GEAR PUMPS SF

COMPACT AND MODULAR PUMP FOR LOW TO HIGH VISCOSITY MEDIA

- Pulsation-free pumping delivery
- Clockwise or counter-clockwise rotation
- Low noise operation
- Easy to assemble and disassemble
- Several sealing types
- Electrical heating possible

THE VARIANTS OF THE FEED PUMP SF

Type SF

- Pulsation-free pumping delivery
- Clockwise or counter-clockwise rotation
- Compact design
- Easy to assemble and disassemble
- Several sealing types
- Electrical heating possible

Type SF ATEX

- Application in explosive locations acc. to EC-Directives 94/9/EC (ATEX 95)
- Area 1 + 21 with temperature control
- Area 2 + 22 with/without temperature control
- High degree of safety in potentially explosive atmospheres

Type SF...M with magnetic coupling

- Hermetically closed
- Even at high temperatures and with media difficult to seal
- Application acc. to ATEX possible

Type SFE with heating

- Electrically heated pump housing with temperature control and heated sealing chamber
- On request with pressure relief valve for both directions
- Operating temperature up to 250 °C
- Viscosity range 5 to 50,000 mm²/s

KEY DATA

- Feeding capacity 2 - 1,000 cm^3 / rotation
- Max. speed 1,800 min^{-1}
  (Higher speeds possible depending on application)
- Inlet pressure -0.4 to 10 bar
- Differential pressure up to 25 bar
- Viscosity range 5 to 50,000 mm^2/s
- Temperature range -40 °C to +250 °C

Depending on the application and varying according to the pump size. Please contact us - we will advise you!

APPLICATIONS

General machine construction, system engineering, chemical industry, dyestuff industry, filtration, foil manufacture, gear construction, engine construction, paper machines, marine engineering, engineering of lubricating systems, turbine construction, compressors, machine tools, cement systems and many more.

USE IN THE ATEX-RANGE

We deliver gear pumps according to **EC-Directives 94/9/EC (ATEX 95)**.

Area 1 + 21: devices that ensure a high level of security and are designed for use in atmospheres that are likely to be explosive. **Shaft seal with temperature control**. Area 2 + 22: devices that ensure a normal level of security and are designed for use in atmospheres that are rarely, and if so, only for a short time potentially explosive. **Shaft seal according to application with/ without temperature control.**

MAIN FEATURES

Gear pumps of the series SF are particularly suitable for the transport of media that do neither contain solids nor chemically attack the pump materials while ensuring a minimum lubricity.

The standard version is delivered with rotation „clockwise“. Simply turn the pump housing by 180° which - even retroactively – allows a changing of the rotational direction. This also changes the direction of the flow.

Upon request we supply the pumps with an adjustable pressure relief valve built in the housing for short-term protection against pressure spikes.

In addition to the direct installation of the pumps the execution of the mounting flange and shaft end also permits many variations of the aggregate assembly.

The optimum integration with minimal tolerances of the pinions and gear wheels cause an extremely smooth running. The use of gear wheels with 12 teeth reduces the delivery flow pulsation. This is an important contribution to noise reduction.

The shaft journals are mounted in composite bearing bushings, which allow a high continuous duty, and ensure long service life.

To accommodate radial and axial forces all pump sizes can be equipped with an antifriction bearing at the driving end.

In supplement to the standard program, we offer a variety of special designs.

RANGE OF PUMPING LIQUIDS (EXTR.)

used oil • binding agent • bitumen • brake fluid • diesel oil printing inks • emulsions • colours • fats • transmission lubricant • glycol • resins • fuel oil • hydraulic oil • isocyanate • cocoa butter • cocoa mass • refrigeration oil glue • engine oil • paraffins • vegetable oil • polygycol oil • polyol • lubricating oil • cutting oil • heavy oil turbine oil • waxes • heat transfer oil • plasticizer oil drawing oil • and many more

STEIMEL DEVELOPS AND MANUFACTURES INDIVIDUAL PUMPS

The most modern software is used to design and develop the layout according to the individual application criteria of our customers.

In the process, the adaptation of our pumps to your equipment as well as the determination of the ideal operating points for the respective application is taken into consideration.

