

**HMD KONTRO**  
Sealless Pumps

# CSA FRAME 1 PUMP RANGE (60HZ)

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Magnet Drive end suction centrifugal pumps in accordance to:  
ASME B73.3-2015



## Introducing HMD

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Having pioneered the magnetic drive pump over seventy years ago HMD Kontro have continued to develop the technology. We are proud to offer an extensive range of products and services to satisfy the pumping needs and specific requirements found within the Chemical industry, whilst maintaining our flexible approach and without compromising the quality or reliability of our equipment. The products and services provided by HMD Kontro offer the ultimate solution to;

- **Environmental concerns**
- **Recurring mechanical seal problems**
- **Health and safety concerns**
- **Seal system complexities**
- **Maintenance / downtime reduction**
- **Minimising spare parts inventory**
- **Lowering the cost of ownership**

The chemical industry demands reliability, safety and cost efficiency. The production of chemicals in their various forms leads to great volumes of liquid and other materials being pumped around a plant. Containing these liquids calls for pump systems that can be relied upon to keep hazardous chemicals contained throughout the production process and so, sealless pumps are playing an ever greater part in meeting these challenges. Indeed, in some cases more stringent regulations and local agencies are mandating their use.

# Introducing the CSA Range

The CSA magnet drive end suction centrifugal pumps are a modular range of chemical service pumps designed to cover a wide duty and application base using the minimum of pump models by maximising interchangeability of components.

The range is based on a number of hydraulic sizes and fully conform to the current ASME B73.3 dimensional, performance and construction requirements. Close coupled and separately mounted variants are available.

A wide range of options are available including secondary sealing options and numerous bearing assembly variants. The range is specifically designed for maximum part interchangeability, ease of onsite service and has a wide number of site upgradable features.

## Products in the Range

### Parameters

<b>Temperatures:</b>	- 40°F to 500°F
<b>Flow Rates to:</b>	340 USgpm
<b>Heads to:</b>	296 ft
<b>Viscosity:</b>	0.1 to 200 cSt
<b>Powers:</b>	40hp
<b>Design Pressures:</b>	275 psi @ 100°F
<b>Solids Capability:</b>	5% w/w <0.006'

**CSA** (ASME B73.3-2015)

### Key Design Features

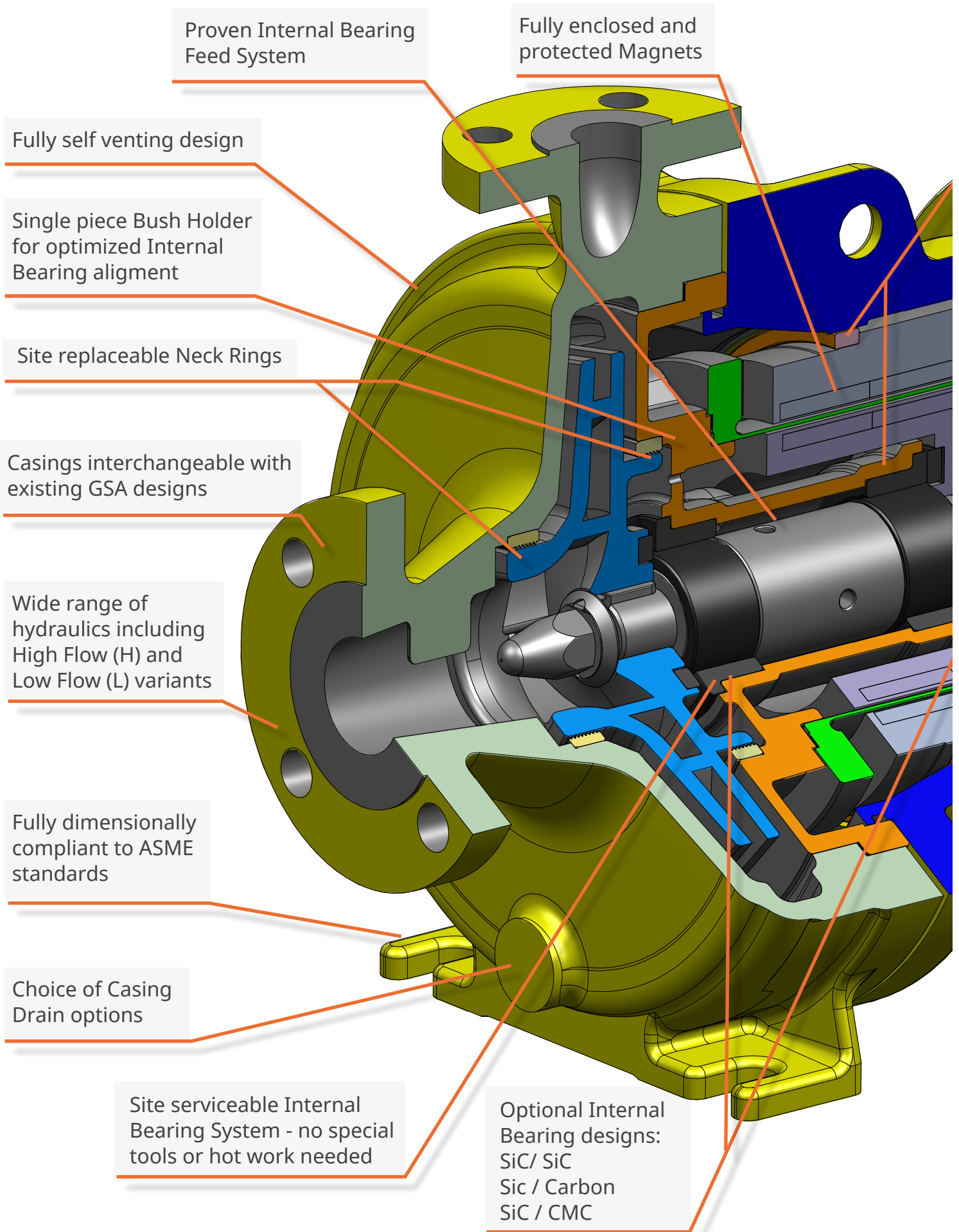
- **No Seals:** Minimises maintenance, all of the associated costs and eliminates potential leaks.
- **Sealless design:** For total containment, essential for hazardous, aggressive or valuable product.
- **Modular & Interchangeable components:** For maximum convenience and minimal lead time.
- **High efficiency hydraulics:** To benefit maximum flow / head coverage.
- **Low and High Flow hydraulic variants:** Provides optimised hydraulic fit.
- **Robust design:** Featuring ZeroLoss® containment shell for tolerance to system upsets.
- **Casing Gasket fully confined:** Eliminating risk of blowout.
- **Internal & External Bump Ring Design:** Providing additional level of robustness.
- **Modular Rotating Element Cartridge:** Providing the most efficient way to perform rapid replacement and manage spare part inventory.

