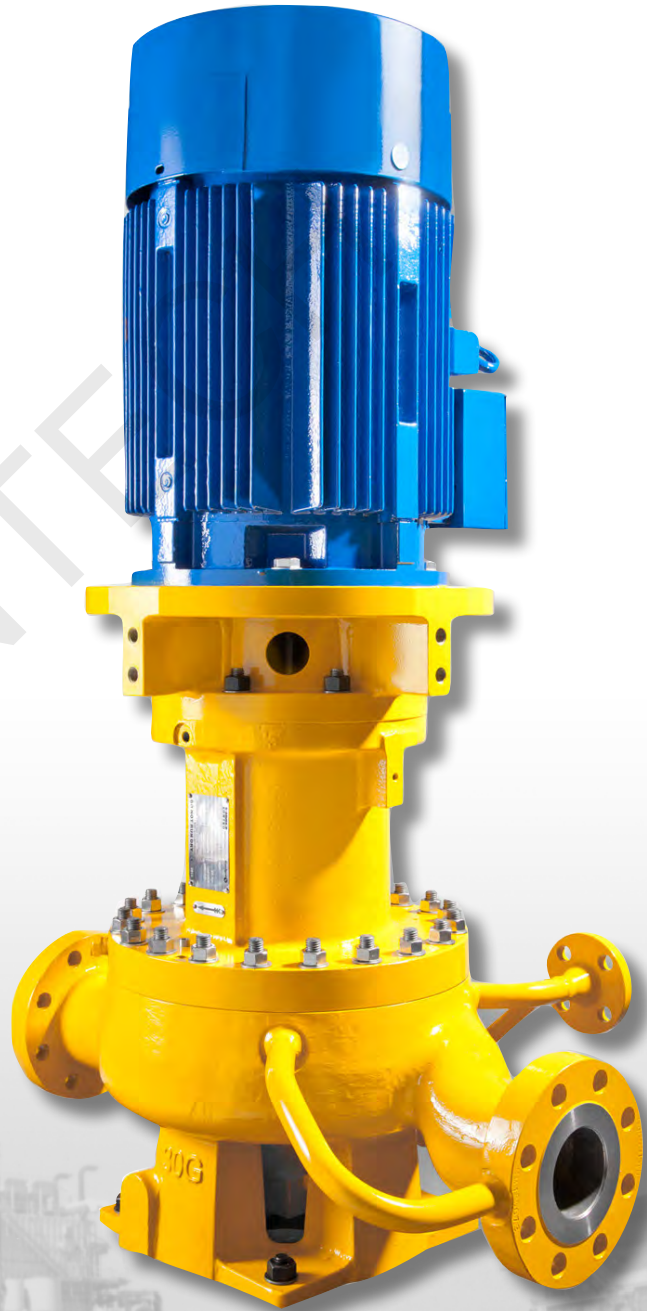


## GSPV Range

Vertical Inline Sealless  
Magnetic Drive Pumps  
API 685



**Sundyne Sealless**

## Standing Up for API 685

# The Sundyne GSPV (V for Vertical)

**All of Sundyne's API 685 expertise in a vertical pump, ideal for space optimization.**



The Sundyne GSPV vertical in-line sealless magnetic drive centrifugal pump is the latest evolution of Sundyne innovation with sealless fluid handling solutions. Combining the operational benefits of magnetic drive sealless technology with exacting API 685 / ISO 13709 and API 610 standards – developed by Sundyne in conjunction with the American Petroleum Institute – this remarkable pump delivers the rugged reliability required for safely handling volatile materials in the most challenging of conditions.

Additionally, the GSPV features a vertical configuration and an exceptionally compact footprint, making this the perfect pump for use in environments where space is at a premium, such as offshore installations. Plus, with no costly seals or seal support systems to replace or maintain, the Sundyne GSPV sealless magnetic drive pump is a cost saving powerhouse, leading to maximized efficiency via lowered operating costs.



## Sundyne Sealless Pumps Are The Solution

Sundyne sealless pumps are designed to comply with API 685 specifications for magnetic drive, sealless end suction, centrifugal pumps, as required by the oil, gas, petroleum and heavy chemical industries.