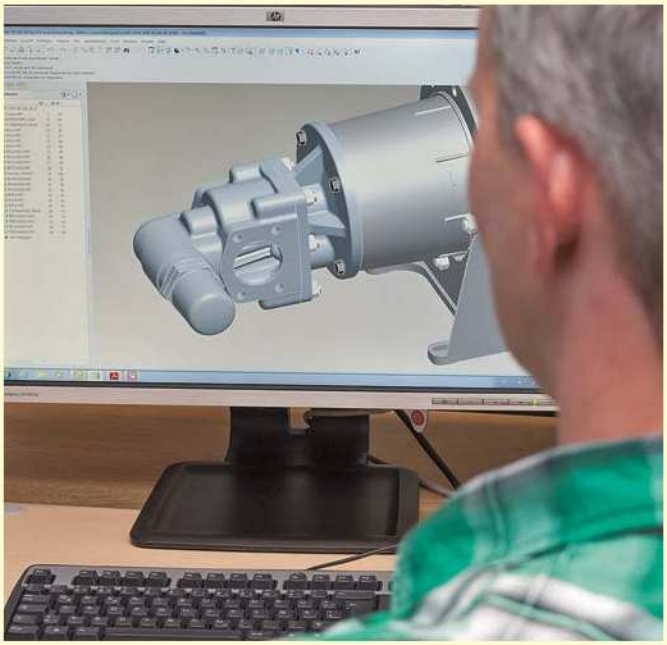
Our experienced engineers and technicians work with the aim of achieving a high efficiency in order to increase energy efficiency with a reduction of noise emission at the same time.

Thus, subjects, such as

- flow analysis and
- cavitation examinations

are assisted by a close co-operation with universities and institutes.

With respect to lifetime, we carry out tests on our test benches in the company, and alternatively we offer to carry out tests directly on your plant with your medium.



CLASSIFICATION OF VARIANTS

Construction types

SF	Standard design
D	Pressure relief valve (DBV)
F	Base
VL	Lantern according to VDMA
VLM	Lantern with motor according to VDMA
VLMF	Lantern w. motor and motor base acc. to VDMA
VLFM	Lantern w. base and motor acc. to VDMA

Shaft seals

R	Radial shaft seal (WDR)
G	Mechanical seal (GLRD)
P	Stuffing box packing
GGK	Double mechanical seal with support bearing and quench recipient
KR	Ball bearing with radial shaft seal
M	Magnetic coupling

ORDERING EXAMPLE

SF 4/63 RD-VLFM

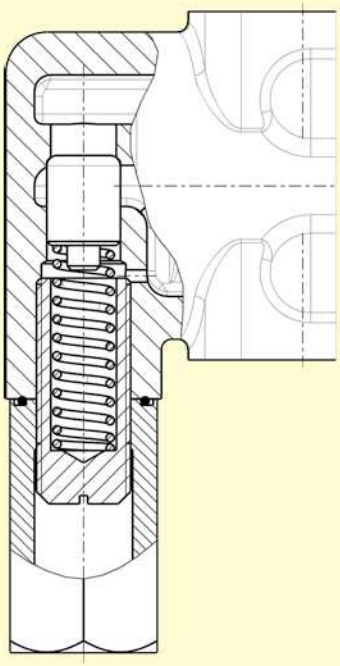
SF	Pump type
4	Size
63	Geometric displacement (cm^3)
R	Radial shaft seal
D	Pressure relief valve
VLF	Lantern with base
M	Drive motor

CONSTRUCTIONS

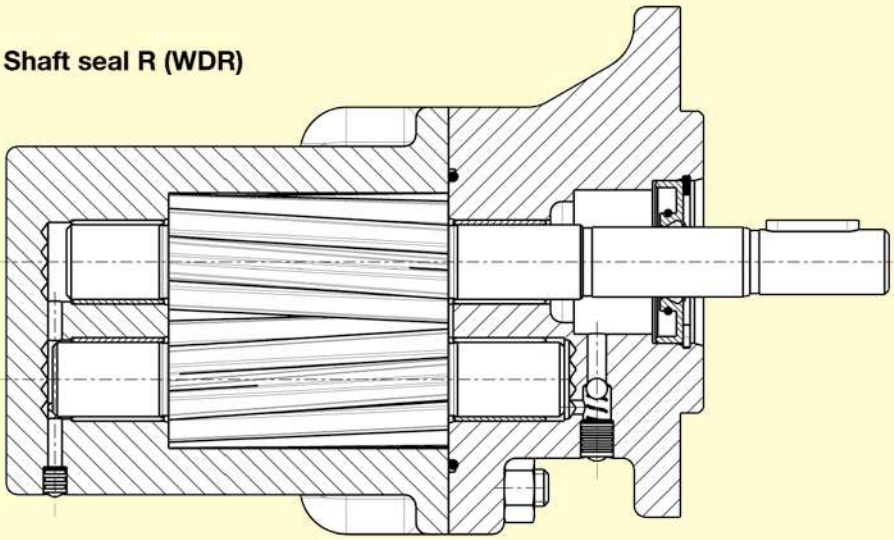
Casing parts:	Grey cast iron, optional Nodular iron or Cast steel
Pinion shafts (SF 2+3):	Case hardening steel Hardened, helical-toothed, Profile-grinded gear teeth
Shafts (SF 4-10):	Case hardening steel Hardened
Gear wheels (SF 4-10):	Nodular iron ionitrided, Helical-toothed
Bearings:	Composite slide bearings, Bronze
Shaft seal:	Radial shaft seal, Mechanical seal, Stuffing box packing or Magnetic coupling
Pump body seal:	O-Ring NBR (Perbunan®) O-Ring FKM (Viton®) O-Ring PTFE (Teflon®)
Other materials, seals and special designs on request.	

