



# Session 19 – Overhung Process Pumps – Part 2 – Vertical API Types OH3, 4, 5, 6

*Describing, comparing and contrasting the features and benefits of the various vertical overhung process pump configurations, OH3, 4, 5 & 6. Discussing when they are a suitable choice compared with the more conventional horizontal type OH2  
Aimed at Process and Mechanical Engineers, and Consultant Engineers who specify pumping equipment as well as Applications & Sales Engineers selecting and quoting them.*



**“What’s the Difference?”**

# OH3, 4, 5 & 6 Pumps

## What's the Difference? - API 610 definition

### 4.2.2.4 Pump Type OH3

Vertical, in-line, single-stage overhung pumps with separate bearing brackets shall be designated pump type OH3 (Figure 3). They have a bearing housing integral with the pump to absorb all pump loads. The driver is usually mounted on a support integral to the pump. The pumps and their drivers are flexibly coupled.

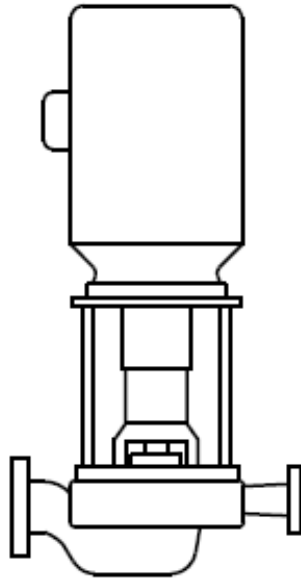


Figure 3—Pump Type OH3



# OH3 Pumps

## MOTOR STOOL INSTALLED DIRECT TO THE PUMP VOLUTE

The motor stool mounts directly to the pump volute.

## PADS IN BRACKET

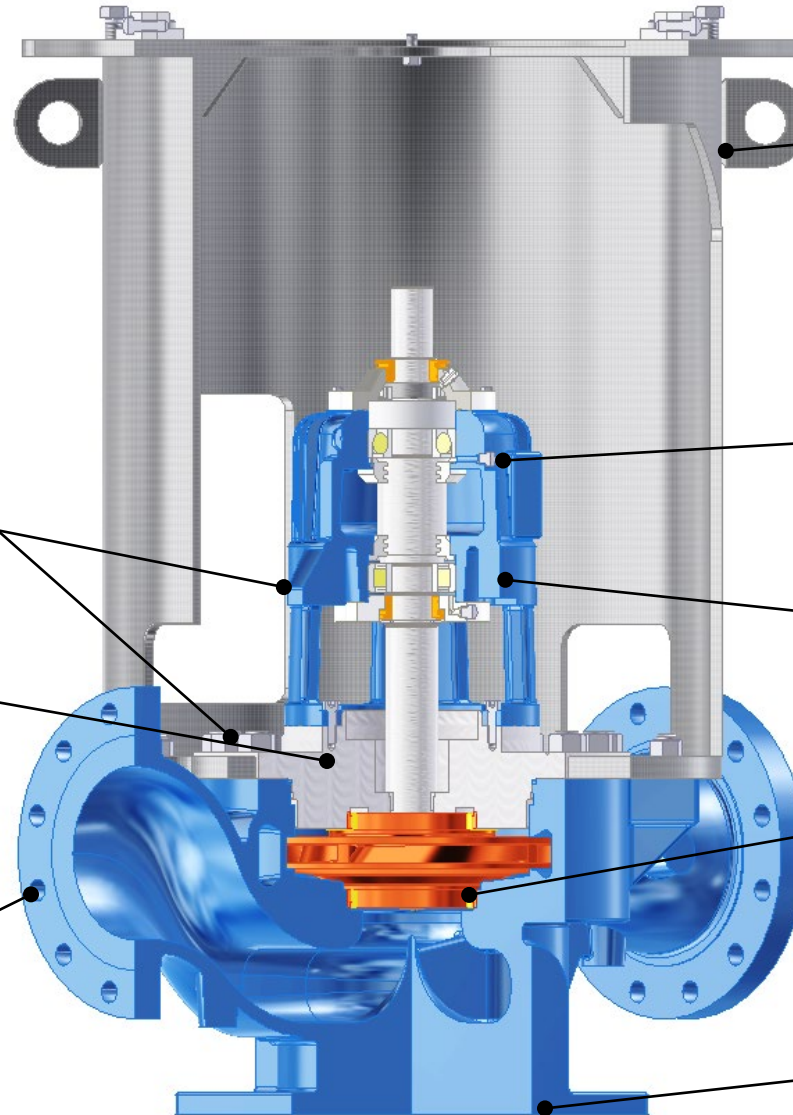
To lift the bracket for maintenance

## STUFFING BOX

For API Mechanical Seals

## DIRECT CONNECTION TO THE PIPELINES

The In-Line pump design allows direct connection to the pipelines which reduces installation costs and minimizes the footprint.



## MOTOR STOOL

Fabricated motor stool

## BEARING FRAME SIZE 35, 55 & 75

Carries pump loads, standard option grease lubricated, Oil mist also available.

## BACK PULL-OUT

For easy maintenance.

## WEAR RINGS

Impeller and casing

## FLAT CONTACT SURFACE

To make the pump stable if freestanding on a pad or foundation



# General Description

## SPI In-Line Vertical Pumps

- Vertical In-line pump
- Flexible Coupling
- Driver is usually mounted on support integral to the pump.
- Fully enclosed, balanced, one-piece design impeller
- Back pull-out design, without lifting the motor or suction and discharge pipework
- Flanged suction and discharge on common centerline casing
- Bearing housing (3 sizes) integral with the pump to absorb all pump loads
- D and C Motors



<b>Capacity</b>	450 m <sup>3</sup> /h	2,000 US GPM
<b>Head</b>	200 m	656 ft
<b>Temperature</b>	-50°C to 450 °C	-58°F to 842 °F
<b>Pressure</b>	80 bar	1160 psi

# OH3, 4, 5 & 6 Pumps

## What's the Difference? - API 610 definition

### 4.2.2.5 Pump Type OH4

Rigidly coupled, vertical, in-line, single-stage overhung pumps shall be designated pump type OH4 (Figure 4). Rigidly coupled pumps have their shaft rigidly coupled to the driver shaft. (This type does not meet all the requirements of this standard; see Table 3.)

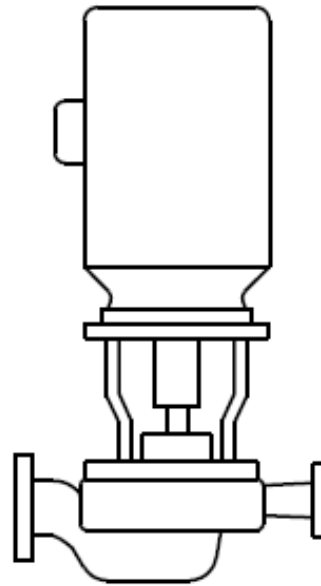
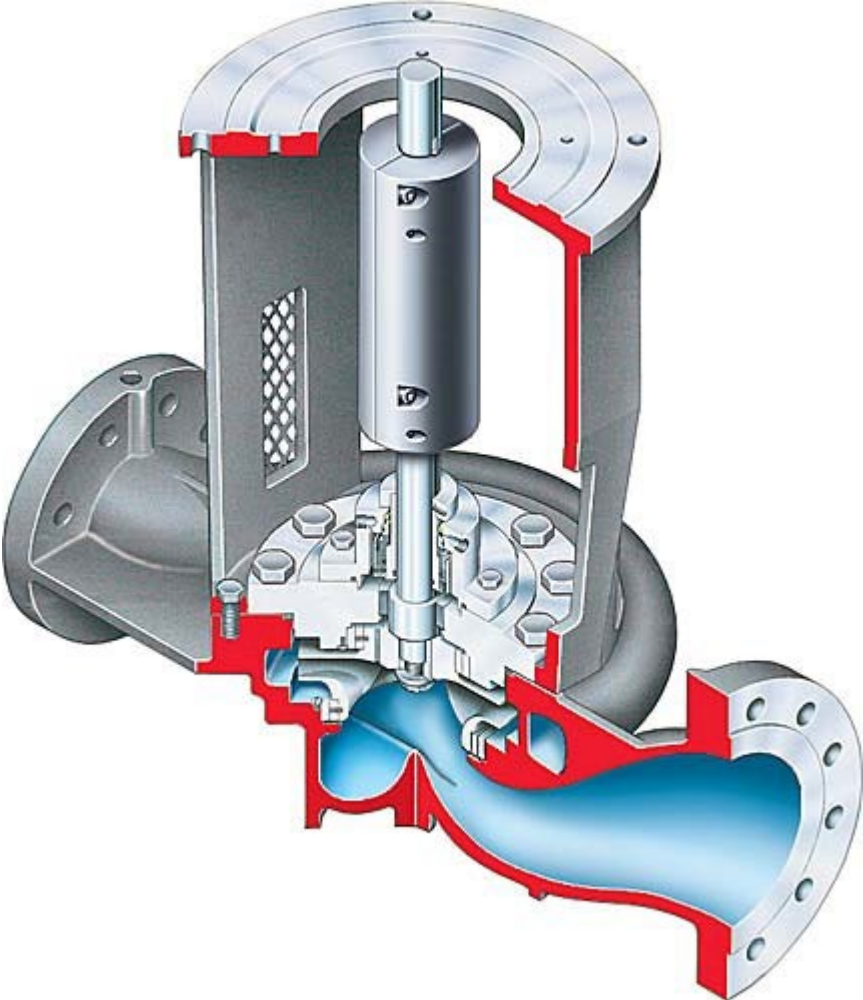


Figure 4—Pump Type OH4

# OH4 Pumps



# OH3, 4, 5 & 6 Pumps

## What's the Difference? - API 610 definition

### 4.2.2.6 Pump Type OH5

Close-coupled, vertical, in-line, single-stage overhung pumps shall be designated pump type OH5 (Figure 5). Close-coupled pumps have their impellers mounted directly on the driver shaft. (This type does not meet all the requirements of this standard; see Table 3.)

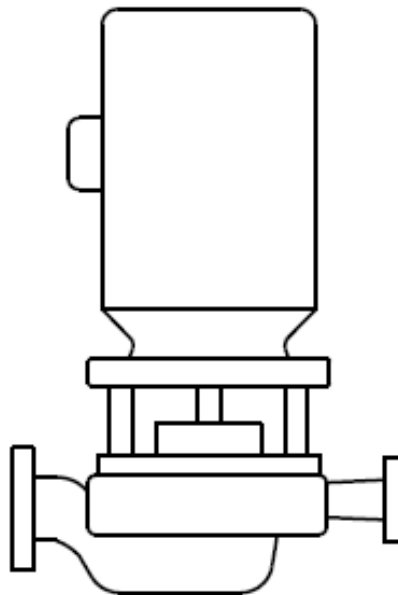
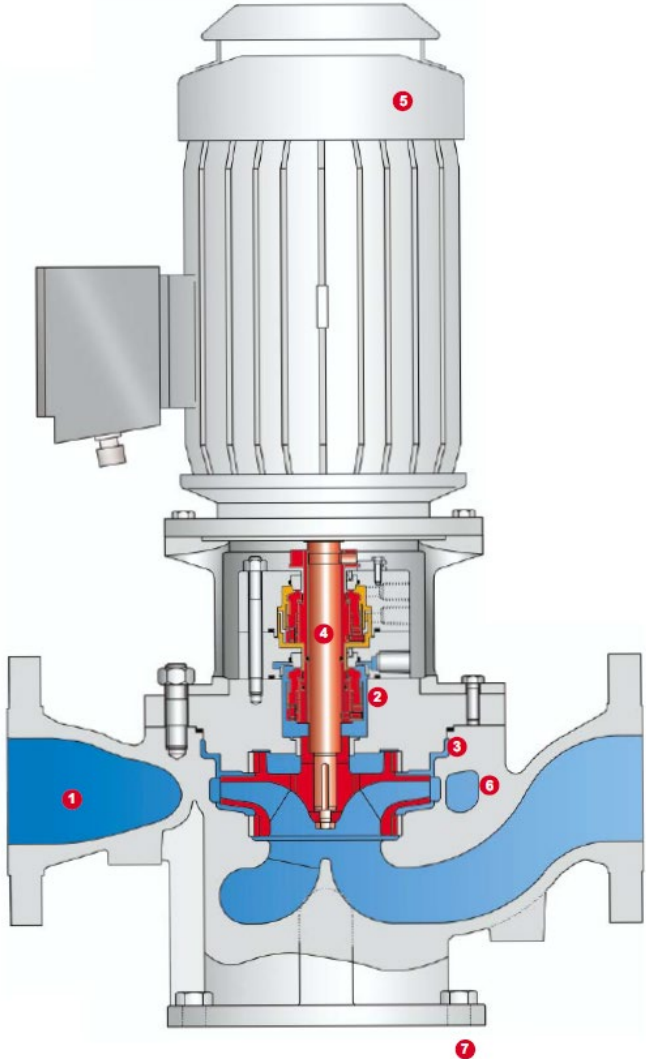


Figure 5—Pump Type OH5



# OH5 Pumps



# OH3, 4, 5 & 6 Pumps

## What's the Difference? - API 610 definition

### 4.2.2.7 Pump Type OH6

High-speed, integral, gear-driven, single-stage overhung pumps shall be designated pump type OH6 (Figure 6). These pumps have a speed-increasing gearbox integral with the pump. The impeller is mounted directly to the gearbox output shaft. There is no coupling between the gearbox and pump; however, the gearbox is flexibly coupled to its driver. The pumps can be oriented vertically or horizontally.

