*ORIGINAL*







# Deduster E2000S/E2000A

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# 1 Manufacturer‘s address and Type identification plate

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The type identification plate is fixed on the back of the drive unit next to the vacuum connector.

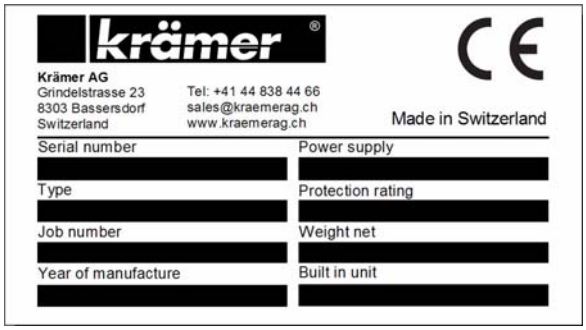



*Fig. 1 Type identification plate on drive unit*

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# 2 Scope

The deduster models E2000S and E2000A offer increased possibilities in the production of tablets whenever a conveyor is required with combined deburring and dedusting functions. Experience gained with models 79, 80 and 92 have lead to the following features:

- Vibration-free housing
- Stainless steel housing with inspection window
- Compatible with peripherals
- High-performance conveying (standard)
- Conveying heights: 250, 500, 750, 1000, 1250 and 1500 mm



*Fig. 2 Deduster E2000S with conveying heights 250 to 1000 mm*

For a better visual control of the dedusting process and an improvement on the dustproofness the turret of the model E2000A is made of plexiglass.

*Fig. 3* shows the deduster type E2000A-250 with plexiglass as the dust improved version (dust cannot get through the gaps of the inspection window).




*Fig. 3 Deduster E2000A-250 with plexiglass turret*

Basic operation of the deduster model E2000-250 to E2000-1500

- Upward conveying range: 250 mm to 1500 mm
- Buffering allows continuous tablet press/capsules filling equipment operation
- Conveying of tablets of 3 – 25 mm diameter, and capsules

Design

- Stainless steel housing and drive (E2000S)
- The cylindrical housing consists of modular PMMA elements (E2000A)
- Construction according to GMP specifications
- Upward conveying of tablets/capsules generated by continuously adjustable vibration.
- The process can be visually permanently controlled.
- The electronic control allows the pre-selection and reproduction of operating conditions.
- The device outlet can be fitted with various peripherals such as metal detectors, diverter switches, slides etc.
- The outlet can be rotated up to 360° facing the inlet. The deduster complies thus with any local situation.

Deburring and Dedusting

- Conveyed tablets/capsules are electrically discharged within the device.
- Dust particles adhering to the surface of tablets/capsules are removed by compressed air stream.

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- The collected dust is aspirated by a reverse air flow.

Features

- A patented suspension system based on counterweights eliminates vibration of the housing
- Disassembly and reassembly of the deduster required for cleaning can be easily performed by a single person without the use of tools.
- Low maintenance
- Use only in non-explosive environment

Note: There is no difference in the throughput between the model E2000S and the model E2000A.

*Tab. 1 Technical Data (see Layout KR501376 and KR504488 chpt. 10.1)*

| Type | 250 | 500 | 750 | 1000 | 1250 | 1500 |
|---|---|---|---|---|---|---|
| WEIGHT & MEASUREMENTS: | | | | | | |
| Weight E2000S [kg] | 55 | 66 | 75 | 81 | 92 | 98 |
| Weight E2000A [kg] | 51 | 62 | 71 | 77 | 88 | 94 |
| Overall height E2000S (without stand) [mm] | 812 | 1182 | 1328 | 1583 | 1848 | 2141 |
| Overall height E2000A (without stand) [mm] | 834 | 1092 | 1322 | 1607.5 | 1865.5 | 2163.5 |
| Inlet height E2000S (without stand) [mm] | 345 | 345 | 345 | 345 | 345 | 345 |
| Inlet height E2000A (without stand) [mm] | 381 | 381 | 381 | 381 | 381 | 381 |
| Conveying height E2000S [mm] | 256 | 516 | 744 | 1029 | 1287 | 1585 |
| Conveying height E2000A [mm] | 209 | 467 | 697 | 978 | 1239 | 1534 |
| Max. tablet ∅ 25 mm | 25 | 25 | 25 | 25 | 25 | 25 |
| Dedusting/deburring distance [m] | 5 | 7 | 9 | 11 | 15 | 18 |
| TECHNICAL DATA: | | | | | | |
| Power supply 100 V – 240 V, 50/60 Hz<br>Mains fuse, max. 10 A | x | x | x | x | x | x |
| Current required, max. 1 A | x | x | x | x | x | x |
| Compressed air required 1.5 – 2.0 bar,<br>50 – 100 l/min | x | x | x | x | x | x |
| Aspiration performance: 10 – 20 mbar,<br>100 – 250 $m^3/h$ | x | x | x | x | x | x |
| Acoustic value at work location (1 m) [dB(A)] | 67 | 67 | 67 | 67 | 67 | 67 |
| Protection class - Drive | IP50 | IP50 | IP50 | IP50 | IP50 | IP50 |
| THROUGHPUT - TABLETS/h | | | | | | |
| Round ∅ 4.8 x 2.3 mm 3‘500’000 pce/hr | x | x | x | x | x | x |
| Round ∅ 9.1 x 3.2 mm 1‘300’000 pce/hr | x | x | x | x | x | x |
| Round ∅ 12.1 x 3.7 mm 410’000 pce/hr | x | x | x | x | x | x |
| Round ∅ 16 x 4 mm 280’000 pce/hr | x | x | x | x | x | x |
| Round ∅ 23.4 x 5.7 mm 103’000 pce/hr | x | x | x | x | x | x |
| Round ∅ 25 x 7 mm 68’000 pce/hr | x | x | x | x | x | x |
| Oblong 16.3 x 7.6 x 5.7 mm 425’000 pce/hr | x | x | x | x | x | x |
| Capsules 19.5 x 7 mm; No 1 448’000 pce/hr | x | x | x | x | x | x |

# 3 Safety tips

The following ANSI standard safety symbols and indications are used in these operating instructions:



**⚠DANGER**

**Maximum danger level. Risk of fatal injuries!**



**⚠WARNING**

**Medium danger level. Risk of serious injuries.**



**⚠CAUTION**

**Low danger level. Risk of minor injuries.**

***NOTICE***

**Possibility of material damage.**

*Tab. 2 List of critical parts*

| Tag | Description | Endangerment | Removal |
|---|---|---|---|
| X1 | Controller: Connection plug of deduster | High voltage | Unplug first mains and then the other plugs! |
| CP1 | Clamping ring for cylinder connection conveying heights 1250 up to 1500 (*Fig. 5*) | Risk of finger trapping | Lay your hand flat |
| CP2 | Telescopic column (*Fig. 22*) | Mechanical compressive stress | Undo the height locking mechanism of the telescopic column with care. |

# 4 Designation/Description of the deduster components

## 4.1 Equipment components

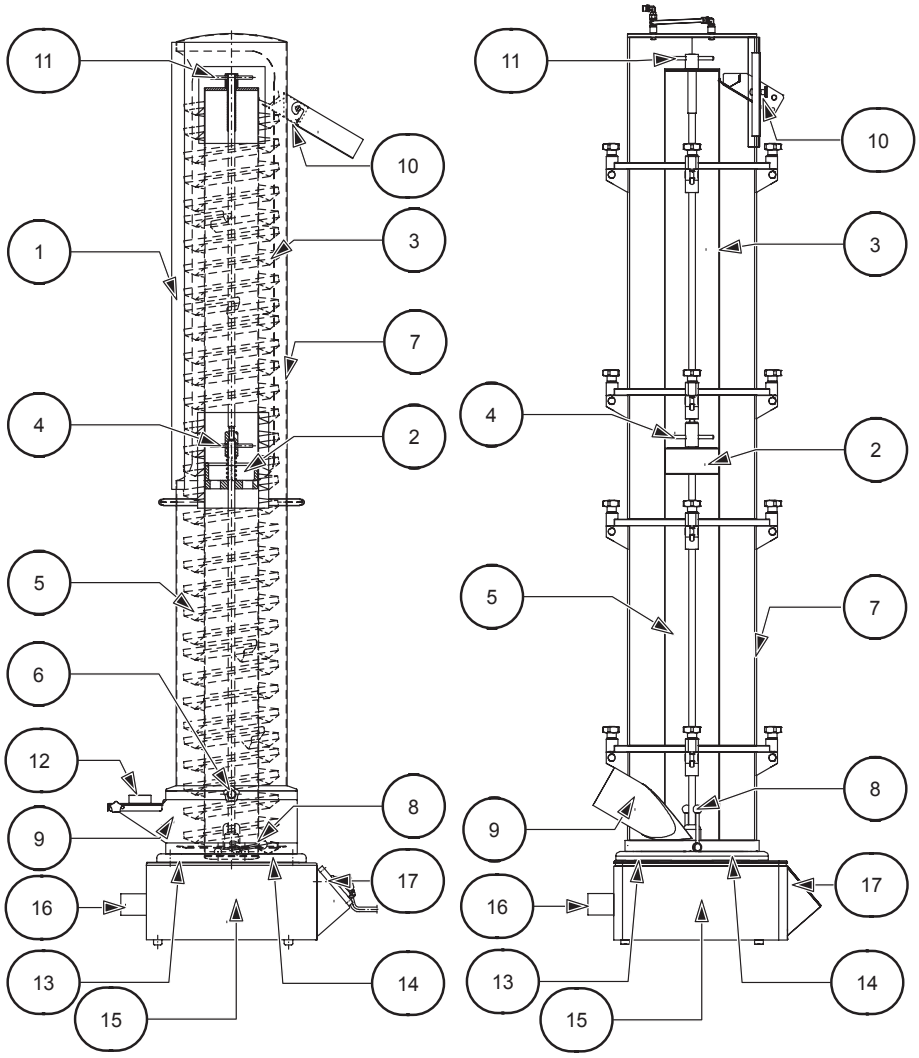



*Fig. 4 Cross section of the deduster E2000S/E2000A*

① Inspection window
② Tension unit (one piece: conveying height 250 up to 750 mm)
③ Upper helix (2nd part: conveying height 1000 up to 1500 mm)
④ Lower tension unit (E2000-1000 up to 1500)
⑤ Lower helix (one piece: conveying height 250 up to 750 mm)
⑥ Star-shaped knob screw
⑦ Cylinder (E2000S-1250 up to 1500, have two parts)
⑧ Eccentric clamping lever
⑨ Inlet unit
⑩ Tablet outlet
⑪ Upper tension lever (E2000-1000 up to 1500)
⑫ Tablet inlet cover
⑬ Sealing membrane
⑭ Vacuum ring
⑮ Drive
⑯ Vacuum connector
⑰ Controller

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## 4.2 Controller



**⚠DANGER**

**When working on the device: Always disconnect the device from the mains. First remove the power plug.**



**⚠CAUTION**

**Incorrectly set frequency F and power P may cause severe damage both to the relevant controller and to the device!**

The controllers below are used by Krämer AG. Other controllers are possible.

Note: The controller is shop-tuned to each deduster delivered.

### 4.2.1 Frequency controller C820

The deduster E2000S/E2000A can be operated either with the internal (C820IR) or the external (C820ER) frequency controller. The components used and functions available in the internal and external variants are identical.

Notice: For further information, please refer to the Operating Instructions Manual for the C820 Frequency Controller (Part No. KR700105).

### 4.2.2 Process Controller C920

The C920 process controller is able not only to control the E2000S/E2000A deduster but also to operate and monitor peripheral devices such as the V4000/V5000 diverters, metal detectors, conveyor belts.

Notice: For further information, please refer to the Operating Instructions Manual for the C920 Process Controller (Part No. KR700117).

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# 5 Commissioning of the deduster

The deduster E2000S with conveying heights 250 – 1000 mm is packed as a whole and is immediately ready for operation after connection of the electrical cables and the aspiration.

The deduster E2000S with conveying heights 1250 and 1500 mm is packed in two parts. Before commissioning, the helix ⑤, the upper tension unit ⑪ and the cylinder ⑦ must be assembled.

The deduster E2000A is put together depending on conveying height of a certain amount of different cylinder sections (see ch. 9.5).

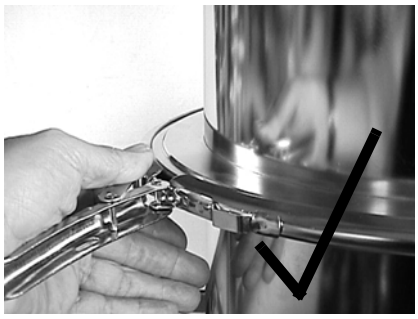
Proceed as follows:

1. Remove the plastic packaging of the components
2. Put the upper cylinder on the lower cylinder. Two cylindrical pins on the flange facilitate positioning.
3. Fix the assembling ring.