DETAILS IN SECTION

Optional pressure relief valve DBV

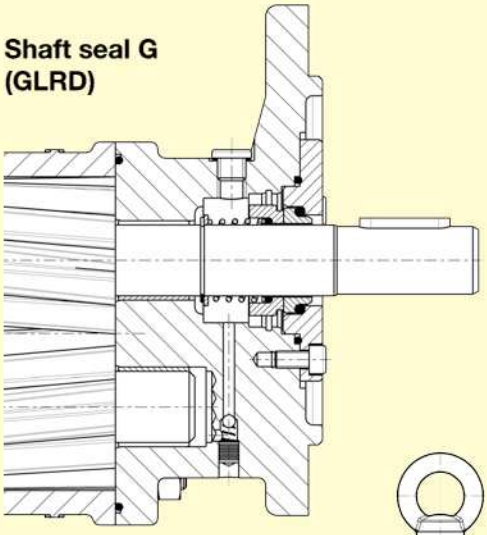


Shaft seal R (WDR)

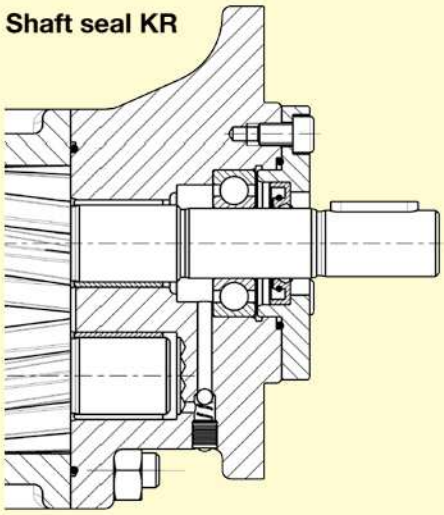


DETAILS IN SECTION

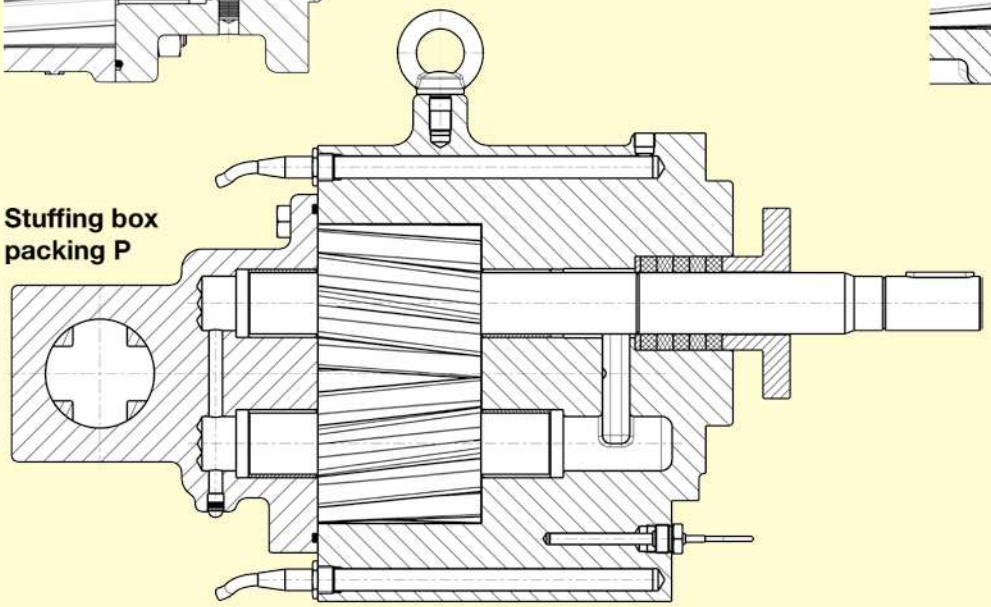
Shaft seal G
(GLRD)