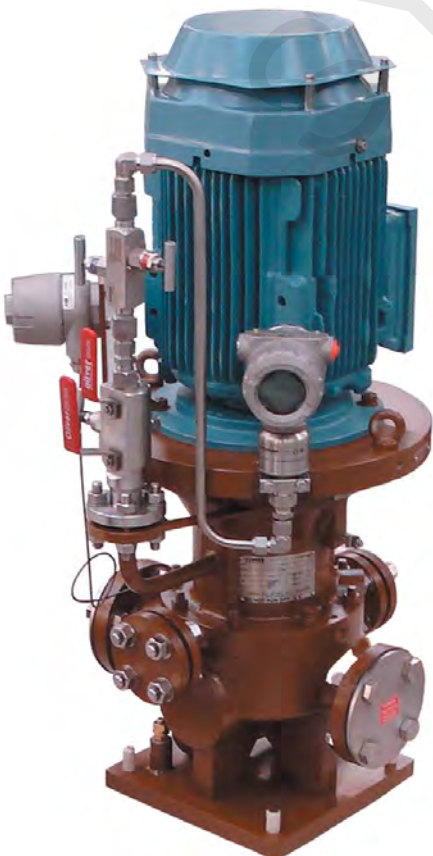
Sundyne has provided sealless magnetic drive pump units for the oil and gas industry since 1983. With increasing demands for the safety and welfare of personnel, plus the environment, these sealless pumps are playing an ever-greater role in achieving these goals. Improved magnet drive technology has enabled more efficient and powerful pumps to be built, including vertically-orientated units such as the GSPV, thereby increasing the application scope for this technology.



Starting with API 610 6<sup>th</sup> edition and then modifying to incorporate 7<sup>th</sup> and 8<sup>th</sup> edition requirements, we first ensured that our sealless pumps met and exceeded the original requirements for sealed units. However, October 2000 saw the official release of API 685, a code dedicated to sealless pumps. These were updated to the 2<sup>nd</sup> edition in 2011. With the development of the GSP, HPGSP and GSPV pump ranges, where were designed to meet the new API edition, Sundyne continues to be at the forefront of sealed technology development.

With over twenty-five years of API experience and our sixty year heritage in magnetic drive technology, Sundyne is in an ideal position to provide a sealless solution for your fluid handling applications. Our range of pumps is continuously being refined and expanded. Currently, we offer over forty models, including these vertical GSP configurations. These deliver a range of benefits, including minimal space requirements, making them ideal for many applications, including offshore installations where space is at a premium.

Manufactured in the United Kingdom at our Sundyne HMD Kontro facility, GSPV pumps are easily accessible. Plus, our global network of Authorized Service Centers and sales partners means that we are where you are, offering sales and support no matter where your operation is located.





Note:  
Paragraph references refer to API 685 2nd edition.

**KEY**

	Pump Casing		Containment Shell
	Impeller		Magnetic Drive
	Bush Holder		Bump Ring
	Silicon Carbide Bushes		Coupling Housing
	Silicon Carbide Shaft Sleeves and Thrust Washers		Motor Adaptor

**Paragraph 6.9.4**

Sleeves – Concentrically located bearing sleeves. Design compensates for relative thermal expansion, concentrically located with O-rings.

**Paragraph 9.1.3.5**

Outer magnets are fully sheathed to prevent damage during assembly or disassembly.

**Paragraph 6.6.3**

Renewable front and rear wear rings – located by tack welding (locking pins on request).

**Paragraph 6.2.7**

Confined controlled compression gasket.

**Paragraph 6.1.29**

Inline pump casing complying with 6.1.29.1 and 6.1.29.2

**Paragraph 6.2.9**

Centerline mounted Casing and Coupling Housing – provided as standard.

