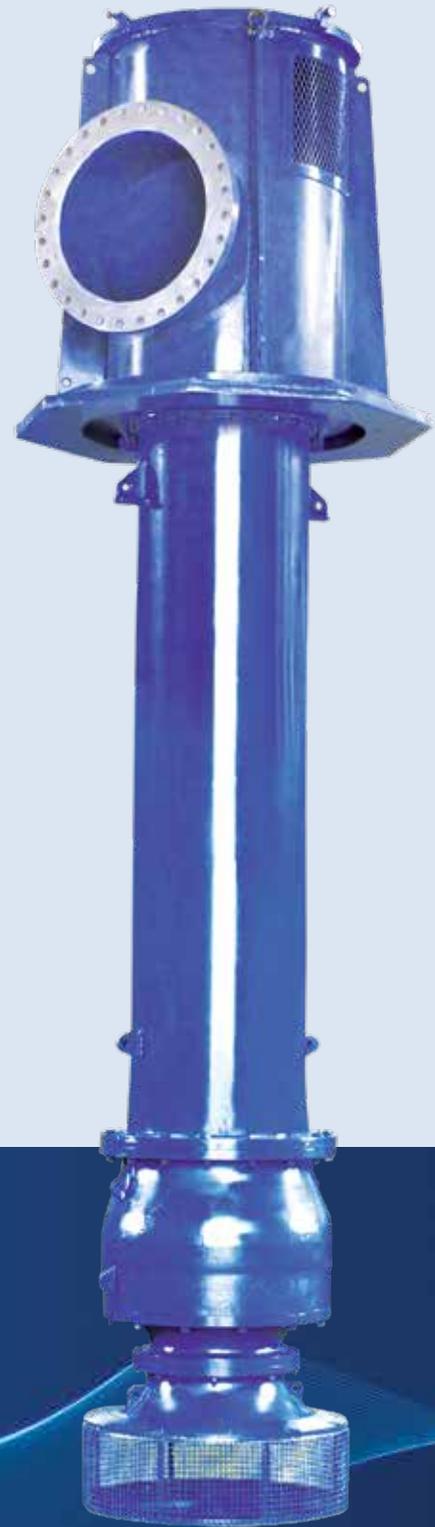




Specialist for Pumping Technology



VCT

**(KX, HX, WX, VMF, MX, RX, VX, SX, TR, PMR)
Vertical Axial Mixed and Radial Flow
Circulating Pump Single and Multi-stage**

For more than 70 years the name Ruhrpumpen™ has been synonymous worldwide with innovation and reliability for pumping technology

Ruhrpumpen is an innovative and efficient centrifugal pump technology company that offers operators of Pump Systems and a wide range of quality products. Ruhrpumpen is committed to global excellence with a complete range of Pumps, Fire Pump Packages and related products, such as Decoking Systems and Tools to support the core markets, namely Oil & Gas, Petrochemical, Power, Heavy Industry Applications, Mining and Water Services.

The broad product line complies with the most demanding quality specifications and goes beyond stringent industry standards such as API, ANSI, Hydraulic Institute, Underwriter's Laboratories, Factory Mutual and ISO 9001.

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

Vertical Circulation Pumps

Our VCT models are pumps for wet pit, they are vertically-suspended, single-casing, mixed or semi-radial flow pumps, single or multi-stage. If required, they comply with API 610 latest edition (VS1 code). With barrel/can they become our model VMT (VS6 code).

