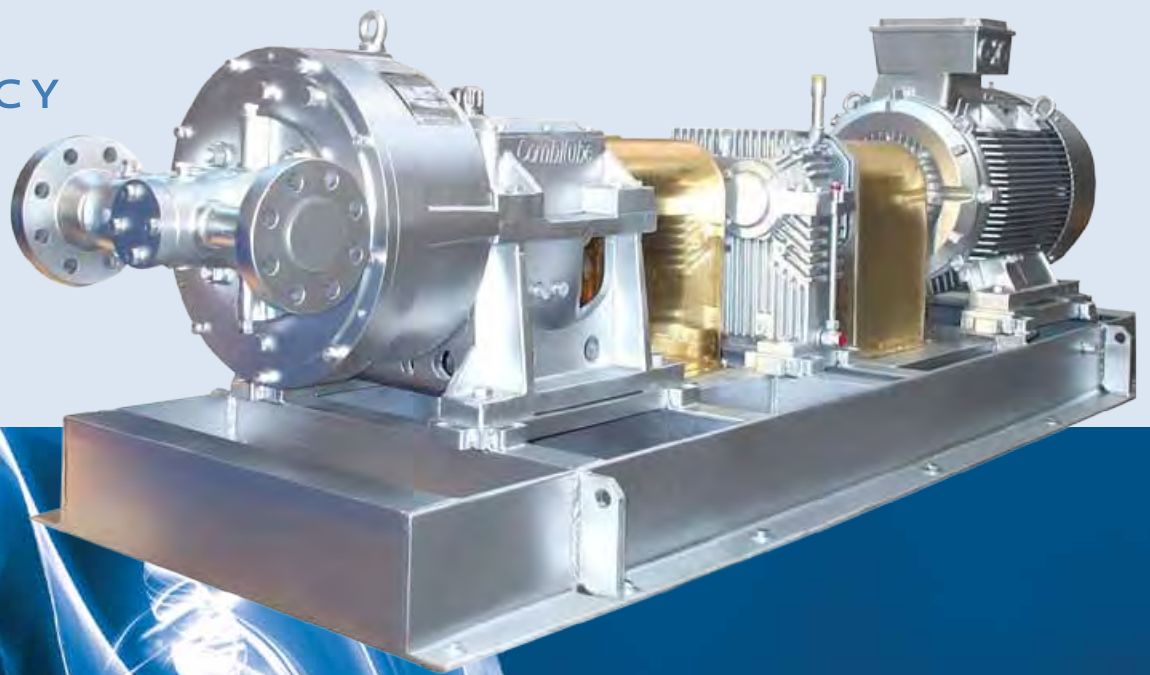




Specialist for Pumping Technology

INNOVATION
EFFICIENCY
QUALITY



Combitude

Low Flow, High Head, Pitot Tube Pumps

For more than 60 years the name Ruhrpumpen™ has been synonymous worldwide with innovation and reliability for pumping technology

Ruhrpumpen is an innovative and efficient centrifugal pump company that offers operators of Pump systems a wide range of quality products. Ruhrpumpen is committed to worldwide excellence, with a complete range of pumps to support core markets, such as Petrochemical, Oil & Gas, Power, Heavy Industry Applications, Municipal, Chemical, Offshore, Mining and Water. Our broad product line complies with the most demanding quality standards and industry specifications such as: API, ANSI and Hydraulic Institute Standards.

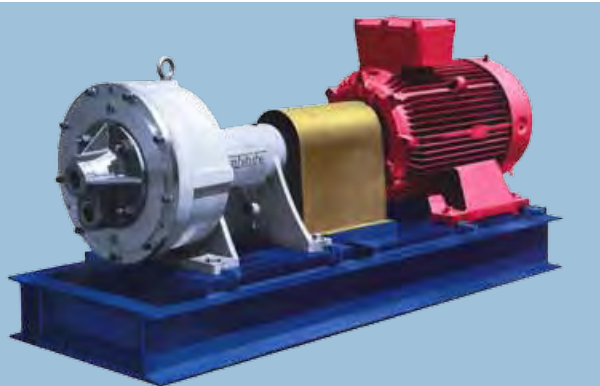
Ruhrpumpen is a vertically integrated company with its own foundry, machine shop, pump design & manufacturing plants and service centers. With strategically located manufacturing plants, operating offices and service centers in many parts of the world, Ruhrpumpen truly is a global pump company which also has the strength to focus on the local necessities of each client.