**Paragraph 6.5.1 / 2 / 3 / 4**

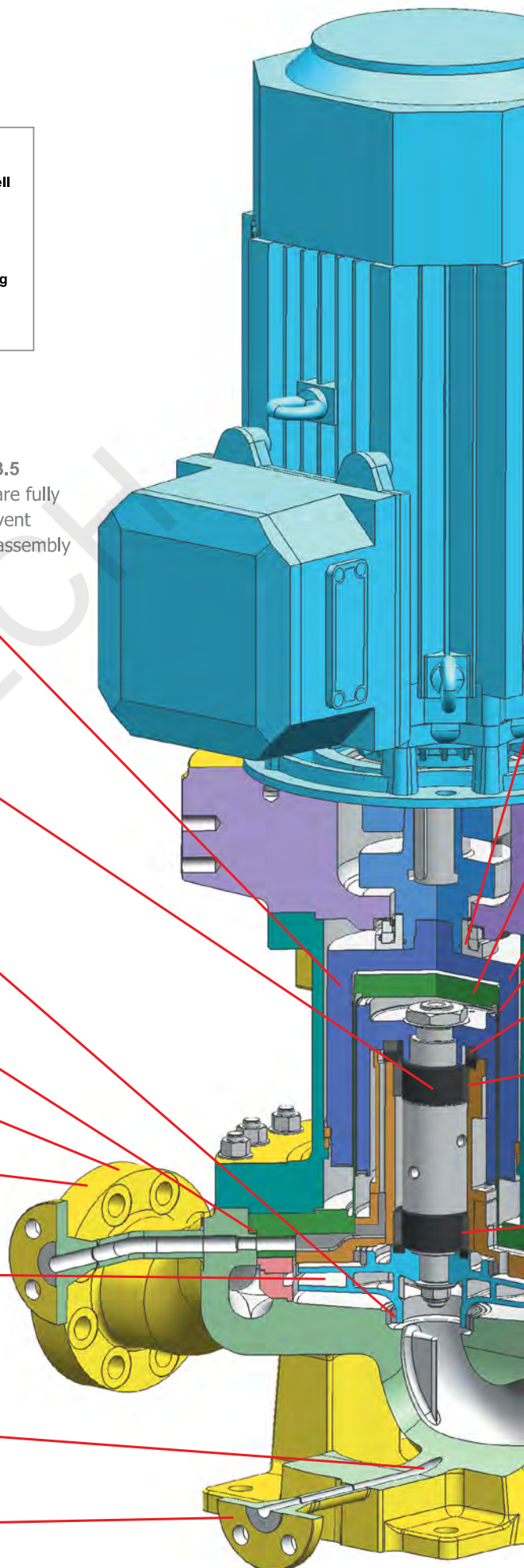
Impellers – fully enclosed, single-piece cast with solid hubs. Keyed to the shaft.

