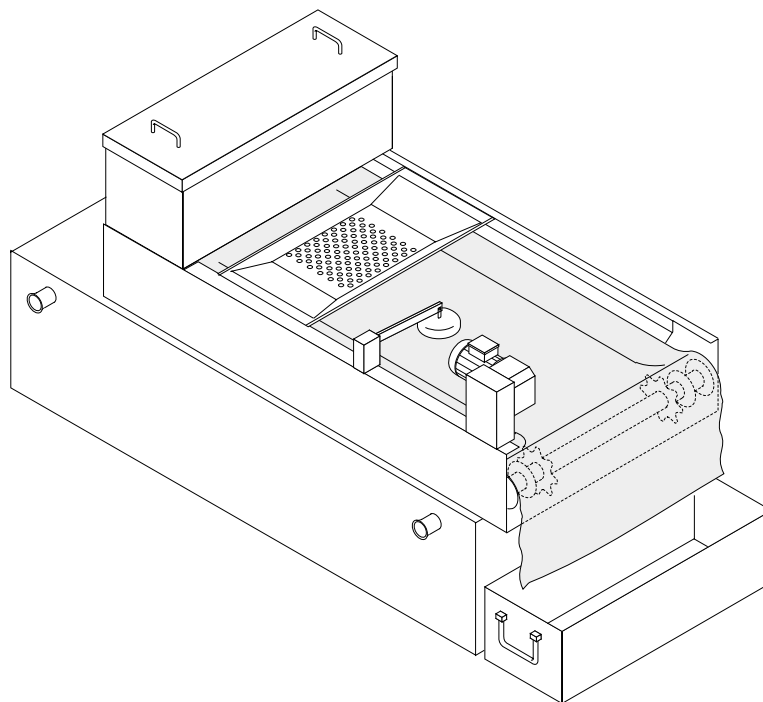


**KNOLL**

# Installation and Operating Instructions

## Gravity Band Filter Typ PF

GB





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Documents on special components and accessories



## 1 Description of product and function

### Scope

Cleaning of cooling lubricants (oils, emulsions) and scouring solutions

Range of application

- For use with machine tools (individual machines and machine groups) as
  - independent cleaning unit
  - addition to swarf conveyors
- Effective separating size up to 12 µm, depending on quality of filter band and type liquid

### Function

- Contaminated liquids are conveyed to the gravity band filter
- The liquid flows through the filter band
- Swarf and dirt particles are held back

Automatic regeneration of the filter band

a) Mainly sludge contamination

- Increasing filter resistance because of the retained dirt particles
- Liquid level rises
- Switch pulse of the float switch (top switch point, adjustable), the filter band drive is switched on
- Used filter band is moved out and new filter band is pulled in
- Liquid level decreases
- Switch pulse of the float switch (bottom switch point, adjustable), the filter band drive is switched off

b) Mainly swarf contamination

- Liquid level does not rise despite of increasing contamination
- Interval control by means of two separately controllable time relays, resulting in brief belt advance and swarf discharge



- **Do not clean combustible liquids!**
- **Do not use equipment for purposes other than intended!**

**Noise level:** < 70 dB

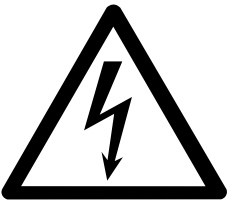
Most equipment is customized, therefore shape and position of components described in this documentation may vary. In this case, these operating instructions may be used as an example.

## 2 Safety instructions

### 2.1 General instructions



- Always observe all the specifications and instructions of the supplied operating instructions!
- Unqualified personal is not authorized to work with the equipment!
- When components are mounted by the customer, watch for correct fastening!
- Never bypass safety contrivances (e.g. level limit switches)!
- The operation of safety contrivances must always be guaranteed.

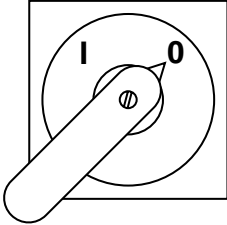


- Work on the electrical equipment must only be carried out by qualified electricians
- Observe the relevant VDE regulations and connecting requirements of the responsible Electricity Board!

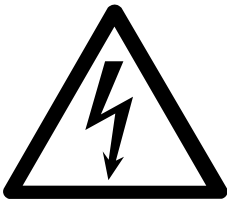


- Do not remove the covers during operation of the equipment

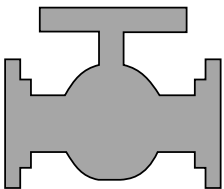
## 2.2 Instructions for repair and maintenance work and for malfunctions



- Switch off the main switch.
- Secure the plant against being started accidentally.



