

## Technical Profile

### GSA/GSI frame I

Magnet drive end suction centrifugal pumps  
to ASME B73.3 / ISO 2858 / DIN. EN 22858:1993

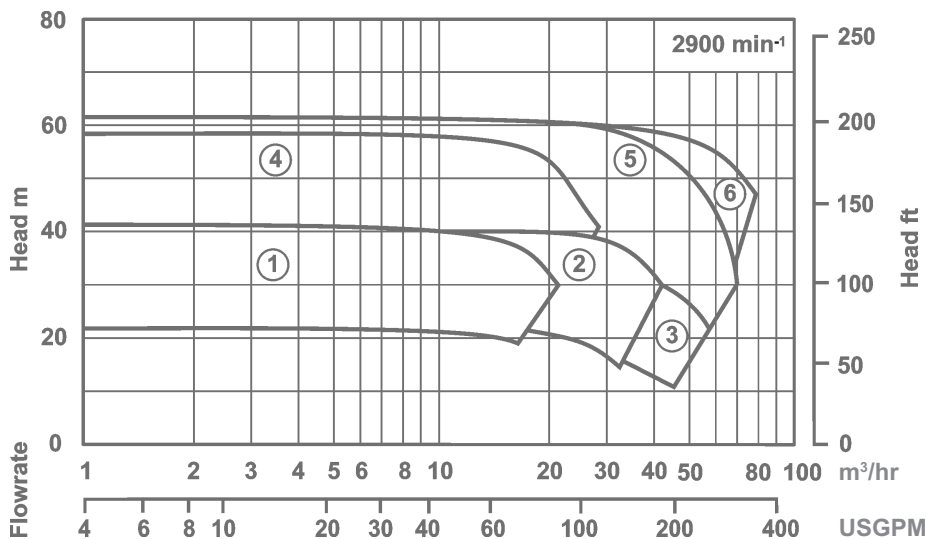
A versatile range of general service pumps designed to cover a wide duty and application base using the minimum of pump models by maximizing interchangeability of components. Available within the range is the GSA (ASME standard pump) and the GSI (ISO DIN standard pump). A GSL option is available for temperatures down to  $-150^{\circ}\text{F}$  /  $-100^{\circ}\text{C}$ .

The GSA (ASME) and GSI (ISO) product covers a hydraulic range that is split between three frame sizes, Frames 0, I, & II. The pumps are offered with a range of Synchronous Magnet Drives rated to match prime mover performance, hence specifications of all denominations can be catered for.

This range is based on sizes conforming to ASME & ISO performance and dimensional standards.

The standard materials of construction are Stainless Steel with silicon carbide internal bearings.

### Performance of the GSA/GSI frame I pumps



### Pump model

Reference	GSA	GSI
1	1.5 x 1 x 6H*	50-32-160H
2	3 x 1.5 x 6H	65-50-160H
3	3 x 2 x 6	80-65-160

Reference	GSA	GSI
4	1.5 x 1 x 8*	50-32-200
5	3 x 1.5 x 8H*	65-40-200H
6	–	80-50-200

\* Includes low flow hydraulic options

### HMD Kontro



#### Design range limits

The GSA/GSI pump is designed to operate from  $-40^{\circ}\text{F}$  up to  $500^{\circ}\text{F}$  /  $-40^{\circ}\text{C}$  up to  $260^{\circ}\text{C}$  without the need for any ancillary cooling medium. Design working pressure is 275 psi / 18.9 bar.