**⚠CAUTION**

**Risk of injury! Lay your hand flat to the equipment in order to prevent clamping your fingers.**



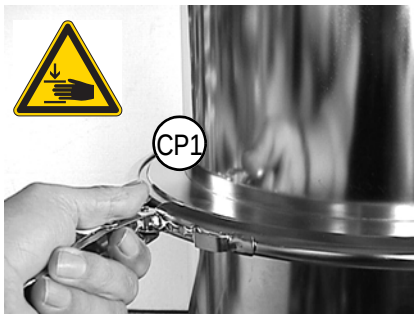



*Fig. 5 Fixing the assembling ring*

4. Carefully set the upper helix with the upper tension unit on the lower helix and turn it clockwise around 90° until it engages on the lower helix (see *chpt. 6.2.3*).
5. Tighten the clamping bolt of the tension unit.
6. Hook in the inspection window.

## 5.1 General Instructions

### Adjusting of transition area from the helix into the outlet

Check looking into the tablet outlet at the cylinder that the area of transition from the helix into the outlet is properly adjusted (see *Fig. 6*).

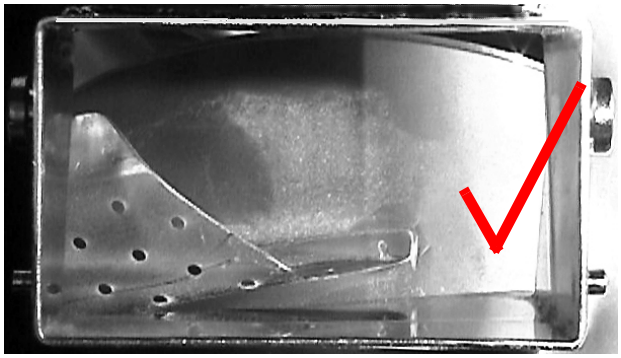


*Fig. 6 Correct adjusting of transition area from the helix into the outlet*

Tablets exit the device through outlet correctly.

Note: In this case, consider clearance helix - outlet. spiral (*Fig. 7*). It should be at least 3 mm. If that is not the case, check the position of the cam ring which has to point in outlet direction (see *Fig. 29*).




*Fig. 7 Clearance helix – outlet*

Graphic below shows a wrong positioning:

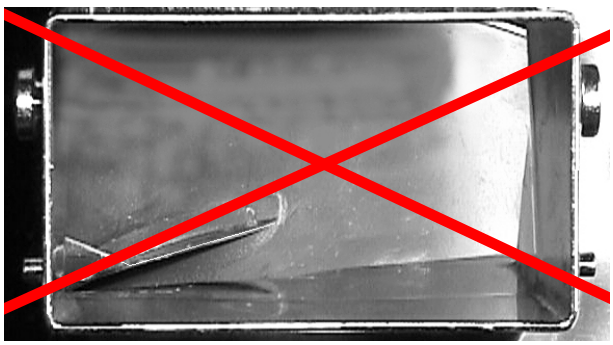


*Fig. 8 Transition area is too low*

Tablets drop back into the device.

Remedy:

1. Loosen the three star-shaped grip screws on the cylinder.
2. Rotate the cylinder into the correct position.
3. Retighten the screws.

Graphic below shows another wrong positioning:

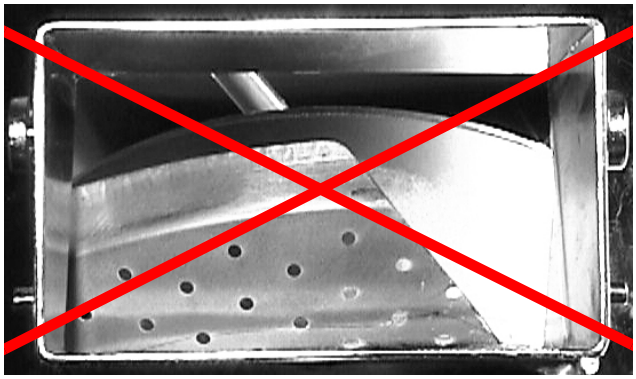


*Fig. 9 Transition area is too high*

Tablets jam at the outlet. The helix strikes audibly against outlet.

Remedy:

1. Loosen the three star-shaped grip screws on the cylinder.
2. Rotate it into the correct position.
3. Retighten the screws.

Note: If the outlet is not in the right position, see also *chpt. 6.2*.

## Correct degree of overlap at put helices

Check the correct degree of overlap at put helices (Conveying heights 1000 – 1500 mm).

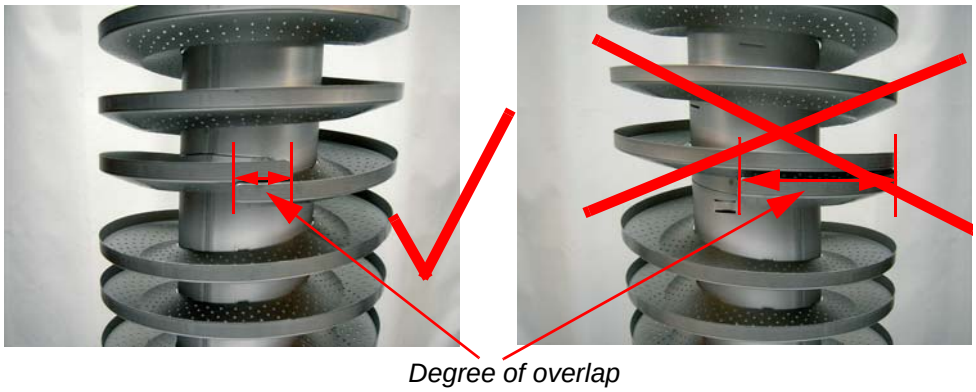



*Fig. 10 Degree of overlap*

Remedy:

1. Loosen the tension lever on top of the tension unit ⑪ counterclockwise.

2. Turn the helix at 180°.
3. Tighten the tension lever again.

## Installation of inspection window

**⚠CAUTION**

**Risk of injury. Use a safety-approved ladder when assembling and disassembling the device in order to assure reliable stability.**

**NOTICE**

**The dismounted parts must be laid down and/or transported with care. Risk of damage.**

**NOTICE**

**The inspection windows consist of acrylic glass. Do not put on hard. Break danger!**

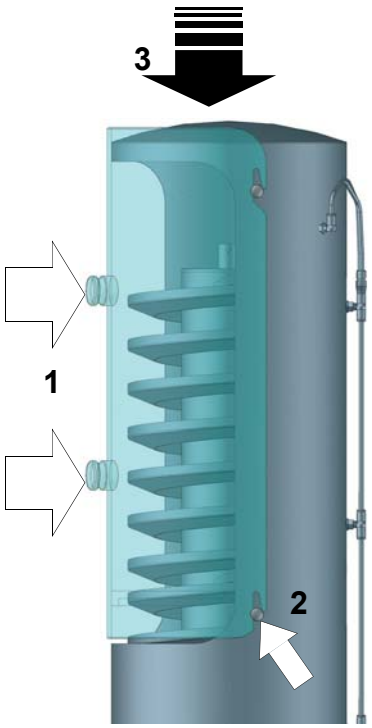



*Fig. 11 Assembly of inspection window*

1. Push the inspection window (1) flatwise to the cylinder until the hanging bolt (2).
2. Let the inspection window swim down (3) (without huge force) until it hangs up.

Note: Important! It satisfies if the window covers the aperture all-round (*Fig. 12*).



*Fig. 12 Inspection windows covers aperture all-round*

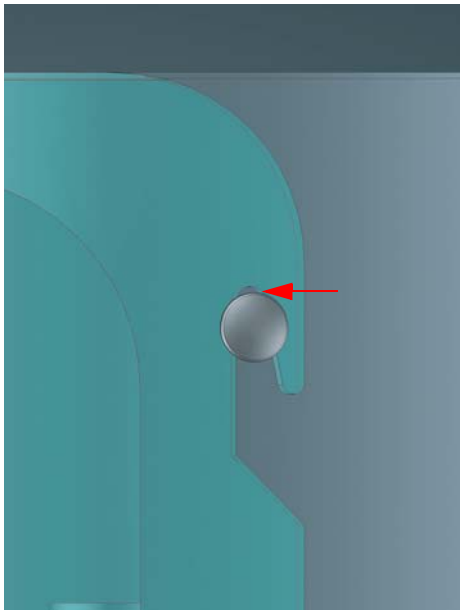


*Fig. 13 Hanging of inspection window not to the end*

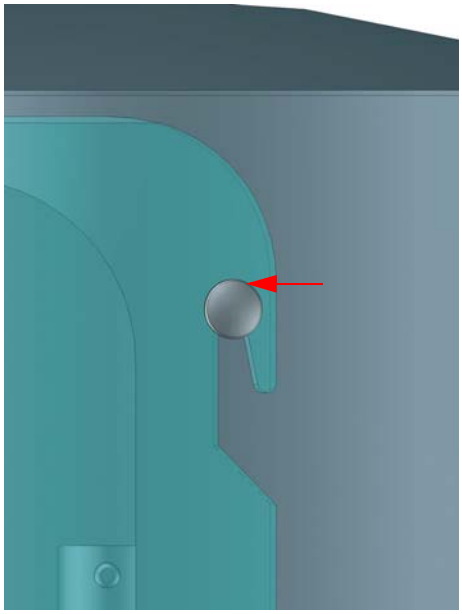


*Fig. 14 Not necessary*

Caution: It is not necessary to hang up the inspection window to the utmost corner of the hanging bolt (*Fig. 14*).

## 5.2 Air extraction

1. Make sure the clamping bolt of the tension unit is correctly tightened (see *Fig. 15* item ⑱).
2. Dust is sucked off through the lateral holes in the central tube (see *Fig. 15* item ⑲). 60% of the dust is removed when the tablets enter into the deduster.

Transporting the tablets generates new dust which is sucked off continuously during the conveying process.

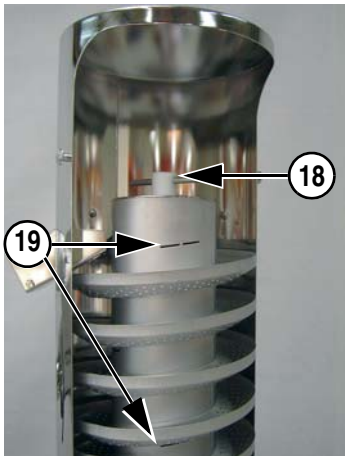



*Fig. 15 Air extraction through lateral holes*

3. The 50 mm vacuum connector diameter ⑯ guarantees optimal aspiration.

Aspiration performance: 10 – 20 mbar, 100 – 250 $m^3$ per hour.

4. The closed tablet entrance area ⑳ from the press into the deduster reduces aspiration of undesired ambient air. Thus the aspirated air passes over the tablets increasing the dedusting efficiency.

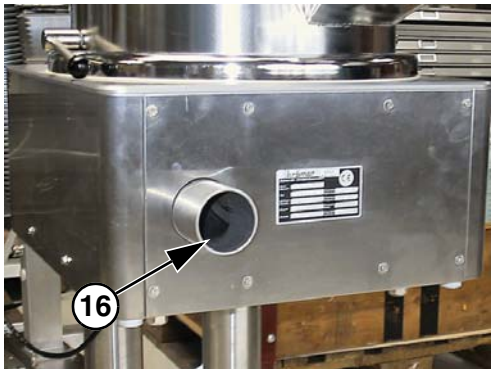



*Fig. 16 Vacuum connector*

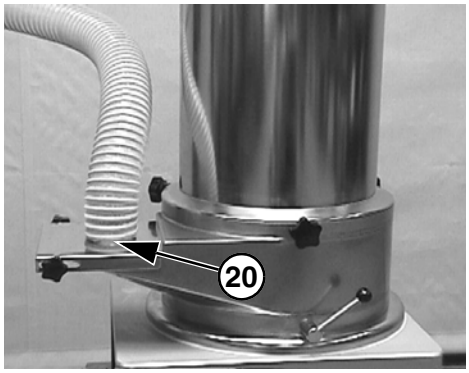



*Fig. 17 Closed tablet inlet*

## 5.3 Compressed air connection

In order to improve the dedusting efficiency air can be blown onto tablets through nozzles ㉑ *Fig. 18* (see pneumatic schema *chpt. 10.2*)

The use of clean compressed air is a expected. It is fed into the system through the connection ㉒ *Fig. 18*.

Air pressure depends on the shape and diameter of tablets and should not exceed 1.5 – 2.0 bar else the tablets will be slowed down.

Note: Air consumption 50 – 100 l/min.

