C.

☝ Once the maximum brake drum temperature is reached, the brake drum has to be cooled down sufficiently!

7 Check the brake drum and brake pads for damages!

☝ Before starting the next lowering try, the brake disc temperature must be below:

- 80 °C.

8 Repeat the last four points until the load has been grounded.

8 Maintenance

DANGER!

Danger to life due to uncontrolled restart!

Sudden starting of the drive during work endangers the lives of maintenance and service personnel!

- ► Before starting any work, secure the drive against movement of any kind.
- ► Make sure that nobody can be injured by starting the actuators.
- ► Only switch on the actuators when there is no danger.

DANGER!

Danger to life due to electrical voltage!

The applied voltages are dangerous to life!

- ► Electrical work may only be carried out by trained electricians!

WARNING!

Risk of injury from pressurized hoses and lines!

- ► Before starting any work, make sure that no hoses and lines are damaged and all connections are correctly tightened and sealed!

WARNING!

Risk of injury from closing the brake!

If the brake needs to be released for maintenance, it may close unexpectedly and pinch your limbs if you do not observe all safety instructions!

- ► If the brake has to be released manually in an emergency, consult a second person to ensure that the brake does not close uncontrolled!

WARNING!

Risk of injury due to components coming loose!

When reusing Nord-Lock or Schnorr washers, screw connections can become loose.

- ► Only use new Nord-Lock or Schnorr washers!

ATTENTION!

The assembling of non-approved spare parts can impair the function of the disc brake!

- ► Only use original DELLNER BUBENZER spare parts!

NOTE!

If the brake is at a standstill for a longer period of time, rust and dirt can deposit on the brake pad and brake drum. This leads to an increase in braking times! Keep the brake pads and brake drum surface clean, e.g. by performing a dynamic brake test

NOTE!

Cotter pins at bolts have to be opened, so they can’t fall out.

Cotter pins at castellated nuts have to be opened completely!

8.1 Maintenance Intervals

Check:	Interval [operating hours]		Maintenance work see chapter
	(dynamic brakes)	(Holding brakes without dynamic braking)	
Function of the brake/brake system	100 bis 150	450 oder monatlich	6.5
Brake shoe lift-off	100 bis 150	450 oder monatlich	8.7
Brake pad wear/thickness	100 bis 150	450 oder monatlich	8.5
General state of the brake	100 bis 150	450 oder monatlich	Visual inspection
Thruster reserve stroke	100 bis 150	450 oder monatlich	-
Brake spring tension (torque)	100 bis 150	450 oder monatlich	6.3
Adjustment of sensors, manual release devices and other optional equipment	100 bis 150	450 oder monatlich	6.2
Easy mobility of the brake linkage	100 bis 150	450 oder monatlich	-
State of the automatic wear compensator	100 bis 150	450 oder monatlich	7.4
Condition of the brake drum	100 bis 150	450 oder monatlich	8.4

Table 10: Maintenance intervals

Check the brake/brake system outside the regular inspection intervals if:
Prolonged braking times or -distances appear.
Extreme operating conditions appear:
• Overspeeding of the brake drum,
• And/or excessive braking times.
A sensor indicates brake pad wear or lack of releasing stroke,
After a longer period of brake-standstill or drive standstill.

Table 11: Checks outside the maintenance intervals

NOTE!

In case the brake is used as holding brake or with low dynamic braking requirement, the surface of the sintered lining will accumulate dirt and thus the available braking torque will be reduced. Keep the brake pads and disc surface clean, e.g. by performing a dynamic brake test.

8.2 Lubrication

Because of the maintenance free bushings assembled on the brake, no lubrication is needed. Neither additional lubrication nor greasing is allowed!

8.3 Cleaning

WARNING!

Risk of injury due to jamming!

During cleaning, the hydraulic power unit must be switched off and secured against being switched on again!

ATTENTION!

Do not use aggressive chemicals for cleaning. Only use grease dissolving cleaners (e.g. brake cleaner) and suitable cleaning material. Under no circumstances should the brake be cleaned with a high-pressure cleaner or wire brush!

The braking force can only be transferred correctly to the brake disc if both contact surfaces (brake pad and brake disc) are clean.

