

S and P Flex Separation



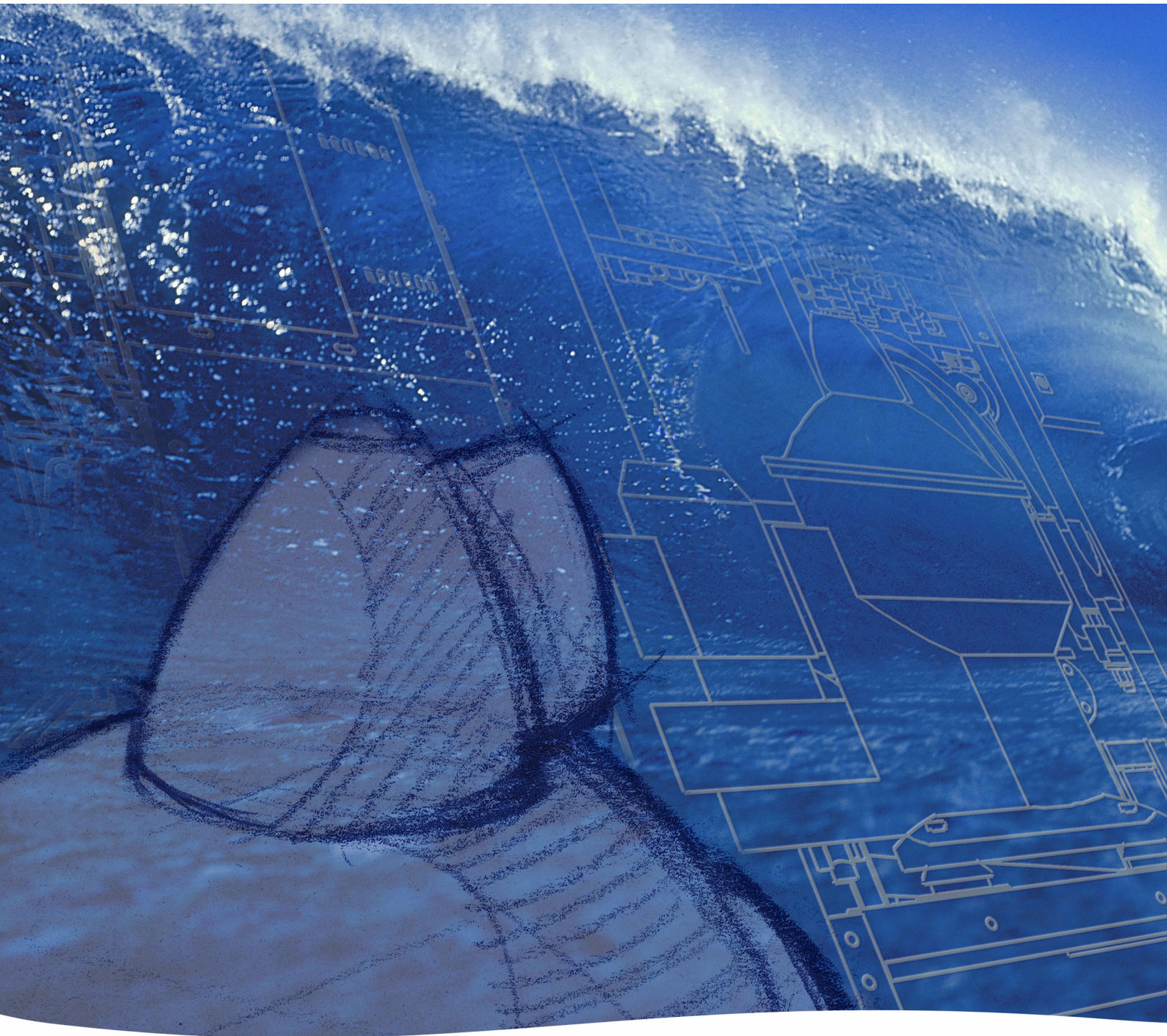
Safety

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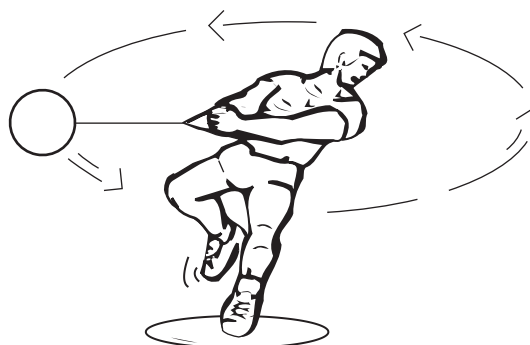
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1 Safety Instructions

Important – read this!

The centrifugal separator includes parts that rotate at very high speeds, generating huge forces. It is therefore essential for the safe operation of this separator system that you read and understand this manual, including the warning signs and safety precautions presented in this manual. Failure to do so may cause a fatal accident.



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1.1 Key Factors for Safe Operation

The separation system is designed and supplied for a specific function (type of liquid, rotational speed, temperature, density, etc.). The system must be used for this function only, and strictly within Alfa Laval's specifications.

Incorrect operation or maintenance may result in a heavy unbalance, reduction of material strength, etc. that could lead to serious breakdown with fatal injury or damage to property.

For safe operation, strictly follow the instructions for installation, operation and maintenance in this manual.



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The following is compulsory for safe operation:

- 1** Never start up a separator before the bowl is completely assembled, and all fastenings securely tightened.
- 2** Never discharge a vibrating separator. Always stop with the emergency stop button.
- 3** Never begin to disassemble a separator before it has come to a complete standstill.
- 4** Always set the discharge intervals according to instructions in the instruction book.
- 5** Never ignore alarms. Always eliminate the cause before resuming operation.
- 6** Never use the separator for other liquids than those specified by Alfa Laval.
