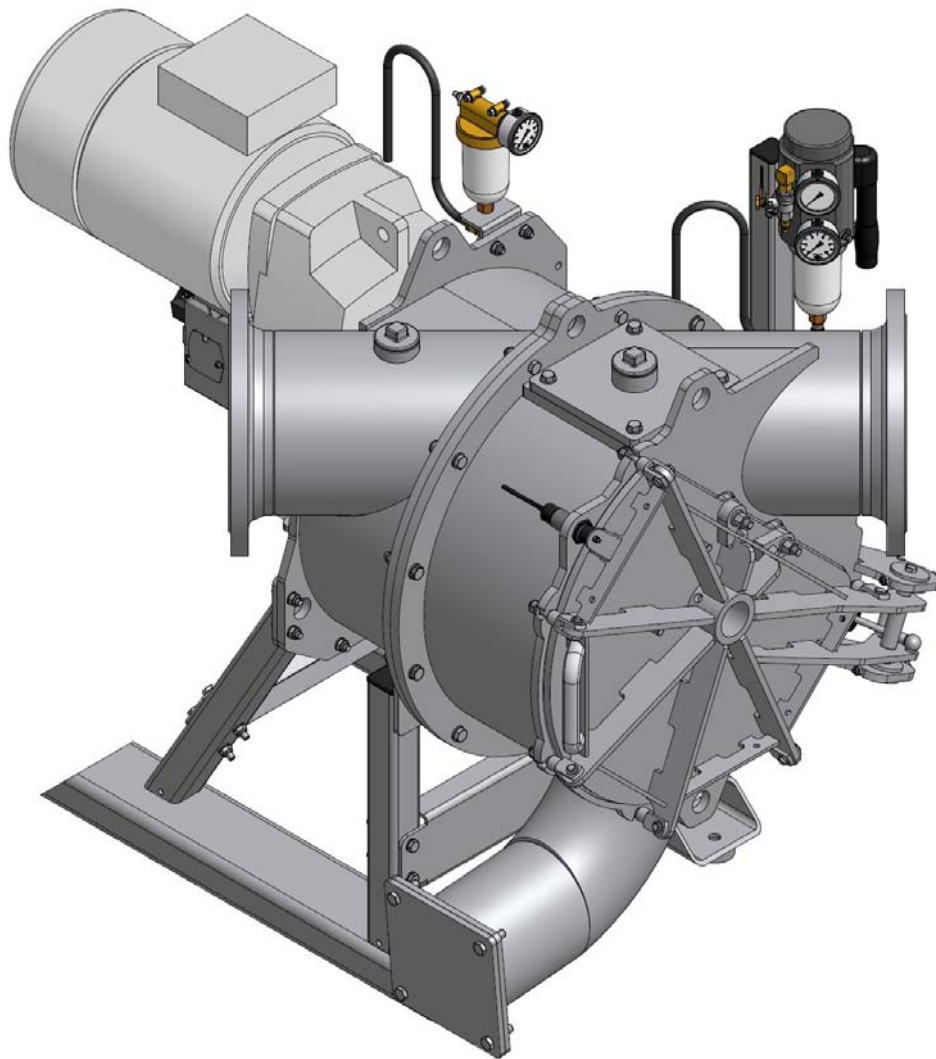




Operating instructions

RotaCut®
RCX-48G

ENGINEERED TO WORK



Original operating instructions

Issuer

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1 User information

1.1 Using the operating instructions

These instructions contain all necessary information concerning the operating elements, handling, start-up and maintenance and repair work, as well as all of the relevant technical data.

The operating instructions are a component of the machine.

Please therefore keep the instructions ready to hand to ensure easy access to the necessary information at all times.

Read the operating instructions thoroughly. All of the points presented in these instructions must be understood and observed by those persons responsible for the installation, operation, maintenance and repair of the machine.

Vogelsang does not accept any liability for damage resulting from failure to comply with these maintenance and operating instructions.

1.2 Warning signs, danger symbols, information

Legend of symbols



Warning advisory

A warning advisory warns you of possible dangers to the health and life of yourself and other people resulting from the handling and operation of this machine.



Warning advisory

This warning advisory warns you of possible dangers through electric shock.



This warning advisory warns you of possible dangers for your machine.



This information provides you with additional advice and tips.

2 Intended purpose

The Vogelsang RotaCut is intended for cutting up fibrous materials, macerating solid matter and separating foreign objects in pumpable fluids (medium).

The medium can have the following properties:

- Temperature: 0°C to max. 80°C
- pH: <7 (acidic), =7 (neutral) or >7 (alkaline)

The use of the RotaCut as a shredder for macerating solid matter or as a mixer for mixing fluids and/or solid matter, as well as any other use, is contrary to the intended purpose. Vogelsang is not liable for any damage resulting from incorrect use.

A RotaCut without a pot or without a safety device is an incomplete machine. The installation instructions are provided in the chapter "Installation".

The declaration of installation is part of these operating instructions.

The RotaCut may be used only in the ambient temperature range of -20°C up to +45°C.

The RotaCut described in these operating instructions is not intended for use in potentially explosive environments.

3 Safety Notes

Before putting into operation, carefully read and note the contents of the operating instructions and the safety information.

- The warning and safety labels fitted provide important information for safe operation.
- In the interests of your own safety, pay attention to these labels.
- The warning and safety labels must not be removed and must be replaced immediately if damaged or lost (see chapter "Warning and safety labels").



Risk of injury from rotating parts

- Start-up of the RotaCut can only be done once the suction and discharge pipes are connected. This ensures that access to the blades is not possible.
- Before performing any maintenance and repair work, switch off the drive and make sure that the drive cannot be unintentionally switched on again.



Skin and eye irritation caused by auxiliary materials, operating materials and macerating medium

Protective clothing (protective goggles, protective gloves) must be worn during all work involving possible contact with auxiliary materials, operating materials and macerating medium.

Before opening maintenance ports, covers, connectors etc., the system must be depressurised to prevent the medium from spraying out.



Risk of injury from rotating parts when the RotaCut is unintentionally started up

To prevent unintentional starting, the control system of the RotaCut must conform to **Performance Level "c"** or higher as per EN ISO 13849 (safety device). The safety device must be connected and regularly checked by qualified technical personnel, especially before start-up and after maintenance and repair work.



Risk of injury from electric shock when using RotaCut with an electrical drive

Only qualified electricians may connect the device to the power supply.



Risk of injury from sharp cutting edges

Wear protective gloves when working in the danger area and be sure to prevent the blade rotor and blades from falling off.

Lock any movable parts, e.g. the blade rotor, before carrying out maintenance and repair work.



Risk of injury from bursting components and medium spraying out under high pressure

- The maximum operating pressure must not be exceeded (see chap. "Technical data").
- Fermentation may occur in closed pipes and/or in the RotaCut pot during periods of inactivity. The resulting gas can result in a large pressure increase that can damage the system and cause injury. To prevent the build-up of pressure, open the following components:
 - the slide valve of the RotaCut/system
 - the ball valve in the RotaCut cover (cutter head)
- Vent the RotaCut before rinsing.
- When the direction of flow of a positive displacement pump is changed, the suction side becomes the discharge side and must be protected against overpressure.



Risk of crushing caused by the RotaCut falling

- The unit may only be transported in a suspended position (see fig. "Transport aids") or when it is screwed on to a Euro pallet.
- Observe the transport recommendations, identified articulation points and directional arrows on the transport crates.



Thermal hazards (burns)

Gas accumulation in the system can cause the RotaCut and the connected pipes to become very hot.

- The contractor and the operator must ensure that gas cannot accumulate in the system (see chap. "Installation").
- The RotaCut must be vented before positive medium pressures are reached.
- Avoid dry running of the blades.

3.1 Opening the RotaCut

Attention! In the interest of safety, take note of the following warning advisories before opening the RotaCut cover (cutter head):



Risk of injury from rotating parts

- Switch off the drive and make sure that the drive cannot be switched on again while the RotaCut is open.
- Also set the main switch to "0".
- Ensure that the installed safety switch (part no. SMD0013) is connected and adjusted in such a way, that the RotaCut ceases operation immediately when the cover is opened, see chap. "Safety device safety switch".



Skin and eye irritation caused by macerating medium

To prevent the medium from spraying out,

- depressurise the system
- carefully open the ball valve on the cutter head



Risk of injury from sharp cutting edges

Wear protective gloves when working in the danger area and be sure to prevent the blade rotor and blades from falling off.

Lock any movable parts, e.g. the blade rotor, before carrying out maintenance and repair work.

3.2 Warning and safety labels

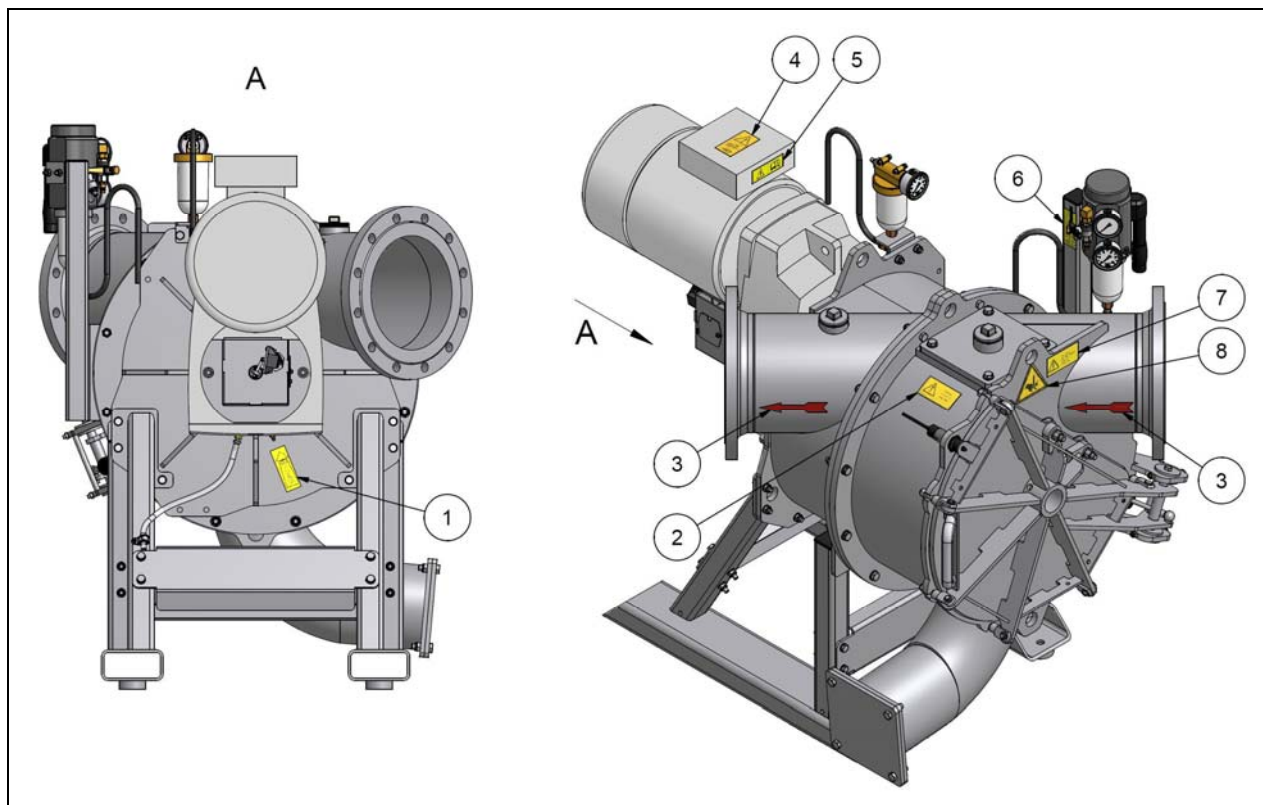
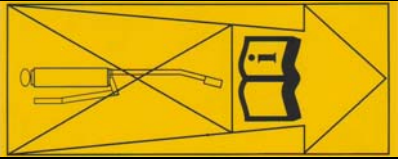