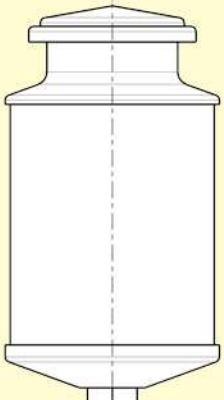


Shaft seal KR

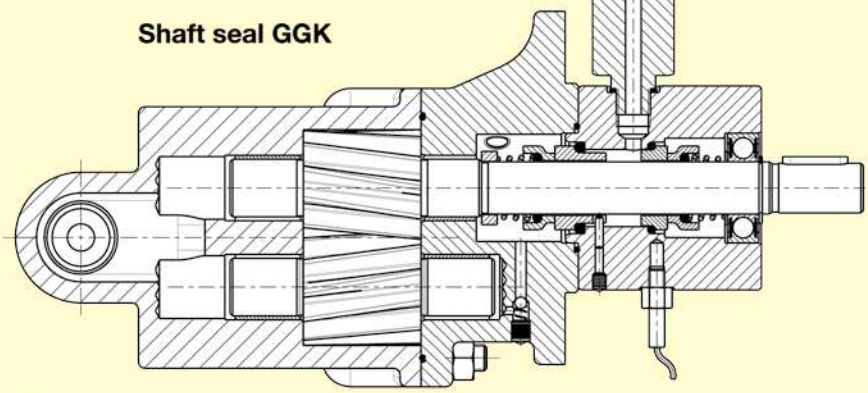


Stuffing box
packing P

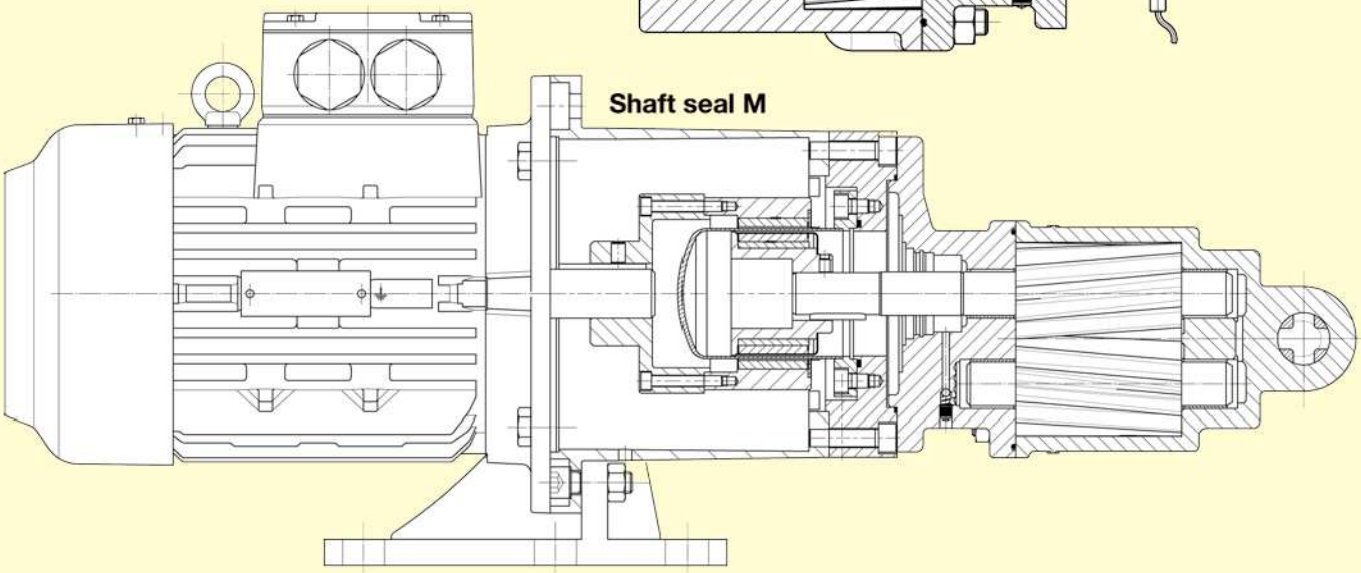




Shaft seal GGK

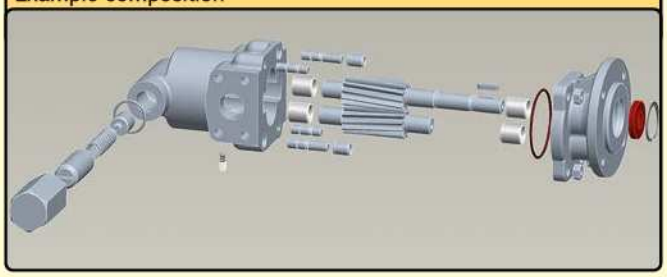


Shaft seal M



COMPONENTS OVERVIEW

Example composition



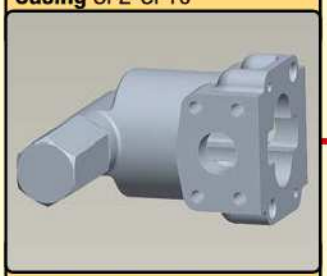
The parts of an SF pump presented in the components overview are to illustrate the variety of this type of pump.

For the sake of clarity, not all optional components are shown. Here we show the essential parts.

Gebr. Steimel is your partner for individual solutions. Talk to us without obligation if you are interested in a consultation on the standard components or even in a customized version besides the range shown here.

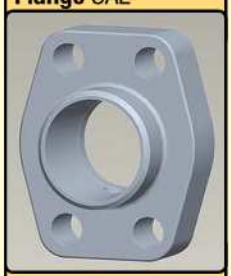
The marking of the ATEX-compliant assemblies made here is not sufficient for an aggregate compilation. ATEX units require advice.