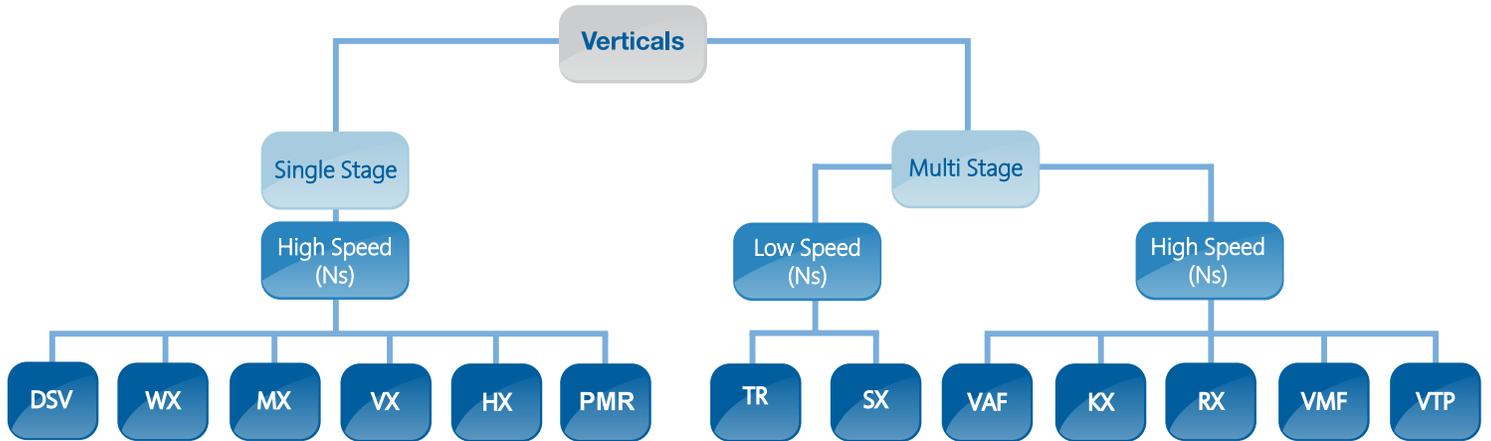


VCT

Vertical pumps consist of a bowl assembly (3), single-stage or multi-stage, suspended on a discharge head (1) from baseplate at the mounting floor. The column (2) length is dictated by the application and installation site.



Ruhrpumpen's VCT models



WX, MX, VX, HX

- Mixed flow
- 4000, 6000 and 5000 nominal specific speed respectively
- 35 ft (11m) to 150 ft (45m)

PMR

- Axial flow
- Between 5000 - 10000 nominal specific speed
- 25 ft (8m) to 40 ft (12m) of head

TR

- Mixed flow
- Up to 1800 min⁻¹
- 33 ft (10 m) to 330 ft (100 m) of head

SX

- Radial flow
- 1000 specific speed
- 150 ft (46 m) to 430 ft (131 m) per stage of head
- Multi-staging when higher heads are required

KX, RX, VMF

- Semi-radial flow
- 2600 and 3600 nominal specific speed
- 100 ft (30 m) to 575 ft (175m) per stage
- Multi-staging when higher heads are required

Applications

Ruhrpumpen has, for many years, been the main choice in Power and Oil & Gas markets for supplying equipment with the best quality and complying with the toughest standards. Our VCT pumps are key during the process of any of these markets.

VCT pumps in power generation plants are useful in different technologies, such as:

FOSSIL FUELED

- Conventional Steam
- Combined Cycle
- Integrated Gasification Combined Cycle

ALTERNATIVE

- Geothermal Energy



This pump is ideal for

- Cooling Tower services
- Circulating Water

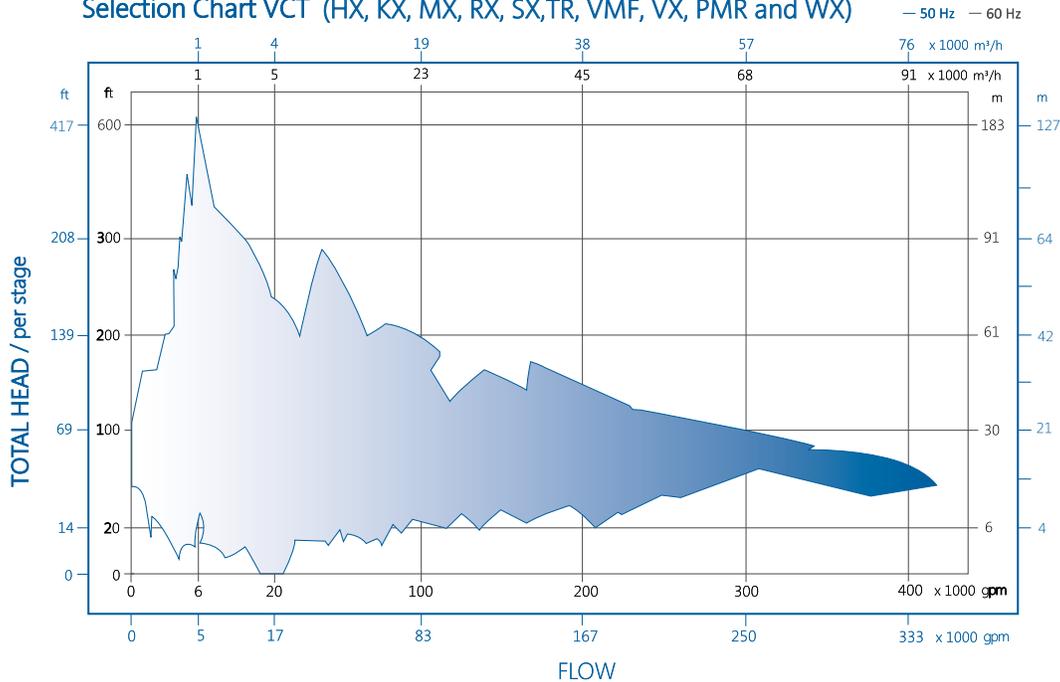
VCT application for Petroleum, Petrochemical and Natural Gas plants:

- Cooling towers
- General offshore
- Crude handling and treatment
- Heavy oil and upgrading
- Water injection
- Water handling and treatment



Performance Range

Selection Chart VCT (HX, KX, MX, RX, SX, TR, VMF, VX, PMR and WX)



RX PERFORMANCE DATA

| | | |
|---------------|--------------------------------|------------------|
| Capacity | up to 45,000 m ³ /h | 200,000 U.S. gpm |
| Head | 24 to 42 m | 18 to 40 feet |
| Max. Pressure | 20 bar | 285 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

TR PERFORMANCE DATA

| | | |
|---------------|--------------------------------|------------------|
| Capacity | up to 25,000 m ³ /h | 110,000 U.S. gpm |
| Head | 10 to 100 m | 33 to 330 feet |
| Max. Pressure | 10 bar | 146 psi |
| Temperature | -30 °C to 80 °C | -20 °F to 180 °F |

KX PERFORMANCE DATA

| | | |
|---------------|--------------------------------|-------------------|
| Capacity | up to 90,850 m ³ /h | 400,000 U.S. gpm |
| Head | 28 to 55 m | 100 to 200 feet |
| Max. Pressure | 12 bar | 174 psi per stage |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

WX & VX PERFORMANCE DATA

| | | |
|---------------|----------------------------|---------------------|
| Capacity | Q 68,137 m ³ /h | to 300,000 U.S. gpm |
| Head | 22 to 45 m | 75 to 150 feet |
| Max. Pressure | 10 bar | 145 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

VMF PERFORMANCE DATA

| | | |
|---------------|--------------------------------|------------------|
| Capacity | up to 34,070 m ³ /h | 150,000 U.S. gpm |
| Head | up to 25 m | up to 80 feet |
| Max. Pressure | 11 bar | 160 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

SX PERFORMANCE DATA

| | | |
|---------------|---------------------------|-------------------|
| Capacity | Q 1,885 m ³ /h | to 8,300 U.S. gpm |
| Head | up to 131 m | up to 430 feet |
| Max. Pressure | 10 bar | 145 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

