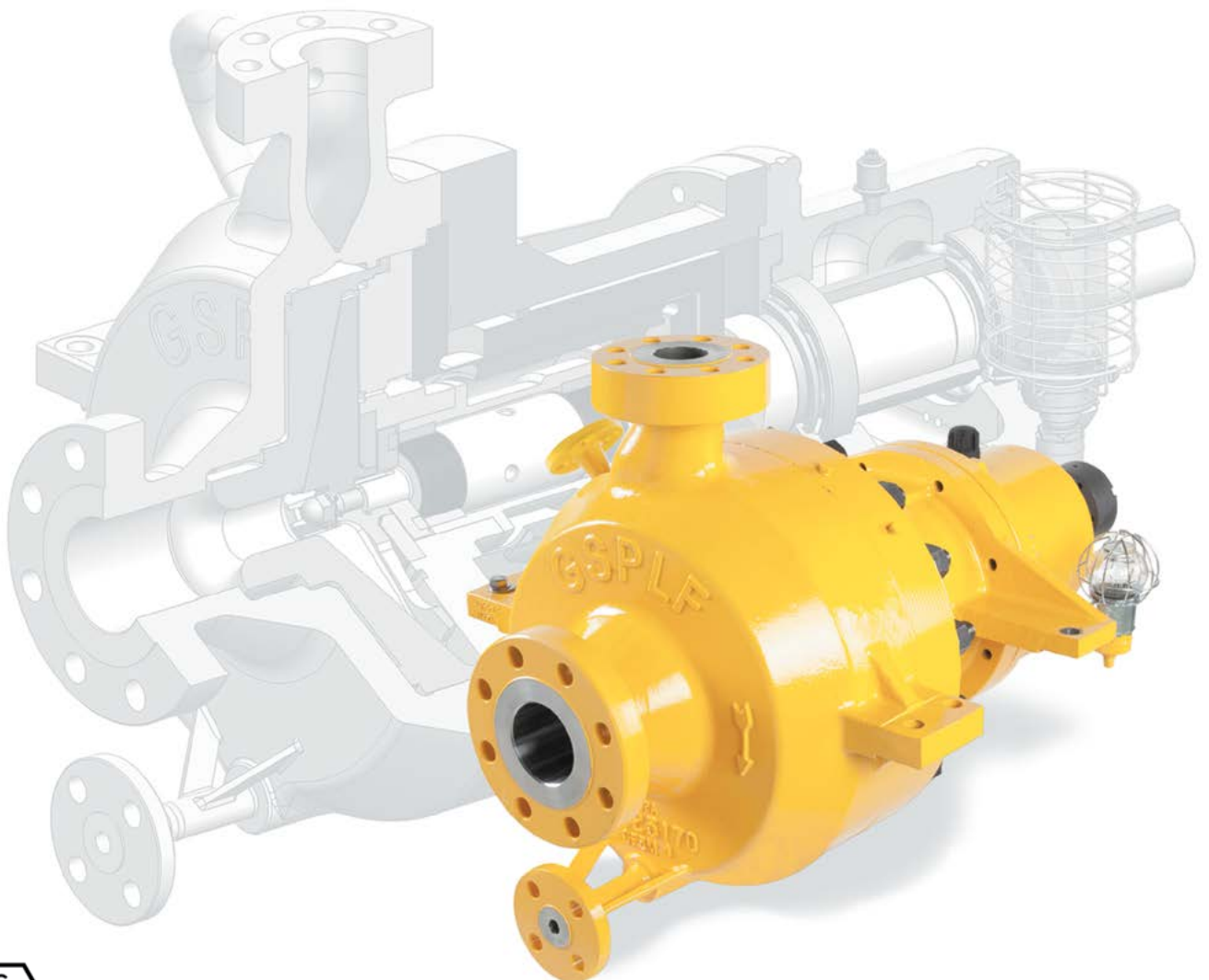


GSPLF Magnetic Drive Pumps

Low Flow

API 685 - 2nd Edition



Sundyne Sealless

Optimizing Low Flow Efficiency

The Sundyne Sealless GSPLF (LF for Low Flow) Pump

**Combining Proven Low Flow Sundyne Hydraulics
With Sundyne Sealless MagDrive Technology**



Since 1983, Sundyne has collaborated with the American Petroleum Institute to define and develop rigorous API 685 / ISO 13709 industrial standards regarding sealless centrifugal pumps for use in petroleum, heavy duty chemical and gas industry services; the Sundyne / HMD Kontro family of GSP sealless magnetic drive centrifugal pumps represents the culmination of that work.

