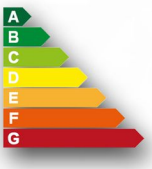
Rodelta: More than just a pump supplier.



Innovative Upgrades for Drinking Water Pumps: Durability and Performance Improvement

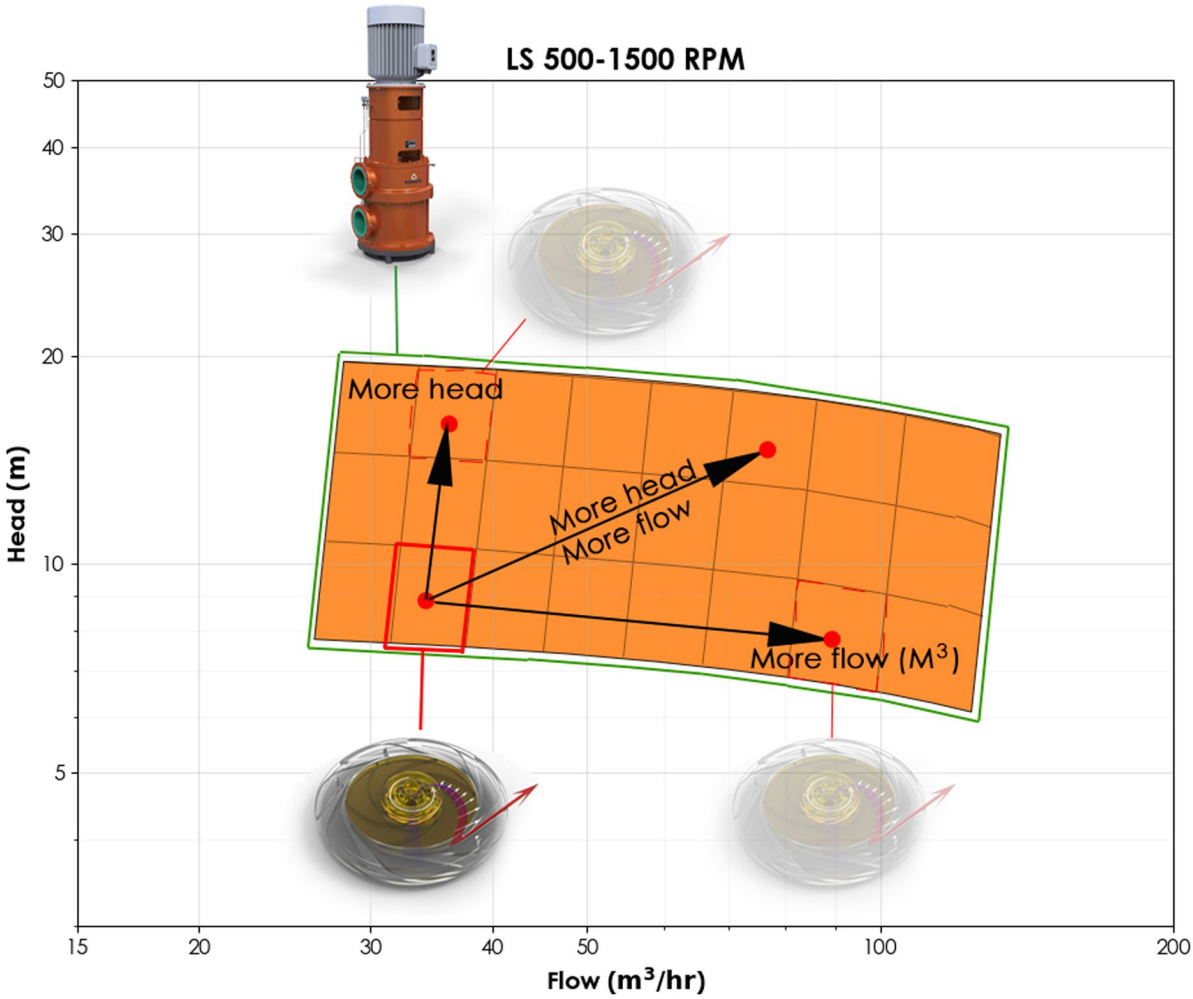
Nowadays, water companies are actively taking steps to ensure the future availability of safe drinking water. These efforts are driven by various factors, including the growing population and increasing demand for sustainability in the drinking water sector.

