RHEINHÜTTE PUMPEN

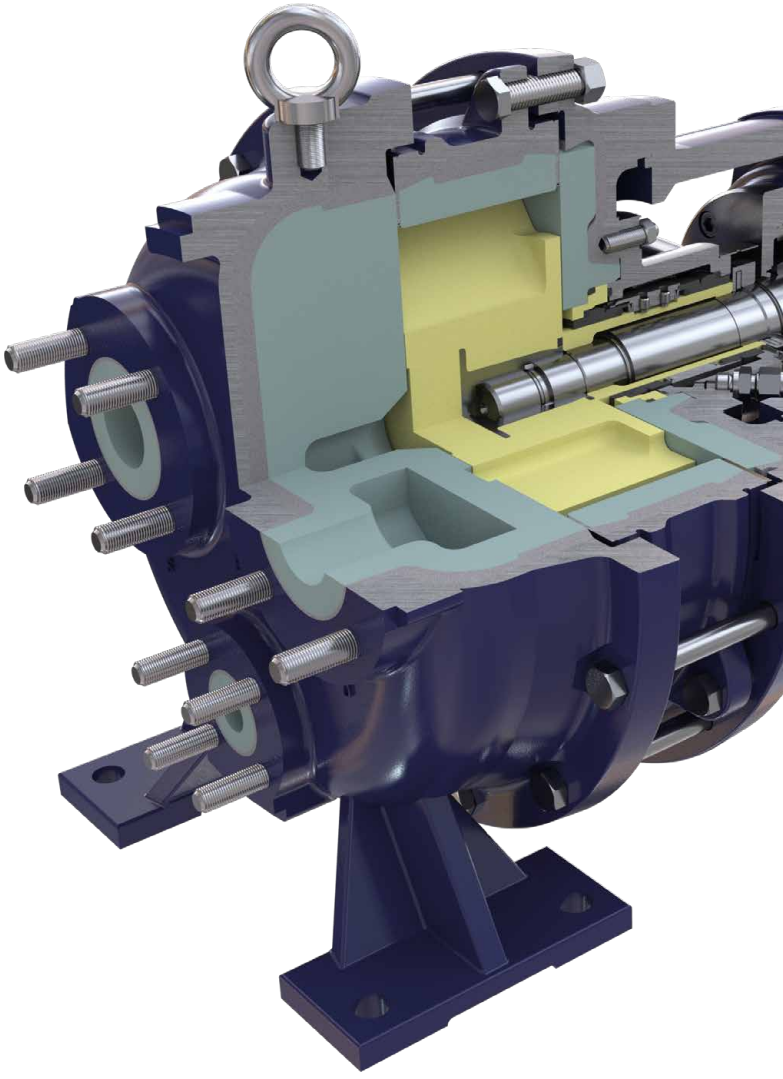
An ITT Brand

FGP

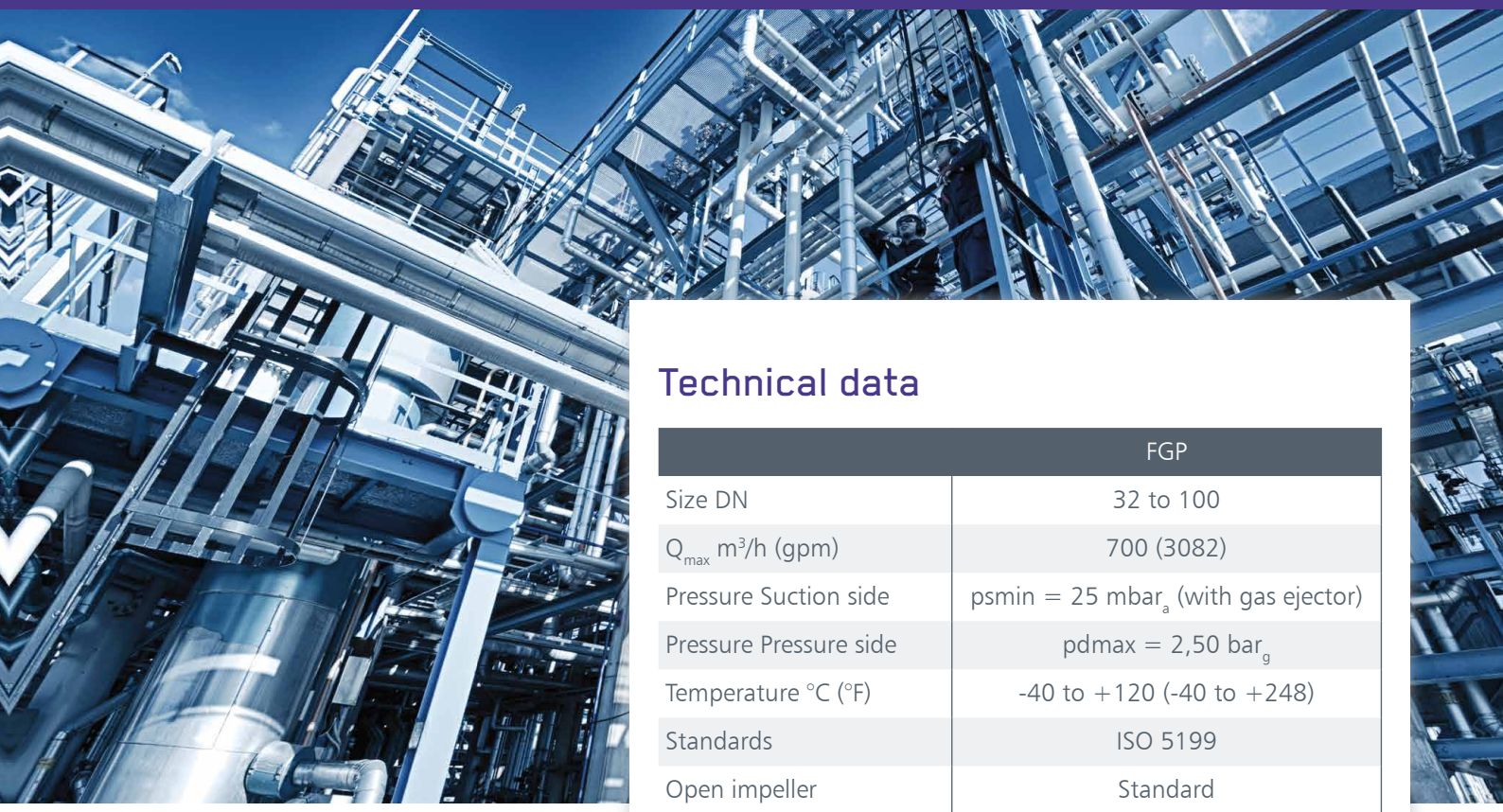
Horizontal liquid ring vacuum pump in ceramic

The FGP

Liquid ring pumpe



Our FGP liquid ring pump is the suitable partner for difficult evacuation and compression processes involving gases and vapours in all corrosion-critical areas of application in the chemical industry.
Manufactured from solid and gas-tight silicate ceramic FRIKORUND, the FGP is ideally suited to all media which contain i.e. chlorine or hydrogen chloride. The valveless working principle of the pump promises a high level of safety in critical, multi phase applications – with compression processes of ignitable gases and vapours up to explosion zone 1. Thanks to the individually selectable operating medium, completely oil-free, contamination-free and virtually isothermal pumping processes are possible. The double-acting mechanical seal which is employed as standard reliably protects the surrounding environment and the fluid medium itself.
Together with the freely selectable operating medium of the liquid ring, the FGP allows volume flows of up to 700 m^3/h. In compressor mode gas pressures of up to p2 max = 2.5 bar_g are easily created. In vacuum mode for aggressive media the pump produces suction pressures of p1 = 100 $mbar_a$ up to p1 = 25 $mbar_a$ with an additional gas ejector. And this all takes place at gas temperatures of up to 120 °C (+248 °F).



Technical data

	FGP
Size DN	32 to 100
Q_{max} m^3/h (gpm)	700 (3082)
Pressure Suction side	psmin = 25 $mbar_a$ (with gas ejector)
Pressure Pressure side	pdmax = 2,50 bar_g
Temperature °C (°F)	-40 to +120 (-40 to +248)
Standards	ISO 5199
Open impeller	Standard
Back pull out design	Standard
Seal	Mechanical seal

Design features

- Design: Horizontal, single-stage
- Bearing bracket:
  with adjustable bearing (gap adjustable from outside)
- Bearing lubrication: oil lubrication
- Installation versions: base plate or compact unit
- Ambient temperature: -20 °C to +60 °C (-4 °F to +140 °F)