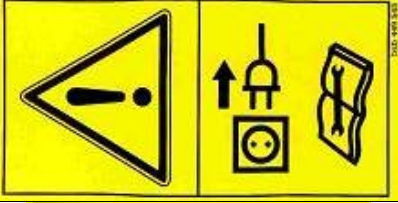

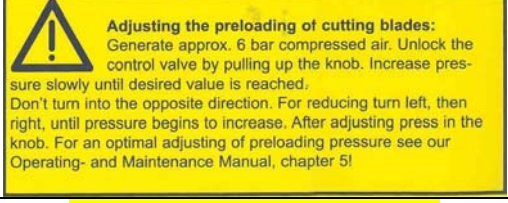




Fig. 1: Position of the warning and safety stickers

Pos.	Sticker	Part no.	Meaning
1		VAU.130	Do not lubricate here, read operating and maintenance manual
2		VAU.146.EN	See sticker: "Permissible internal pressure: max. 6 bar (87.02 psi)"
3		VAU.109	Direction of flow
4		VAU.012	Before carrying out repair and maintenance work, disconnect the main plug
5		VAU.133	Before starting up the machine, read the operating and maintenance manual.
6		VAU.140.EN	See sticker (for a RotaCut with ACC)
7		VAU.013.EN	See sticker
8		VAU.014	Beware of injuries to your hands!

4 Assembly

4.1 Transport



Risk of crushing caused by the RotaCut falling

- The unit may only be transported in a suspended position (see fig. "Transport aids") or when it is screwed on to a Euro pallet.
- For suspended transport of the RotaCut, attach the round slings as shown in fig. "Transport aids".

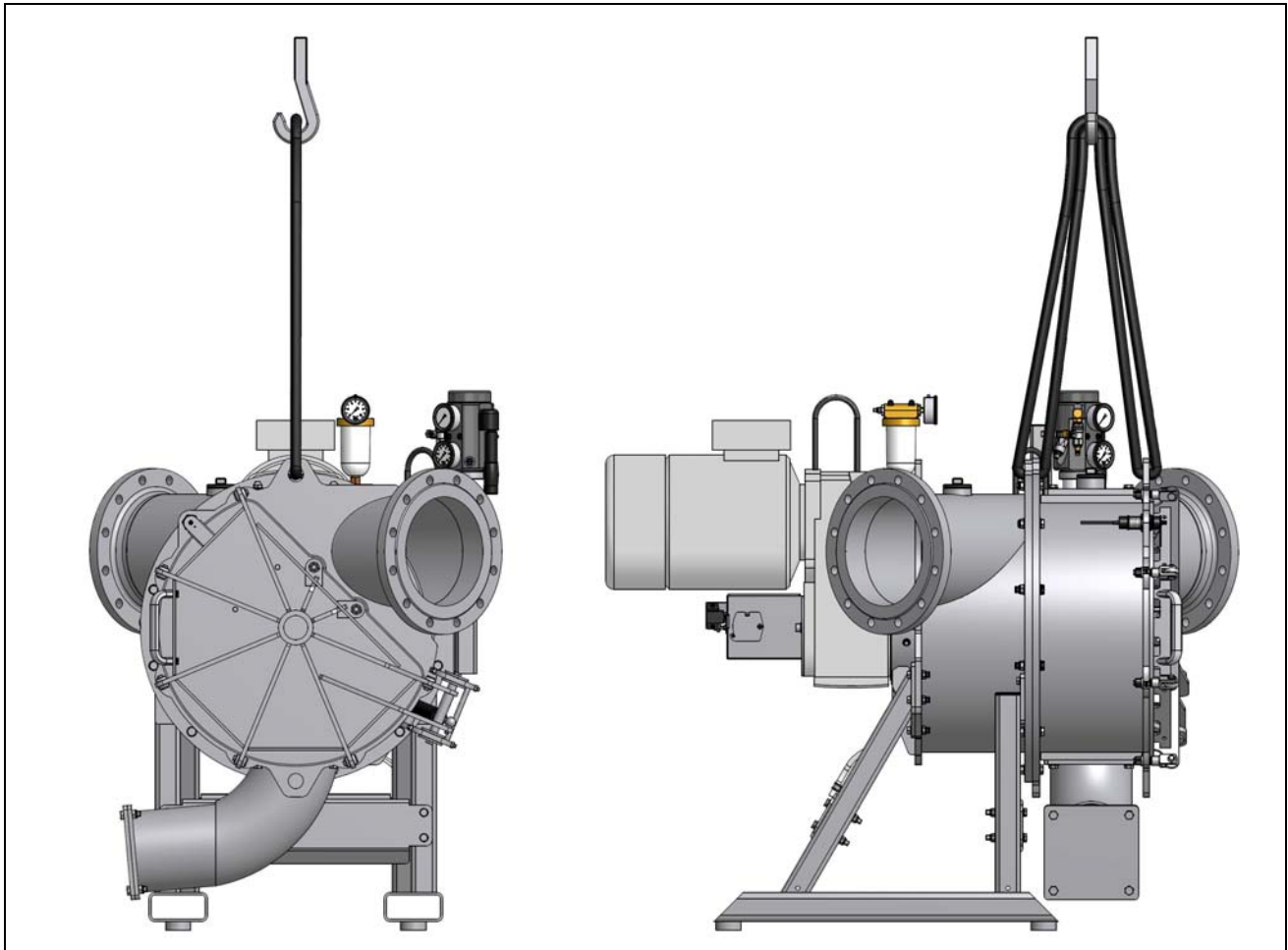


Fig. 2: Transport aids

4.2 Installation

The RotaCut is usually installed on the suction side. When installing on the pressure side, observe the maximum pressure stated in the chapter "Technical data".



Thermal hazard (burns) due to incorrect installation in the pipe

Gas accumulation in the system can cause the RotaCut and the connected pipes to become very hot.

- Especially in the case of positive medium pressures, the pipe on the outlet side of the RotaCut must be installed so that it inclines upwards.
- The RotaCut must be vented before positive medium pressures are reached.
- Avoid dry running of the blades.



Skin and eye irritation caused by leakages of auxiliary materials, operating materials and macerating medium as a result of faulty seals.

- The sealing materials must be compatible with the medium.
- Protective clothing (protective goggles, protective gloves) must be worn during all work involving possible contact with auxiliary materials, operating materials and macerating medium.
- Before opening maintenance ports, covers, connectors etc. the system must be depressurised to prevent the medium from spraying out.



Risk of vibrations or breakage as a result of misalignment

The connectors must be mounted free from stress. In other words, the connectors have to be precisely one in front of the other, even when they are not screwed into place.



Cleaning port

Since the RotaCut needs to be drained for maintenance, we recommend that you connect a drain line to the cleaning port or provide a drain for the medium.

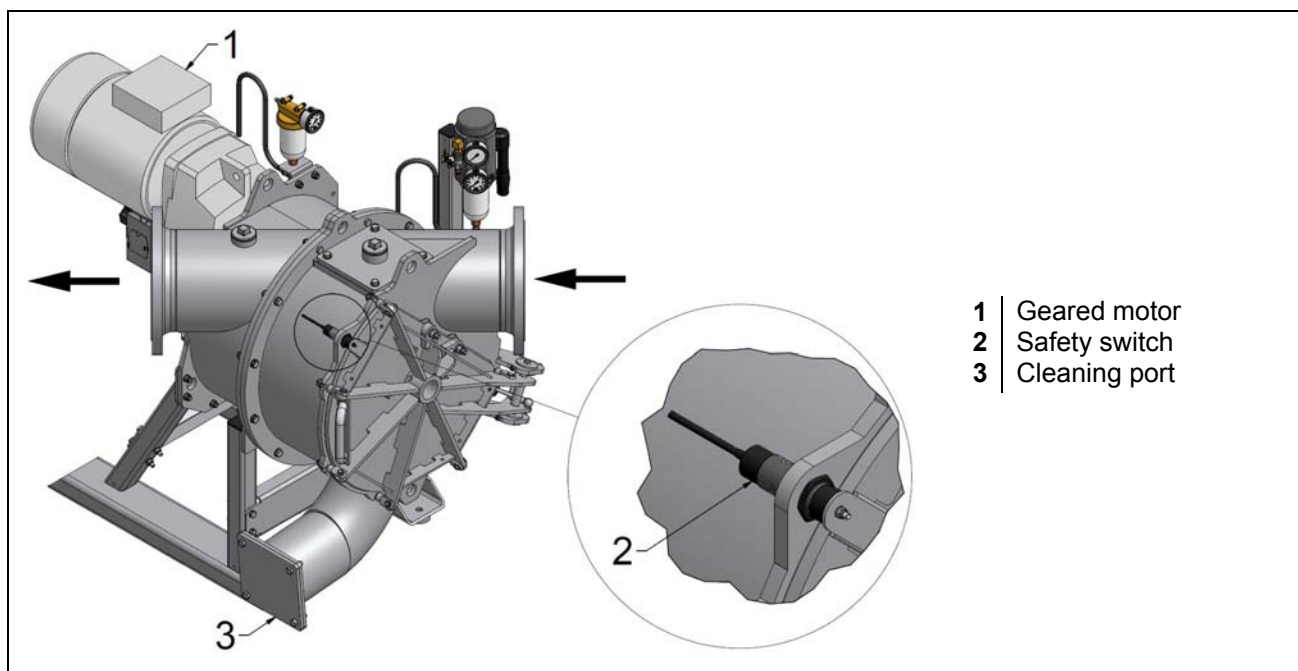


Fig. 3: Installation and direction of flow

4.2.1 Direction of flow

- During installation, note the red directional arrows on the RotaCut pot which indicate the direction of flow.

4.3 Safety device safety switch



Risk of injury from rotating parts when the RotaCut is unintentionally started up

To prevent unintentional starting, the control system of the RotaCut must conform to **Performance Level "c"** or higher as per EN ISO 13849 (safety device). The safety device must be connected and regularly checked by qualified technical personnel, especially before start-up and after maintenance and repair work.