Casing SF2-SF10



Standard design, with **DBV**

Flange SAE



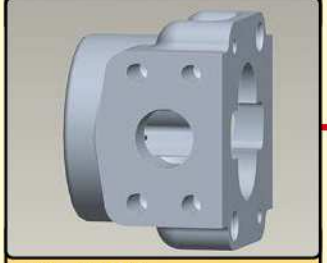
weld

Flange SAE

screw in

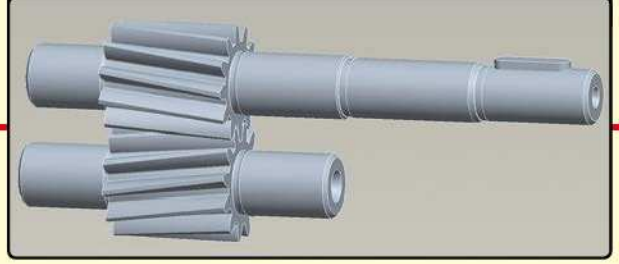
Cover

Casing SF2-SF10



without **DBV**

Rotating parts



Cover

Temperature control

Casing SFE

without **DBV**

Main structural components of the pump
Connection options at the pressure connection and suction port
Optional components

Casing SFE

with **DBV**

Recipient tank

QB500

Recipient tank

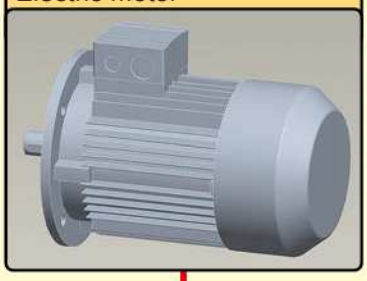
QB1000

Recipient tank

QBS1000

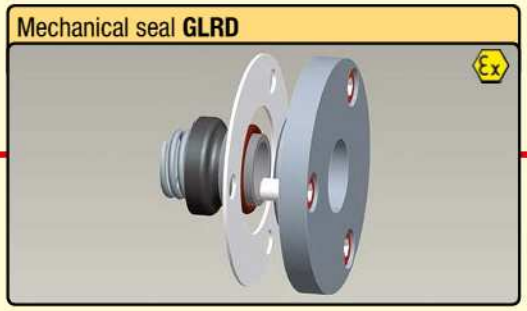
Radial shaft seal **WDR**

Electric motor

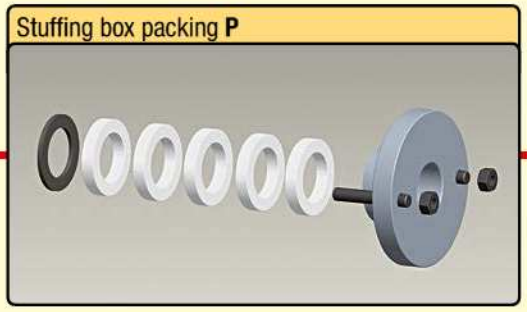


Electric motor acc. to ATEX

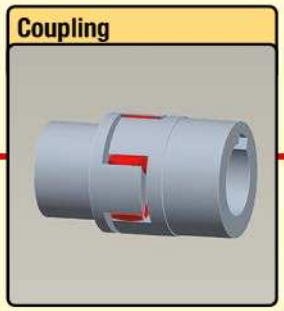
Mechanical seal **GLRD**



Stuffing box packing **P**



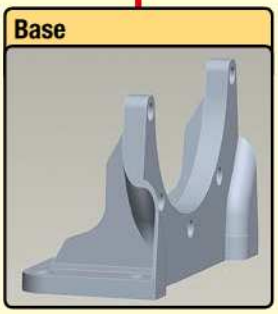
Coupling



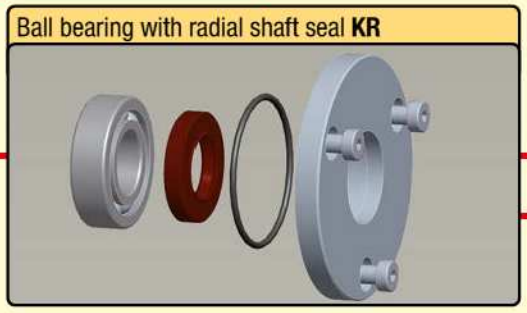
Lantern

Double mechanical seal **GGK**

Base

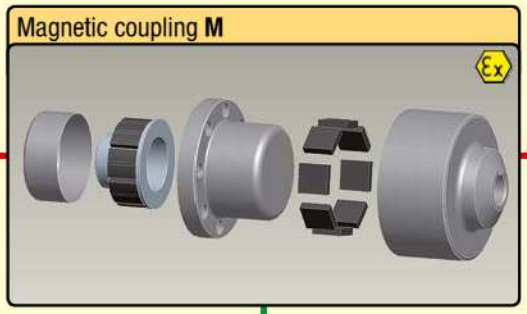


Ball bearing with radial shaft seal **KR**



External drive

Magnetic coupling **M**



PT100

FLOW RATES SF

Size	Pump rate	Pressure p (bar) at speed n = 1,450 min^{-1}										Pump rate cm³/U
	Rating	2	4	6	8	10	12	14	16	20	25	
SF 2/2	l/min	3.48	3.19	2.99	2.70	2.50						
	NkW	0.10	0.10	0.10	0.12	0.13						2
Motor [1]	kW	0.25	0.25	0.25	0.25	0.25						
SF 2/3	l/min	4.32	4.06	3.87	3.67	3.48						
	NkW	0.10	0.10	0.12	0.15	0.17						3
Motor [1]	kW	0.25	0.25	0.25	0.25	0.25						
SF 2/4	l/min	5.32	5.12	4.93	4.64	4.45	4.16	3.96	3.77			
	NkW	0.10	0.13	0.16	0.18	0.21	0.24	0.26	0.29			4
Motor [1]	kW	0.25	0.25	0.25	0.25	0.37	0.37	0.37	0.37			
SF 2/5	l/min	7.44	6.96	6.67	6.28	6.09	5.70	5.41	5.12	4.74		
	NkW	0.12	0.15	0.18	0.21	0.24	0.28	0.31	0.34	0.40		5
Motor [1]	kW	0.25	0.25	0.25	0.37	0.37	0.37	0.55	0.55	0.55		
SF 2/6	l/min	9.38	8.89	8.51	8.12	7.83	7.44	7.06	6.67	5.99		
	NkW	0.13	0.17	0.21	0.25	0.29	0.32	0.36	0.40	0.47		6
Motor [1]	kW	0.25	0.25	0.37	0.37	0.37	0.55	0.55	0.55	0.75		
SF 2/8	l/min	11.70	11.21	10.63	10.15	9.67	9.18	8.80	8.31	7.35	6.28	
