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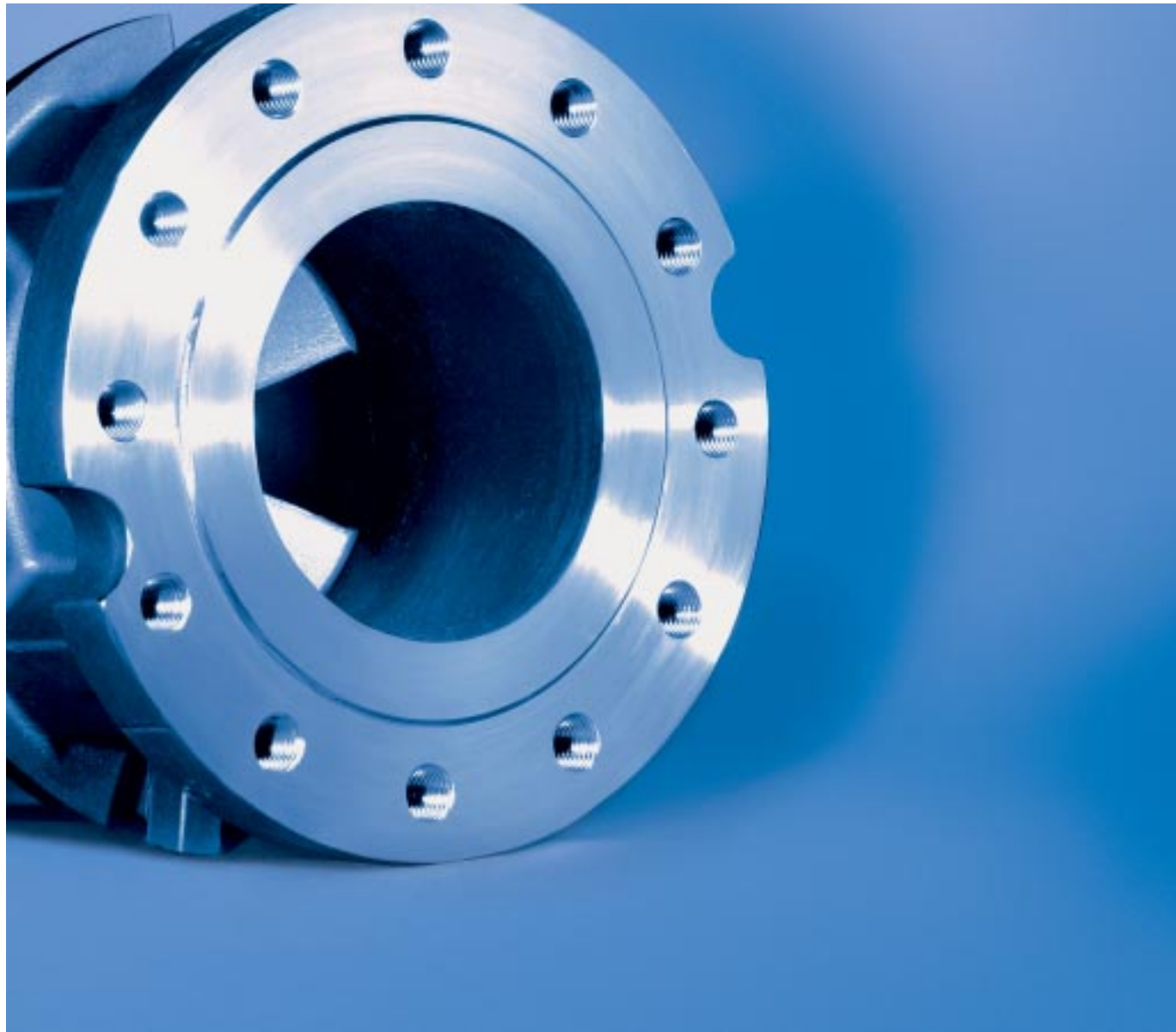
# HDM – Double Suction Submersible Deepwell Pumps