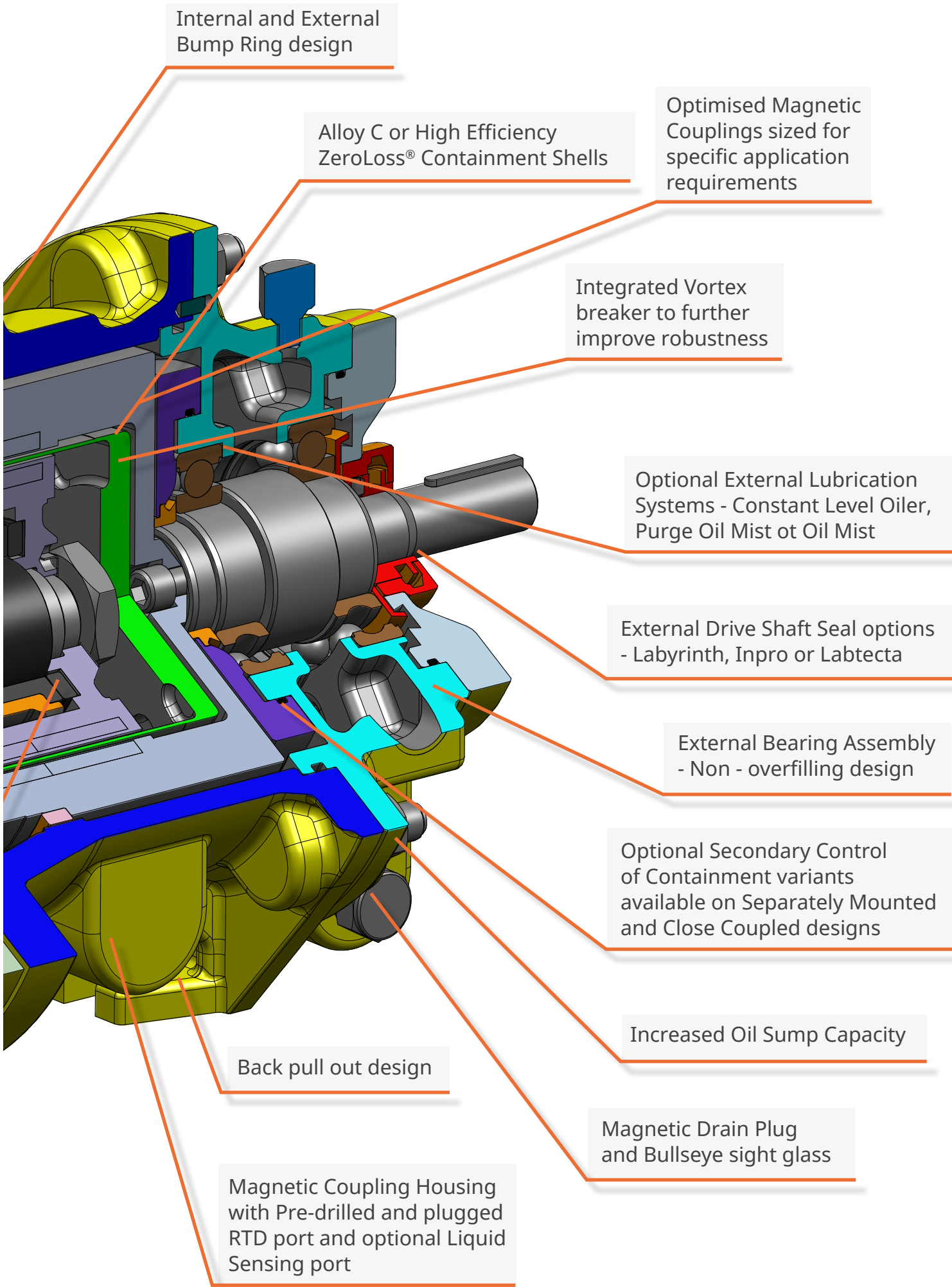
### Benefits of CSA Frame 1 Pump Range:

- Sealless design for total product containment
- Ideal for hazardous, toxic, aggressive, hot and valuable product
- Fully Enclosed Magnets
- Modular construction
- Choice of materials of construction
- Site upgradable design features