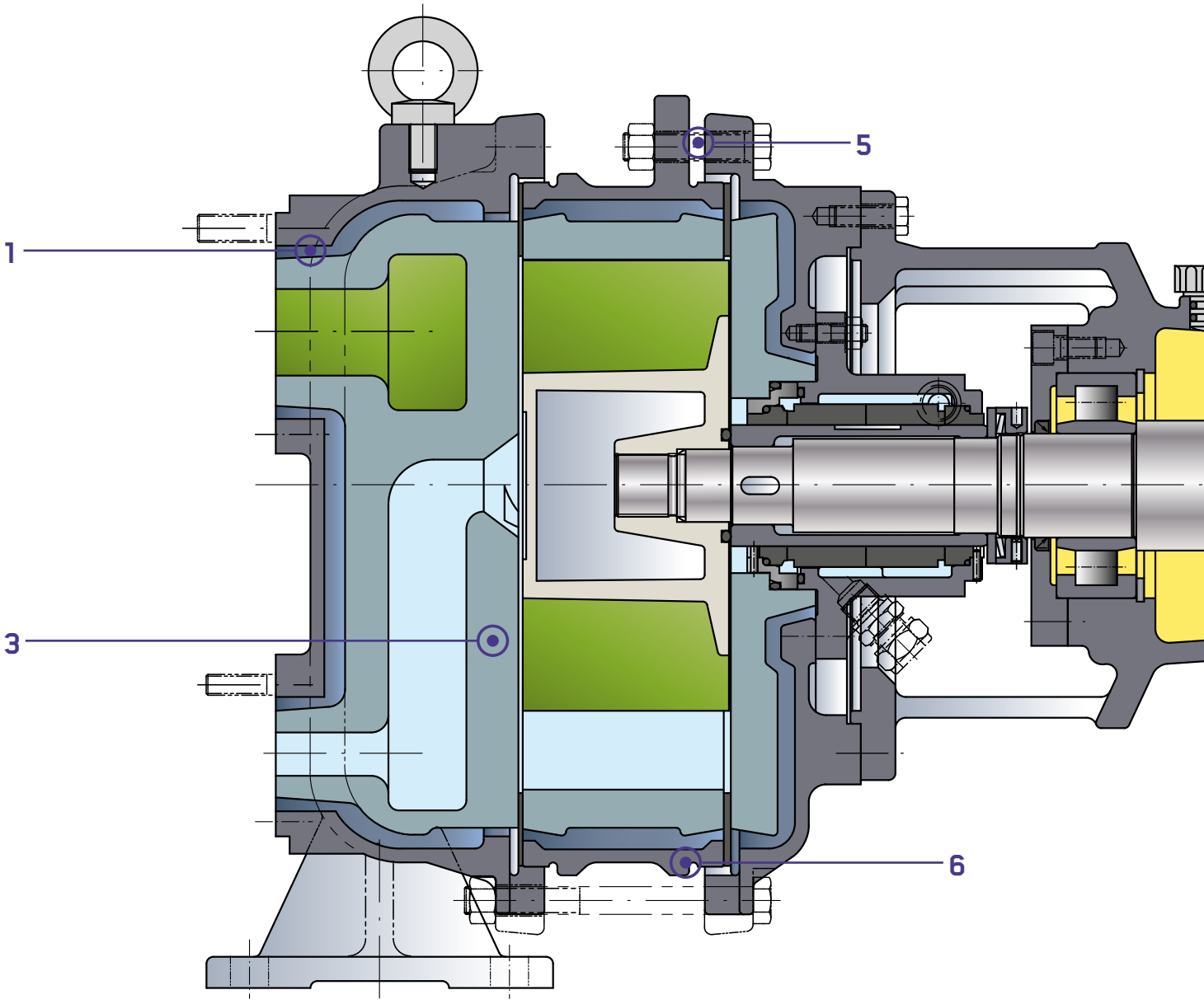
Applications

- Caustic gases
- Chemical industry
- Chloralkali electrolysis
- Chlorine gas
- Hydrochloric acid
- Titanium dioxide

Options

- Equipment health monitoring with i-Alert®3
- Drain of volute casing
- Various corrosion-resistant impeller materials such as ceramic, titanium, PTFE or Hastelloy
- Gas ejector made from various materials, each adapted to the medium
- Flange connections according to DIN (with adapter others possible)
- Delivery up to a fully wired compact unit with junction box
- Thermosyphon system
- Storage and priming tank
- Pump accessories