Combining the operational benefits of magnetic drive sealless technology with exacting API 610 and 685 standards, these pumps deliver rugged reliability ideal for safely and economically handling volatile materials in challenging conditions. With flexible horizontal and vertical configurations, Sundyne sealless API pumps are custom engineered for use in environments where space is at a premium, such as offshore installations. Boasting nine hydraulics and a wide operating envelope, Sundyne GSP sealless magnetic drive pumps are some of the most adaptable heavy duty pumps available today.

The Sundyne GSPLF expands this product range, combining Sundyne Barske Wheel hydraulics with their advanced sealless magnetic drive systems. This combination serves to further advance the pump's reliability and efficiency, ensuring trouble-free plant operation and maximized productivity. Additionally – like the rest of the GSP range – the GSPLF meets all requirements of API 685 and is fully ATEX compliant, making it ideal for use in oil and gas installations, as well as chemical and petrochemical applications.



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, but with increasing demands being placed on the safety and welfare of personnel, as well as the environment, our 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 the Low Flow specialized GSPLF variant, thereby increasing the application scope for this technology.



Starting with API 610 6th edition and then modifying to incorporate 7th and 8th 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 2nd edition in 2011. With the development of the GSP, GPGSP and GSPV pump ranges, which were designed to meet the new API edition, Sundyne continues to be at the forefront of sealless technology development.

With over twenty-five years of API experience and a sixty year heritage in the development of magnetic drive technology, Sundyne is in an ideal position to provide a sealless solution for your fluid handling application. Our range of pumps is continuously being refined and expanded. Currently, we offer over forty models, including the GSPLF, which 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.



Paragraph 6.2.7

Pump casings have metal to metal fits with confined controlled compression spiral wound gasket.

Paragraph 9.1.3.5

Magnet rings are fully sheathed to prevent damage during assembly or disassembly.

Paragraph 6.6.1

Low specific speed semi-open impeller design with generous clearances.

Paragraph 6.2.9

Centerline mounted casing and coupling housing – provided as standard.

Paragraph 6.2.1 / 6.4

Flanges and Casings – full compliance to nozzle loading requirements.

Paragraph 6.5.1 / 2 / 3 / 4

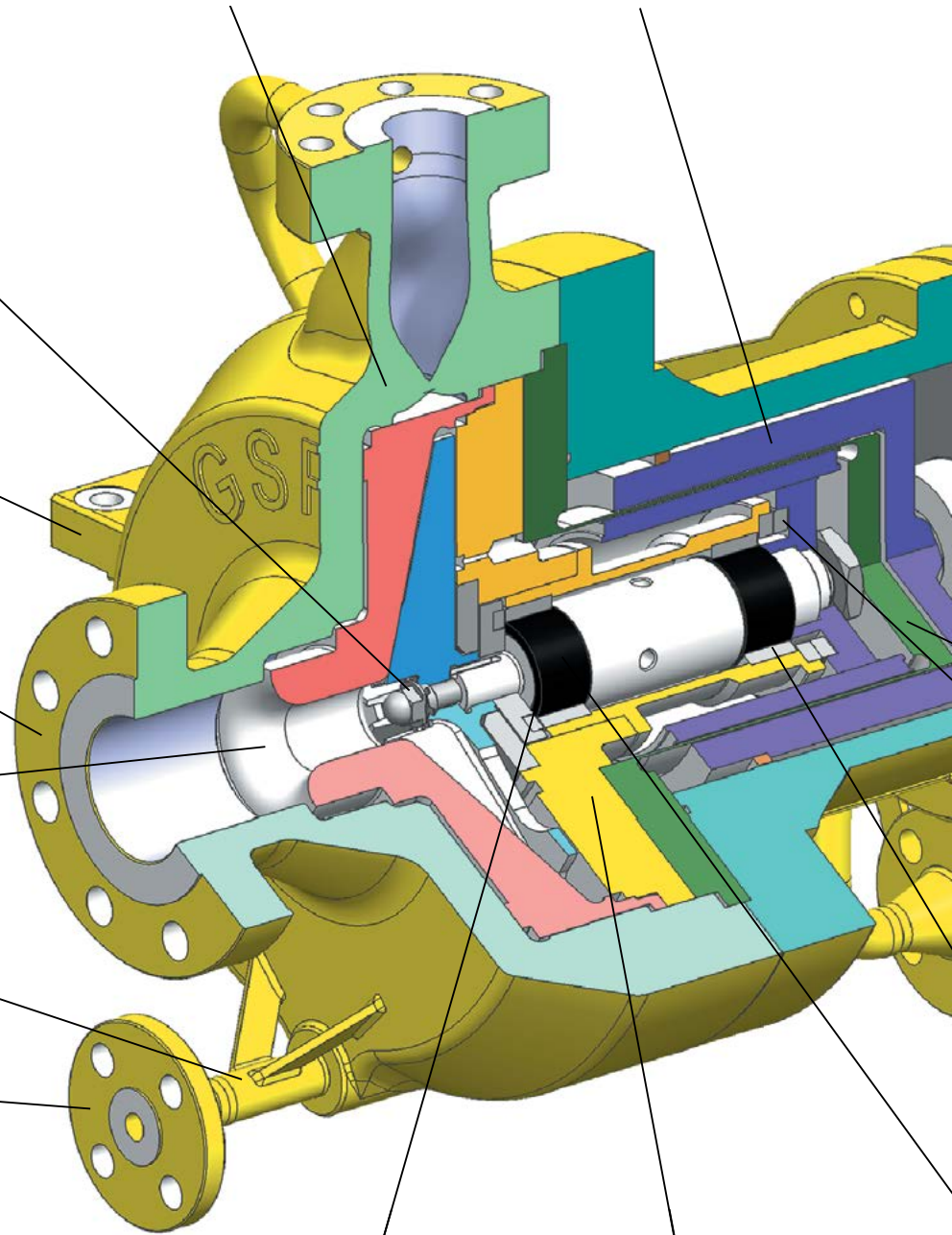
Impellers – semi-open single-piece cast with solid hubs. Keyed to the shaft.