**Minimum Thrust = Maximum Trust**

**HDM**

**Powerful Arguments** points for the HDM invented by RITZ

**Hard Facts** points for the HDM invented by RITZ



## Maximum Operating Safety

Constant performance – error-free operation: An HDM invented by RITZ uncompromisingly guarantees maximum operating safety. This is the RITZ formula for success:

- Double-entry construction with two pumps operating in opposite directions
- 100 percent free of axial thrust without any load influencing the thrust bearing
- Low suction effect achieved by cutting flow velocity in half
- Minimum draw-in of floating and solid matter
- Specifically tuned motor developed by ourselves



## Long Service Life

The calculation is simple: Maximum operating safety ensures an extremely long service life. This is what RITZ's good reputation stands for – it has been linked with longevity for decades. Because time and again, RITZ pumps define anew the state of the art for trouble-free continuous operation.

**HDM delivers a lastingly convincing argument with:**

■ **Free of axial thrust:**

There is no heavy load acting on the thrust bearing, as is the case for single-entry pumps.

■ **Cutting the inlet flow velocity in half:**

Minimises wear in the pump by reducing intake of abrasive particles.



## High Profitability

There is no need to have knowledge of business management in order to understand that the long service life of the HDM guarantees high profitability. Extremely high efficiency in operation / power consumption – pump up to 85 percent, motor up to 90 percent – as well as exceptionally long service life ensures minimum life-cycle-costs, which are, on the long term, more significant than the acquisition cost.