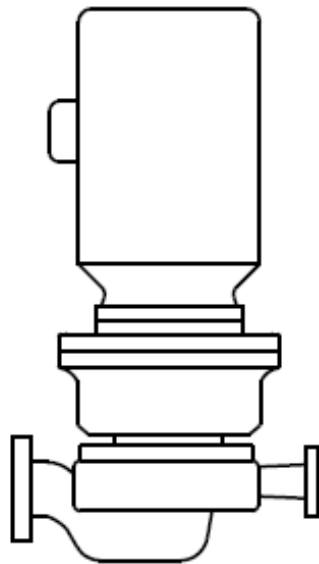
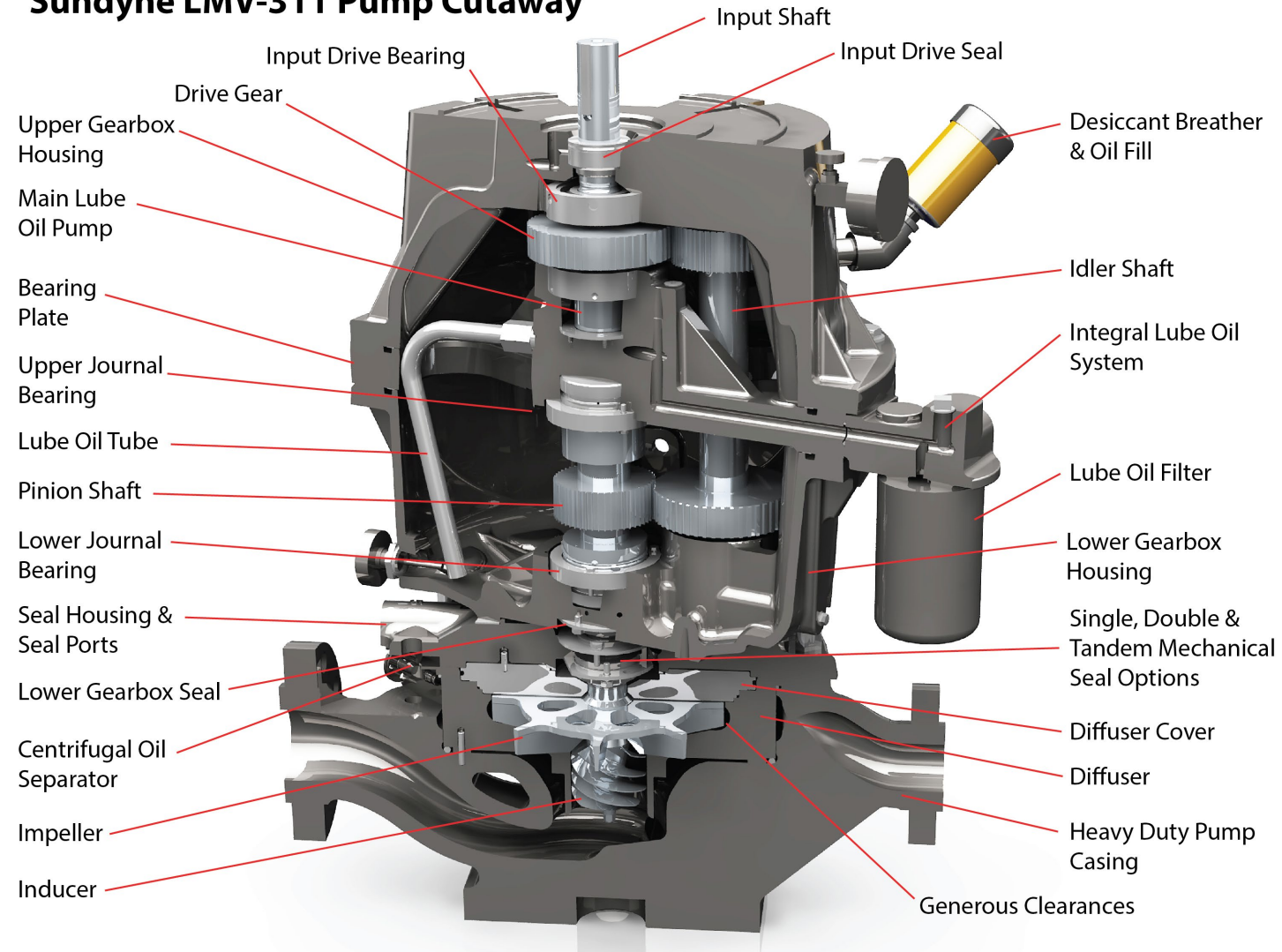


Figure 6—Pump Type OH6



# OH6 Pumps

## Sundyne LMV-311 Pump Cutaway



# OH3, 4, 5 & 6 Pumps

## What's the Difference? - API 610 definition

### 6.2 Pump types

The pump types listed in Table 3 have special design features and shall be furnished only if specified by the purchaser and if the manufacturer has proven experience for the specific application. Table 3 lists the features requiring special consideration for these pump types, and gives in parentheses the relevant subclause(s) of this International Standard.

**Table 3—Special Design Features of Particular Pump Types**










Pump Type	Features Requiring Special Consideration
Rigidly coupled vertical in-line, OH4	<ul style="list-style-type: none"><li>a) Motor construction (7.1.8, 7.1.9)</li><li>b) Rotor stiffness (6.9.1.3)</li><li>c) Product-lubricated guide bearing (6.10.1.1)</li><li>d) Shaft runout at seal (6.6.9, 6.8.5)</li></ul>
Close-coupled (impeller mounted on motor shaft), OH5	<ul style="list-style-type: none"><li>a) Motor construction (7.1.8, 7.1.9)</li><li>b) Motor bearing and winding temperature at high pumping temperatures</li><li>c) Seal removal (6.8.2)</li></ul>

**“Who Makes Them?”**

# OH3, 4, 5 & 6 Pumps

## Who Makes Them?

*API 610 Pump Models of the Key Global Manufacturers*

	API Pump Type	Description									
Over Hung / Single Stage	OH1	Foot Mounted	Not Applicable								
	OH2	Centreline Mounted	SMK	HPXPHL	OHH/PRE	3700	RPH	UCW/UCS	SCE	TC	CUPOH2
	OH3	Vertical Inline Flexibly Coupled, Bearing bracket	LMV 801 CS	HPX-V	OHV	3910			SPI	VP	CUPOH3
	OH4	Vertical Inline Rigidly Coupling		MSP/DSVP				LPWM			CUPOH4
	OH5	Vertical Inline Close Coupled	LMV 80X	PVML		3900		LPW	SPN		
	OH6	High Speed Integrally Geared	LMV 3XX HMP/BMP								

Source – Kirit Domadiya - Sundyne



# **OH3 Pumps**

RP Model SPI




# Applicable Standards

The SPI corresponds to the following standards:

- API 610 11<sup>TH</sup>/12<sup>th</sup> Edition
- API 682 3<sup>RD</sup> Edition for mechanical seals
- ATEX (Explosion Protection Directive 94/9/EC)

*The pump line is designed to meet group II, category 2 G (intended use in zone 1). This includes category 3 (intended use in zone 2).*

*The required risk analysis for the pumps has been performed at Ruhrpumpen.*

*Basis for the analysis are the standards EN 13463-1, EN 13463-5 and EN 1127.  II 2G c X*

*The final documentation is retained at the notified body.*





# General Description

## SPI In-Line Vertical Pumps

- Vertical In-line pump
- Flexible Coupling
- Driver is usually mounted on support integral to the pump.
- Fully enclosed, balanced, one-piece design impeller
- Back pull-out design, without lifting the motor or suction and discharge pipework
- Flanged suction and discharge on common centerline casing
- Bearing housing (3 sizes) integral with the pump to absorb all pump loads
- D and C Motors



SPI
1.5 X 1.5 X 8
2 X 2 X 7
2 X 2 X 10
2 X 2 X 12
3 X 3 X 7
3 X 3 X 9 A
3 X 3 X 9 B
4 X 4 X 8
4 X 4 X 9
3 X 3 X 12
3 X 3 X 15
4 X 4 X 12
4 X 4 X 15
6 X 6 X 10
6 X 6 X 12
6 X 6 X 15
8 X 8 X 10
8 X 8 X 12
8 X 8 X 15
12 X 10 X 20
6 X 20

<b>Capacity</b>	450 m <sup>3</sup> /h	2,000 US GPM
<b>Head</b>	200 m	656 ft
<b>Temperature</b>	-50°C to 450 °C	-58°F to 842 °F
<b>Pressure</b>	80 bar	1160 psi



# Applications

- The Ruhrpumpen In-Line Pumps OH3 are designed for continuous duty, pumping various fluids, with a combination of mechanical and installation features for applications in petroleum, petrochemical, and industrial product service.

- Refinery Process Services
- Off-site hydrocarbon
- Tank Transfer
- Tank Farm Booster
- Fuel Oil
- Gasoline
- Crude Oil
- LPG
- Water
- Naptha
- Kerosene

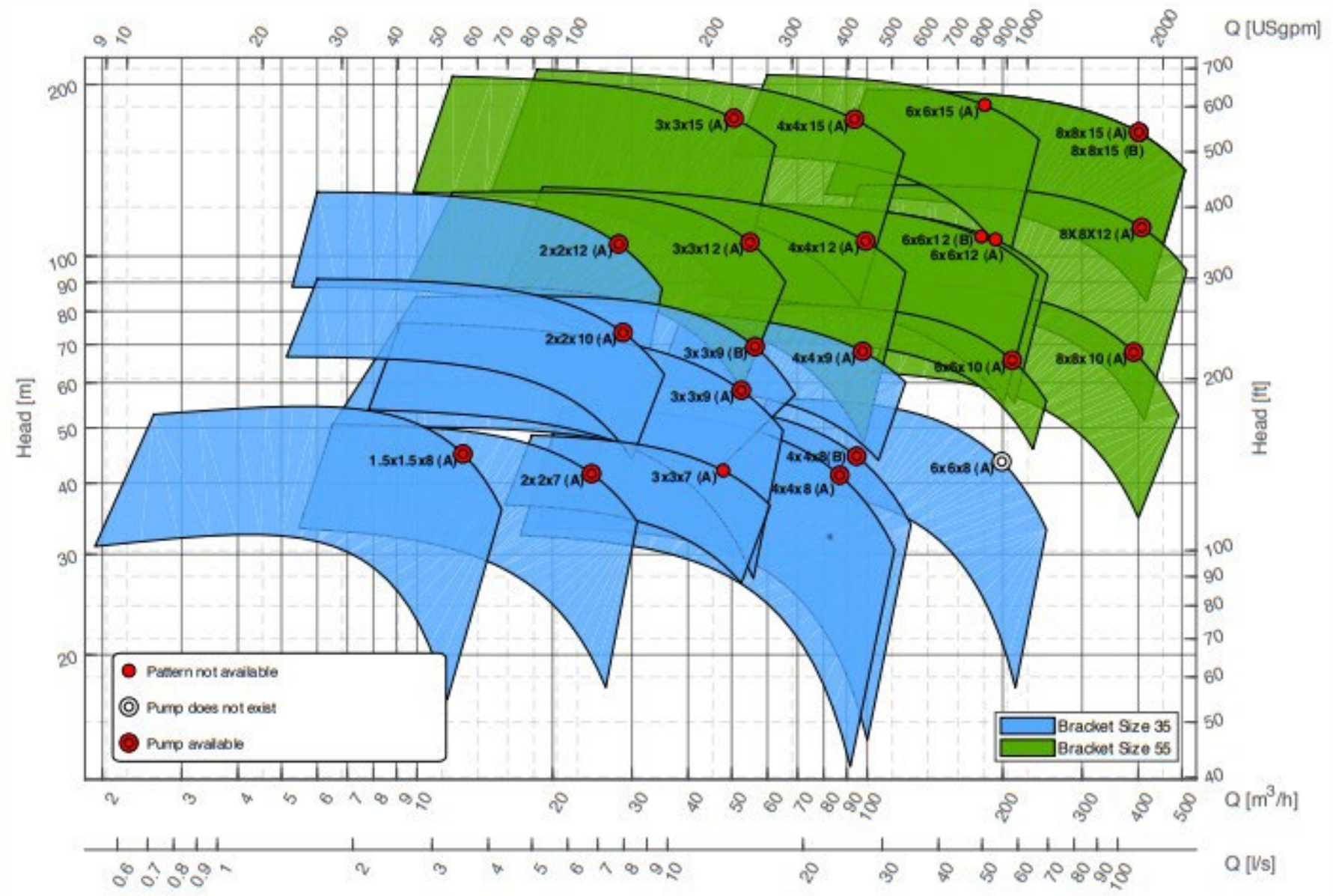




# SPI Selection Chart

## 2 poles - 50Hz

Drawn by: AMJ
Date: 21-Aug-2018
Drawing: 51046200001
Version: 01

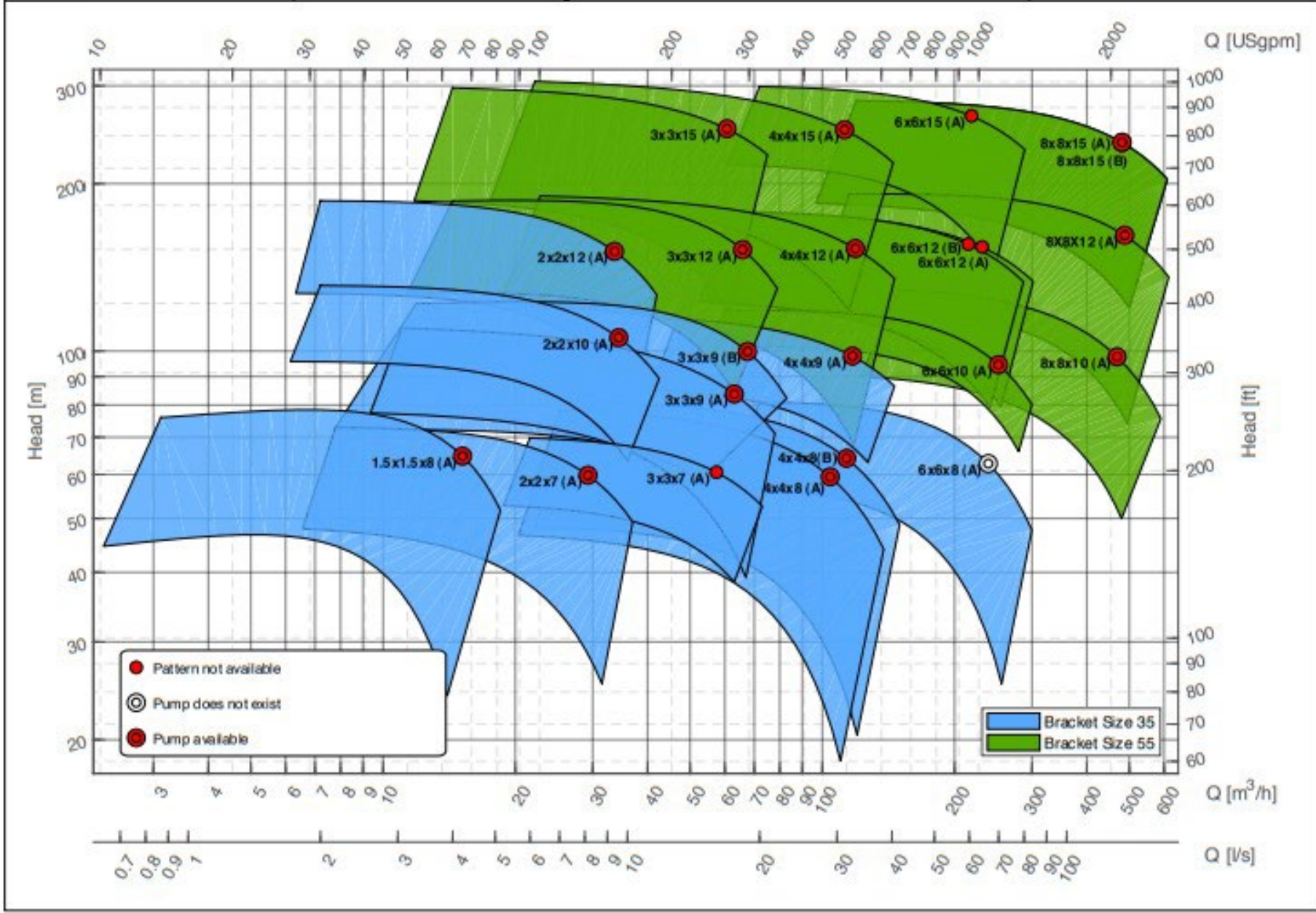




# SPI Selection Chart

## 2 poles - 60Hz

Drawn by: AMJ  
Date: 21-Aug-2018  
Drawing: 5 1046200003  
Version: 01





# Advantage of OH3 SPI line over OH2

Vertical Inline Pump Design eliminates the need for an expensive base-plate and saves valuable floor space.

- Reduces footprint
- Saves in platform, FPSO deck cost
- Reduces installed weight vs OH2 systems
- Do not require grouting



**LESS SPACE REQUIREMENT**



# OH3 (SPI) - Characteristics

## MOTOR STOOL INSTALLED DIRECT TO THE PUMP VOLUTE

The motor stool mounts directly to the pump volute.

