

# INFORMATION ON THE TYPE OF SUPPLY

Unsuitable inlet conditions can also cause even the best designed pump to malfunction. Surprisingly, serious problems can be caused by the simplest issues or go unnoticed by inexperienced machine operators.

## ***READ THIS CHECK-LIST WITH DUE CARE AND ATTENTION BEFORE STARTING UP A SYSTEM***

*Remember, there is no best or standard way to set-up a system because no two systems are the same. Every single factor has to be taken into consideration with due care and attention.*

***SUPPLY INLET: the flow rate at the pump inlet must be higher than the maximum flow rate delivered by the pump for satisfactory pump performance.***

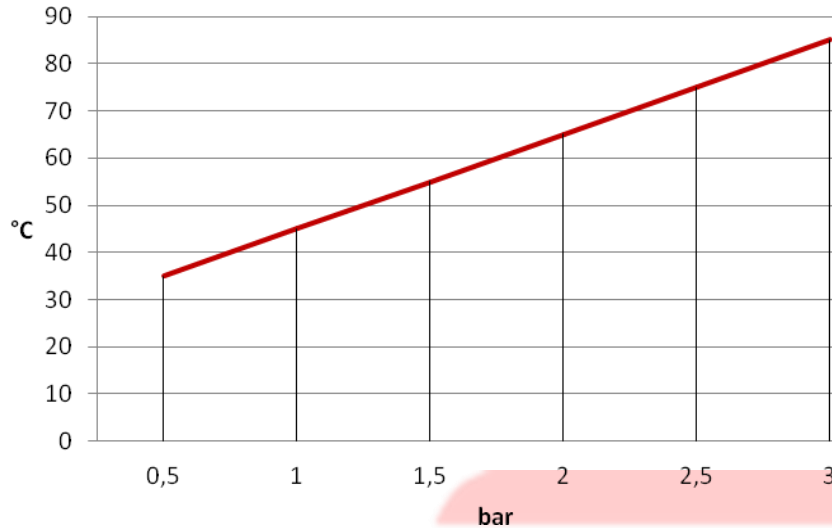
- **DO NOT RUN THE PUMP DRY.** Open the suction valve to guarantee the supply of water to the pump.
- Always feed the pump with positive pressure, controlling the working temperature of the pump and the inlet water. Temperatures in excess of 65°C are allowed with HT versions, provided you follow the instructions below.

*There is an increased probability of cavitation and the formation of steam as the temperature of the inlet liquid increases.*

*With temperatures in excess of 65°C, you should take several aspects of the system into account in order to achieve optimum performance.*

- **Increase the supply pressure**  
*As the water temperature increases, the vapour pressure also increases (the pressure needed to remain in a liquid state). The risk of cavitation can be reduced to a minimum by increasing the pump's inlet pressure. An auxiliary pump is often required to increase the pressure at the pump inlet. The auxiliary pump should have at least twice the flow rate of the piston pump.*
- **Reduce the number of pump rpm**  
*The acceleration and vaporisation of the water can be decreased by reducing the number of rpm, consequently reducing the risk of cavitation and its damaging effects.*
- **Fit a buffer device at the pump inlet.**  
*A suitably sized supply tank is needed for water at room temperature whose position must guarantee the elimination of air bubbles and turbulence in order to ensure the pump is supplied correctly. The size of the tank must generally be 6÷10 times the flow rate of the pump. However, factors such as high temperature can affect this value. Hawk pumps are not self-priming and correct operation is not guaranteed with negative suction.*
- **Increase the section of the supply circuit.**  
*It is always important to make sure the supply circuit is the correct size so that the pump is supplied with the correct flow of water. This is even more critical when the pumped liquid is at a high temperature. Undersizing the supply line will exacerbate the generation of vapour and thus cavitation.*

See the chart below.



- Avoid closed-loop systems, especially when the pump liquid is at high temperatures, high pressures or flow rates.
- We recommend fitting a pressure gauge on the supply circuit in order to monitor the supply pressure.

**SECTION OF THE SUPPLY CIRCUIT.** *must be the appropriate size in order to avoid the risk of pump supply failure.*

- The supply circuit should be one size larger than the pump's inlet connector.
- Avoid "T" and 90° connectors and any other elements that could impede the supply flow.
- We advise using a flexi hose for the supply circuit instead of a rigid pipe in order to prevent the possibility of rupture caused by vibration.
- The simplest systems always give fewer problems. Keep the length of the supply circuit as short as possible with as few curves, joints and accessories as possible.
- Use sealant for pipes to safeguard the seal of pipes under pressure and prevent water entering the pipes.

**INLET PRESSURE:** *must remain within the specifications of the pump.*

- High rpm, high temperatures, vapour pressures and high or low viscosity can result in the acceleration of the inlet liquid decreasing. An auxiliary pump and/or buffer should be fitted in such cases in order to safeguard the correct supply to the pump.
- With clean water at room temperature, optimum pump performance is obtained at 2 bar and with a buffer fitted at the pump inlet. With an adequate hydraulic system on the suction line, most pumps will operate with direct suction without the need for auxiliary pumps. Recommended range of inlet pressure from 0.5 to 3 bar (max. 10 bar). Refer to the pump in question.
- If the pump has been in storage for some time, it should be moved by hand and the delivery pipeline should be disconnected in order to remove any air inside the pump.

***SUCTION ACCESSORIES:*** are designed for protection against overpressure, to control the inlet flow rate, contamination or temperature and to facilitate maintenance.

- We recommend fitting a shut-off valve on the suction circuit to facilitate pump maintenance.
- We recommend fitting a supply buffer on the supply circuit to combat high stress conditions, such as high temperatures, auxiliary pump, very high pressures or flow rates, and long pipelines.
- Check and clean inlet filters regularly to prevent low or no flow.
- Intermittent cavitation will not damage the pump in the short term, but a pressure gauge should be fitted on the pump supply to check the supply pressure accurately.
- The size of all accessories must be chosen with care to ensure the inlet flow is not impeded.
- All accessories must be compatible with the pumped solution in order to prevent premature failure or malfunction.
- Fitting a pressure sensor on the pump inlet offers additional protection by turning off the motor when the inlet pressure is not positive.

***INLET BY-PASS:*** choose the type of control valve by-pass with due care and attention.

- The valve by-pass on the pump outlet must be connected to a tank separated from the pump suction by at least one partition wall.
- It is possible, but not recommended, to connect the by-pass directly to the supply circuit provided the pump is protected. This protection may be provided by a pulsation damper or pressure reducer. We also recommend fitting a thermostatically operated valve, which will be triggered if the by-pass pipeline temperature becomes dangerous.
- We advise using a braided flexi hose to connect the by-pass to the pump inlet (not metal braid).
- It is very important that the diameter and length of the by-pass pipe are dimensioned correctly. Restricting the by-pass line can lead to problems with the system, such as turbulence in the supply tank, counter pressure on the control valve and excessive pressure at the pump inlet.
- It is usually sufficient to dimension the circuit one size above the size of the by-pass connector. However, this can vary depending on the variations in the length of the line.
- Control the pressure in the by-pass line to prevent the risk of excessive pressure at the pump inlet.
- The by-pass line must be connected to the pump inlet at an angle of 45° or less, and the length of the line must not be below 10 times the inlet diameter of the pump.  
For example: inlet 1" – the length of the by-pass line must not be below 10" (254 mm.)