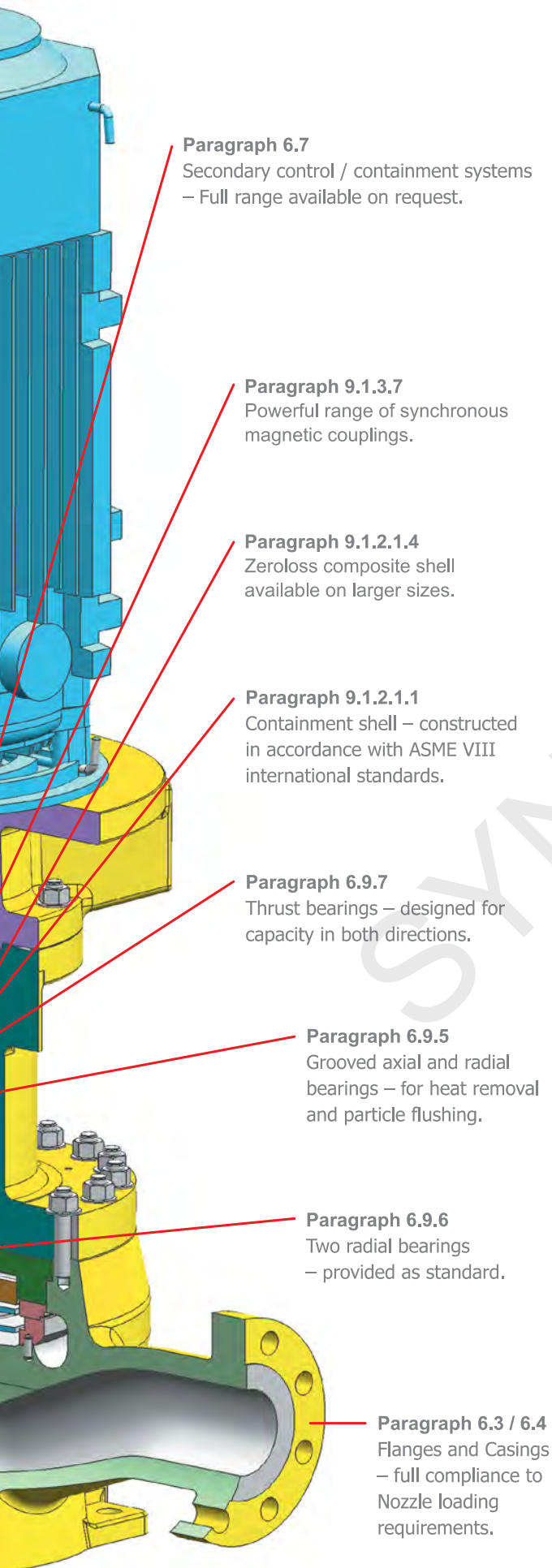
**Paragraph 6.1.10**

All internal cavities are fully drainable – optional flush out or steam out connections available.

**Paragraph 6.3.3.5**

Casing features flanged drain supported in two planes.





**Paragraph 6.7**

Secondary control / containment systems  
– Full range available on request.

**Paragraph 9.1.3.7**

Powerful range of synchronous  
magnetic couplings.

**Paragraph 9.1.2.1.4**

Zero-loss composite shell  
available on larger sizes.

**Paragraph 9.1.2.1.1**

Containment shell – constructed  
in accordance with ASME VIII  
international standards.

**Paragraph 6.9.7**

Thrust bearings – designed for  
capacity in both directions.

**Paragraph 6.9.5**

Grooved axial and radial  
bearings – for heat removal  
and particle flushing.

**Paragraph 6.9.6**

Two radial bearings  
– provided as standard.

**Paragraph 6.3 / 6.4**

Flanges and Casings  
– full compliance to  
Nozzle loading  
requirements.

The GSPV is engineered  
to meet stringent API 685  
requirements.

## Notes

**6.1.20** No Cooling required for operating  
temperatures up to 205°C (400°F).

**6.1.26** Rapid & Economical maintenance –  
shoulders and dowels to facilitate assembly  
and disassembly.

**6.1.3.4 / 6.1.3.7** Temperature and pressure  
profiles – heat balance calculations provided.

**6.2.2** Pressure Casings, Flanges and Coupling  
housings rated for 40 Bar (580 psig) – higher  
pressure rating available on request.

**6.2.12** No tapped holes in the pressure  
boundary. Flanged connections supplied  
as standard.

**6.10** Materials – GSPV pumps are available as  
standard with S-5, A8, D-1j and D-2j materials.  
Other variations are available on request.

**6.10.3** Welding in compliance with ASME  
Section VIII, Div 1, and section IX.

**7.6** Special Tools – not required for  
maintenance of Sundyne GSPV pumps.

**9.1.3.2** All Magnetic Couplings feature  
mechanically retained and bonded magnets.

**9.1.3.5** Outer magnet rings have non-  
magnetic metallic sheathing to protect exposed  
magnets.

**9.1.3.3** All units feature a non-sparking bump  
ring to prevent outer magnet ring contacting  
containment shell in the event of an external  
bearing assembly failure.

# A History Of Complying With API Requirements

**Sundyne pioneered the first sealless, magnetic drive pump over sixty years ago. Therefore, it is natural that the company should now be at the forefront of development for API 685 applications.**

