

Technical Profile

GS Self Priming

Synchronous magnet drive, hydraulic pumps

This range is designed, primarily, for the emptying of sumps and road/rail tankers.

The SPGS product covers an hydraulic range that is split between two frame sizes, Frames 0 & 1.

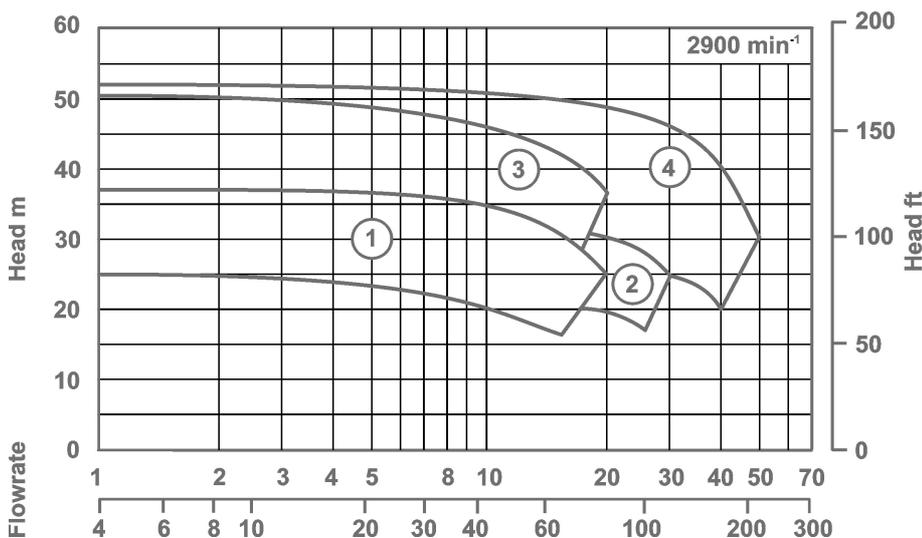
The pumps are offered with a range of Synchronous Magnet Drives rated to match prime mover performance. Prime mover specifications of all denominations can be catered for.

The standard materials of construction are stainless steel with silicon carbide internal bearings.

HMD Kontro



Performance of the GS self priming range



Pump model

	Imperial	Metric
1	1.5 x 1 x 6H	50-32-160H
2	3 x 1.5 x 6H	65-50-160H

	Imperial	Metric
3	1.5 x 1 x 8	50-32-200
4	3 x 1.5 x 8H	65-40-200H

Design range limits

The SPGS pump is designed to operate from -40°C up to 120°C, -40°F up to 250°F without the need for any ancillary cooling medium. Design working pressure is 10 bar, 145 psi.

Solids handling capability

The unit is capable of handling solids up to 5% w/w less than 150 microns.

Options

Materials of construction

Wetted Parts Alloy 20, Alloy C
Gaskets PTFE

Other options

Large range of pump protection.