## PADS IN BRACKET

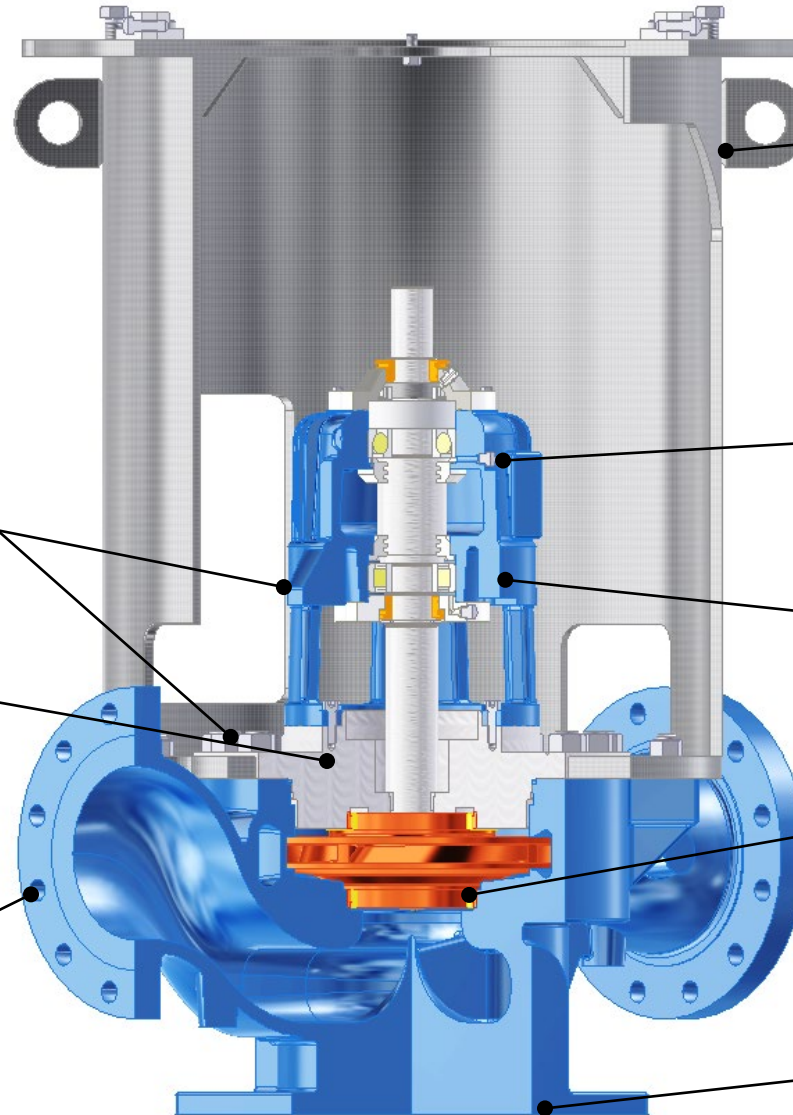
To lift the bracket for maintenance

## STUFFING BOX

For API Mechanical Seals

## DIRECT CONNECTION TO THE PIPELINES

The In-Line pump design allows direct connection to the pipelines which reduces installation costs and minimizes the footprint.



## MOTOR STOOL

Fabricated motor stool

## BEARING FRAME SIZE 35, 55 & 75

Carries pump loads, standard option grease lubricated, Oil mist also available.

## BACK PULL-OUT

For easy maintenance.

## WEAR RINGS

Impeller and casing

## FLAT CONTACT SURFACE

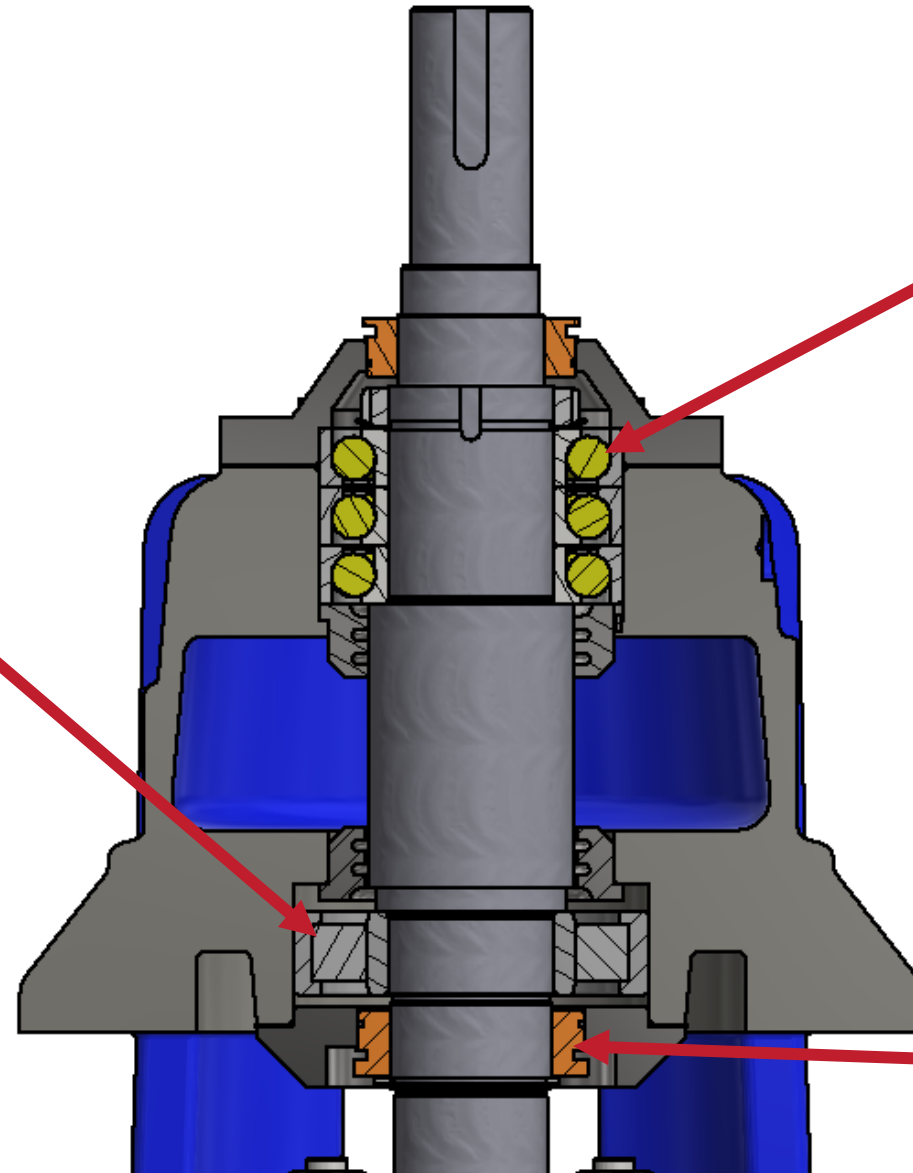
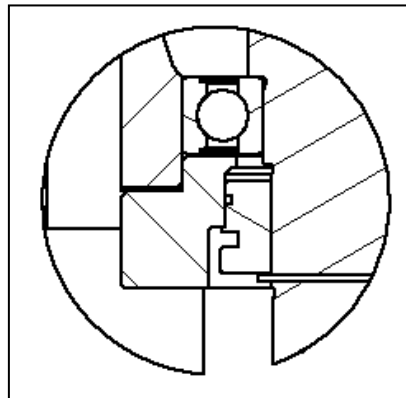
To make the pump stable if freestanding on a pad or foundation



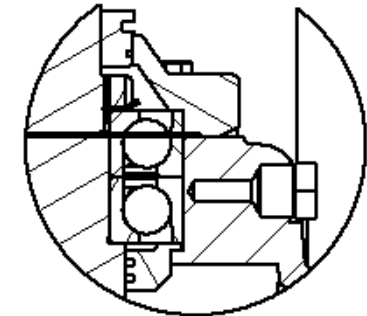
# OH3 (SPI) - Characteristics

## Bracket specification

- Deep groove ball bearings used for radial bearings for bearing bracket 35
- Cylindrical roller bearings are used for the rest of the bearing brackets



- Dual Row Thrust Bearings in back-to-back – and tandem arrangement
- Heavy duty thrust bearings allow higher suction pressure as standard by bracket 55
- Bracket 35 use the same bearing arrangement as SCE



- Labyrinth seal for bearing housing sealing
- Designed with internal taper to prevent oil flow to mechanical seal during disassembly



# OH3 (SPI), S-6 Standard MOC

ITEM DESCRIPTION	ASTM DESCRIPTION
VOLUTE CASING	A 216 Gr. WCC + QT 300 (Casting)
CASING COVER	A 216 Gr. WCC + QT 300 (Casting) or A 516 Gr. 70 (Plate)
IMPELLER	A 487 Gr. CA6NM Class A (Casting)
WEAR RINGS	A 743 Gr. CA6NM (340-375HB) - UNS J91540 (Casting) or A 240 Type 410 (340-375HB) - UNS S41000 (Wrought) or A 276 Type 420 (340-375HB) - UNS S42000 (Bar)
CASING COVER WEAR RING	A 743 Gr. CA6NM (340-375HB) - UNS J91540 (Casting) or A 240 Type 410 (340-375HB) - UNS S41000 (Wrought) or A 276 Type 420 (340-375HB) - UNS S42000 (Bar)
PUMP SHAFT	A 434 Gr. 4140 CI BC (Bar) or A 322 Gr. 4140 - UNS G414000 (Bar)
STUFFING BOX BUSHING	A 743 Gr. CA6NM (340-375HB) - UNS J91540 (Casting) or A 240 Type 410 (340-375HB) - UNS S41000 (Wrought) or A 276 Type 420 (340-375HB) - UNS S42000 (Bar)
CONTINUOUS STUD - VOLUTE CASING	A 193 Gr. B7 (Zinc Plated)
HEX NUT - VOLUTE CASING	A 194 Gr. 2H (Zinc Plated)
ANTI-FRICTION BEARING	BECBM (Machined Brass Cage Ring)
RADIAL BALL BEARING	6211 or 6211-Z (Steel Stamped Cage Ring)
RADIAL ROLLER BEARING	ECJ (Steel Stamped Cage Ring)
BEARING BRACKET	A 216 Gr. WCB - UNS J03002 (Casting)
MOTOR STOOL	A 36 (Plate) and A 53 Gr. B (Structural Pipe)
GREASE RETAINERS	A 36 (Plate)
BEARING COVER DE	A 216 Gr. WCB - UNS J03002 (Casting) or A 36 (Plate)*
BEARING COVER NDE	A 36 (Plate)



Also...	
Description	API Option
Carbon Steel	S-1, S-4, S-5, S-6, S-8
12 % CR	C-6
316 AUS	A-8
Duplex	D-1
Super Duplex	D-2

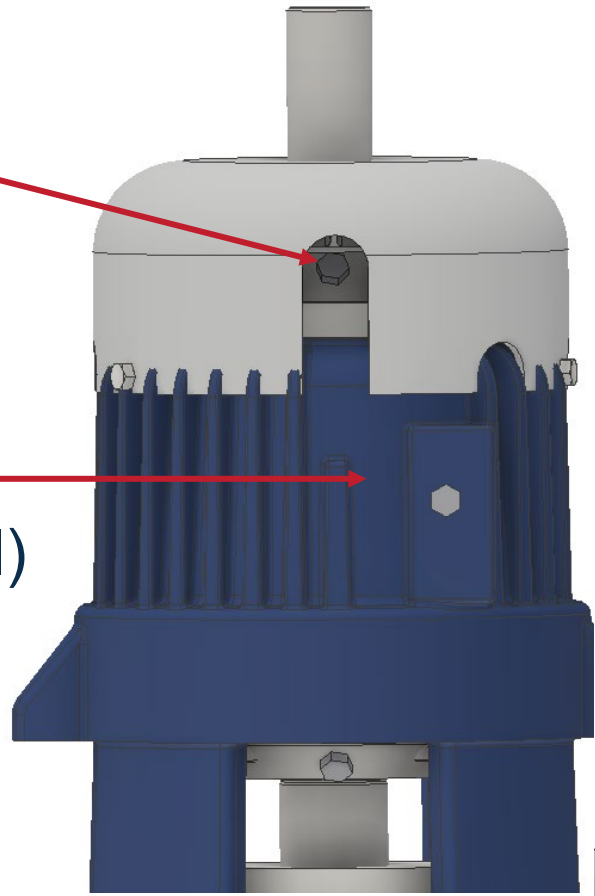


# Lubrication

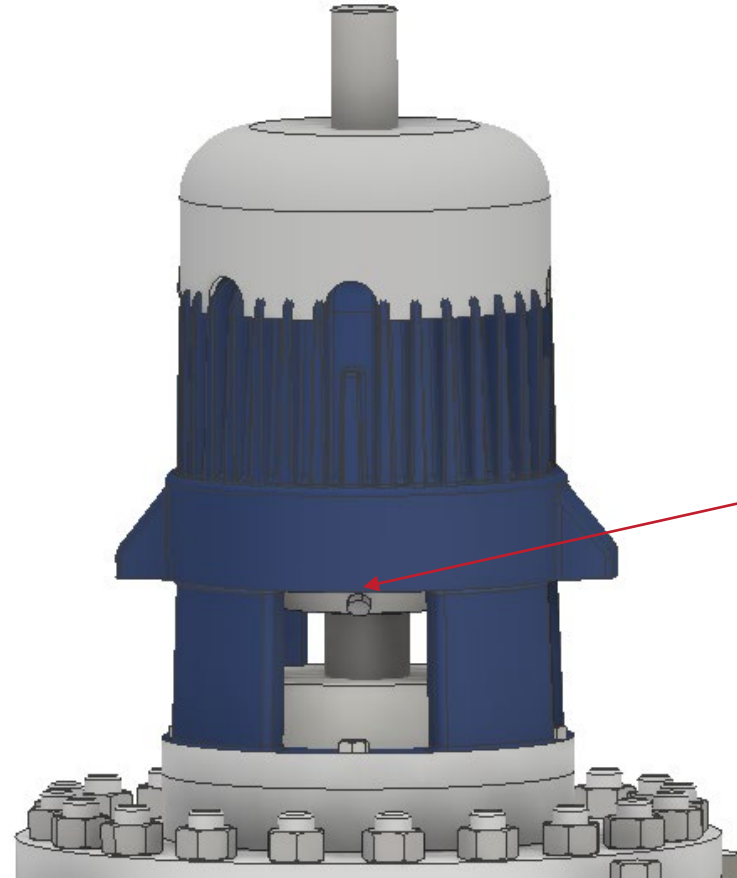
- Oil mist

Oil mist inlet  
1/4 NPT (Axial)

Oil mist inlet  
1/4 NPT (Radial)



Oil mist Outlet  
1/4 NPT



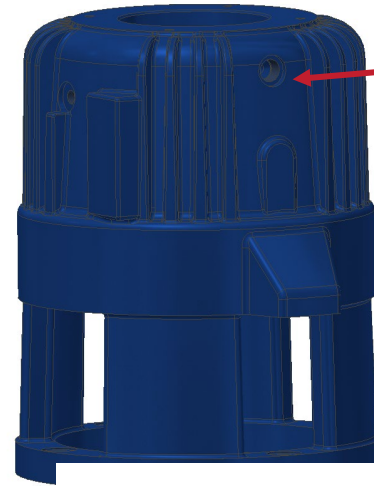
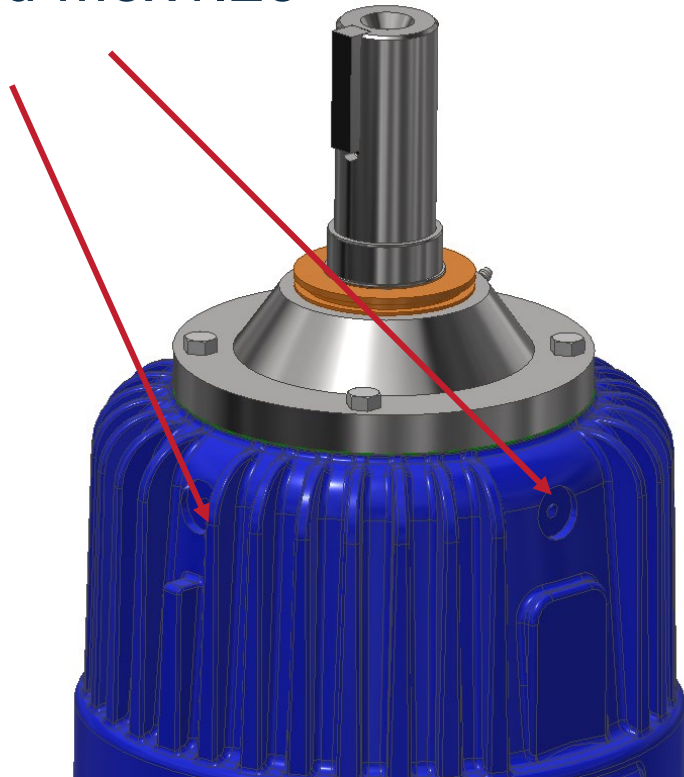