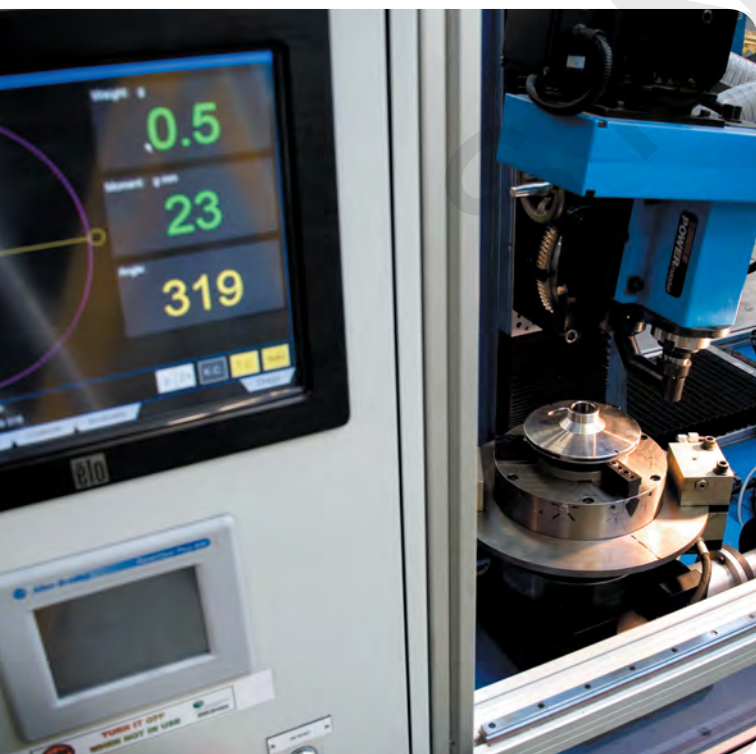
Sundyne installed the first API magnetic drive centrifugal pump in 1983 at a major blue-chip oil company in Australia. These were followed shortly by further installations with BP in Norway. At that time, the American Petroleum Institute did not have a specific standard that applied to sealless pumps. Therefore, the first Sundyne API pumps were designed to follow the then current API 610 standard.

It started with API 610 centrifugal pumps for petroleum, petrochemical and natural gas applications, as developed by Sundyne legacy brand HMD Kontro. As much of the API 610 standard concerns seals and seal support systems, a considerable portion of the specification was not applicable to Sundyne sealless API pumps.

In 2000, the American Petroleum Institute launched the API 685 standard for Sealless Centrifugal Pumps for Petroleum, Heavy Duty Chemical and Gas Industry Services. At this time, sealless technology had become well accepted in the chemical processing industry, but they had not been as widely accepted in the refinery and petroleum industries. This was partly due to the lack of an API specification specifically addressing sealless designs.

Since 1983, many successful API 610 and 685 Sundyne magnetic drive pump installations have been implemented with clients worldwide on a huge variety of different applications. As a result, a substantial reference list is available.

The GSPV range of pumps is designed to comply with all of the requirements set out by the API 685 Sealless Centrifugal Pumps for Petroleum, Heavy Duty Chemical, and Gas Industry Services guidelines, including the second editions published in 2011.







## Vertical Inline

# Magnetic Drive Pumps to API 685

GSPV Magnetic drive sealless pumps offer significant advantages and benefits over conventional sealed designs:

- No seals
- No seal support systems
- Complete fluid containment
- Zero emissions
- Zero contamination of pumped liquid
- Cost effective installation
- No ancillary seal support systems to specify and install
- Longer MTBM
- No EPA monitoring required
- Improved operator safety and protection of the environment
- Small foot print
- Dimensionally compliant to BS4082

Mechanical seals are widely regarded as the weakest point in any pumping system using them. Over 85% of pump failures involve mechanical seal failure and/or leakage through static seals such as gaskets and/or O-rings and bearing failure.

When planning a new pump installation or an upgrade to an existing site, often the financial impact of the mechanical seal support system is considerable. Additional design time, utility provision, installation and commissioning is required. Once such a system is installed, further cost implications are caused by the need for new seals, replacement of barrier fluids and ongoing maintenance. Also, the need to comply with local, regional or national environmental requirements – which often involve monitoring the ineffectiveness of such a system – is introduced.