- The installed safety switch (part. no. SMD0013, PL=d) must be connected and adjusted in such a way that when the cover is opened, the RotaCut ceases operation immediately (see fig. "Safety switch – schematic diagram").
- The RotaCut may only be restarted via acknowledgement of a fault or via a restart if the cover is closed, and must be safeguarded by the connected control system.
- The RotaCut must not be put into operation if the safety switch is not working properly.

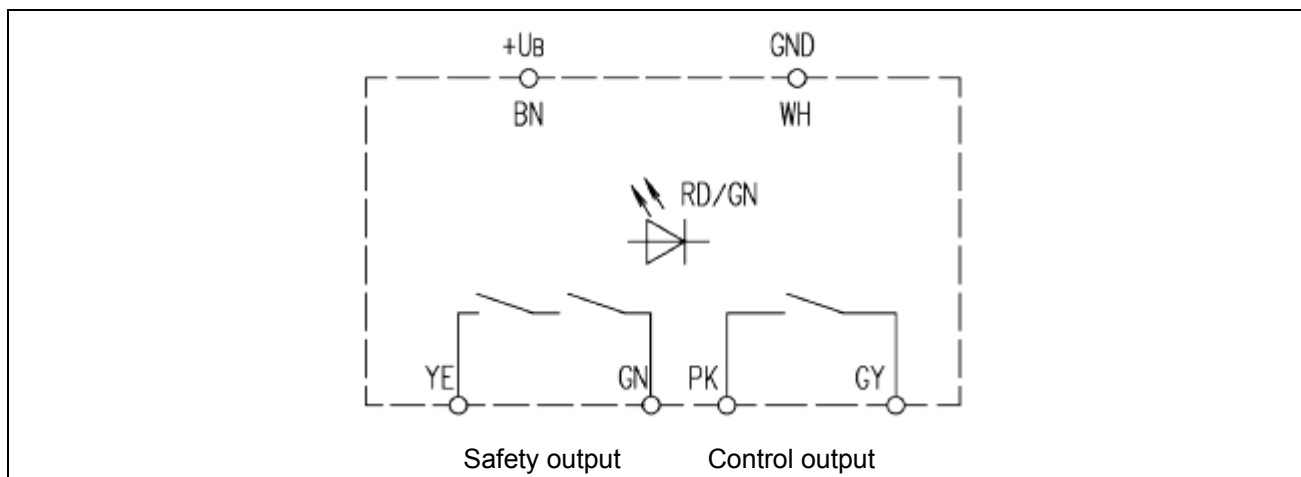


Fig. 4: Safety switch – schematic diagram of switch in idle condition, sensor not activated

	GN	operational de-energized	
	GN	energized	
	RD/GN	wrong energized	} blinking
	RD	fatal error	

4.4 Electronic wear indicator for blades

4.4.1 Function and technical data of angle sensor

The angle sensor **1** on the ACC protective cover **2** is used as a wear indicator for the blades. Blade wear causes a continual linear motion of the pre-tensioning parts. The swivel head **5** records this linear motion and passes it on as a rotary motion to the angle sensor via a lever. The current position of the blade rotor, and thus the wear rate of the blades, can be retrieved via the rotary motion within the angle measurement range of 30°.

The output signal of the angle sensor displays the wear rate of the blades:

If the output signal of the angle sensor is 5 mA, the wear rate is 0 % (blades worn).

If the output signal is 18 mA, the wear rate should show 100% (blades new).

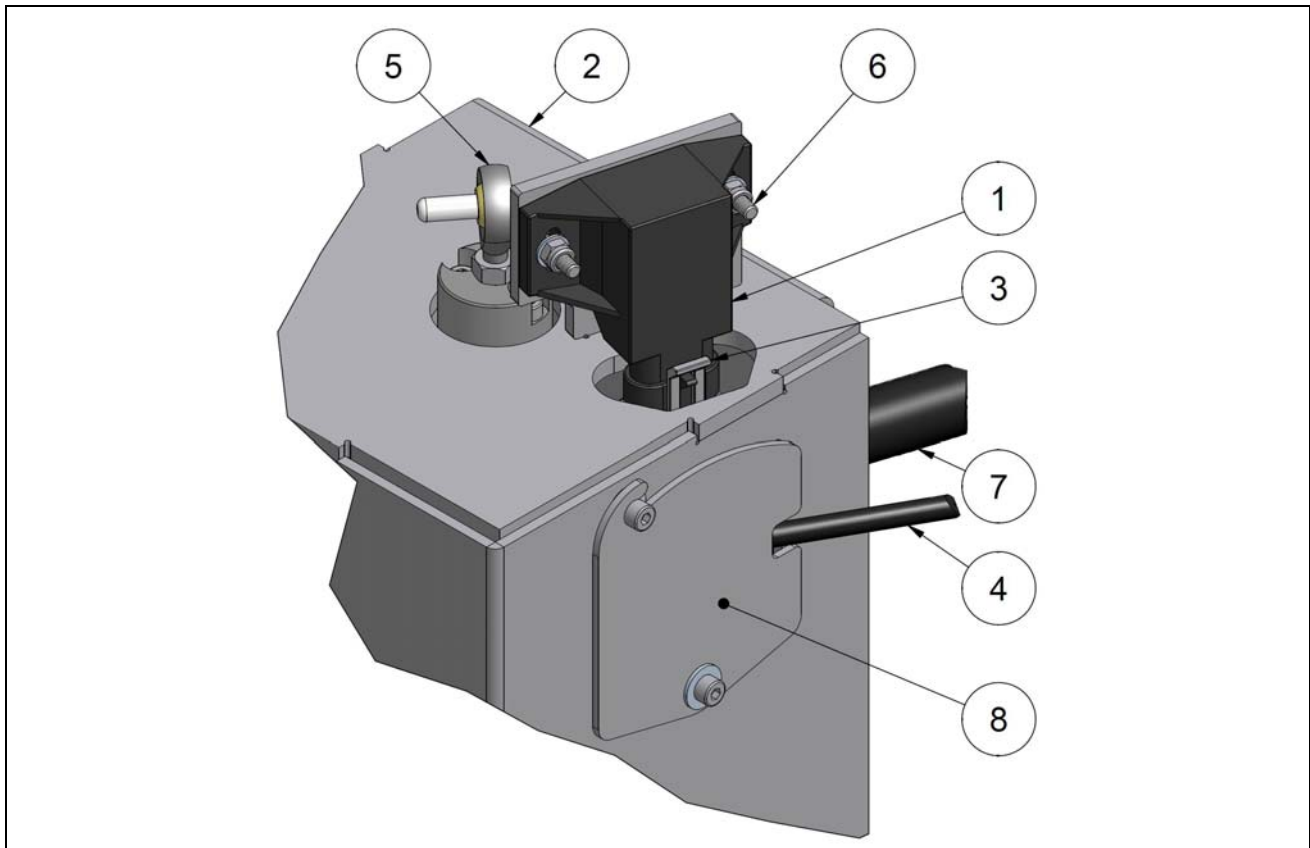


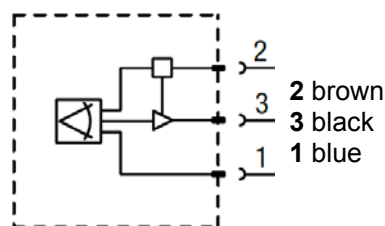
Fig. 5: Angle sensor on the ACC protective cover

- | | |
|---------------------------------|------------------------------|
| 1 Angle sensor | 5 Swivel head |
| 2 ACC protective cover | 6 Adjustment screws |
| 3 3-PIN AMP plug | 7 Oil pipe |
| 4 Connection cable | 8 Maintenance port |

Technical data of angle sensor

Angle measurement range: 30 °
 Operating voltage: 10...30 V DC
 Output signal : 4 - 20 mA
 Power consumption: 12 V -> 18 mA
 Resolution: 0.1 °
 Temperature range: -40...+85°C
 Protection class: IP 67

Circuit diagram for plug pos. 3



4.4.2 Adjusting the angle sensor

1. Remove the blade from the blade rotor.
2. Using the pressure regulator on the pressure transmission unit, set the preloading pressure low enough so that the blade rotor stops just before the cutting screen on its mechanical stop (→ position for "Blades worn", wear rate 0 %).
3. Adjust the angle sensor in this position for "Blades worn":
 - Slightly loosen the adjustment screws **6** (see Fig. "Angle sensor on the ACC protective cover") so that the angle sensor can be turned to the left and right
 - Set the output signal to 4.5 mA.
 - Tighten the adjustment screws.
4. Install the blades → wear indicator is ready for operation.



Angle sensor settings

- The angle sensor comes already adjusted.
- If the blades are changed, the angle sensor does not have to be readjusted.

4.4.3 Angle sensor control unit

The Vogelsang RotaCut control unit (Performance Control Unit (PCU) RotaCut) displays the analog output signal (4-20mA) of the angle sensor as a percentage of blade wear. In this way the current wear rate can be retrieved at any time. Two different wear limits can be set via the parameters of the control unit. Each limit triggers a warning message.



Setting control unit parameters

- The control parameters of the angle sensor are set at the factory.
- When the blades are changed, the parameters of the control unit do not have to be reset.

Warning message for low blade height

This warning message informs that user that blades will soon be worn out.

The wear limit should be set so that there is enough time to order wear parts (factory setting is 20%).

When the defined percentage is reached, a warning light illuminates and the control unit display flashes, displaying the warning message "Low blade height".

Warning message for worn blades

The switch-off point of the RotaCut due to worn blades can be defined with this warning message.

For the RotaCut to switch off, the defined value for the wear limit must be $\geq 0\%$ (factory setting: 0%).

When the defined percentage is reached, the RotaCut stops and the control unit display flashes, displaying the warning message "Blades worn".

If the value is set to **negative** percentages, the switch-off function and the warning message are not triggered and the blade rotor will stop at its mechanical stop.

4.5 Notes on the control



Control system: Performance Control Unit (PCU)

We recommend the implementation of our control system that is specially designed for use with the RotaCut, in order to provide optimal effectiveness and service life of the RotaCut. All connections that are required for connecting the RotaCut to a control system are readily available.

If a new control system is developed by a switchgear manufacturer, the following points must be observed:

- The control system must at least fulfil PL "c" in accordance with EN ISO 13849.
- AC4 contactors should be used.
- Soft starters or variable frequency drives must be suitable for high starting currents and at least 8 starts within a minute. Therefore, oversized devices should be used for heavy starting.
- Please contact us with regards to the correct programming of the control system.

4.6 Connection to the power supply

4.6.1 Connecting the geared motor

The geared motor can only be connected to the energy supply **after** it has been installed in the pipe.



Risk of injury from electric shock when using RotaCut with an electrical drive

Only qualified electricians may connect the device to the power supply.