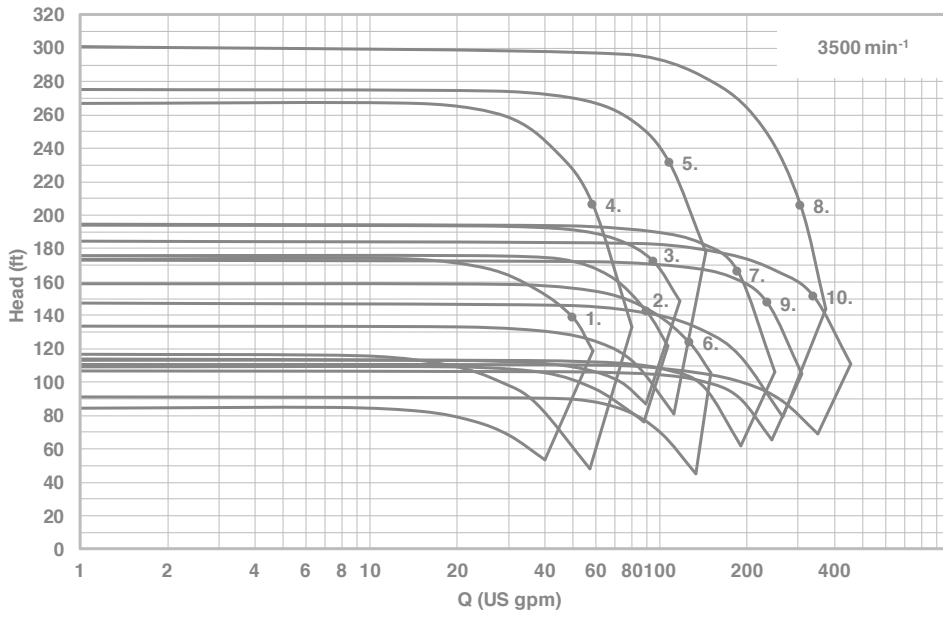


# CSA Pump range



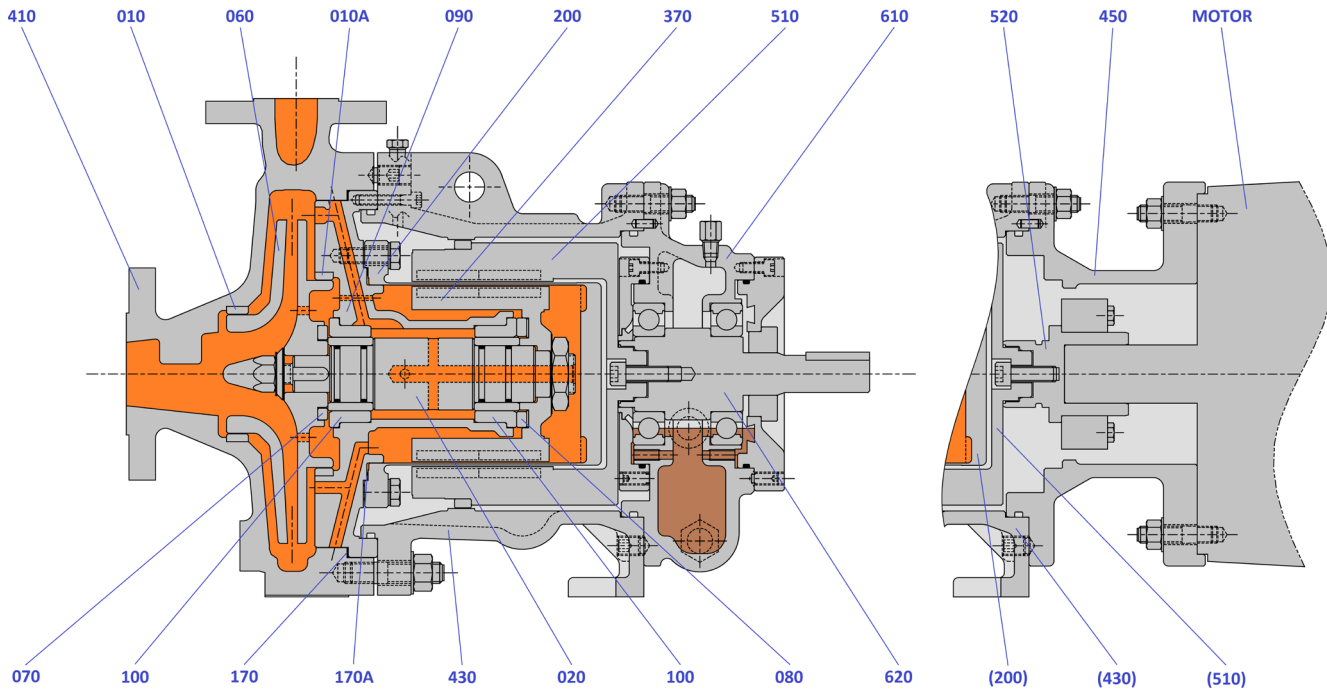


## Performance of the CSA Frame 1 Pump Range



Reference	CSA
1	1.5x1x6-L1
2	1.5x1x6
3	1.5x1x6H
4	1.5x1x8-L1
5	1.5x1x8
6	3x1.5x6
7	3x1.5x6H
8	3x1.5x8H
9	3x2x6
10	3x2x6H