MX & HX PERFORMANCE DATA

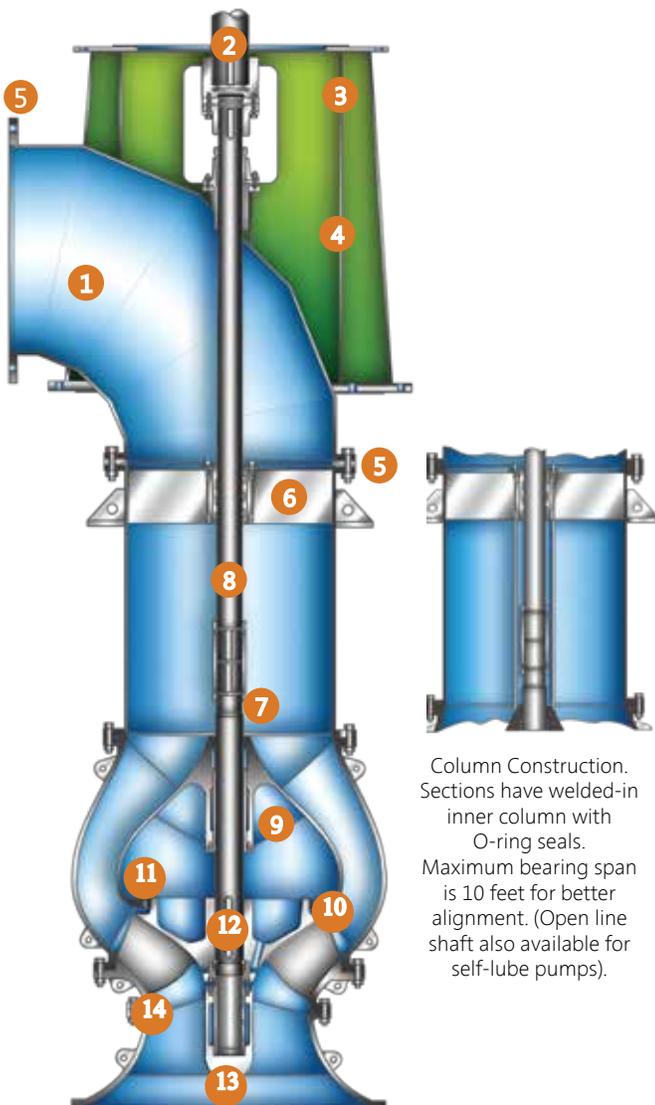
| | | |
|---------------|--------------------------------|------------------|
| Capacity | up to 56,781 m ³ /h | 250,000 U.S. gpm |
| Head | 10 to 30 m | 35 to 100 feet |
| Max. Pressure | 11 bar | 150 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

PMR PERFORMANCE DATA

| | | |
|---------------|--------------------------------|------------------|
| Capacity | up to 56,781 m ³ /h | 250,000 U.S. gpm |
| Head | up to 12 m | up to 40 feet |
| Max. Pressure | 11 bar | 150 psi |
| Temperature | -30 °C to 135 °C | -20 °F to 275 °F |

4 Note: For performances outside this range, please contact a Ruhrpumpen representative.

Characteristics



Column Construction. Sections have welded-in inner column with O-ring seals. Maximum bearing span is 10 feet for better alignment. (Open line shaft also available for self-lube pumps).

- 1** MIXED FLOW DISCHARGE ELBOW. Provides better flow and reduces losses.
- 2** ALL METAL THREE-PIECE ADJUSTABLE COUPLING. Ensures positive, foolproof shaft alignment.
- 3** THRUST POT. Thrust pot installation capability
- 4** LARGE STUFFING BOX. For easy maintenance, containing packing seal, packing rings and the follower mounting gland.
- 5** HEAVY DUTY FLANGES. Positive and registered fit alignment
- 6** FLANGED BEARINGS. Self-lubed or non self-lubed, maximum span of 10 ft.
- 7** SLEEVE TYPE COUPLING. Ensures proper alignment and fast assembly/disassembly, could be threaded or keyed depending on its size.
- 8** SELF. Lubed (open line shaft)
- 9** FLANGED BEARING. A bearing is located on the top case hub to provide maximum support and alignment to the impeller.
- 10** IMPELLER. Semi-open, open or closed according conditions of service, 3 plane dynamically balanced.
- 11** WEAR RINGS. Provides flow efficiency, and long service life.
- 12** IMPELLER. Secured impeller
- 13** SUCTION BELL. Less downtime, Bottom bearing keeps shaft aligned. Self lubed or greased for long service life.
- 14** IMPELLER CASE/LINER. Saves replacing the bowl in the high velocity zone.