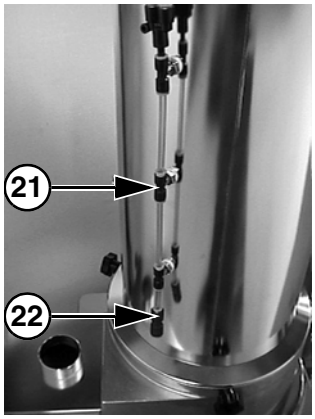



*Fig. 18 Air nozzle and connection*

## Connecting and disconnecting of hose connection

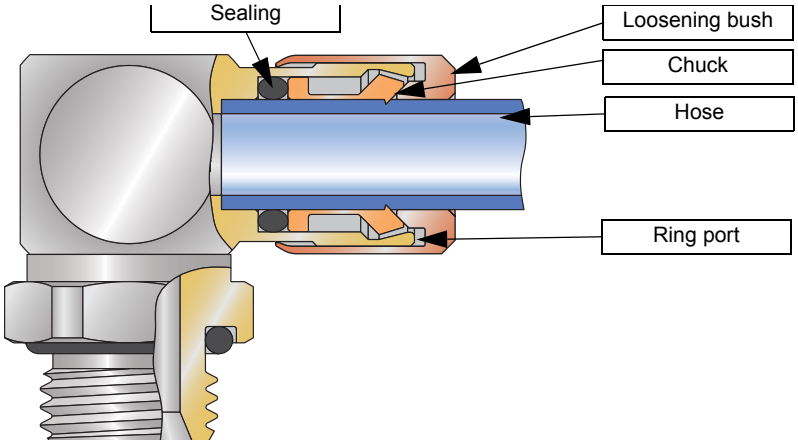



*Fig. 19 Angled screw coupling Water connection*

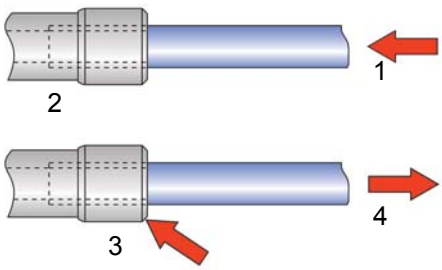



*Fig. 20 Connecting and disconnecting of hose connection*

1. Plug in the hoses while insert the hose up to the limit stop (1) and then further push the hose until the resistance of the O-ring is overcome (2).

Note: At the dis connection, withdraw bush (3) of the hose connection and then withdraw out the hose (4).

The blast air assembly is connected via a non return valve.

Note: Please note the flow direction of the non return valve (see *Fig. 21*).

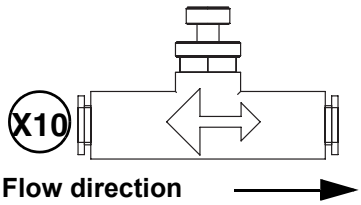



*Fig. 21 non return valve (P/N 99001370)*

## 5.4 Stands

To guarantee the stability ofthe deduster E2000S/E2000A Krämer AG Bassersdorf supplies matching stands. Single stands or complete combination units with metal checks and other peripherals can be offered.




*Fig. 22 Deduster E2000S on roll-away stand STW500*



*Fig. 23 Combination unit with metal detector*

The roll-away stand height is factory-adjustable in order to meet customer requirements in terms of inlet height. The roll-away stand is raised and lowered using a fixing-clamp. Both excellent mobility and stability at the operating location are thus achieved.

**⚠WARNING**

**Risk of serious injuries! Undo the height locking mechanism of the telescopic column with care. The ad justable column is under high pressure. Ensure that no parts of the body come within the danger area.**

### Fixing of the deduster on the stand

The base plate of the deduster drive boasts welding nuts (*Fig. 24*) so that the lateral casing needs not be removed while fastening.

Screw in the screws through the holes of the fixing plate of the stand from below into the welding nuts (*Fig. 25*).



*Fig. 24 Welded nut*



*Fig. 25* Fixing of the deduster on the stand

# 6 Assembly of the model E2000S/E2000A

## 6.1 Drive unit

**⚠CAUTION**

**Risk of material damage! Each drive unit is tuned to a specific conveying height of the deduster. Only use drive units matching the specific conveying height!**

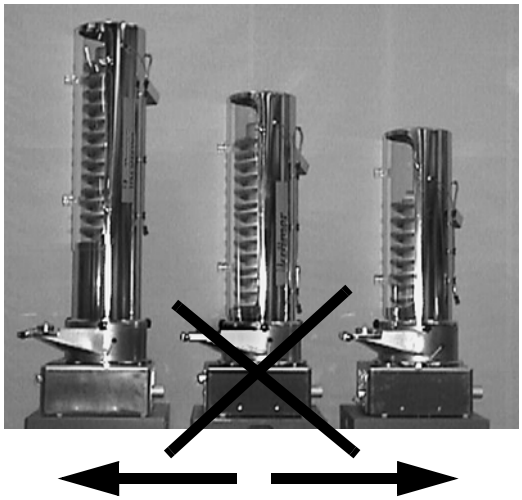


*Fig. 26 Conditional exchangeability of drive units*

Note: Consider the different fixing elements of the helix on the armature coupling. For the dedusters E2000S/E2000A-250 to -750 the threaded bush *Fig. 27* is used and for the dedusters E2000S/E2000A-1000 to -1500 the tension bolt *Fig. 28* is used.



*Fig. 27 Threaded bush at conveying heights 250 – 750*



*Fig. 28 Tension bolt at conveying heights 1000 – 1500*

## 6.2 Selecting the angle between inlet and outlet position

1. Loosen the three hexagonal-head screws.

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2. Place the inlet unit ⑨ on the drive ⑮ in the position that provides the optimal configuration between the inlet ⑫ and the vacuum connector ⑯ for the particular workstation (each 90°) (*Fig. 4*/*Fig. 29*).

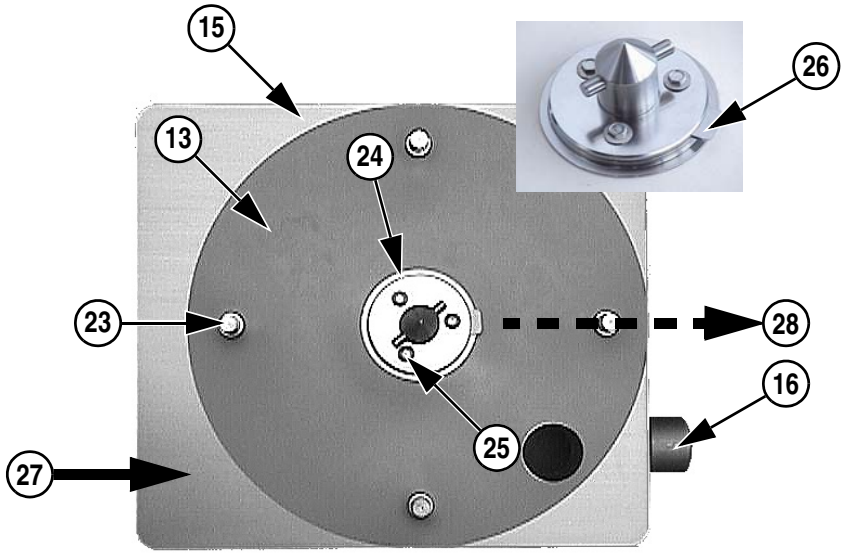



*Fig. 29 Drive – Top view*

⑬ Sealing membrane used as dust seal
⑮ Drive unit–Top view
⑯ Vacuum connector (50 mm OD)
㉓ Tension bolts
㉔ Cam ring
㉕ Hexagonal-head screws
㉖ Cam
㉗ Factory-preset tablet inlet direction (in the wrapping)
㉘ Factory-preset tablet outlet direction (in the wrapping)

3. Use the tension bolts ㉓ for positioning (*Fig. 67*).
4. Lock the tablet inlet with the two eccentric levers ⑧.
5. Rotate the cam ring ㉔ in order for the cam ㉖ to be pointing into the direction into which the tablets are to leave the deduster.
6. Make use of either of the following options:

   a Tighten the three hexagon-head screws. The Deduster is now securely positioned.

   b Screw the three hexagonal-head screws snugly. This allows the helix to be rotated to it‘s exact position. Remove the helix and tighten the screws to complete the adjustment to the precise position.

### 6.2.1 Assembly of the model E2000S-250

The deduster model E2000S-250 is assembled as follows:




*Fig. 30 Lay down vacuum ring*

1. Lay down the sealing membrane ⑬, the vacuum ring ⑭ and the inlet unit ⑨.




*Fig. 31 Swivel eccentric clamping-levers*

2. Swivel the eccentric clamping-levers ⑧ to the right.

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*Fig. 32 Fit helix*

3. Carefully fit the helix ⑤ together with the tension unit ②.

Note: Hold the helix with both hands!



*Fig. 33 Tighten tension lever*

4. Tighten the tension lever on top of the tension unit ②.



*Fig. 34 Hook the cylinder*

5. Turn the cylinder approx. 20 – 30° clockwise so that the transition area from the helix to the outlet does not strike the outlet.



*Fig. 35 Tighten star-shaped knob-screws*

6. Tighten star-shaped knob-screw ⑥.



*Fig. 36 Hook the inspection window*

7. Slide inspection window ① downwards.

Notice: Consider instructions for handle of inspection window (*chpt. 5.1*).

### 6.2.2 Assembly of the models E2000S-500 to E2000S-1000

The deduster models E2000S-500 to E2000S-1000 are assembled as follows:




*Fig. 37 Lay down vacuum ring*

1. Lay down the sealing membrane ⑬, the vacuum ring ⑭ and the inlet unit ⑨.




*Fig. 38 Swivel eccentric clamping-levers*

2. Swivel the eccentric clamping-levers ⑧ to the right.



*Fig. 39 Fitting cylinder*

3. Fit the cylinder ⑦.



*Fig. 40 Insert lower helix*

4. Carefully insert the lower helix ⑤ together with the lower tension unit ④.

Note: Hold the helix with both hands.

5. Tighten the star-shaped knob-screw ⑥.



*Fig. 41 Tighten tension lever of the lower helix*

6. Rotate the lower helix assembly ⑤ 90° clockwise.
7. Tighten the tension lever ④ on top of the tension unit by rotating clockwise.

Note: Steps 8 – 9 only apply to E2000S-1000.



*Fig. 42 Fit upper helix*

8. Carefully fit the upper helix ③ together with the upper tension unit ⑪.
9. Rotate the upper helix assembly ③ 90° clockwise.



*Fig. 43 Tighten star-shaped knob-screw*

10. Turn the cylinder approx. 20 – 30° clockwise so that the helix transition area from the helix to the outlet does not strike the outlet.
11. Tighten the star-shaped knob-screw ⑥.



*Fig. 44 Tighten tension lever*

12. Tighten the tension lever ⑪ on top of the tension unit (E2000S-1000) or ④ between the helix se ctions (E2000S-500/-750) by rotating them clockwise.



*Fig. 45 Hook the inspection window*

13. Slide the inspection window ① downwards.

Notice: Consider instructions for handle of inspection window (*chpt. 5.1*).

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### 6.2.3 Assembly of the models E2000S-1250 and E2000S-1500

**⚠CAUTION**

**Risk of injury! Use an approved ladder when assembling and disassembling the device in order to assure proper body stability.**

**⚠CAUTION**

**Risk of injury to hands. Hold your hand flat in order to prevent your fingers being caught/crushed.**

1. Lay down the vacuum ring and the sealing membrane. Swivel the eccentric clamping-lever ⑧ to right and fit the inlet unit ⑨.



2. Fit the lower helix assembly ⑤ together with the tension unit ④

Note: Take the helix with both hands.



3. Turn the lower tension lever 90° clockwise.



4. Fit the lower cylinder ⑦ by lifting it on.



5. Slide the assembling ring downwards over the lower cylinder.



6. Fit the upper cylinder ⑦.



7. Tighten the assembling ring, which holds both cylinders together.



8. Connect the air blow connection (hose) between the cylinders:

Note: At disconnecting slide the bush upward and pull the hose (*Fig. 20*).



9. Carefully fit the upper helix ③ together with the upper tension unit ⑪.

Note: Take the helix with both hands.



10. Turn the upper helix ③ 90° clockwise.
11. Tighten the tension lever ⑪ on top of the tension unit by rotating it clockwise.



12. Slide the inspection window ① downwards.

Notice: Consider instructions for handle of inspection window (*chpt. 5.1*).

### 6.2.4 Assembly of the models E2000A-250 to E2000A-1500




Fig. 46 View E2000A-250



Fig. 47 Lay down the sealing membrane

1. Lay down the sealing membrane ⑬.



Fig. 48 Put the vacuum ring

2. Put the vacuum ring ⑭.



Fig. 49 Assembly the helix

3. Assembly the helix ⑤ and tighten the tension unit knob ②.



Fig. 50 Fit the lower cylinder

4. Fit the lower cylinder ⑦.

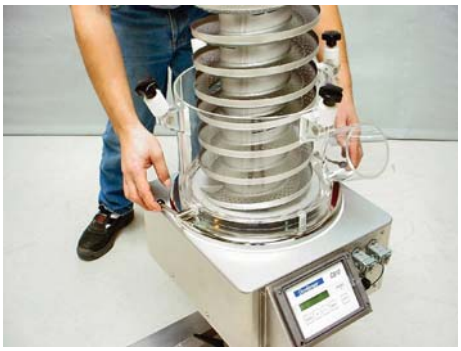


Fig. 51 Tighten the clamping lever

5. Tighten the clamping lever ⑧.



Fig. 52 Assembly the upper cylinder

6. Tighten the star-shaped knob-screws.
7. Assembly the upper cylinder ⑦.



Fig. 53 Screw the tablet outlet

8. Screw the tablet outlet ⑩.



Fig. 54 Fit the tablet outlet adapter

9. Fit the tablet outlet adapter.

Mounting of turrets with other conveying heights is carried out in the same way.