Connecting the geared motor

Before connecting the geared motor

- check that the power supply is correct for the motor.
- check that the wiring and fuse protection are adequately dimensioned to cope with multiple changes of direction of rotation and possible peak loads over short periods of time.
- be sure to follow the cable layout diagram on the inside of the motor terminal box cover. Normally the RotaCut is operated without a star-delta connection, i.e., directly.
- note that the PTC sensor of the geared motor must be connected to the terminals provided on the RotaCut control, to a PTC actuation unit or to a variable-frequency drive with a PTC input (each available as an option).
- install a repair switch near to the machine (recommendation).

Before start-up or long-term storage

- remove the seal in the bleed screw (if present) in order to prevent excessive pressure build-up in the gearbox and thus leaks (see the accompanying documentation "Operating and maintenance instructions – geared motor").

5 Start-up

- The RotaCut must only be started if the cover is closed and, in the event that an ACC is installed, if the compressed air tank of the pressure transmission unit is pressurised with at least 5 bar of compressed air (7-10 bar is recommended). If the pressure drops to 3.5 bar, it is switched off.
- The RotaCut should be operated using the VOGELSANG RotaCut control system. This system can be adapted to a particular case of use and significantly increases the range of applications. The effectiveness of the RotaCut and the service life of the wear parts (automatic sharpening of the blades) are improved by time and load-controlled reversing and control of the pumping. The control system can be retrofitted to existing equipment and can also be used to control pumps.
- Under very light operating conditions, you can also use a reversing switch. This enables the direction of rotation of the cutting unit to be changed from time to time. This in turn sharpens the blades and increases the service life. This solution should only be used in exceptional cases.



Protection against cavitation

To protect the pump unit from cavitation, a pressure monitoring unit, for example a gauge, should be installed on the suction side, between the pump and the RotaCut. This means that the pump and the RotaCut can be switched off if the pressure is too low or too high. If the pressure is extremely low, check whether the suction pipe or RotaCut is clogged (see chap. "Safety notes").



Protection against gearbox damage

While the machine is running, the direction of rotation must not be changed without a delay of about 2 seconds.

5.1 Check list before start-up

- ☐ Is the buffer chamber pressure OK?
- ☐ Are the type of oil and oil level in the gearbox and buffer chamber of the RotaCut OK?
- ☐ Have all seal plugs been removed from the bleed screws?
- ☐ Have all safety devices been installed and their proper functioning ensured?
- ☐ Is the motor connected correctly to the power supply (see documents provided by the motor manufacturer)?
 - ☐ Star or delta connection, voltage, frequency (see name plate and inside of terminal box)?
 - ☐ Motor protection ensured, e.g., by a circuit breaker?
 - For star-delta starting, if present, a short switching time should be set.
 - For the soft starter, if present, a short start ramp should be set.
 - ☐ Is the variable-frequency drive/soft starter, if present, designed and configured correctly?
 - Equipment should be suitable for heavy starting.
- ☐ Is the **emergency stop** device/repair switch easily accessible?
- ☐ Is the direction of flow OK? Check the pump's direction of rotation.
- ☐ Is the pipe system sealed and free of leakage?
- ☐ Are the drain cocks closed and is the RotaCut filled with fluid?
- ☐ Is the angle sensor set correctly?
- ☐ Have the parameters of the control unit been correctly set?

6 Maintenance



Risk of injury from rotating parts

- Switch off the drive and make sure that the drive cannot be switched on again while the RotaCut is open.
- Also set the main switch to "0".
- Ensure that the installed safety switch (part no. SMD0013) is connected and adjusted in such a way, that the RotaCut ceases operation immediately when the cover is opened, see chap. "Safety device safety switch".



Risk of injury from sharp cutting edges

Wear protective gloves when working in the danger area and be sure to prevent the blade rotor and blades from falling off.

Lock any movable parts, e.g. the blade rotor, before carrying out maintenance and repair work.

6.1 Buffer fluid

Buffer fluid amount: approx. 0.4 litres*

* + 0.2 litres for the buffer fluid tank

Please check your order confirmation to see if your RotaCut is filled with a buffer fluid not included in the following table. In this case use this buffer fluid only.

We recommend the following oils to ensure optimal function of the mechanical seal:

Vogelsang standard oil
EP (Extreme Pressure) gearbox oil
SAE class 90 (85W-90)
Part-no. BSS.006

Alternatively: Medical white oil
Part-no. BSS.010

Mineral oil based hydraulic and
lubricating oil
ISO VG 46
Part-no. BSS.014

Alternatively: Biodegradable hydraulic oil as per ISO 15308
Viscosity index 220
Part-no. BSS.016

For electronic buffer chamber monitoring:

Fully synthetic EP industrial gear oil on the basis of selected polyglycols
ISO VG 100
Part-no. BSS.021

The viscosity breakdown rating must be ≥ 12 (for seal ring material combination Cr₂O₃/Duronit)

6.1.1 Controlling and changing the buffer fluid - maintenance intervals

- Check the buffer fluid:
 - After the first 20 operating hours
 - Every 200 operating hours
- If there is severe contamination, change the buffer fluid.
- Change the buffer fluid every 2000 operating hours, in accordance with the chapter "Maintenance instructions".
- Change the mechanical seal in the event of severe leakage.



Buffer fluid

Slight contamination of the buffer fluid as well as a slight increase or decrease in the buffer fluid level are both determined by the hydrodynamic lubrication film of the mechanical seal.



Preventing damage to the seals by checking the buffer fluid

- If medium escapes from the control opening during operation (pos. 1 in fig. "Filling/draining the buffer chamber" b), the cartridge mechanical seal (chapter "Cartridge mechanical seal change") needs to be replaced.
- If clean oil is leaking out, it is imperative to check whether the oil is coming from the gearbox or from the sealing system. If it comes from the sealing system, change the cartridge mechanical seal.
- If oil is missing from the gearbox, check the shaft clearance. If it is OK, change the lip seal.
- If air is sucked in through the control opening when the RotaCut is installed on the suction side, the cartridge mechanical seal needs to be replaced.

6.1.2 Buffer chamber assembly

The pressurised buffer fluid tank with manual pump, see fig. "Pressurised buffer fluid tank" ensures a constant and defined buffer chamber pressure (buffer chamber pressure = tank pressure). The tank is for safely monitoring the buffer chamber.

Tank pressure:

The tank pressure should be about 0.5 bar higher than the average pressure of the RotaCut™. However, the tank pressure should not exceed 5 bar.

Tank level:

The tank should be filled by about a quarter.

Procedure for topping up the buffer fluid

(see fig. "Pressurised buffer fluid tank")

- Use the air valve to release the pressure from the buffer chamber.
- Loosen the upper screw connection on the upper housing.
- Top up the buffer fluid in the tank
- Readjust the tank pressure

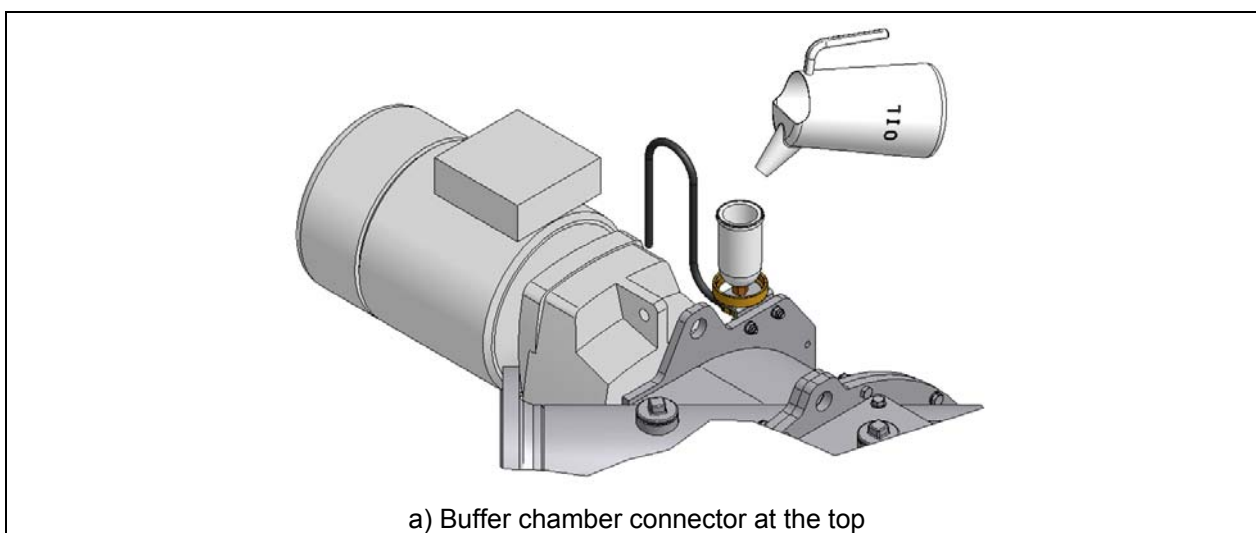
Trouble indication:

Trouble at the sealing system after the running period may be displayed:

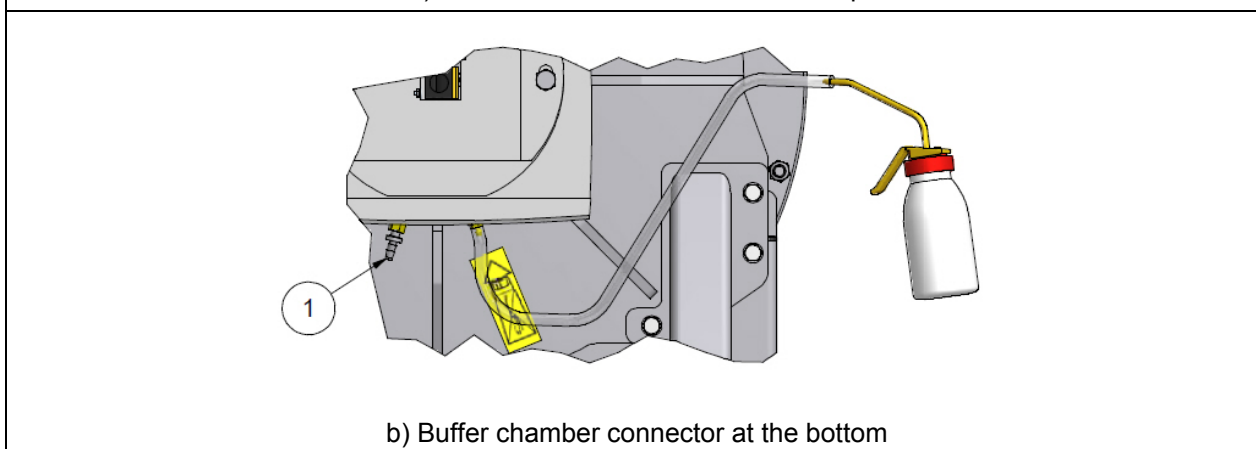
- Due to severe contamination of the buffer fluid in the tank
- Due to buffer fluid escaping (tank is empty)
- Due to an increase of the buffer fluid (tank is full)



Fig. 6: Pressurised buffer fluid tank



a) Buffer chamber connector at the top



b) Buffer chamber connector at the bottom

Fig. 7: Filling/draining the buffer chamber



Cartridge mechanical seal change

- Before changing a cartridge mechanical seal, release the pressure in the buffer fluid tank.
- Drain the buffer chamber and clean it if it is contaminated severely.
- After changing the cartridge mechanical seal, fill with buffer fluid again.
- Readjust the pressure at the buffer fluid tank.