- 7** Never operate a separator with a different power supply frequency than stated on the machine plate.
- 8** Clean the operating system regularly to avoid sludge discharge malfunction.
- 9** Ensure that personnel are fully trained and competent in installation, operation, maintenance, and emergency procedures.
- 10** Use only Alfa Laval genuine spare parts and the special tools supplied.

1.2 Warning Sign Definitions

Below are definitions of the warning signs used.

Danger – serious injury or death

This type of safety sign or instruction indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Example:



Entrapment hazard

Make sure that rotating parts have come to a complete standstill before starting any dismantling work.

Warning – serious injury or death

This type of safety sign or instruction indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Example:



Disintegration hazard

If unusually strong vibration occurs, press the Emergency Stop button and leave the room. Do not enter the room after an emergency stop while the separator is still rotating.

Caution – minor or moderate injury

This type of safety sign or instruction indicates a situation which, if not avoided, could result in minor or moderate injury.

Example:



‘CAUTION’ used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in equipment damage.

Burn hazard

Various machine surfaces can be hot and cause burns.

1.3 Summary of Safety Hazards

Below follows a selection of the warnings which have been used in the text of this instruction manual to ensure safe installation, start-up, operation, stop, and maintenance. Further warnings are to be found in the appropriate places throughout the manual.

Start-up

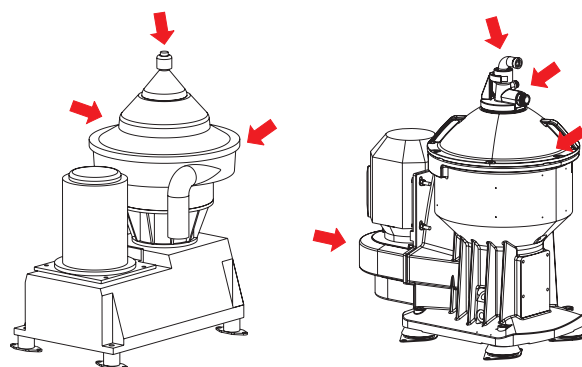
Check that the separator is correctly assembled and connected to power supply of correct voltage and frequency. The control panel must be ON.