Paragraph 6.3.3.5

Casing features flanged drain supported in two places.

Paragraph 6.1.10

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



Paragraph 6.9.4

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

Paragraph 9.1.1.6

Internal Bearings – not supported by the containment shell.

KEY

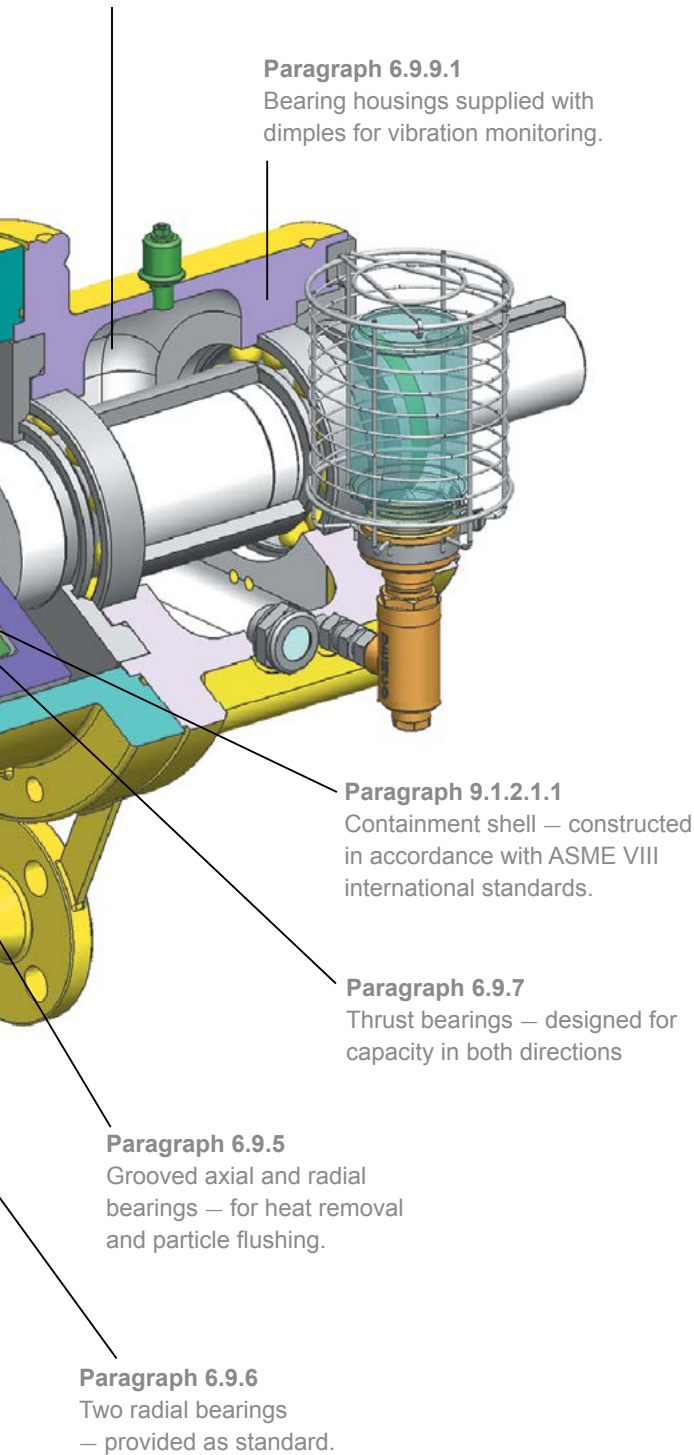
- | | |
|--|---|
|  Pump Casing |  Containment Shell |
|  Impeller |  Magnetic Drive |
|  Bush Holder |  Bump Ring |
|  Silicon Carbide Bushes |  Coupling Housing |
|  Silicon Carbide Shaft Sleeves and Thrust Washers |  Power Frame |

