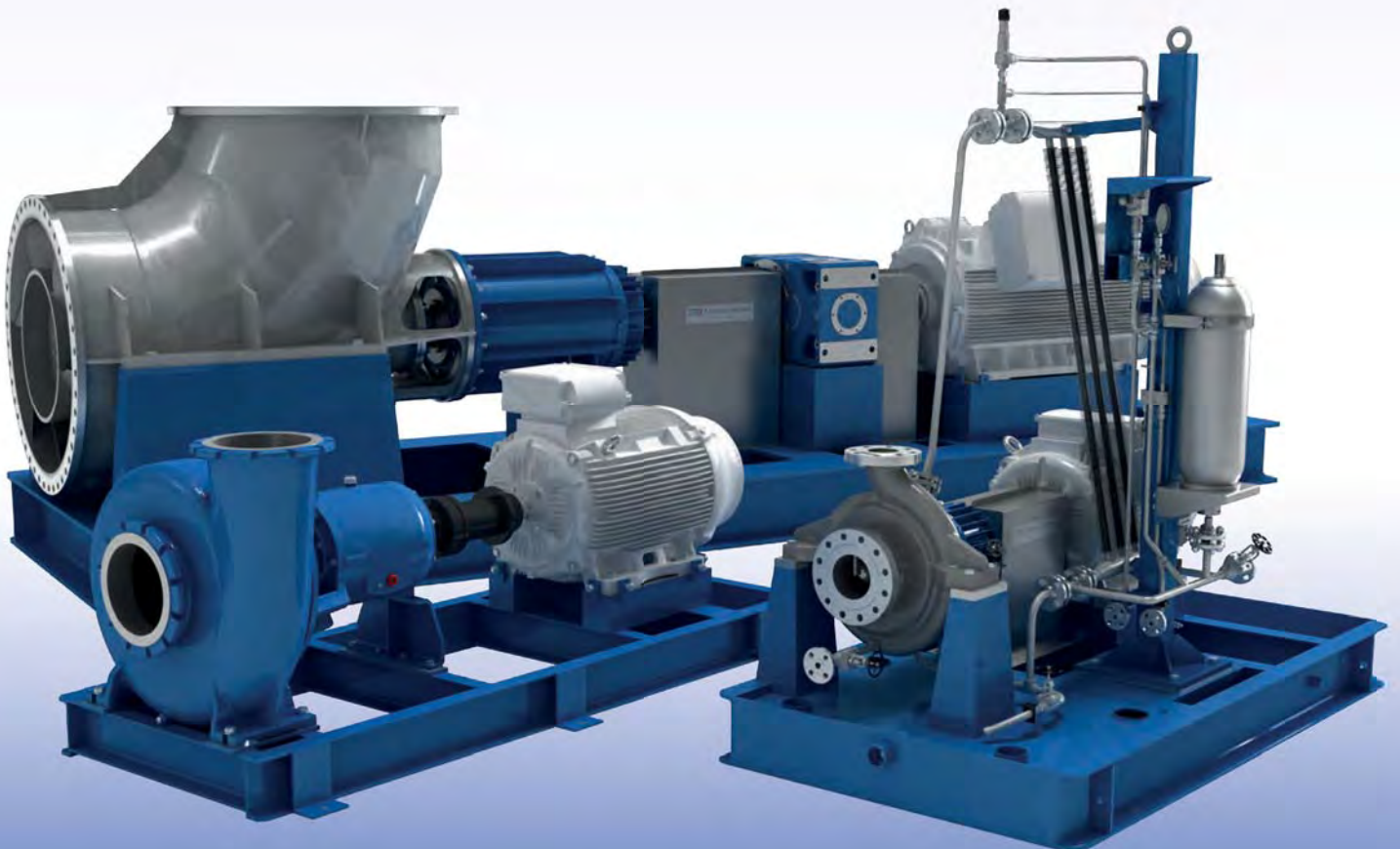


# MANUFACTURING RANGE



**Making Progress Together**

 **Ensival Moret**  
A Moret Industries Company



[www.ensival-moret.com](http://www.ensival-moret.com)



# THE COMPANY

## Ensival Moret: "Innovations provider"

/ With a hundred-year experience in the design and manufacturing of industrial pumps, Ensival Moret is a world-famous supplier whose know-how is internationally recognised. Renowned for its reliable technical solutions and high quality products, Ensival Moret supplies a wide range of industrial pumps for meeting all industrial requirements, even the most specific ones with difficult pumping conditions.

/ Ensival Moret offers a complete range of centrifugal and mixed flow pumps for a capacity up to 30.000 m<sup>3</sup>/h with operating temperatures from -160°C to +900°C. This product range also includes a series of self-priming pumps, liquid ring vacuum pumps, high capacity submersible pumps and canned motor pumps. A wide choice of material is available.



/ Thanks to its remarkable technical skills and commercial reactivity, Ensival Moret is a highly adaptable supplier, close to its customers and able to adapt to all specific requirements. Its continuous innovation policy and the efficiency of its R&D Department enable Ensival Moret to provide its customers with ever more efficient solutions.



/ Ensival Moret is historically constituted by the merger of two family companies. Ensival was founded in 1905, and Moret in 1868. These two companies have contributed to the European industrial development with state-of-the-art products. In 2007, Fapmo joined Ensival Moret bringing advanced expertise in the desalination and navy industry.



/ With a worldwide presence in the oil industry, in solar power plants, in the chemical and petrochemical industry, in the sugar industry, the fertilizers industry, the paper industry, the food industry, and in the metallurgic industry, Ensival Moret has long been recognized as a quality supplier providing high performance pumping solutions where special skills are required in difficult pumping situations.

/ Ensival Moret has 7 manufacturing facilities (2 plants in France, 2 plants in Belgium, 1 plant in China, 1 plant in Brazil, 1 plant in India) and 15 service centres, a large number of commercial offices and a network of more than 80 agents for projects in the 5 continents.

/ Each of our manufacturing plants has a modern machine-tool stock for complete machining of parts of various materials and of various sizes allowing us a very precise finishing. Each manufacturing plants are also equipped with state of art and sophisticated hydraulic laboratories for both pump production testing and R&D developments.

/ To complete this full service range, Ensival Moret has his own foundry bringing flexibility, reactivity and quick prototyping project.

/ Polyolefins Industry

/ Desalination

/ Oil & Gas

/ Fertilisers  
/ Phosphoric Acid  
/ Sulfuric Acid

/ Chemical processing

/ Sugar industry  
/ Biofuels

/ Energy  
/ Concentrated Solar Power

/ Navy





# CUSTOM ENGINEERED SOLUTIONS

/ Ensival Moret's success is based on its ability to design original and frequently complex technical solutions, and to select and combine the materials to create powerful equipment to suit your process.

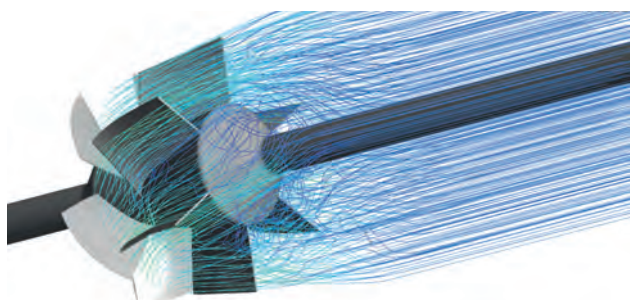
Ensival Moret knows how to bring solutions where special skills in difficult pumping situations are required

## Ensival Moret : A partner on your projects

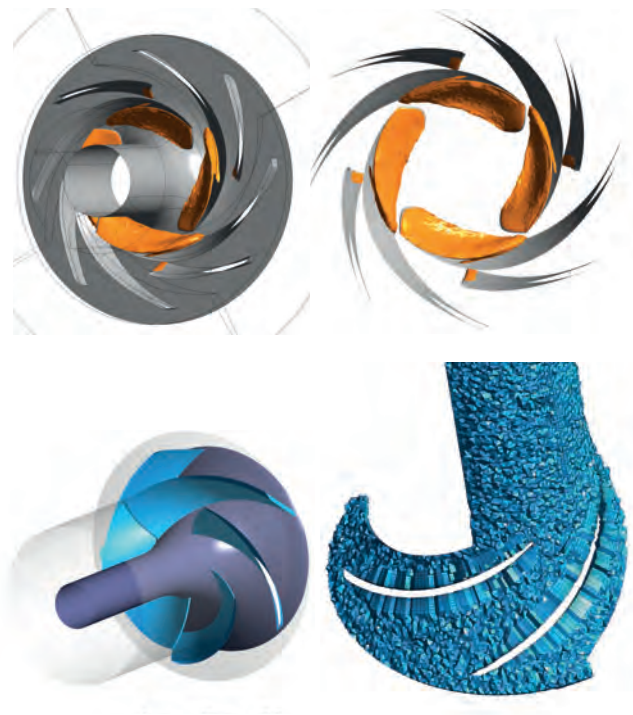
/ Working close to users, our R&D team can support all of your projects with specific needs.

Our R&D team is very innovation orientated and works hard to develop new ranges of hydraulics (CFD studies, energy efficiency, low NPSH) and to improve or adapt our range of pumps to specific customer requirements. Our R&D team can offer tailor-made technical solutions for specific pumping needs:

- Very high temperature,
- Very high pressure,
- High flow
- Self-priming solution (with our AS system or with integrated priming chamber)
- NPSH requirement
- Specific fluids (crystallising fluids, very corrosive fluids, ...)



/ To provide innovative and tailor-made solutions, our R&D team includes qualified PhD and engineers. The gathering of multi-disciplinary skills makes it possible to carry out all kinds of studies: mechanical, hydraulic and thermal studies, but also vibratory and energy analysis and specific customer studies.



**Based on the results of studies, we can provide you the best solution for your specific needs.**

/ Innovative pumping solutions for a large variety of difficult applications in global industries

Thanks to its reliable and efficient pumping solutions for the most critical requirement, Ensival Moret participates in a growing number of important international projects. We stand ready to bring our technologies to you today!

Ensival Moret has pioneered vertical molten salt pumps for CSP with Andasol in 2006 and has become the world preferred supplier of pumps for Concentrated Solar Power plants.



## ISO PUMPS :

ICN	horizontal single stage overhung pump	page 5
EMTECH	horizontal single stage overhung pump	page 6
MFR	horizontal single stage overhung pump	page 7
ICN LF	horizontal single stage overhung pump	page 8
AS System	Self-priming solution	page 9

## API PUMPS :

PRE	horizontal single stage overhung pump	page 10
PRE LF	horizontal single stage overhung pump	page 11
PR2M	radially split, between bearing pump	page 12
PRD	radially split, between bearing pump	page 13
MN	radially split, multistage, ring section pump	page 14
MNF	radially split, multistage, barrel pump	page 15
VE-VEC	single or multistage vertical (can) pump	page 16
VN-VNC	single or multistage vertical (can) pump	page 17
VLC	long shaft, vertical sump pump	page 18
MNVC	multistage vertical can pump	page 19

## GENERAL INDUSTRY :

CAHRM / CAHRK	axial flow pump	page 20
AH for high pressure	axial flow pump	page 21
V	long shaft, vertical sump pump	page 22
VA	cantilever sump pump	page 23
VAS	vertical acid pump	page 24
VEY-VEYR	single or multistage vertical (can) pump	page 25
VNY-VNYR	single or multistage vertical (can) pump	page 26
AGV	vertical axial flow pump	page 27
Pumps for severe conditions	horizontal single stage overhung pump	page 28
EMW-R	extra heavy duty rubber slurry pump	page 29
EMW-M	extra heavy duty metal slurry pump	page 30
Recessed impeller pump	horizontal single stage overhung pump	page 31
D SERIE	horizontal monoblock single stage overhung pump	page 32
AM	self priming pump	page 33
SC	split case pump	page 34
Rota	Rotary displacement pump	page 35
VRN	liquid ring vacuum pump	page 36

## Maintenance and Repair Service

page 37



### Design:

- / Flanges PN16 - Option PN20 ANSI (150 lbs).
- / Metal-to-Metal casing seal providing the right O-Ring compression and a perfect alignment.
- / Tapered seal chamber with ribs to reduce circumferential velocities, solids and gas pockets.
- / Grooved wear ring to prevent seizing risks.
- / Closed or semi-open impellers provide high efficiency over a wide performance range while maintaining low NPSHr.
- / Wear plate is sealed by O-ring.
- / The design allows for easy installation and removal of the impeller while providing a strong reliable power transmission (double that of keyed impeller design). It is self-locking and tolerates reverse rotation.
- / Shaft sealing by mechanical seal (cartridge seal or component) and various optional sealing constructions.
- / Bearing frame has a large oil capacity to provide optimum bearing lubrication.
- / Adjustable bearing carrier allows for easy impeller clearance adjustment to the wear plate.
- / Standard shaft material is duplex stainless steel, which provides both high mechanical strength and superior corrosion resistance.
- / Standard bearing protection by Inpro or equivalent oil seals.
- / Back-to-Back angular contact bearings handle both high hydraulic axial loads and radial loads due to belt drives.
- / High radial load roller bearing.



### Performances:

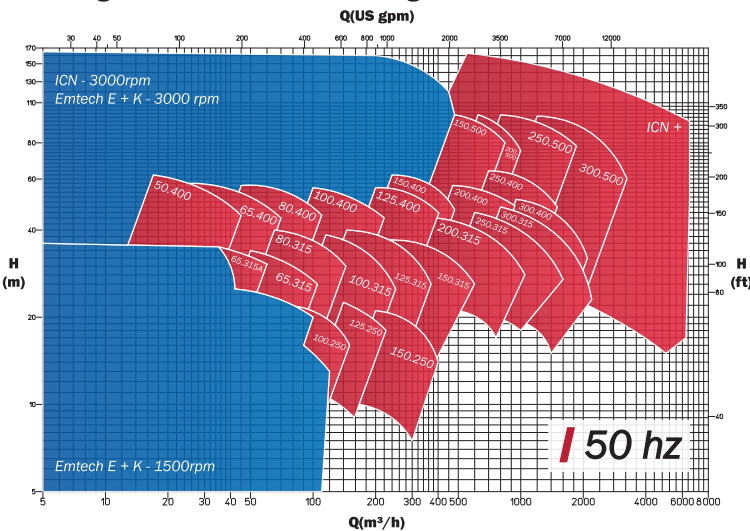
- / Flow : up to 6500 m<sup>3</sup>/h (28,622 US gpm)
- / Total head : up to 160 m (525 ft)
- / Maximum operating pressure : 16 bar (232 PSI)
- / Temperature operating range : up to 180 °C (356 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Standard: 26/5/2 + Cu stainless steel, FT25 cast iron
- / Other materials upon request: nodular cast iron, hastelloy, titanium, inconel,...