- Ensure that the plant is dead.



- Close pipe valves.
- Remove all noxious materials.
- Coolants must not enter the environment.



- When handling chips, wear protective clothing, safety boots and protective gloves.

## 3 Unpacking and handling

### 3.1 Unpacking

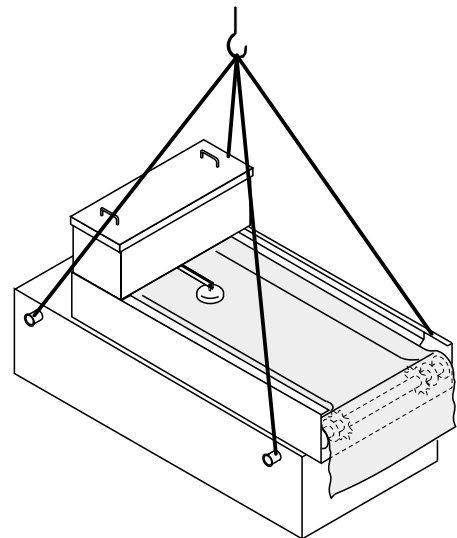
- Remove packing foil
- Loosen and mount the components (e.g. deposit container) fastened to the equipment
- Remove any accessories that may be inside the equipment
- Remove the shipping pallet

### 3.2 Transport

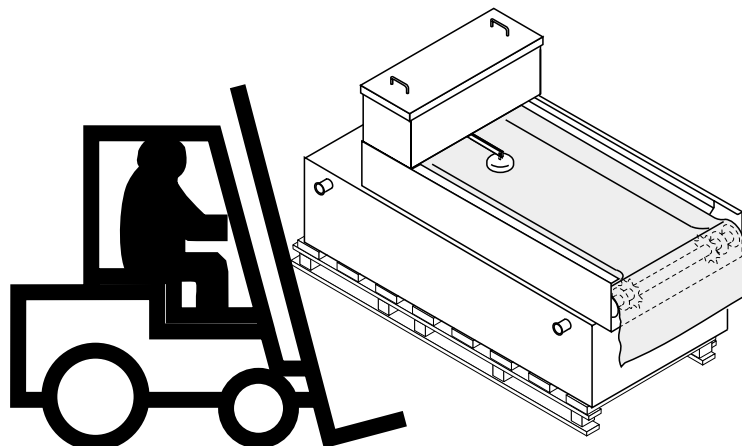


- **Do not stand beneath suspended loads!**
- **Never lift combined equipment at the top**

- **With a crane:**  
Always to be used when not in original packing  
Use provided suspension devices (e.g. eyes, eye bolts)



- **With a stacker truck:**  
Only in original packing and with utmost care





## 4 Erection and installation



- **Ensure secure and stable installation**
- **Secure the equipment against accidental start-up!**

- Mount the gravity band filter on an even surface
- Connect the supply and return lines



Check retrofitted lines for leaks

- Mount the deposit container
- Connect electric power supply of motor(s) and pump(s)



Check for the correct sense of rotation (see arrow)

(After the float switch has been lifted, the conveyor belt must move towards the deposit container)

## 5 Start-up and operation

### 5.1 Prior to initial operation:

- Insert the filter band as described in Chapter 6.1
- Do a leak check on pipings for liquids (transport damage)
- Fill in the required liquids (coolants, lubricants, oils, etc.)
- The entire equipment must be free of coarse parts (tools, etc.)

### 5.2 Switching on/off



In general, gravity band filter systems are switched on and off automatically with the processing machine

A separate switch cabinet is manufactured and designed according to customer specifications

## 6 Maintenance

### 6.1 Installing a new filter band

- Switch off equipment and secure against accidental start-up
- Lift off the cover of the filter band container
- Take the roller (1) out of the filter band container
- Loosen the hexagon socket screw (2)
- Pull the retainer (3) off the roller
- Remove the used filter band roll
- Put a new filter band roll (4) onto the roller