	NkW	0.15	0.19	0.24	0.29	0.33	0.37	0.42	0.45	0.54	0.65	8
Motor [1]	kW	0.25	0.25	0.37	0.37	0.55	0.55	0.55	0.55	0.75	1.1	
SF 2/10	l/min	15.47	14.99	14.50	14.11	13.73	13.34	12.95	12.47	11.60	10.63	
	NkW	0.18	0.23	0.28	0.33	0.38	0.42	0.46	0.51	0.61	0.72	10
Motor [1]	kW	0.25	0.37	0.37	0.55	0.55	0.55	0.75	0.75	0.75	1.1	
SF 2/13	l/min	19.53	18.85	18.27	17.59	17.11	16.53	16.05	15.56	14.60	13.44	
	NkW	0.21	0.26	0.32	0.37	0.42	0.47	0.53	0.58	0.69	0.82	13
Motor [1]	kW	0.37	0.37	0.55	0.55	0.55	0.75	0.75	0.75	1.1	1.1	
SF 2/16	l/min	24.75	23.97	23.39	22.72	22.14	21.46	20.88	20.20	19.14	17.40	
	NkW	0.24	0.31	0.38	0.45	0.52	0.60	0.67	0.74	0.89	1.07	16
Motor [1]	kW	0.37	0.37	0.55	0.55	0.75	0.75	1.1	1.1	1.1	1.5	
SF 2/20	l/min	29.77	28.90	28.03	27.16	26.39	25.62	24.84	23.97	22.43	20.69	
	NkW	0.26	0.36	0.44	0.53	0.63	0.72	0.82	0.92	1.11	1.35	20
Motor [1]	kW	0.37	0.55	0.55	0.75	0.75	1.1	1.1	1.1	1.5	2.2	
SF 3/25	l/min	38.3	37.9	37.5	37.1	36.7	36.4	36.0	35.6	34.8	33.8	
	NkW	0.46	0.60	0.73	0.88	1.00	1.14	1.28	1.42	1.69	2.03	25
Motor [1]	kW	0.75	0.75	1.1	1.1	1.5	1.5	2.2	2.2	2.2	3	
SF 3/32	l/min	51.5	50.8	50.3	49.9	49.5	48.9	48.5	48.0	47.2	45.9	
	NkW	0.60	0.77	0.95	1.12	1.29	1.45	1.67	1.80	2.17	2.57	32
Motor [1]	kW	0.75	1.1	1.5	1.5	2.2	2.2	2.2	2.2	3	4	
SF 3/40	l/min	61.9	61.4	60.9	60.2	59.6	59.0	58.5	57.8	56.7	55.4	
	NkW	0.62	0.81	1.00	1.20	1.40	1.60	1.80	2.01	2.42	2.90	40
Motor [1]	kW	0.75	1.1	1.5	1.5	2.2	2.2	2.2	3	3	4	
SF 3/50	l/min	73.7	72.7	72.0	71.1	70.2	69.4	68.6	67.6	65.7	63.8	
	NkW	0.77	0.98	1.23	1.47	1.74	1.95	2.22	2.46	2.95	3.58	50
Motor [1]	kW	1.1	1.5	1.5	2.2	2.2	3	3	3	4	5.5	
SF 4/63	l/min	92.3	91.8	90.9	90.4	89.4	88.9	88.0	87.5	86.0	84.1	
	NkW	1.06	1.34	1.64	1.93	2.24	2.51	2.80	3.14	3.77	4.54	63
Motor [1]	kW	1.5	2.2	2.2	3	3	3	4	4	5.5	5.5	
SF 4/80	l/min	110	109	108	107	106	105	104	103	101	99	
	NkW	1.14	1.50	1.87	2.21	2.58	2.97	3.24	3.57	4.32	5.18	80
Motor [1]	kW	1.5	2.2	3	3	4	4	4	5.5	5.5	7.5	
SF 4/90	l/min	129	127	126	124	123	121	120	118	116	114	
	NkW	1.16	1.61	2.04	2.45	2.83	3.40	3.72	4.09	5.02	6.06	90
Motor [1]	kW	1.5	2.2	3	3	4	5.5	5.5	5.5	7.5	7.5	