6.1.3 Changing the buffer fluid - procedure

(see also chapter "Buffer chamber assembly")

- Use the air valve on the buffer fluid tank to release the pressure from the buffer chamber.
- Release the bottom valve and drain the the buffer chamber (see figure "Filling/draining the buffer chamber b)").
- Unscrew the upper section of the buffer fluid tank (see fig. "Pressurised buffer fluid tank").
- Clean the buffer chamber in the event of severe contamination.
- Fill up the buffer chamber from below using the manual pump (tool part no. WKZ0123) (see fig. "Filling/draining the buffer chamber b)").
- When oil reaches the buffer fluid tank, close the valve at the bottom again and fill the buffer fluid tank until it is approx. one fourth full.
- Screw the upper section of the buffer fluid tank back on again.
- Adjust the tank pressure.

6.2 Check cutting blades - adjusting of preload

The blades themselves and the preload of the blades must be checked regularly.

Without sufficient preload, the blades are not sharpened. Rounded cutting edges lift the blades. This leads to uneven running as well as wear on the blade rotor and the shaft.

The time period between inspections varies and depends on the medium **to a high degree**.

The optimum time period is based on experience acquired by the operator under his own operating conditions. An abrasive medium should be assumed to begin with. Use the following table as a **rough** guide:

	Abrasive	Normal	Non-abrasive	
First inspection after	4	8	8	operating hours
Subsequent inspections after every	12	120	240	operating hours

The preload should be checked according to these intervals and corrected if necessary.



Preload

A blade rotor that turns very easily, an increase in noise, rounded cutting edges or clogging of the RotaCut are signs of insufficient preload.

6.3 RotaCut with automatic preload (Automatic Cut Control (ACC))

Automatic preloading (Automatic Cut Control (ACC))

A hydraulic cylinder (ACC cylinder as a component of the ACC unit) is screwed to the shaft of the RotaCut. Preload pressure is generated in the ACC cylinder via the pressure regulator of the pressure transmission unit (pos. 4 in Fig. "Pressure transmission unit"). By defining the preload pressure, the pressure force of the blade rotor on the cutting screen can be changed while the RotaCut is running.

Advantages:

- The preload pressure can be easily adapted to the medium.
- The load is automatically adjusted to compensate for wear. The preload pressure is kept constant over the entire area of wear.
- When the wear limit is reached, the RotaCut can be automatically switched off.

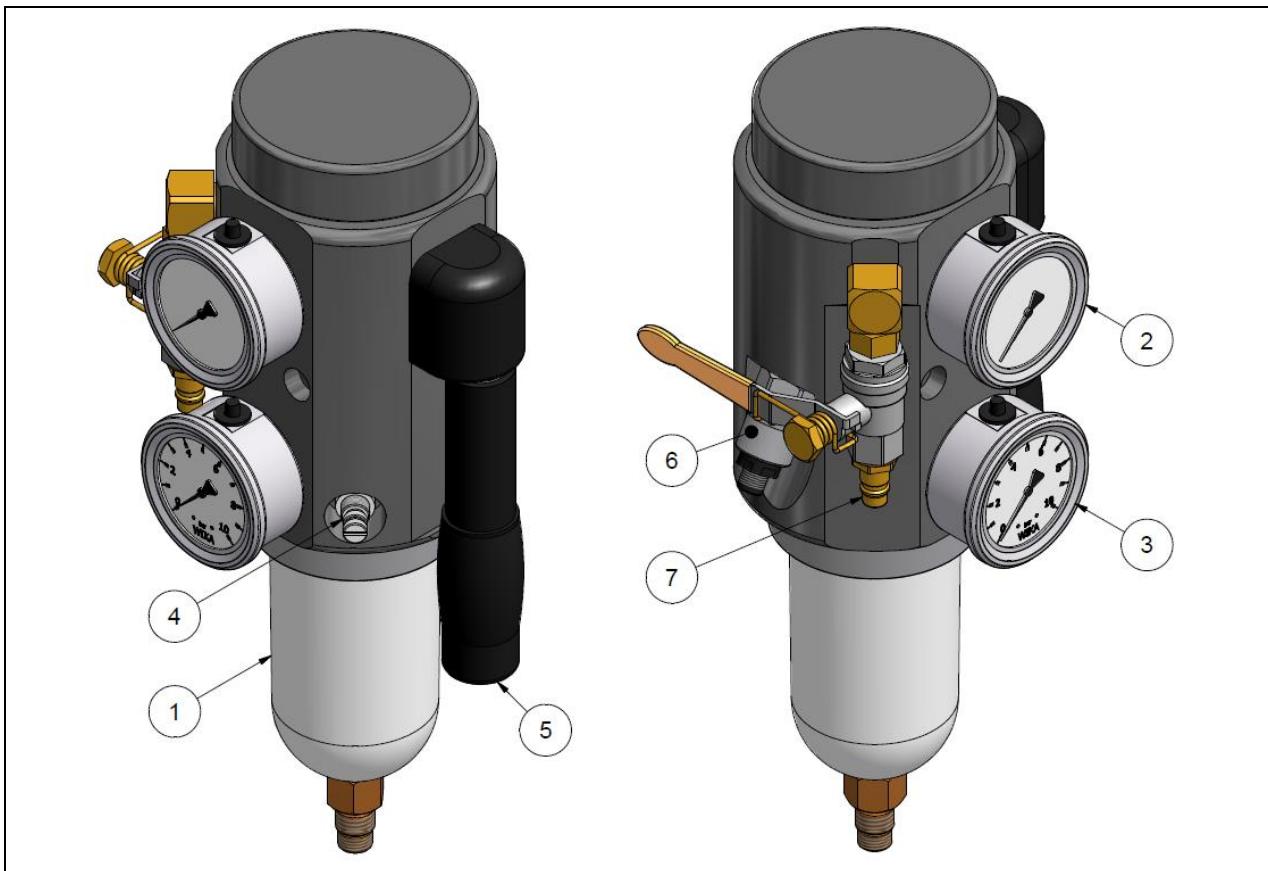


Fig. 8: Pressure transmission unit

- | | |
|---|---|
| 1 | Oil tank |
| 2 | Pressure gauge (16 bar for compressed air tank) |
| 3 | Pressure gauge (10 bar for oil tank) - preload pressure for blades |
| 4 | Pressure control valve (for adjusting the preload pressure in the oil tank) |
| 5 | Manual pump |
| 6 | Pressure switch |
| 7 | Compressed air plug nipple (for compressed air supply) |

6.3.1 Adjusting preloading pressure at the pressure control valve

(see fig. "Pressure transmission unit")

- Produce a pressure of approx. 7-10 bar in the compressed air tank by means of the manual pump (5) or the compressed air supply (7).
- Set the **preload pressure** on the pressure control valve (4). The preload pressure depends on the macerating medium, the quantity and width of the blades, the cutting screen, the medium pressure, the speed and the RotaCut series. The pressure can lie between 0.5 and 8 bar.

Recommendation for setting the preload pressure (suggestion):

- for light use, e.g., sewage plants: 3 bar
- for heavy use, e.g., biogas plants: 4-5 bar



Optimising the service life of the cutting components

- An optimal setting of the preload pressure leads to an increased service life. If the preload is too low, the service life of the blade rotor and drive shaft are significantly reduced. The blades and the cutting screen lose their cutting effect.
If the preload is too high, the wear on the blades and cutting screen is increased.
- A pressure that remains constant for the blades' entire service life is achieved as follows:
starting at 0, slowly set the pressure to the desired value. Do not turn back in the opposite direction. If the pressure is to be reduced, reduce it by "turning to the left" (anticlockwise direction). Then "turn to the right" (clockwise direction) again, until the pressure in the oil tank begins to increase.



Wear on the blades

Setting the preload pressure when the level of wear on the blades is too high:

1. Start with a high preload pressure
2. Reduce the preload pressure at increments of 0.5 bar
3. Operate the RotaCut at this reduced preload pressure for 10 hours
4. If after approx. 10 operating hours you notice noises, vibrations (uneven running), rounded cutting edges, clogging or accumulation of fibres on the blades and the cutting screen, the pressure is set too low.
5. Increase the pressure to the previous setting (0.5 bar increment) until quiet running and safe cutting are ensured again. This is how the correct preload pressure is found. Continue with step 2 if necessary.

6.3.2 Adjusting the pressure control switch

ACC-pressure switch = pos. 15.24 cm the fig. "Pressure transmission unit"

Technical data

Power: max. 42 V
Rated current (resistive load): max. 4 amperes
Switching capacity: 100 VA

Function and adjustment

See the Fig. "Adjusting the ACC-pressure switch".

The ACC-pressure switch (normally closed contact) is used to check the tightness of the ACC and the pressure transmission unit.

The switching point of the ACC-pressure switch is set to 3.5 bar at the factory and should

- Not be set higher unless the ACC pressure or medium pressure is above 4 bar
- Be 0.5 bar higher than the ACC or medium pressure

To check the switching point:

- Generate 5 bar compressed air pressure
- Connect continuity tester to contacts A and B
- Slowly release the pressure at the manual inflating valve:
The continuity tester should show contact from 3.5 bar onwards.