Main features

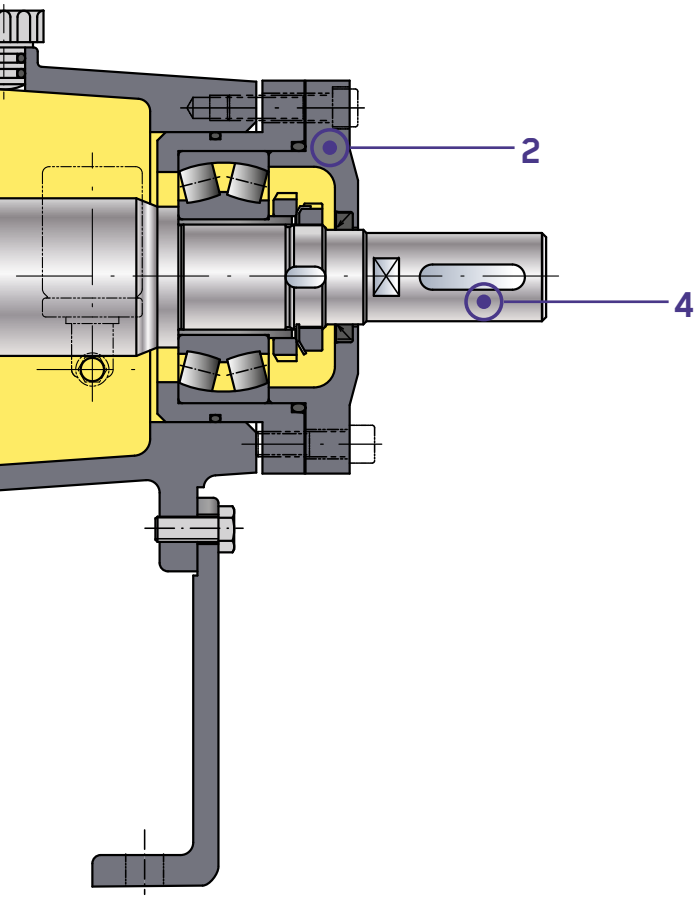


1 The FGP can accommodate and help to convey up to three times of the required quantity of liquid in multiphase operation. In order to protect the ceramic components from external influences and any forces, the ceramic is embedded in an armour made from spheroidal graphite cast iron.

2 Possible Adaptation for the service liquid to the gas which is to be pumped. The impeller gap can be adjusted from the outside to cater to individual pumping needs.

3 The isothermal compression process prevents overheating of the pumping medium. When the pump is at a standstill, an internal siphon holds some of the service medium back in the pump. Thus easy starting and stopping of the pump is possible. The pump is protected from running dry and is guaranteed to keep working under any operating conditions. During pump mode, there is no mechanical friction as there is only one moving part in the pump chamber. This ensures a high level of operation.

The drawings essentially correspond to the execution. We reserve the right to make design changes.