#### Solids handling

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

#### Options

##### Materials of construction

Wetted parts	Alloy 20, Alloy C, Alloy B
Internal bearings	SiC / Carbon
Gaskets	PTFE / Graphite

##### Other options

Casing drains flanged or screwed  
Jacketed pump casing  
Coupling housing drain  
Large range of pump protection

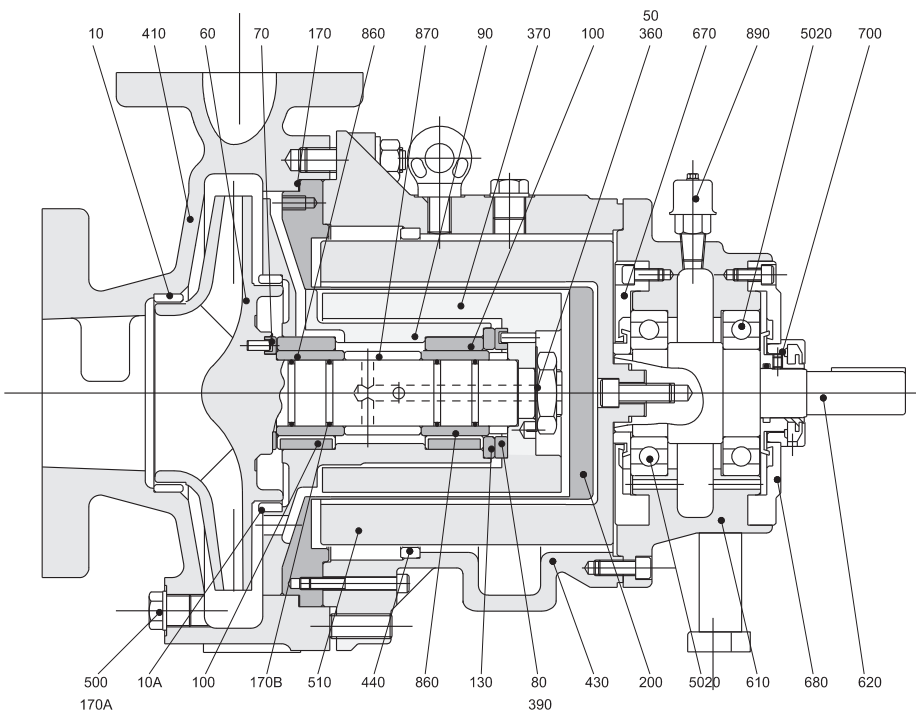
## Key Design Features

- **No seals:** To minimize 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 metallurgy to suit the application requirements.
- **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 GSA/GSI Pump Range:

- Sealless design for total product containment.
- Ideal for hazardous, toxic, aggressive, hot and valuable product.
- Conforms to ASME and ISO standards.
- Modular high efficiency wet ends.
- Designed to ensure maximum flow/head coverage across all ranges.
- Choice of various metallic materials of construction.
- One fully confined casing / containment shroud / shell joint.

## Construction of GSA/GSI frame I pumps



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 [Casing]	CSF / PTFE
170A	Gasket [Drain]	CSF / PTFE
170B	O' Ring	Viton A / PFR
200	Containment Shroud/Shell	Alloy C & SS
360	Coupling Nut	Stainless Steel
370	Inner Magnet Ring	Stainless Steel
390	Support Gasket	Exfoliated Graphite & SS
410	Casing	Stainless Steel
430	Coupling Housing	SG Iron
440	Bump Ring	Phosphor Bronze
500	Drain Plug	Stainless Steel
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
870	Shaft Sleeve Spacer	Stainless Steel
860	Shaft Sleeve	Alpha SiC
890	Breather	Stainless Steel
5020	Race	Steel
****	Fixings [Kit]	Various

## Flanges and Connections

### Casing

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

**ASME B16.5 Class 150 + 300** Machined with 0.06" (1.5mm) high raised face having a continuous spiral groove.

**DIN 2543/2545 PN16 + PN40** Machined with a 2mm high raised face with a continuous spiral groove. (Note: these flanges are identical to BS4504 PN40.)