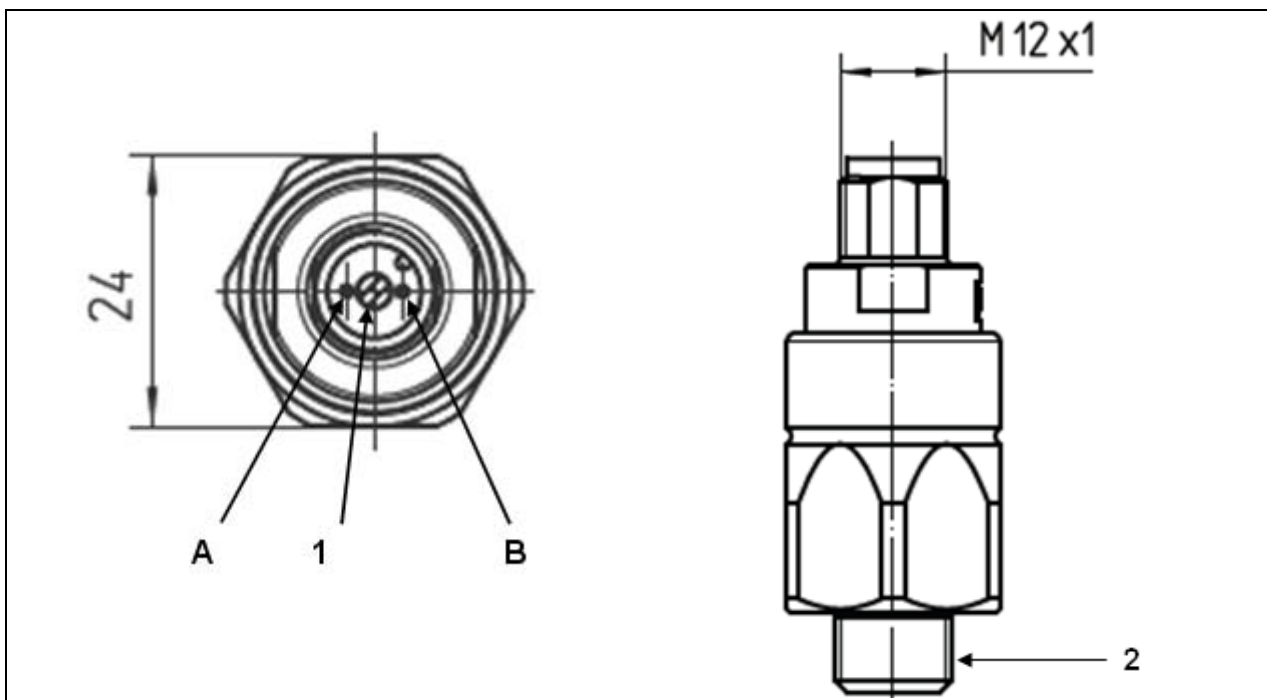


Fig. 9: Adjustment of the ACC pressure switch

A	Blue	1	Adjustment screw
B	Brown	2	Medium connection G1/4"

6.4 Check and change the cutting blades



Risk of injury from rotating parts

- Switch off the drive and make sure that the drive cannot be switched on again while the RotaCut is open.
- Also set the main switch to "0".
- Ensure that the installed safety switch (part no. SMD0013) is connected and adjusted in such a way, that the RotaCut ceases operation immediately when the cover is opened, see chap. "Safety device safety switch".



Risk of injury from sharp cutting edges

Wear protective gloves when working in the danger area and be sure to prevent the blade rotor and blades from falling off.

Lock any movable parts, e.g. the blade rotor, before carrying out maintenance and repair work.

Inspection

- After long breaks from operation, check the blades in the blade rotor for movability. Clean and lubricate the blades if necessary.
- If the wear rate is 0 %, see chapter "Electronic wear indicator for blades", the blades have to be replaced.

Change

6.4.1 Disassembling the blade rotor

1. Set the preload pressure to 0 bar via the pressure regulator (Pos. 4 in Fig "Pressure transmission unit").
2. Open the maintenance port of the ACC protective cover.
3. Undo the release screw (Pos. 1 in Fig. "Release screw") on the ACC piston by about 2 revolutions.

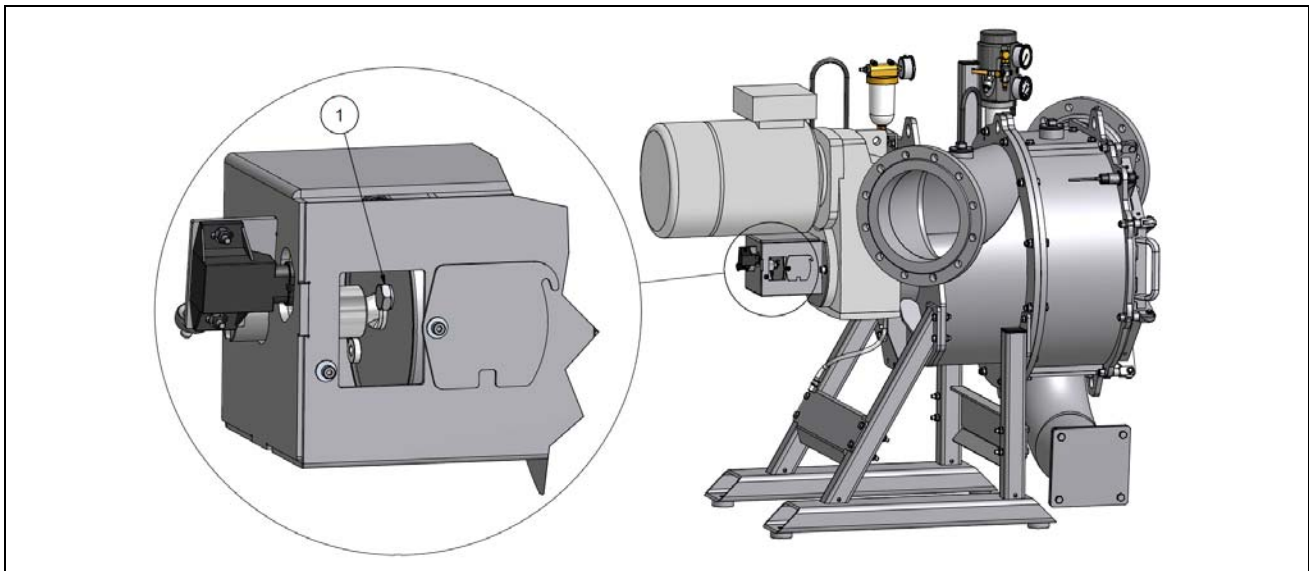


Fig. 10: Release screw

4. Pull the blade rotor slowly back to the end stop using a lever.
5. Disassemble the rotor (see Fig. "Rotor mount")



Mounting screws

Before loosening the mounting screws, the hexagonal socket must be cleaned.

6. Remove the two hex socket head screws (1) (seal) from the back-off threads.
7. Undo the six hex socket head screws (2) (fastening).
8. If necessary, with two loosened hex socket head screws (2), disassemble the rotor using the two back-off threads from which the hex socket screws were removed (1).

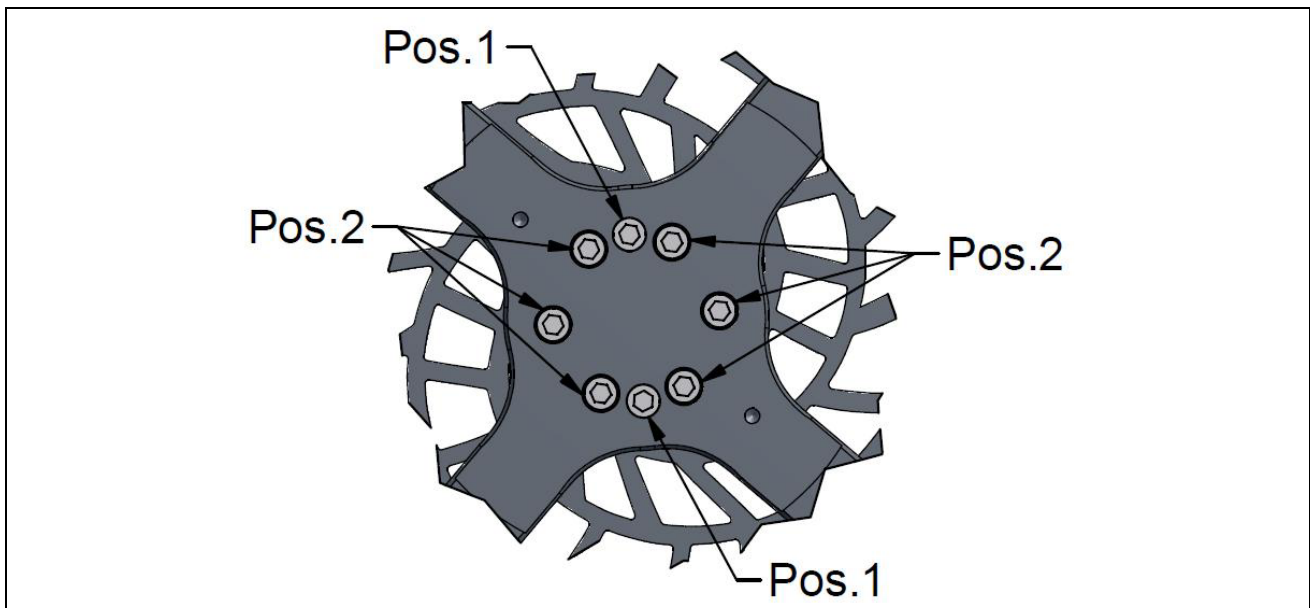


Fig. 11: Rotor mount

6.4.2 Replacing the blades

1. Remove the blades.
2. Carefully clean and lubricate the seating surfaces of the blades.
3. Install new blades and spring pins and read the following notes and information.



Preparing the blade rotor for installation of the blades

Place the foam (polyethylene cord - item no. see spare parts list) at the end of the blade rotor slit and press the foam into the slot, for example, using a screwdriver.

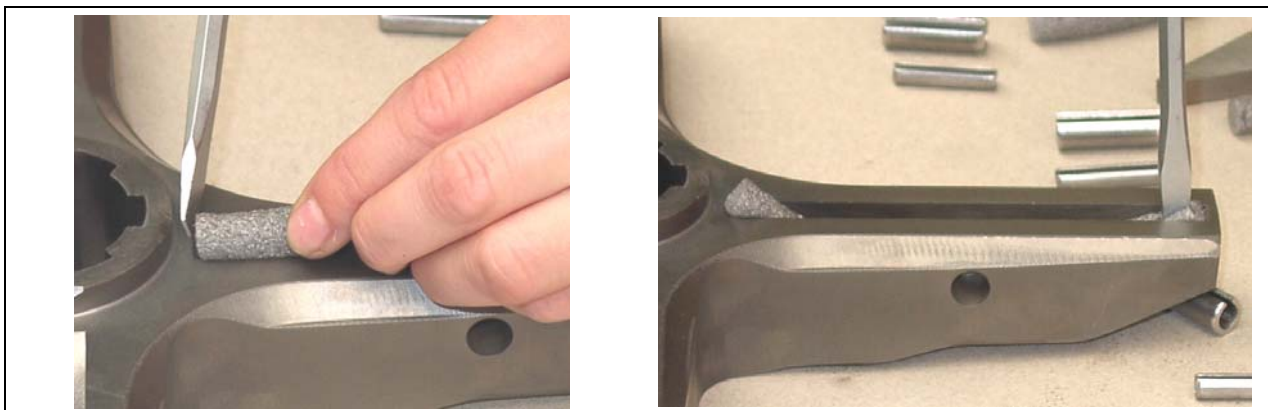


Fig. 12: Preparing the blade rotor for installation of the blades



Assembly instructions: installation tool WKZ.082

Place the blade rotor and blades into the installation tool. Turn the capstan head screw until the holes of the blade and the blade rotor are aligned.