# Temperature/Vibration- provision

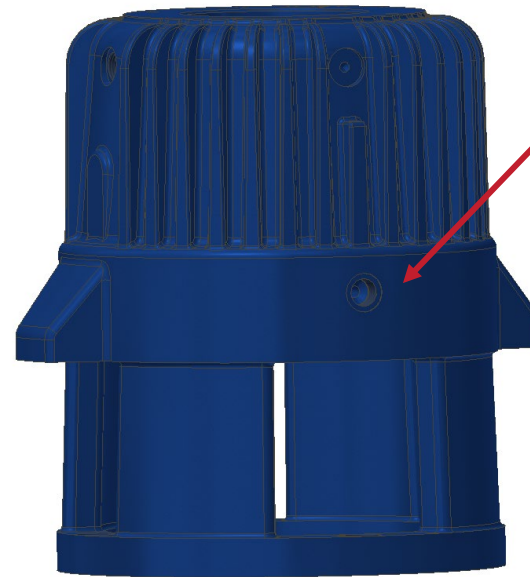
OH3 - SPI

Vibration provision

- 1.Flat Surface ( standard)
- 2.Thread M8x1.25

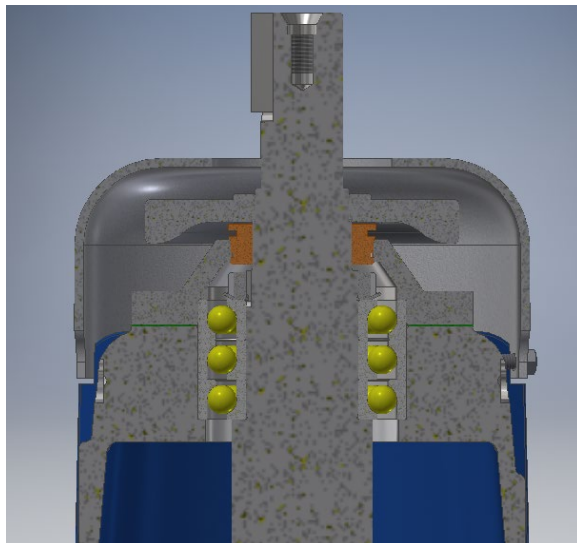
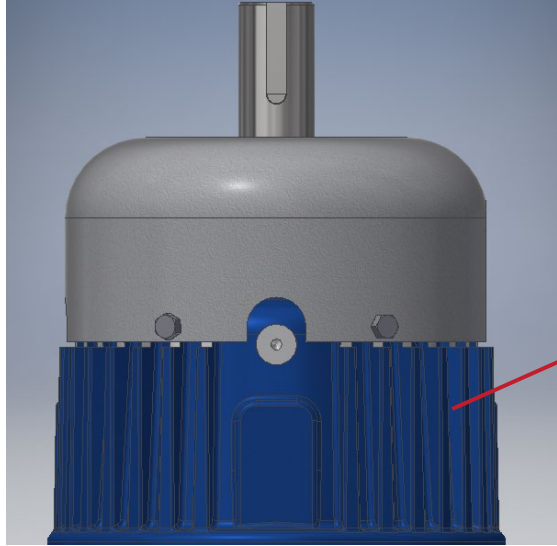


Temperature provision  
1/2 NPT



Temperature provision  
1/2 NPT

# Bearing cooling

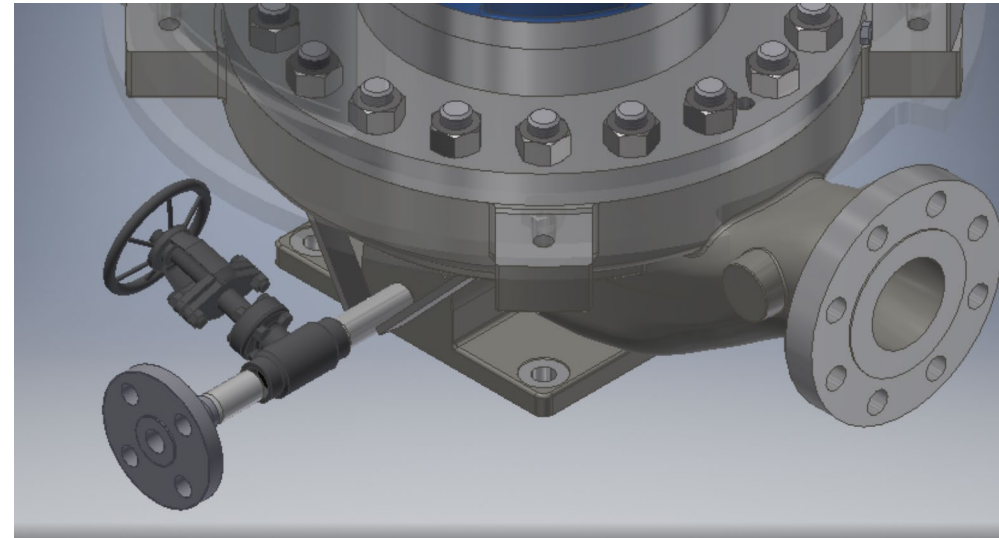
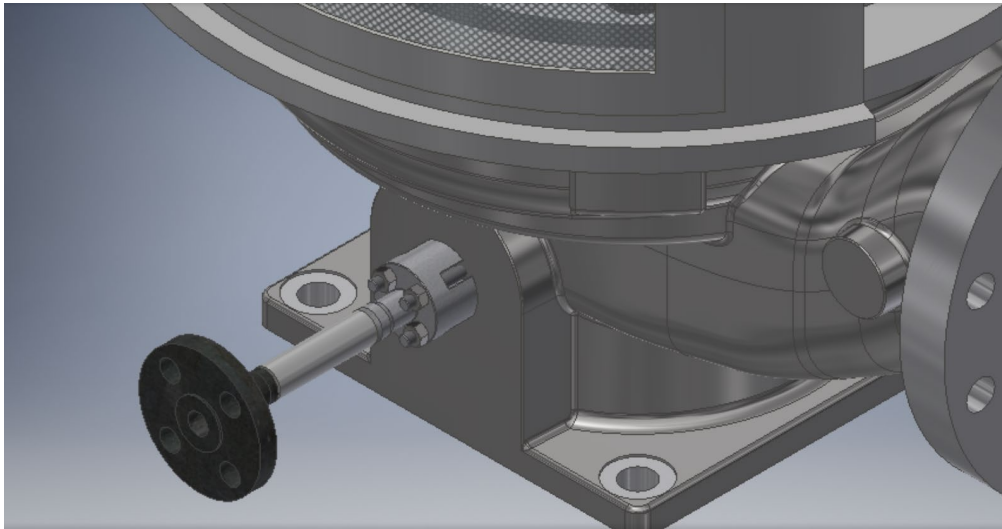


- The bearing bracket has a ribs and fan to assist cooling by natural and forced convection. This design is sufficient for temperatures up to 248 ° F 120° C) as standard.

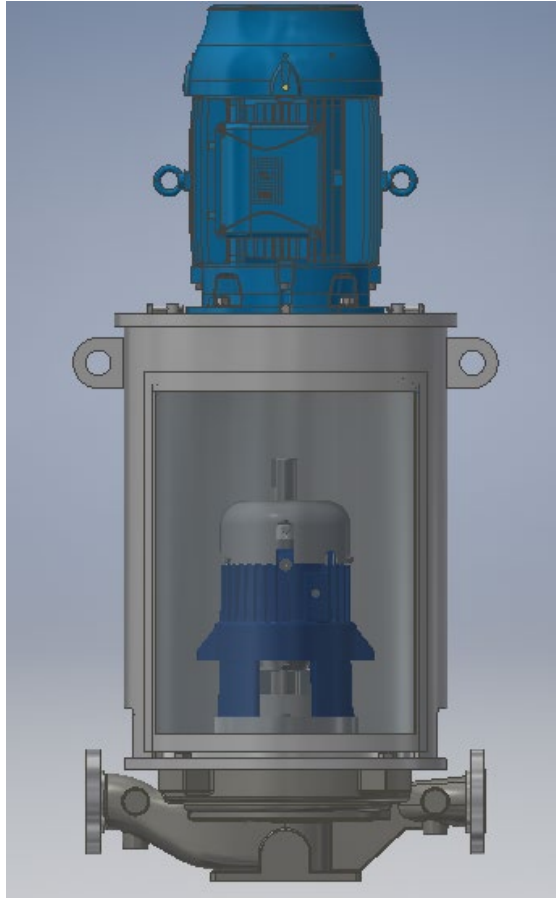
PROCESS FLUID TEMPERATURE		
[°F]	[°c]	FAN
T ≤ 248	T ≤ 120	Optional
T > 248	T > 120	Standard

# Case connection

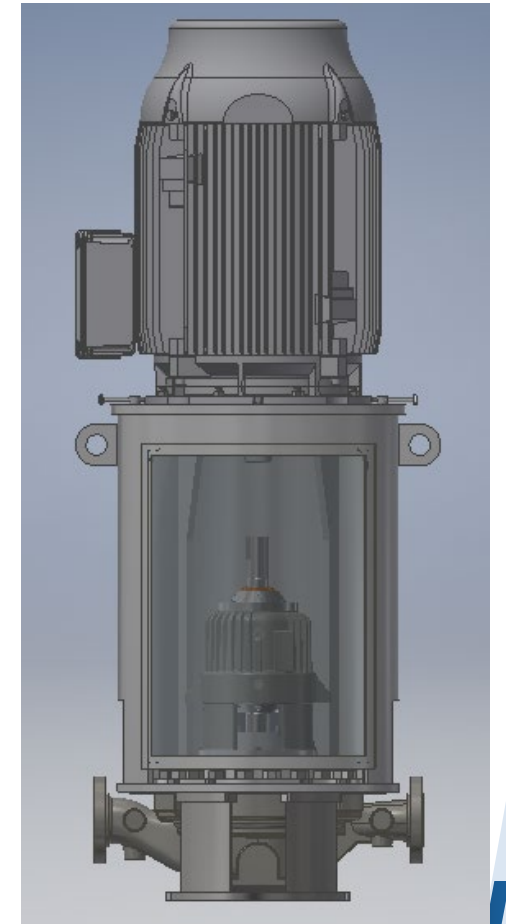
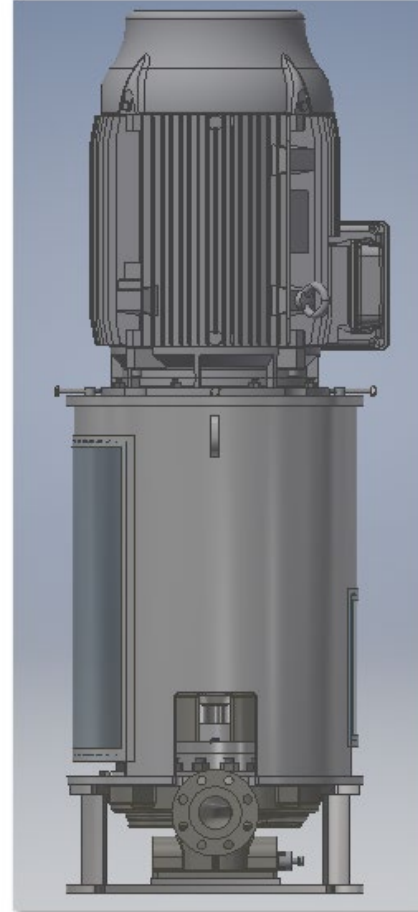
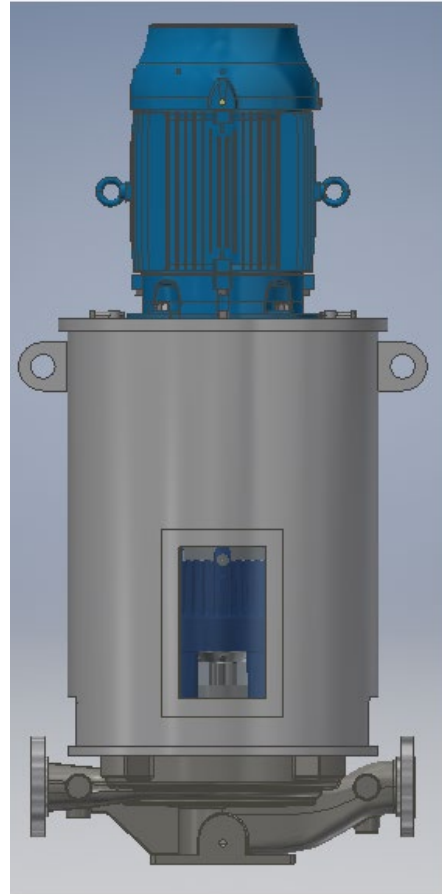
- Integrally flanged as standard (see separate presentation)
- Reduced need for welding and therefore NDE
  - Reduced manufacturing time
  - Easy maintenance
  - Integrated orifice for seal plans connected to the casing.
- Option for socket welded case connections if required by specification



# Motor Stool



Standard Design



Heavy duty Design



# Back Pull-Out

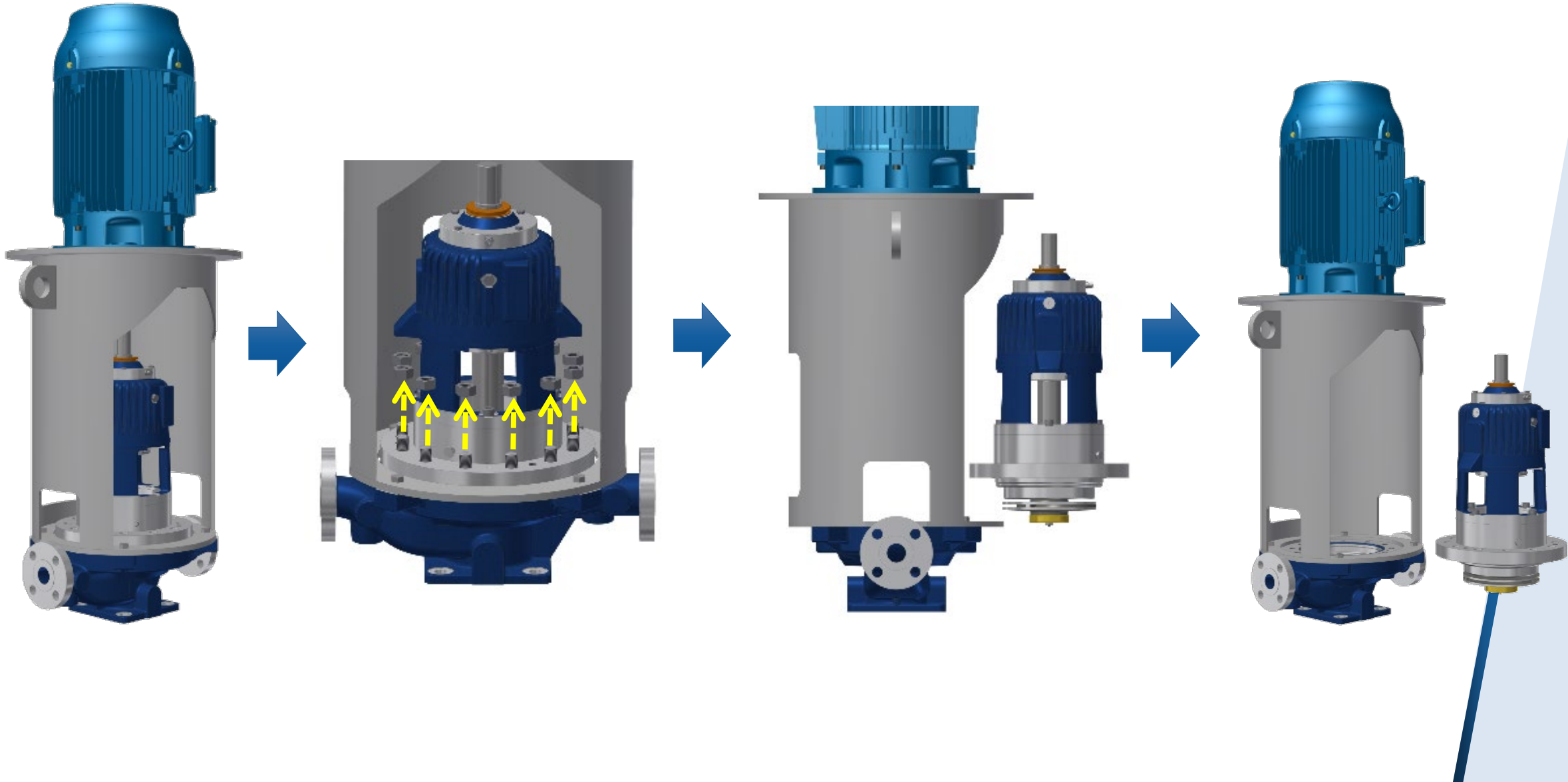


- Easy Installation
- Mount in the pipeline
- Support on pipe or foundation
- Save space
- Save time