### Industrial applications:

- FOR ALL INDUSTRIES
- / Chemical
  - / Petrochemical
  - / Food processing
  - / Desalination
  - / Water treatment
  - / Pulp and paper...





### Design:

- / Flanges PN16 - Option PN20 ANSI (150 lbs).
- / Construction in accordance with ISO 5199 and dimensions in accordance with ISO 2858.
- / BACK PULL-OUT design: dismantling without disturbing piping or motor.
- / Suitable for severe continuous duties.
- / Bearing type : three rolling-contact bearings lubricated by oil or by grease as required.
- / Impeller of open or closed type.
- / Closed impeller provided with wear rings.
- / Shaft fully protected from pumped liquid by shaft sleeve and O-ring.
- / Shaft seal by standard single, double, tandem or cartridge mounted mechanical seal.
- / Mechanical seal installation in open type stuffing box as standard.
- / Pressure in stuffing box controlled by impeller back vanes.
- / High efficiency.
- / Low NPSHr.
- / Maximum interchangeability of parts throughout the series.
- / Most standard models available ex stock.
- / Adapter frame manufactured from 316 stainless steel upon request.
- / Heating or cooling jacket upon request.
- / Option: INPRO SEAL VBX



### Performances:

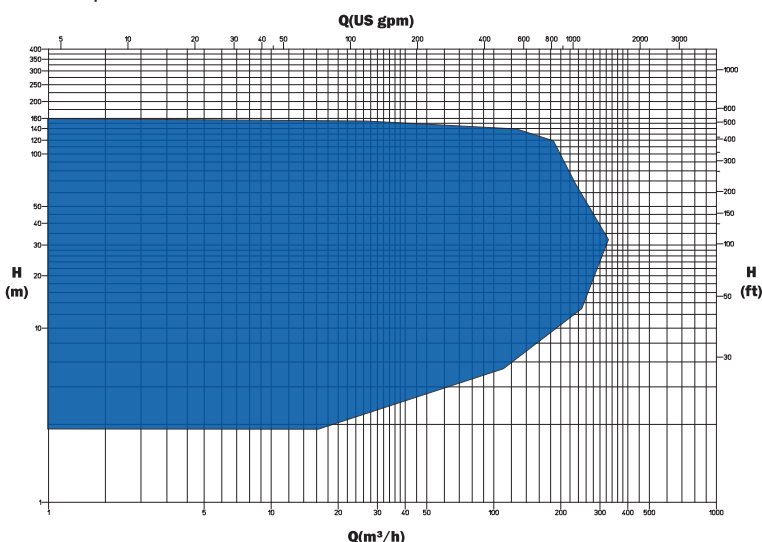
- / Flow : up to 350 m<sup>3</sup>/h (1,540 US gpm)
- / Total head : up to 160 m (525 ft)
- / Maximum operating pressure : 20 bar (290 PSI)
- / Temperature operating range : up to 180 °C (356 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Duplex SS : A743 CD4Mcu
- / Super Austenitic SS : A 743 CN7M
- / Cast iron : A48 class 35B
- / 30% chr. Cast iron A532 Class 3
- / Other materials upon request, titanium, Hastelloy, nickel...

### Industrial applications:

- / Chemical industry
- / Petrochemical industry
- / Steel industry
- / Paper industry
- / Food industry





### Design:

- / Construction in accordance with ISO 5199 and dimensions in accordance with ISO 2858.
- / BACK PULL-OUT design: dismantling without disturbing piping or motor.
- / Suitable for severe continuous duties.
- / Bearing type : three rolling-contact bearings lubricated by oil or by grease as required.
- / Semi-open or closed impeller
- / Shaft fully protected from pumped liquid by shaft sleeve and O-ring.
- / Shaft seal by standard single, double, tandem or cartridge mounted mechanical seal.
- / Mechanical seal installation in open type stuffing box as standard.
- / Pressure in stuffing box controlled by impeller back vanes.
- / Low NPSHr.
- / Maximum interchangeability of parts throughout the series.
- / Most standard models available ex stock.
- / Adapter frame manufactured from 316 stainless steel upon request.
- / Heating or cooling jacket upon request.
- / Option: INPRO SEAL VBX



### Performances:

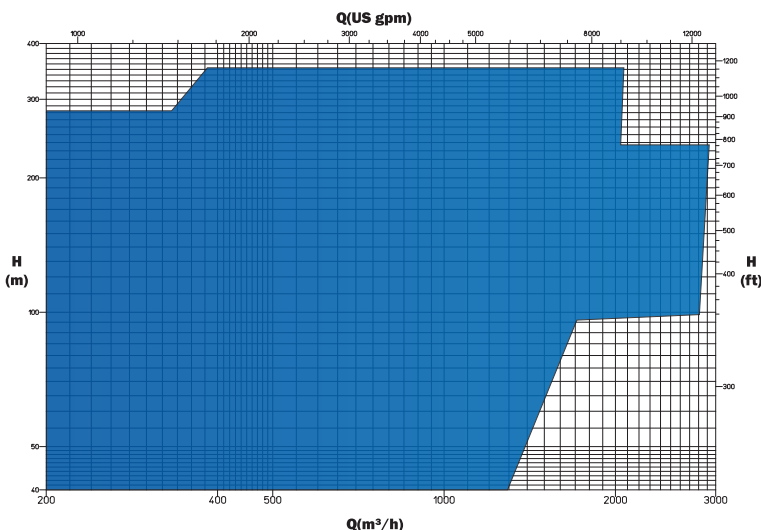
- / Flow: up to 780 m<sup>3</sup>/h (3,434 US gpm)
- / Total head: up to 160 m (525 ft)
- / Maximum operating pressure : 16 bar (232 PSI)
- / Temperature operating range: up to 180 °C (356 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Duplex SS : A743 CD4Mcu
- / Super Austenitic SS : A 743 CN7M
- / Cast iron : A48 class 35B
- / 30% chr. Cast iron A532 Class 3
- / Other materials upon request, titanium, hastelloy, nickel...

### Industrial applications:

- / Chemical industry
- / Petrochemical industry
- / Steel industry
- / Paper industry
- / Food industry





# ICN LF

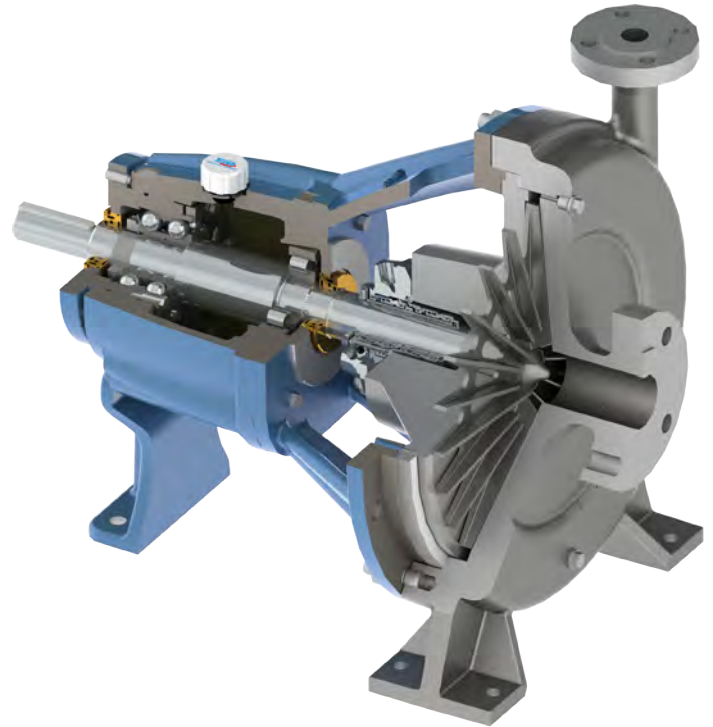
## ISO5199

**FOR LOW-FLOW AND HIGH HEAD REQUIREMENTS**

FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE, HOT LIQUIDS.

### Design:

- / Flanges per ANSI PN 40. Other flange standards upon request
- / Metal-to-metal casing seal providing the right O-Ring compression and a perfect alignment
- / Different impeller and casing machining types for a same size of pump ensure operation near the BEP (best efficiency point) with large operating range
- / Shaft sealed by cartridge mechanical seal or with various optional sealing constructions
- / Permanent bearing protection by labyrinth seal
- / Accessible seal area
- / High radial load roller bearing
- / Extra heavy shaft providing a strong reliable power transmission
- / Case drain is optional
- / Adjustable bearing carrier allows for easy impeller clearance adjustment for high hydraulic efficiency
- / Bearing frame has a large oil capacity to provide optimum bearing lubrication
- / Impeller manufactured with the investment casting process ensuring an optimal surface accuracy and high efficiency



### Performances:

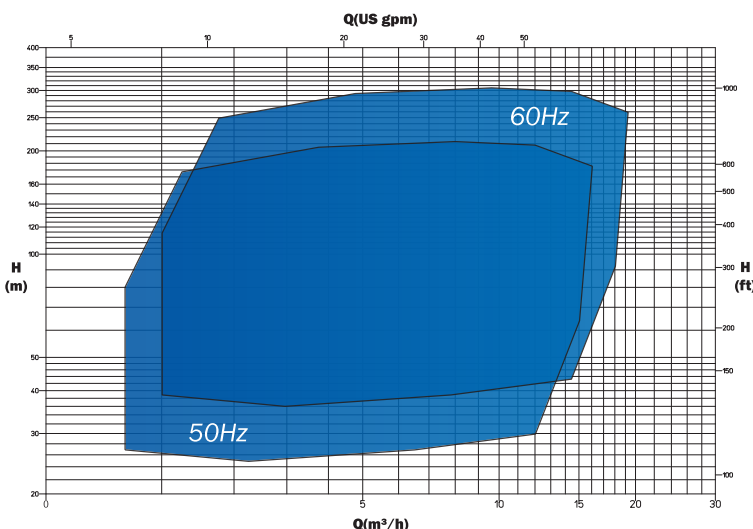
- / Capacity : up to 20 m<sup>3</sup>/h (88 US gpm)
- / Total head : up to 300 m (985 ft)
- / Maximum operating pressure : 60 bar (870 PSI)
- / Temperature operating range : up to 180 °C (356 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Standard: 26/5/2 + Cu stainless steel, FT25 cast iron
- / Other materials upon request: nodular cast iron, hastelloy, titanium, inconel,...

### Industrial applications:

- / Chemical industry
- / Petrochemical industry
- / Oil and Gas
- / Offshore
- / General industry

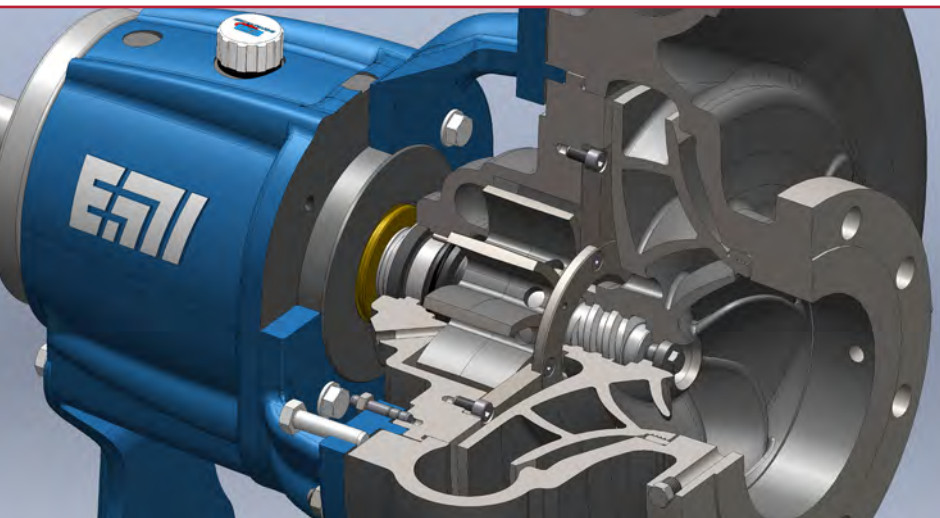
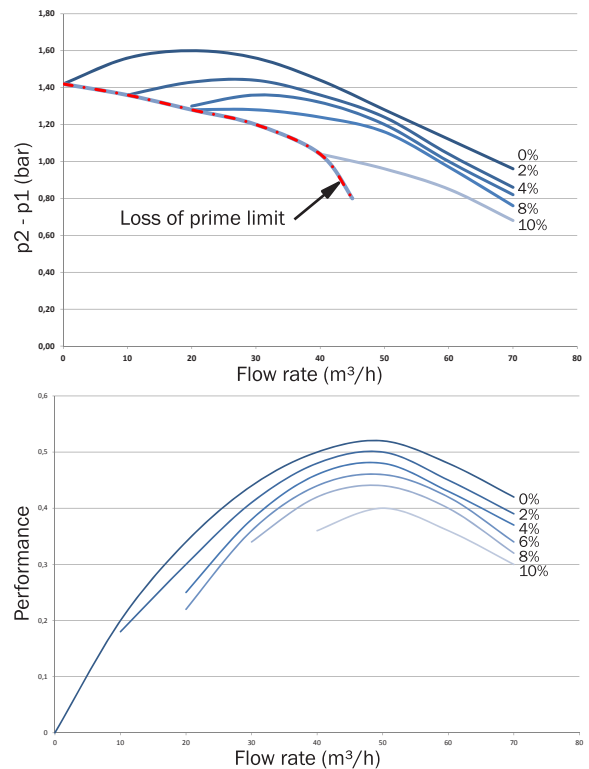


ISO

**/The ICN AS** has the high performance bearings and hydraulics of the standard version. The AS device comprises a vacuum pump that is entirely integrated onto the shaft, this creates negative pressure that makes it possible to evacuate gas from the main hydraulic chamber and therefore, retain the performance of the centrifugal pump, while retaining the dimensions of the ICN.

**/** There are two possible configurations for the ICN AS : self-priming (suction heads of up to 9m) or degassing, making it possible to pump highly aerated fluid with gas concentrations of up to 20%.