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# 7 Deduster Operation

## 7.1 Quick Operating Guide

a) Position the deduster between the press and the bin.
b) Connect the cables.
c) Connect the blast air unit of the Deduster to the local compressed air system[1)].
d) Connect the deduster exhaust hose (suction hose).
e) Connect the hoses to the press and the bin.
f) Switch on the controller. This can be done by switching on directly at the controller (ON/OFF button) or via the remote control.

Notice: Before starting up for the first time and after transportation or re-assembly, the Deduster must be run empty for 6 hours for self-adjustment purposes. For this purpose, find the resonance frequency and increase value P until the armature stops knocking.

## 7.2 Setup procedure for Controller

The aims of commissioning the Deduster Frequency Controller are:

1. to find and achieve the resonance frequency of the oscillating helix (value F = Frequency), and
2. to adjust the tablet flow rate (value P = Power) that you need
   a) for the production process and
   b) for emptying the helix.

At controller C820 and C920, the automatic frequency control can be switch on making use of an acceleration sensor. In a defaulted frequency range, the frequency is controlled. The power is defaulted.

Notice: For further information, please refer to the Operating Instructions Manuals for the C820 Frequency Controller (Part No. KR700105) and for the C920 Process Controller (Part No. KR700117).

Operating instructions manual Deduster E2000S/E2000A KR401690 EN V26a

1) Rule of thumb: The blast air setting must be as powerful as possible but not so strong that it impedes the upward flow of the tablets.

# 8 Cleaning the deduster

## 8.1 Disassembly prior to cleaning

To disassemble the deduster perform assembly operations in reverse order.
For model E2000S-250 see *chpt. 6.2.1*, for models E2000S-500 to E2000S-1000 see *chpt. 6.2.2*, for models E2000S-1250 to E2000S-1500 see *chpt. 6.2.3*. For models E2000A-250 to E2000A-1500 see *chpt. 6.2.4*.

Note: When reassembling the deduster position the helix in accordance to the tablet outlet as described in *chpt. 5.1*.

Note: When reassembling the deduster position the helix (conveying heights 1000 up to 1500 mm) in accordance to the degree of overlap as described in *chpt. 5.1*.



**⚠CAUTION**

**Risk of injury. Use a safety-approved ladder when assembling and disassembling the device in order to assure reliable stability.**

***NOTICE***

**The dismounted parts must be laid down and/or transported with care. Risk of damage.**



***NOTICE***

**The inspection windows consist of acrylic glass. Do not put on hard. Break danger!**

## 8.2 Cleaning of individual parts

The following parts must be cleaned after the production process:

*Tab. 3 Parts to be cleaned (cf. Fig. 4)*

| Pos. | Description | Cleaning |
|---|---|---|
| 1 | Inspection window | Wash and dry |
| 2 | Tension unit | Wash and dry |
| 3+5 | Helix | Wash and dry |
| 4 | Lower tension unit (E2000-1000 to 1500) | Wash and dry |
| 7 | Cylinder | Wash and dry |
| 9 | Inlet unit | Wash and dry |
| 10 | Tablet outlet | Wash and dry |
| 11 | Upper tension unit (E2000-1000 to 1500) | Wash and dry |
| 12 | Tablet inlet cover | Wash and dry |
| 13 | Sealing membrane | Wash and dry |
| 14 | Vacuum ring | Wash and dry |
| 15 | Drive | Clean with a damp cloth |

## 8.3 Detergents

The following detergents are permitted for cleaning the replaceable parts in contact with the product (see *Tab. 4*).

*Tab. 4 Detergents*

| | **Stain-less steel 1.4435; 316 L AISI** | **Poly-methyl meth-acrylate PMMA** | **Poly-acetal POM** | **Silicone elasto-mer MQ** | **Nitrile elasto-mer NBR** | **Poly-ure-thane** |
|---|---|---|---|---|---|---|
| Water up to 80 °C | 1 | 1† | 1 | 1 | 1 | X<br>1* |
| Alkaline and acid-based pharmaceutical detergents | 1 | Take careful note of the specifications of the particular detergent used. | | | | |
| Soap solution | 1 | 1‡ | 1 | 1 | 1 | 2 |
| Hydrogen peroxide, up to 30 % | 1 | 2 | 1 | 1 | X | 2 |
| Caustic soda solution 25 % | 1 | 2 | 1 | 2 | 2 | 2 |
| Sulphuric acid 10 % | 1 | 2 | 1 – 2 | 2 | 1 | 2 |
| Phosphoric acid 50 % | 1 | 2 | X | 2 | 2 | 2 |
| Oxalic acid | 1 | 2 | 2 | 1 | 2 | X |
| Alcohol up to 30 % | 1 | X | 1 | 1 | 1 | 2 |
| Ammonia solution | 1 | X | 1 | 1 | 1 | X |

1 – resistant
2 – conditionally resistant
X – not resistant

* up to 50 °C
†maximum 4 min Exposition in tap water
‡30 °C; time unlimited

**NOTICE**

**Danger of material damage at acrylic glass. Use for cleaning not alcohol! Alcohol lead to cracks in the PMMA material.**

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# 9 Maintenance and Troubleshooting

Maintain the following maintenance schedule:

*Tab. 5 Maintenance schedule*

| Maintenance schedule | | |
|---|---|---|
| after finishing of one production run | Cleaning of individual parts | see *chpt. 8.2* |
| daily | Visual inspection of mechanical and electrical connections | Testing to slack parts or damaged insulation of the electrical connections |
| 1000 hr/6 months | exchange of the sealing membrane | see *chpt. 9.4* |
| 5000 hr/30 months | exchange of the spring assemblies | see *chpt. 9.5* |

*Tab. 6 Troubleshooting*

| # | Problem | Possible reasons | Removal |
|---|---|---|---|
| 1 | Insufficient conveying performance | – Incorrect adjustment of F and P on the controller | See separate Operating instructions Controllers |
| 2 | Tablets hop in the helix | – P set too high on the controller | Correct P slightly lower |
| 3 | Device fails to start<br>Error types shown on display of controllers | – Short-circuit<br>No current<br>Current limiting<br>– Faulty magnetic coil | See separate Operating instructions Controller<br><br>Exchanging magnetic coil (see *chpt. 9.6*) |
| 4 | Device fails to start<br>and no display of controllers | – Faulty controller | Exchange controller |
| 5 | Insufficient dedusting performance | compressed air not turned on | Turn on compressed air (to be provided by the client/customer) |
| 6 | Metallic vibration noise during operation | – Loose parts<br>– Deduster strikes press<br>– Helix strikes tablet outlet<br>– Broken spring assembly | Tighten all devices<br>Adjust helix to correct position (see *chpt. 5.1*)<br>Exchange spring assemblies (see *chpt. 9.5*) |
| 7 | Armature makes knocking noises | – Gap between armature plate and magnetic coil too small | Adjust gap (see *chpt. 9.5*) |
| 8 | Unbalanced running of deduster – drive units housing vibrates | – When transported over longer distances (e. g. with truck) the settings of the spring assemblies may have been shifted | Reset F and P correctly.<br>Run the empty deduster during 6 hours with F and P set at their optimal values in order to let the deduster settle in its regular operating status. |

## 9.1 Adjusting the vibration (oscillation)

Note: See also Operating instructions Controllers.

**NOTICE**

**Risk of material damage. Incorrectly set frequency and pulses can permanently damage the equipment.**

## 9.2 Device fails to start

The failure type is shown on the display.

Fault numbers 3 & 4 in *Tab. 6* are described in greater detail in the C820 and C920 Operating Instructions Manual.

Note: For trouble shooting see Operating instructions Controllers.

Note: The frequency controllers C820 must not open.

Note: The process controller C920 may only open by the specialist.



**⚠DANGER**

**Risk of deadly high voltage! Disconnect the deduster/controller from the mains!**



**⚠CAUTION**

**Risk of electrostatic damage. Don‘t touch any electrical equipment before you being sure that the power is off!**

Check the electrical power supply.

## 9.3 Replacement of Controller



**⚠DANGER**

**Risk of fatal electric shock. Always disconnect the device from the mains before opening it.**



**⚠CAUTION**

**Risk of electrostatic damage. Never touch any electronic assemblies or components.**

Notice: See the Operating Instructions Manuals for the C820 Frequency Controller (Part No. KR7 00105) and for the C920 Process Controller (Part No. KR700117).

## 9.4 Installing the sealing membrane

How to mount the sealing membrane:

1. Lay the sealing membrane below the cam on the drive unit!
2. Position the sealing membrane using the tension bolts.



*Fig. 55 Placing the sealing membrane*

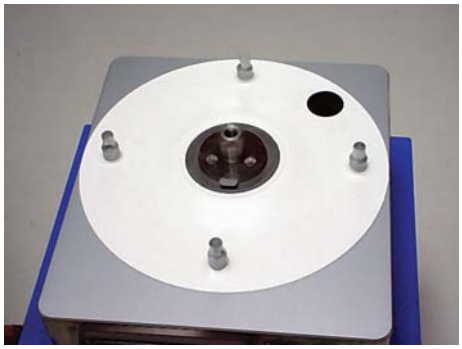


*Fig. 56 Positioning the sealing membrane*

## 9.5 Exchanging the spring assemblies

The four spring assemblies are located inside the drive unit and are fastened to the armature plate above and counterweight below (see *Fig. 57*).

Note: When exchanging the spring assemblies always exchange all four sets at the same time.

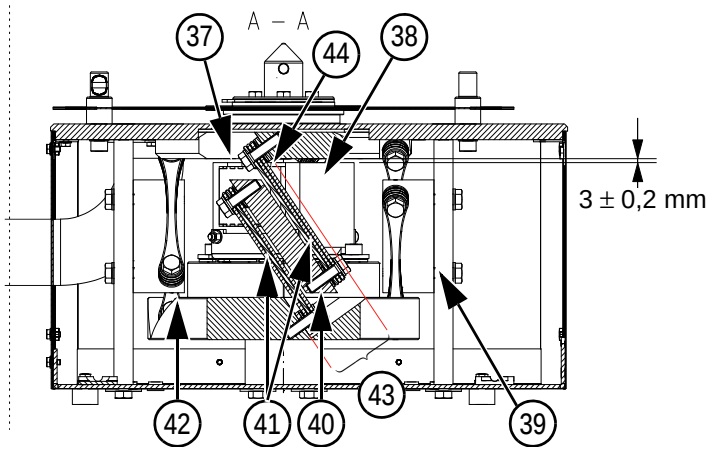



*Fig. 57 Parts of the drive unit*

37 Armature plate
38 Magnetic coil
39 Central beam
40 Spring holder } spring assembly set 43
41 Spring assembly (2 halves)
42 Counterweight
44 Air gap: 3 ± 0.2 mm for all models E2000S/E2000A



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**⚠DANGER**

**Risk of deadly high voltage! Disconnect the deduster/controller from the mains!**

Note: Note the different spring assembly types!

1. Identify your spring assembly set.

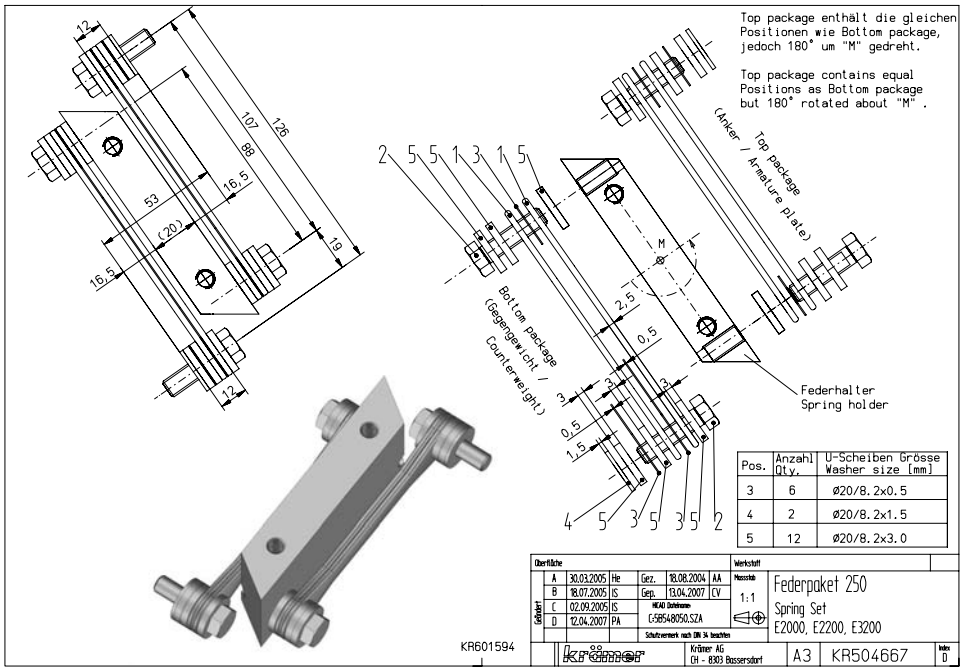



*Fig. 58 Spring assembly set of deduster E2000S/E2000A-250 (contained in spare part kit P/N KR601891)*

