Protecting the Grundfos Redi-Flo 2 Pump from Heat Damage

The Grundfos Redi-Flo 2 Submersible Pump provides an excellent tool for the purging of groundwater monitoring wells. However, it requires special care and handling to prevent catastrophic failure of the pump due to heat damage.

The Grundfos Redi-Flo 2 Pump is designed to provide optimum performance when used in a 2" monitoring well, pumping water free of soil fines and sand particles, and placed well up off the bottom of the well casing. The pumps rated speed is 22,800 rpm at 400 Hz. This high rate of speed or, conversely, extremely low speeds can cause the pump to overheat and suffer catastrophic failure under other than the optimum conditions previously stated.

Figure 1, below, illustrates the design principle of how pumped water circulates past the pump motor to keep the pump cool. Additionally, there is water that circulates inside the pump motor to cool the bearings and bushings. Any combination of the following conditions can inhibit water circulation and subsequent cooling:

- Running the pump in a larger than 2" diameter well casing, or in a bucket, without a cooling shroud.
- Running the pump dry.
- Running the pump for extended periods of time at extremely low speeds.
- Placing the pump on the extreme bottom of the well casing.
- Fines and/or PVC shavings binding the impellers and guide vanes.
- Failure to replenish the water in the rotor/stator jacket during extended periods of use.

Observance of the following precautions can help to prevent catastrophic failure of the pump due to heat damage and limit the cumulative effect of heat damage over the service life of the pump.

A pump cooling shroud must be installed on the pump when using the pump in a larger than 2" diameter well casing. Figure 2, below, illustrates the proper installation of the cooling shroud. The cooling shroud isolates the screened suction interconnector and forces water to circulate past the pump motor. If using the pump cooling shroud in a larger than 2" monitoring well, be sure to install the shroud correctly. The set- screws should be anchored to the pump housing, not the screen. The screws are mainly intended to keep the shroud from sliding off the pump. If they are over-torqued, they will impede the rotation of the impellers and guide vanes and inhibit pump performance.

Do not run the pump dry. Immediate over-heating of the pump will cause irreparable damage. Gauge the well periodically to monitor the water level. Do not simply watch for bubbles in the pump discharge tubing. Harmful heat build-up is occurring by the time you see bubbles in the pump discharge tubing. Before pumping, ensure that there is adequate water in the well to fill the column of tubing. 1/2" tubing contains 0.0425 gallons per foot. 3/8" tubing contains 0.0319 gallons per foot.

The Grundfos Redi-Flo 2 pump is capable of milliliter-discharge-rate performance at shallow depths. However, this flow rate will not provide for the external cooling action of water circulating past the pump motor. For this reason, the Grundfos Redi-Flo 2 pump is not recommended for long-duration low-flow applications. There are several high-performance 12-volt pump options available which are more suited for this application.

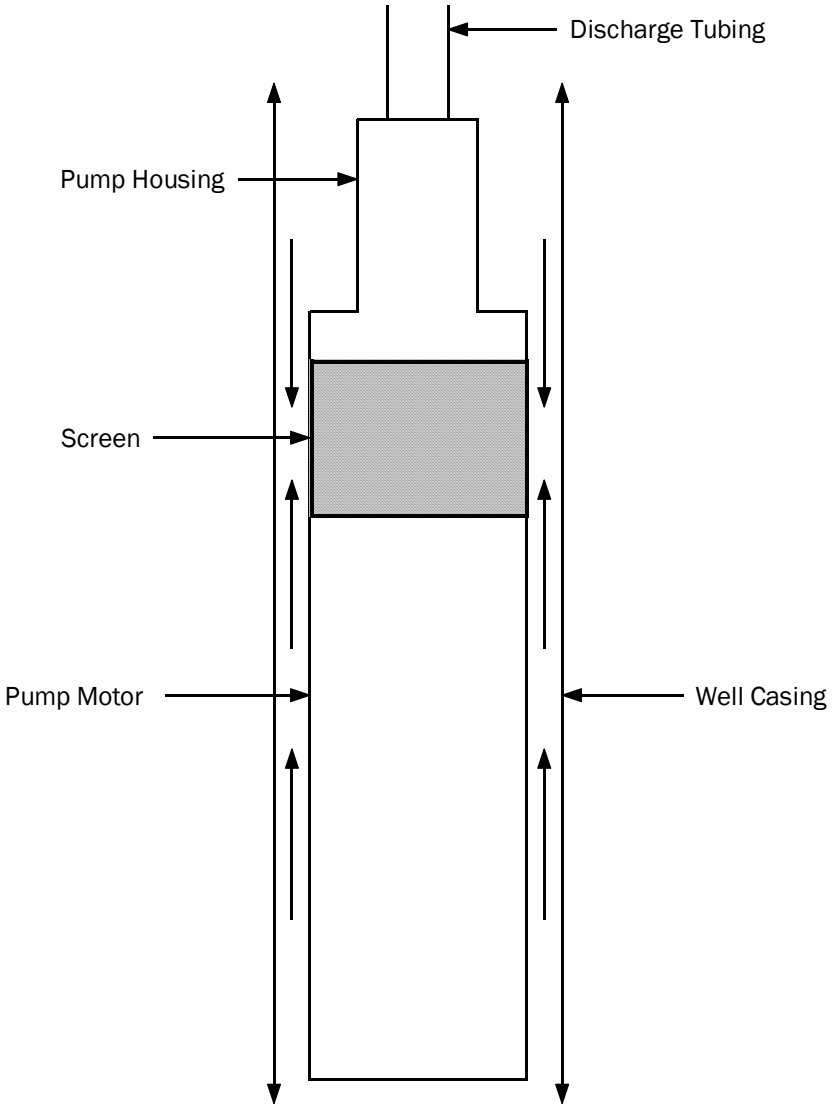
Do not place the pump at the very bottom of the well casing. PVC shavings and/or fines that have accumulated in the well casing bottom cap can cause the impellers to bind and inhibit pump performance. Additionally, it is critical that the pump be placed in the water column at a depth that allows adequate water to circulate past the pump motor and cool it. If possible, there should be at least five feet of water below the pump.