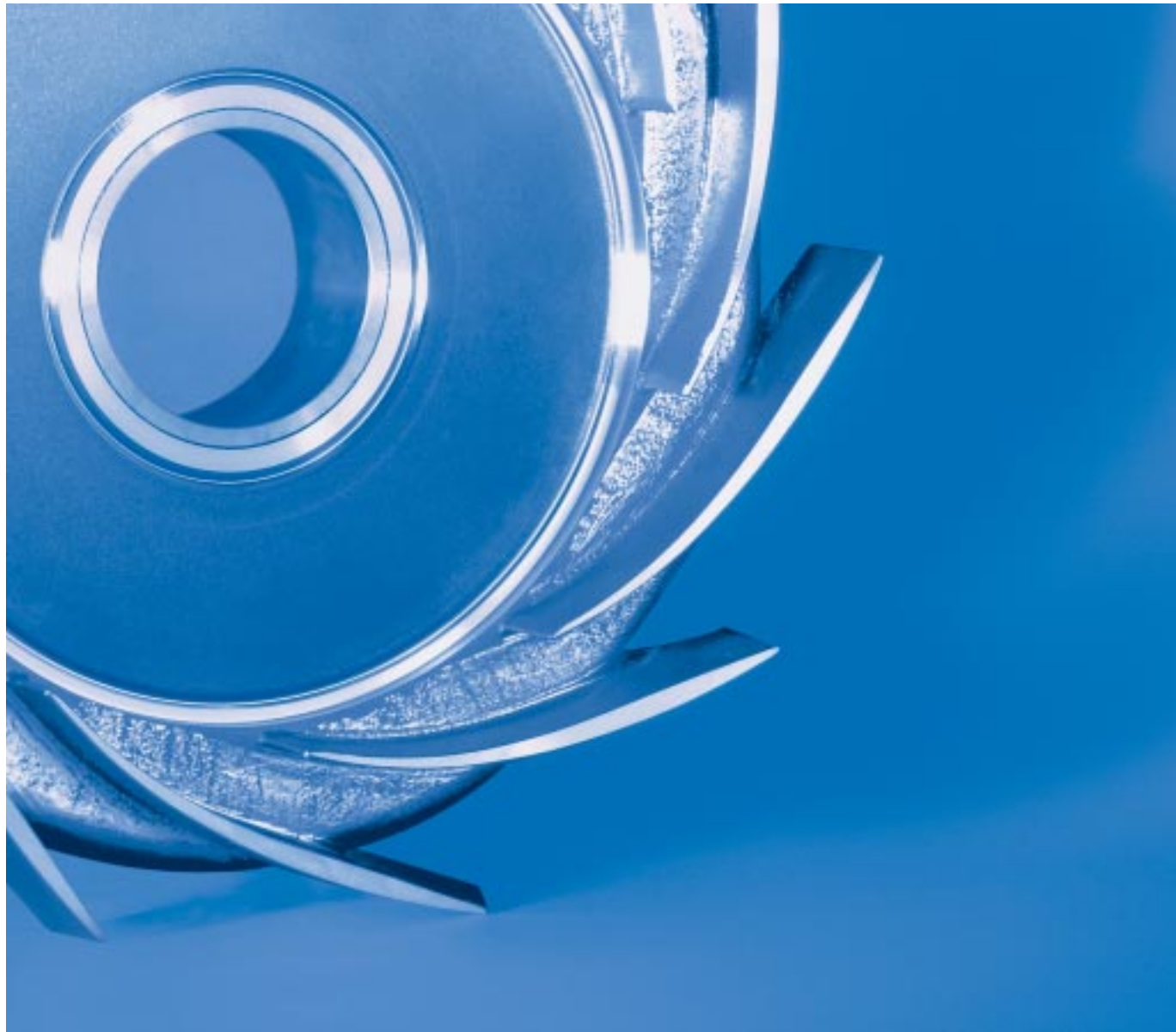


## Challenging Applications

Quality is one, quantity the other outstanding feature of the HDM. For this, RITZ developed its own set theory, which has no equal in the market:

- Flowrate up to and over 2000 m<sup>3</sup>/h (9000 U.S. gpm)
- Delivery head up to and over 1500 m (5000 ft)

This performance is also achieved by the HDM under the most arduous operating conditions: In mining and strip mining for extracting coal, gold, copper, tin or diamonds, offshore or for water delivery – RITZ brings the fluid up to the surface under all conditions. Also, aggressive and abrasive pit water does not impair the HDM in any way!



## Invented By RITZ

Tradition and innovation form the basis for RITZ's success. The development of the axial thrust-free and double-entry submersible motor pump, patented in 1930, was a milestone in the successful history of this pump specialist. The motivation for this brilliant development was higher delivery demands under the most extreme stress.

The development of the double-entry construction provided the basis for managing today's delivery demands. Since then, thousands of pumps have been produced, supplied and, supported operating trouble-free until to date all over the world – among others, also the largest submersible motor pump in the world.

RITZ does not rest on its laurels. We constantly enhance the development of the HDM through updated technology as well as our own experiences in order to maintain the position of market leader.



## **Flexibility**

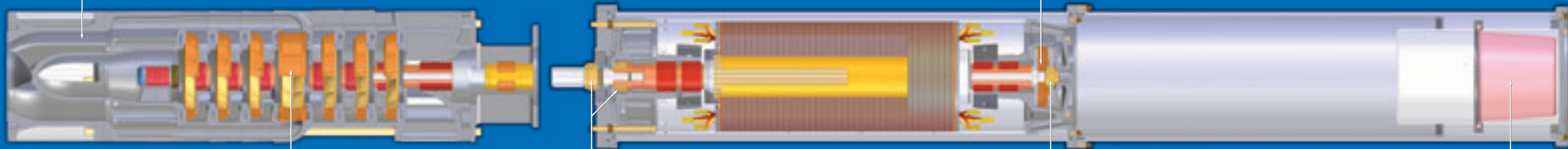
Each HDM is an individual solution including an objective analysis of the operating conditions and an accurate evaluation of the specific requirements. Sound know-how and a complete product range provide the foundation for competent consulting. After having determined the requirements, each HDM is produced in a modular system for the particular application. Producing in series would, of course, be faster, but it would not fulfil the high standards for an HDM. The HDM always represents the optimum solution for each application.