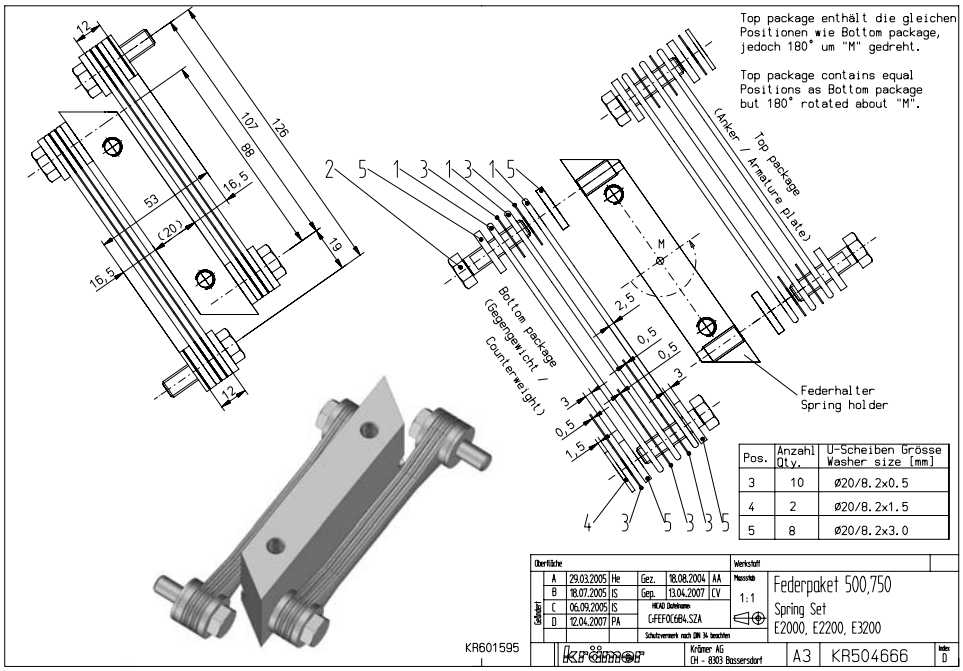



*Fig. 59 Spring assembly set of dedusters E2000S/E2000A-500 and -750 (contained in spare part kit P/N KR601892)*

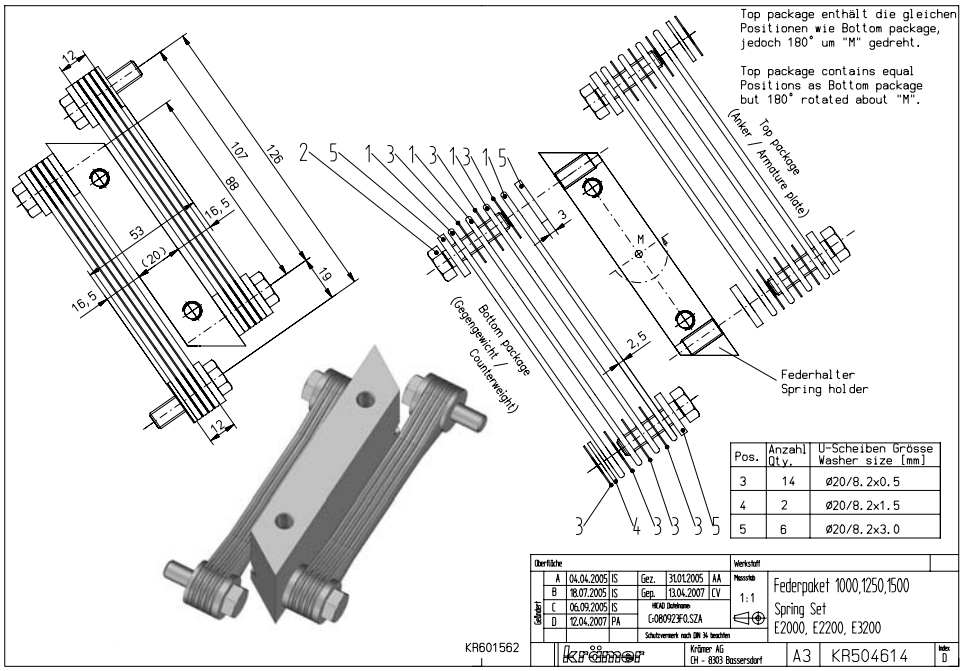



*Fig. 60 Spring assembly set of dedusters E2000S/E2000A-1000 to -1500 (contained in spare part kit P/N KR601893)*

How to exchange the spring assembly set:



*Fig. 61 Remove the lateral casing*

2. Remove the lateral casing of the drive unit.



*Fig. 62 Lift off the drive cover*

3. Lift off the drive unit cover.
4. Unscrew the screws of a central support (39) from the base plate.

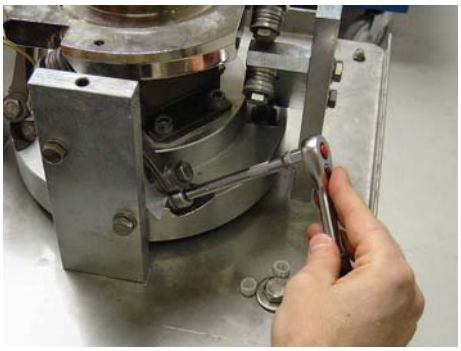


*Fig. 63 Unscrewing the lower screw of the spring set assembly on the counterweight*

5. Unscrew the screw that secures the spring set assembly (43) to the counterweight (42).



*Fig. 64 Unscrewing the upper screw of the spring set assembly on the armature plate*

6. Unscrew the screw that secures the spring set assembly (43) to the armature plate (37). While unsc rewing, hold the screw firmly to prevent the washers of the spring set (41) from falling out.

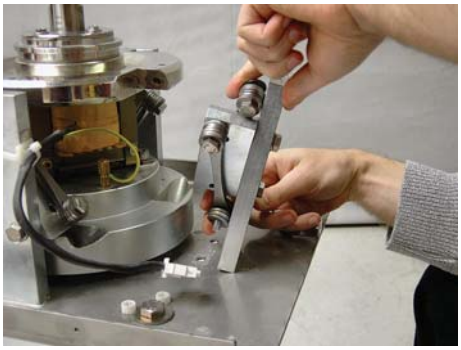


*Fig. 65 Removing the spring set assembly*

7. Remove the comp lete spring set assembly together with the central support.
8. Undo the scr ews fastening the spring holder (40) to the central support (39).

Note: By reassembly sc rew the central support with a torque of 20 Nm!

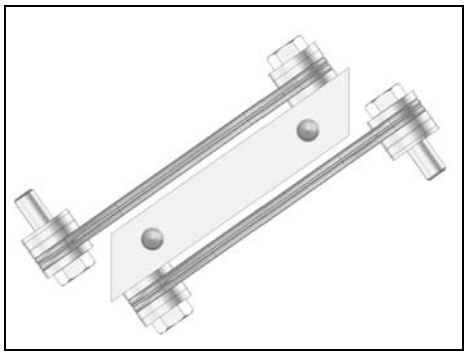


*Fig. 66 Example of a spring assembly with spring holder for E2000S/E2000A-250*

9. Exchange the spring assembly set (43).
10. Fit the drive all the way up to the side panels.



*Fig. 67 Centering of the armature coupler with gages*

11. Check the centering of the armature coupler with the 4 gages (P/N KR502463).
12. Tighten the spring assembly while the gages are on using a torque of 20 Nm. As a result, the armature coupler is trued.

Note: Use a torque wrench!

**NOTICE**

**Risk of malfunction of the equipment! Make sure that the air gap is correctly adjusted.**

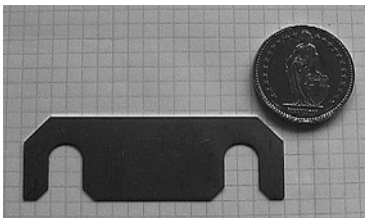


*Fig. 68 Spacer under the coil*

13. Control and adjust the air gap of 3.0 ± 0.2 mm (*Fig. 57*). We recommend to use the gage (KR504572).
14. Use the spacers included in the scope of supply for adjusting the air gap! The spacers are available in material thicknesses 0.1; 0.2; 0.5; 1.0; 2.0 mm.
15. Repeat this sequence of operations for the armature coupler, the cam ring and the threaded bush or tension bolt (see *chpt. 6.1* to *chpt. 6.2*) in reverse order to the disassembly.
16. Assemble the helix with tension unit.
17. To set the springs, carry out a one hour run – function test – with the resonance frequency at basic setting for operation and a high power value.

**⚠CAUTION**

**Danger of injury and material damage! Keep out of the helix's area of vibration! The locking handle must be securely tightened.**

18. Assemble the inlet unit.
19. Check adjustment of inlet plate height.
20. Now completely assemble the deduster.

Note: Perform a 20hr test run after replacement of the springs.

Operating instructions manual Deduster E2000S/E2000A KR401690 EN V26a

Adjustment height of inlet plate Deduster E2000S/E2000A

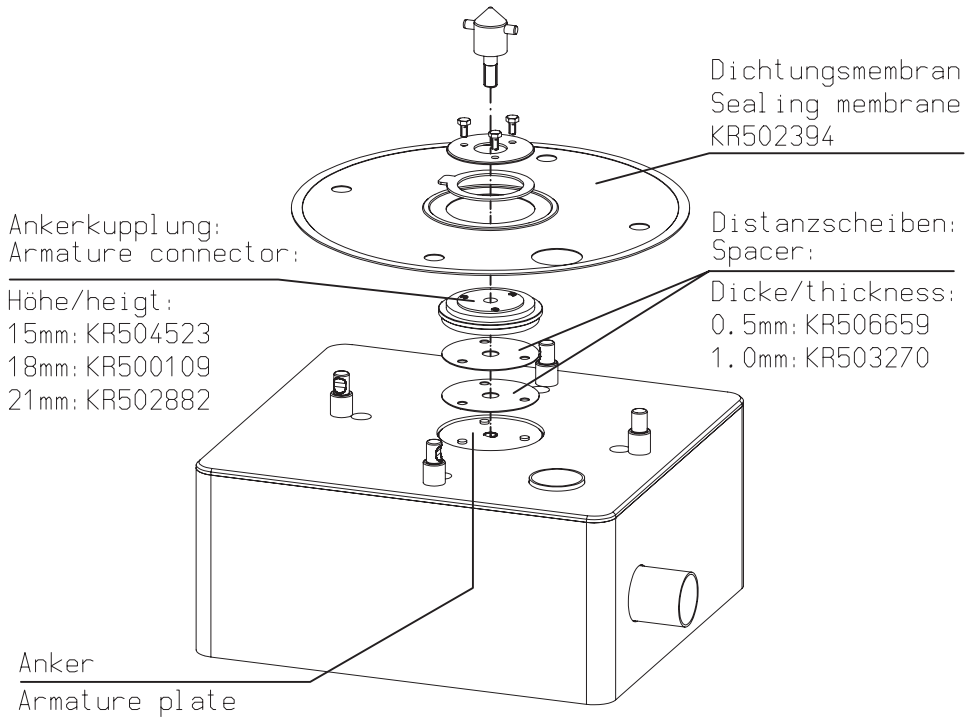



*Fig. 69 Exploded assembly drawing of the armature connector for the drive E2000S/E2000A*

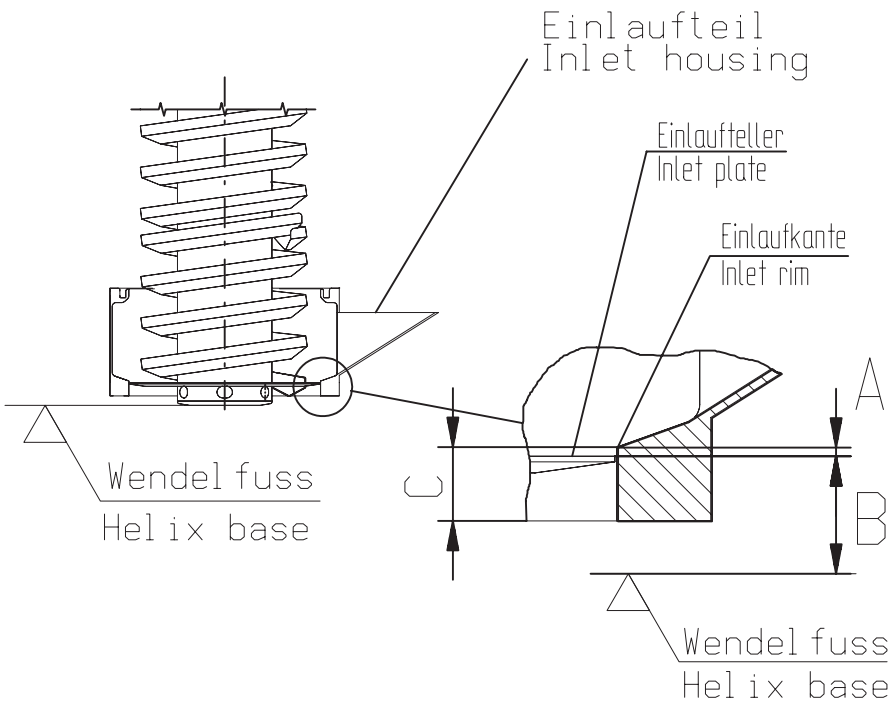



*Fig. 70 Check of the change-over height of the inlet unit to the inlet plate*

The height of step A (see *Fig. 70*) on the whole periphery (360°) of the inlet plate - in each of the 4 possible 90°-positions of the inlet housing - has to be between 0 and 1.0 mm!