The water inside the pump motor must be changed periodically to ensure proper cooling of the motor bearings and bushings. Water inside the pump is circulated around and through the bearings and bushings to lubricate them and help keep them cool. This water will become sludge-like over time as fines from the groundwater penetrate the pump seals. Changing the water provides for more efficient cooling and for proper decontamination of the pump between uses. Please see the section called Grundfos Redi-Flo 2 Pump Preventive Maintenance on the Do-It-Yourself Service page for complete instructions on how to accomplish this procedure.

The Grundfos Redi-Flo 2 Pump is capable of providing years of rugged and reliable service. Follow these basic operational principles to ensure that you get optimum performance and reasonable service life out of your significant equipment investment.

Figure 1

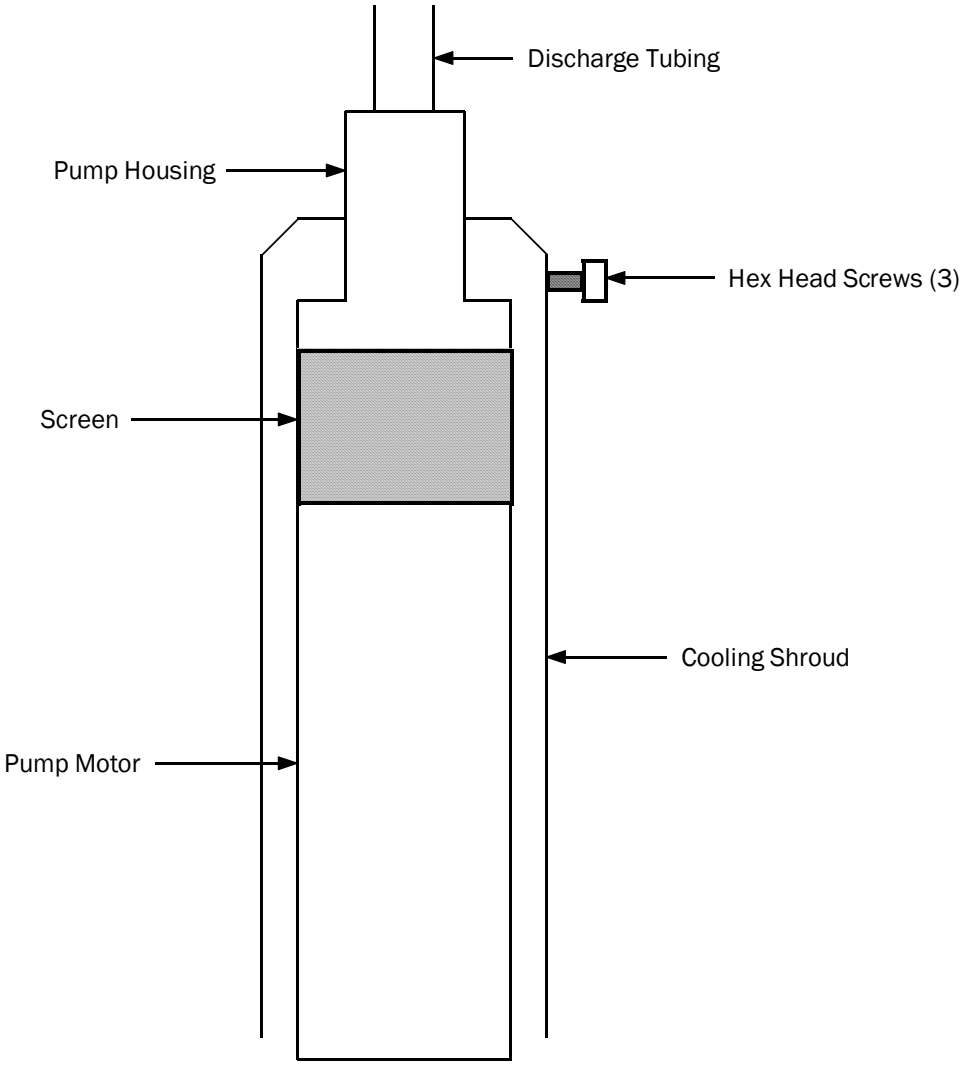
Redi-Flo 2 Pump In Well Casing



The arrows in the annulus between the well casing and the pump motor indicate the flow of water past the pump motor while the pump is running. This water flow provides critical cooling action to keep the pump from over-heating. This water flow is eliminated if the pump is run in a larger than 2" diameter well casing or if it is run in a bucket of water to decontaminate the pump.

Figure 2

Redi-Flo 2 Pump Cooling Shroud Installation



- Slide the cooling shroud up from the bottom of the pump motor.
- Do not anchor the cooling shroud to the screen.
- The hex head screws should be lightly snugged against the impeller housing to keep the cooling shroud from sliding down off of the pump.