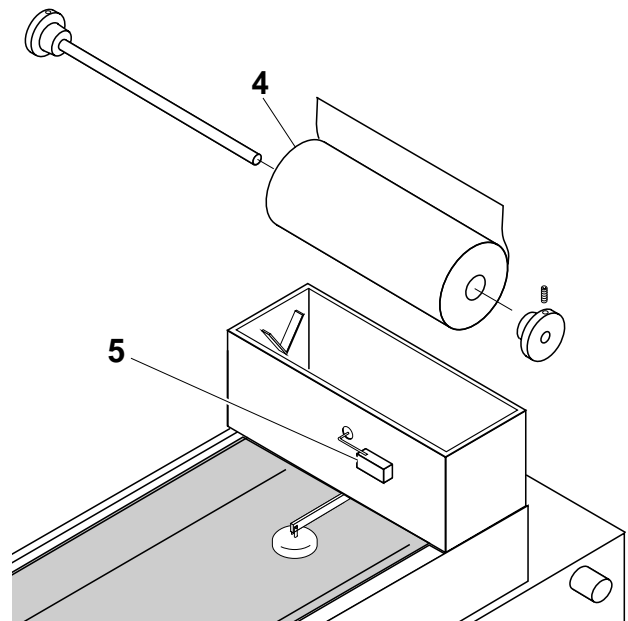
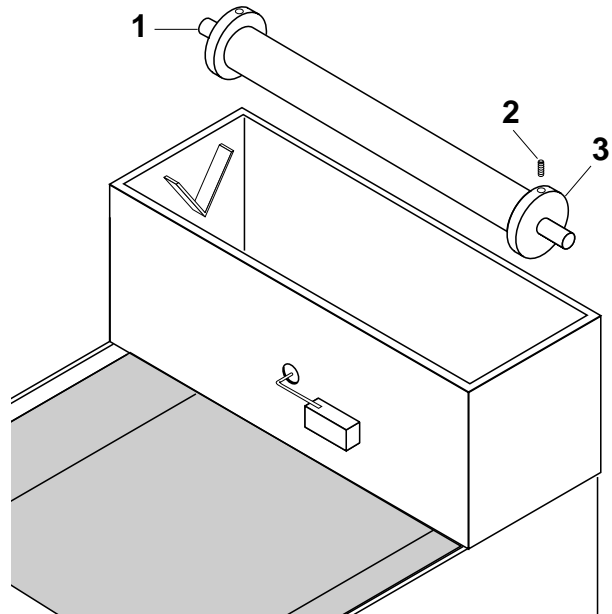
- Use only the specified filter band
- The inside end of the filter band must in no case be glued to the carrier roller

- Push the retainer (3) onto the roller and fasten with hexagon socket screw
- Place filter band roll inside the filter band container



Observe the direction of the filter band

- Lift the sensor arm of the “lack of filter band” switch (5) (if installed)



- Insert the filter band between the top guide rollers (1) and the “lack of filter band” switch to the bottom guide roller (2)
- Switch on the equipment
- Switch on the filter band drive by lifting the float switch (3)

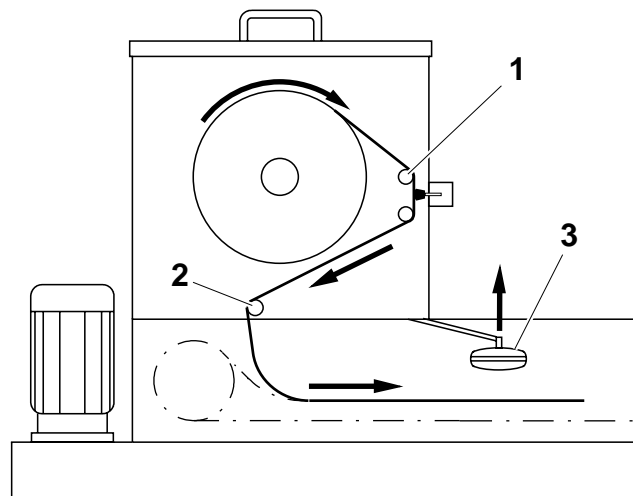


Depending on the model, the float switch can be mounted in any position

- Keep the float switch pressed until the contaminated remaining filter band has been fed out of the equipment
- Switch off the equipment and secure against accidental start-up
- Pull the new filter band around the guide roller (2) into the deposit container



