

General Procedure for Centrifugal Pumps

Start Up and Shutdown Procedure

STARTUP



Every time, before the pump is started up, the safety devices must be mounted and fastened.



In order to avoid risks of injury or damage, all pump units must be equipped with emergency-stop devices.



For operation of electrical drives, control systems and their cable routes, the safety instructions issued by their manufacturers must be observed.



When the pump is shipped with a cartridge mechanical seal type installed, the setting devices on the seal collar might be engaged. In this case, it is necessary to tighten the set screws, disengage these setting devices from the seal, and turn them to allow the operation of the pump. To perform this procedure, please follow the instruction manual from the seal manufacturer.



Figure 1. Seal setting devices

STARTUP *(continues)*

The startup procedure is as follows:

1. Before starting the pump, check the security of all bolting, piping, and wiring.
2. Check all gauges, valves and instruments for proper working order.
3. Check all equipment for proper lubrication and correct rotation.
4. Verify that the discharge valve is closed.
5. Open the suction valve.
6. Open the discharge valve and allow pump to fill with fluid (refer to the "Priming and Warming Up Procedure" document available at this site for details).
7. Keep the valves open approximately 60 seconds to ensure that pump is completely full of fluid.
8. Close the discharge valve.
9. Uncouple the driver and the pump.
10. Start, and **IMMEDIATELY STOP**, the driver and observe the rotation of the shaft.
11. Correct rotation should be in direction of rotation arrow.

ATTENTION

If shaft rotation is incorrect, consult driver manufacturer's instructions in order to change rotation.

12. Once priming is accomplished and the correct shaft rotation is established, the pump is ready for continued operation.
13. Securely couple the driver and the pump, and ensure the discharge valve is approximately $\frac{1}{4}$ fully open.
14. Start driver again, and completely open the discharge valve **IMMEDIATELY** once the operating speed has been reached.



DANGER: Do not allow discharge valve to remain closed for any length of time because this will cause the pumped fluid temperature to rise excessively, causing damage to pump.

STOPPING

1. Throttle pump discharge to minimum flow.



WARNING: do not close the suction valve as this will cause the pump to run dry.

2. Turn the power off to the driver.
3. Close the pump discharge valve.
4. Observe the run-down of the pump until full stop.

ATTENTION

If the rotor is jerky or suddenly stops, there is danger that the rotor has become blocked. The pump must be opened and all running clearances checked.

5. Close the suction valve when the pump shaft stops rotating as the pump must be isolated before examination and made safe.



Do not close the suction valve until the pump has come to a full stop, as it may cause the pump to run dry.

6. Ensure the drive motor cannot be unintentionally turned on.
7. Ensure the shut-off devices in the suction and pressure pipes cannot be unintentionally opened.
8. Drain the pump and the auxiliary piping.

ATTENTION

If the outside temperature is below 32 °F (0 °C), all cooling chambers must be emptied, and all seal system cooling coils must be drained.

SHORT-TERM SHUTDOWN

If the pump was switched off correctly and has not suddenly come to a halt, it may be re-started without the need to take any special measures.

If the pump comes to a sudden halt, or if the pump was switched off because of a possible danger, it must be checked for damage.

LONG-TERM SHUTDOWN

1. Follow the stopping procedure described in the **STOPPING SECTION**.
2. Disconnect the vent filter and seal openings on the bearing frame to lessen the exchange of air.
3. While the unit is idle:
 - a) If the plant is in an operational state, warm up and start the unit at monthly intervals (see the **STARTUP SECTION** and the "[Priming and Warming Up Procedure](#)" document available at our website*).
 - b) If the plant is not in an operational state, turn the unit over by hand a couple of times at monthly intervals, ensuring the shaft is not returned to the same position, to allow the bearings to rest in a different position every time.
4. If there is danger of freezing, drain the pump, drain the oil from the pump bearings and all the auxiliary piping.
5. Change the oil before recommencing operation, ensuring the correct grade and the correct volume has been filled in the bearing frame.

*<http://www.ruhrpumpen.com/downloads/others/225-pump-priming-and-warming-up-procedure/file>