Be specially observant during start-up. If there is any abnormal vibration, immediately stop the separator and investigate the cause. Clean the bowl if it contains sediment.



Breakdown hazard

Assemble the separator completely before start. All couplings, covers, and guards must be in place and properly tightened. Failure to do so may lead to breakdown.



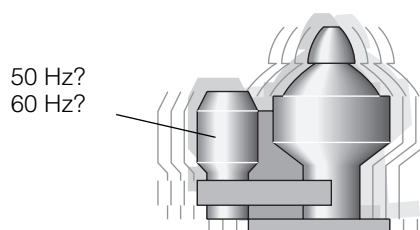
Electrical hazard

Follow local regulations for electrical installation and earthing (grounding).



Breakdown hazard

Check that the power frequency is in agreement with the machine plate. If incorrect, resulting overspeed may cause breakdown.



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Use the separation system for the purpose, and within the limits, specified by Alfa Laval. Failure to do so could cause a violent breakdown.



If power cable polarity has been reversed, the separator will rotate in reverse, and vital rotating parts can loosen.



Check the oil level before start. Top up when necessary. Do not overfill.

Operation



Excessive vibration

If vibration increases, or continues at full speed, keep bowl filled and stop the separator.

The cause of the vibration must be determined and corrected before starting again!

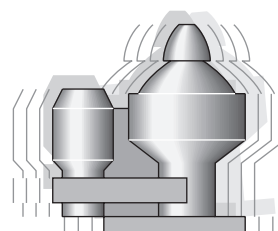
Excessive vibration may be due to incorrect assembly or insufficient cleaning of the bowl.



Breakdown hazard

If strong vibration occurs, press the emergency stop button and evacuate the room.

Never discharge a vibrating separator. Vibration may then become violent and result in breakdown.



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Disintegration hazard

After an emergency stop, the cause of the fault must be identified.

If all parts have been checked and the cause not found, contact Alfa Laval for advice before restarting the separator.



Burning hazard

Lubricating oil and various machine surfaces can be hot and cause burns.



Noise hazard

Use ear protection if noise levels are high.

**Breakdown hazard**

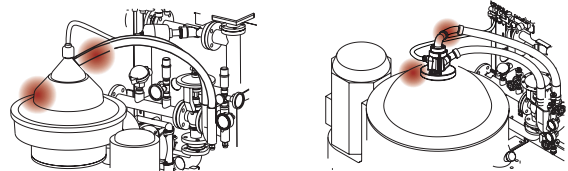
Never reset an alarm without first finding and remedying the cause.

**Disintegration hazard**

Do not discharge a vibrating separator. Vibration can increase if solidified sludge is only partially discharged.

**Burn hazard**

Avoid contact with hot surfaces. Process pipes, various machine surfaces, and processed liquid can be hot and cause burns.

**Slip hazard**

Check all connections for leakage.
Oil leakage may make the floor slippery.

If speed or starting power is not correct:



Stop and change the belt transmission to suit the power supply frequency.

Stop



Breakdown hazard

Stop the separator by means of the control unit, and not by turning off the motor.

Never attempt to clean the bowl by manual discharge in connection with stop.

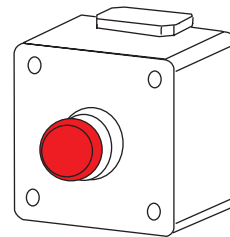
Emergency stop



Disintegration hazard

If unusually strong vibration occurs, press the Emergency Stop button and leave the room

Do not enter the room after an emergency stop while the separator is still rotating.



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Disintegration hazard

Do not start the separator after an emergency stop without first remedying the cause of the emergency.

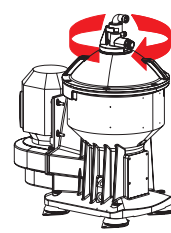
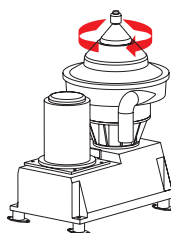
Make sure that the bowl is clean before restart.