Pitot Tube Centrifugal Pumps

The Combitube pumps can operate reliably at any point on the performance curve unlike centrifugal pumps which naturally have a more restricted operating range down to Minimum Sale Flow.

Combitube pumps are single stage, pitot tube pumps developed for low flow, high head applications. The pitot tube design produces a stable, pulsation free flow. The ability of the pump to operate with a low flow, makes the pump suitable for a wide range of applications, such as those applications where the flow required varies continuously. There are no axial thrust problems, the minimum flow limit is the thermal stable flow. The main characteristic of this pump is its no impeller technology.

The combitube pump range has been designed to incorporate the best features of pitot tube technology whilst improving the overall design, reducing part complexity and cutting life cycle costs. The benefits are lower maintenance, a reduced requirement for spare parts, enhanced reliability and therefore reduced "life-cycle" costs increased customer satisfaction.



**GREASE LUBRICATED
VERSION**



**OIL LUBRICATED
VERSION**

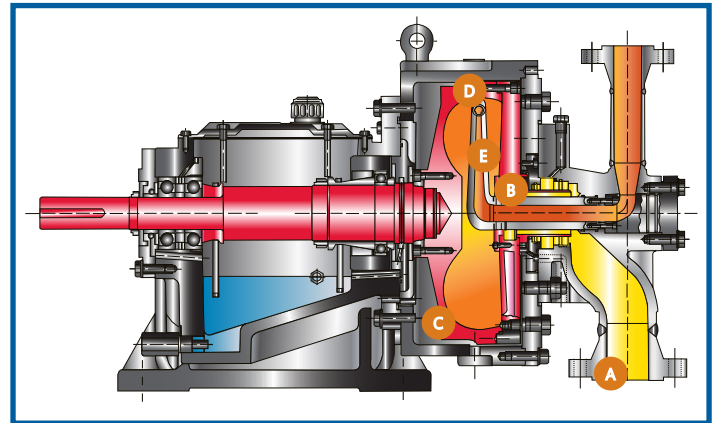
Operation

Liquid enters the pump via the suction line (A) the distribution manifold, which has been specifically designed to maximise interchangeability. The liquid then passes over the mechanical seal (B), which is only under suction pressure, and enters the rotor cover where it is accelerated to a speed identical to the rotor speed (C).

The liquid ring travels at the same peripheral speed as the rotor and this moving fluid annulus has a velocity head.

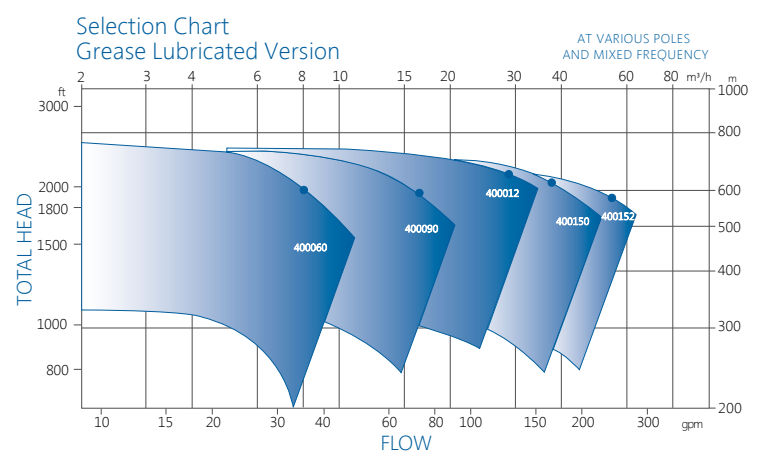
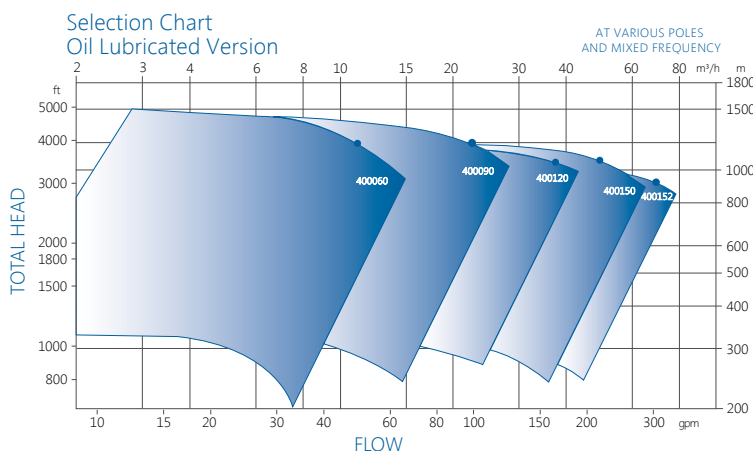
A stationary, airfoil-shaped pitot tube (D) is placed inside the rotor assembly, and has a circular opening located close to the inside of the rotor. The pitot tube works in two ways: firstly, the liquid enters the pitot tube at high velocity under the centrifugal pressure created by the rotor and secondly, much of the high velocity energy is converted into pressure as the liquid passes along the diffuser section (E) of the pitot tube.