The HDM is especially produced for your specific application based on a modular system. It is the goal of the system to find an optimum solution via a combination of proven parts.



## Inlet / outlet casing

Inlet and outlet flow passages are optimised to maximise efficiency by reducing turbulence.



## Deviating stage

The special back-to-back diffuser precisely controls the flow from the final stage of each pump element to the discharge passages.

## Mechanical seal

The mechanical seal prevents pumped media combining with the motor coolant, prolonging life.

## Thrust bearing

Proven materials with highly finished bearing surfaces allow minimum friction losses and long service life.

## Integrated impeller

The integrated impeller circulates the motor coolant also lubricating the thrust and radial bearings.

## Diaphragm

Differential pressure between motor coolant and pumped media is eliminated by use of a pressure compensation diaphragm assembly, prolonging service life.

# Double Entry

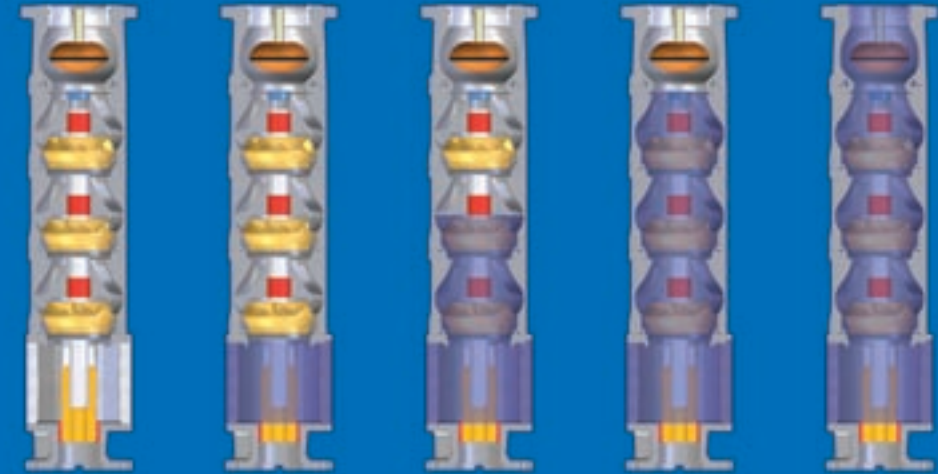
Better safe than sorry: The HDM generates its performance from two contra-rotating submersible pumps arranged one above the other. The pump suction is located at each end of the HDM pump with discharges combined at the centres and piped through casing channels to the top. The HDM pump assembly is driven by a common shaft from the submersible motor mounted below. The double entry construction principle offers significant advantages:

- Complete axial thrust compensation
- Flow velocity cut in half
- Smaller cross-sections of impeller inlets

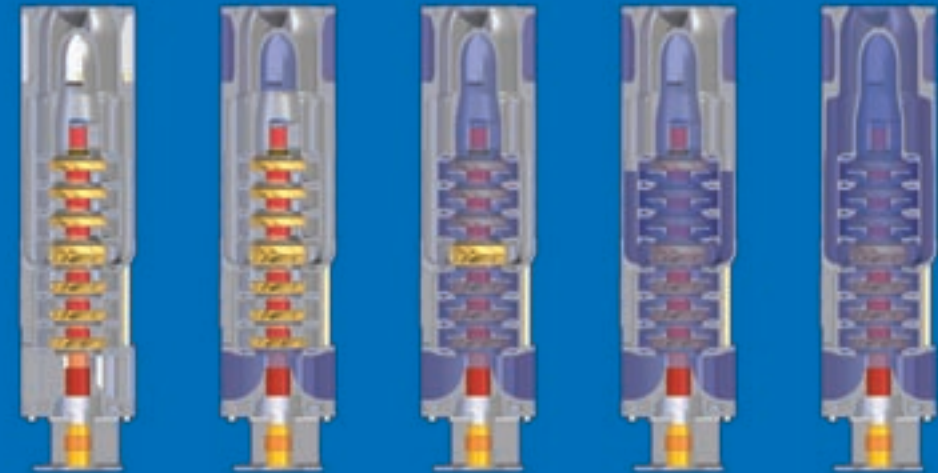
**These three technical advantages ensure less wear, which means:**