Ceramic material

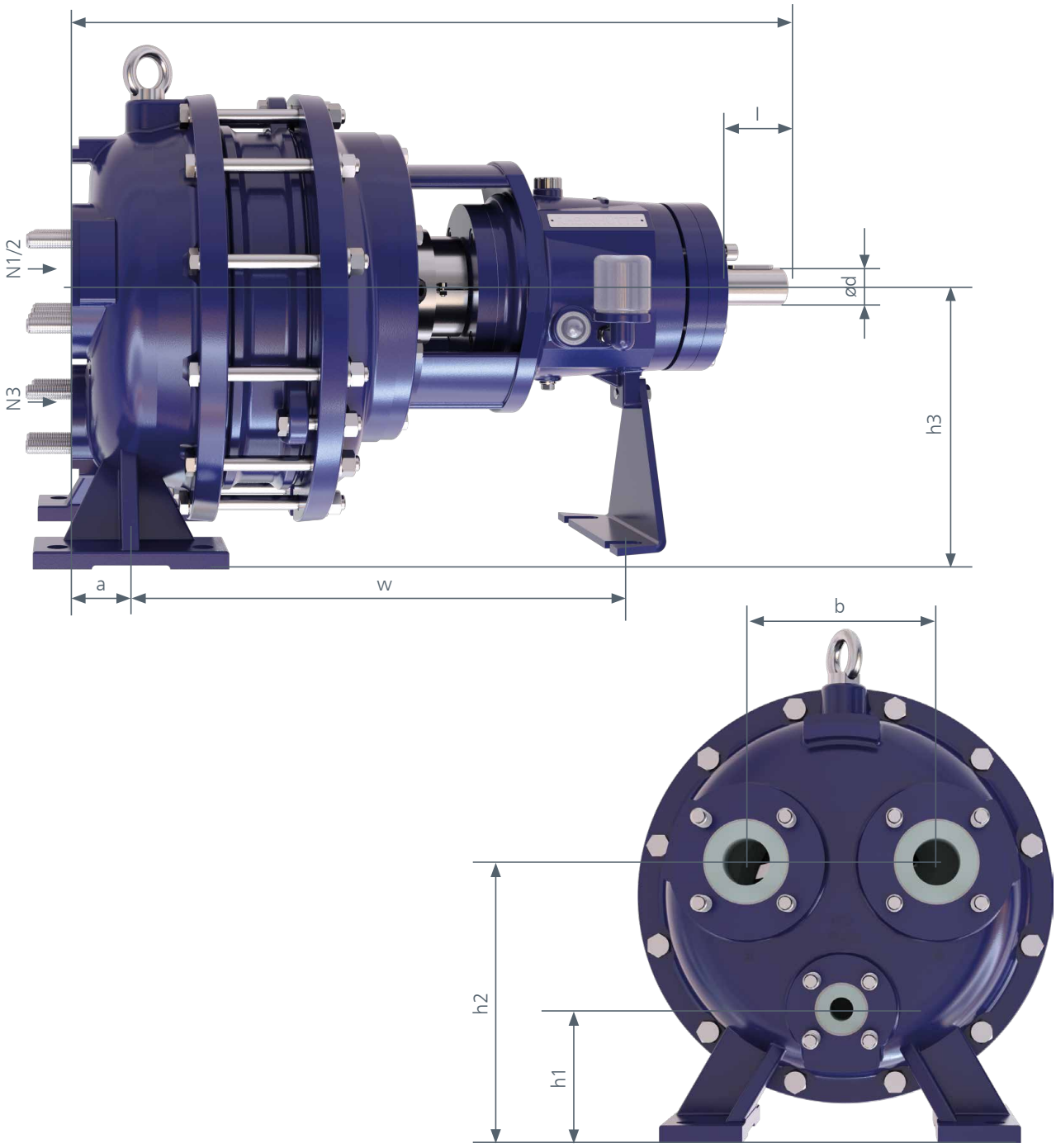
The technical ceramic FRIKORUND set in the pump area is a highly resistant material designed specifically for corrosive media and thus features a previously unattained level of resistance. Combined with different corrosion-resistant materials for the rotating components, the FGP represents one of the most durable and cheapest liquid ring pumps available in the market for corrosive media.

4 The free-floating impeller and the amply dimensioned shaft and bearing with oil lubrication guarantee an extremely long service life. The sealing by the liquid ring and no moving parts in the pump chamber enable the pump to operate without any wear. Increased rigidity of the shaft ensures a longer useful service life for the shaft seal.

5 In addition to speed control, the flow rate can also be adjusted through simple replacement of the impeller and intermediate piece – with fixed installation.

6 The back pull-out design enables the bearing bracket with impeller to be removed without taking apart the casing cover or the connected pipelines. The smart pump design enables a low amount of downtime for servicing.

Pumps & installation dimensions



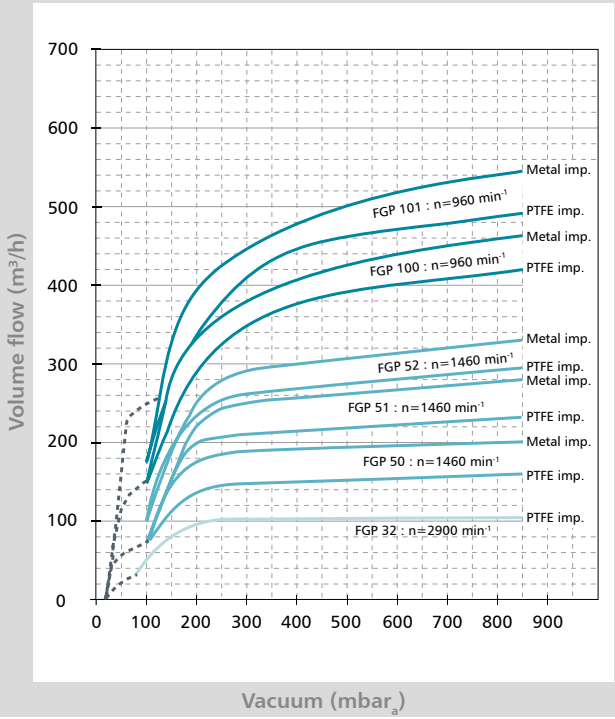
Size	BB	Pump dimensions						Base dimensions	Shaft end		Flange dimensions	
		a	b	L	h_1	h_2	h_3	w	ød	l	N1 / N2	N3
32	0	85	142	582	90	200	160	370	32	70	32	25
50	1	60	200	775	135	290	280	525	42	85	50	25
51	1	60	200	795	135	290	280	545	42	85	50	25
52	1	60	200	825	135	290	280	575	42	85	50	25
100	1	220	260	985	155	435	375	515	55	110	100	50
101	2	260	260	1025	155	435	375	515	55	110	100	50