By completely eliminating the seal and associated seal support system, the Sundyne GSPV range of pumps are ideal for handling liquids with the following characteristics:

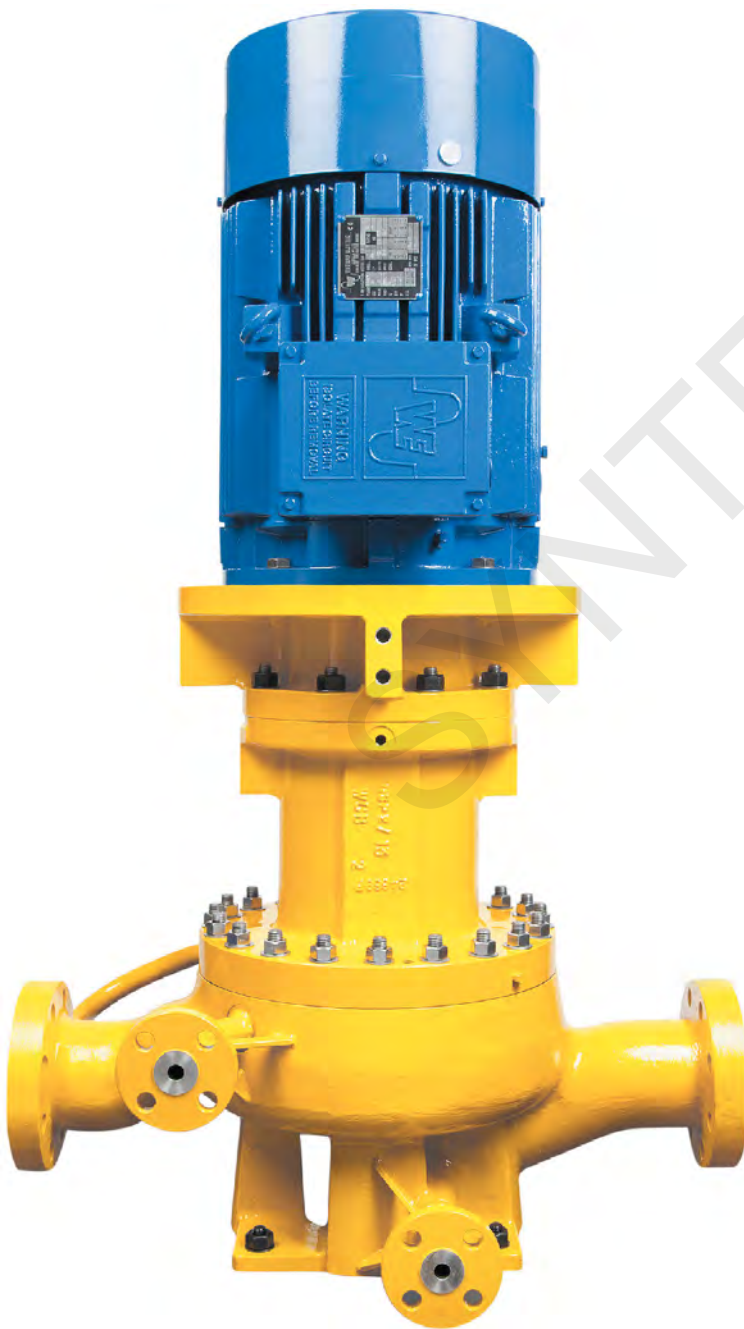
- Toxic
- Lethal
- Carcinogenic
- Flammable
- Expensive Fluids
- Fluids containing dissolved solids (i.e. caustic)
- Fluids containing H<sub>2</sub>S (sour water)
- Heat transfer fluids (cold and hot)
- High vapor pressure liquids

The additional benefit of the vertically mounted GSPV range is the small footprint required, ideal for use in applications, including offshore, where space is at a premium.



# The GSPV

# Pump Range



The GSPV range comprises pumps based on the Sundyne GS drive, built to API 685 specification, suitable for heavy duty applications.

- Vertically mounted design available in nine hydraulic sizes
- Two basic frame sizes to suit power requirements
- Large degree of interchangeability within frame sizes
- Commonality minimizes spare parts inventory and associated costs
- Vertical inline mounted design
- Compliant to BS4082 dimensions
- Completely self-draining
- Conforms to API 685 for sealless pumps and relevant API 610 requirements
- Design ensures safe, leak free operation
- Increased efficiency via low operating costs
- Minimal spares holding and maintenance
- No costly seal support systems to specify, install or maintain
- Reduced specification time and installation costs
- Silicon carbide internal bearings
- Various flange options are available as standard
- Full range of secondary control / containment systems available on request
- Wide range of instrumentation systems available
- Option of high efficiency ZeroLoss composite shell on large hydraulic sizes