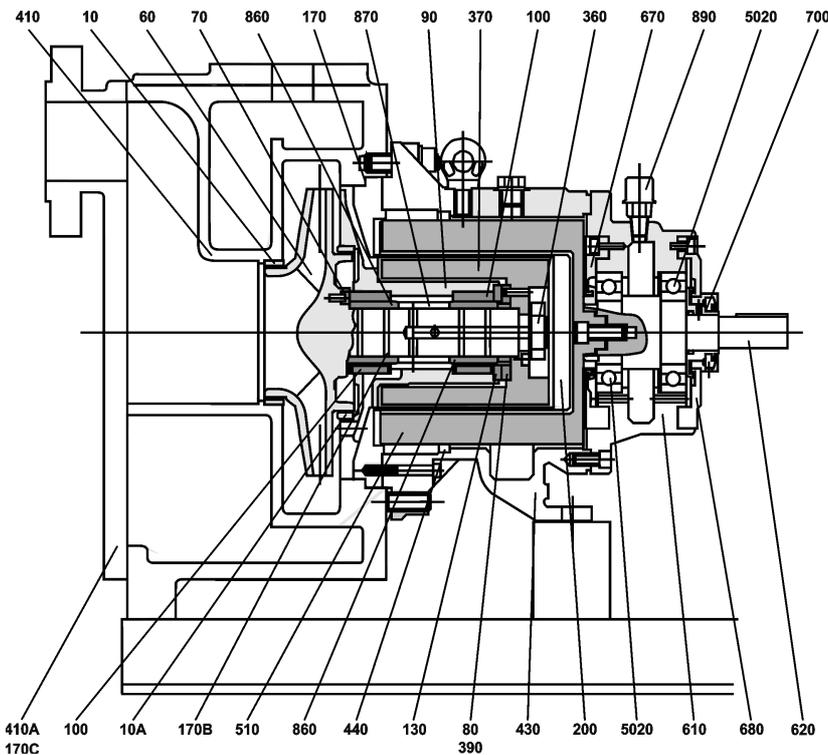
Key Design Features

- **No seals:** To minimise maintenance, all of the associated costs and eliminate potential leaks.
- **Sealless design:** For total containment, essential for hazardous, aggressive or valuable product.
- **Interchangeability of components:** For maximum convenience and reduced stock holding, operator training etc.
- **High efficiency wet end:** To benefit maximum flow / head coverage.
- **Wide choice of materials:** To allow a choice of various metals in the construction of your pump.
- **Casing gasket fully confined:** So eliminating risk of blowout.
- **Universal connection options:** So that suction and discharge flange connections can be configured to your exact requirements.
- **Modular rotating element cartridge:** Providing the most efficient way to perform replacements and manage your spare part inventory.

Benefits of SPGS pump range

- Self-priming capability to ensure the safe transfer of liquid.
- Increased efficiency liquid ends for lower running costs.
- Many compatible spares with other GS range pumps.
- Ease of installation and on-site maintainability.

Construction of SPGS range



10	Neck Ring (Front)	Stainless Steel
10A	Neck Ring (Back)	Stainless Steel
50	Coupling Washer	Stainless Steel
60	Impeller	Stainless Steel
70	Front Thrust Washer	Alpha SiC
80	Back Thrust Washer	Alpha SiC
90	Bush Holder	Stainless Steel
100	Bush	Alpha SiC
130	Thrust Pad	Alpha SiC
170	Gasket (Shroud)	CSF/PTFE
170B	'O' Ring	Viton A
170C	Casing Cover Gasket	CSF/PTFE
200	Containment Shroud/Shell	Alloy C & SS
360	Coupling Nut	Stainless Steel
370	Inner Magnet Ring	Stainless Steel
390	Support Gasket	Exfoliated Graphite & Ni
410	Casing	Stainless Steel
410A	Casing Cover	Stainless Steel
430	Coupling Housing	SG Iron
440	Bump Ring	Phosphor Bronze
510	Outer Magnet Ring	Carbon Steel
610	Bearing Housing	SG Iron
620	Drive Shaft	Carbon Steel
670	Front Cap	Carbon Steel
680	Back Cap	Carbon Steel
700	Labyrinth Seal (Kit)	Brass
860	Shaft Sleeve	Alpha SiC
870	Shaft Sleeve Spacer	Stainless Steel
890	Breather	Stainless Steel
5020	Race	Steel

Flanges and Connections

Casing

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

ANSI B16.5 Class 150 Machined with 1.5mm (0.06") high raised face having a continuous spiral groove.

BS 4505 DIN 2543 PN 16 with 2mm (0.08") high raised face having a continuous spiral groove.

Discharge flanges are supplied with studed connections.

Flange Loadings

Allowable flange loadings imposed by pipework are in accordance with Table 4 of API 685 2nd edition and exceed the values in ISO 5199 Annex C.

Drain Connections

The following drain options are available:

Standard: 1/2" BSP plug.

Option 1: No drain

Option 2: 1/2" NPT plug.