- Make sure that these surfaces are free of grease, oil, rust, protective layers and other contaminants!
- Furthermore, the brake and all moving parts must be kept clean.

8.4 Replace Brake Drum

WARNING!

Risk of injury from hot surfaces!

The brake drum and brake pads are heated up during operation! Danger of burns! Allow brake and brake drum to cool down before starting work!

ATTENTION!

When the brake drum is replaced, also replace the brake pads. The drum has to be run in with the new brake pads!

Replace brake drum when:

- Cracks appear,
- The wear exceeds 2mm of brake drum diameter.

In case of brake drum wear:

- Check/Readjust the braking torque,
- Check/Readjust brake shoe lift-off,
- Check/Readjust the reserve stroke at the thruster.

8.5 Replace Brake Pads

WARNING!

Risk of injury from hot surfaces!

The brake drum and brake pads are heated up during operation! Danger of burns! Allow brake and brake drum to cool down before starting work!

ATTENTION!

Always change both brake pads! Otherwise the brake may malfunction.

NOTE!

New brake pads must be fitted when replace brake discs! The brake disc must be ground in completely with the new pads.

Replace the brake pads:

- when reaching the minimum brake pad thickness:
  - glued/sintered brake pads: 3 mm,
  - riveted/riveted and glued brake pads: 5 mm.
- in case of damage to the brake pad, such as:
  - cracks,
  - breaks.
- when overheating.

1 Completely release brake spring: Rotate nut (3.14) counter clockwise.

2 Loosen lock-nuts (1.36) on both levers.

3 Loosen stop-screws (1.29) on both levers.

4 Loosen lock nuts (2.21) and (2.22).

5 Rotate nut (2.14) counter clockwise ⇒ Brake releases.

6 Loosen lock-nuts (1.9)

7 If necessary: loosen screws (1.8) for an easier dismounting of the brake pads (4).

8 Remove cotter pins and washers from brake shoe pin (1.5).

9 Remove brake shoe pin (1.5).

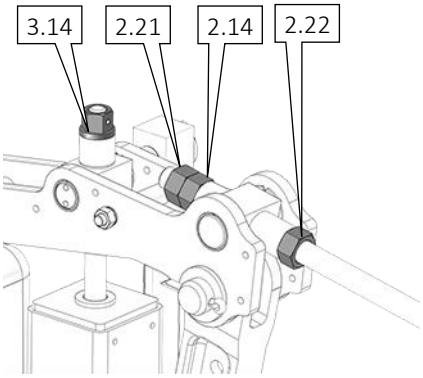


Figure 18

10 Pull out brake shoes (4) towards spindle

11 Insert new brake shoes (4).

12 Insert brake shoe pin (1.5) and secure it with cotter pins and washers.

13 Turn stop-screw (1.29) until the space between brake pads and brake drum surface is equal on both sides.

14 Tighten both lock-nuts (1.36).

15 Loosen lock-nuts (1.9)

16 Adjust equal air gap over the whole gaps by turning adjusting screws (1.8) if necessary.

17 Retighten lock-nuts. (1.9).

18 Release and close the brake.

19 Check function and adjust if necessary.

20 Reset and run in brake (see Section *6 Settings*).

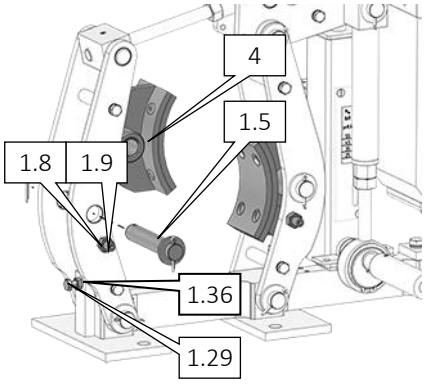


Figure 19

8.6 Replace Pins and Bushings

To replace the bushings, the brake has to be disassembled. This means it has to be dismounted, depending on the installation. Secure the installation against any accidental movement!

For this, the brake has to be disassembled. Secure the installation against accidental movement!