## Construction of the CSA Frame 1 Pump



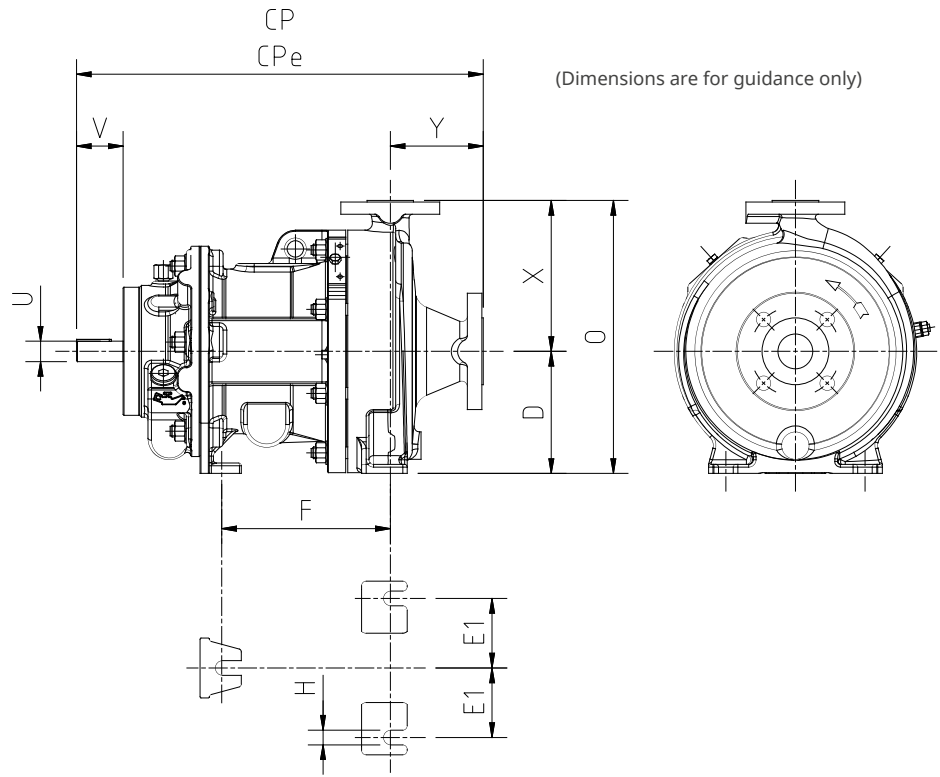
010	Neck Ring (Front)	316L St St
010A	Neck Ring (Back)	316L St St
020	Pump Shaft	316L St St
060	Impeller	316L St St
070	Front Thrust Washer	Silicon Carbide
080	Back Thrust Washer	Silicon Carbide
090	Bush Holder	316L St St
100	Bush	Silicon Carbide
170	Casing Gasket	CSF
170A	Shell Gasket	CSF

200	Containment Shell	Alloy C / 316L
370	Inner Magnet Ring	316L St St Clad
410	Casing	316 St St
430	Coupling Housing	SG Iron
450	Motor Adaptor	SG Iron
510	Outer Magnet Ring	C. Steel (Sheathed)
520	Drive Adaptor	Carbon Steel
610	Bearing Housing	SG Iron
620	Drive Shaft	Carbon Steel

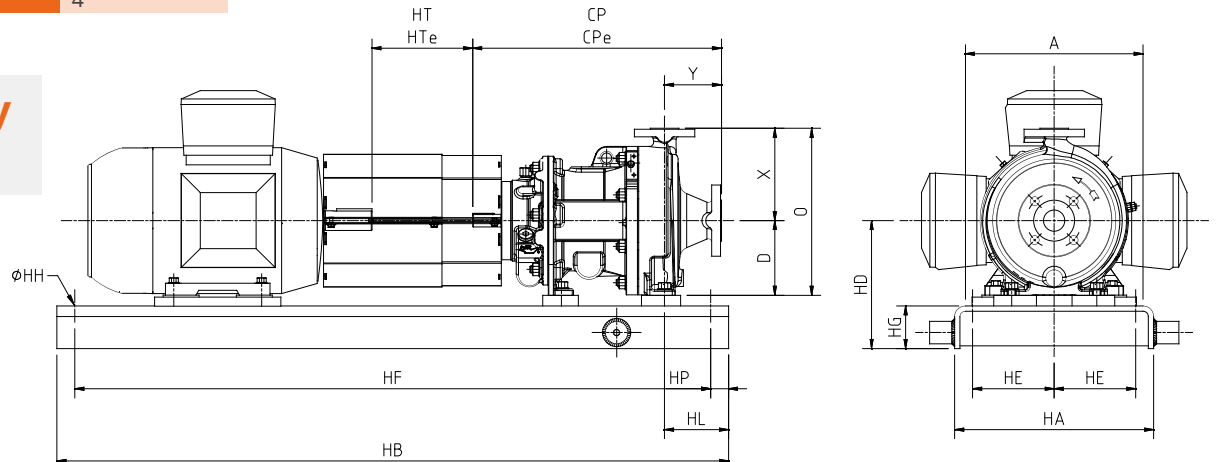
## Dimensions of CSA Frame 1 Pump

### Separately Mounted (Bareshaft)

Size	All Frame 1
CP	17.5
CPe	19
D	5.25
2E1	6
F	7.25
H	0.625
O	11.75
U	0.875
V	2
X	6.5
Y	4

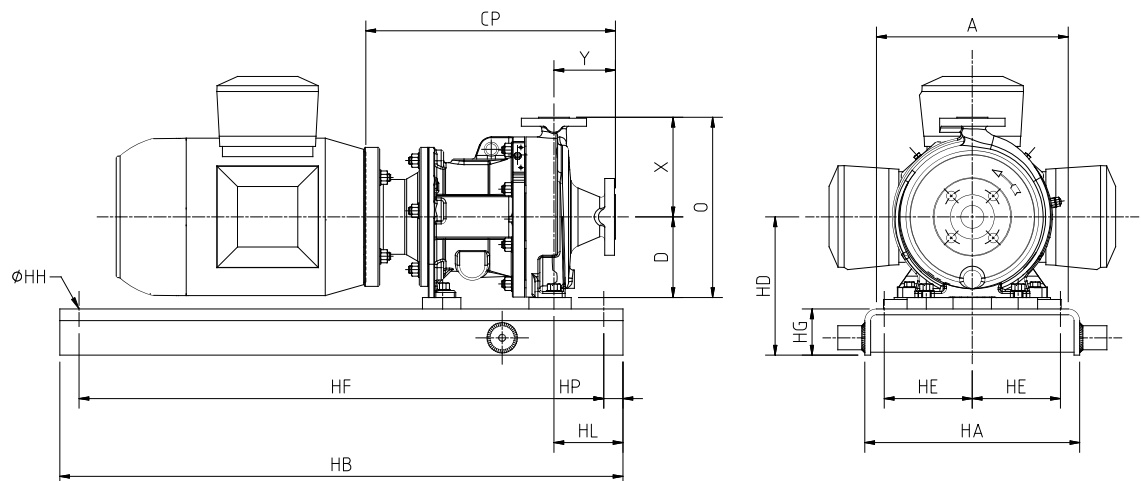


### Separately Mounted



Motor Frame	A	HA	HB	HT	HTe	HD	HE	HF	HG	HH	HL	HP
143TC - 184TC	12	14	43	5.5	4	9	4.5	40.5	3	0.75	4.5	1.25
213TC - 256TC	15	17	52	5.5	4	10.5	6	49.5	3.5	0.75	4.5	1.25
284TSC - 326TC	18	20	57	5.5	4	12.5	7.5	54.5	4	0.75	4.5	1.25