OH3 - SPI

# OH3 (SPI) - Back Pull-out Design





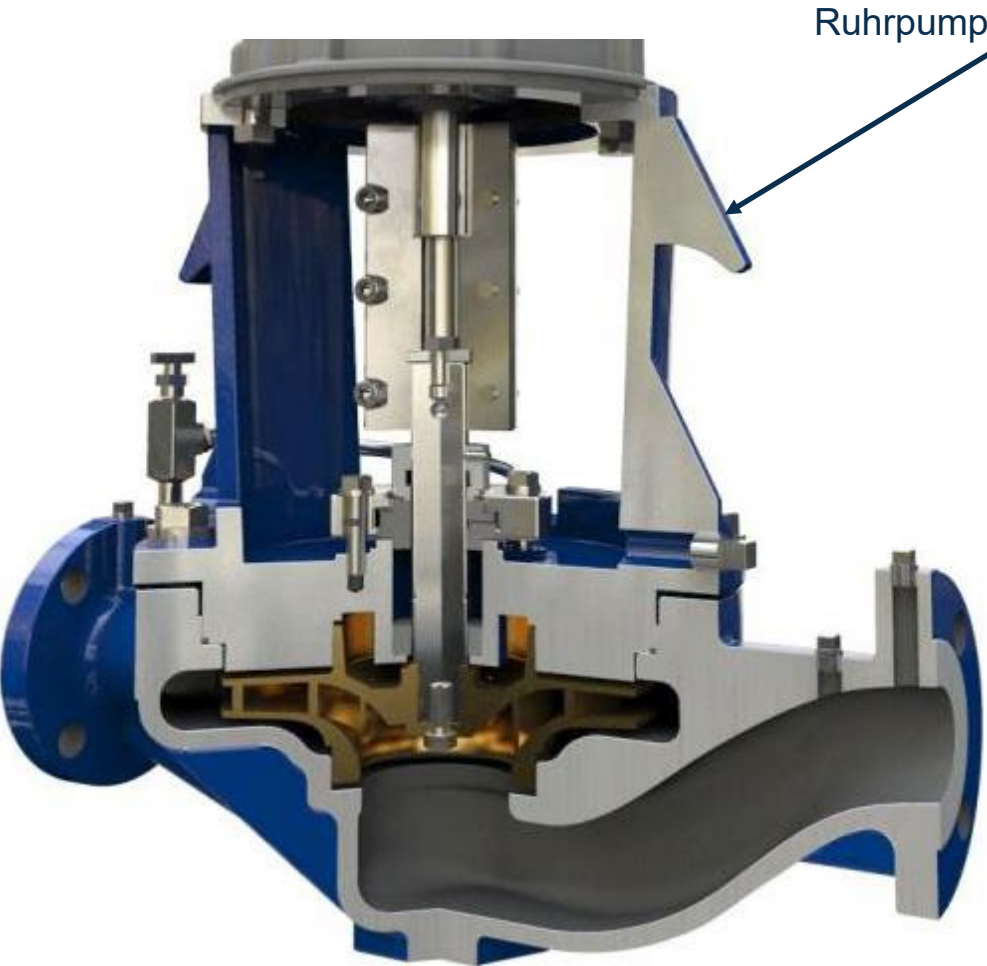
# OH4 Pumps

RP Model IVP (Armstrong Heritage) & IIL (Deming Heritage)

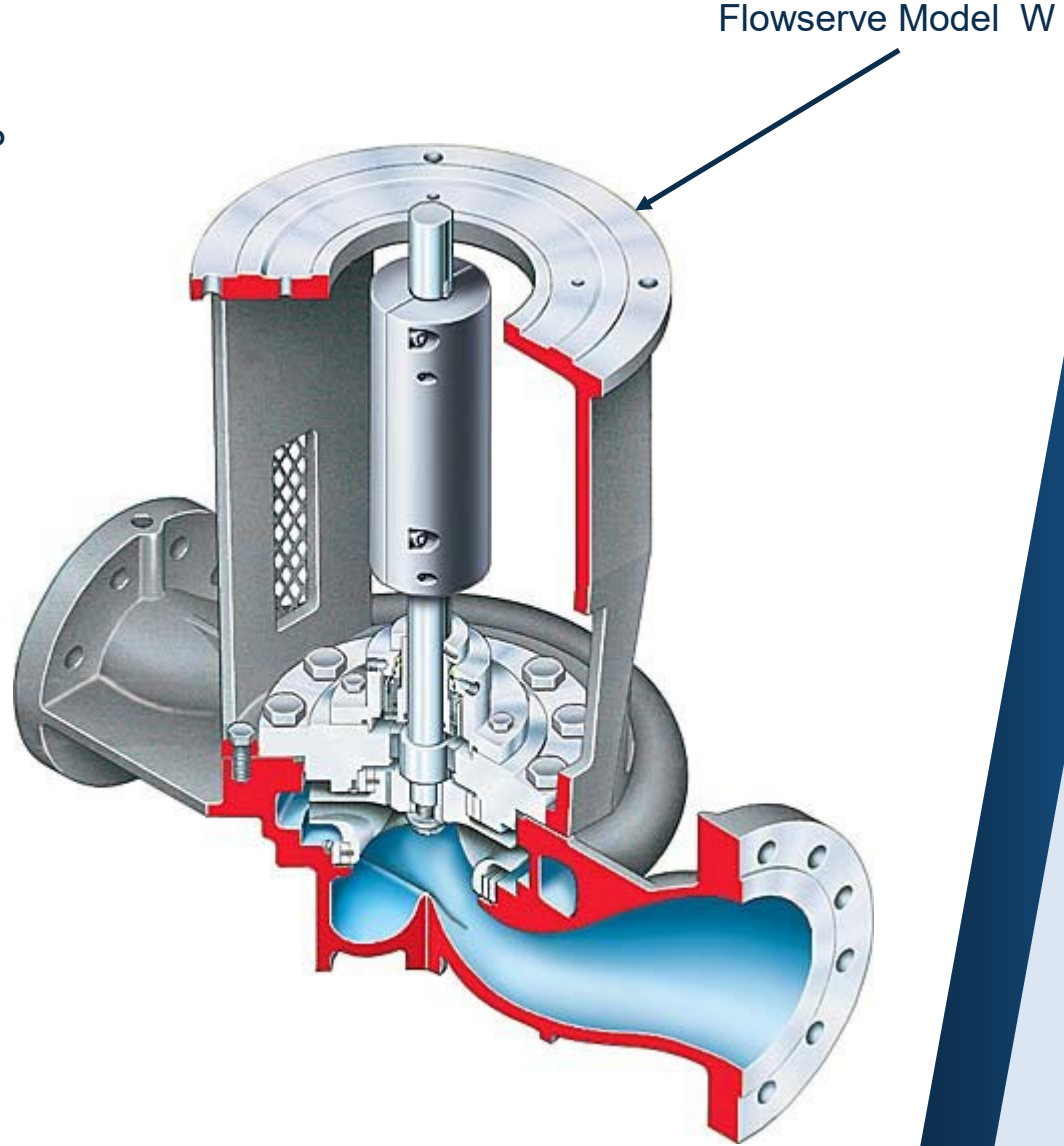




# OH4 Pumps



Ruhrpumpen Model IVP












Flowserve Model W



# OH3, 4, 5 & 6 Pumps

## Who Makes Them?

API 610 Pump Models of the Key Global Manufacturers

	API Pump Type	Description									
Over Hung / Single Stage	OH1	Foot Mounted	Not Applicable								
	OH2	Centreline Mounted	SMK	HPXPHL	OHH/PRE	3700	RPH	UCW/UCS	SCE	TC	CUPOH2
	OH3	Vertical Inline Flexibly Coupled, Bearing bracket	LMV 801 CS	HPX-V	OHV	3910			SPI	VP	CUPOH3
	OH4	Vertical Inline Rigidly Coupling		MSP/DSVP				LPWM			CUPOH4
	OH5	Vertical Inline Close Coupled	LMV 80X	PVML		3900		LPW	SPN		
	OH6	High Speed Integrally Geared	LMV 3XX HMP/BMP								

Source – Kirit Domadiya - Sundyne



# OH4 Pumps

Not very common in API build  
Ruhrpumpen does not offer an OH4 build pump in API build

For these pumps the thrust is taken in the motor. The motor construction might not meet API 7.1.8 / 7.1.9

They might not meet the API shaft deflection at seal requirement of 50 micrometers 6.9.1.3 or runout of 25 micrometers 6.6.9/6.8.5

They will have a product lubricated guide bushing due to the long distance between the mechanical seal and the motor bearings (API 6.10.1.1)

Ruhrpumpen (and several other manufacturers) do have ranges of NON-API OH4 pumps for water and general industrial service

## IVP/IVP-CC Performance Data

### Non-API Pump



IVP/IVP-CC PERFORMANCE DATA		
Capacity	to 2271 m <sup>3</sup> /h	to 10000 GPM
Head	to 152 m	to 500 ft
Pressure	to 15 bar	to 217 psig
Temperature	-20 °C to 150 °C	-4 °F to 300 °F
Discharge flange size	25 mm to 200 mm	1" to 8"
Available in 28 hydraulic sizes		



## Features & Benefits IVP

### Non-API Pump

#### MOTOR ADAPTER DIRECT TO THE PUMP VOLUTE

The motor adapter mounts directly to the pump volute to save space and provide proper alignment.

#### ECONOMIC SEAL OPTION (TYPE 1)

Options exist to select between internally or externally mounted mechanical seal, which allows choice between high performance or economical seals.

#### DIRECT CONNECTION TO THE PIPELINES

The IVP pump design allows direct connection to the pipelines which reduces installation costs and minimizes the footprint.

NO PUMP BEARINGS to service in the IVP design

#### BACK PULL-OUT

A back pull-out configuration provides easy access to interior areas without disturbing piping connections.

#### EASY REPLACEMENT OF THE MECHANICAL SEAL

through a split-coupled design, without disconnecting the pump from the pipeline or removing the motor.



## Features & Benefits IVP

Non-API Pump

SPACER BETWEEN IMPELLER  
AND SHAFT

In some sizes for manufacturing purposes

WASHERS  
for axial retention

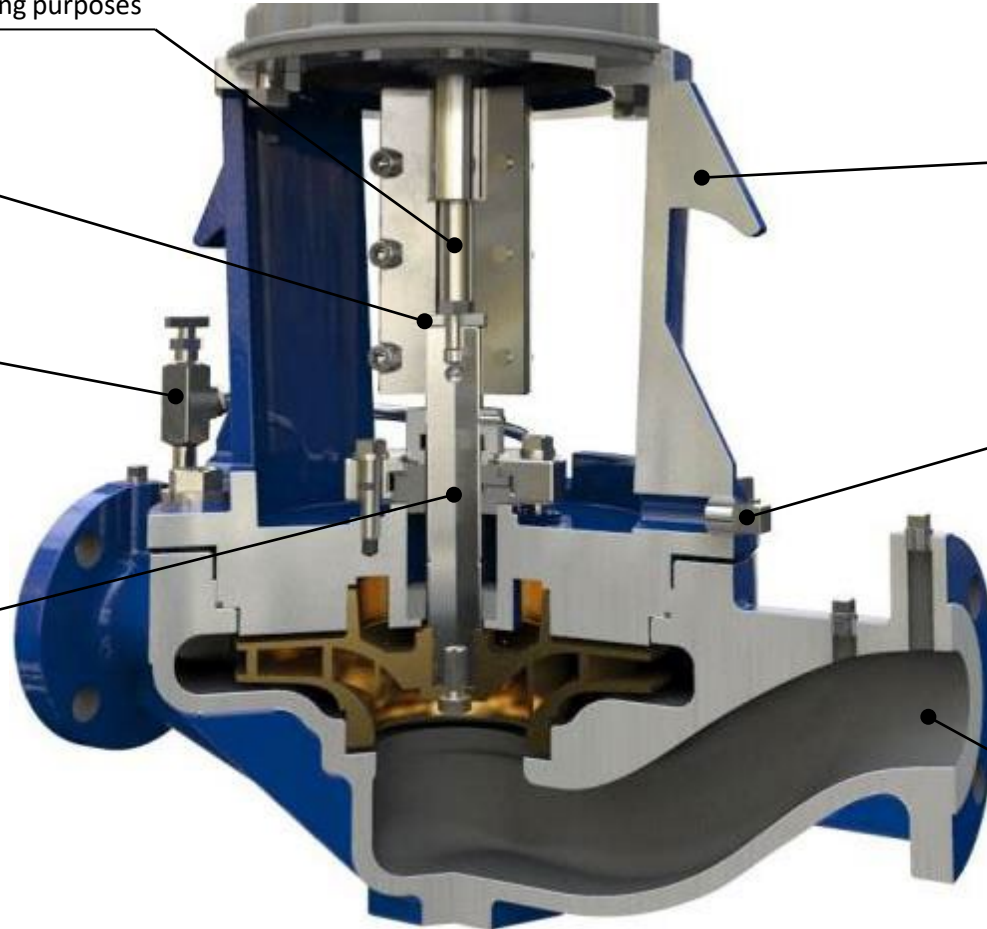
AIR RELIEF VALVE  
avoids air accumulation

STAINLESS STEEL  
PUMP SHAFT  
with radial support  
through graphite throat  
bushing