- Maximum operating safety
- Long service life
- High profitability

Single Suction

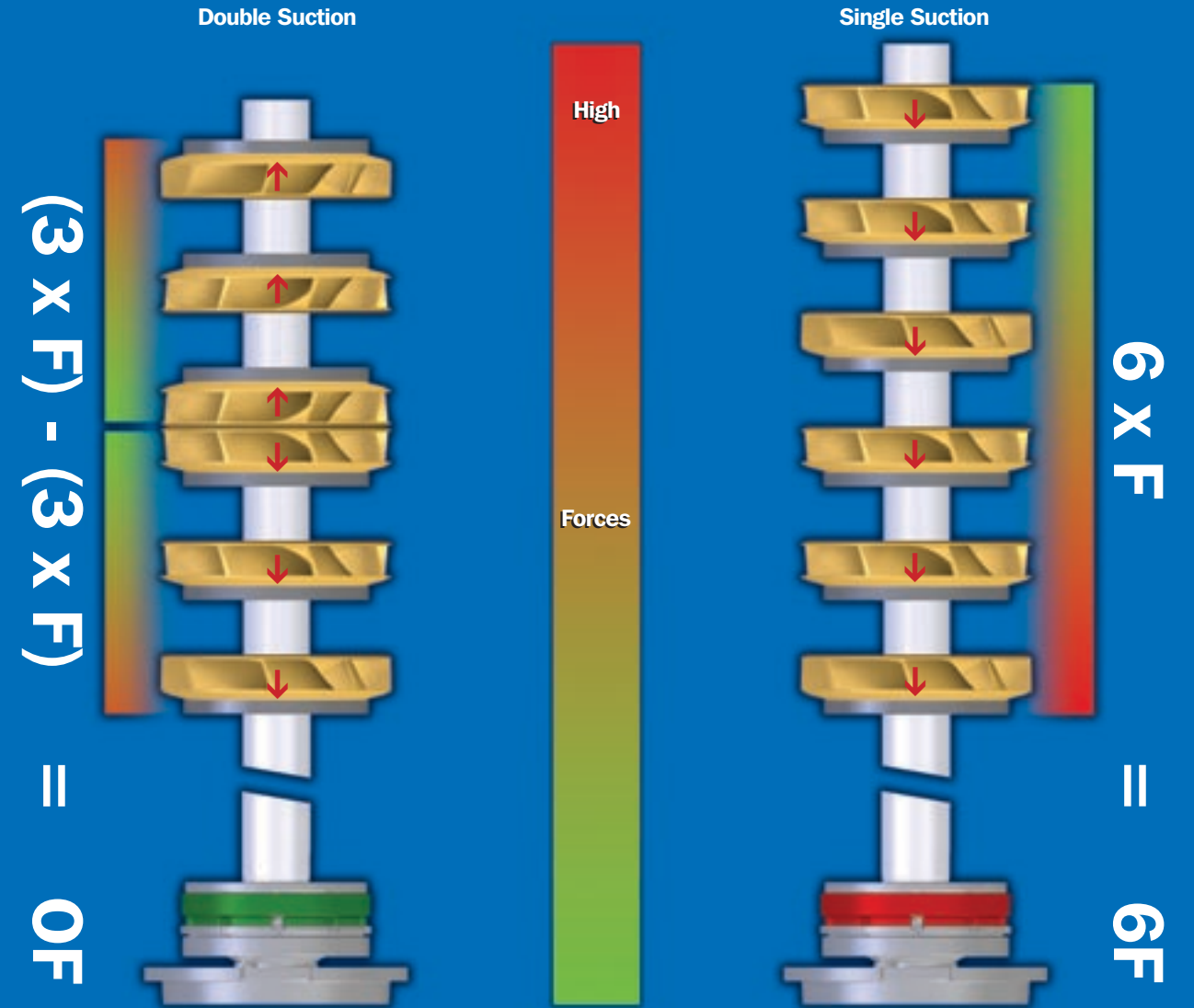


Double Suction



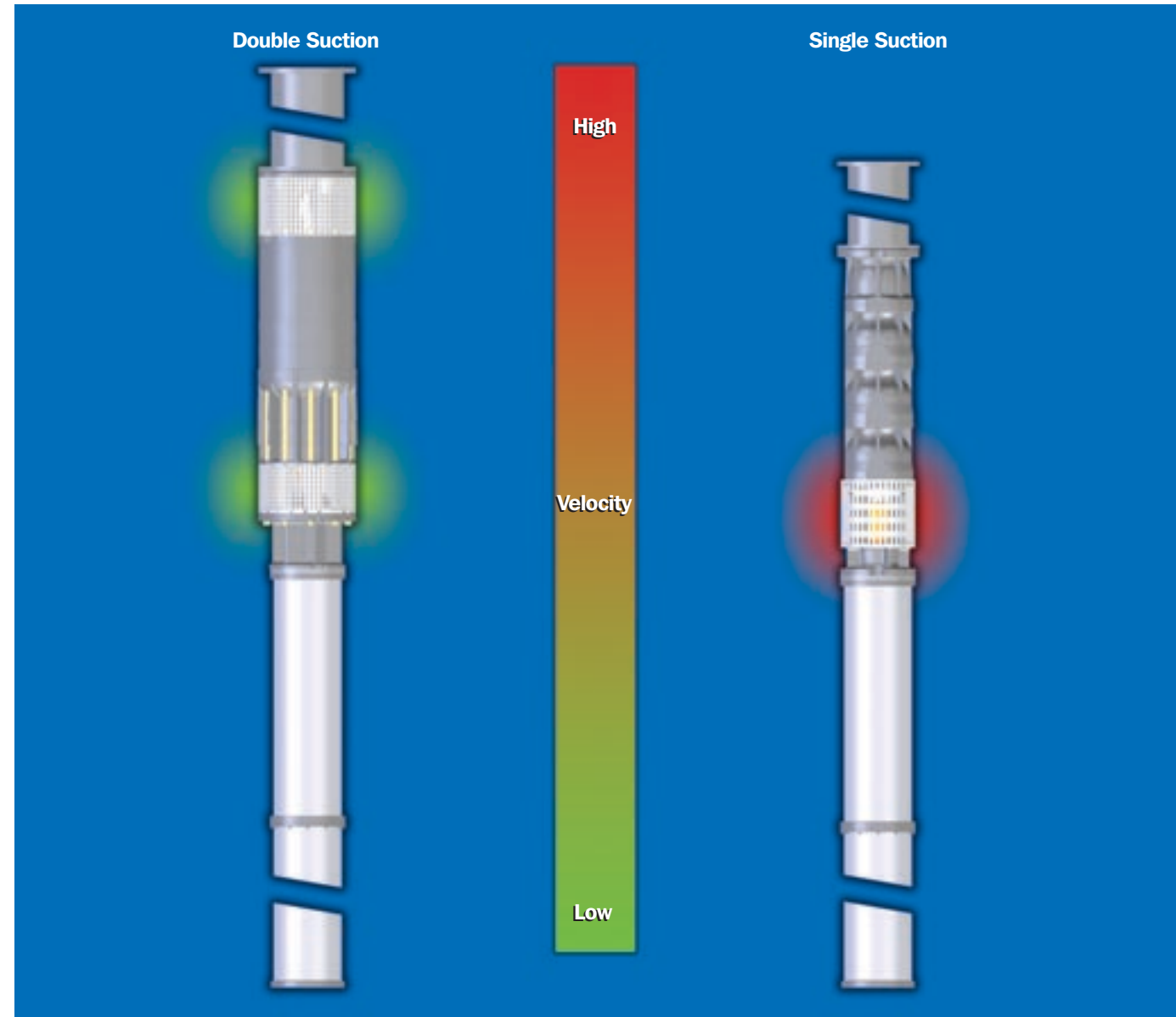
# Free Of Axial Thrust

Single-entry submersible pumps have one key disadvantage: An increase in pump performance leads to an increase in axial thrust, and has fatal consequences: High forces act upon the motor thrust bearing, which is heavily stressed by these extreme loads. When single-entry submersible pumps are confronted with high pump performances, this often means the end. The double-entry construction of RITZ ensures complete axial thrust compensation – the thrust bearing says: Thanks!



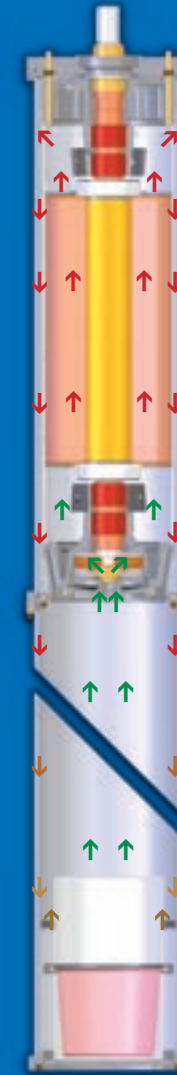