After emergency stop



Entrapment hazard

Make sure that rotating parts have come to a complete standstill before starting any dismantling work. The rotation indicator lamp, where applicable, must be off.



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Entrapment hazard

To avoid accidental start, switch off and lock power supply before starting any dismantling work.

Make sure that separator has come to a complete standstill before starting any dismantling work



Disintegration hazard

Do not start the separator after an emergency stop without first remedying the cause of the emergency.

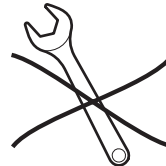
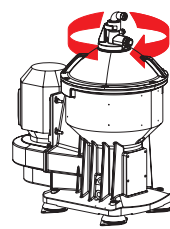
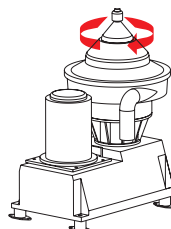
Make sure that the bowl is clean before restart.

Maintenance



Entrapment hazard

Make sure that rotating parts have come to a complete standstill before starting any dismantling work. The rotation indicator lamp, where applicable, must be off.



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**Disintegration Hazards**

Separator parts that are either missing, worn beyond their safe limits or incorrectly assembled, may cause severe damage or fatal injury.

**Burn and Corrode Hazards**

Escaping hot and/or corroding process material, which can be hazardous, may still remain in the separator after stop.

**Disintegration hazards**

Use of imitation spare parts may cause severe damage.

**Entrapment hazard**

To avoid accidental start, switch off and lock power supply before starting any dismantling work.

Make sure that the separator has come to a complete standstill before starting any dismantling work.



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The nut must not be removed before the separator has stopped.

**Crush hazard**

The top disc can adhere to the bowl hood when lifting. Be careful not to accidentally drop it.

**Risk for eye injury from flying seal ring parts**

The seal ring breaks when removed from the bowl hood.

**Crush hazard**

The distributor and disc stack can adhere to the top disc. Separate them from the top disc so that they do not accidentally drop.

**Cut hazard**

Sharp edges on the separator discs may cause cuts

**Crush hazard**

The ring on the lifting tool must be pushed down against the discharge slide, otherwise the discharge slide may come loose from the tool.

**Crush hazard**

Support the bowl body when turning to prevent it from rolling.

**Crush hazard**

The motor will come off if the screws are unscrewed.

**Crush hazard**

Do not rotate the spindle assembly during lifting.
The spindle assembly may otherwise come loose from the lifting tool.

**Risk for eye injury from flying snap ring**

Use the correct pliers for dismantling of snap ring to avoid accidental release.

**Crush hazard**

If not supported, the motor with coupling will drop when removing the screws.

**Electrical hazard**

If the cables are not disconnected during lifting procedures, they may become damaged.

**Inhalation hazard**

When handling friction blocks/pads wear a mask to avoid inhalation of dust.
DO NOT USE COMPRESSED AIR TO REMOVE DUST. Remove dust using vacuum or a damp cloth.

**Crush hazard**

The centrifugal clutch is heavy and can fall, causing injury, when loosened from the motor shaft.

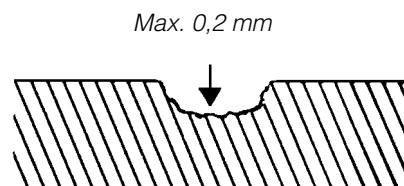
**Electrical hazard**

Never wash down a separator with a direct water stream.

Never play a water jet on the motor. Totally enclosed motors can be damaged by direct hosing to the same extent as open motors, resulting in short-circuit and internal corrosion.

**Disintegration hazards**

Always contact your Alfa Laval representative if you suspect that the depth of the corrosion damage exceeds *0.5 mm (0.2 mm for bowl body and bowl hood)* or if cracks have been found. Do not continue to use the separator until it has been inspected and given clearance for operation by Alfa Laval.

**Disintegration hazard**

Pits and spots forming a line may indicate cracks beneath the surface.