EASY HANDLE  
with lifting ears

DRAINER FOR  
CONDENSATED WATER  
avoids accumulation of  
condensated water

RADIALLY SPLIT CASE  
with ASME flanges FF  
Class 125 and 250





# OH5 Pumps

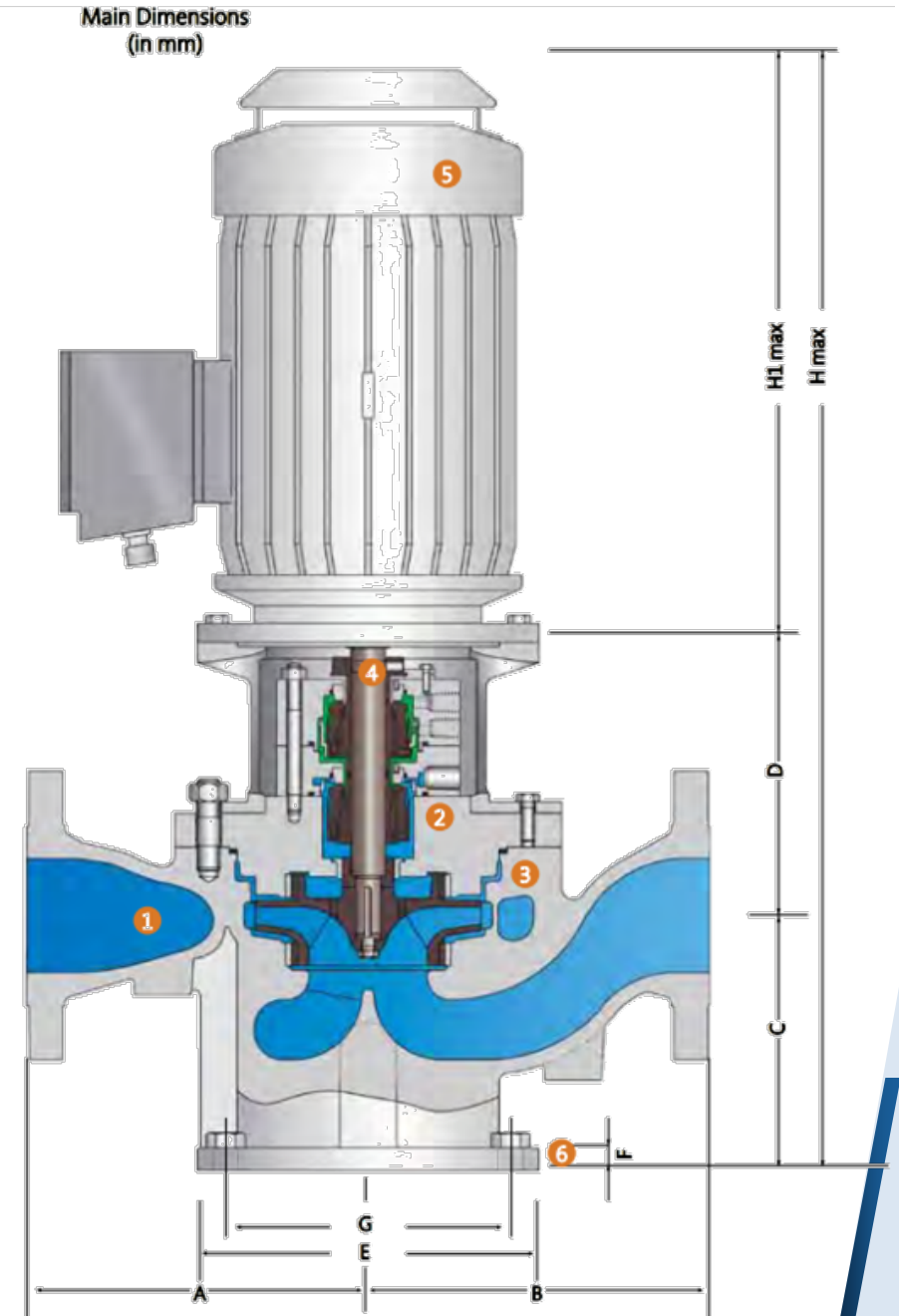
RP Model SPN

# General Description

## SPN In-Line Vertical Pumps

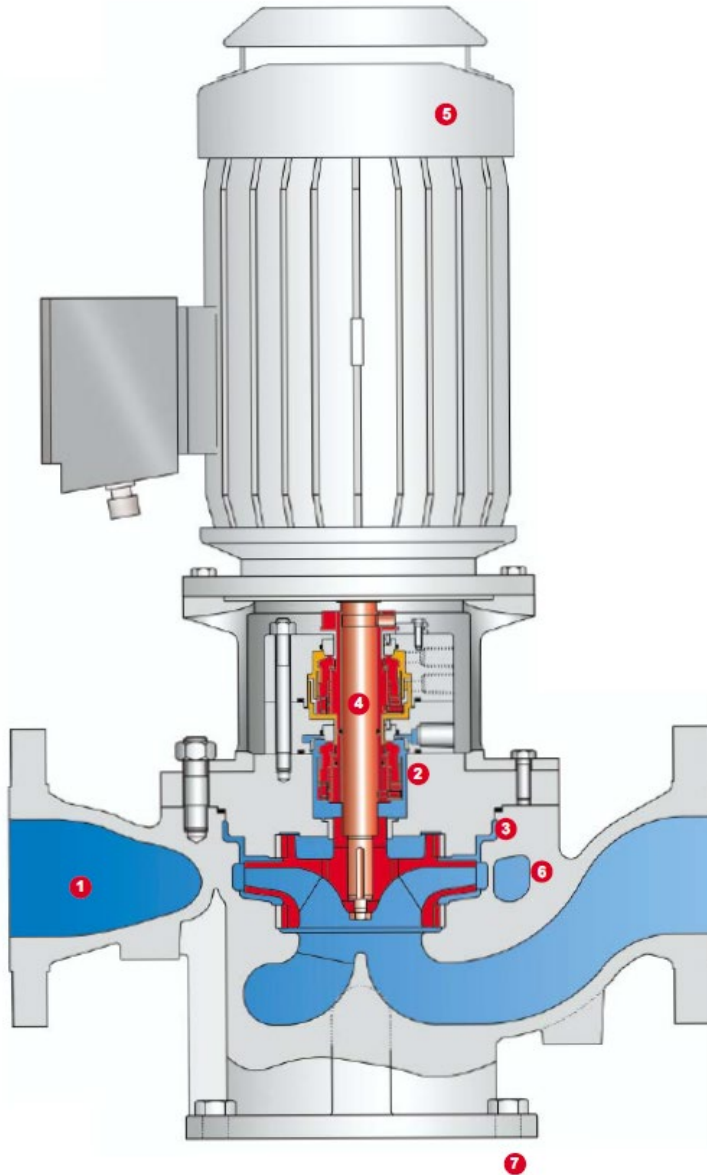
- Vertical In-line pump
- Close Coupled
- D-Flange Motors
- Impellers mounted directly on driver shaft
- **Compliant with Shell DEP and BS4082**

<b>Capacity</b>	450 m <sup>3</sup> /h	2,000 US GPM
<b>Head</b>	200 m	656 ft
<b>Temperature</b>	450 °C	842 °F
<b>Pressure</b>	80 bar	1160 psi





# SPN - Characteristics



1. Volute Casing
2. Mechanical Seal Chamber full compliance with API 610 and API 682
3. Casing/Casing cover in metal-to-metal contact
4. Motor Shaft
5. Antifriction bearings (motor)
6. A double volute is available for sizes greater than 3"
7. Foundation Support is possible with a separate foot-plate
8. Compliant with Shell DEP & BS4082



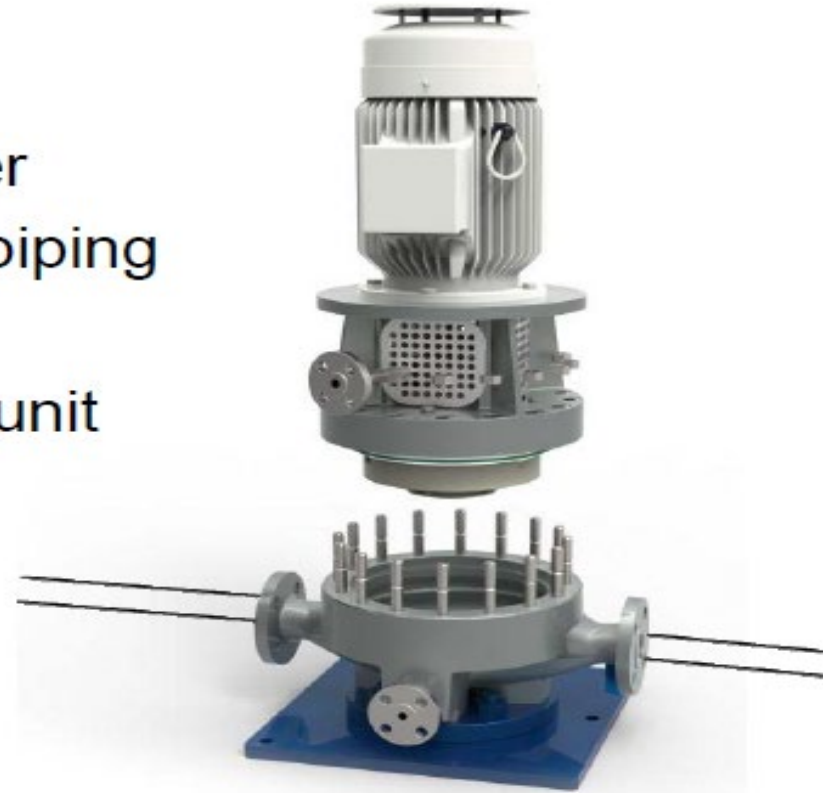
# SPN - Characteristics

- 1.** 19 volute casing in-line pump sizes for 50 Hz and 60 Hz power supply, in top pull-out design from 1 1/2" to 8" discharge nozzle, acc. to API 610 latest edition, BS 4082 and Shell DEP latest edition.
- 2.** Mechanical seal chamber dimensions in full compliance with API 610 and API 682.
- 3.** Casing and casing cover in metal-to-metal contact. Non-asbestos spirally wound gasket made of stainless steel / graphite foils totally enclosed.
- 4.** Shaft deflection in less than 0.03 mm in the stuffing box area is achieved by correct sizing of the bearings and the use of double volutes. Low vibration values will be achieved.
- 5.** Anti-friction bearings with an operating life of more than 25,000 h. Special double angular contact bearings in the motor are available for compensation of high axial forces.
- 6.** Foundation support is possible with a separate foot-plate.

# SPN - Back Pull-out Design



- Disconnect Power
- Disconnect seal piping
- Undo 16 Nuts
- Remove pull out unit