If A is more then 1.0 mm or negative (upward step), the height of step A has to be adjusted by choosing a suitable different armature connector (15, 18 or 21 mm height, see *Fig. 69*) as well as eventually some spacers[1)] (0.5 or 1.0 mm thickness) to the **measurement 0 - 1.0mm**!

If it is not possible to reach this range of tolerance along the whole periphery the upper rim of the inlet plate (measurement B) and the circumferential rim of the inlet housing (measurement C) have to be checked (see *Fig. 70*). The height deviation all around (360°) of both measurements B and C must not be more then 1mm!

If the deviation is more then 1 mm and it is localized on the inlet plate the latter has to be bent corresponding to a separate working instruction. Is the deviation localized on the inlet housing the latter has to be exchanged. In both cases please contact Krämer AG!

## 9.6 Exchanging the magnetic coil

How to exchange the magnetic coil:

**⚠DANGER**

**Risk of deadly high voltage! Disconnect the deduster/controller from the mains!**

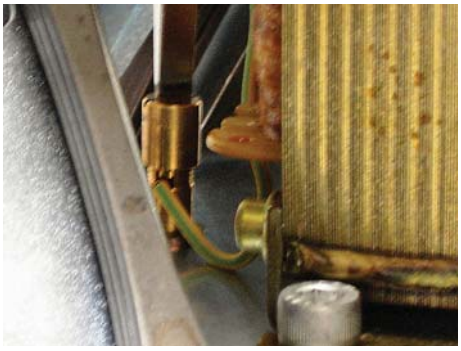


*Fig. 71 Loosing grounding screw*

1. In order to reach the coil, remove a one spring assembly set (43), however not on the side where the grounding screw is located.
2. Carry out disassembly steps *2.* to *7.* in *chpt. 9.5*.
3. Loosen the fixation bolt of the grounding cable in the armature plate through the drilling hole.

1) Attention: The height of the stack of all spacers must not be more then 2.5 mm!

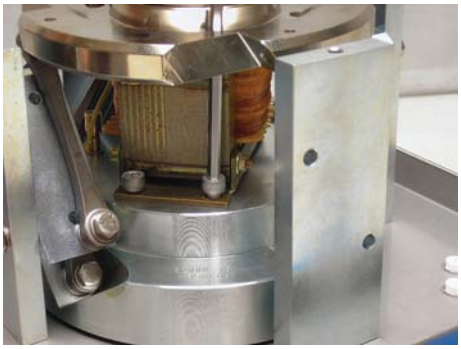


*Fig. 72 Removing screws of the coil*

4. Remove the screws on the coi l through the holes in the armature plate with a hexagonal wrench.



*Fig. 73 Exchanging the coil*

5. Exchange the magnetic coil.



*Fig. 74 Pushing a spacer under the coil*

6. Push the spacers under the coil and screw it securely back into place.

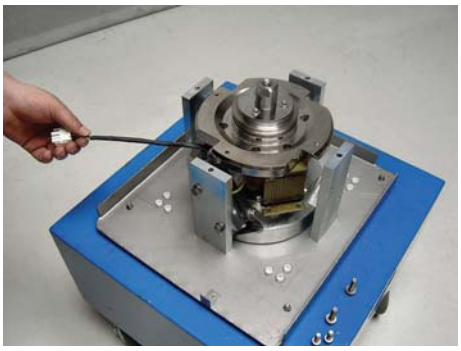


*Fig. 75 Pulling the connecting cable through next to the grounding screw*

7. Position the co nnecting cable on the grounding screw side.



*Fig. 76 Fixing cable*

8. Fix the cable to the central beam.

**NOTICE**

**Risk of malfunction of the equipment! Make sure that the air gap is correctly adjusted.**

Note: Take note of the instructions in *chpt. 9.5*.

Note: Perform a 20hr test run after replacement of the coil!

Operating instructions manual Deduster E2000S/E2000A KR401690 EN V26a

# 10 Technical documents

## 10.1 Wiring schematics for Controller

See operating instructions manuals „Frequency controller C820" or "Process controller C920".

## 10.2 Pneumatic schema

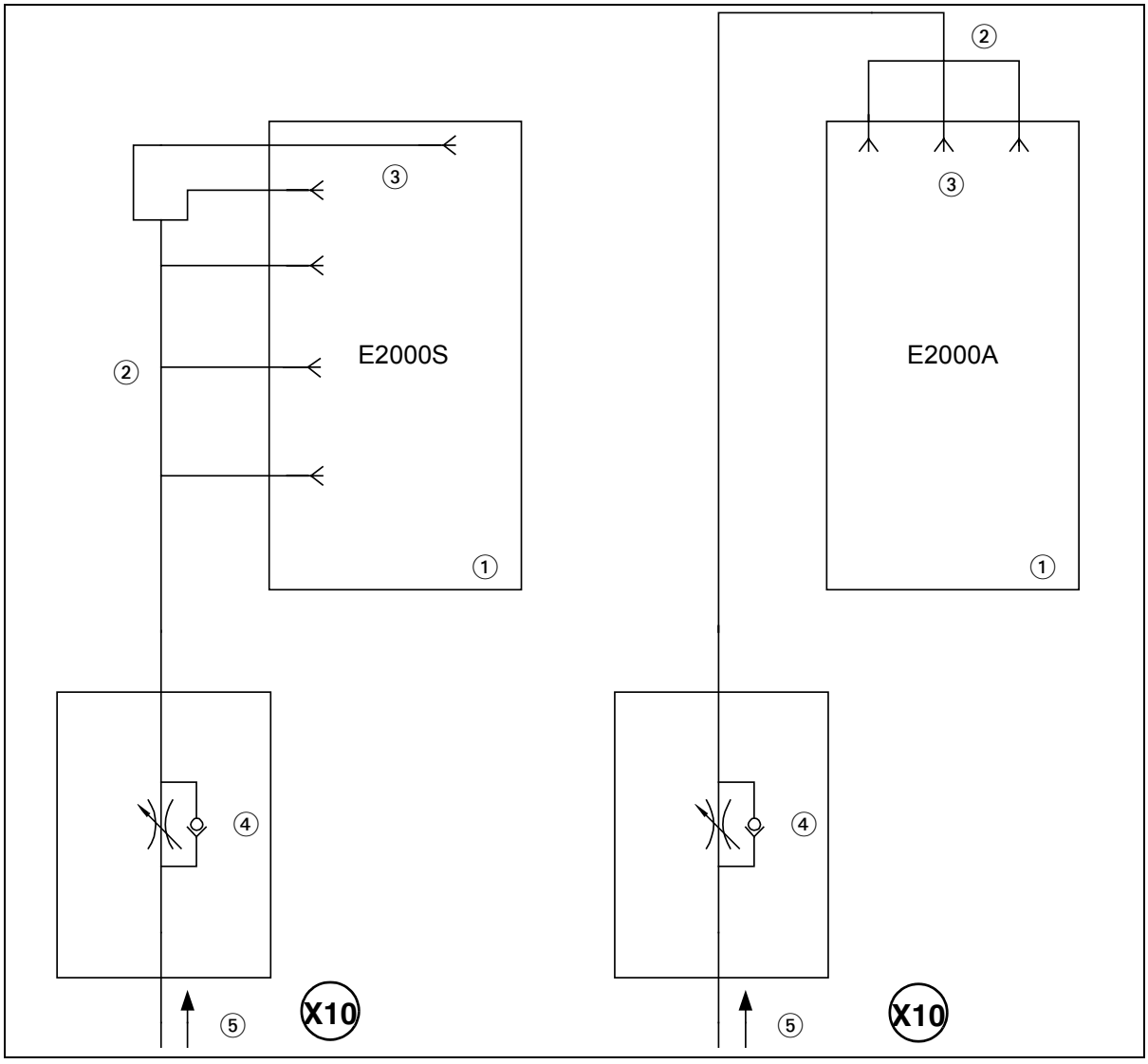


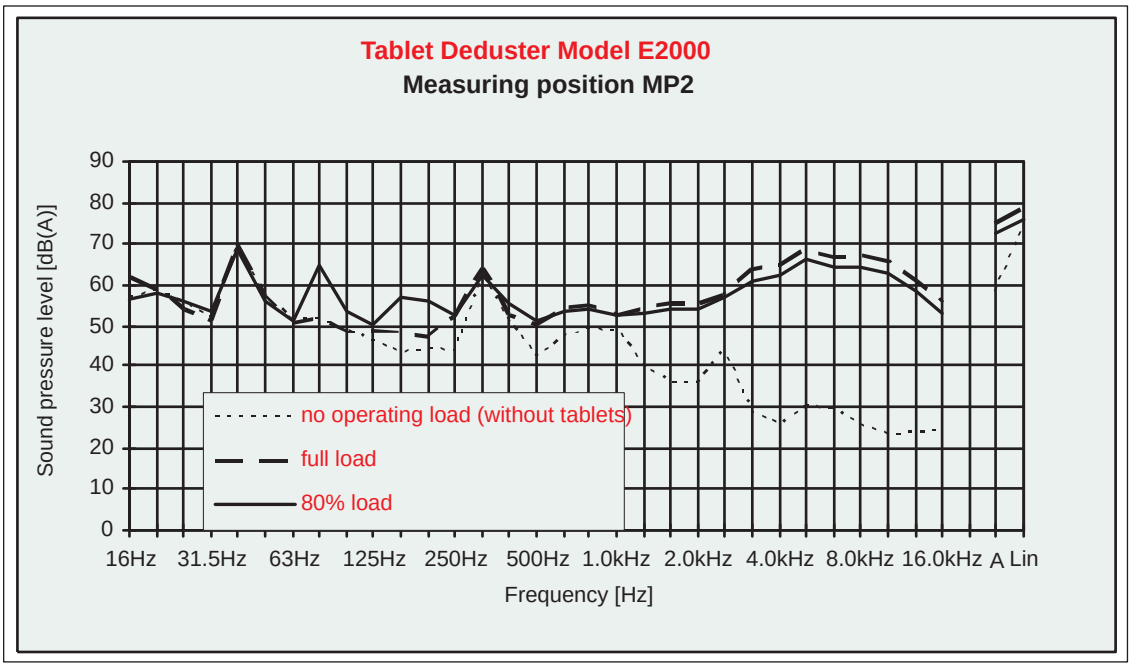

*Fig. 77 Pneumatic schema of the Blast air system deduster E2000S/E2000A*

① Deduster
② Air distribution
③ Air nozzles
④ non return valve
⑤ Blast 6 bar

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## 10.3 Acoustic Emission at Work

| Working position-related emission | | | | | | |
|---|---|---|---|---|---|---|
| EEA guideline 89/392/EU, Art. 1.7.4 f | | | | | | |
| Designation: | Tablet Deduster | | | | | |
| Type: | Model E2000 | | | | | |
| Working order: | 80% load | | | | | |
| Working conditions: | with tablets, diameter 13 mm, 3 mm thick | | | | | |
| Environment | Volume of the test room : | | V | = | approx. 500 $m^3$ | |
| | Surface of the test room : | | $S_V$ | = | approx. 400 $m^2$ | |
| | mean reverberation time : | | $T_{m^{500}}$ | = | 1.4 sec. | |
| | mean sound absorption coefficient : | | $\Pi s$ | = | | |
| | Difference to background noise : | | | = | approx. 30 dB(A) | |
| | Measurement surface : | | S | = | 32.6 $m^2$ | |
| Measurement | Measuring date : | 08. Nov 95 | Environment : | Assembly shop of Krämer AG | | |
| | Microphone position : | | Distance: 1 m, height: 1.6 m over floor | | | |
| | Measurement procedure : | | one-third octave analyse with time-constant "FAST" | | | |
| | | | and A-weighted equivalent sound pressure level | | | |
| | Sound pressure level LpA : | | $L_{pA}$ | = | 72.5 dB(A) | |
| | Measurement uncertainty : | | | = | ± 3 dB(A) | |
| | Background noise correction : | | $K_1$ | = | 0 dB(A) | |
| | Environmental correction : | | $K_2$ | = | 5.1 dB(A) | |
| | | | | | | |
| **Working position-related emission $L_{pAeq} = L_{pA} - K_1 - K_2 = 67$ dB(A)** | | | | | | |
| | | | | | | |
| Noise reduction measure (ev possibility) - Use tablet conveyance with closed feeder system | | | | | | |