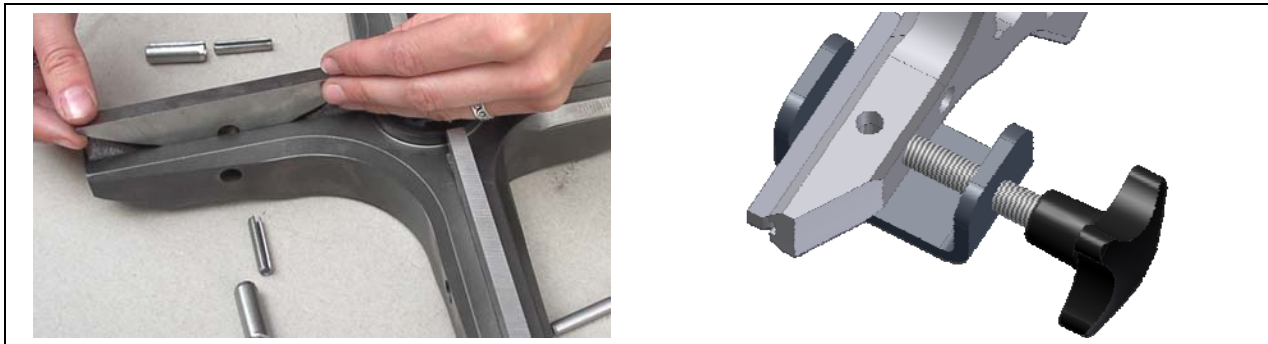


Fig. 13: Installation tool

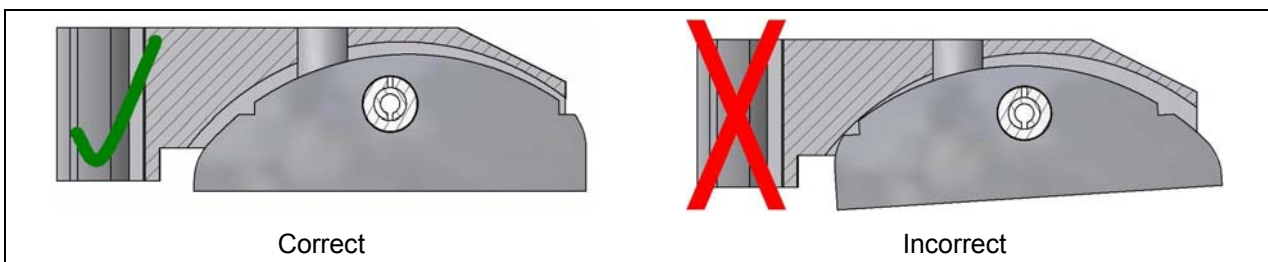


Fig. 14: Correct installation of the blades



Alignment of the spring pins

To avoid premature wear, the slots of the outer spring pins (2) must be aligned so that they face away from the cutting surface and the slots of the inner spring pins (3) must be fitted in the opposing position (see Fig. "Aligning the spring pins").

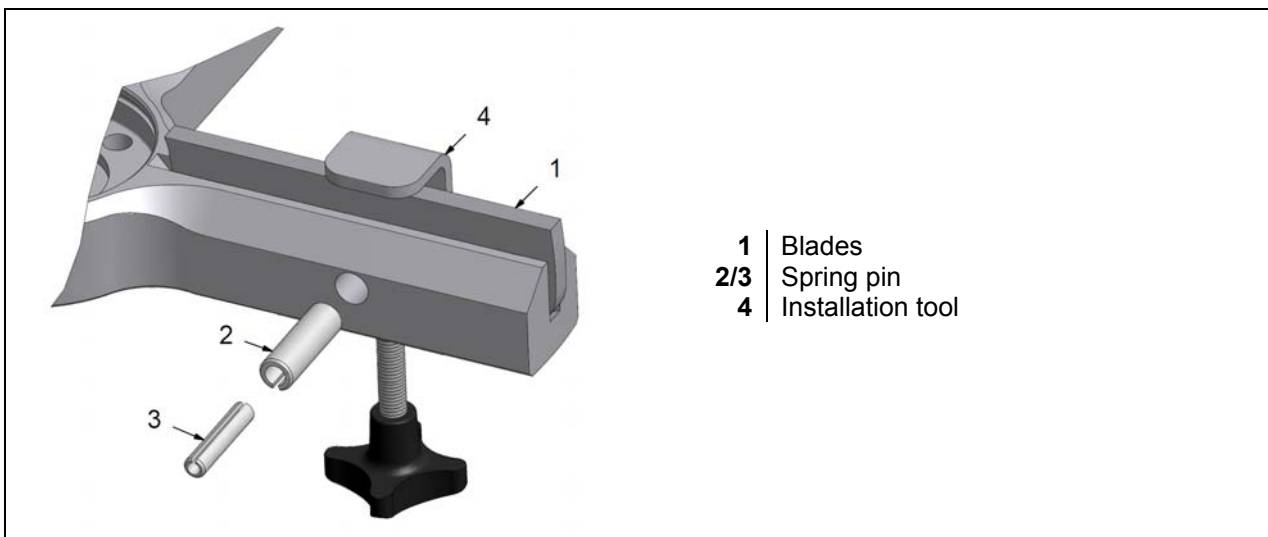


Fig. 15: Alignment of the spring pins

6.4.3 Replacing the cutting screen

(see fig. "Cutting screen assembly")

1. Loosen the eight hex head screws (Pos. 1) that hold the cutting screen and disassemble the cutting screen (the cutting screen can be turned once).
2. Clean the contact surface of the cutting screen and remove any oil and grease.
3. Attention! Each time the cutting screen is replaced, replace the two foam PU ring gaskets in the sealing sleeve in the cutting screen support (Pos. 22 in Fig. "Exploded view of the cartridge mechanical seal change").
4. Coat the hex head screws (Pos. 1) evenly with anti-seize paste in order to avoid 'seizing' of the stainless steel.
5. Mount the cutting screen using hex head screws (Pos. 1).



Tightening torque

Tightening torque for mounting the hex head screws for fastening the cutting screen: **137 Nm**

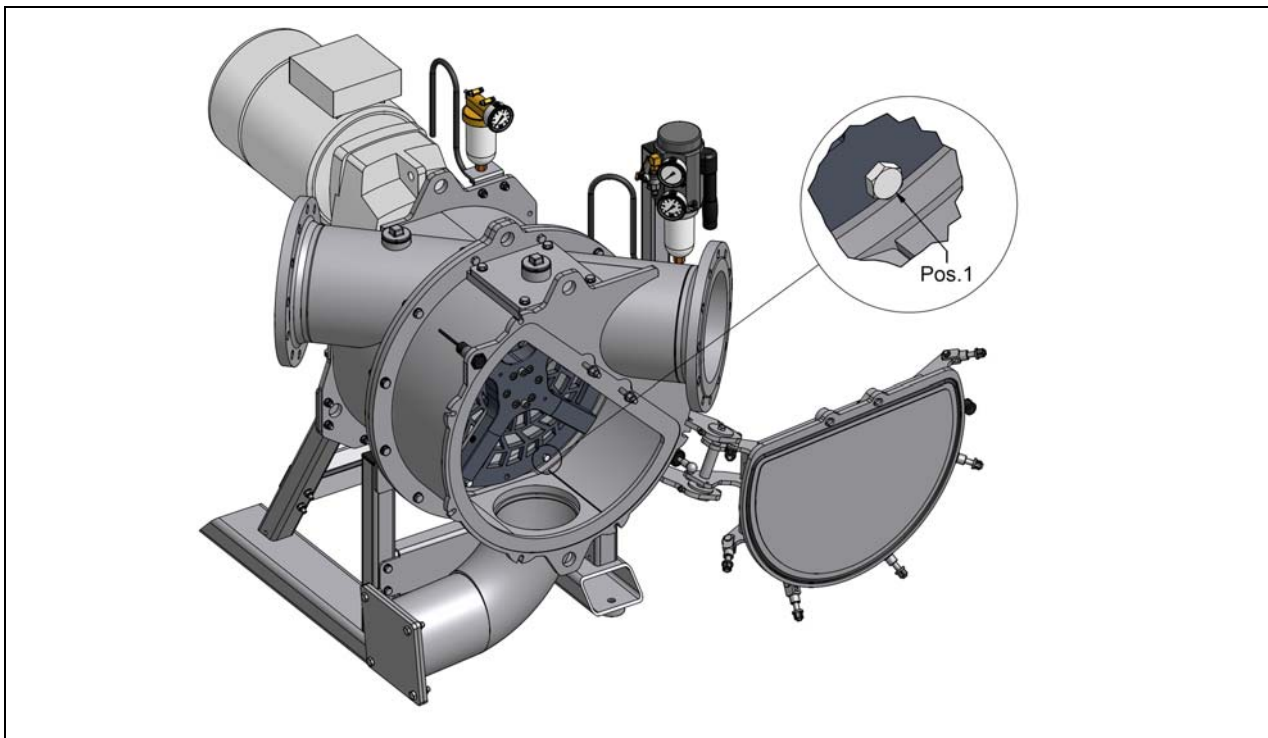


Fig. 16: Cutting screen assembly

6.4.4 Assembling the blade rotor

1. Before installing the mounting screws in the blade rotor, insert six new pairs of lock washers (Pos. 8 in Fig. "Exploded view of the cartridge mechanical seal change").



Tightening torque

Tightening torque of the mounting screws in the blade rotor: **128 Nm**

2. Re-tighten the release screw on the ACC piston.
3. Close the maintenance port of the ACC protective cover.
4. Set the preload of the cutting blades via the pressure regulator of the pressure transmission unit (see chapter "Checking the blades - Setting the preload").

6.5 Control foreign matter

The RotaCut™ pot must be cleaned of foreign matter at regular intervals.
At the bottom of the pot there is a cleaning port. Foreign matter can be removed through this opening.
The separation volume can be increased by a pipe.

6.6 Checking for wear and corrosion

Particularly abrasive or corrosive pump media can lead to a reduction in wall thickness, particularly in the area of the RotaCut pot. If the wall thickness has been reduced by more than 1 mm, the pot should be replaced.

6.7 Changing of gearbox oil



Gearbox oil

Information about the **gearbox oil grade**, **quantity of gearbox oil** and **maintenance intervals** can be found in the "Operating and maintenance instructions" for the geared motor.

7 Repair



Risk of injury from rotating parts

- Switch off the drive and make sure that the drive cannot be switched on again while the RotaCut is open.
- Also set the main switch to "0".
- Ensure that the installed safety switch (part no. SMD0013) is connected and adjusted in such a way, that the RotaCut ceases operation immediately when the cover is opened, see chap. "Safety device safety switch".



Risk of injury from sharp cutting edges

Wear protective gloves when working in the danger area and be sure to prevent the blade rotor and blades from falling off.

Lock any movable parts, e.g. the blade rotor, before carrying out maintenance and repair work.

7.1 Conversion and spare parts

Modifications or changes to the unit are only permissible after consultation with the manufacturer. Only spare parts approved by the manufacturer or original spare parts can be used. The use of other parts invalidates the guarantee for any resulting damage.

7.2 Change of cartridge mechanical seal



Cartridge mechanical seal change

- Before changing a cartridge mechanical seal, release the pressure in the buffer fluid tank.
- Drain the buffer chamber and clean it if it is contaminated severely.
- After changing the cartridge mechanical seal, fill with buffer fluid again.
- Readjust the pressure at the buffer fluid tank.