**/** In this version, the gas present in the pumped fluid, whether in the form of absorbed or dissolved gas, is concentrated in the form of pockets in the low pressure areas of the centrifugal wheel. These gas pockets are captured and then evacuated by the AS device, which makes it possible to attain the flow rate/head performance that is close to that of the non-aerated liquid centrifugal pump.



**/** So the benefits of using the ICN AS for aerated fluids are :

- The flow rate/head performance of a gas free operation are retained, the dimensions of the pump are tailored specifically for the use of the application.
- The performance gains mean that energy consumption can be reduced and the power of the motor installed limited.
- Easy to use : after initial setting via the control panel, the pump self-regulates around the operating point.
- Additional savings by simplification of the process means it is no longer necessary to inject an anti-foaming agent.

**/** This industrial process developed and operated for over ten years makes Ensival Moret a key player in the field of two-phase fluid transfer together with, a wealth of experience with cooling tower water, untreated water from printing machines, emulsions, juices, paper pulps and starch milk, etc.



# PRE

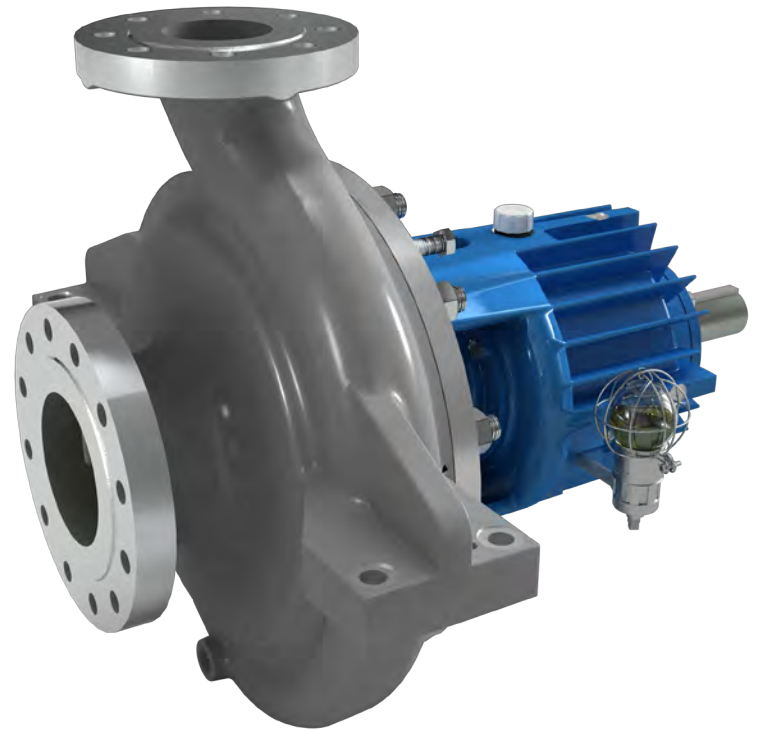
API 610 - OH2

API 610 (OH2) LATEST EDITION ISO13709

HEAVY DUTY CONSTRUCTION FOR  
CLEAR, TOXIC, CORROSIVE, FLAMMABLE, HOT LIQUIDS

## Design:

- / Flanges per ANSI B16.5  
Other flanges standards upon request
- / Closed impeller provides high efficiency over a wide performances range while maintaining low NPSHr
- / Replaceable casing and impeller wear rings (front and back side)
- / Shaft sealed by cartridge mechanical seal + API flushing plans
- / Accessible Seal chamber per API682 and ISO21049
- / Heavy duty one-piece cast bearing frame to ensure optimal rigidity of the pump
- / Efficient airfins cooled bearing housings
- / Heavy duty stiff shaft for low deflection
- / Bearing frame sealed by deflector to prevent oil contamination. Inpro Seal or equivalent are available
- / Discharge size from 25 mm to 500 mm / 1 to 20 inches
- / High radial load roller bearing
- / Back-to-Back angular contact bearings handle high axial loads
- / Anti-vortex rib
- / Casing drain is standard
- / **Additional design:**  
PRE Low Flow  
PREK - PRESF : special design for slurry applications  
PRECF : closed impeller with relief vanes  
PRER - PRETR : reinforced design for high temperature and pressure



## Performances:

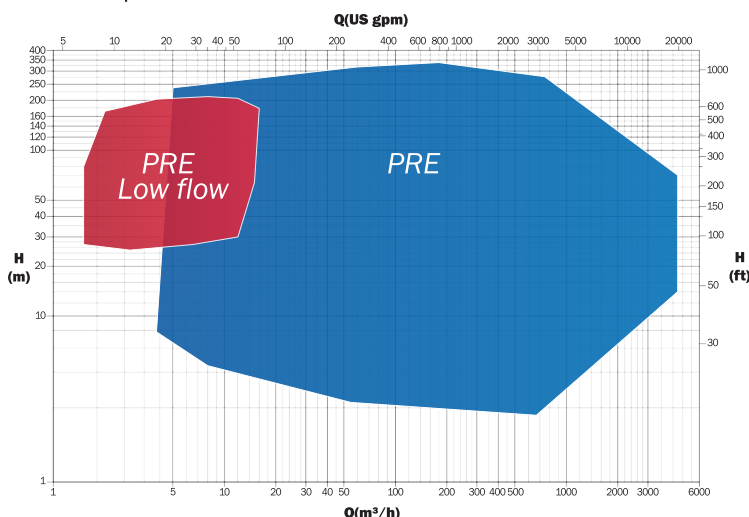
- / Capacity : up to 4500 m<sup>3</sup>/h (19,800 US gpm)
- / Total head : up to 320 m (1,050 ft)
- / Maximum operating pressure : 60 bar (870 PSI)
- / Temperature operating range :  
from -90 to 400 °C (-130 to 752 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

## Standard materials:

- / Materials per API standard:  
S5, S6, C6, A8, D1, D2.
- / Other materials available upon request

## Industrial applications:

- / Petrochemical industry
- / Oil and Gas
- / Offshore
- / General industry



API

# PRE LF

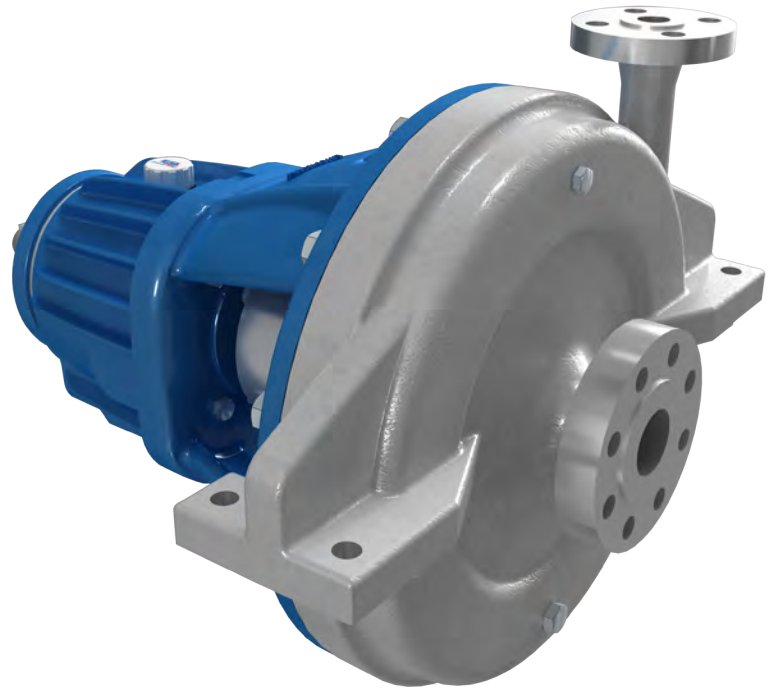
API 610 - OH2

FOR LOW-FLOW AND  
HIGH HEAD REQUIREMENTS

FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE, HOT LIQUIDS.

## Design:

- / Flanges per ANSI B16.5 - #300 - PN50 - Other flange standards upon request.
- / Metal to metal casing fit providing the right O-Ring compression and a perfect alignment
- / Different impeller and casing machining types for a same size of pump ensure operation near the BEP (best efficiency point) with large operating range.
- / Shaft sealed by cartridge mechanical seal + API flushing plans
- / Efficient airfins cooled bearing housings
- / Bearing frame has a large oil capacity to provide an optimum bearing lubrication
- / Adjustable bearing carrier allows for easy impeller clearance adjustment in order to maintain the pump performance
- / Permanent bearing protection by labyrinth seal
- / Accessible seal area
- / High radial load roller bearing
- / Centre line mounted pump casing and base plate complying with API610 standards.
- / Extra heavy shaft providing a strong reliable power transmission.
- / Casing drain as per API610
- / Bearing frame has a large oil capacity to provide optimum bearing lubrication
- / Impeller manufactured with the investment casting process ensuring an optimal surface accuracy and high efficiency w



## Performances:

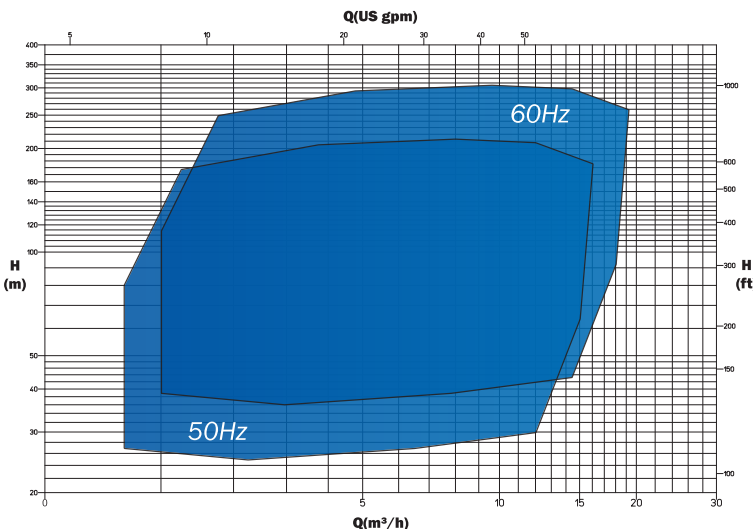
- / Capacity : up to 20 m<sup>3</sup>/h (88 US gpm)
- / Total head : up to 300 m (985 ft)
- / Maximum operating pressure : 60 bar (870 PSI)
- / Temperature operating range :  
from -90 to 400 °C (-130 to 752 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

## Standard materials:

- / Standard: 26/5/2 + Cu stainless steel, FT25 cast iron
- / Other materials upon request: nodular cast iron, hastelloy, titanium, inconel,...

## Industrial applications:

- / Petrochemical industry
- / Oil and Gas
- / Offshore
- / General industry





# PR2M

API 610 - BB2

BETWEEN BEARING RADIAL SPLIT PUMP

SUITABLE FOR SEVERE CONTINUOUS DUTIES

## Design:

- / Centerline mounted casing, rotor between bearings.
- / Construction in accordance with API610
- / Back pull-out design : dismantling without disturbing the piping nor the motor
- / Flanges according to customer's specifications
- / 2 antifriction bearings, oil-lubricated by oil ring
- / 2 Closed impellers in back-to-back mounting arrangement with wear rings on suction side
- / Shaft sealing by soft packing or by standard single, double or tandem mounted mechanical seals
- / Cooling jackets on stuffing box in the standard design



## Performances:

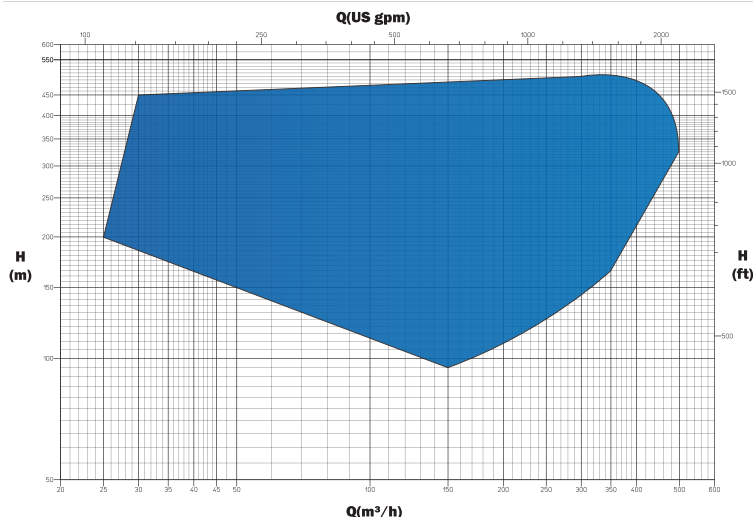
- / Capacity : up to 600 m<sup>3</sup>/h (2,642 US gpm)
- / Total head : up to 500 m (1,640 ft)
- / Maximum operating pressure : 80 bar (1,160 PSI)
- / Temperature operating range : up to 425 °C (1160 °F)
- / Higher capacities and heads upon request

## Standard materials:

- / Materials as API standards: S5, S6, C6, A8, D1.
- / Other materials available upon request

## Industrial applications:

- / Petrochemical industry
- / Oil and Gas
- / Offshore
- / Water desalination
- / General industry



API

# PRD

API 610-BB2

**BETWEEN BEARINGS PUMP**

**HEAVY DUTY CONSTRUCTION  
FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE, HOT LIQUIDS.**

## Design:

- / Radial casing split
- / The double-suction impeller with removable wear rings reduces axial thrust problems while maintaining low NPSHr.
- / Heavy duty double bearing frame to ensure optimal rigidity of the pump + fins on bearing housing for efficient cooling.
- / Accessible Seal chamber per API682 and ISO21049.
- / Optional cooling or heating jacket of the seal chamber.
- / Shaft seal by cartridge mechanical seal + API flushing plans.
- / Shaft offering strong resistance to deflection.
- / Standard bearing protection by labyrinth type seal and deflector.
- / Centerline mounted pump casing and base plate complying with ISO13709 / API610 standards.
- / High radial load roller bearing.
- / Back-to-Back angular contact bearings handle high axial loads.
- / Casing and impeller wear rings are shrunk fitted.
- / Fan-cooled bearing frame in option.
- / Constant level oiler.
- / Discharge size from 150 mm to 400 mm.
- / Flanges per ANSI B16.5 - Other flange standards upon request.