BB = Bearing bracket N2 = Pressure flange

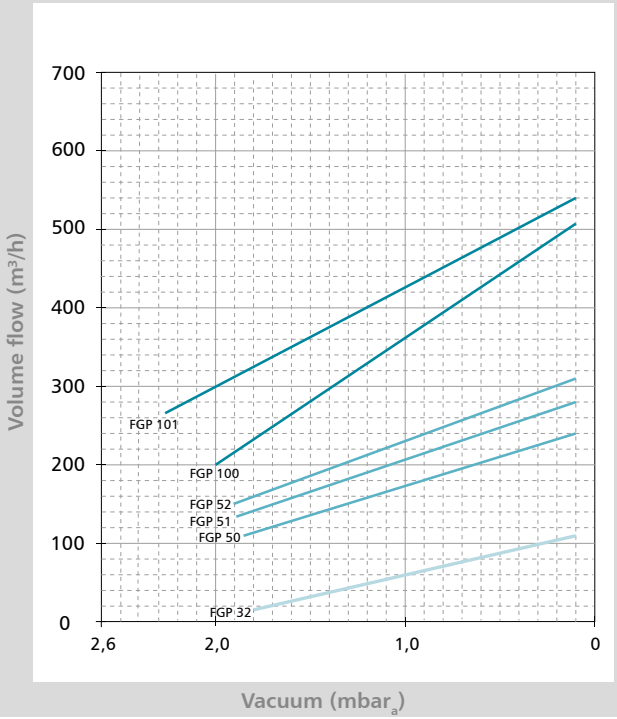
All dimensions are shown in millimetres.