After disassembling the blade rotor and the cutting screen (see chapter "Checking and changing the blades"), the following parts need to be removed:

(see fig. "Exploded view of the cartridge mechanical seal change")

1. Loosen the central hex socket head screw (14) and remove the pressure washer (15). Replace the O-ring (17).
2. Pull the rotor adapter bushing (16) off the shaft and replace the O-ring (19).
3. Remove the cutting screen (26).
4. Pull the sealing sleeve (18) out of the cutting screen and replace the two foam PU ring gaskets (22).
5. Remove the ACC cover hood (F).
6. Use the tool with part-no. GMS0001 to release the ACC cylinder and remove it from the shaft. Use the plastic hammer to gently knock the shaft to remove the preload from the gasket (a few mm are sufficient). Clean the end of the shaft and the ACC cylinder to remove any glue residue.
7. Loosen the retaining ring (31) and pull the support ring (30) off the shaft.
8. Pull the cartridge distance sleeve (29) together with the cartridge (23) off the shaft. Pull the cartridge off the distance sleeve.
9. Replace the o-rings (23.1, 23.2, 23.3, 25, 17) and the shim (23.4).
10. Carefully remove any burrs and unevenness on the shaft before installing the new cartridge.
11. Push the new cartridge together with the distance sleeve onto the shaft. Carefully oil the outer O-ring (23.2) on the cartridge before installation. Attention! Do not use oil for EPDM O-rings (silicone oil or soap as an alternative). Push the cartridge as far as possible onto the shaft.
12. Insert the O-ring (25) into the groove of the distance sleeve (29).
13. Push the support ring (30) onto the shaft and re-insert the retaining ring (31). Before assembling, clean the contact surfaces of the gasket and support ring thoroughly.
14. Also carefully oil the second O-ring (23.2) before inserting it into the cutting screen (26). Attention! Do not use oil for EPDM O-rings (silicone oil or soap as an alternative). Install the cutting screen.
15. Screw the ACC back onto the shaft and tighten with 350 Nm after first applying Weicon Lock AN 305-74 glue to the contact surface between the ACC cylinder and the hollow shaft. Attention! The glue takes about 12 hours to harden. If total blockages are to be expected, do not operate the RotaCut during this time.
16. Insert sealing sleeve (18) with new foam PU ring gaskets (22).
17. Re-insert the rotor adapter bushing (16) with new O-ring (19). Attention during assembly: take great care when fitting the profile. Only after the teeth mesh is it permitted to knock it gently using a plastic hammer.
18. Fit the pressure washer (15) with new O-ring (17) and central hex socket head screw (14) and tighten to 137 Nm. Make sure that the ACC cylinder is completely retracted (setting for new blades).

Re-assemble the remaining parts in the reverse sequence.

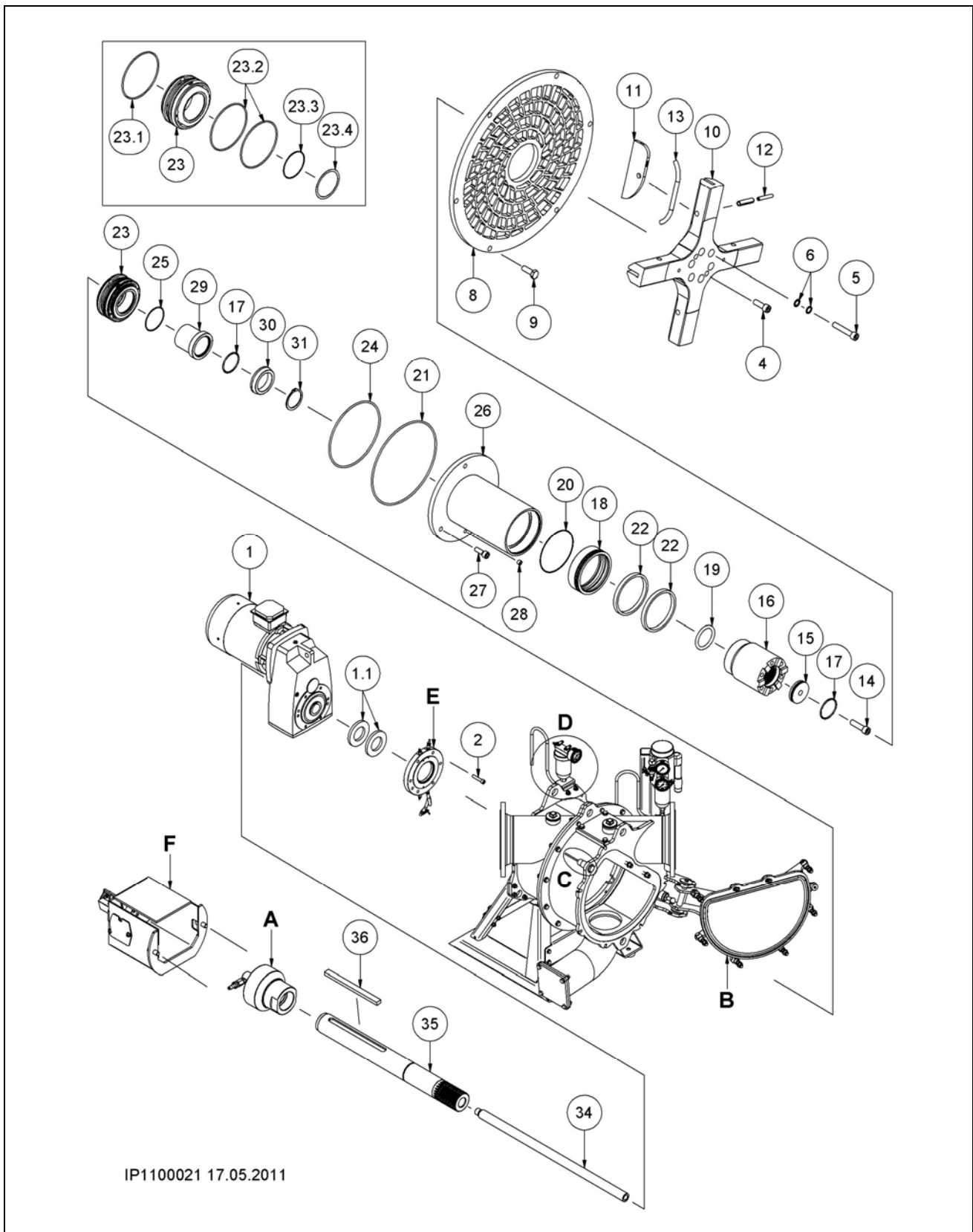


Fig. 17: Exploded view of the cartridge mechanical seal change

8 Service Instructions In Tabular Form

	Before starting up the pump after longer storage periods/decommissioning, every 2 months	Start-up*	Before and after longer periods of non-use	After the first 10 operating hours	After the first 20 operating hours	Every 200 operating hours	Every 2000 operating hours, at least once a year	When there is severe contamination
RotaCut with mechanical seal with SiSiC-SiSiC material combination. In the case of a new RotaCut with this type of seal that is not put into operation immediately, the shaft needs to be rotated (at least one revolution).	X							
Tighten the screws for the base					X			
Check the buffer fluid		X			X	X		
Change the buffer fluid							X	X

*see chapter "Checklist before start-up"

9 Service Plan

The warranty is invalid if maintenance work has not been performed and documented according to the chapter "Maintenance instructions in tabular form".

[illegible]

10 Trouble-shooting

RotaCut stops after starting	Suction flow breaks away after start	Flow rate too low	RotaCut blocked	Power consumption too high	Leakage at RotaCut	Pressure and level variations in the buffer chamber	Extreme pressure and level changes in the buffer chamber	Medium or oil is escaping from the leakage control opening	RotaCut too hot	Motor too hot	Noises & vibration	Cause	Action to be taken
									X		X	Pump is not priming	Check pump
			X	X	X						X	Pipe causing tension in the RotaCut housing	Check the alignment of the pipe to the RotaCut; if necessary, install a compensator or fasten the pipe more securely
	X										X	Suction pipe clogged	Check the free flow of the pipe system on the suction side
X			X							X	X	Faulty electrical connection	Check electrical equipment
			X									Fault in the hydraulic system	Check the hydraulics
			X									Large foreign objects in medium	Retrofit the control system, which attempts to get rid of the blockage by reversing several times
										X		Motor speed too low during variable frequency drive operation	Install external fan Increase motor speed
									X		X	Oil level in the gearbox is not OK	See chapter "Maintenance"
						X						Operation-related fluctuations	See chapter "Maintenance"
							X	X				Cartridge mechanical seal damage Faulty repair Buffer fluid tank leaking	Replace cartridge mechanical seal See chapter "Repair" Check leak-tightness of buffer fluid tank
								X				Seal leaking	Replace the cartridge
X			X	X	X				X	X	X	Operating pressure too high	Reduce the operating pressure
			X						X			No medium in the RotaCut	Check RotaCut clogging, check pump
								X		X		Geared motor gearbox is leaking	Check oil level of geared motor
X	X	X	X	X						X		Cutting screen clogged	Increase ACC pressure

11 Specifications

		RCX-48G
Max. flow rate*	[m³/h]	600
Max. ball diameter	[mm]	Ø 25-34 (standard Ø 34)
Approx. flow area	[cm²]	468 - 865
DIN connector flange inlet***		DN 200
DIN connector flange discharge***		DN 200
Cleaning port		6", DN 150
Max. internal pressure**	[bar]	6
RotaCut pot volume	[litres]	90

* Theoretically achievable flow rate with standard cutting screen + water as macerating medium

** Only the pressure from the liquid column of the medium may be applied.
Pressure may only be applied when the RotaCut pot is filled with fluid.

*** DIN flanges up to and including DN 150, DIN 2633
DIN flanges above DN 150, DIN 2632



RotaCut type designation

The number in the RotaCut type designation indicates the outer diameter of the cutting screen in cm, e.g., RotaCut RCX-48: outer diameter = 48 cm.

12 Declaration of Installation



Declaration of installation

for an incomplete machine
according to Machinery Directive 2006/42/EG; annex II B

Manufacturer: Hugo Vogelsang
Maschinenbau GmbH
Holthöge 10-14
D-49632 Essen/Oldb.

We declare that this delivery concerns the following machine which is not complete. The machine must not be put into service until the machinery into which this incomplete machine is incorporated is in conformity with the Machinery Directive 2006/42/EC.

Product: Cutting tool installation kit
for macerating fibrous matter in pumpable fluids

Type of machine: RotaCut®

The technical documents according to annex VII B have been prepared and can if necessary be obtained from: Ms Ilona Ballmann; Hugo Vogelsang Maschinenbau GmbH; D-49632 Essen/Oldb., Germany

All basic health and safety requirements according to Annex I of the above-mentioned directive are applied and observed.

Applied harmonised standards:

DIN EN 349:1993+A1:2008
DIN EN 1037:1996
DIN EN ISO 12100-1:2003
DIN EN ISO 12100-2:2003
DIN EN ISO 13857:2008

Applied national standards and technical specifications:

DIN 4844-1:2002
DIN 4844-2:2001+A1:2004
DIN 4844-3:2003
DIN EN 707:1999
DIN EN 982:1996
DIN EN 62079:2001

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