### Flange Loadings

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

### Drain Connections

The following drain options are available:

**Standard:**  $\frac{3}{8}$ " BSP drain plug fitted with fully trapped gaskets.

**Option 1:** No drain, boss left undrilled.

**Option 2:**  $\frac{1}{2}$ " NPT plug.

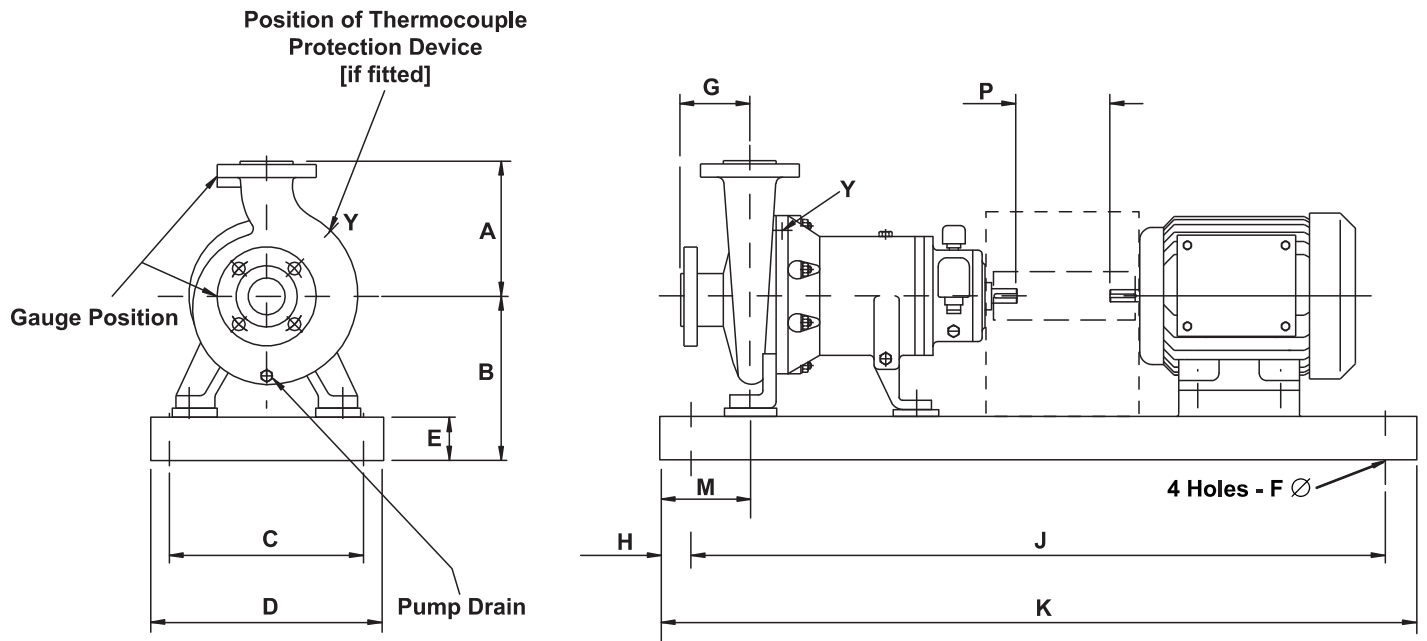
**Option 3:**  $\frac{1}{2}$ " flanged drain rated to the casing flanges.

### Gauge Connections:

Suction and discharge flanges are fitted with bosses for drilling/tapping:  $\frac{3}{8}$ " NPT

# Dimensions of GSA/GSI frame I

Dimensions are for guidance only



## GSA frame I

Dimension P is 1" / 25.4mm for non-spacer type coupling and 4" / 101.6mm for spacer type