## 10.4 Product contacting surfaces

| Pos | deutsch | english | français | Material material matériel | | Oberläche, surface, surface [$cm^2$] | | | | | | Ra |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | E2000S | E2000A | H=250 | H=500 | H=750 | H=1000 | H=1250 | H=1500 | µm |
| 1 | Einlauf-stutzen | Inlet | Orifice d'entrée | stainless steel 1.4435 AISI316L | PMMA | 1980 | 1980 | 1980 | 1980 | 1980 | 1980 | 0,2 |
| 2 | Einlaufteller | Inlet plate | Plateau d'entrée | stainless steel 1.4435 AISI 316L | stainless steel 1.4435 AISI 316L | 600 | 600 | 600 | 600 | 600 | 600 | 0,25 |
| 3 | Wendel oben | Upper helix | Colimaçon supérieur | stainless steel 1.4435 AISI 316L | stainless steel 1.4435 AISI 316L | 4130 | 7430 | 10190 | 13285 | 17620 | 20760 | 0,31 |
| 3a | Wendel unten | Lower helix | Colimaçon inférieur | | | | | | | | | |
| 3b | Zugstange 2-teilig | 2-part traction bar | Unité de traction à deux tiges | stainless steel 1.4301 AISI 304 | stainless steel 1.4301 AISI 304 | - | - | - | - | - | - | 0,25 |
| 4 | Auslauf-stutzen | Outlet | Orifice de sortie | stainless steel 1.4435 AISI 316L | stainless steel 1.4435 AISI 316L | 192 | 192 | 192 | 192 | 192 | 192 | 0,25 |
| 5 | Zylinder (oben/unten) | Cylinder (upper/lower) | Cylindre (en haut / en bas) | stainless steel 1.4435 AISI 316L | PMMA | 2120 | 4455 | 4769 | 6957 | 9873 | 10947 | 0,25 |
| 5b | Kontroll-fenster | Inspection window | Lucarne de contrôle | PMMA | none | 1660 | 2694 | 3330 | 3330 | 2694 | 3300 | 0,25 |
| 6 | Deckel | Cover | Couvercle | stainless steel 1.4435 AISI 316L | PMMA | 543 | 543 | 543 | 543 | 543 | 543 | 0,25 |
| 7 | Dichtungs-membran | Sealing membrane | Membrane de cachetage | NBR | NBR | 866 | 866 | 866 | 866 | 866 | 866 | 0,60 |

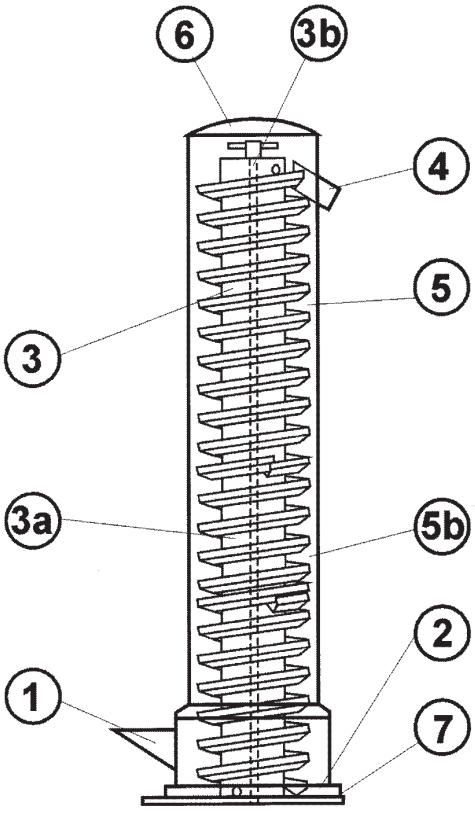



*Fig. 78 Product contacting surfaces*

## 10.5 Spare and wear parts

The spare parts are described in *Tab. 7*

**NOTICE**

**Risk of loosing warranty! Risk of malfunction of the equipment! Only use original parts!**

*Tab. 7 Spare and wear parts deduster E2000S/E2000A*

| Spare parts E2000S/E2000A | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. in Layout KR503770 Turret E2000S | No in Layout KR504398 Turret E2000A | Name | Part-No. | E2000S/E2000A-250 | E2000S/E2000A-500 | E2000S/E2000A-750 | E2000S/E2000A-1000 | E2000S/E2000A-1250 | E2000S/E2000A-1500 | Wear parts |
| | | Sealing membrane | KR502394 | 1 | 1 | 1 | 1 | 1 | 1 | x |
| | | Cam ring | KR401508 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 21 | 21 | Helix | KR602694 | 1 | | | | | | |
| 21 | 21 | Helix | KR602695 | | 1 | | | | | |
| 21 | 21 | Helix | KR602696 | | | 1 | | | | |
| 20 | 20 | Lower helix | KR602697 | | | | 1 | | | |
| 19 | 19 | Upper helix | KR602698 | | | | 1 | 1 | | |
| 20 | 20 | Lower helix | KR602699 | | | | | 1 | 1 | |
| 19 | 19 | Upper helix | KR602700 | | | | | | 1 | |
| 21 | 21 | Helix 180° optimized (optional) | KR600997 | | | | | | 1 | |
| 2 | 2 | Clamping lever | KR402037 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 3 | Clamp | KR501426 | 4 | 8 | 8 | 12 | 12 | 16 | |
| | 3 | Star-shaped knob-nut M8 E2000A | 99000171 | 4 | 8 | 8 | 12 | 12 | 16 | |
| 3 | | Star-shaped knob-screw M8 E2000 | KR401976 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 4 | Tablet outlet adapter | KR600619 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 5 | Cover (PMMA) | KR501801 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 32 | 32 | Tension unit | KR600576 | 1 | | | | | | |
| 32 | 32 | Tension unit | KR402226 | | 1 | | | | | |
| 32 | 32 | Tension unit | KR401630 | | | 1 | | | | |
| 33 | 33 | Tension upper unit | KR600083 | | | | 1 | 1 | | |
| 34 | 34 | Tension lower unit | KR401539 | | | | 1 | | | |
| 34 | 34 | Tension lower unit | KR600098 | | | | | 1 | 1 | |
| 33 | 33 | Tension upper unit | KR600251 | | | | | | 1 | |
| 17 | | Cylinder inspection window (acrylic glass) | KR501496 | 1 | | | | | | |
| 17 | | Cylinder inspection window (acrylic glass) | KR200350 | | 1 | | | 1 | | |
| 17 | | Cylinder inspection window (acrylic glass) | KR501993 | | | 1 | 1 | | 1 | |

*Tab. 7 Spare and wear parts deduster E2000S/E2000A*

| Spare parts E2000S/E2000A | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. in Layout KR503770 Turret E2000S | No in Layout KR504398 Turret E2000A | Name | Part-No. | E2000S/E2000A-250 | E2000S/E2000A-500 | E2000S/E2000A-750 | E2000S/E2000A-1000 | E2000S/E2000A-1250 | E2000S/E2000A-1500 | Wear parts |
| | 1 | Tablet outlet adapter | KR601051 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 40 | Cylinder 258 | KR601033 | | 1 | 1 | 1 | | | |
| | 41 | Cylinder 230 | KR601032 | | | 1 | | | | |
| | 42 | Cylinder outlet | KR601031 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 43 | Cylinder 516 | KR601165 | | | | 1 | 2 | 2 | |
| | 44 | Cylinder 298 | KR601034 | | | | | | 1 | |
| | 6 | Tension bolt (POM) | KR401527 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | Tension bolt (metal) | KR505023 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | Solenoid with 920 windings | KR402625 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | Spacer (0.5 mm; 1 mm; 1.5 mm two each!) | KR400876 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | Controller see Operating instructions manual Controller | | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | Spring assembly spare part kit E2000/E2000A-250 | KR601891 | 1 | | | | | | |
| | | Spring assembly spare part kit E2000/E2000A-500 – 750 | KR601892 | | 1 | 1 | | | | |
| | | Spring assembly spare part kit E2000/E2000A-1000 – 1500 | KR601893 | | | | 1 | 1 | 1 | |
| 40 | | Inlet silicon flap | KR506236 | 1 | 1 | 1 | 1 | 1 | 1 | x |
| 10 | | Nozzle flat | KR401758 | 5 | 5 | 5 | 5 | 5 | 5 | |
| 9 | | L-Fitting M5 | 99001006 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 7 | | T-Fitting M5 | 99001007 | 3 | 3 | 3 | 3 | 6 | 6 | |
| 8 | | Y-Fitting M5 | 99001008 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 6 | | Reducing fitting 6/8 mm | 99001005 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 7 | Blast air connection X | KR600956 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | 8 | Blast air connection Y | KR600955 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 9 | PU hose | 99000394 | | | | | | | x |
| 35 | 35 | non return valve | 99001370 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | | Absorbing pad | 99000010 | 4 | 4 | 4 | 4 | 4 | 4 | |

See the drawings KR503770 and KR504398 on the following pages. The numbers encircled are available as spare and wear parts. All other numbers are not available as spare and wearing parts.