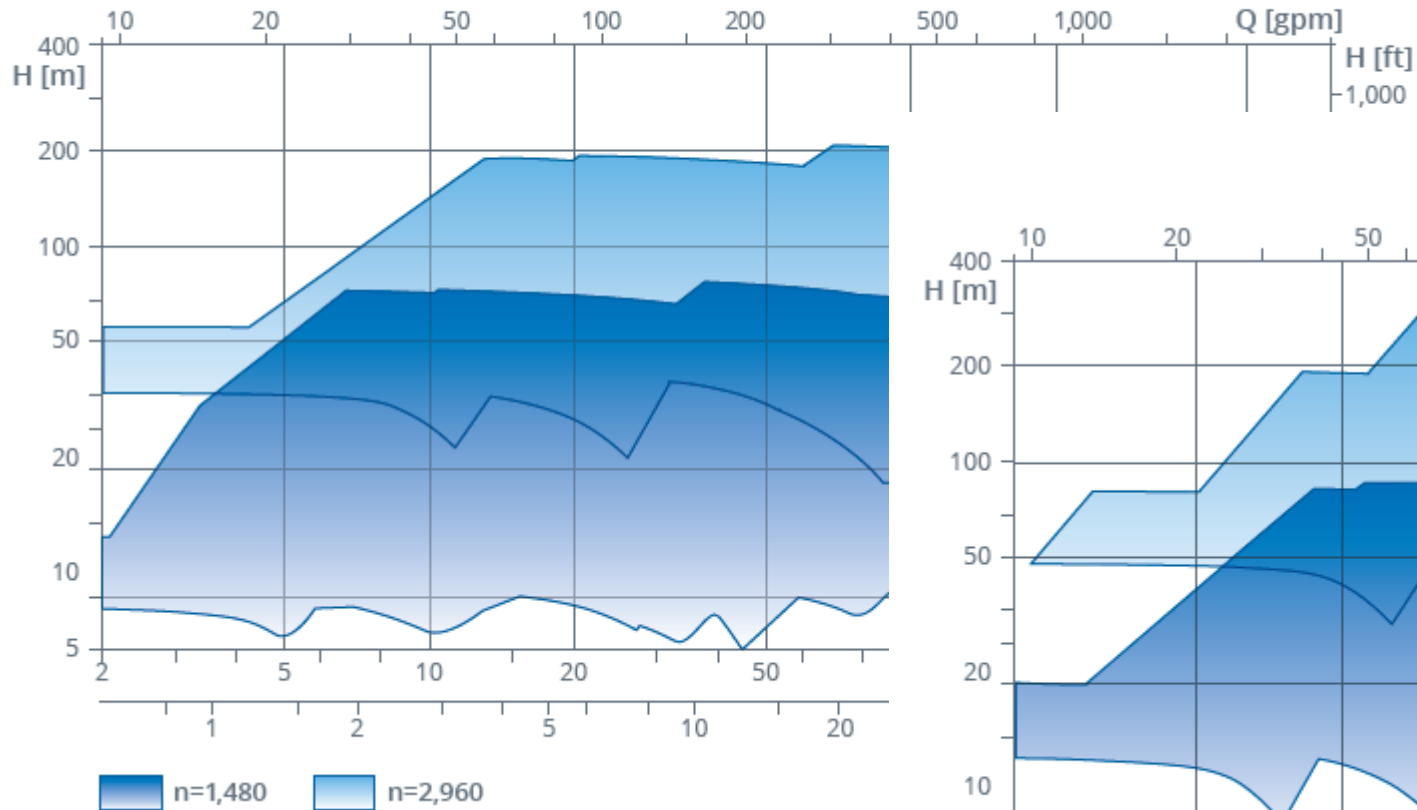


The pump casing and piping remain in place

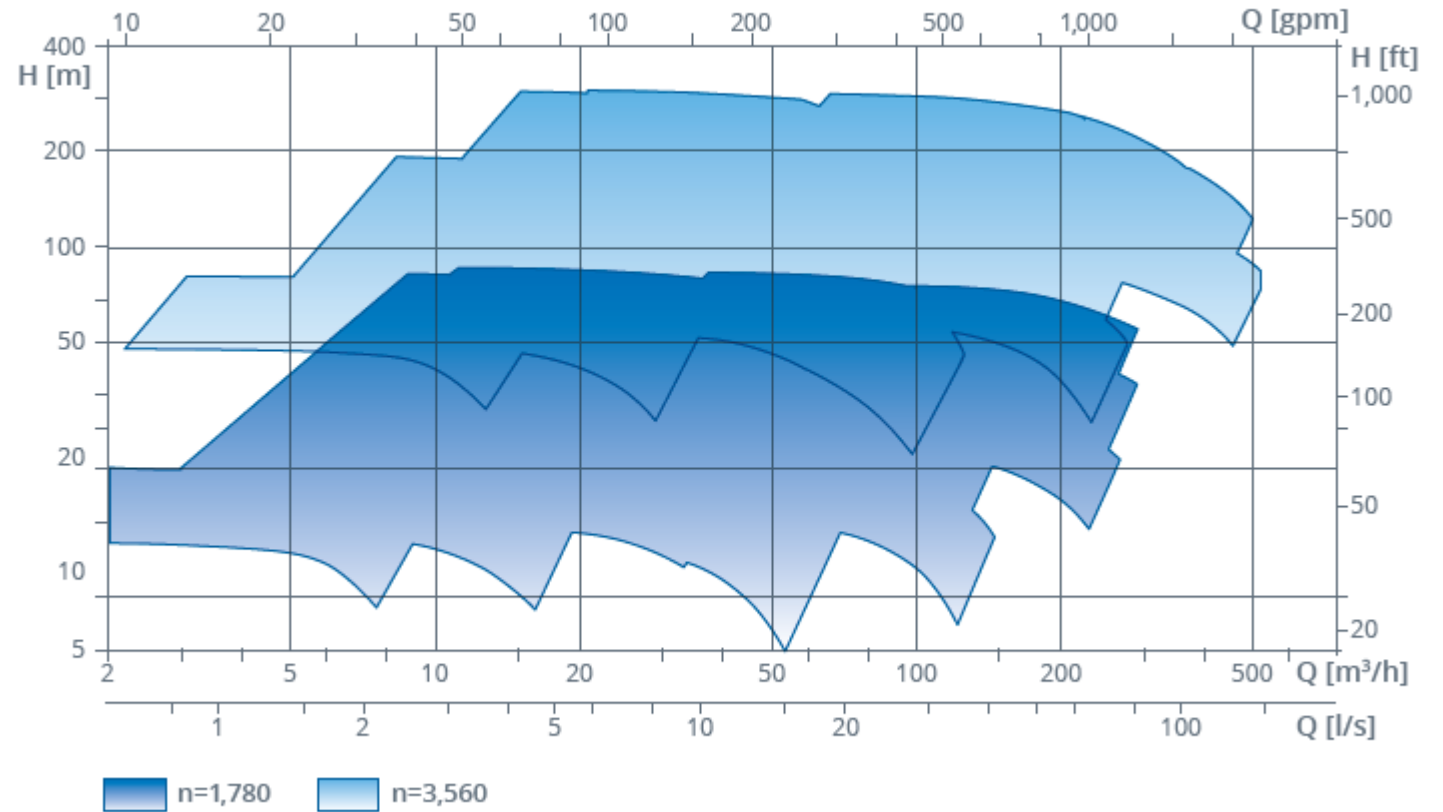


# SPN – Range Coverage

n = 1,480/2,960 rpm **50 Hz**



n = 1,780/3,560 rpm **60 Hz**





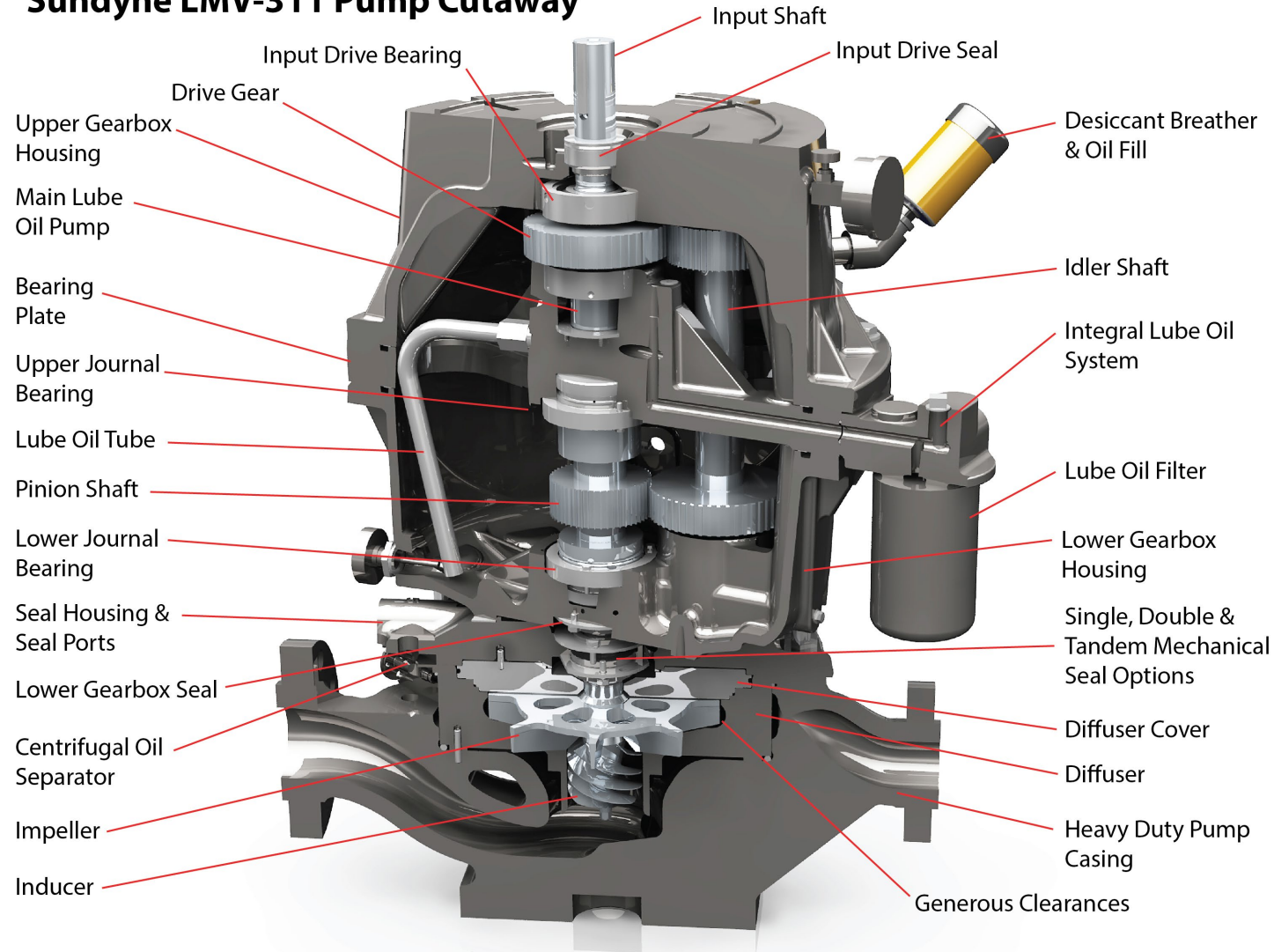
# **OH6 Pumps (Sundyne)**



# OH6 Pumps

Up to 22,000 RPM!!

## Sundyne LMV-311 Pump Cutaway





# OH6 Pumps

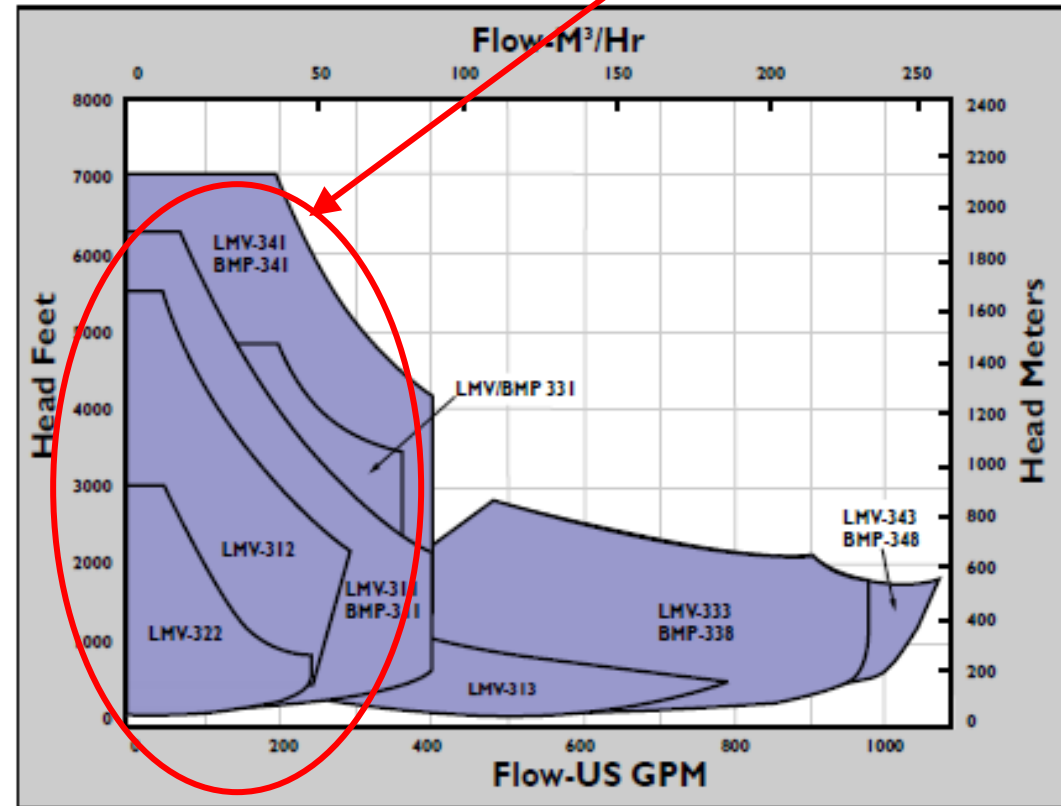


# OH6 Pumps

## Performance Envelope and Specifications

Sundyne's Niche

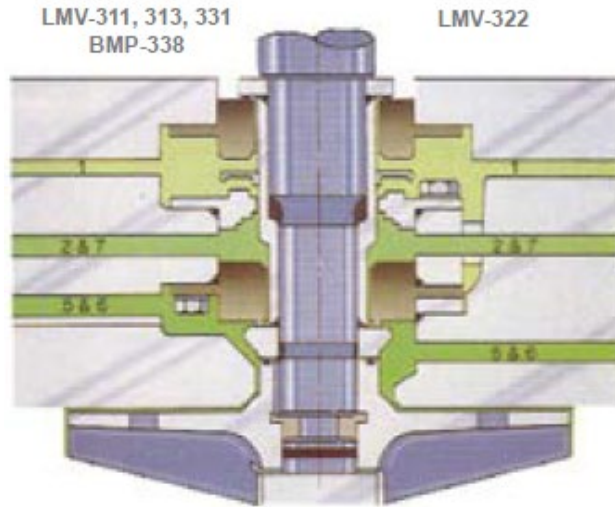
- Flows to 1,100 gpm (250 m<sup>3</sup>/hr)
- Heads to 6,300 ft (1,921 m)
- Maximum case working pressure 3,465 psig (230 barg)
- Maximum suction pressure 1,000 psig (70 barg)
- Temperature range: -200° to 650°F (-130° to 340°C)
- Industry leading inducer designs reduce NPSHr
- Multiple API 610 piping plans are available
- ASME B16.5 600# RF flanges standard  
900# RF flanges optional on select models
- Special metallurgies: all machineable alloys available



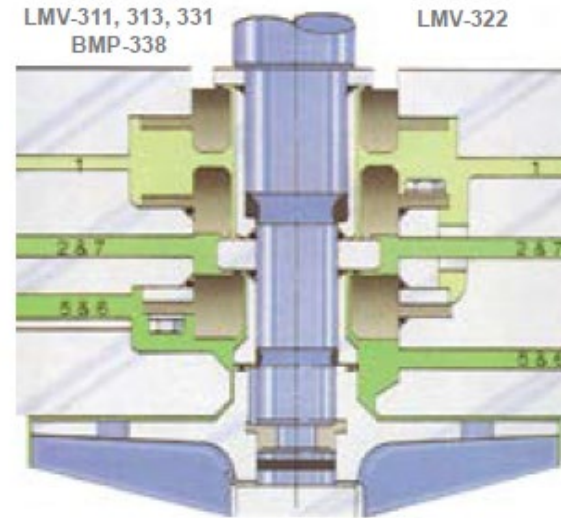


# OH6 Pumps

## Seal Configurations

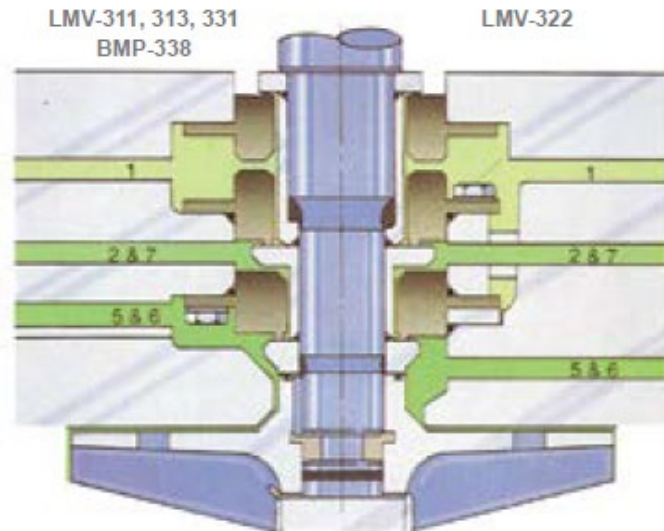


**Double Seal** ▶  
 Recommended when the pumped liquid contains abrasive, leakage could be hazardous, or when the pump is likely to run dry.



◀ **Tandem Seal**  
 Used to accommodate quenching, automatic shutdown systems and high pressure services. With no requirement for a buffer liquid, a film-riding gas seal may be placed in the upper position, thereby providing a secondary seal backup in the event of main seal failure.

**Single Seal** ▲  
 Standard seal used in most applications for non-abrasive or non-hazardous liquid. Bellows seals are also available for higher temperatures and abrasive liquids.