### Close Coupled

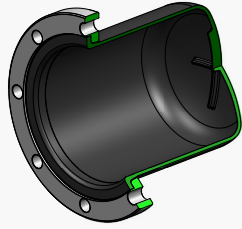


Motor Frame	CP	A	HA	HB	HD	HE	HF	HG	HH	HL	HP
143TC - 145TC	15.14	12	14	32	9	4.5	29.5	3	0.75	4.5	1.25
182TC - 184TC	15.65	12	14	32	9	4.5	29.5	3	0.75	4.5	1.25
213TC - 215TC	16.17	15	17	41	10.5	6	38.5	3.5	0.75	4.5	1.25
254TC - 256TC	16.80	15	17	41	10.5	6	38.5	3.5	0.75	4.5	1.25
284TSC - 286TSC	16.05	18	20	44	12.5	7.5	41.5	4	0.75	4.5	1.25

# Metallic and ZeroLoss® shell options

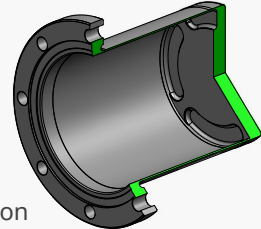
## - interchangeable

### ZeroLoss® Shell



- 275 psi Design pressure
- PEEK Composite design
- Suitable for process temperatures up to 250°F
- High Power NdFeB Magnetic Coupling
- High efficiency – no induction losses, no heat into process liquid
- Provides highest process upset tolerance
- In-built vortex breaker

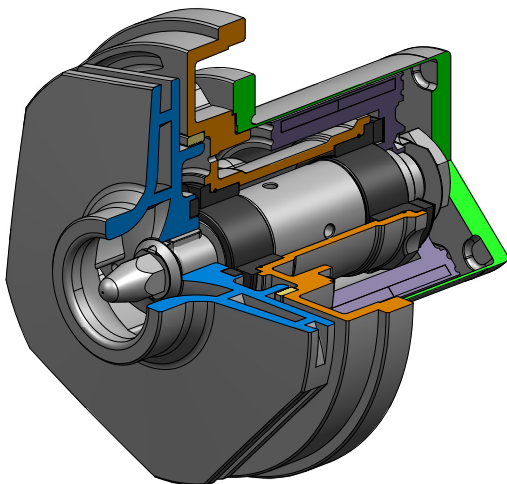
### Metallic Shell



- 275 psi Design pressure
- Proven welded construction
- High strength alloy C276 tube
- Suitable for process temperatures up to 500°F
- Range of SmCo Magnetic Couplings to suit specific duty requirements
- In-built vortex breaker

## Site Serviceable Design

Site replaceable Cartridge design ensures maximum up time and minimum disruption in the unlikely event of a breakdown.



### Comprising of wetted parts (not casing):

- Impeller
- Shaft
- Internal Bush Holder and Bearings
- Containment Shell
- Inner Rotor

### Designed to be serviced / overhauled on site:

- No special tools
- No hot working
- Simple to decontaminate
- No special motor decontamination needed

### Site serviceable Internal Product Lubricated Bearing assembly:

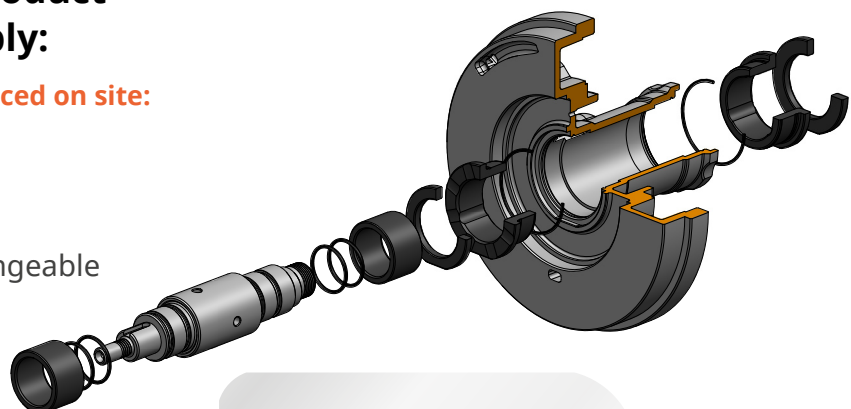
#### Single piece Bush Holder – easily serviced on site:

- No hot working
- No special tools
- In built bush retention features

Radial and Thrust Bearings interchangeable across entire Frame 1 range

#### Optional Internal Bearing Materials

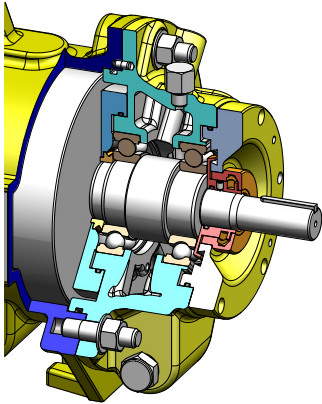
- SiC vs Sic (Standard Build)
- SiC vs Carbon (Variant for low lubricity conditions)
- SiC vs Ceramic Matrix Composite (CMC) thrust bearing (Variant for marginal applications)