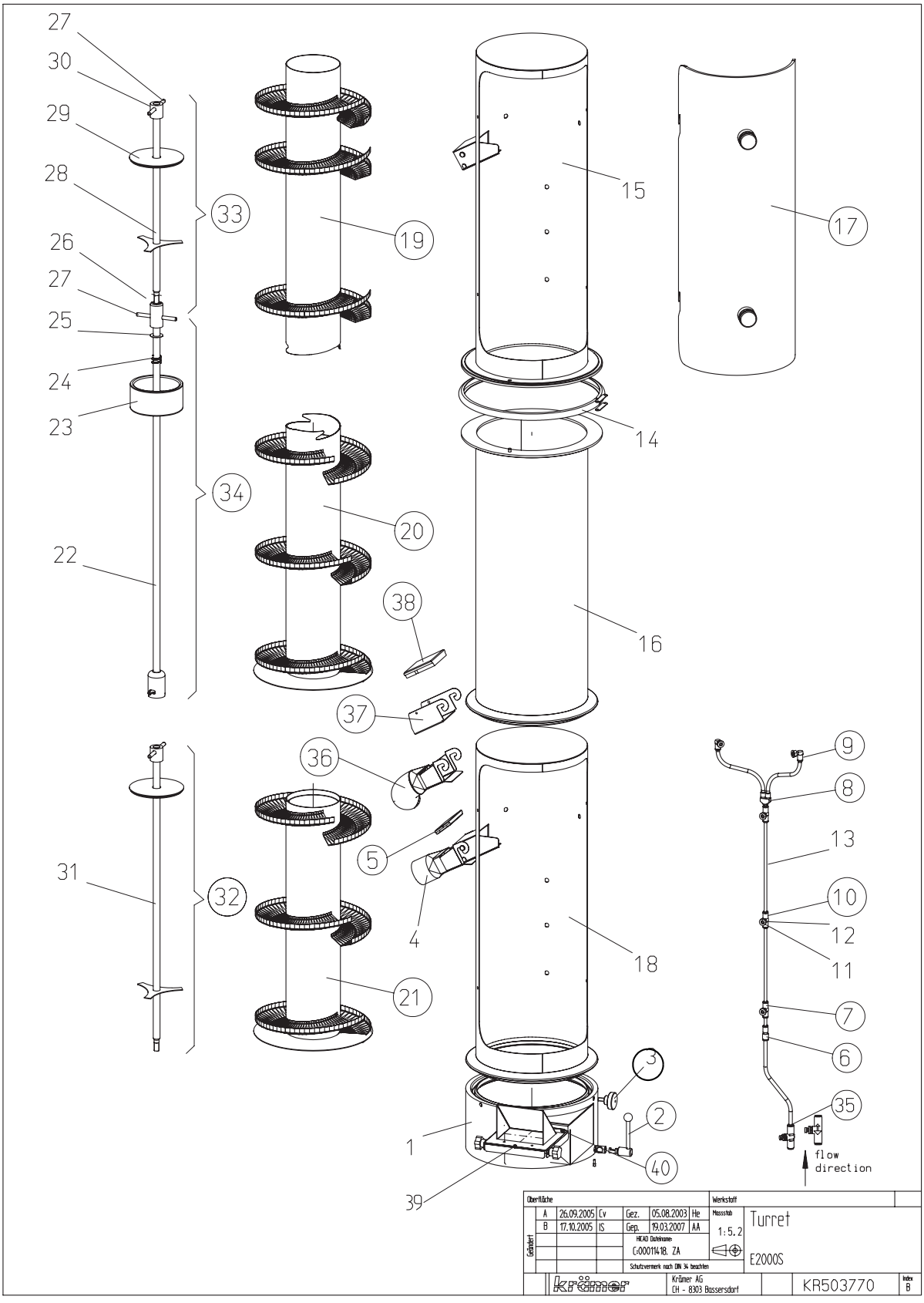



Fig. 79 Layout KR503770 - Spare and wear parts Turret E2000S

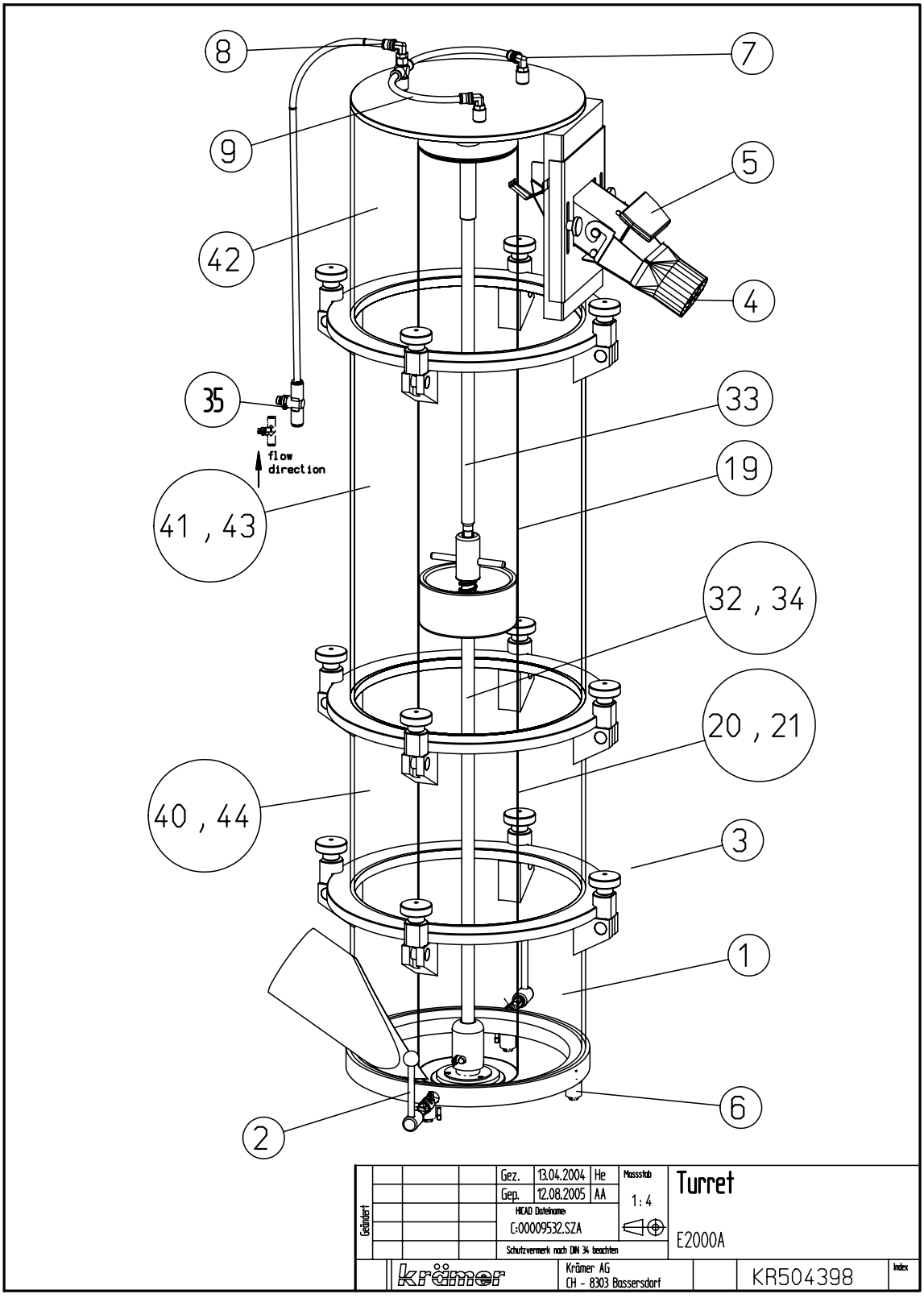


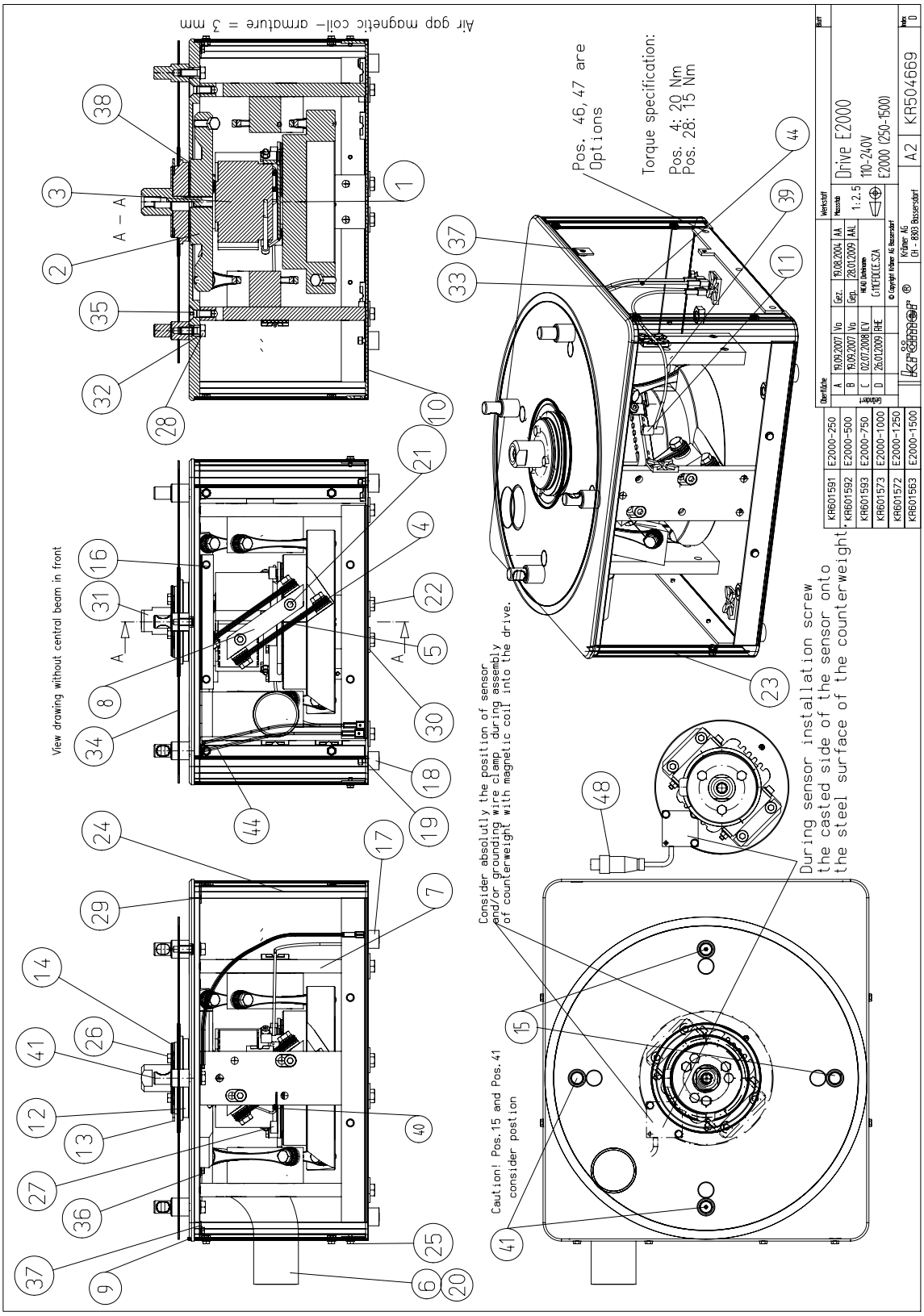

*Fig. 80 Layout KR504398 - Spare Parts Turret E2000A*

*Tab. 8 Spare and wear parts drive E2000S/E2000A*

| Item | Part number | Designation/Comment | E2000S/E2000A-250 | E2000S/E2000A-500 | E2000S/E2000A-750 | E2000S/E2000A-1000 | E2000S/E2000A-1250 | E2000S/E2000A-1500 | wear parts |
|---|---|---|---|---|---|---|---|---|---|
| 1 | KR504663 | Counter weight | 1 | | | | | | |
| 1 | KR504662 | Counter weight | | 1 | | | | | |
| 1 | KR504661 | Counter weight | | | 1 | | | | |
| 1 | KR504646 | Counter weight | | | | 1 | | | |
| 1 | KR504621 | Counter weight | | | | | 1 | | |
| 1 | KR504656 | Counter weight | | | | | | 1 | |
| 2 | KR600678 | Armature plate assy | 1 | 1 | 1 | 1 | 1 | 1 | |
| 3 | KR402625 | Magnetic coil 920 windings | 1 | 1 | 1 | 1 | 1 | 1 | |
| 4 | KR601594 | Spring assy E2000-250 | 4 | | | | | | |
| 4 | KR601595 | Spring assy E2000-500-750 | | 4 | 4 | | | | |
| 4 | KR601562 | Spring assy E2000-1000-1500 | | | | 4 | 4 | 4 | |
| | KR601891 | Spring assembly spare part kit E2000/E2000A-250 | 1 | | | | | | |
| | KR601892 | Spring assembly spare part kit E2000/E2000A-500 – 750 | | 1 | 1 | | | | |
| | KR601893 | Spring assembly spare part kit E2000/E2000A-1000 – 1500 | | | | 1 | 1 | 1 | |
| 5 | KR400876 | Spacer of magnetic coil | 1 | 1 | 1 | 1 | 1 | 1 | |
| 6 | KR402423 | Vacuum connector drive unit | 1 | 1 | 1 | 1 | 1 | 1 | |
| 7 | KR502333 | Central beam | 4 | 4 | 4 | 4 | 4 | 4 | |
| 8 | KR401505 | Spring holder | 4 | 4 | 4 | 4 | 4 | 4 | |
| 9 | KR502576 | Cover plate | 1 | 1 | 1 | 1 | 1 | 1 | |
| 10 | KR601558 | Base plate | 1 | 1 | 1 | 1 | 1 | 1 | |
| 11 | 99000093 | Ground wire clamp 2,5 mm² brass | 1 | 1 | 1 | 1 | 1 | 1 | |
| 12 | KR504523 | Armature coupling 15 mm | 1 | 1 | 1 | 1 | 1 | 1 | |
| 13 | KR401508 | Cam ring | 1 | 1 | 1 | 1 | 1 | 1 | |
| 14 | KR401507 | Clamping disc | 1 | 1 | 1 | 1 | 1 | 1 | |
| 15 | KR401527 | Tension bolt POM | 2 | 2 | 2 | 2 | 2 | 2 | |
| 16 | KR401920 | Angle | 1 | 1 | 1 | 1 | 1 | 1 | |
| 17 | 99000010 | Device damper 20/5 x 12 EPDM Elastomer, 75° +/-5 Shore A | 4 | 4 | 4 | 4 | 4 | 4 | |
| 18 | 99000011 | Cheese head screw hexagon socket M5 x 16 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 19 | 99000219 | Locknut M5 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 20 | 99000014 | O-Ring 50 x 3 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 21 | 99000009 | Cheese head screw hexagon socket M8 x 16 | 8 | 8 | 8 | 8 | 8 | 8 | |
| 22 | 99000360 | Hexagon screw M8 x 16 | 8 | 8 | 8 | 8 | 8 | 8 | |
| 23 | KR504604 | Casing side suction | 1 | 1 | 1 | 1 | 1 | 1 | |

*Tab. 8 Spare and wear parts drive E2000S/E2000A*

| Item | Part number | Designation/Comment | E2000S/E2000A-250 | E2000S/E2000A-500 | E2000S/E2000A-750 | E2000S/E2000A-1000 | E2000S/E2000A-1250 | E2000S/E2000A-1500 | wear parts |
|---|---|---|---|---|---|---|---|---|---|
| 24 | KR601556 | Side panel fore and aft | 2 | 2 | 2 | 2 | 2 | 2 | |
| 25 | 99000017 | Hexagon screw M4 x 8 | 25 | 25 | 25 | 25 | 25 | 25 | |
| 26 | 99000018 | Hexagon screw M6 x 12 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 27 | 99000612 | Cheese head screw M8 x 20 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 28 | 99000021 | Hexagon screw M8 x 22 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 29 | 99000361 | Sealing 2 x 6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| 30 | 99000022 | Washer without phase M8 / 8.4 x 24 x 2 | 8 | 8 | 8 | 8 | 8 | 8 | |
| 31 | KR401628 | Threaded bush | 1 | 1 | 1 | | | | |
| 31 | KR600941 | Tension bolt | | | | 1 | 1 | 1 | |
| 32 | 99001514 | Serrated lock washer M8 | 6 | 6 | 6 | 6 | 6 | 6 | |
| 33 | 99000898 | Socket for cable bride strap | 6 | 6 | 6 | 6 | 6 | 6 | |
| 34 | KR502394 | Sealing membrane | 1 | 1 | 1 | 1 | 1 | 1 | x |
| 35 | 99000589 | Counter-sunk screw M8 x 25 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 36 | 99000600 | Serrated lock washer M5 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 37 | KR500589 | Slide-in module | 1 | 1 | 1 | 1 | 1 | 1 | |
| 38 | KR503270 | Spacer 1.0 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 39 | KR590223 | Grounding wire counterweight | 1 | 1 | 1 | 1 | 1 | 1 | |
| 40 | KR506745 | Ground strap D8,2 L=150 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 41 | KR505023 | Tension bolt metal | 2 | 2 | 2 | 2 | 2 | 2 | |
| 44 | KR590304 | Grounding wire cylinder | 1 | 1 | 1 | 1 | 1 | 1 | |
| 46 | 99000557 | Hexagon nut M4 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 47 | 99000019 | Washer M4 / 4.3 x 8 x 0.5 | 3 | 3 | 3 | 3 | 3 | 3 | |
| 48 | 99000173 | Cable plug M12 | 1 | 1 | 1 | 1 | 1 | 1 | |




Operating instructions manual Deduster E2000S/E2000A KR401690 EN V26a

*Fig. 81 Layout KR504669 - Spare and wear parts drive E2000S/E2000A*

Operating instructions manual Deduster E2000S/E2000A KR401690 EN V26a