### Essential Sundyne Benefits:

- High efficiency magnet drive
- Almost zero unplanned maintenance
- Absolutely no leakages
- Environmentally safe
- System pressures up to 40 Bar / 580 psi (higher pressures available upon request)
- Fully encapsulated magnets
- ASME VIII containment shell
- Standard electric motors utilised
- No cooling required up to 205°C / 400°F
- Material options available
- Alpha SiC internal bearings
- Non-sparking bump ring for safety
- Sundyne worldwide service support

### Typical Applications Include:

- Booster packages
- Pipeline injection
- Monitoring and sampling
- Densitometers
- Remote locations
- Heavy duty chemical applications
- Petrochemical processing plants

### Liquids Handled by GSP Pumps Include:

The following is a sample of some of the typical liquids that the Sundyne GSP API 685 pumps have been used for:

Acrylic Monomers	MDI
Acrylonitrile	Methanol
Alkylate	MEG
Amyl Acetate	Methylene Dichloride
Anhydrous HF	Methyl Mercaptan
Amines	Methyl Naphthalene
Aromatics	MMA
Benzene	Naphtha
Butadiene	Naphthalene
Butane	Pentane
Caustic Soda	Phenol
Chloroform	Produced Water
Condensate	Pyridine
Crude Oil	Sour Water
Cyclohexane	Styrene
Dichlorobenzene	Sulphuric Acid
Ethylene	TDA
Hexane	TDI
Hydrocarbons	Thermal Oil
Hydrofluonic Acid	Toluene
Kerosene	Trichloroethylene
Isobutane	Vinyl Acetate
Iso-Propyl Alcohol	Various Chlorinated
LPG	Xylene

The above list is not exhaustive. Please contact us for reference and information for many other liquids successfully handled.

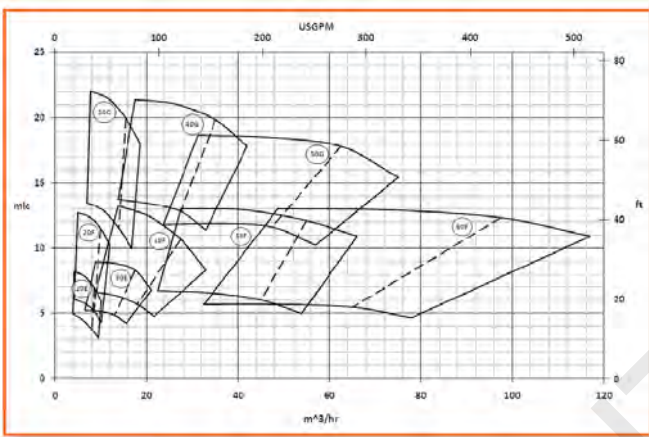


## GSPV Hydraulic Coverage

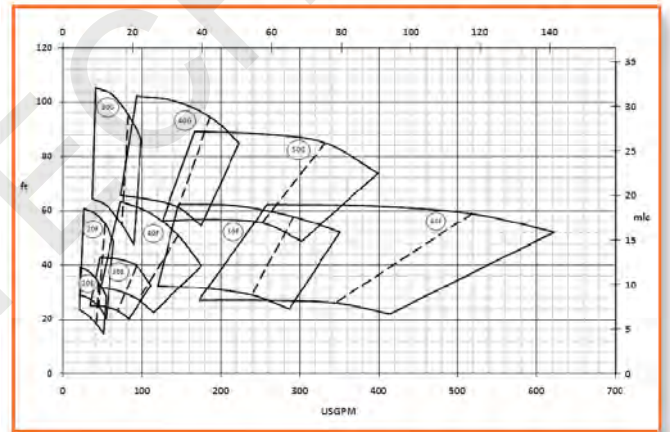
Head	Flow	Temperature	Design Pressure*
120 m	230 m <sup>3</sup> /hr	-40 to 205 °C	40 Bar
400 ft	1000 usgpm	-40 to 400 °F	580 Psi

\* Design pressures up to 100 bar are available on request.