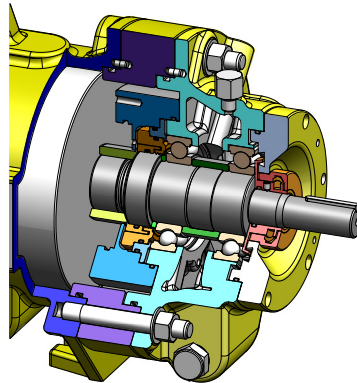


# External Bearing Assembly

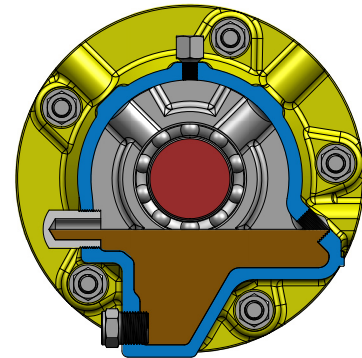
Extended Spacer and Shaft design for increased process temperatures from 400°F to 500°F.



Standard design



Extended CPe design



Non-overfilling design

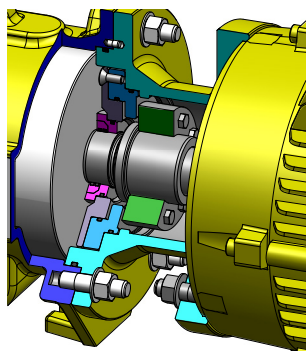
## External bearing assembly:

- Non-overfilling design
- Large sump capacity
- Magnetic sump plug
- Bulls eye style sight glass
- External bearing isolator options available

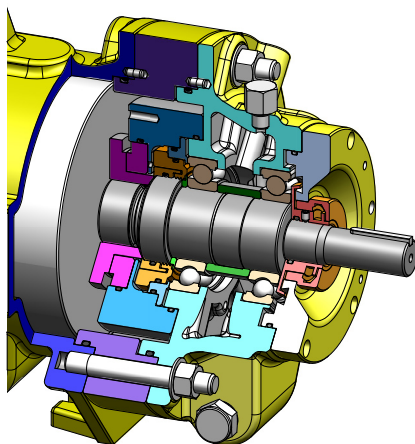
## Available lubrication systems:

- Oil bath (standard)
- Oil bath and constant level oiler
- Purge Oil mist
- Pure Oil mist

# Additional Security



Close Coupled Secondary Control



Separately Mounted Secondary Containment

...designed for maximum service life and ease of maintenance

## Secondary Control and Containment Options:

- Choice of secondary control or secondary containment systems
- Secondary housing designed for 275 psi pressure conditions
- O-rings to completely seal secondary housing
- Provision for Liquid Sensing probe or Pressure Sensing device to be fitted in Secondary housing
- Fully compliant to ASME requirements
- Available on both Close Coupled and Separately Mounted design configurations
- Extended Spacer and Shaft design utilised on Separately Mounted designs
- For process temperatures < 400°F

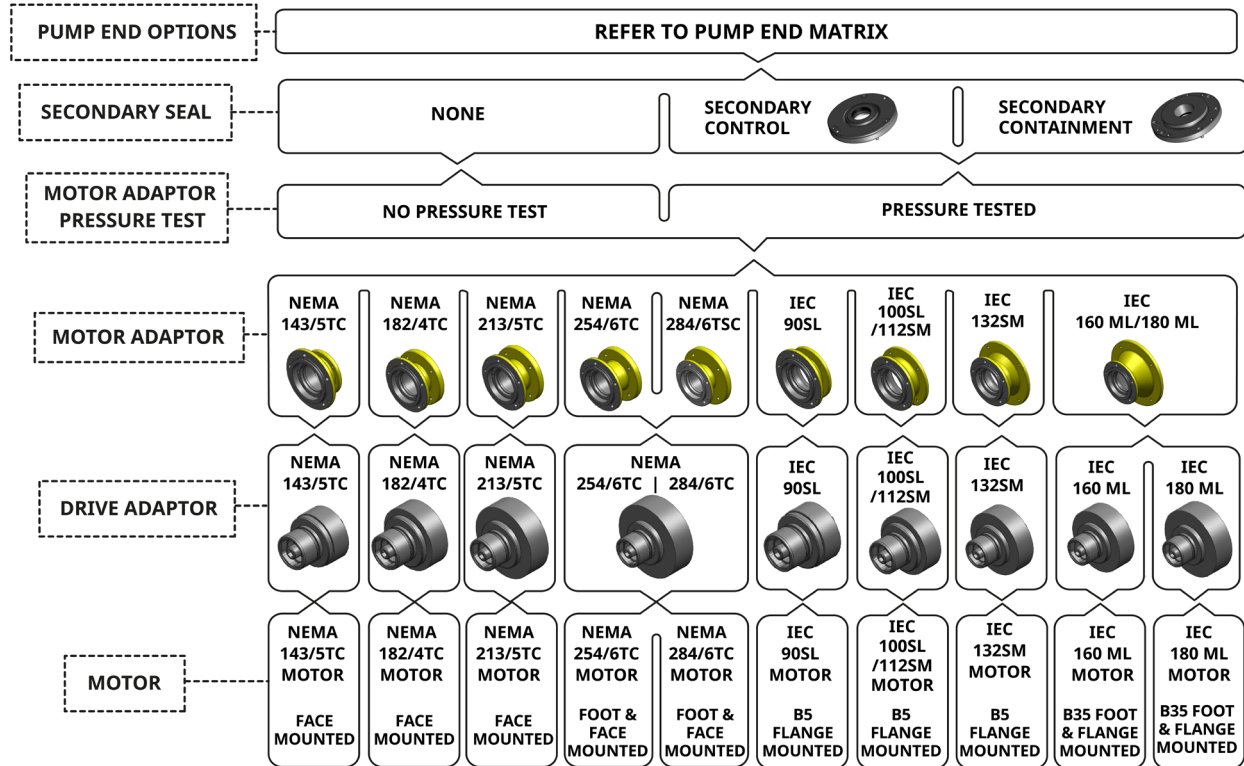
...when product integrity cannot be compromised