NkW = Nominal power consumption at the pump shaft relative to a viscosity of 50-150 mm²/s (cSt). With a viscosity > 150 mm²/s (cSt), the nominal power consumption increases. Subject to change.
The flow rate (l / min) refers to 1,450 1/min. It is reduced according to the rated speed of the engine. Deviation of flow ±5%.
A viscosity of less than 50 mm²/s reduces the capacity.
1 Required drive power (20% surcharge is included).

FLOW RATES SF

Size	Pump rate	Pressure p (bar) at speed n = 1,450 min⁻¹										Pump rate cm³/U
	Rating	2	4	6	8	10	12	14	16	20	25	
SF 4/112	l/min	148	146	144	142	140	139	137	135	132	128	
	NkW	1.24	1.72	2.24	2.70	3.35	3.67	4.30	4.80	5.80	7.06	112
Motor [1]	kW	1.5	2.2	3	4	4	5.5	5.5	7.5	7.5	11	
SF 6/120	l/min	176	175	174	173	171	170	169	167	165		
	NkW	1.59	2.17	2.75	3.38	3.96	4.54	5.12	5.70	6.86		120
Motor [1]	kW	2.2	3	4	5.5	5.5	5.5	7.5	7.5	11		
SF 6/132	l/min	193	192	191	190	188	187	186	185	183		
	NkW	1.79	2.48	3.19	3.91	4.59	5.32	5.99	6.72	8.12		132
Motor [1]	kW	2.2	3	4	5.5	5.5	7.5	7.5	11	11		
SF 6/160	l/min	229	228	227	225	224	223	222	221	219		
	NkW	1.98	2.80	3.67	4.49	5.32	6.19	7.01	7.83	9.52		160
Motor [1]	kW	3	4	5.5	5.5	7.5	7.5	11	11	15		
SF 6/180	l/min	263	262	261	259	258	256	255	254	252		
	NkW	2.17	3.19	4.17	5.17	6.14	7.15	8.12	9.09	11.12		180
Motor [1]	kW	3	4	5.5	7.5	7.5	11	11	11	15		
SF 8/212	l/min	318	316	314	311	308	304	300	296	290		
	NkW	2.7	3.8	4.9	6.0	7.2	8.3	9.6	10.7	13.0		212
Motor [1]	kW	4	5.5	7.5	7.5	11	11	15	15	18.5		
SF 8/250	l/min	370	368	366	363	360	356	352	348	342		
	NkW	3.3	4.6	6.0	7.4	8.8	10.2	11.3	12.5	15.4		250
Motor [1]	kW	4	5.5	7.5	11	11	15	15	15	18.5		
SF 8/300	l/min	445	443	440	437	434	430	426	422	416		
	NkW	3.7	5.3	6.9	8.6	10.2	11.7	13.4	15.0	18.3		300
Motor [1]	kW	5.5	7.5	11	11	15	15	18.5	18.5	22		
SF 8/350	l/min	518	515	512	508	504	500	495	490	483		
	NkW	4.5	6.4	8.3	10.4	12.3	14.2	16.1	18.0	22.1		350
Motor [1]	kW	5.5	7.5	11	15	15	18.5	22	22	30		
SF 8/400	l/min	592	589	586	582	578	574	569	564			
	NkW	6.0	8.0	9.9	11.9	13.9	16.0	18.1	20.1			400
Motor [1]	kW	7.5	11	15	15	18.5	22	22	30			
SF 8/450	l/min	665	661	657	653	649	645	640	635			
	NkW	6.8	9.2	11.5	13.7	16.1	18.3	20.6	22.9			450
Motor [1]	kW	11	11	15	18.5	22	22	30	30			
SF 10/500	l/min	715	704	694	677	667	657	647	640			
	NkW	6.6	9.35	12.1	14.9	17.6	20.4	22.6	25.3			500
Motor [1]	kW	11	11	15	18.5	22	30	30	30			
SF 10/575	l/min	835	825	815	800	785	770					
	NkW	7.7	10.9	14.1	17.3	20.5	23.8					575
Motor [1]	kW	11	15	18.5	22	30	30					
SF 10/650	l/min	965	955	945	930	915	900					
	NkW	8.8	12.5	16.2	19.8	23.5	27.1					650
Motor [1]	kW	11	15	22	30	30	37					
SF 10/750	l/min	1,075	1,055	1,035	1,015	995	970					
	NkW	9.9	14.0	18.2	22.3	26.4	30.6					750
Motor [1]	kW	15	18.5	22	30	37	37					
SF 10/875	l/min	1,258	1,238	1,218	1,198	1,178						
	NkW	11.6	16.4	21.2	26.0	30.8						875
Motor [1]	kW	15	22	30	37	37						
SF 10/1000	l/min	1,440	1,420	1,400	1,380	1,360						
	NkW	13.2	18.7	24.2	29.7	35.2						1,000
Motor [1]	kW	18.5	22	30	37	45						