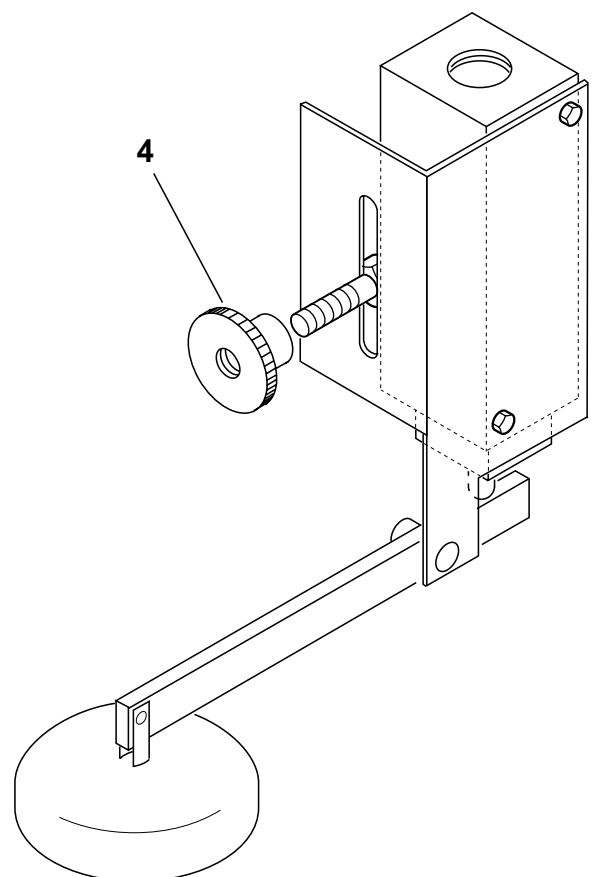
The filter band must be centred and installed without wrinkles.



## 6.2 Setting the float switch



- Among other factors, filter band consumption depends on the setting of the float switch
  - The float switch is factory-set. However, different operating conditions may require readjustment
  - The setting of the float switch is changed after loosening the knurled nut (4). Therefore always mark the initial position
- Switch off the equipment and secure against accidental start-up
- Loosen the knurled nut (4)



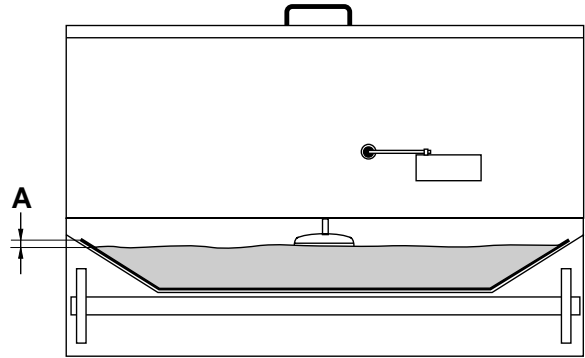
- Changing the position of the float switch:
  - if coolant level too high: float switch to be moved down
  - if coolant level too low: float switch to be moved up
- Tighten knurled nut
- Start the equipment and watch the coolant level until the belt advance is switched on, readjust float switch if necessary



Optimum float switch setting:

Slow rise of the liquid level up to approx. 10 mm underneath the top edge of the filter band (A)

The float switch starts the filter band drive

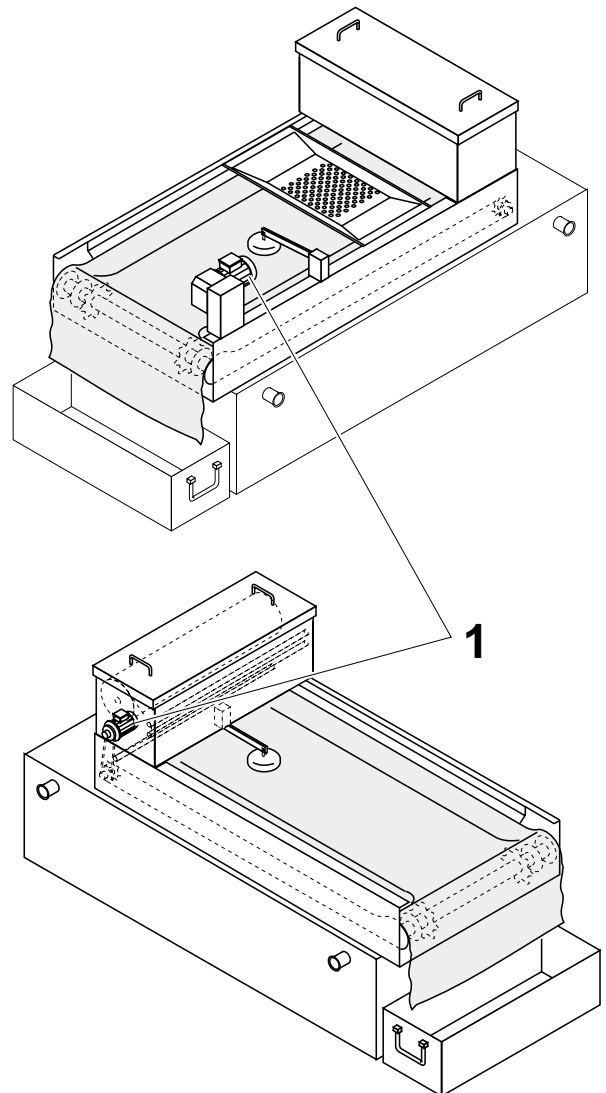



### 6.3 Tightening the drive chain



Depending on the model, the drive motor (1) is located in the filter band container or at the side of the gravity band filter