# Pump End Interchangeability Matrix

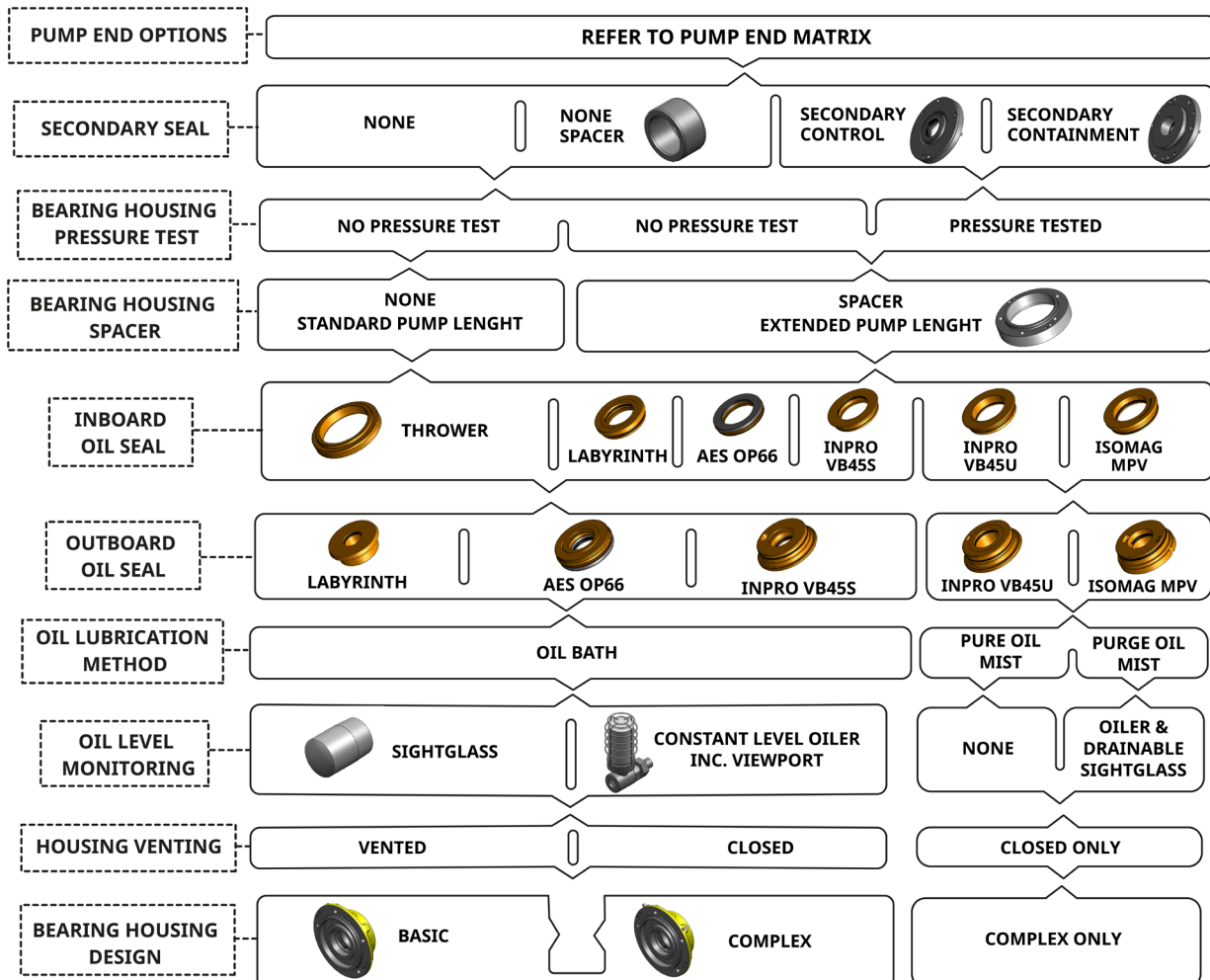
<b>SIZE</b>	K3 1.5x1.6L	K1 1.5x1.6	K1H 1.5x1.6H	K2 3x1.5x6	K2H 3x1.5x6H	K4 3x2x6	K4H 3x2x6H	K6 1.5x1x8L	K5 1.5x1x8	K7H 3x1.5x8H	
<b>CASING &amp; IMPELLER</b>											
<b>PUMP SHAFT</b>	STANDARD										
<b>BUSH HOLDER</b>	STANDARD										
<b>PRIMARY CONTAINMENT GASKETS</b>	STANDARD					CASING & CONTAINMENT SHELL					
<b>INNER MAGNETIC RING</b>											
<b>CONTAINMENT SHELL</b>											
<b>OUTER MAGNETIC RING</b>											
<b>SECONDARY CONTROL / SECONDARY CONTAINMENT</b>	NO					YES					
<b>COUPLING HOUSING</b>						 VENT, DRAIN & INSTRUMENT CONNECTIONS PRESSURE TESTED					
<b>DRIVE END OPTIONS</b>	REFER TO CLOSE COUPLED DRIVE END MATRIX					REFER TO SEPARATE MOUNTED DRIVE END MATRIX					

PUMP END MATRIX

# Drive End Interchangeability Matrix



CLOSE COUPLED DRIVE END MATRIX



SEPARATE MOUNTED DRIVE END MATRIX

# Flanges and Connections

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## Casing

Suction and discharge flanges are designed in accordance with the following standards:

ASME B16.5 Class 150lb Machined with 0.006" high raised face having a continuous spiral groove

## Flange Loadings

Allowable flange loadings imposed by the pipework are in accordance with ANSI/HI 9.6.2.