To meet this market demand, expansion of pump stations with new pumps is being considered, among other measures. In some cases, this even leads to new construction, especially when there are significant changes in water demand. However, in practice, it sometimes happens that, despite changing water needs over the years, the pump station remains unchanged. Due to frequency inverter-controlled motors, the demand could still be met by increasing the pump speed. This likely caused the pump to operate outside its optimal working range. At that time, this was of secondary importance as the focus was less on energy consumption due to low energy prices, and there was less attention to environmental effects.

In today's climate of rising energy prices and an increasing focus on sustainable business practices, we see a growing attention to these aspects. However, water companies often overlook opportunities in their primary processes and instead invest in solar parks and wind turbines. Significant savings can be achieved in their systems, not only in energy costs but also in CO2 reduction. This can be accomplished through impeller diffuser upgrades for pumps.

The principle works as follows:

Consider the impeller-diffuser combination in the pump as a kind of cartridge that can be replaced as a unit with another. In this way, the performance of the pump can be tuned within a certain range. See Figure 1.



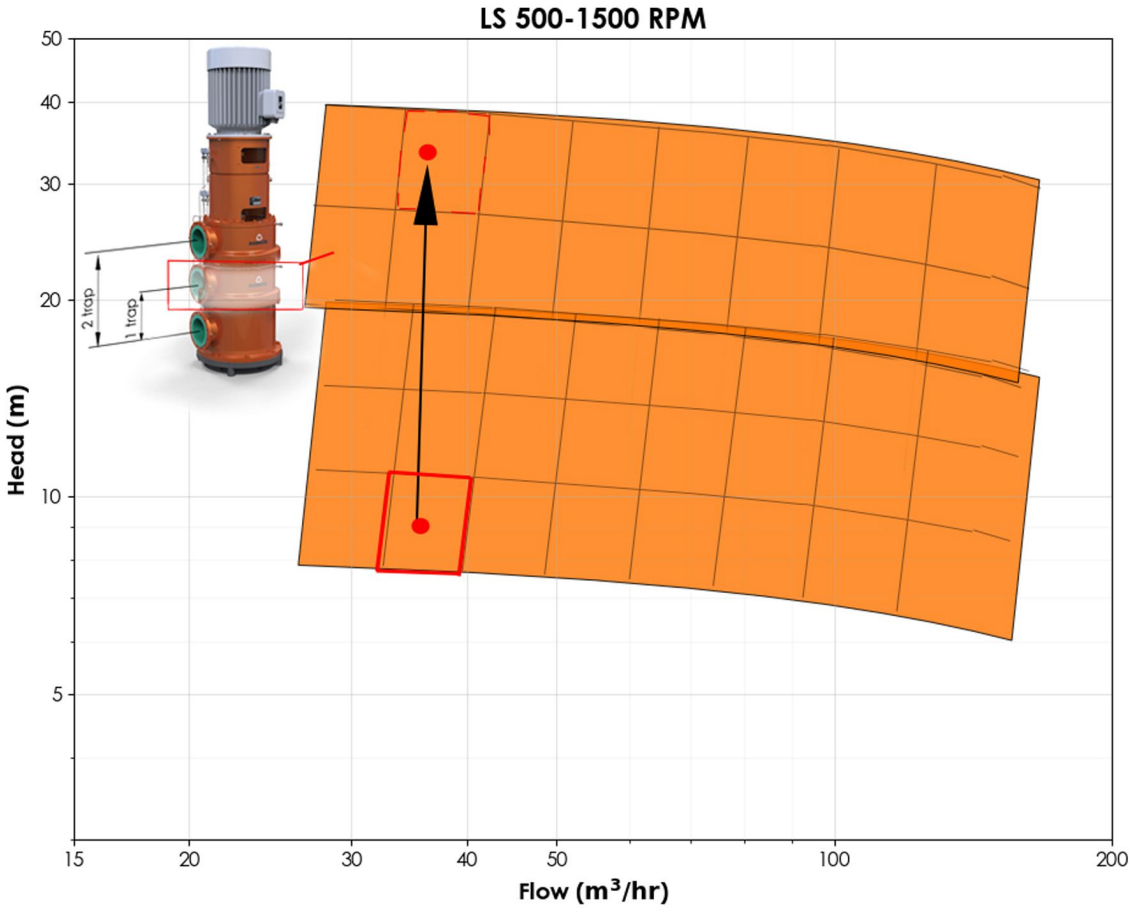
Figuur 1

In this example, we take the LS5 as a starting point, but these principles apply to all impeller diffuser pumps. Suppose the optimal efficiency point of the pump is at a operating point of 35m3 with a head of 9 meters. It is possible to shift this operating point to 90m3 at 8 meters by only replacing the hydraulics, the impeller, and the diffuser.