1 Release brake spring: Turn nut (3.14) counter clockwise.

2 Loosen lock nuts (1.36).

3 Loosen centring screws (1.29).

4 Loosen lock nuts (2.21) and (2.22).

5 Turn nut (2.14) counter clockwise Brake shoes move away from brake drum.

6 Dismount brake.

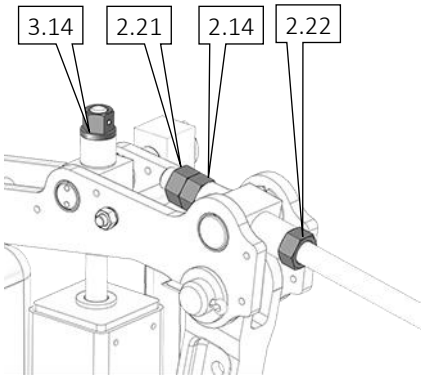


Figure 20

7 Before removing the bushings note positions.

8 Don’t damage the bores when removing the bushings.

9 Clean and debur bores if necessary.

10 Note the mounting-direction of the bushings.

11 Don’t damage or jam the bushings when driving/pressing them into the levers.

12 Reset brake to operating values (see Section *6 Settings*).

13 Retighten lock nuts (2.21) and (2.22).

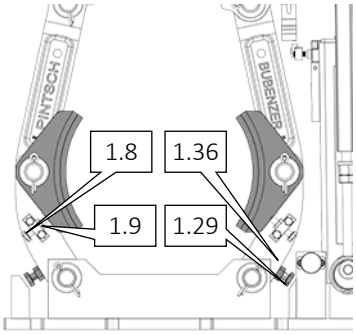


Figure 21

8.7 Replace Thruster

DANGER!

Danger to life due to electrical voltage!

The applied voltages are dangerous to life!

► The electrical work may only be carried out by trained electricians!

WARNING!

Danger of cuts and crushing injuries!

When the upper pin (5.2) is pulled out, the thruster may tilt and fall!

► Secure the thruster against accidental movements!

NOTE!

Also refer to the instructions in the operating manual of the thruster, as well as the wiring diagram the inside of the terminal box cover!