## Options

A wide variety of options are available:

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### Materials of Construction:

316L Stainless Steel (standard)  
Alloy C (optional variant)  
Alloy 20 (optional variant)

### Containment Shells:

Metallic Construction (- 40°F to 500°F)  
High Efficiency ZeroLoss® PEEK (- 40°F to 250°F)

### Internal Bearings:

Silicon Carbide vs Silicon Carbide (standard)  
Carbon vs Silicon Carbide (optional)  
Silicon Carbide vs CMC (optional)

### Casings Drain:

No Drain or 1/2" NPT Plugged

### Gaskets:

Compressed Synthetic Fibre, PTFE or Graphite

### Mounting Configuration:

Close Coupled:  
(NEMA C-Face or C-Face/Foot Flange Mounted Motor)  
Separately Mounted:  
(NEMA Foot Mounted Motor and Flexible Coupling)

### Constructional Variants:

Secondary Containment  
Secondary Control  
Oil Bath / Oil Mist Lubrication of external bearing assembly  
400 - 500°F Thermal Break

### Instrumentation:

Power Sensing, Temperature Sensing and VapourView®

# Instrumentation and Protection

It is recommended that magnetic drive pumps are installed with one or more of the following instrumentation options.

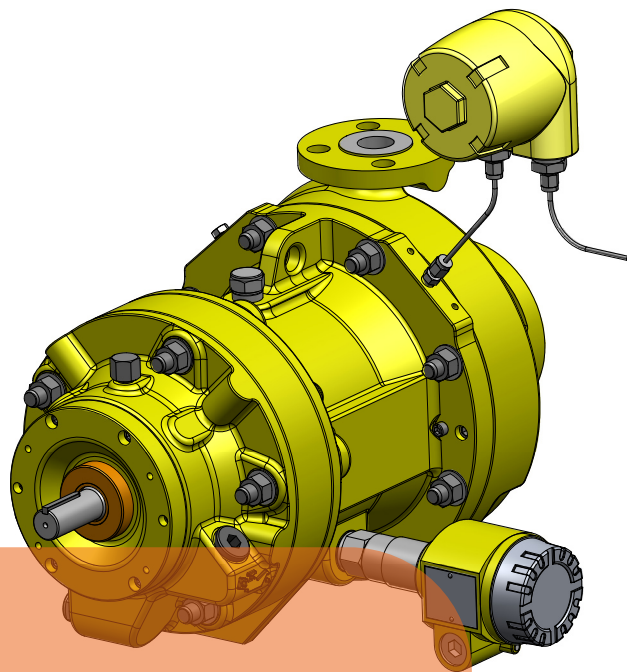
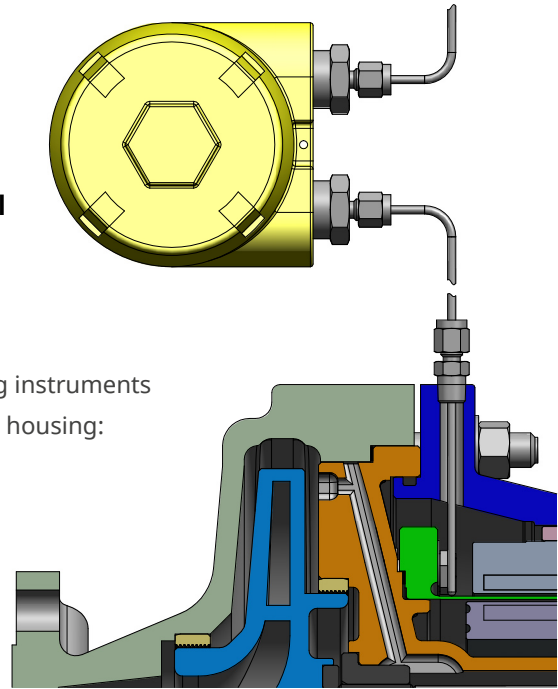
- **Power Control Monitor**
- **Temperature measurement of the containment shell**

Provision for VapourView® is also included.

For pumps supplied with Secondary Sealing systems, the following instruments should be considered to detect leakage in the secondary pressure housing:

- **Liquid sensing probe**
- **Pressure sensing device**

It should be noted that both should be set to stop the pump immediately if the presence of process liquid is detected



## In situ site upgrade options

The CSA pump has been specifically designed to allow onsite changes/upgrades to be carried out with ease. All require only standard tools and no hot working:

- Conversion between Close Coupled and Separately Mounted configurations
- Lubrication type of the external bearing assembly
  - Oil bath / Purge Oil Mist / Purge Oil Mist
- Upgrades to the external bearing assembly seals
  - A number of proprietary seal options are available
- Change to ZL magnetic coupling and containment shell
- Upgrade of CC or SM pumps to feature secondary control or containment

# Value Proposition

HMD Kontro high quality Sealless Pumps move hazardous and high value liquids with simplicity and in complete safety whilst ensuring maximum production output and profitability.



## Sealless Service

Although our pumps only require minimal maintenance, that does not mean there is no after sales service from HMD Kontro. Quite the opposite in fact.

Our own After Sales team, together with our channel partners around the world, can help to optimise the performance and through life experience of using HMD Kontro pumps. From assisting with installation and commissioning, including ensuring smooth contract execution and swift provision of all the appropriate documentation, through to optimising your spares inventory and operating efficiency using the benefit of our experience.

Extending MTBF (mean time between failure) and providing you with the appropriate parts to effect fast maintenance and quick replacement where necessary, will significantly assist in reducing downtime and minimising through life costs, which are already inherently low with an HMD Kontro pump.

To learn more about why sealless is so suitable for your application, please contact us, either directly or through your country partner, details of which can be found on [www.sundyne.com](http://www.sundyne.com). We look forward to helping sealless be of service to you.

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