Benefits

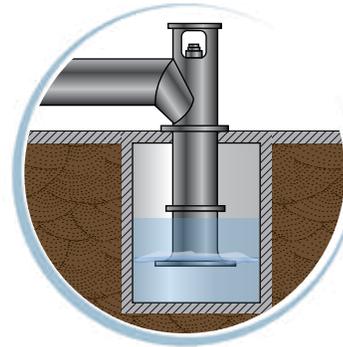
- Space saving, due to vertical installation
- Engineered to customer specifications
- Wide range of impeller designs
- Integral bearing retainer
- Sizes 20in (500mm) to 120in (3000 mm)
- Optional pull-out design for ease in maintenance
- Pump mounted thrust bearings when required

Optional Features

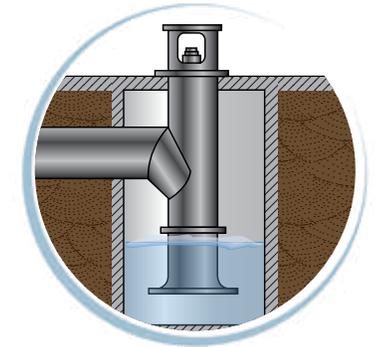
Discharge Head Options

- Above and below ground discharge installation
- Mechanical seal can be furnished
- All metal four piece coupling available

Above ground discharge



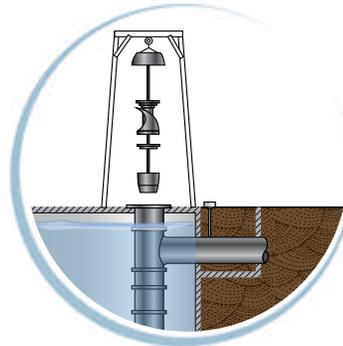
Below ground discharge



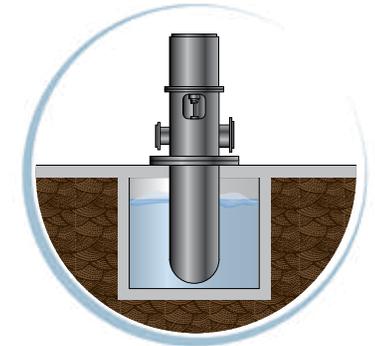
Column Options

- Pull out design for maintenance, accessibility, and dismantling ease.
- Barrel / Can assembly is available to meet API and ISO standards.

Pullout Design



Barrel / Can Applications



Bowl Assembly Options

- Flanged bearing - A bearing on the top case hub to provide maximum support and alignment to the impeller.
- Double suction enclosed impeller as a first stage can be mixed (Using our Double Suction Volute Pump) in our KX and RX pumps.
- Vane grating flow modifier can be installed in the suction bell for improving efficiency and represents cost savings.

Double suction enclosed impeller, first stage



Vane grating flow modifier



Materials of Construction

- Cast Iron (standard)
- Ductile Iron
- 410 Stainless Steel
- 316 Stainless Steel
- Duplex
- Super Duplex
- Aluminum Bronze
- Nickel Aluminum Bronze
- Copper – Tin Bronze



Other Ruhrpumpen Products



Fire Pump

Horizontal split case, listed by Underwriters Laboratories Inc. and approved by Factory Mutual. Water, Hydrocarbons, Chemical Solutions.



Vertical In-line Process Pump

Radially split, vertical in-line centrifugal pump, heavy duty process design according to API 610 latest edition (type OH3 / OH5).

Petroleum Refining, Petrochemical and Chemical Applications.



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.



Sump Pump

Vertical arrangement, single-suction, single-stage.

Water, Hydrocarbons and Chemical Solutions.



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

+65 years creating the pumping technology that moves our world

Ruhrpumpen is an innovative and efficient pump technology company that offers highly-engineered and standard pumping solutions for the oil & gas, power generation, industrial, water and chemical markets. We offer a broad range of centrifugal and reciprocating pumps that meet and exceed the requirements of the most demanding quality specifications and industry standards such as API, ANSI, UL, FM, ISO and Hydraulic Institute.