- Switch off the equipment and secure against accidental start-up
- Loosen the hexagon head cap screw of the drive motor holding angle
- Tighten the drive chain by shifting the drive motor
- For models with protective covering: shift the protective covering by the same distance




 Correct tension of the drive chain:  
The drive chain runs without play and without tension on the drawing chain wheels

- Tighten the hexagon head cap screws at the drive motor holding angle

## 6.4 Tightening the conveying belt

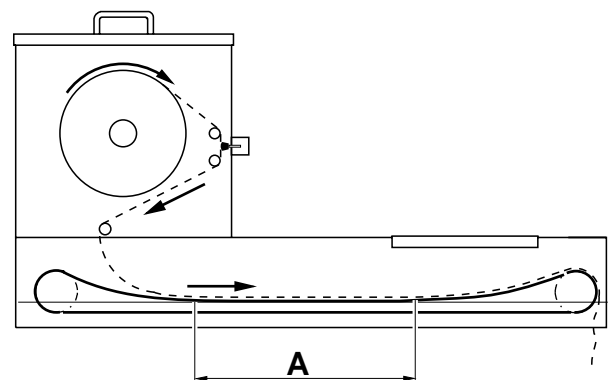
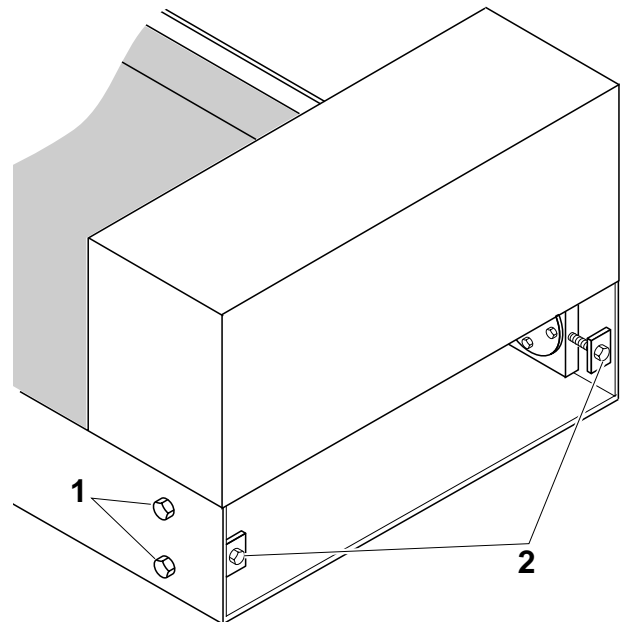
 Depending on the model, the tightening device for the conveying belt is located at the back (underneath the filter band container) or at the front (at the discharge side)

- Switch off the equipment and secure against accidental start-up
- Loosen the hexagon head cap screws (1) on both sides
- Gradually tighten the hexagon head cap screws (2) clockwise on both sides


 - Gradually and evenly tighten the conveying belt on both sides

- If the drive shaft and lateral shaft of the conveying belt are not parallel, the filter band moves out of the filter on one side
- Optimum tension of the conveying belt:  
The conveyor belt is lifted from the container bottom near the guide rollers and touches the container bottom in area "A"

- Tighten the hexagon head cap screws (1) on both sides




## 6.5 Setting the adjusting sleeve

 Adjusting sleeves are optional accessories and control the rate of flow

When the adjusting sleeve is not set correctly:

- this results in high filter band consumption
- equipment does not function correctly
- The adjusting sleeve is to be set only at maximum liquid consumption of the processing machine

- Unscrew the sealing cap (A) with seal
- Loosen the locking screw (B)
- Screw in the adjusting nipple (C) in clockwise direction until the liquid level in the gravity band filter only rises slowly with increasing contamination of the filter band