## Performances:

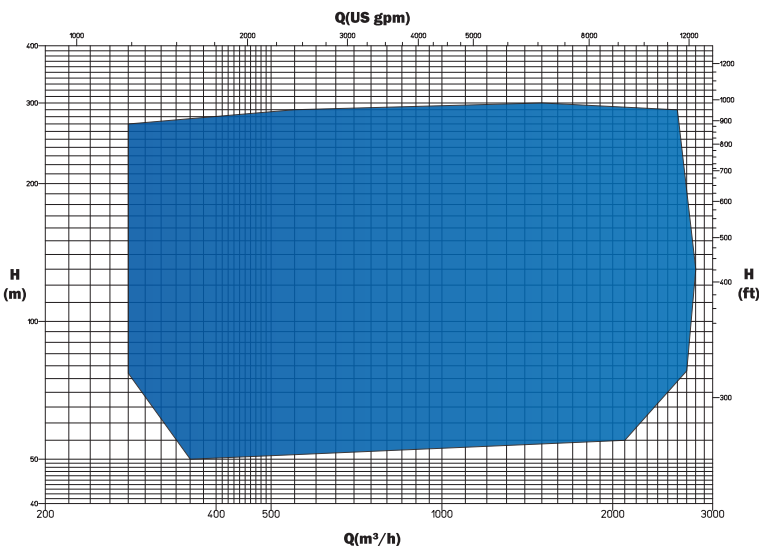
- / Capacity : up to 2800 m<sup>3</sup>/h (12,330 US gpm)
- / Total head : up to 320 m (1,050 ft)
- / Maximum operating pressure : 80 bar (1,160 PSI)
- / Temperature operating range :  
/ from -90 to 425 °C (-130 to 800 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

## Standard materials:

- / Materials as API standards: S5, S6, C6, A8, D1, D2.
- / Other materials available upon request

## Industrial applications:

- / Petrochemical industry
- / Oil refineries
- / Offshore
- / Power generation
- / General industry





### Design:

- / Construction with ring section. Centerline supported or foot mounted.
- / Sealing system : single or double mechanical seal
- / Anti-friction rolling bearings or tilting Pad Thrust Bearings
- / Axial Thrust Balancing Device with balance drum or balancing disc upon request
- / Flanges per ANSI B16.5 - Other flange standards upon request
- / Lubrication with constant level oilers
- / Fan cooled bearing frame is optional



### Performances:

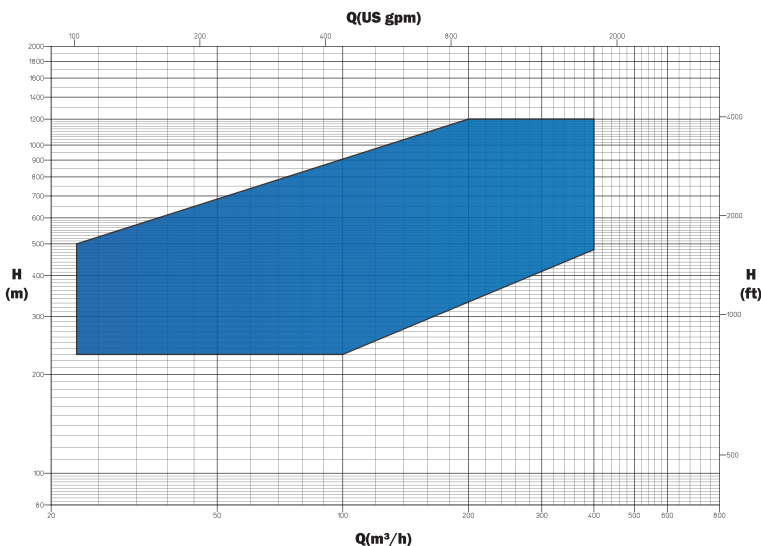
- / Capacity : up to 400 m<sup>3</sup>/h (1,761 US gpm)
- / Total head : up to 1200 m (3940 ft)
- / Maximum operating pressure : 100 bar (1450 PSI)
- / Temperature operating range : up to 220 °C (428 °F)
- / Higher design pressure upon request

### Standard materials:

- / Materials : I1, S1, S5, S6, C6, A8, D1, D2.
- / Other materials available upon request

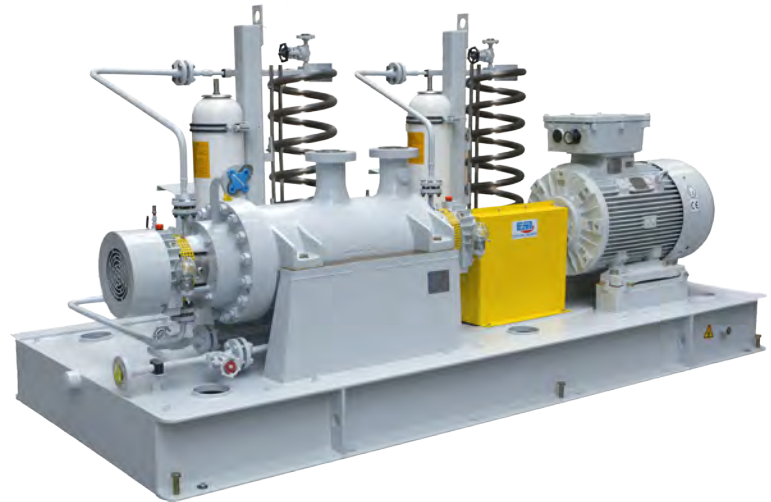
### Industrial applications:

- / BFW pump
- / Hydrocarbon applications
- / Petrochemicals
- / Oil and gas



### Design:

- / Construction with barrel. Centerline supported.
- / Barrel according pressure requirement
- / Heavy duty double bearing frame to ensure optimal rigidity of the pump + fins on bearing housing for efficient cooling
- / Flanges per ANSI B16.5 - Other flange standards upon request
- / Sealing system : cartridge mechanical seals according API682 standards
- / Anti-friction rolling bearings or tilting Pad Thrust Bearings
- / Axial Thrust Balancing Device with balance drum. Balancing disc upon request
- / Lubrication with constant level oilers
- / Fan cooled bearing frame is optional



### Performances:

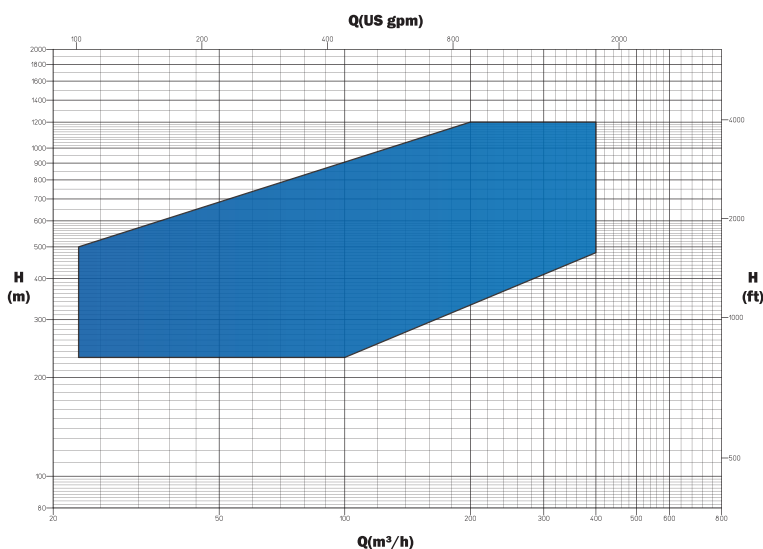
- / Capacity : up to 800 m<sup>3</sup>/h (1,761 US gpm)
- / Total head : up to 1200 m (3,940 ft)
- / Maximum operating pressure : 200 bar (2,900 PSI)
- / Temperature operating range : up to 220 °C (428 °F)
- / Higher design pressure upon request

### Standard materials:

- / Impeller and diffusor in chrome steel, barrel in steel and shaft in steel : S6
- / Other materials available upon request: A8, D1

### Industrial applications:

- / Petrochemical applications
- / Liquefied gas
- / Injection pump
- / BFW pump
- / Reverse osmosis
- / Any pumping of a clean fluid under high pressure





# VE-VEC

API 610-VS1

## VERTICAL PUMP WITH SUBMERGED CASING

FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE LIQUIDS

### Design:

- / Single or multi-stage with closed impeller(s), stages bolted together
- / Keyed impeller(s)
- / Side discharge through sump head
- / Thrust bearing oil or grease-lubricated
- / Column bearings lubricated by the pumped liquid or lubrication by external liquid optional
- / Bearing material dependent on liquid pumped : PEEK, PTFE, carbon, silicon carbide, stellite, nitronic...
- / Absence of radial loads on column bearings because of the concentric discharge
- / Excellent efficiency
- / Shaft sealing by packing rings or by standard single, double or tandem-mounted mechanical seal
- / Maximum length 16m
- / Foundation ring optional
- / Shaft sheathing possible
- / Fitting of a suction inducer possible (low NPSH)



### Performances:

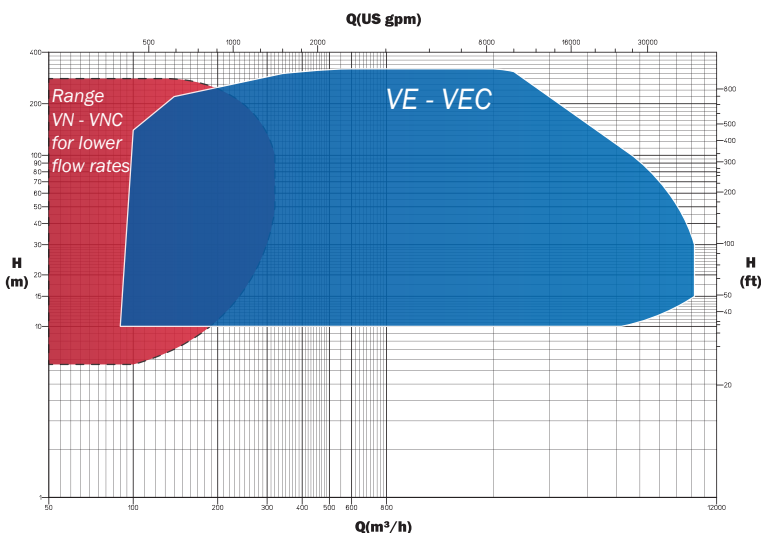
- / Flow : up to 10000 m<sup>3</sup>/h (44,030 US gpm)
- / Total head : up to 350 m (1,150 ft)
- / Maximum operating pressure : 50 bar (72 PSI)
- / Temperature operating range : from -160 to 600 °C (-256 to 1112 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Materials per API standard : I1, S6, C6, A8, D1, D2.
- / Other materials available upon request

### Industrial applications:

- / Water distribution
- / Chemicals
- / Petrochemicals
- / Mining
- / Offshore industries
- / Electricity generation
- / Sea Water desalination
- / Pump for general applications : cooling, circulation, etc...



API

# VN-VNC

API 610-VS1

**SINGLE OR MULTISTAGE  
VERTICAL (CAN) PUMP  
WITH SUBMERGED CASING**

FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE LIQUIDS

## VN:

/ Clear liquids : clear water, seawater, hydrocarbons, condensate, acids, ...

## VNC:

/ Liquid with high vapour pressure/ low NPSH (liquefied gas, condensate extraction)

## Design:

- / No radial force on column sleeve bearings due to the concentric discharge
- / No axial thrust due to the wear ring at the back of the impellers and balancing holes in impeller hub
- / Grease lubricated thrust ball bearings (oil lubricated upon request)
- / Shaft sealing : conventional packing rings or mechanical seal (single, double or tandem)
- / Sleeve bearings are lubricated normally by pumped liquid but if there are solids in the liquid it's possible to lubricate them by grease or with clean liquid injection on the sleeve bearings
- / Inducer may be fitted to reduce the required NPSH value of the pump
- / Removable shaft sleeve under sleeve bearing and packing rings
- / Maximum length: 16 m
- / Upon request : possibility to supply suction strainer and foundation rings



## Performances:

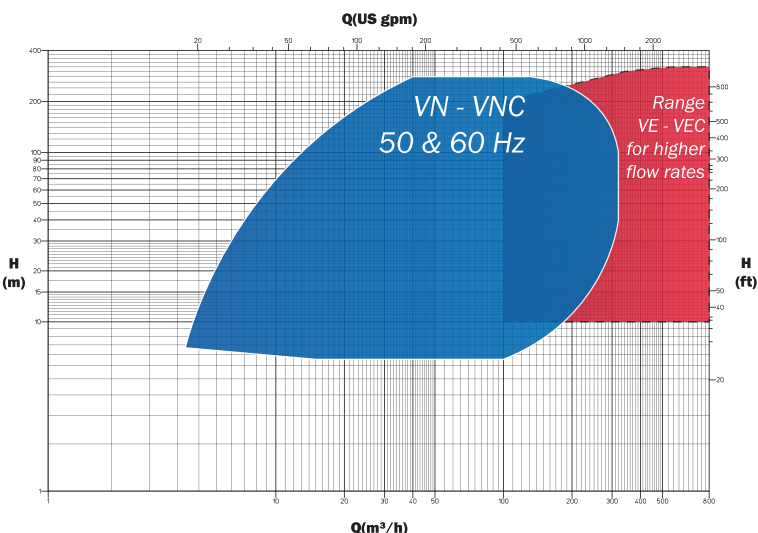
- / Capacity: up to 300 m<sup>3</sup>/h (1320 US gpm)
- / Total head: up to 280 m (918 ft)
- / Maximum operating pressure: 25 bar (326 PSI)
- / Operating temperature range: up to 120 °C (up to 248 °F)
- / Higher capacities and heads upon request

## Standard materials:

- / Materials as per API standards: I1, S1, S5, S6, C6, A8, D1
- / Other materials available upon request

## Industrial applications:

- / Water feeding
- / Fire fighting
- / Potable water distribution
- / Water treatment
- / Seawater desalination
- / Irrigation
- / Condensate
- / The barrel pumps VNC : where horizontal pump cannot be installed due to the low NPSH available