1 Secure the movable parts (levers, etc.) against tilting! Danger of squeezing.

2 Completely release brake spring: Rotate nut (3.14) counter clockwise.

3 Loosen lock-nuts (1.36) on both levers.

4 Loosen stop-screws (1.29) on both levers.

5 Loosen lock nuts (2.21) and (2.22).

6 Rotate nut (2.14) counter clockwise ⇒ Brake releases.

7 Dismount sensor if mounted.

8 Disconnect thruster (5.8).

9 Remove cotter pins and washers from Eldro pins (5.2) and (5.4).

10 Loosen and remove pin (5.2)

11 Attach thruster (5) with e.g. a rope to a suitable lifting device.

12 Loosen and remove pin (5.4).

13 Replace thruster (5).

14 Reassemble brake

15 Reset brake to its original values.

16 Replace thruster (5).

17 Reassemble brake

18 Reset brake to its original values

19 Attach thruster (5) with e.g. a rope to a suitable lifting device.

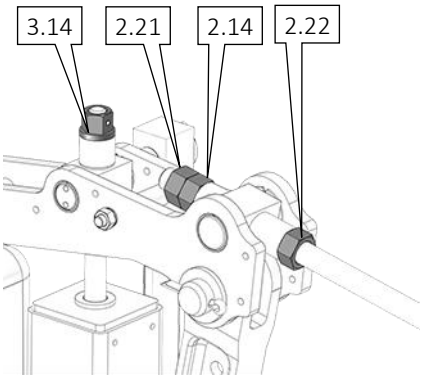


Figure 22

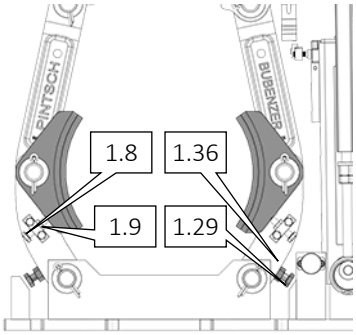


Figure 23

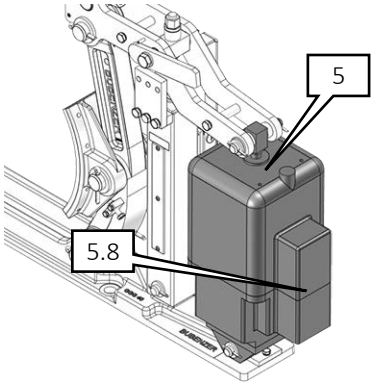


Figure 24

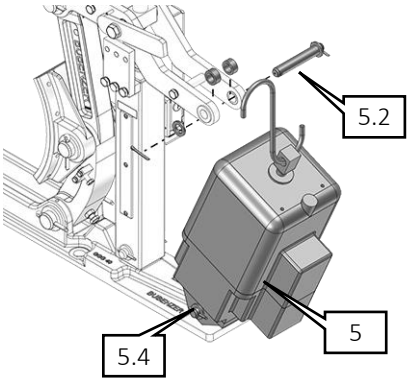


Figure 25

8.8 Replace Spring Unit

WARNING!

Risk of injury due to deactivated brake.

When the spring unit is dismounted the brake is not active. The overall braking force is reduced!

► Secure the drive and the installation against all accidental movements.

1 Secure the movable parts (levers, etc.) against tilting! Danger of squeezing.

2 Completely release brake spring: Rotate nut (3.14) counter clockwise.

3 Loosen lock-nuts (1.36) on both levers.

4 Loosen stop-screws (1.29) on both levers.

5 Loosen lock nuts (2.21) and (2.22).

6 Rotate nut (2.14) counter clockwise ⇒ Brake releases.

7 Dismount thruster (see Section *8.7 Replace Thruster*).

8 If mounted: remove manual release lever (6.1), Roll carrier.

9 Loosen and dismount screws (1.14).

10 Pull out pin 1.6.

11 Remove upper levers (1.3) and (1.4).

12 Remove cotter pins and washers from pin (3.8) from lower end of spring unit (3).

13 Pull pin (3.5) out of spring unit (3).

14 Replace spring unit (3) with crosspiece.

15 Reassemble brake.

16 Reset brake to its original values.

17 Check function and adjust if necessary.

18 Reset and run in brake (see Section *6 Settings*).

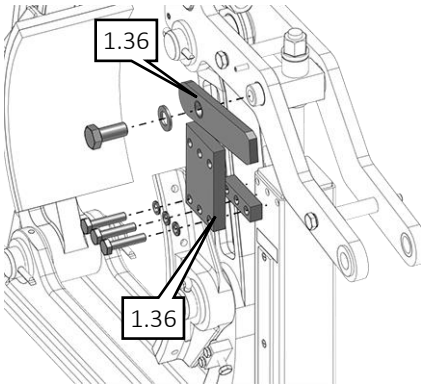


Figure 26

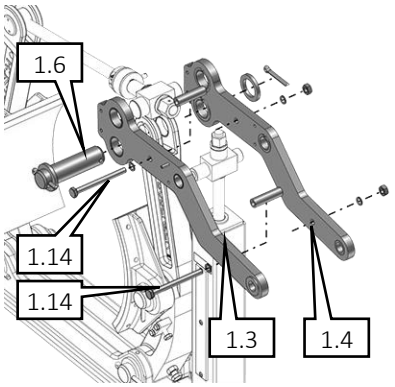


Figure 27

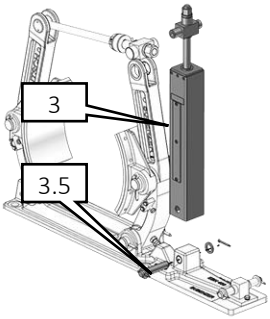


Figure 28

9 Decommissioning and Disposal

Decommissioning may only be carried out by trained and adequately instructed personnel!

Please also observe the applicable guidelines and laws!

Observe the following safety instructions during decommissioning - This can prevent life-threatening injuries, damage to property and also environmental damage.

DANGER!

Danger to life due to uncontrolled restart!

Sudden starting of the drive during work endangers the lives of maintenance and service personnel!

- ▶ Before starting any work, secure the drive against movement of any kind.
- ▶ Make sure that nobody can be injured by starting the actuators.
- ▶ Only switch on the actuators when there is no danger.