Using this operating principle, high discharge pressures can be obtained in a single stage process. The pump generates a pulsation free flow and has a stable Head curve over a wide flow range.



Locating a filter in the suction line is recommended, if there are particles in the fluid.

Performance Range



NOTE: The Oil Lubricated version has a more extended operating range than the Grease Lubrication version.
Contact a Ruhrpumpen representative for more information.

Characteristics

OIL LUBRICATED VERSION

1 PEDESTAL / BEARING HOUSING.
Made of Cast Iron and Ductile Iron.

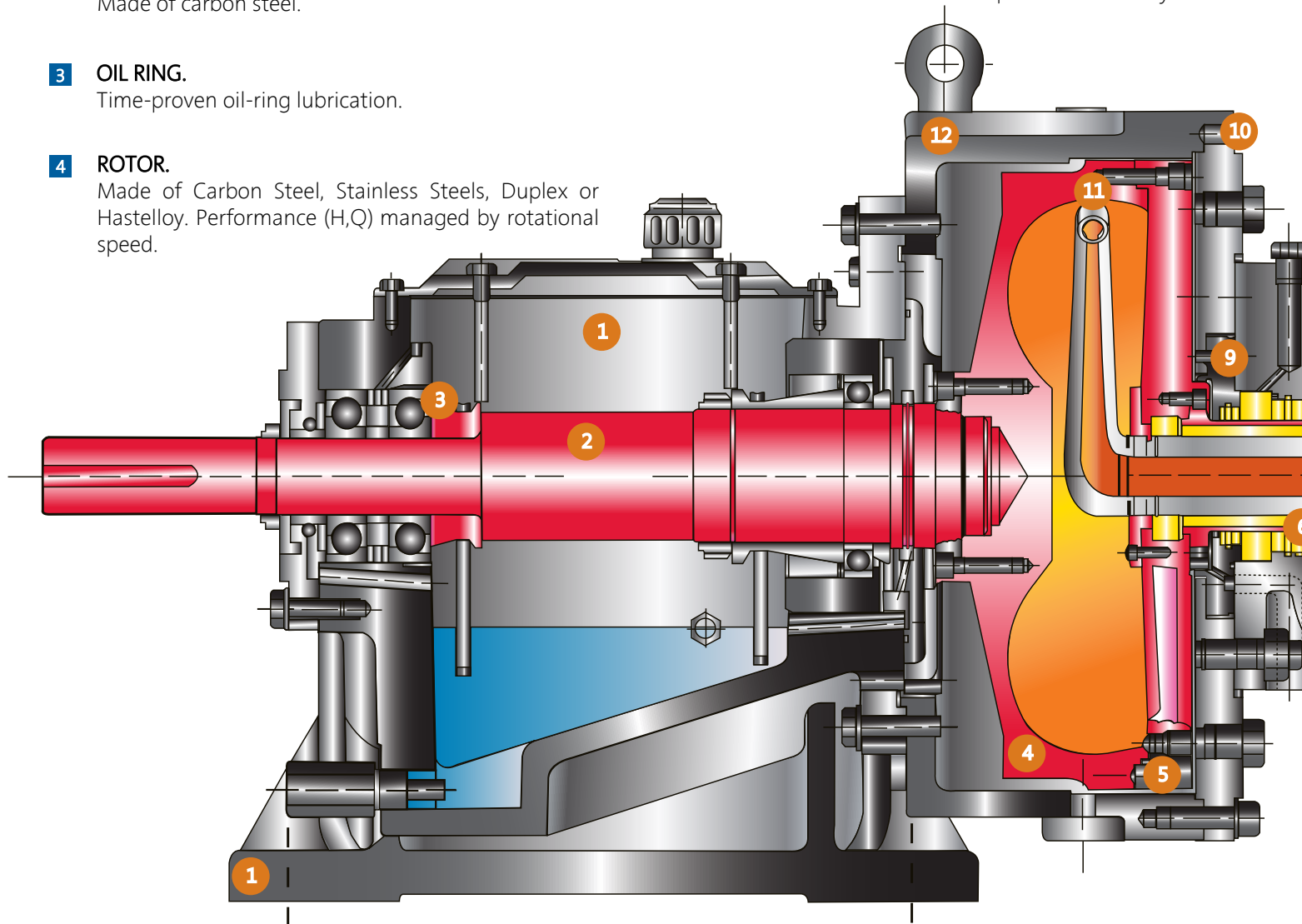
2 SHAFT.
Made of carbon steel.