# VE-VEC

API 610 - VS1 upon request

## VERTICAL PUMP WITH SUBMERGED CASING

FOR CLEAR, TOXIC, CORROSIVE, FLAMMABLE LIQUIDS

### Design:

- / Single or multi-stage with closed impeller(s), stages bolted together
- / Keyed impeller(s)
- / Side discharge through sump head
- / Thrust bearing oil or grease-lubricated
- / Column bearings lubricated by the pumped liquid or lubrication by external liquid optional
- / Bearing material dependent on liquid pumped : PEEK, PTFE, carbon, silicon carbide, stellite, nitronic...
- / Absence of radial loads on column bearings because of the concentric discharge
- / Excellent efficiency
- / Shaft sealing by packing rings or by standard single, double or tandem-mounted mechanical seal
- / Maximum length 16m
- / Foundation ring optional
- / Shaft sheathing possible
- / Fitting of a suction inducer possible (low NPSH)



### Performances:

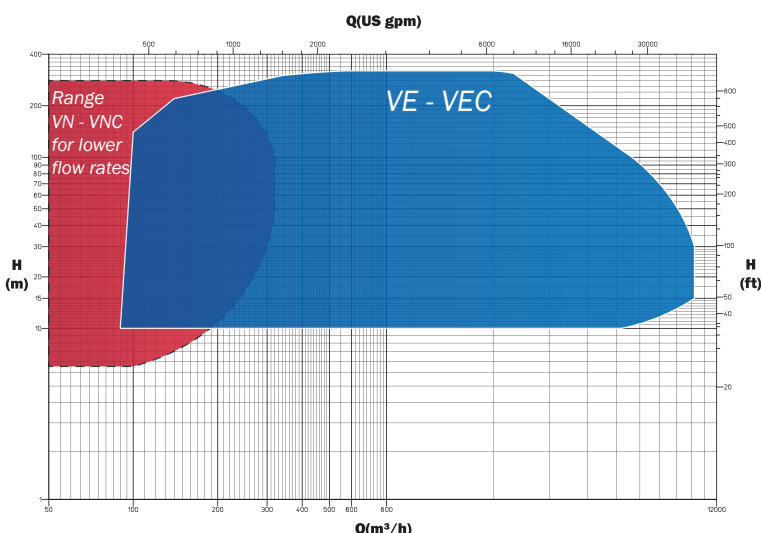
- / Flow : up to 10000 m<sup>3</sup>/h (44,030 US gpm)
- / Total head : up to 350 m (1,150 ft)
- / Maximum operating pressure : 50 bar (72 PSI)
- / Temperature operating range : from -160 to 600 °C (-256 to 1112 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Materials per API standard : I1, S6, C6, A8, D1, D2.
- / Other materials available upon request

### Industrial applications:

- / Water distribution
- / Chemicals
- / Petrochemicals
- / Mining
- / Offshore industries
- / Electricity generation
- / Sea Water desalination
- / Pump for general applications : cooling, circulation, etc...



API



# MNVC

API 610-VS6

## VERTICAL MULTISTAGE CANNED PUMP

FOR LIQUID HIGH VAPOUR PRESSURE / LOW NPSH  
(LIQUIFIED GAS, CONDENSATE EXTRACTION)  
WITH SUBMERGED CASING

### Design:

- / Casing are composed with suction, discharge collector and interstage ring sections which are assembled with tie-rods
- / Each stage contain 5 parts : closed impeller, diffusor, the interstage ring section and the wearings
- / First stage of impeller can be specially designed to reduce the NPSH required
- / Type of bearing depends on balancing system and suction /discharge pressures
- / Sealing system by packing rings, single or double mechanical seal



### Performances:

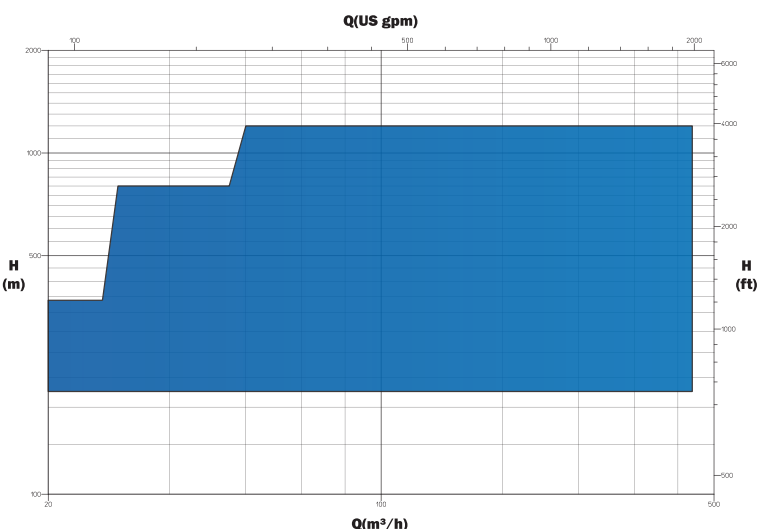
- / Capacity: up to 400 <sup>3</sup>/h (1,761 US gpm)
- / Total head: up to 1200 m (3,940 ft)
- / Maximum operating pressure: 100 bar (1450 PSI)
- / Operating temperature range : up to 200 °C (up to 392 °F)
- / Higher capacities and heads upon request

### Standard materials:

- / Materials as per API standards : I1, S1, S5, S6, C6, A8, D1, D2
- / Other materials available upon request

### Industrial applications:

- / BFW
- / Hydrocarbon applications
- / Petrochemicals
- / Oil and Gas
- / Gas / steam condensate
- / Application with low NPSH available and high pressure



# CAHR(M) CAHR(K)

**AXIAL FLOW PUMP FOR HIGH FLOW,  
LOW HEAD APPLICATIONS**  
SUITABLE FOR CORROSIVE, ABRASIVE,  
OR SOLIDCONTAMINATED LIQUIDS AS WELL AS FOR CLEAR LIQUIDS

## Design:

- / Flanges PN10 or ANSI150 FF - Other flange standards upon request. Cladding of flanges with special alloy are optional.
- / Discharge diameter from 200 mm to 1600 mm. (1 to 63 inches)
- / Cast construction design or mechanical-welded construction.
- / Keyed impeller provide high efficiency over the entire performance range while maintaining low NPSHr.
- / Available in top or end suction configurations.
- / Replaceable casing wear ring.
- / Optional shaft protected by a removeable shaft sleeve.
- / High radial and axial load roller bearing.
- / Strong shaft reduces deflection and ensures long term reliability of shaft seal.
- / Heavy duty bearing frame to ensure optimal rigidity of the pump.
- / Cartridge seal is standard. Packing gland, single or double mechanical seal are available.
- / No bearing in the pumped liquid.



## Additional Design:

- / CAHR-M : axial discharge/ CAHR-K : Axial suction
- / CAHRMV / CAHRKV : vertical version

## Performances:

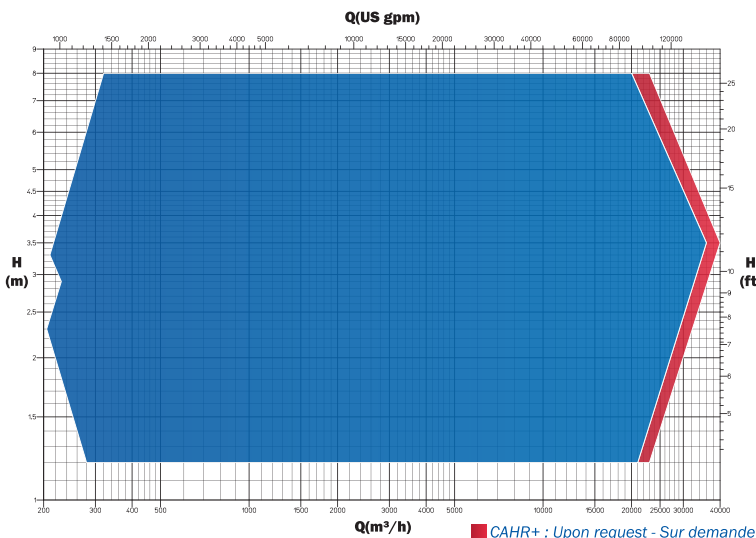
- / Flow: up to 30000 m<sup>3</sup>/h (132,100 US gpm)
- / Total head: up to 8 m (26 ft).
- / Maximum operating pressure: 10 bar (145 PSI)
- / Operating temperature range: from - 40 °C to 180 °C (-202 °F up to 356 °F)
- / Higher flows upon request

## Standard materials:

- / Cast iron, steel
- / Austenitic stainless steel, duplex alloys
- / Other materials available upon request : titanium, nickel, monel...

## Industrial applications:

- / Chemical industry
- / Petrochemical industry
- / Sugar Industry
- / De-Sulphurization



GENERAL  
INDUSTRY

### Design:

- / Casing designed per ASME Section VIII, Division 1.
- / Internal surfaces polished.
- / Antifriction bearings for small pump sizes
- / Thrust bearing by tilting pads with integrated exchanger for larger sizes.
- / Flanges following customers specifications
- / Mechanical seals designed to target a minimum service and a 5 year life expectancy.
- / Double (API plan 32 + 52/53C) or triple mechanical seal (API plan 32 + 53C + 52).
- / Common base plate for pump and motor with springs or pump hanging in the piping with cardan shaft coupling



### Performances:

- / Flow : up to 18000 m<sup>3</sup>/h (79,260 US gpm)
- / Total head : up to 45 m (148 ft).
- / Maximum operating pressure : 100 bar (1,500 PSI)
- / Operating temperature range :  
from - 40 °C to 200 °C (-50 °F up to 392 °F)
- / Higher flows and heads upon request

### Standard materials:

- / Casing / Propeller : LTCS, S304L or 316L
- / Shaft: 42CrMo4 Steel or S304L or duplex stainless steel 22/6/3
- / Other materials available upon request

### Industrial applications:

- / Polyolefins (PE and PP) industry



## Design:

- / Designed to accept all types of hydraulics: semiopen, open or torque flow impellers: suitable for all kinds of liquids. (pumps type: VL / VM)
- / Pump length to 16m (52ft) (higher sizes upon request)
- / Sealing options:
  - for contaminated liquids: Shaft is sealed-off by single or double mechanical seal
  - for clear liquids: without sealing systems
- / Shaft guided by column bearings
- Lubrication options:
  - by the pumped fluid
  - external flush options (with water or compatible fluids)
  - grease lubricated rolling bearing (<50 °C) or oil lubricated bearing (>150 °C)
  - discharge recirculation via filters or cyclone separators to lubricate line bearing(s)
- / Discharge separate from the shaftline.
- / Can be supplied with a V-Belt drive
- / Optional basket strainer



## Performances:

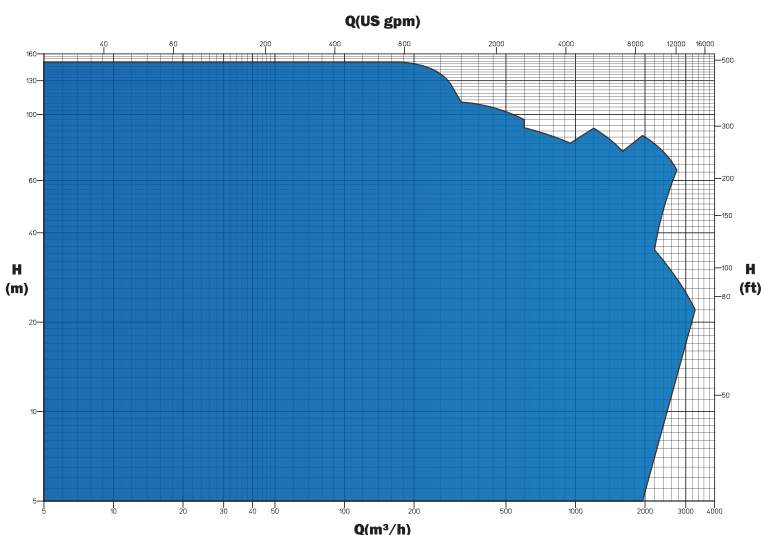
- / Capacity : up to 3300 m<sup>3</sup>/h (14.500 US gpm)
- / Total head : up to 150 m (500 ft)
- / Maximum operating pressure: 20 bar (290 PSI)
- / Operating temperature range : up to 120 °C (up to 248 °F)
- / Higher capacities and heads upon request

## Standard materials:

- / Grey cast iron, hard duplex iron, chromium iron.
- / Austenitic or duplex stainless steel of all grades.
- / All materials used for horizontal design.
- / Special alloys available upon request.

## Industrial applications:

- / Fertilizer plants
- / Iron and steel industry
- / Chemical industry
- / Petrochemical industry
- / Hydrocarbon processing
- / Various industrial applications

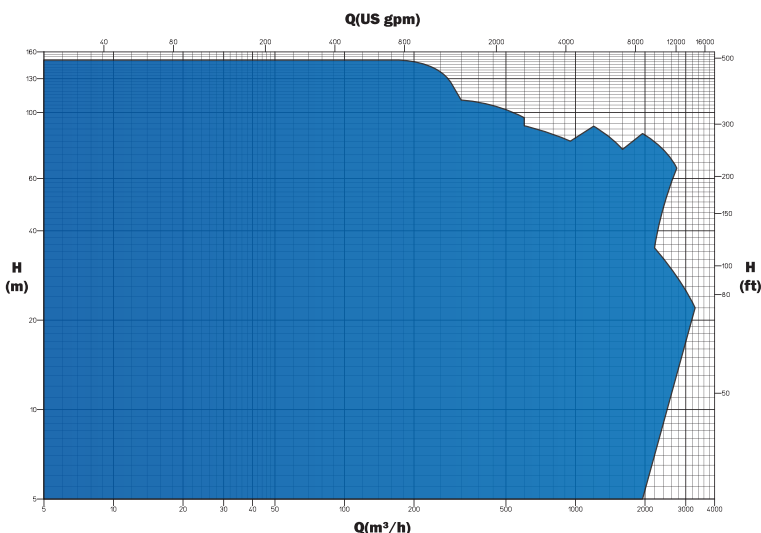


#### Design:

- / Designed to accept all types of hydraulics: semi-open, open, closed or torque flow impellers: suitable for all kind of liquids. (Type VAP/VO)
- / Simple and robust design with ease of maintenance.
- / Cantilever Design without submerged bearings and without shaft seal.
- / Shaft guided by grease-lubricated roller bearings located above the base plate and sealed-off from contamination by a labyrinth ring.
- / Construction with the bearing assembly under the base plate is possible.
- / Discharge separate from the shaftline.
- / Short in length (<1,8m). Can be extended by means of a suction pipe allowing the pump to operate with a liquid level under the impeller level.
- / Bearing assembly is sealed-off to prevent bearing contamination by liquids or gases / vapors.
- / Can run dry without risk of damage.
- / Can be supplied with a V-Belt drive.