Paragraph 6.7

Secondary control / containment systems – full range available upon request.

Paragraph 6.9.9.1

Bearing housings supplied with dimples for vibration monitoring.



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.

The Sundyne GSP range meets and often exceeds API 685 2nd Edition requirements.

Notes

6.1.20 No cooling required for operating temperatures up to 660°F / 350°C.

6.1.26 / 6.2.11 Rapid & economical maintenance – shoulders and dowels to facilitate assembly and disassembly.

6.1.3.4 Temperature and pressure profiles – heat balance calculations provided.

6.2.2 Pressure casings, flanges and coupling housings rated for 600 psig (40 Bar).

6.3.3.1 No threaded connections to the primary pressure casing. Flanged connections supplied as standard.

6.10 Materials – GSP pumps are available as standard with S-5, A-8, D-1j, D-2j and S-9l 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 GSP pumps.

9.1.3.2 All magnetic couplings feature mechanically retained and bonded 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.

9.1.4 Antifriction bearing assemblies – fully compliant rolling element bearings, sized in accordance with requirements.

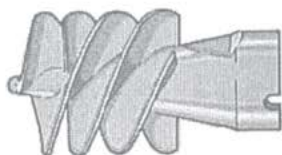
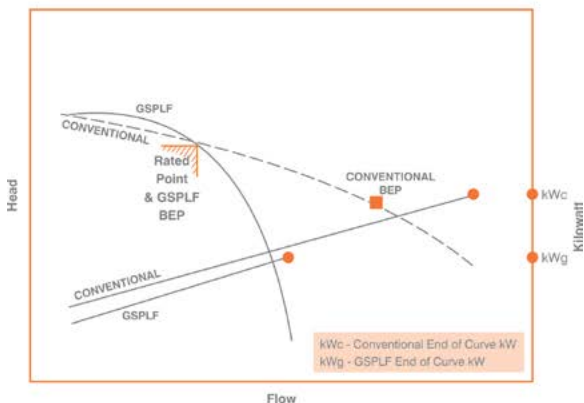
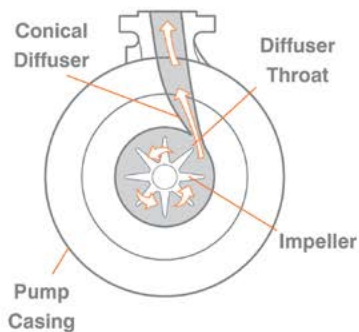
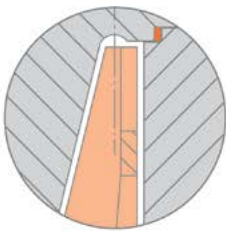
9.1.5.3 Baseplate – heavy duty design incorporates continuous welds, leveling screws, lifting lugs, grout locking cross-members and drain connection.