DANGER!

Danger to life from electric current!

There is a danger to life by electric shock when touching live parts. Damage to the insulation or individual components can be life-threatening.

- ▶ Electrical work may only be carried out by qualified electricians.
- ▶ If the insulation is damaged, switch off the power supply immediately and arrange for repair.
- ▶ Before starting work on active parts of electrical systems and equipment, ensure that they are de-energized. Observe the safety rules:
  - unlock,
  - secure against reconnection,
  - establish voltage-free operation,
  - earth and short.
- ▶ Never bypass or disable fuses. Observe the correct current rating when replacing fuses.
- ▶ Keep moisture away from live parts. This can lead to short circuits..

WARNING!

Risk of injury from pressurized hoses and lines!

Pressurized, damaged or improperly connected lines and hoses can cause serious injury.

Maintenance and repair work on the hydraulic equipment may only be carried out by specially trained personnel!

Before starting work on these components:

- ▶ establish depressurized condition. Also discharge residual energy,
- ▶ replace defective components that are supplied with hydraulic oil during operation immediately.

DANGER TO THE ENVIRONMENT!

Ensure that the operating materials, lubricants and auxiliary materials as well as oily components are disposed of in an environmentally friendly manner. The regulations for proper waste recycling or disposal must be observed. Electrical waste must be collected separately and recycled.

NOTE!

Due to its weight, the disc brake must always be lifted with suitable lifting equipment! Risk of injury!

1 Disconnect thruster.

2 Release brake spring: Turn nut (3.14) counter clockwise.

3 Loosen lock-nuts (1.36).

4 Open centring screws (1.29).

5 Loosen lock nuts (2.21) and (2.22).

6 Turn Nut (2.14) counter clockwise.

7 Brake shoes (4) move away from brake drum.

8 Depending on the mounting situation.

9 Screw spindle has to be screwed out of the crosspiece to open the levers.

10 Dismount lower bolt(s) at lever(s) if necessary (arrow).

11 Dismount levers, if necessary.

12 Loosen mounting bolts.

13 Dismount brake.

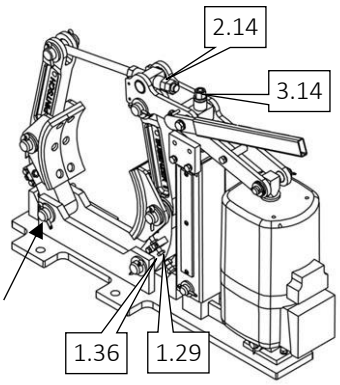


Figure 29

10 Troubleshooting

Brake does not close

Possible reason	Action	Section
Brake is mechanically blocked	Check	-
Brake is manually released	Close manually	7.3
Spring tension to low	Set spring tension	0
Spring damaged	Replace spring unit	8.8
Signal „released“ is active	Check connection	ES
Reserve stroke to small	Set reserve stroke	6.3
Brake pads worn	Replace brake pads	0

Table 12: Troubleshooting brake does not close

Brake does not release

Possible reason	Action	Section
Brake is mechanically blocked	Check	-
Centring screws have been tightened while brake was closed.	Set equal air gaps	6.1
Spring tension to high	Set spring tension	0
Signal „close” is active	Check connection	ES
Reserve stroke to big	Set reserve stroke	6.3
No power supply	Check electrical supply and connection	5.3
Thruster damaged	Replace thruster	8.7

Table 13: Troubleshooting brake does not release

Braking distance to long

Possible reason	Action	Section
Spring tension to low	Set spring tension	0
Brake pads have uneven contact	Align brake	5.2
Brake pads haven’t been run in correctly	Run in brake pads	0
Reserve stroke to small	Set reserve stroke	6.3
Brake pads soiled	Clean brake	-
Brake soiled	Clean brake	8.3
Brake pads worn	Replace brake pads	0
Brake drum worn	Replace brake drum	-

Table 14: Troubleshooting braking distance to long

Notes

ES = Data sheet of sensor
HA = Operating manual of the hydraulic power unit

11 Spare Parts

ATTENTION!

The assembling of non-approved spare parts can negatively affect the function of the disc brake! Only use original DELLNER BUBENZER spare parts!