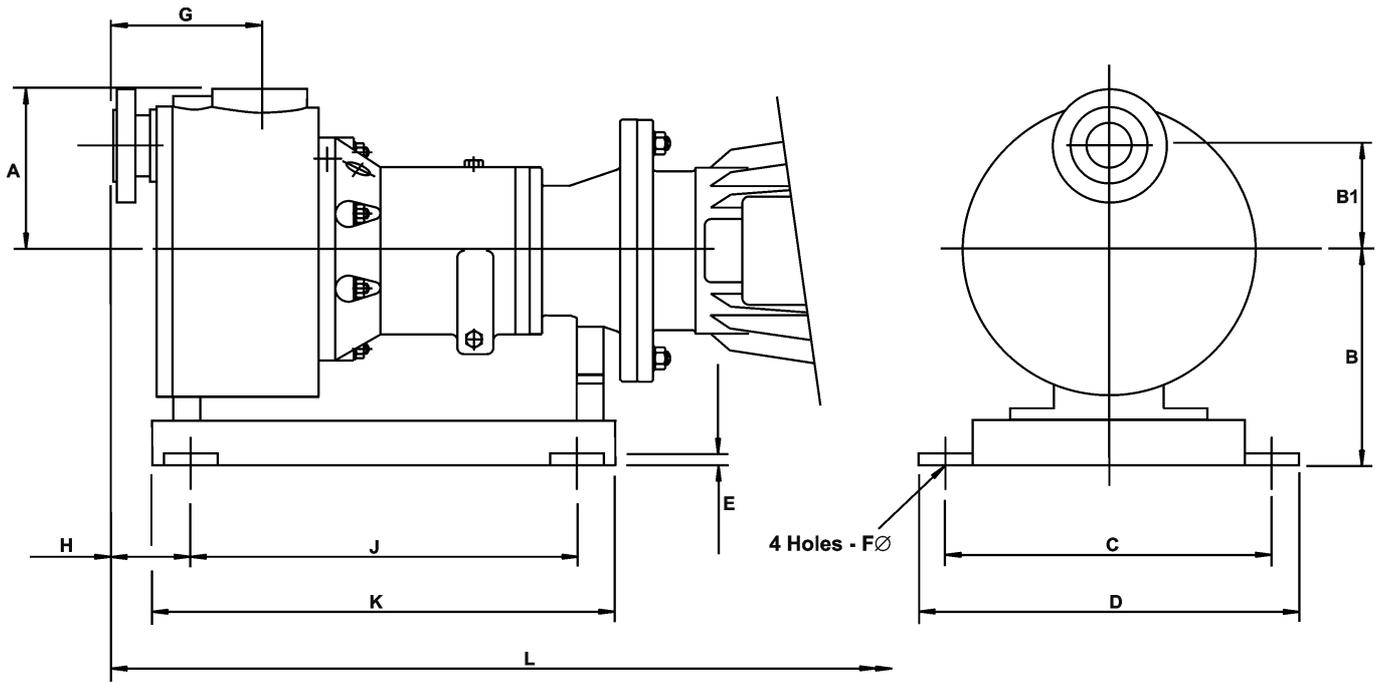
Option 3: 1/2" flanged drain rated to the casing flanges.

Gauge Connections:

No provision for gauge connection bosses has been made on this range.

Dimensions of SPGS range

Dimensions are for guidance only



Pump size	A	B	B1	C	D	E	F	G	H	J	K	Motor Frame	L
1.5x1x6H	220/8.66"	312/12.28"	131/5.16"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	100/3.93"	440/17.32"	500/19.7"	80-90	143/33.2"
1.5x1x8	245/9.65"	340/13.38"	156/6.14"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	100/3.93"	440/17.32"	500/19.7"	100-112	909/35.8"
3x1.5x6H	220/8.66"	312/12.28"	112.5/4.43"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	108/4.28"	440/17.32"	500/19.7"	132	1015/40"
3x1.5x8H	245/9.65"	340/13.38"	135/5.3"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	108/4.28"	440/17.32"	500/19.7"	160	1150/45.3"
												180	1210/47.6"
50-32-160H	220/8.66"	312/12.28"	131/5.16"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	100/3.93"	440/17.32"	500/19.7"	143-145	841/33.1"
50-35-200	245/9.65"	340/13.38"	156/6.14"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	100/3.93"	440/17.32"	500/19.7"	182-184	934/36.8"
65-50-160H	220/8.66"	312/12.28"	112.5/4.43"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	108/4.28"	440/17.32"	500/19.7"	213-215	1031/40.6"
65-40-200H	245/9.65"	340/13.38"	135/5.3"	350/13.78"	400/15.75"	12/0.5"	14/0.55"	238/9.4"	108/4.28"	440/17.32"	500/19.7"	254-256	1145/45.1"

Dimensions shown are metric (mm) / imperial (inches).