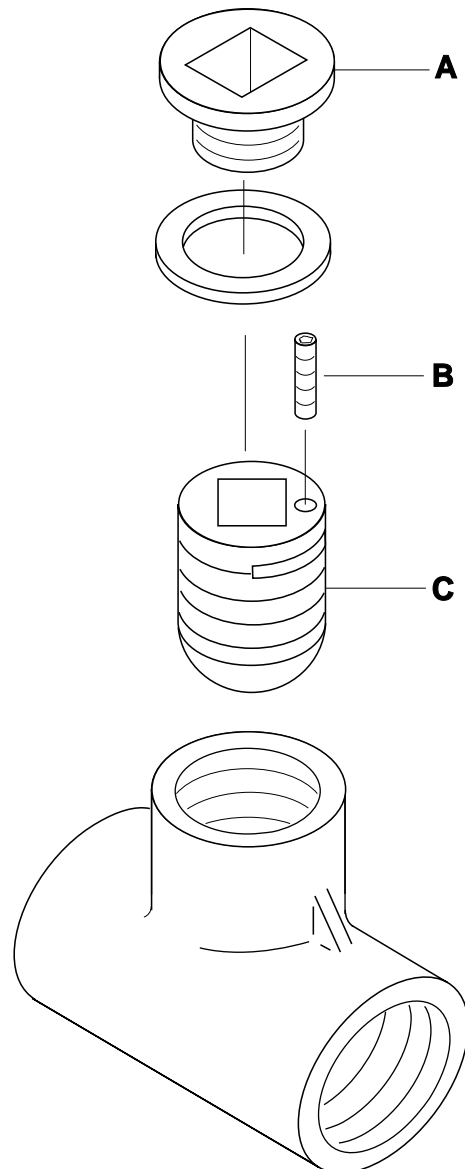
 - Turning the adjusting nipple (C) in clockwise direction reduces the rate of flow

- Do not completely unscrew the adjusting nipple, otherwise liquid is forced out by pressure

- Tighten the locking screw (B)
- Screw in the sealing cap (A), use new seal if necessary

 Liquid level with correctly adjusted rate of flow:

- Rising slowly with increasing contamination of the filter band
- Dropping fast after filter band transport
- Constant circulation between processing machine and filter system



## **7 Information on coolants / tanks**

- Circulate coolants continuously (weekend circulation recommended).
- Do not feed any organic matter.
- Avoid foreign oil charge.
- Temperature should be below 25°C for emulsion, if possible.
- pH-value should be within neutral range
- Hardness of the initial water should not exceed 15° dH
- Hardness due to upgrading must not exceed 20° dH.

### **Cleaning the coolant tanks**

- Cleaning intervals greatly depend upon the kind of processing, material, coolant and working hours; no general interval can therefore be specified.  
A cleaning interval between four and eight weeks is recommended as standard value.

## 8 Maintenance table

<b>Subassembly/ component</b>	<b>Interval</b>	<b>Action</b>	<b>Safety instructions/ remarks</b>
<b>Drive</b> - Drive chain	3 months	Check tension and tighten if necessary, lubricate drive chain	See Chapter 6.3
- Bearing of drive shaft and guide roller	—	Check wear and play	When conveying belt is damaged, check and replace if necessary
<b>Electrical equipment</b> - Motor(s)	—	See operating instructions of manufacturer	
- Wiring	3 months	Check for ruptures and damage	Replace defective wiring
- Level switch	3 months	Check function	Exceed both switch points by manual actuation
- Protective gear	3 months	Check function	
<b>Pumps</b>	—	See operating instructions of manufacturer	
<b>Containers</b>	6 months	Check for leaks, damage and corrosion	Ensure that no hazardous substances escape
<b>Conveying belt</b>	6 months	Check for damage	Replace conveying belt when damaged



## 9 Correction of malfunctions

<b>Malfunctions</b>	<b>Possible causes</b>	<b>Remedy</b>
Drive motor races, wire mesh belt does not move	Drive chain torn	Replace drive chain
Filter band does not run centrally in container	Rollpin spring of drive sheared off	Drive in new rollpin spring
Coolant flows over at filter band	Drive axis and lateral axis are not parallel	Adjust lateral axis with conveying belt clamping bolt parallel to drive axis (see Chapter 6.4)
Filter band does not move	Float switch set too high	Adjust float switch (see Chapter 6.2)
Drive runs without interruptions	Excessive foaming of liquid	Add foam inhibitor
	Liquid level on filter band too low (load on filter band too low)	Increase liquid level by adjusting the float switch (see Chapter 6.2)
	Float switch defective	Replace
	Float switch set too low	Adjust float switch (see Chapter 6.2)

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