Capacity ranges

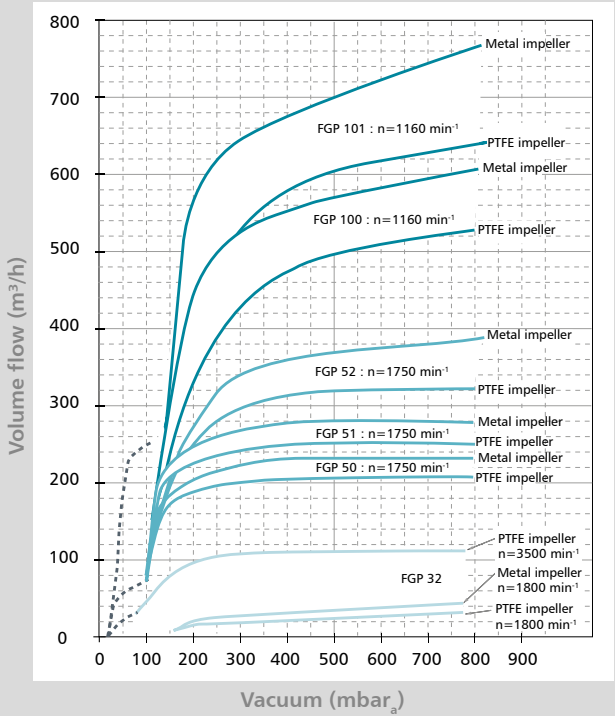
FGP - Vacuum : 50 Hz



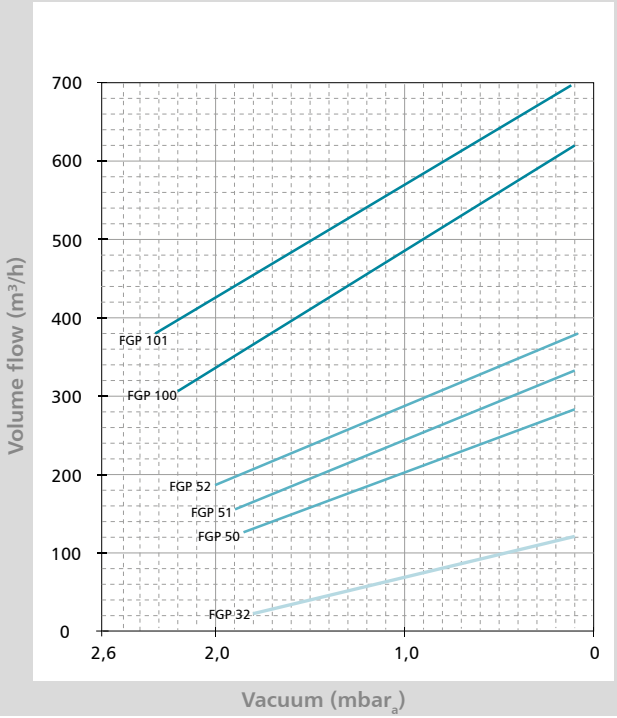
FGP - Compressor : 50 Hz



FGP - Vacuum : 60 Hz



FGP - Compressor : 60 Hz



The performance data correspond to the chemical standard DIN 28431.
In different conditions, the characteristic curves will change accordingly.
On request we will be pleased to review your requirements.

Bearing bracket with ventury jet impeller: 0 1 2

imp.

Compact units

In addition to the FGP liquid ring pump, we will provide you with all of the components connected to each another to ensure simple and safe operation of your pump – everything from one source. This space-saving compact design enables a simple installation and commissioning of the system.

Modular concept – Individually adjusted
Complete system with modular construction: All process components such as instrumentation, control fittings etc. are combined in a compact unit – specifically designed to meet the needs of each customer.
All components are completely piped up and installed on a common base frame.

One connection point for rapid implementation
We recommend full electrical cabling within the compact installation with a switching cabinet as a central transition junction to your plant.

One base frame – many functions
The base frame is used to accommodate all components and loads which are produced, as a lifting point for transportation and as a fixing point for the packaging. It is also designed to fit in your overall installation, as a support point for further fittings such as mounting brackets for incoming and outgoing pipelines, cable ducts for electrical cabling and much more.

Recovery of the operating medium
In our modular FGP unit condensates of gases or acids can be used as the service liquid without any corrosion effects. It is therefore generally necessary for the service liquid to be circulated in a closed circuit. The waste water is thus reduced to a minimum. The reuse of the service liquid thus helps to preserve the environment, as well as saving energy and costs.

The right combination
The modular FGP unit combines the know-how of the liquid ring pump with the process components required to ensure safe and smooth operation. Designed to meet your demands and assembled in a turnkey system. The product supplied extends here from a manually controlled system through to a fully automated compact installation.

Main features of the compact units

1. Base frame

For mounting all components and for easier transport.

2. Separator

The separator is one of the main constituents of the plant and is used to separate the liquid and gas phase. This means that the service liquid can be used in a closed circuit and the waste water can be reduced to a minimum. The separator is designed specifically for each application and is also available in different materials, e.g. graphite, rubber-coated steel, titanium or plastic.