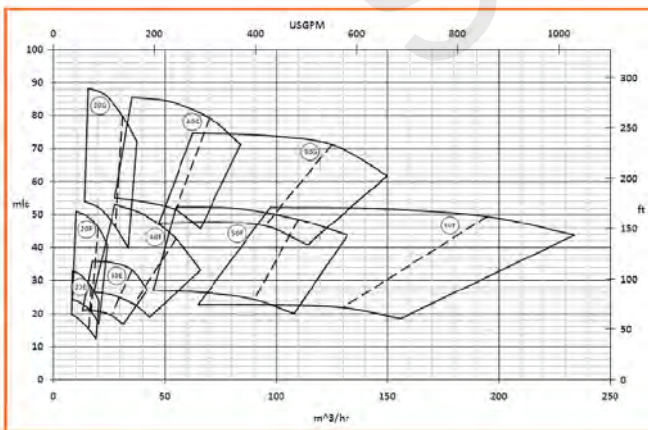
Internal pressure / temperature profile available. Optional instrumentation packages available



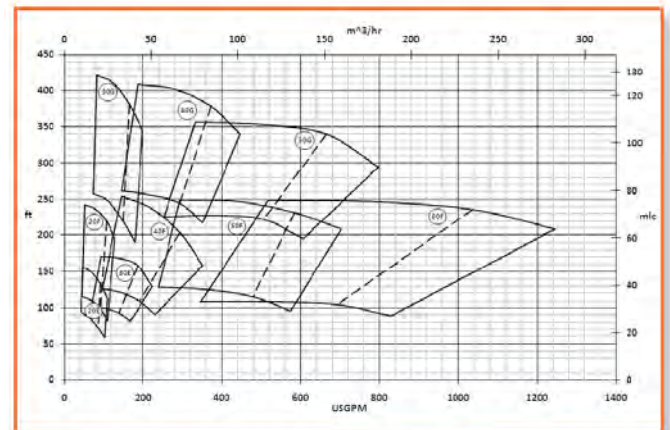
1450 rpm



1750 rpm



2900 rpm



3500 rpm

## Sealless *Savings*

Specifying sealless magnetic drive pumps can save significant costs both in respects of time and money. Indeed, a major feature is that saving can be made before, during and after installation, thanks to reduced running costs.

Having no seal system to specify or support means that design and engineering time, as well as time for procurement, is significantly reduced. Thanks to the much simpler design of the sealless pump, commissioning is quicker at the time of installation, allowing for faster project completion and fewer time consuming HazOps (Hazard and Operability) studies to undertake.

Once up and running, sealless pumps really come into their own. Reduced downtime, because of less maintenance and no need for seal changes, contributes to much improved plant utilization and profitability.

The simple design of a sealless pump, together with a proven track record, provides a 'fit and forget' advantage. Not only is maintenance much reduced, but there is also less need to keep spare parts on hand. In particular, there are no seals to stock, and the need for skilled labor overhead is greatly reduced.

## Sealless *Safety*

With a magnetic drive pump there is no opportunity for leaks or emissions; therefore, your EH&S (Environmental Health & Safety) personnel will appreciate your decision to go sealless.

Because there are no seals and thus no resultant leak path to lubricate, risk towards operational personnel is greatly reduced. Additionally, there is no need for EPA monitoring of the seal system. Plus, with no required seal support systems, the likelihood of accidents or unwanted emissions is virtually eliminated. This reduced liability can lead to lower insurance rates.

Sealless pumps represent better operator safety, a cleaner working environment and reduced potential for legislation and litigation, leaving you with reduced overhead and maximized R.O.I.





## Sealless **Service**

Although our pumps only require minimal maintenance, that does not mean we don't offer after sales service from Sundyne. Quite the opposite, in fact.

Our own After Sales team, together with our partners around the world, can help to optimize the performance and through life experience of using Sundyne pumps. From assisting with installation and commissioning, including ensuring smooth contract execution and swift provision of all appropriate documentation, to optimizing your spares inventory and operating efficiency using the benefit of our experience, the Sundyne family is behind you.

Extending MTBM (mean time between maintenance) and providing you with the appropriate parts to effect fast maintenance and quick replacement where necessary will significantly reduce downtime and minimize through life costs, which are already inherently low with Sundyne pumps.

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