3 OIL RING.
Time-proven oil-ring lubrication.

4 ROTOR.
Made of Carbon Steel, Stainless Steels, Duplex or Hastelloy. Performance (H,Q) managed by rotational speed.

8 DISCHARGE .

9 SEAL PLATE .
Made of Stainless Steel Duplex and Hastelloy.



5 ROTOR COVER.
Made of Carbon Steel, Stainless Steels, Duplex or Hastelloy.

6 SEAL HUB .
Made of Stainless Steel Duplex or Hastelloy .

7 SUCTION .

10 ROTOR CASING COVER.
Made of Steel.

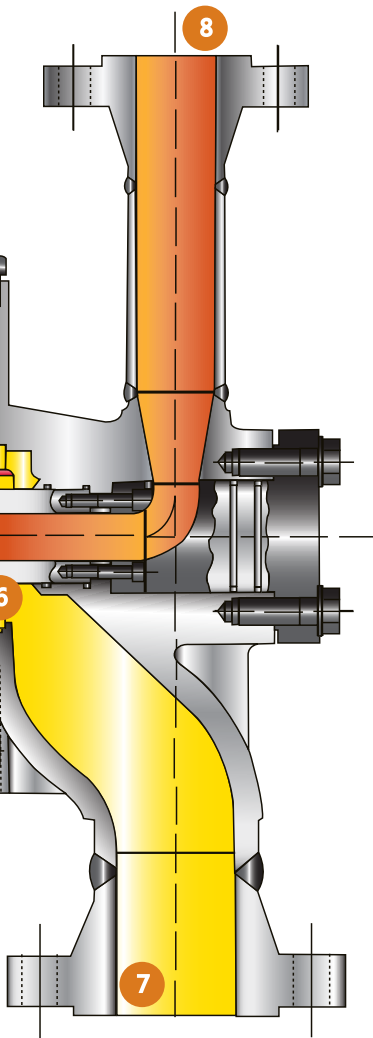
11 PITOT TUBE.
Made of Stainless Steel or Hastelloy .

12 ROTOR CASING.
Made of Cast Iron and Cast Steel upon request.

Description

PRODUCT DESCRIPTION

- Single stage, pitot tube pumps.
- Oil or grease lubrication possible.
- Counter clockwise when viewed from motor end.
- Single or double mechanical seal for shaft sealing.
- Materials of construction available Carbon Steel, Stainless Steel, Duplex or Hastelloy. For bearing housing and Rotor Casing, Ductile and Cast Iron, Cast Steel.
- Sealing of the casing via an O-Ring made from FKM (e.g. Viton). Other materials up on request.
- Oil cooling coil could be provided.
- Designed for mounting horizontally.
- Threaded or flange connections.
- Heavy duty mechanical construction.
- Bearing arrangement available for V-belt in oil lubricated version.
- Rugged wet-end.
- In-line inlet and discharge flanges.



BROAD APPLICATION RANGE

INDUSTRIES.

- Chemical
- Pulp and Paper Industry
- Food Industry
- Brewing Industry
- Steel Manufacturing
- Metal plating
- Automotive production
- Desalination
- Transportation
- Oil extraction
- Cogeneration of "On Site" power

TYPICAL APPLICATIONS.