Sundyne

# OH6 Pumps



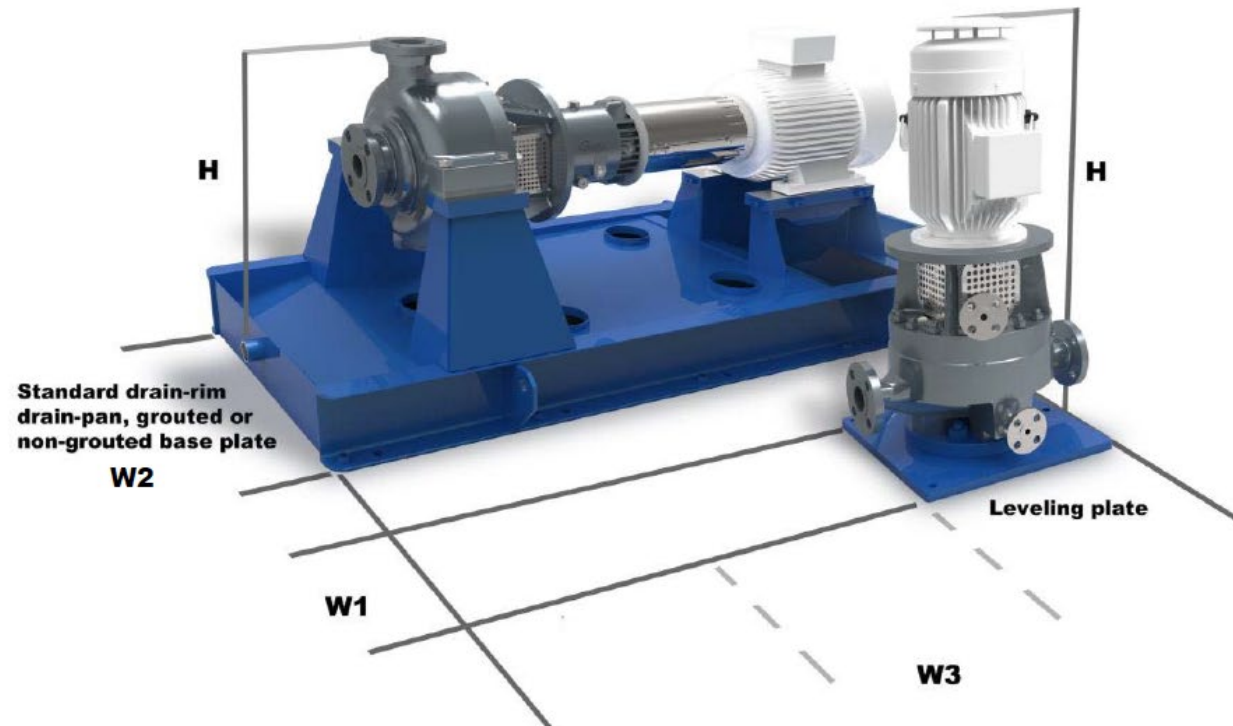


# Vertical vs Horizontal

Benefits of the Various Configurations

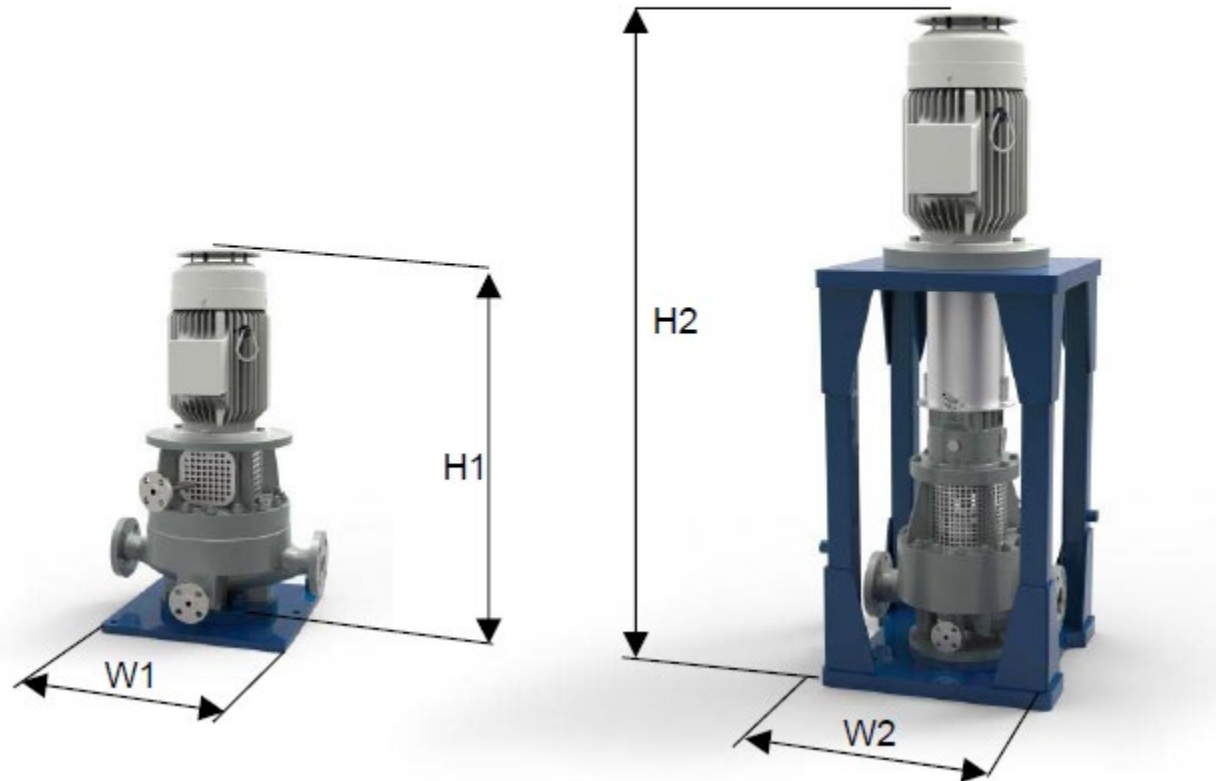
# Vertical vs Horizontal arrangement

OH5	OH2
Floor space of largest OH5 is square $W1 = 450 \times 450$ mm	Floor space of largest OH2 is $W3 \times W2 = 4800 \times 1800$ mm

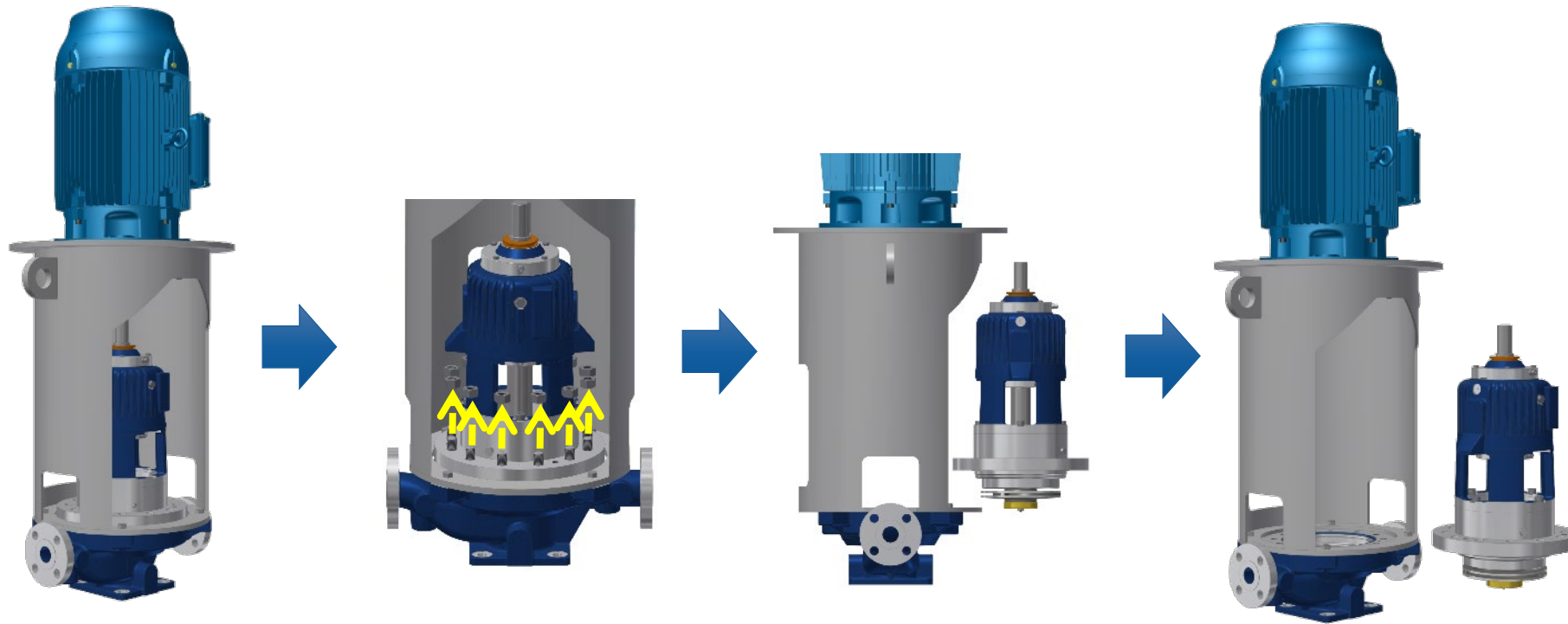


# Vertical vs Horizontal arrangement

OH5	OH3
Floor space of largest OH5 is square $W1 = 450 \times 450 \text{ mm}$	Floor space of largest OH3 is square $W2 = 1300 \times 1300 \text{ mm}$



# Back Pull-out

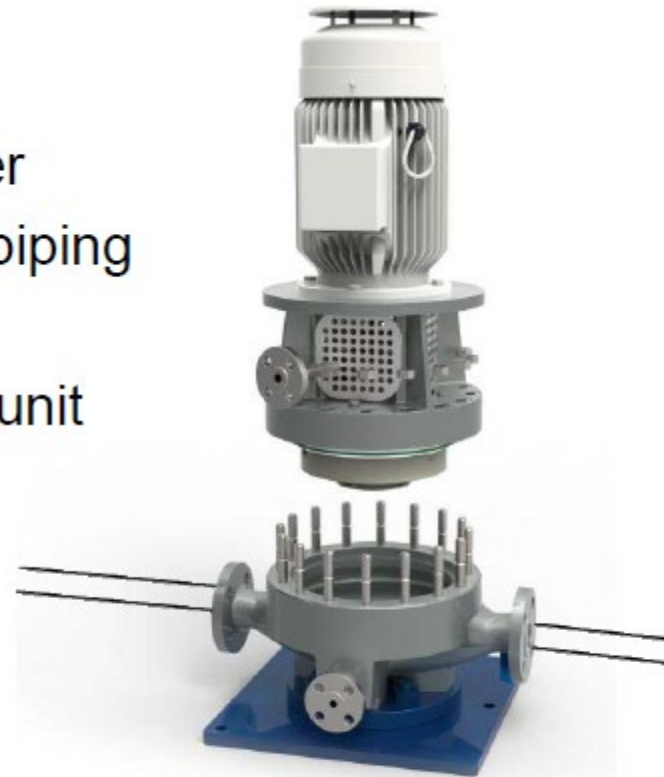


SPI

## Back Pull-out



- Disconnect Power
- Disconnect seal piping
- Undo 16 Nuts
- Remove pull out unit

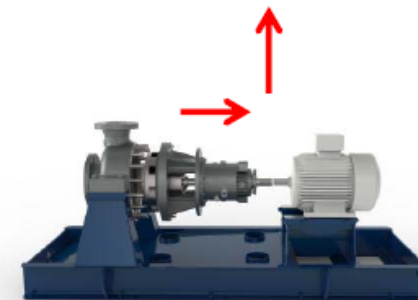
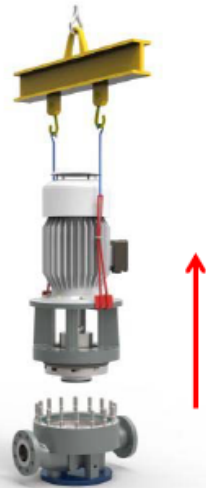


The pump casing and piping remain in place

SPN

# Vertical vs Horizontal arrangement

OH5	OH3	OH2
Minimum dismantling space required (only vertical)	Considerable dismantling space required for use of lifting tool	Dismantling requires movement in multiple directions
Motor alignment not needed as motor is part of the pull-out and rabbet fitted	Alignment of motor towards pump with a alignment ring, flat mounted on the motor support head	Alignment of motor towards pump, independent, depending on flatness of baseplate
No pump alignment at re-installation of pull-out unit	Pump alignment check at re-installation	





## Vertical vs Horizontal arrangement

OH5	OH3	OH2
Minimum floor space, therefore low civil cost for pump foundation	Higher civil costs due to larger footprint & weight	Highest civil costs due to largest footprint & weight
Higher NPSH margin due to lower centerline position of impeller Centerline height varies from 250 – 350 mm		Lower NPSH margin Centerline height of >700mm
Initial cost	Initial cost higher than OH5 (+/-10%)	Initial cost higher than OH5 (+/- 25%)
Sturdy and robust design, not sensitive to earthquake's, rapid displacements and alike	Due to separate motor support head, less robust and more sensitive to earthquake's, rapid displacements and alike	Due to horizontal centerline mounting robust, but more sensitive to earthquake's, rapid displacements and alike
Due to compact design, not sensitive to natural frequency vibration.	Due to combination factors as motor, motor support head and pump each unit is checked for natural frequency vibrations	Due to centerline and robust mounting not sensitive to natural frequency vibrations



# Photo- Album

## SPI pumps



“Most Sold”  
2x2x12 during Test  
#111000457 (2 pumps)  
API S-6 with SST Shaft  
Bracket Size 35, grease lubricated

Other sold projects

- 111000477
- 101000057
- 101000058



Bare shaft pump



Ready for shipment

8x8x15  
#121000294 (2 pumps)  
API S-5, Bracket Size 55  
For a 1,500Kg - 2 poles motor





SPI

“The big one”



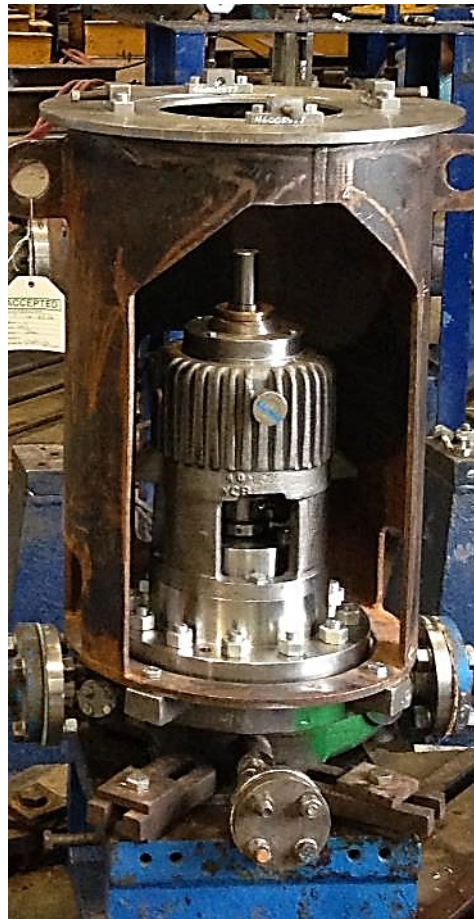
8x6x26

#121000295, #121000296, #121000297

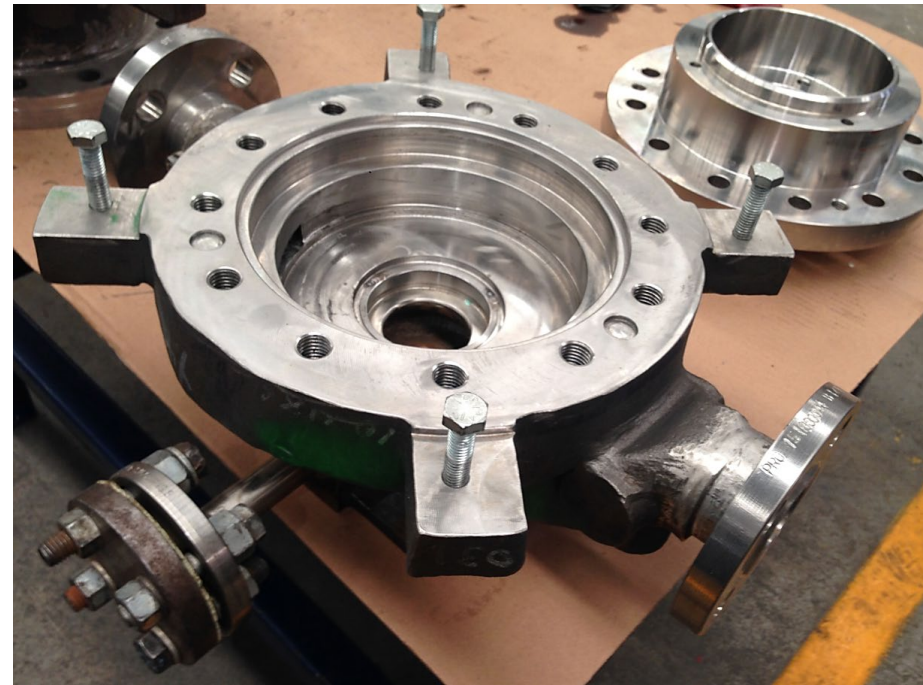
API S-5, Bracket Size 75

For a 2,000Kg - 4 poles motor, to be tested in Tulsa





1,5x1,5x8  
#151000044  
API A-8, Bracket Size 35





1.5x1.5 & 8x8x15  
During Test

1.5x1.5x8	8x8x15
3600 RPM	3600 RPM
Motor 7.5HP, 85 Kg	Motor 215 HP, 1500 Kg
0.6 x 1.2m	1.0 x 3.2m
Total weight 300 Kg	Total weight 2,500 Kg





## Coming Attractions 😊

To be Decided – I welcome your suggestions for topics to cover

Send your suggestions to: [ssmith@ruhrpumpen.com](mailto:ssmith@ruhrpumpen.com)

*Next session will be in the New Year – Date TBA*

*Probably 12<sup>th</sup> or 19<sup>th</sup> January 2023*