Sundyne Sealless

GSPLF Design Features

Low Flow Sealless Magnetic Drive Pumps



Removable Diffuser

- Allows for re-rating of pumps for use in different process conditions without costly machining
- Allows for easy on-site conversions

Generous Clearances

- No wear rings eliminate potential performance degradation associated with wear ring designs
- Maintains as-built efficiency over lifetime

Low Specific Speed Best Fit Hydraulics

- Barske hydraulics for optimized efficiency in low specific speed (N_s) applications
- Optimized hardware to fit precise design requirements
- Lower end-of-curve power requirements
- Maximized efficiency

Low Bearing Loads

- Semi-open impeller design reduces radial and axial bearing loads on product lubricated internal bearing system

Optional Inducers

- Deliver low NPSH and super NPSHr performance
- Suction designed for cavitation-free operation

Build Options:

- High efficiency ZeroLoss containment shell
- Secondary control system
- Secondary containment system
- External filtration
- Inducers
- NACE compliant materials
- Vertical (OH5) derivative

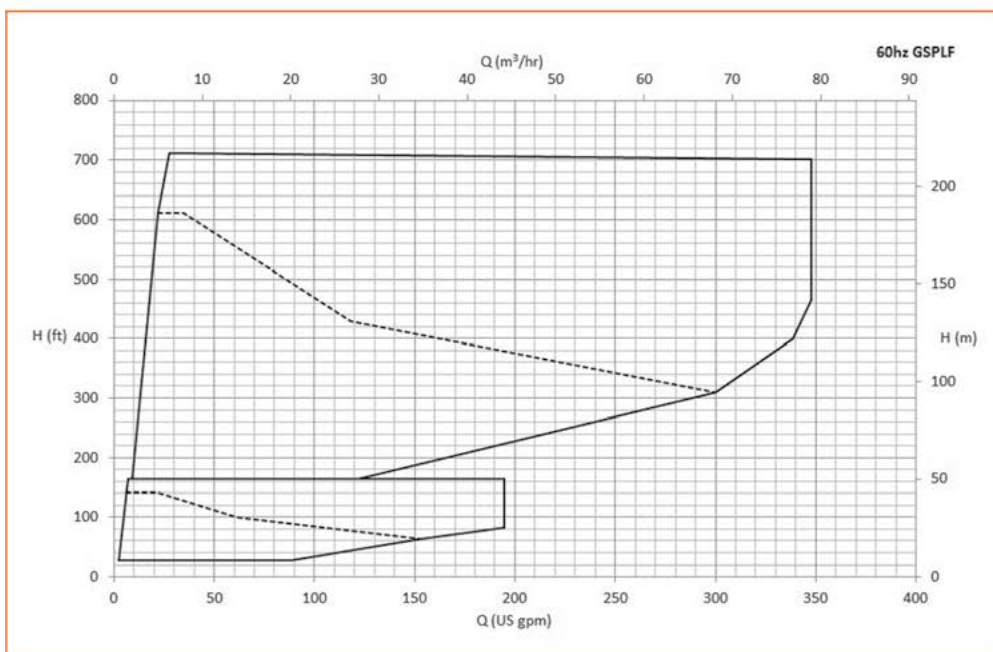
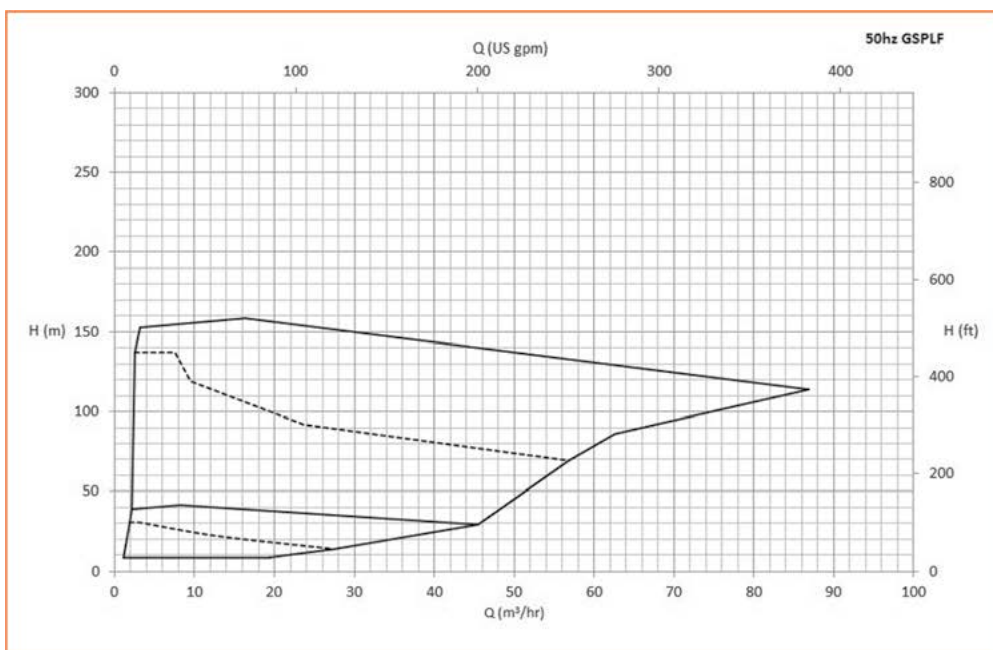
Instrumentation Options:

- Power control monitor
- RTD temperature sensing
- Secondary housing monitor (liquid or pressure)
- VapourView™ ultrasonic gas detection system

GSPLF Hydraulic Coverage

	Head	Flow	Design Temperature ¹	Design Pressure ²
US Units (60 hz)	720 ft	380 usgpm	-40 to 500°F	580 PSI
SI Units (50 hz)	150 m	60 m ³ /hr	-40 to 260°C	40 Bar

1. Standard design temperature. Higher and lower limits available on request -148°F (100°C) to 600°F (315°C).
2. Standard design pressure. Design pressures up to 1400 PSI (100 Bar) available on request.



Sundyne Sealless

The GSPLF

Pump Range

The GSP range comprises pumps based on the Sundyne HMD Kontro GS drive, built to API 685 specifications and suitable for heavy-duty applications.

- Separate mounted OH2 design
- One frame size to suit power requirements
- Large degree of interchangeability across hydraulic range
- Commonality minimizes spare parts inventory and associated costs
- Center line mounted design with support brackets on both the casing and the magnetic coupling housing to minimize vibration and allow for thermal expansion
- Mounted on a heavy-duty fabricated steel drip pan baseplate
- Self-venting and self-draining
- Conforms to API 685 standards for sealless pumps, as well as 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
- Standard materials of construction per S-5, A-8, D-1j and D-2j; other variations available on request
- Silicon carbide internal bearings and spiral wound gaskets
- Various flange options are available as standard
- Full range of secondary control / containment systems available on request
- Wide range of instrumentation systems available
- Optional vertical OH5 design available
- Choice of metallic or ZeroLoss containment shell





Magnetic Drive Pumps to API 685

Sundyne GSP range magnetic drive sealless pumps offer significant advantages and benefits over conventional sealed designs, including:

- 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 environmental protection

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 or o-rings, as well as 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 generated by the need for new seals, replacement of barrier fluids and ongoing maintenance. Additionally, the need to comply with local, regional or national environmental requirements – which often involve monitoring the ineffectiveness of seal systems – is introduced.

Thus, by completely eliminating the seal and associated support system, the Sundyne GSP range of pumps represents an ideal solution for handling liquids with the following characteristics:

- Toxic
- Lethal
- Carcinogenic
- Flammable
- Expensive fluids
- Fluids containing dissolved solids (i.e. caustic)
- Fluids containing H₂S (i.e. sour water)
- Heat transfer fluids (cold and hot)
- High vapor pressure liquids



Essential Sundyne Benefits

- High efficiency magnet drive
- Almost zero unplanned maintenance
- Absolutely no leakages
- Environmentally safe
- Options for system pressures up to 1,500 PSI / 100 Bar (higher pressures available upon request)
- Fully encapsulated magnets
- Heavy-duty power frame
- ASME VIII containment shell
- High system pressure capability without 'backup' systems
- Standard electric motors utilized
- No cooling required up to 600°F / 350°C
- Material options available
- Alpha SiC Internal Bearings
- Non-sparking bump ring for safety
- Sundyne worldwide service support

Typical Applications Include:

- Oil refineries
- FPSO (Floating Production Storage & Offtake) facilities
- Oil rigs
- Chemical processing plants
- 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 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.



Sealless Savings

Specifying sealless magnetic drive pumps can save significant costs both in respects of time and money. Indeed, a major feature is that savings 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 Sundyne 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 specify sealless.

Because there are no seals and their 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.

In sum, 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.

The Sundyne 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, through to optimizing your spare 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.

To locate the global representative, distributor or authorized service center nearest you, or for additional information please visit www.sundyne.com

GLOBAL STRENGTH, powered by people

COMPRESSORS

PUMPS

GENUINE PARTS

SERVICE

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Pumps Brochure
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