## Flow Velocity Cut In Half

Each of the two pumps arranged one above the other delivers half of the flowrate. This also results in a halving of the flow or prime velocity, outside the pump, protecting the well sides around the pump suctions and minimising the draw-in of abrasive solid and floating matter. This solution considerably reduces the wear of the pump. In addition, the halved capacity per each pump allows smaller cross-sections of the impeller inlets and leads to lower circumferential velocities in the sealing gaps – a further reduction in wear.



# Strong Drive

The heart of each HDM beats accurately in a powerful cycle: A heavy-duty motor built from a one-piece casting, which takes the electrical conditions into consideration already in the construction stage. In order to keep the cross-sections of the cables and the energy losses as low as possible, HDM high-voltage motors are built for up to 13 kV operation. The future operating conditions also play an important role when developing the motor: A modular cooling system is tailored individually to the application, thus making it possible to match the components (winding, forced circulation cooling and heat exchanger) to the real operating conditions already during production.



# Technical Features

## Specifications of the pump

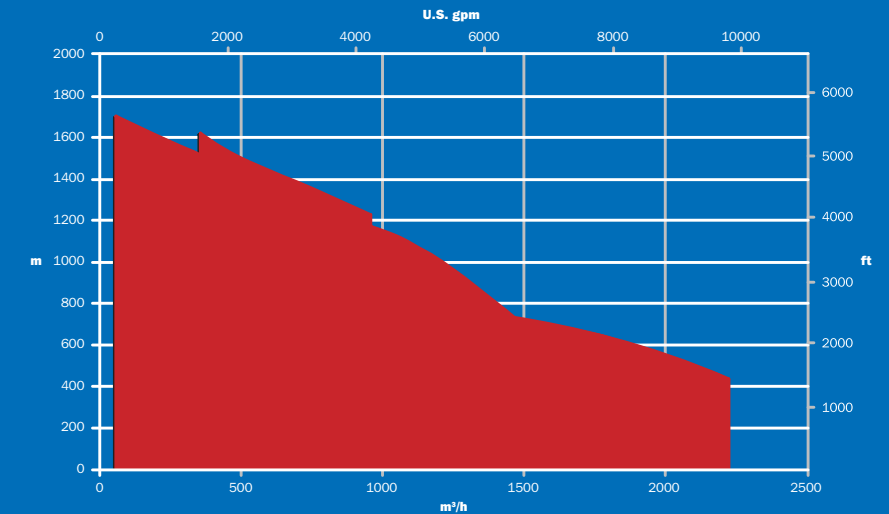
Well diameter	20" - 40" (inches)
Pump connection (discharge side)	DN 150-350 6" - 14" (inches)
Flowrate	Q up to and over 2000 m <sup>3</sup> /h (9000 U.S. gpm)
Delivery head	H up to and over 1500 m (5000 ft)
Pressure	p up to 150 bar (2200 psi)
Speed	n up to 3600 rpm