NOTE!

When ordering spare parts, please provide disc brake type and serial number! You find this information on the type plate of the brake.

Brake

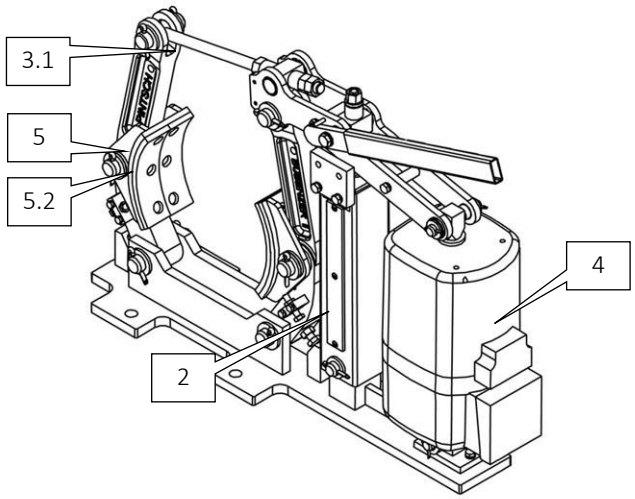


Figure 30: Spare parts

Pos.	Nr.	Item	Pos.	Nr.	Item
3.1	1	Spindle	5.2	2	Brake pad
2	1	Brake spring unit	W/o	1	Bushing kit
4	1	Thruster	W/o	2	Pin kit
5	2	Brake shoe - Complete withe lining (riveted or glued)			

Table 15: Spare parts

12 Appendix

12.1 EC Declaration of Conformity

EG-Konformitätserklärung

im Sinne der Maschinenrichtlinie 2006/42/EG, Anhang II, 1. A.

EC Declaration of Conformity

according to the Machinery Directive 2006/42/EC, annex II, 1. A.

Hersteller:
Manufacturer:

DELLNER BUBENZER Germany GmbH
Friedrichshüttenstraße 1
57548 Kirchen-Wehbach

In der Gemeinschaft ansässige Person, die bevollmächtigt ist, die relevanten technischen Unterlagen zusammenzustellen:
Person residing within the Community authorized to compile the relevant technical documentation:

Siehe beiliegender original Konformitätserklärung.
See enclosed original declaration of conformity.

Beschreibung und Identifizierung des Sicherheitsbauteils:
Description and identification of the safety component:

Produkt/ *Product:*	Trommelbremse/ *Drum brake*
Typ/ *Type:*	EBA 5“- 30“
Funktion/ *Function:*	Bei oben genannten Bremsen handelt es sich um elektrohydraulisch lüftende und federschließende Trommelbremsen. *Above mentioned brakes are electro-hydraulically released and spring-applied drum brakes.*

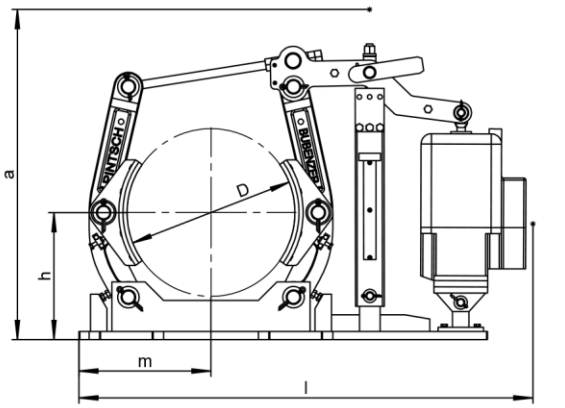
Es wird ausdrücklich erklärt, daß das obengenannte Sicherheitsbauteil allen einschlägigen Bedingungen der folgenden Richtlinien entspricht:
We declare explicitly that the above mentioned safety component corresponds to all the relevant regulations of the following directives:

2006/42/EG:2006-05-17	Richtlinie 2006/42/EG des europäischen Parlaments und Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG (Neufassung)
2006/42/EG:2007-03-16	Berichtigung der Richtlinie 2006/42/EG des Europäischen Parlaments und des Rates vom 17. Mai 2006 über Maschinen und zur Änderung der Richtlinie 95/16/EG
2006/42/EC:2006-05-17	*Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)*
2006/42/EC:2007-03-16	*Corrigendum to Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC*