#### Additional design:

- / High temperature design up to 450°C ( 850°F)
- / Design with heating jacket (Molten sulphur)
- / Design for ammonium nitrate



#### Performances:

- / Flow : up to 3500 m³/h (15.400 US gpm)
- / Total head : up to 150 m (500 ft)
- / Maximum operating pressure : 20 bar (290 PSI)
- / Operating temperature range : up to 120°C (up to 248°F)
- / Higher capacities << and heads upon request

#### Standard materials:

- / Grey cast iron, hard duplex iron, chromium iron.
- / Austenitic or duplex stainless steel of all grades.
- / All materials used for horizontal design.
- / Special alloys available upon request.

#### Industrial applications:

- / Fertilizer plants
- / Iron and steel industry
- / Chemical industry
- / Petrochemical industry
- / Hydrocarbon processing
- / Various industrial applications

### Design:

- / Single-stage with closed impeller Vertical construction
- / Three types of design :
  - 1) discharge through side branch for small sizes
  - 2) discharge through head for large sizes
  - 3) dry installation out of the tank
- / Grease-lubricated ball bearings
- / Absence of radial load on column bearings because of the concentric discharge.
- / Column bearings by the pumped liquid
- / Simple shaft sealing by throttle bush with leakage back to the tank
- / Auxiliary packing rings preventing acid vapors (for safety and maintenance)
- / Axial balancing by front and rear casing wear rings
- / Mating faces protected against acid corrosion
- / Threads protected by cap nuts and O-rings
- / Multi-stage construction available upon request



### Performances:

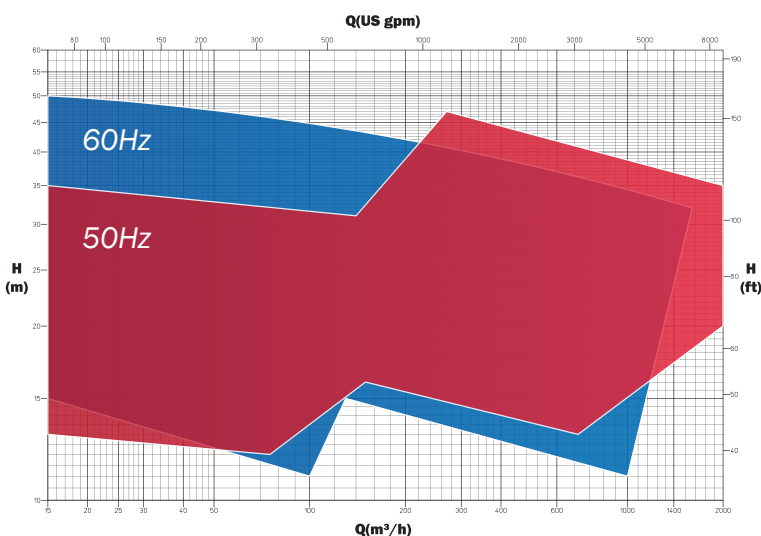
- / Capacity : up to 2000 m<sup>3</sup>/h (8,800 US gpm)
- / Total head : up to 45 m (148 ft)
- / Maximum operating pressure : 20 bar (290 PSI)
- / Operating temperature range : up to 120 °C (up to 250 °F)
- / Higher capacities and heads upon request

### Standard materials:

- / For hot concentrated sulphuric acid : 96 to 99%, temperature from 80 to 120 °C
- / Pump casing in acid-proof cast iron
- / Special stainless steel for impeller, wear rings and shaft sleeves
- / Sleeve bearings in ferro-silicium or special alloy
- / Shaft made of 20/25/4 stainless steel (U45N) or 316SS, with FEP tube upon request
- / Austenitic stainless steel with 6% silicium

### Industrial applications:

- / H<sub>2</sub>SO<sub>4</sub> production plants : absorption, drying - transfer





# VE-VEYR

**SINGLE OR MULTISTAGE VERTICAL PUMP WITH SUBMERGED CASING AND THROTTLE BUSHING**

FOR MOLTEN SALT, MOLTEN SULPHUR, HYDROCARBON, SMELTED NITRATE...

## VE:

/ Clear liquids : clear water, seawater, hydrocarbons, condensate, acids, ...

## VEYR:

/ Liquid with high vapour pressure/ low NPSH (liquefied gas, condensate extraction)

## Design:

- / No radial force on column sleeve bearings due to the concentric discharge.
- / No axial thrust due to the wear ring at the back of the impellers and balancing holes in impeller hub
- / Grease lubricated thrust ball bearings (oil lubricated upon request).
- / Shaft sealing : conventional packing rings or mechanical seal (single, double or tandem)
- / Sleeve bearings are lubricated normally by pumped liquid but if there are solids in the liquid it's possible to lubricate them by grease or with clean liquid injection on the sleeve bearings.
- / Inducer may be fitted to reduce the required NPSH value of the pump.
- / Removable shaft sleeve under sleeve bearing and packing rings.
- / Upon request : possibility to supply suction strainer and foundation rings.



## Performances:

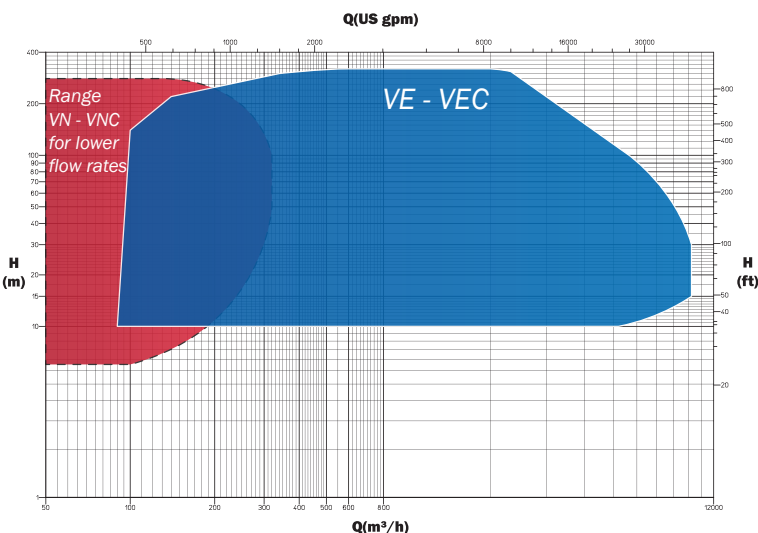
- / Capacity: up to 10000 m<sup>3</sup>/h (44030 US gpm)
- / Total head: up to 350 m (1150 ft)
- / Maximum operating pressure: 50 bar (725 PSI)
- / Operating temperature range : up to 600 °C (up to 1,112 °F)
- / Maximum length: 16m
- / Higher capacities and heads upon request

## Standard materials:

- / Materials as per API standards : I1, S1, S5, S6, C6, A8, D1, D2
- / Other materials available upon request

## Industrial applications:

- / Sulphur application (molten sulphur)
- / Concentrated solar power (CSP) : molten saltw
- / Refineries (hydrocarbons)



### VNY:

/ Design for high temperature

### VNYR:

/ Design with steam heating

### Design:

- / No radial force on column sleeve bearings due to the concentric discharge
- / No axial thrust due to the wear rings at the back of the impellers and balancing holes in impeller hubs
- / Grease lubricated thrust ball bearings (oil lubricated upon request).
- / Throttle bushing sealing system is requested for critical liquid
- / Heating of the collector and column for critical crystallizing liquid
- / Inducer may be fitted to reduce the required NPSH of the pump
- / Removable shaft sleeve under sleeve bearing and packing rings
- / Upon request : possibility to supply suction strainer and foundation ring



### Performances:

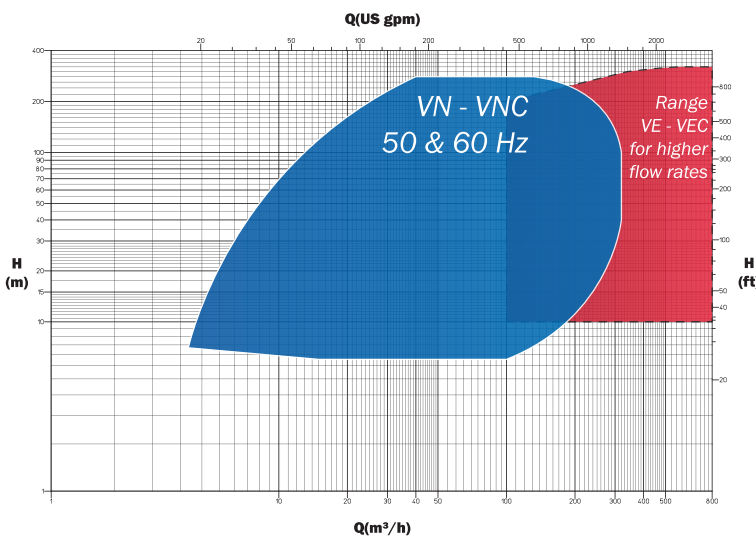
- / Capacity: up to 3000 m<sup>3</sup>/h (1320 US gpm)
- / Total head: up to 280 m (918 ft)
- / Maximum operating pressure: 25 bar (326 PSI)
- / Operating temperature range : up to 600 °C (up to 1,112 °F)
- / Maximum length: 16m
- / Higher capacities and heads upon request

### Standard materials:

- / Materials as per API standards : I1, S1, S5, S6, C6, A8, D1, D2
- / Other materials available upon request

### Industrial applications:w

- / Sulphur application (molten sulphur)
- / Concentrated solar power (CSP) : molten salt
- / Refineries (hydrocarbons)



### Design:

- / Propeller type - axial flow pump
- / Heavy duty construction
- / Design offering high efficiency for high flow requirement
- / Discharge Sizes : 300 mm up to 1400 mm. Larger diameter upon request
- / Simple design offers ease of installation and minimum maintenance
- / Solid cast steel construction of the pump casing
- / Optimized suction bell (Low NPSH)
- / Construction with the discharge head under the base plate available upon request
- / Sealing system :
  - Shaft sealing by packing rings are standard.
  - Throttle bushing sealing system allowing reduced maintenance
  - Optional mechanical seal available upon request.
- / Column bearings lubricated by the pumped liquid or grease lubrication optional
- / Pump length according customer specifications
- / Bearing assembly : Grease lubricated thrust bearings
- / Suction strainer is optional



### Performances:

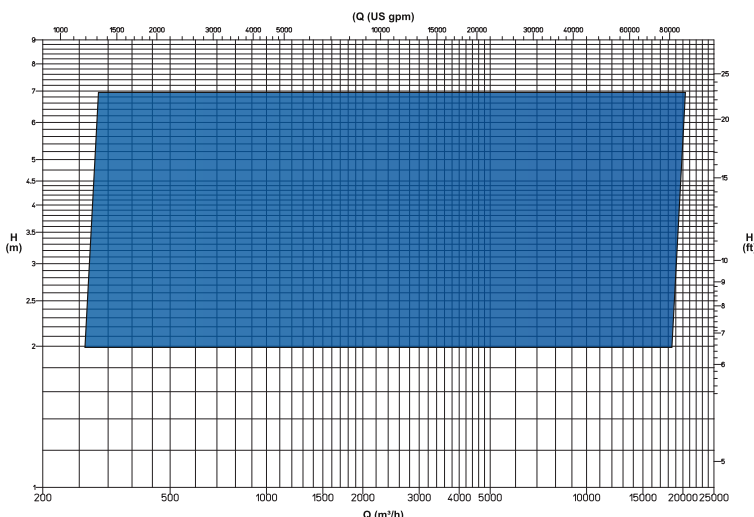
- / Capacity : up to 20000 m<sup>3</sup>/h
- / Total head : up to 7 m
- / Higher capacities and heads upon request

### Standard materials:

- / Cast iron, carbon steel, stainless steel, duplex steel
- / Other materials available upon request

### Industrial applications:

- / Irrigation
- / Water and waster
- / Sump drainage
- / Power generation
- / General industry





# PLR - NC - CR

## GENERAL INDUSTRY PUMP FOR SEVERE CONDITIONS

FOR SLURRIES, CORROSIVE, ABRASIVE LIQUIDS

### Design:

- / Specially designed to handle slurries with high level of very abrasive solids
- / Grease or oil lubricated double tapered roller bearings for V-belt transmission or for direct drive
- / Adjustable discharge nozzle position
- / Closed type impeller screwed on shaft with front and back relief vanes
- / Wear plate fitted on back of the impeller
- / Adjustment of capacity-head characteristics by speed variation (V-belt transmission, frequency converter, etc.)
- / Large clearances preventing wear
- / Shaft sleeve-protected from pumped liquid (hard material sleeve)
- / Shaft seal by packing, special slurry mechanical seal or hydrodynamic by expeller

### Additional Design:

- / Vortex impeller, semi-open impeller, dynamic seal («packing expeller»)
- / Special design for high temperatures



### Performances:

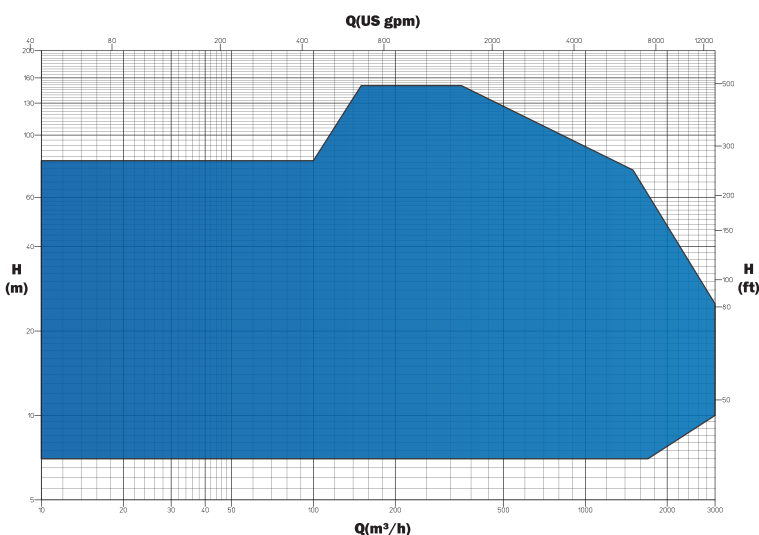
- / Flow : up to 3500 m<sup>3</sup> (15,400 US gpm)
- / Total head: up to 130 m (430 ft)
- / Maximum operating pressure : up to 10 bar (145 PSI)
- / Operating temperature range : up to 150° C (up to 300° F)
- / Higher capacities and pressures upon request