- Reactor feed, boiler feed
- Felt cleaning, edge cutting, condensate injection
- High pressure cleaning in food processing, packaging
- Filter press cleaning
- Descaling, high pressure showers for quenching
- High pressure coolant feed
- Leak testing engine injector testing
- Reverse Osmosis
- High pressure cleaning of tanks, trucks and trains
- Injection for secondary recovery
- Boiler feed, desuperheating

GREASE LUBRICATED PERFORMANCE DATA

Capacity	Up to 65 m ³ /h	286 gpm
Head	Up to 680 m	2,231 ft
Pressure	Up to 85 bar	1,230 psi
Temperature	Up to 100 °C	212°F
Speed	4,300 min ⁻¹	4,300 RPM

OIL LUBRICATED PERFORMANCE DATA

Capacity	Up to 80 m ³ /h	352 gpm
Head	Up to 1,480 m	4,856 ft
Pressure	Up to 160 bar	2,320 psi
Temperature	Up to 200 °C	390 °F
Speed	6,000 min ⁻¹	6,000 RPM

Note: For pump operations outside this range, please contact a Ruhrpumpen Representative.

Features & Benefits

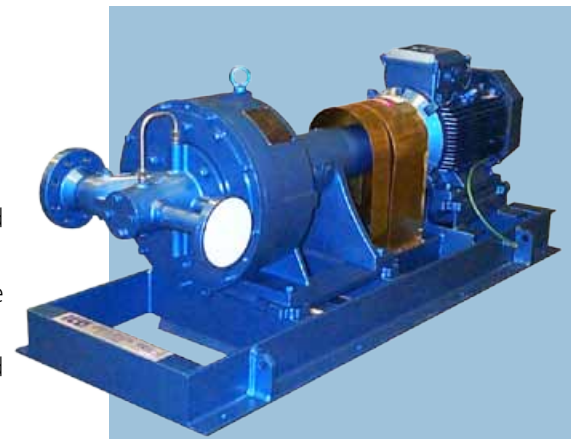
FEATURES.

- Wide operating range.
- Complies with ATEX legislation.
- Multistage pump performance with single stage, centrifugal pump robustness and simplicity.
- Pulsation free operation.
- Seal only subject to suction pressure.
- No contact between pumped medium and pump lubricant.
- Modular construction, designed to maximise interchangeability and minimise stocking & "Life-cycle" costs.



BENEFITS.

- Hydraulically Stable.
- Low speed means low wear & low noise.
- Handles wide variations in flow (from 20% to 110% of BEP flow).
- Wide application in oil extraction and oil processing.
- Suitable for applications in Ex-zone 1.
- Extended MTBF, low cost operation and easy maintenance compared with reciprocating pumps and high speed pumps.
- No dampers or relief valves required. Reduced cost investment because no pulsation.
- Reduced seal costs, leakage minimized, maintenance costs reduced compared with high speed pump and multistage pumps.
- Wide range of applications.
- Isolated bearing pedestal to minimize bearing contamination.
- Flexible. Performance can be adjusted by changing the pitot tube.
- Sloping sump ensures clean oil.
- Wide range of rotational speeds.
- High performance seal availability.



Seize-Proof and "Wet – Dry Isolation"

The Combitube will not seize because there are no close-clearance areas like in conventional multistage & high speed pumps. The Combitube design isolates the fluid fully from the power frame thereby providing enhanced safety, compared with small multistage & high speed pump designs.

Other Ruhrpumpen Products



ANSI Horizontal Process Pump

Single stage, radially split casing with flanged connections, enclosed impeller, foot mounted. Municipal, General Industry, Irrigation, Fire Service and Pressure Equipments.



Heavy Duty, Double Suction, Vertical Process Pump

Heavy Duty, Double Suction, Vertical Process Pump (type VS2).

Cooling towers and other applications requiring large volumes of liquid with relatively high head. Raw water intake.



Single Stage Horizontal Pump

Overhung, radially split, flanged connections, enclosed impeller, mechanical seal. Standard design meets API latest edition (type OH2). Petrochemical, Oil & Gas, Steel Industry, Automotive, Power Generation, Water Treatment, Pharmaceutical and General Process.



Vertical Barrel Pump

Low NPSH "Shockless Entry" first stage impeller (single or double suction), Single or multi-stage. Standard construction materials according to API latest edition (type VS6).








Condensate, Power Plants, Municipal, Hydrocarbons, Pipeline and Refineries.



With every project you can count on **QUALITY, SERVICE, EXPERTISE, INNOVATION** and **COMPETITIVENESS**.
Because we have a commitment to each customer, the community, and the world.
We are Ruhrpumpen, the specialist for pumping technology!



RUHRPUMPEN PLANTS

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-  USA, Tulsa & Orland
-  MEXICO, Monterrey
-  EGYPT, Cairo
-  INDIA, Chennai
-  BRAZIL, Rio de Janeiro
-  ARGENTINA, Buenos Aires

More Information:



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CORPORACION 

February.12