Range capabilities

Model	Head	Flow	Design Temperature	Design Pressure	Viscosity cSt	Mounting
SPGS 0	37 m 121 ft	14 m ³ /h 62 USgpm	-40 to 120°C -40 to 250°F	10 bar 145 psi	200	Close Coupled (CC) or Separate Mounted (SM)
SPGS I	52 m 170 ft	25 m ³ /h 110 USgpm	-40 to 120°C -40 to 250°F	10 bar 145 psi	200	Close Coupled (CC) or Separate Mounted (SM)

Pressure Limits

All parts are to be rated to the pressures shown below at 38°C / 100°F

Flange standard	Design pressure		
	316 St St	Alloy 20	Alloy C
ANSI B16.5 Class 150	1.0 MPa 145 psi	1.0 MPa 145 psi	1.0 MPa 145 psi
BS 4504 PN16	1.0 MPa 145 psi	1.0 MPa 145 psi	1.0 MPa 145 psi
DIN 2543	1.0 MPa 145 psi	1.0 MPa 145 psi	1.0 MPa 145 psi

Component	Hydrostatic test values		
	316 St St	Alloy 20	Alloy C
Casing (ANSI 150 lb)	1.5 MPa 218 psi	1.5 MPa 218 psi	1.5 MPa 218 psi
Casing (PN16)	1.5 MPa 218 psi	1.5 MPa 218 psi	1.5 MPa 218 psi
Containment Shroud/Shell	2.93 MPa 425 psi	2.41 MPa 350 psi	3.1 MPa 450 psi

Temperature limits

Standard Range -40°C to 120°C / -40°F to 250°F

Self Priming Operation

In general, centrifugal pumps and their suction pipework have to be filled with liquid prior to starting up (i.e. primed). Self priming pumps are capable of priming their suction pipework themselves.

The priming cycle begins with an initial charge of liquid to the large priming chamber (casing) via the filling port, allowing the pipework to remain in situ. The casing design allows a large volume of liquid to remain in the casing for repriming in the event that the suction and discharge lines drain back to source. On start up the initial charge of liquid that fills the internal volute is expelled into the casing discharge reservoir by the centrifugal action of the impeller. Simultaneously, a lower pressure is formed in the suction allowing in air from the suction line. Air is drawn into the casing by a combination of the low pressure in the suction and the atmospheric pressure acting on the liquid in the open tank.

The priming action is a process by which air from the suction line is drawn into the lower pressure impeller eye and is mixed with liquid from the casing discharge reservoir which has recirculated through the lower inner volute. The liquid/air mixture is rotated inside the inner volute and is selectively discharged through the top inner volute by the centrifugal action of the impeller and the variation in specific gravities of the air and liquid. Additionally, the mixture of air and liquid collides with an air separation plate as it leaves the inner volute, causing the separation of air to be accelerated. The liquid passes over the plate in the lower portion of the casing from where it returns to the impeller. The air passes into the casing discharge reservoir which, by providing a relatively large free liquid surface, allows a reduction in velocity which further assists the separation and venting of the air out of the casing discharge.

As the liquid in the casing is circulating, the pressure remains low in the suction and air continues to be drawn from the suction pipework. The liquid rises in the suction pipe and, once all the air is evacuated, fills the pump which then runs like any other centrifugal pump. If a pocket of air exists in the suction pipework and the pump loses prime, it will fully recover and reprime to continue pumping.

Suction lifts in excess of 5 metres are achievable in less than 1 minute.

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