All forms of cracks are a potential danger and are totally unacceptable.

Replace any part where corrosion can be suspected of affecting its strength or function.

**Disintegration hazard**

All forms of cracks are potentially dangerous as they reduce the strength and functional ability of components.

Always replace a part if cracks are present.

**Disintegration hazard**

Erosion damage weakens parts by reducing the thickness of the material.

Pay special attention to the pillars between the sludge ports in the bowl wall.

Replace parts if erosion is suspected of affecting strength or function.

**Disintegration Hazard**

If the belt pulley must be renewed, check that the new pulley has the correct diameter. An incorrect pulley will cause the separator bowl to run at either an excessive or insufficient speed.

**Burn hazard**

Use protective gloves when handling any heated parts.

**Risk for eye injury from flying snap ring**

Use the correct pliers for assembly of snap ring to avoid accidental release.

**Cut hazard**

Do not put fingers between the frame and air deflector while lowering the assembly.

**Disintegration hazard**

Impact marks may cause the separator to vibrate while running.



Crush hazard

The ring on the lifting tool must be pushed home against the discharge slide, otherwise it may come loose from the tool.



The number of discs may have to be increased to adjust the disc stack pressure. Always check before operating the separator.



Crush hazards

A falling separator can cause accidents resulting in serious injury and damage.

Never lift the separator by any other method than described in this manual.



Crush hazards

Use correct lifting tools and follow lifting instructions.



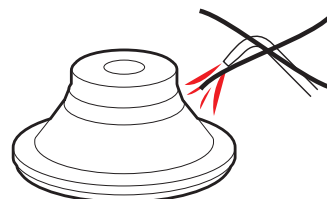
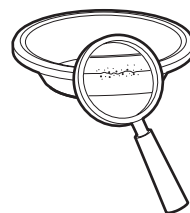
Disintegration hazard

Separator parts that are either missing, worn beyond their safe limits, or incorrectly assembled, may cause severe damage or fatal injury.



Disintegration hazard

Do not weld nor heat parts that are subject to high-speed rotation.

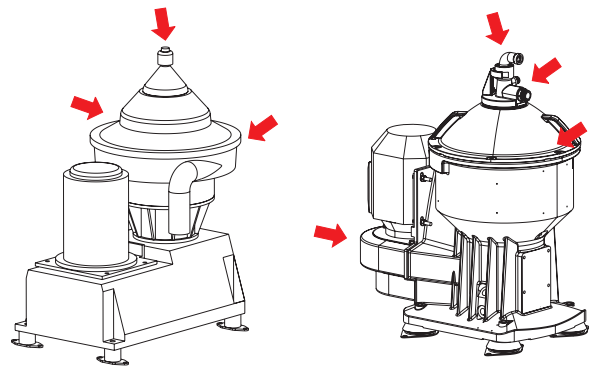


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Separator reassembled**Breakdown hazard**

Assemble the separator completely before restart. All couplings, covers, and guards must be in place and properly tightened. Failure to do so may lead to breakdown.



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Cleaning in place**Health Risk**

Do not forget to disconnect the CIP equipment and re-connect connections.



Use only Alfa Laval recommended CIP liquids.

1.4 Optional Heaters

1.4.1 CBM heaters

**Burn Hazard**

The heater must not be used without the insulated protection cover. This shields the hot surfaces and also acts as a safety cover in the unlikely event of leakage.

**Burn Hazard**

To prevent pressure or heat shocks in the system, adjustment of the flow rate must be carried out slowly. The heater can otherwise be damaged.

**Burn Hazard**

Shut off the oil flow and the heating medium flow before starting maintenance.

**Corrosion Hazard**

Pay strict attention to the safety instructions for the cleaning liquid used.

**Burn Hazard**

Make sure that the relief valve outlet leads into a collecting tank or below floor level.

1.4.2 Electric heaters



Electrocution Risk

Switch off the main power before opening the heater junction box, or dismantling the heater.



It is very important that the correct heater element is installed.