Similarly, all other points in the operating range can be achieved solely by adjusting the hydraulic "cartridge." Within this operating range, the impeller and diffuser can then be reoptimized for the exact point within this field. This process is carried out by machining the impeller and adapting the diffuser accordingly. The significant advantage of this technique is that there is no need to modify the piping to and from the pump.

However, there are even more possibilities.
Suppose the original operating point of 35m3 at 9 meters needs to be adjusted to 35m3 at 30 meters of head (with higher pressure). In such a situation, this specific operating point may not be achievable within the original operating range. To achieve this, it is possible to add an additional pump stage.

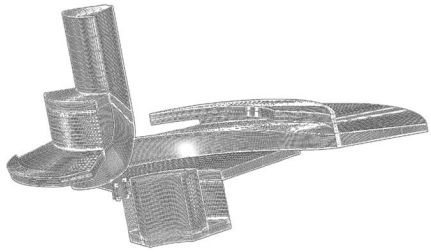
What is a pump stage? It involves an additional combination of impeller, diffuser, and a volute casing. An additional volute casing is placed between the cast part of the suction flange and the cast part of the discharge flange, in which an extra impeller and diffuser are integrated. This raises the pump, resulting in a so-called multistage pump. This is represented as the second orange area in the table in Figure 2.

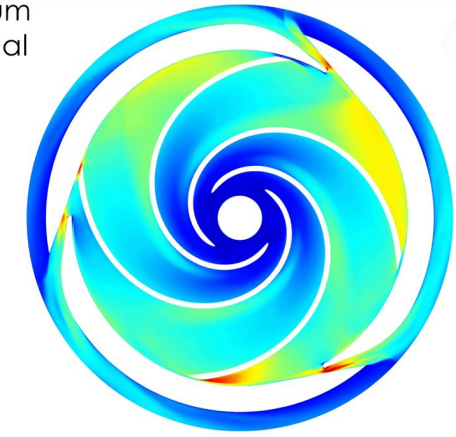


Figuur 1

Similar to the first orange field, this area consists of a series of impeller-diffuser combinations covering the entire spectrum. By selecting the appropriate impeller and diffuser that matches the new head of 30 meters and a capacity of 35m3, the pump can deliver this specific performance. Within this range, the speed, impeller, and diffuser are then reoptimized to operate precisely at the most efficient point, meaning that the pump delivers the required performance with minimal energy consumption.k.

When pumps have been in the field for a significant period (approximately 15 years) and are still operating at their optimal efficiency point, it can still be interesting to make hydraulic adjustments. Over the years, Rodelta has optimized its impellers and diffusers with the help of contemporary technological possibilities, surpassing the maximum achievable efficiency of Anderson. This often allows for additional significant savings. The hydraulic improvements can be likened to the classes IE2, IE3, IE4, and now even IE5 in electric motors. Continuous improvements are possible over the years, similar to the ongoing progress in electric motor classes.





But how do you determine if there are improvements and savings possible in your pump system?

Rodelta offers the option to conduct performance audits, and detailed information is available in our comprehensive brochure, obtainable from our sales representatives. The purpose of these analyses is to assess whether a pump system is operating optimally at its designed operating point. For stations equipped with impeller diffuser pumps, such as the LS type and other pumps from various manufacturers, this evaluation can determine whether upgrading the hydraulics to a pump characteristic that better aligns with the most efficient point yields savings. These savings extend not only to recovering investment costs within a certain period but also encompass the contribution of this upgrade to the goals related to CO2 reduction according to the Sustainable Development Goals (SDG).

If you have any questions or would like to learn more about these possibilities based on this information, feel free to contact our sales representatives at any time. They will be happy to connect you with our hydraulic team, who can provide you with more detailed information about the range of options available.

RODELTA®

Twentepoort Oost 24,
7609 RG Almelo, the Netherlands
Tel: +31 (0)85 049 5900
Email: info@rodelta.com
www.rodelta.com