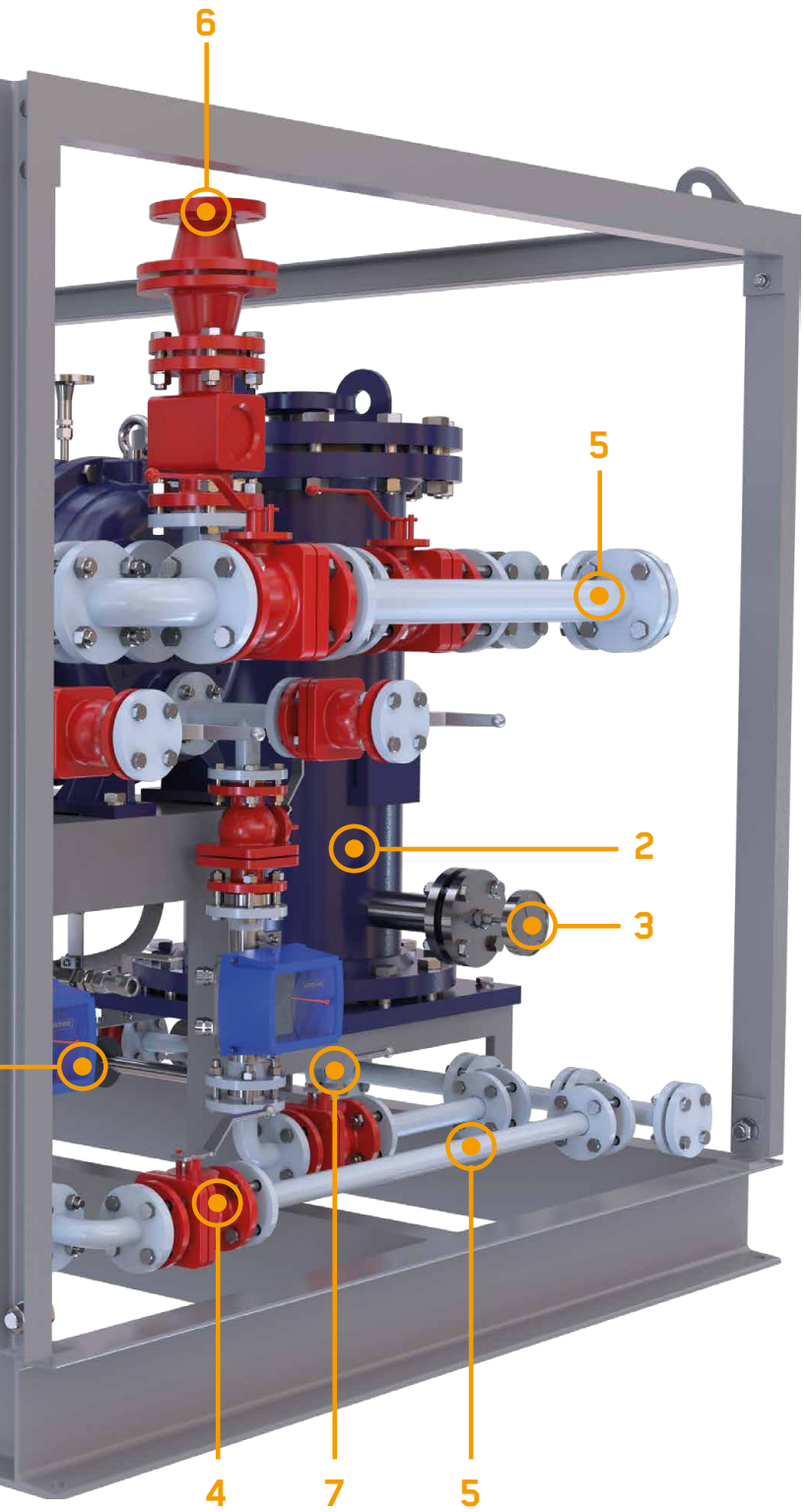
3. Heat exchanger

Made from titanium, graphite, PVDF or other special materials in different versions, e.g. with a cooling coil, panels, tube bundle. The heat exchanger is adapted to the pump, which means that on the corrosive side no further additional units such as a circulation pump are required.

4. Fittings / Valves

All fittings required for control and regulation purposes are activated either mechanically or with a drive system – which can be regulated on request.

Example unit:
Customer-specific design



5. Pipelines

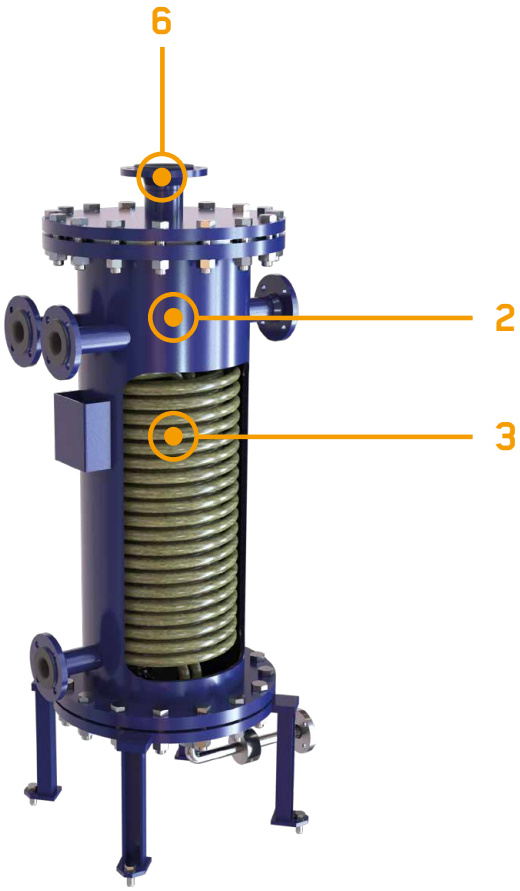
For all components, usually lined in PTFE, PVDF or other special materials, resistant to corrosive gases.

6. Connections

Extended to the edge of the base frame in order to enable simple and direct transfer to the overall plant.

7. Instruments

All instruments required for safe operation such as devices for measuring through-flow, pressure and temperature as well as the fill level are fitted, calibrated and wired into a terminal box on request.



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