Pump size	A	C	D	E	F	G	H	M	Motor Frame	J	K	B
1.5x1x6H*	6.5"/165	9"/229	12"/305	3.5"/89	0.75"/19	4"/101.6	1.25"/31.75	4.5"/119.4	90-100	36.5"/927	39"/990	9"/229
3x1.5x6H	6.5"/165	9"/229	12"/305	3.5"/89	0.75"/19	4"/101.6	1.25"/31.75	4.5"/119.4	112-132	36.5"/927	39"/990	9"/229
3x2x6	6.5"/165	9"/229	12"/305	3.5"/89	0.75"/19	4"/101.6	1.25"/31.75	4.5"/119.4	160-180	49.5"/1258	52"/1321	11"/280
1.5x1x8*	6.5"/165	9"/229	12"/305	3.5"/89	0.75"/19	4"/101.6	1.25"/31.75	4.5"/119.4	182-184	36.5"/927	39"/990	8.4"/214
3x1.5x8H*	6.5"/165	9"/229	12"/305	3.5"/89	0.75"/19	4"/101.6	1.25"/31.75	4.5"/119.4	213-215	49.5"/1258	52"/1321	9.8"/248
									254-256	49.5"/1258	52"/1321	10.5"/267
									284-286	49.5"/1258	52"/1321	10.5"/267
									324-326	55.5"/1410	58"/1473	11.5"/293

\* Includes low flow hydraulic options.

## GSI frame I

Pump size	A	G	M	Motor Frame	B	C	D	E	F	H	J	K
50-32-160H	6.3"/160	3.1"/80	2.4"/60	90-100-112	9.9"/252	13.8"/350	15.3"/390	3.5"/90	0.75"/19	5.9"/150	23.6"/600	35.4"/900
50-32-200	7.1"/180	3.1"/80	2.4"/60	132-160-/180	10.4"/265	17.3"/440	19.3"/490	4"/102	1"/24	7.5"/190	29.1"/740	44.1"/1120
65-50-160H	6.3"/160	3.1"/80	2.4"/60									
65-40-200	7.1"/180	3.9"/100	2.4"/60									
80-65-160	7.1"/180	3.9"/100	2.4"/60									
80-50-200	7.9"/200	3.9"/100	2.4"/60									

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

## Range capabilities

Model	Head	Flow	Design Temperature	Design Pressure	Viscosity cSt	Mounting
GSA 1	200 ft 61 m	308 USgpm 70 m <sup>3</sup> /h	-40 to 500°F (315°F*) -40 to 260°C (315°C*)	275 psi 18.9 bar	200	Close Coupled (CC) Separate Mounted (SM)
GSI 1	200 ft 61 m	343 USgpm 78 m <sup>3</sup> /h	-40 to 500°F -40 to 260°C	232 psi 16 bar	200	Close Coupled (CC) Separate Mounted (SM)

\* High temperature build option.

## Pressure Limits

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

Flange standard	Design pressure		
	316 St St	Alloy 20	Alloy C
ASME B16.5 Class 150 + 300	1.89 MPa 275 psi	1.59 MPa 230 psi	2.0 MPa 290 psi
DIN 2543 PN16 + PN40	1.6 MPa 232 psi	1.52 MPa 220 psi	1.6 MPa 232 psi

Component	Hydrostatic test values		
	316 St St	Alloy 20	Alloy C
Casing (ASME 150 + 300lb)	2.93 MPa 425 psi	2.41 MPa 350 psi	3.1 MPa 450 psi
Casing (PN16 + PN40)	2.4 MPa 348 psi	2.3 MPa 350 psi	2.4 MPa 348 psi
Containment Shroud /Shell	2.93 MPa 425 psi	2.41 MPa 350 psi	3.1 MPa 450 psi

## Temperature limits

Standard Range	-40°F to 300°F / -40°C to 150°C
Option 1	-40°F to 500°F / -40°C to 260°C
Option 2	-40°F to 600°F / -40°C to 315°C

For sub zero temperatures a suitable sealing compound (Loctite Multi Gasket or similar) is used to prevent the ingress of moisture into the coupling housing between the containment shroud/shell and motor adaptor assembly interface.

For Option 2 operational temperatures, thermal break and finned oil filled bearing assembly is utilized.

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