### Standard materials:

- / Duplex stainless steel
- / Austenitic stainless steel
- / Other stainless steel grades upon request
- / Martensitic cast iron, Ni-hard cast iron, chromium cast iron
- / Hastelloy

### Industrial applications:

- / Petrochemical industry
- / Chemical industry
- / Mining industry
- / Steel industry
- / Sugar industry
- / Cement works
- / Quarries



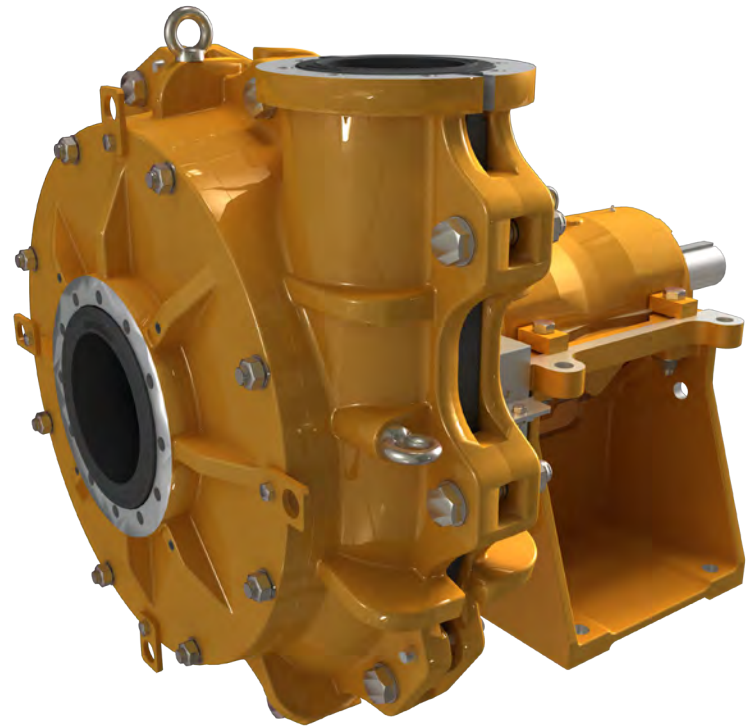
# EMW-R

## EXTRA HEAVY DUTY RUBER SLURRY PUMP

HIGH ABRASION AND CORROSION RESISTANCE

### Design:

- / Closed impeller with optimized hydraulics ensures high efficiency and maximized wear performance over a wide range of services.
- / Natural rubber in standard. (Other types of rubber upon request)
- / Liners contain inserts for strength and durability.
- / Shaft sealing with hydrodynamic expeller + gland packing is standard, with other options available
- / Bearing :
  - Grease lubrication standard (oil lubrication is optional)
  - Heavy-duty bearings offer LB10 bearing life of more than 50.000 hours
  - Common and available bearings used.
- / A new design allows for easy installation and removal of the impeller while providing a strong reliable power transmission.
- / Roller bearings handle both high radial and axial loads, capable of both direct and belt drive configurations.
- / Adjustable discharge nozzle
- / Standard bearing protection by labyrinth (Impermeable to water-flushing)
- / Separate and removable suction plate (From size 200)
- / Release collar allows quick and easy removal of the impeller (From size 200)
- / Dowel allows for easy assembly and alignment of the cover and frame plates.



### Performances:

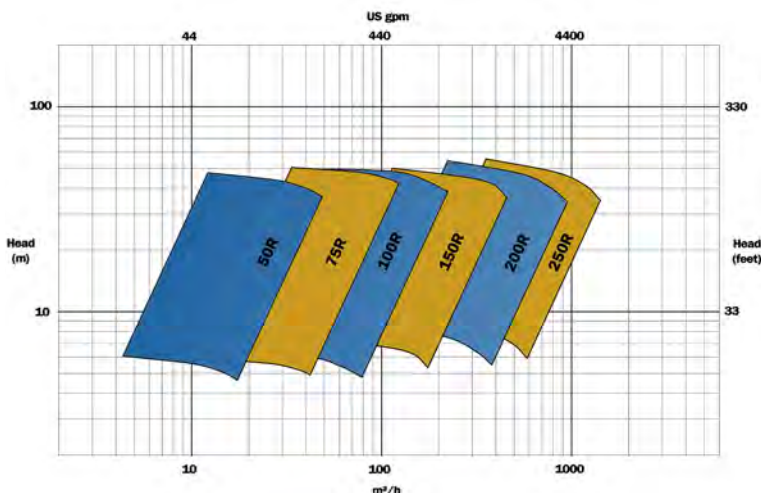
- / Capacity : up to 1050 m<sup>3</sup>/h (4623 US gpm)
- / Total head : up to 55 m (180 ft)
- / Maximum operating pressure : 15 bar (217 PSI)
- / Higher capacities and heads upon request

### Standard materials:

- / Natural rubber in standard.
- / Other types of rubber upon request.

### Industrial applications:

- / Mining and mineral processing
- / Aggregates (Sand and Gravel )
- / Power (Bottom ash, lime slurry for FGD)
- / Food industry
- / Waste water
- / Chemical slurries



# EMW-M

## EXTRA HEAVY DUTY METAL SLURRY PUMP

HIGH ABRASION AND CORROSION RESISTANCE

### Design:

#### / Impeller :

- Closed impeller provides high efficiency
- Long service life impeller (important thickness)
- Large flow passage.
- Front / back impeller clearing vanes for maximized flow characteristics for high efficiency and long wear life

#### / Shaft sealing via gland packing is standard, with other options available

#### / Suction nozzle design with antivortex ribs for improved wear

#### / Shaft/impeller thread design provide for high power transmission

#### / Floating steel flange with patented locking system for easy assembly and positive sealing

#### / Bearing :

- Grease lubrication standard (oil lubrication is optional)
- Heavy-duty bearings offer LB10 bearing life of more than 50.000 hours
- Common and available bearings used.

#### / Roller bearings handle both high radial and axial loads, capable of both direct and belt drive configurations.

#### / Adjustable discharge nozzle

#### / Standard bearing protection by labyrinth (Impermeable to water-flushing)

#### / Clearance adjustment with the adjustable suction plate (from size 200)

#### / Release collar allows quick and easy removal of the impeller (From size 200)



### Performances:

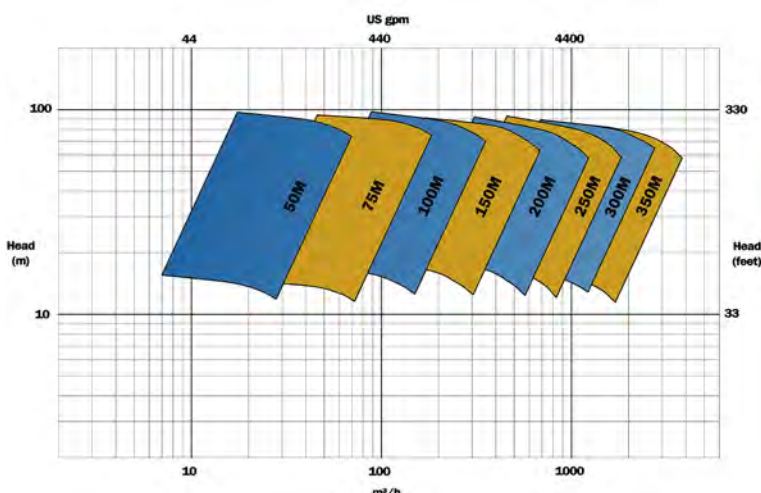
- / Capacity : up to 4000 m<sup>3</sup>/h (17600 US gpm)
- / Total head : up to 55 m (180 ft)
- / Maximum operating pressure : 15 bar (217 PSI)
- / Higher capacities and heads upon request

### Standard materials:

- / Chrome iron high in hardness and toughness for maximum wear life
- / Other materials available upon request

### Industrial applications:

- / Mining and mineral processing
- / Aggregates (Sand and Gravel )
- / Power (Bottom ash, lime slurry for FGD)
- / Food industry
- / Waste water
- / Chemical slurries



GENERAL  
INDUSTRY

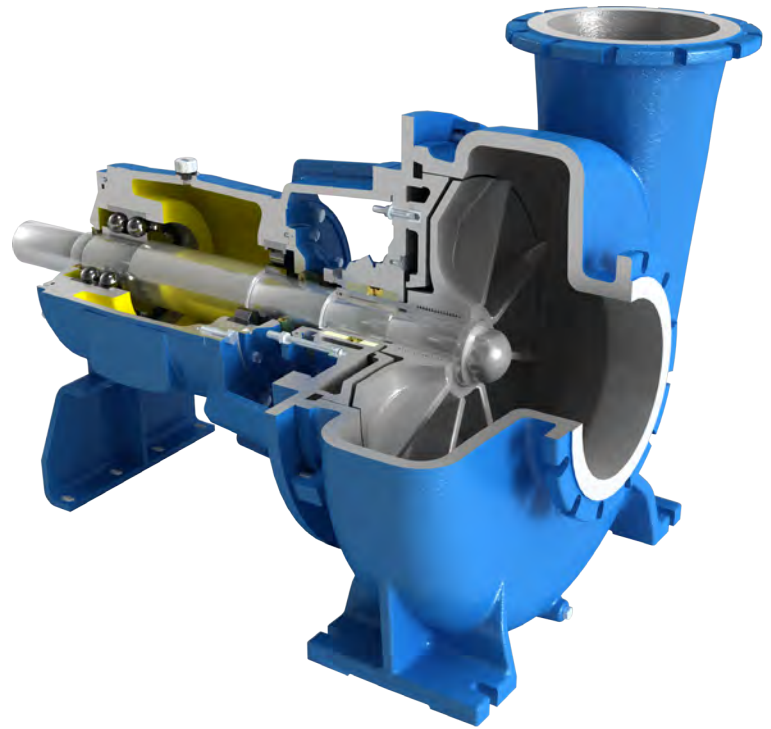


# MRA-MT

## RECESSED IMPELLER PUMP

### Design:

- / Large shaft diameter reduces shaft deflection and vibrations to preserve the bearing's life span.
- / Shaft fully protected from the pumped liquid by the shaft sleeve and O-ring.
- / Screws entirely outside of the fluid and protected from abrasive and corrosive actions.
- / The stuffing box is cooled and easily accessible.
- / Various seal options are available: packing, single, double, tandem mounted mechanical seal or hydrodynamic seal .
- / Non-clogging impeller.
- / Wear of hydraulic components is limited. The impeller creates a vortex field in the casing which moves the fluid and solids minimizing contact with the hydraulic components.
- / BACK PULL-OUT design: dismantling without disturbing the piping or the motor.
- / Standard bearing protection by labyrinth type seal and deflector.
- / Bearing housing with oversized oil lubricated bearings (or grease lubricated as an option) allowing V-Belt transmissions as well as direct transmission.
- / Roller bearing's life span is superior to 25.000 hours.
- / Available with lateral, axial discharge nozzle or with adjustable discharge nozzle



### Performances:

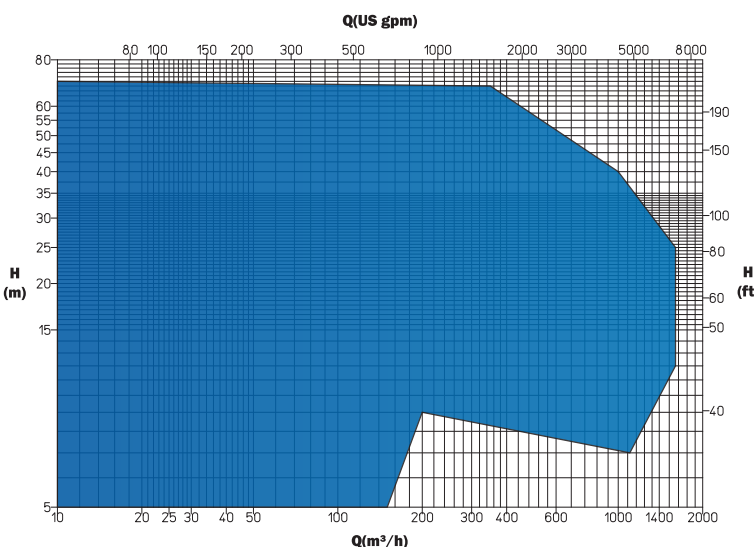
- / Flow : up to 1500 m<sup>3</sup>/h (6,000 US gpm)
- / Total head : up to 65 m (215 ft)
- / Maximum operating pressure : 15 bar (220 PSI)
- / Temperature operating range : from -30 to 140 °C (-22 to 284 °F)
- / Maximum speed : 3,600 rpm at 60 Hz
- / Higher capacities and pressures upon request

### Standard materials:

- / Duplex, cast iron, stainless steel, chromium alloy, Ni-hard cast iron
- / Other materials upon request

### Industrial applications:

- All industries :
- / Food processing
  - / Water treatment
  - / Ore treatment
  - / Iron and steel
  - / General supplies...