Fundstelle der angewandten harmonisierten Normen:
Reference to the harmonized standards used:

DIN EN ISO 12100:2011-03	Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung *Safety of machinery – General principles for design – Risk assessment and risk reduction*

12.2 Dimension Sheet



(1) - Minimum space required for removing brake shoe pin

(2) - Average friction factor of standard material combination

(3) - AISE-NEMA does not define a 6-inch drum brake

Alterations reserved without notice

Brake Type	Torque	Drum Size	Shoe Width	Dimensions													Weight	
	μ=0.4(2)	D	B	h	a	c	d	e	g	t	i	k	l	m	n	p	w/o thruster	with thruster
	lb-ft		(inches)														lbs	
EBA 6” - 12/4(3)	50	6	2.50	5.25	14.75	4.50	0.47	6.00	5.91	0.31	2.25	2.75	19.88	5.31	2.75	2.00	31	48
EBA 6” - 23/5(3)	110							6.10					21.25					53
EBA 8” - 23/5	180	8	3.00	7.00	21.00	4.50	0.69	6.10	7.25	0.59	2.88	3.25	26.00	7.09	3.00	2.17	79	101
EBA 8” - 30/5	260							6.30										110
EBA 10” - 23/5	230	10	3.50	8.38	21.50	5.50	0.69	6.10	8.00	0.59	3.13	4.00	30.75	8.27	3.50	2.76	95	117
EBA 10” - 30/5	330				23.25			6.30										230
EBA 13” - 30/5	400	13	5.50	9.88	28.50	6.50	0.81	6.30	11.00	0.59	4.50	5.75	35.50	11.02	4.33	4.53	179	210
EBA 13” - 50/6	750							8.66					38.75					230
EBA 16” - 50/6	800	16	6.50	12.13	29.50	8.00	1.06	8.66	13.25	0.79	5.38	7.50	43.00	12.60	5.12	5.51	241	292
EBA 16” - 80/6	1250																	294
EBA 19” - 121/6	2138	19	8.75	13.25	33.25	9.58	1.06	9.50	16.14	0.79	6.50	9.25	51.18	14.58	7.48	7.09	269	355
EBA 23” - 301/6	4240	23	9.50	15.88	38.50	11.87	1.31	9.50	18.75	0.79	8.00	11.75	53.15	16.93	6.77	9.75	502	589
EBA 30” - 301/12	9000	30	13.50	20.75	48.75	13.62	1.56	9.50	23.00	1.18	9.50	15.00	71.65	22.05	10.25	9.84	1515	1600

12.3 Tightening Torques

NOTE!

The following values apply unless other values are specified in the operating manual.

The following applies to the screw tightening torques: μ_{ges} = 0,12 (black or phosphated, lightly oiled)

Coarse-pitch thread – with or without NORD-LOCK-washers							
Size	Tightening Torques M_A [Nm] for strength class:						SW [mm]
	8.8		10.9		12.9		
	[Nm]	[Lb*ft]	[Nm]	[Lb*ft]	[Nm]	[Lb*ft]	
M4	3,0	2.3	4,6	3.4	5,1	3.8	7
M5	5,9	4.4	8,6	6.3	10,0	7.4	8
M6	10,1	7.5	14,9	11.0	17,4	12.8	10
M8	24,6	18.2	36,1	26.6	42,2	31.1	13
M10	48	35.4	71	52.4	83	61.3	17 (16)
M12	84	62.0	123	90.8	144	106.3	19 (18)
M14	133	98.2	195	143.9	229	169.0	22 (21)
M16	206	152.0	302	222.9	354	261.3	24
M18	295	217.7	421	310.7	492	363.1	27
M20	415	306.3	592	436.9	692	510.7	30
M22	567	418.4	807	595.6	945	697.4	32 (34)
M24	714	526.9	1017	749.1	1190	878.2	36
M27	1050	774.9	1496	1104.0	1750	1291.5	41
M30	1428	1053.9	2033	1500.4	2380	1756.4	46

Table 16: Tightening torques