## Specifications of the motor

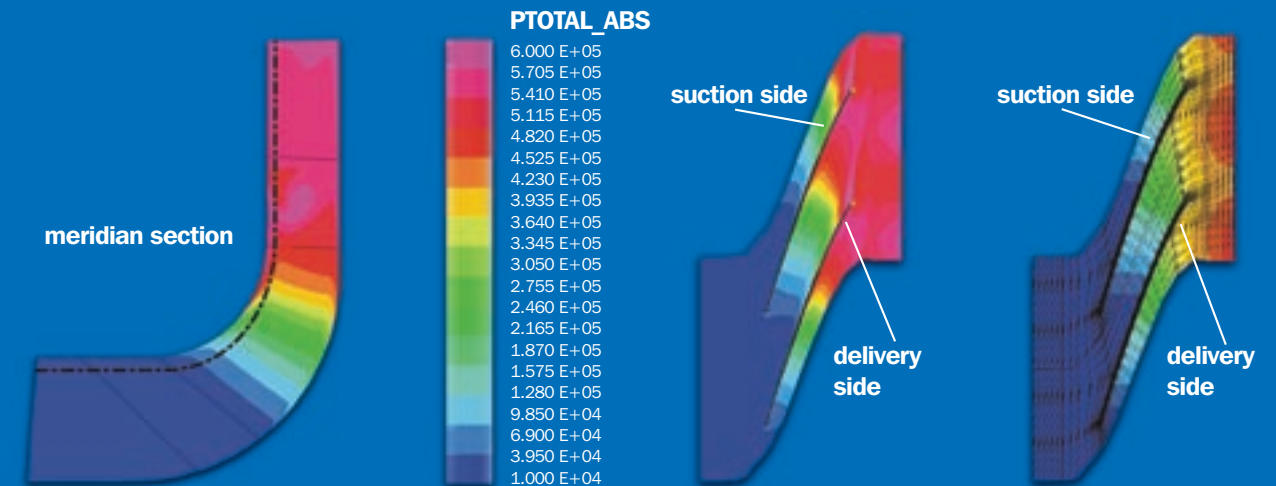
Frequency	50Hz / 60 Hz
Voltage	up to 13 kV
Motor power	up to 6000 kW (8200 HP)
Speed	up to 3600 rpm
Water temperatures	up to 90 °C (200 °F)

The materials are selected individually as per your requirements. Available are: cast iron, bronze, special steel, Ni-resist, nodular cast iron, nickel aluminium bronze, duplex special steel

## Performance diagram



## Vane section 90% vane height



# Flexibility

Each HDM is unique. Instead of producing in series, RITZ focusses on flexible construction and solutions specific to the application:

- **Modular hydraulics:**

The optimum combination of impeller, diffuser and casing results in the best possible adaptation to the duty point at high efficiency.

- **Modular material:**

The specific selection of materials guarantees an optimum matching to the operating conditions.

- **Modular motor:**

The electrical conditions are taken into account, including voltage, frequency and the operating conditions for the design of the winding and the cooling system.