# D SERIE

## HORIZONTAL CENTRIFUGAL CLOSE COUPLED PUMP

FOR LIQUID SLURRIES, CORROSSIVE,  
ABRASIVE, AND FIBROUS FLUIDS

### Design:

- / Well suited for transfer of all corrosive, abrasive, and fibrous fluids and allow a free flow passage of solids (Non clogging impeller centrifugal pumps)
- / Variable speed
- / Simple design for easy maintenance
- / Optimum efficiency over the entire service life
- / Standard motors
- / Single mechanical seal (flushing is optional)
- / Wear of hydraulic components is limited. The impeller creates a vortex field in the casing which moves the fluid and solids minimizing contact with the wet end components



### Performances:

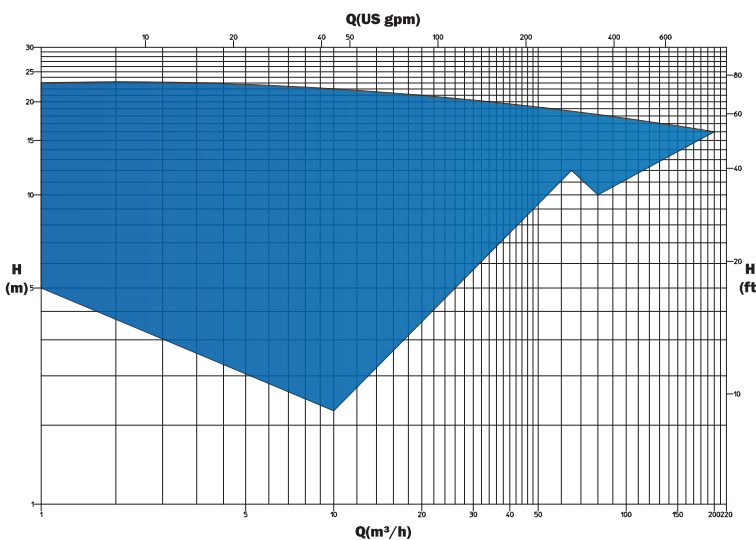
- / Capacity : up to 200 m<sup>3</sup>/h (880 US gpm)
- / Total head : up to 23 m (75 ft)
- / Maximum operating pressure : 10 bar (145 PSI)
- / Operating temperature range : up to 120° C (up to 248° F)
- / Higher capacities and heads upon request

### Standard materials:

- / 26/5/2 + Cu duplex stainless steel
- / 1% chromium cast iron
- / Cast iron NFA32-101 : FGL250
- / Special alloys available upon request.

### Industrial applications:

- All industries
- / Food processing
- / Water treatment
- / Ore treatment
- / Iron and steel
- / General supplies...



### Design:

- / Self-priming pump without auxiliary reservoir
- / Construction in accordance with ISO 5199
- / Back pull-out design : dismantling without disturbing the piping or the motor
- / Suitable for severe continuous duties
- / Standard DIN/NFE PN16 flanges
- / Bearing type : three rolling-contact bearings lubricated by oil with constant level oiler
- / Shaft fully protected from pumped liquid
- / Pressure in stuffing box controlled by impeller back vanes
- / Cooling jacket in the standard design
- / Maximum interchangeability of the various components throughout the series
- / Low NPSH characteristics



### Performances:

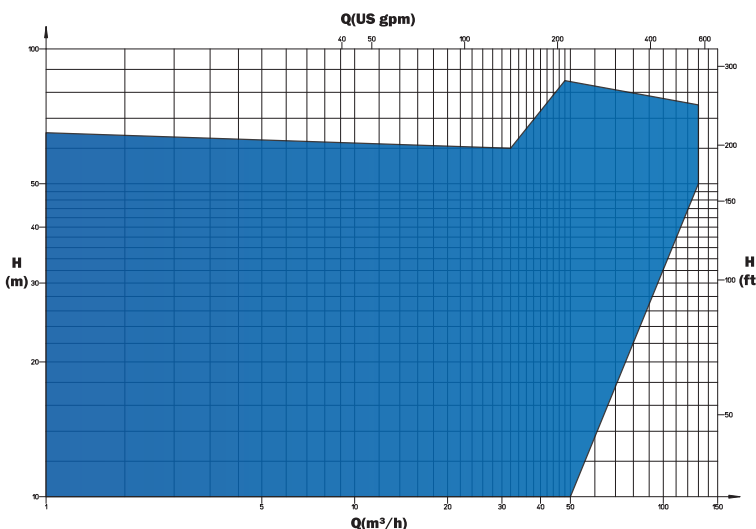
- / Flow : up to 130 m<sup>3</sup>/h (572 US gpm)
- / Total head : up to 85 m (278 ft)
- / Maximum operating pressure : 20 bar (290 PSI)
- / Temperature operating range : up to 120°C (248°F)
- / Maximum speed : 3000 rpm at 50 Hz
- / Higher capacities and heads upon request

### Standard materials:

- / Cast iron
- / 18/10/2.5 austenitic stainless steel
- / 20/25/4 +Cu stainless steel
- / 26/5/2 + Cu ferritic-austenitic stainless steel
- / Other materials available upon request : titanium, nickel, ...

### Industrial applications:

- For all industries :
- / Chemical industry
  - / Petrochemical industry
  - / Fibers / cellulose processing industry
  - / Sugar industry
  - / Mines / quarries
  - / Offshore
  - / General industry



### Design:

- / Horizontal centrifugal single stage pumps with radial suction and discharge. Working conditions according to curves hereunder.
- / Pump casing flanges according to ISO PN 10 - Other flange standards upon request
- / Double entry impeller, between bearings construction.
- / Oil or grease lubricated bearings, depending on working conditions.
- / Common welded steel base plate under pump and motor, with drip tray system (optional).
- / Shaft seal insured by mechanical seal (API plan 11, 31, or 32 on standard, others on request) or alternatively by gland packing. Options : manometers, pressure switch, flow meter, temperature sensors, etc.
- / Reduced maintenance costs thanks to casing wear rings durably protecting fixed and turning parts.
- / Improved MTBM: high safety-factor design on shaft, high life-length calculation on bearings.
- / Corrosion resistance improved by shaft and casing wear rings in stainless steel.
- / Preventive control operations eased by the dismantling of upper casing part (no need to remove inlet and outlet pipings).
- / Coupling with spacer simplifies the access to the bearing frame and the seal chamber (driving end).
- / Jack screws (motor side) for an easier alignment setting.
- / Preventive monitoring assured by temperature sensors on each bearing. For an improved maintenance, pumps can be equipped with vibration sensors, SPM nipples, connexion boxes



### Performances:

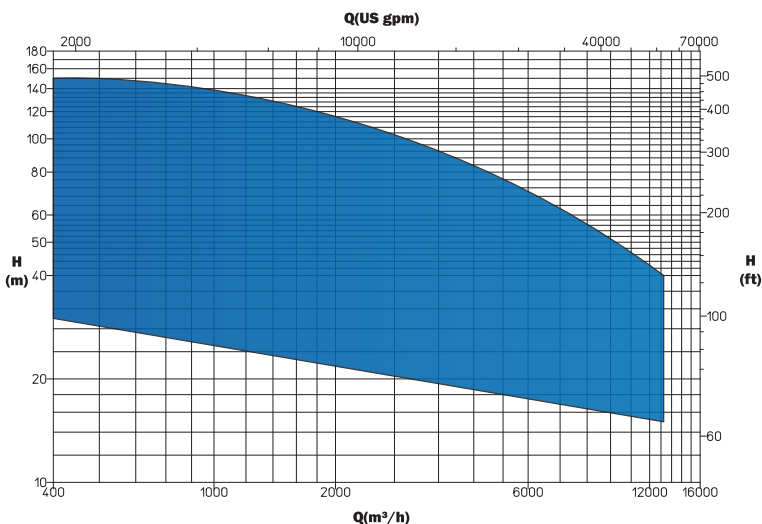
- / Flow : up to 15 000 m<sup>3</sup>/h (66 000 US gpm)
- / Total Dynamic Head : up to 160 m (525 ft)
- / Maximal Working Pressure : up to 16 bar (232 PSI)
- / Working Temperatures : from 10 to 80 °C (50 to 176 °F)
- / Rotating speed : up to 1 800 rpm
- / Variable speed driving acceptable
- / Higher capacities and heads upon request

### Standard materials:

- / Casing and impeller : Mainly Stainless steels (Duplex or Super Duplex)
- / Other materials upon request : Ductile or Cast Irons, Carbon Steel, Special Alloy Steels, Bronze, Aluminium Bronze, Cu-Ni Bronze, Hastelloy ...

### Industrial applications:

- / Pump designed for a huge panel of fluids : Especially filtered liquids as sweet water, distillate water, condensate water, filtered water (...) or lightly loaded liquids as sea water, brine, raw or treated water (...)



# ROTA

## ROTARY DISPLACEMENT PUMP FOR MASSECUITE AND MAGMA

### Design:

- / Simple and robust construction.
- / Low Maintenance
- / Flexible and simple use : insensitive to feeding fluctuations
- / Shaft sealing with gland packings
- / Optimized feeding thanks to the rectangular flange. Flange adaptor for cylindrical piping available upon request.
- / Transmission with pulleys/belts or with a geared motor. (Driving from both ends is possible.)
- / Rotation speed between 30 and 60 rpm reducing the wear of the rotating components.
- / Bearings with ball bearing are optional
- / Lubrication for food-processing
- / Connection for water or steam injection for washing
- / Wiper wear indicator
- / Option : By-pass



### Performances:

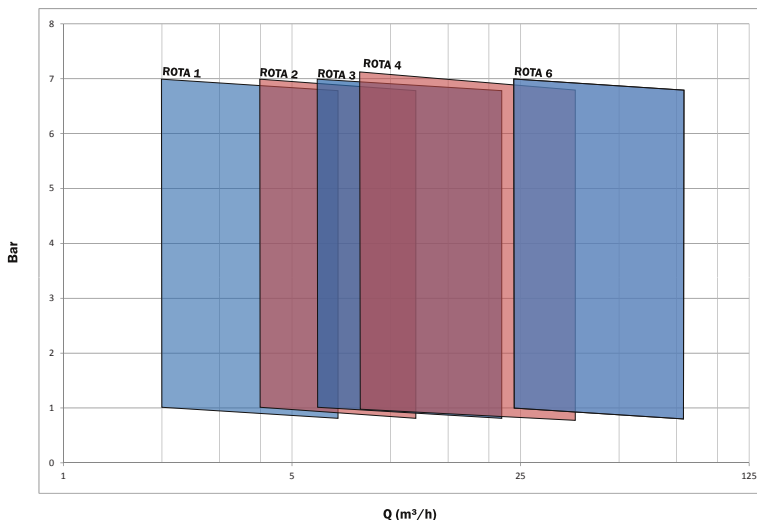
- / Capacity : 5m<sup>3</sup> up to 80m<sup>3</sup>  
(22 US gpm up to 325 US gpm)
- / Discharge pressure : 7 bar (100 PSI)

### Standard materials:

- / Piston : cast iron (standard) / bronze (option)
- / Pump casing : cast iron
- / Wiper : carobronze

### Industrial applications:

- / Sugar industry : massecuite and magma





### Design:

- / Between bearings eccentric blades impeller
- / Shaft sealing by packing with inserted lantern rings
- / Shaft fully protected
- / Self-adjusted compression rate
- / Not affected by liquid or dust
- / Silent running
- / Low maintenance
- / Water saving reservoir at pump discharge



### Performances:

- / Capacity : up to 11000 m<sup>3</sup>/h (48,500 US gpm)
- / Suction pressure : up to 50 Torr

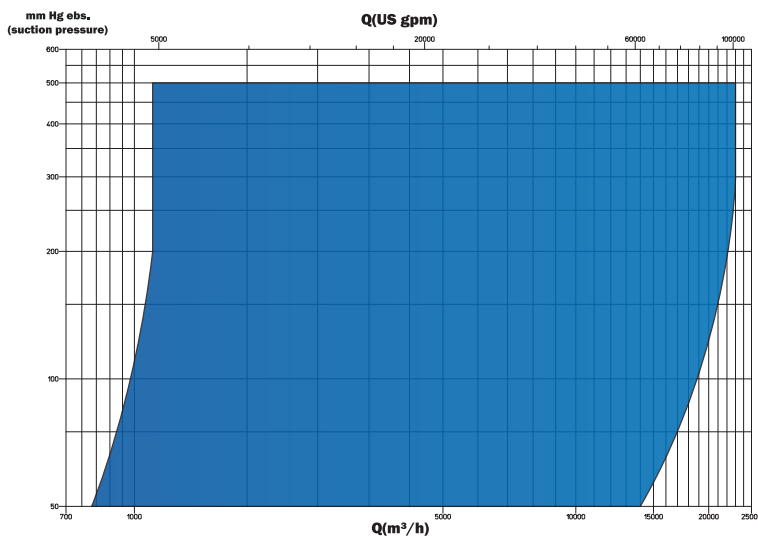
### Standard materials:

- / Cast iron with nodular cast iron impeller
- / Cast iron, impeller 90/10 bronze or stainless steel
- / 18/10/2.5 stainless steel \*
- / 26/5/2+Cu stainless steel \*
- / Other materials upon request

\* The values are the percentages in Cr/Ni/Mo.

### Industrial applications:

- / Chemical
- / Industry
- / Mining Industry
- / Iron and steel Industry
- / Sugar industry
- / Pulp and paper industry



# Refurbishment - Maintenance - Retrofit

Mechanical inspection, performance analysis, or complete refurbishment, provide you the best solutions

**1** Reception in one of our service centers



**2** Cleaning and sand blasting

**4** Machining, line boring, flange facing, shaft alignment...



## Repair Services

All brands and types of pumps can be serviced. Qualified Ensival Moret technicians and repairmen are able to provide complete pump repairs restoring your equipment to their original condition. The rebuilt pumps are fully tested and returned to your facility with a full factory warranty. A summary report is also provided to document the work.

## Equipment upgrades

Our engineers can also provide equipment analysis and equipment upgrade solutions in order to improve performance as well as efficiency.

Equipment upgrades include :

- / Hydraulics (NPSH improvement, material upgrades, new wet end components)
- / Mechanical components (sealing configuration, lubrication system and improved bearings configurations)
- / Shaft Sealing upgrades (single, double seals, quenching systems or hydrodynamic solutions may be available)



**3** Mechanical inspection



**5** Repair by coating and hardfacing processes

**6** Balancing of rotating parts



**8** Re-Assembling



**7** Advanced hydrostatic and hydraulic test available



**9** Paint



**10** Pump working "as-new"



## Technical Support

Equipment installation and start-up include:

- / Verification and alignment of piping, (laser alignment.)
- / Complete verification of the sealing system, control of oil level.
- / Assistance for the starting, performance and vibration analysis.

Our highly skilled technicians and engineers are available to carry out interventions twenty four hours a day, seven days a week.

## Maintenance

We are dedicated to provide you timely and high quality repair services during your process shutdown. Our very mobile team can perform repairs at one of our service centers or on-site. Our team is empowered to carry out all repair requirements.

Ensival Moret is also offering a complete maintenance package tailored to meet customer requirements. This maintenance can be either preventive or curative.

## Energy efficiency

In addition to pumps repair, we also offer complete diagnostic on site together with analysis in order to optimize a complete pumping installation in terms of performance, maintenance cost, and energy consumption.

After taking measurements on site (Key parameters), our engineers provide a complete analysis and identify potential failures and problems.

After this impact assessment, we are able to eliminate sources of decreasing performance and useless cost.



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