NkW = Nominal power consumption at the pump shaft relative to a viscosity of 50-150 mm²/s (cSt). With a viscosity > 150 mm²/s (cSt), the nominal power consumption increases. Subject to change.
The flow rate (l / min) refers to 1,450 1/min. It is reduced according to the rated speed of the engine. Deviation of flow ±5%.
A viscosity of less than 50 mm²/s reduces the capacity.
1 Required drive power (20% surcharge is included).

SFE8 AND SFE10 WITH ELECTRICAL HEATING

Size	Pump rate	Pressure p (bar) at speed n = 950 min^{-1}					Pump rate cm³/U
	Rating	2	4	6	8	10	
SFE 8/250	l/min	242	241	240	238	236	
	NkW	2.2	3.0	3.9	4.8	5.8	250
Motor [1]	kW	3.0	4.0	5.5	7.5	7.5	
SFE 8/300	l/min	292	290	288	286	284	
	NkW	2.4	3.5	4.5	5.6	6.7	300
Motor [1]	kW	3.0	5.5	5.5	7.5	11.0	
SFE 8/350	l/min	339	337	335	333	330	
	NkW	2.9	4.3	5.4	6.8	8.1	350
Motor [1]	kW	4.0	5.5	7.5	11.0	11.0	
SFE 8/425	l/min	412	409	407	404	401	
	NkW	3.6	5.1	6.6	8.3	9.8	425
Motor [1]	kW	5.5	7.5	7.5	11.0	11.0	
SFE 10/500	l/min	468	461	455	444	437	
	NkW	4.3	6.1	7.9	9.8	11.5	500
Motor [1]	kW	5.5	7.5	11.0	15.0	15.0	
SFE 10/575	l/min	547	541	534	524	514	
	NkW	5.0	7.1	9.2	11.3	13.4	575
Motor [1]	kW	7.5	11.0	15.0	15.0	18.5	
SFE 10/650	l/min	632	626	619	609	599	
	NkW	5.8	8.2	10.6	13.0	15.4	650
Motor [1]	kW	7.5	11.0	15.0	18.5	18.5	
SFE 10/750	l/min	704	691	678	665	652	
	NkW	6.5	9.2	11.9	14.6	17.3	750
Motor [1]	kW	11.0	15.0	15.0	18.5	22.0	
SFE 10/875	l/min	824	811	798	785	772	
	NkW	7.6	10.7	13.9	17.0	20.2	875
Motor [1]	kW	11.0	15.0	18.5	22.0	30.0	
SFE 10/1000	l/min	943	930	917	904	891	
	NkW	8.6	12.3	15.9	19.5	23.1	1,000
Motor [1]	kW	11.0	15.0	22.0	30.0	30.0	

NkW = Nominal power consumption at the pump shaft relative to a viscosity of 50-150 mm²/s (cSt). With a viscosity > 150 mm²/s (cSt), the nominal power consumption increases. Subject to change.
The flow rate (l / min) refers to 950 1/min. It is reduced according to the rated speed of the engine. Deviation of flow ±5%.
A viscosity of less than 50 mm²/s reduces the capacity.
1 Required drive power (20% surcharge is included).

SFE 10 WITH OPTIONAL DOUBLE PRESSURE RELIEF VALVE

The double pressure relief valve of the SF / SFE 10 Steimel - gear pumps **protects the pump and the motor in both pumping directions against overloading**.

For example, fields of application for the pumps would be tank systems in the **bitumen processing industry** in which the pumps are used for filling and emptying.

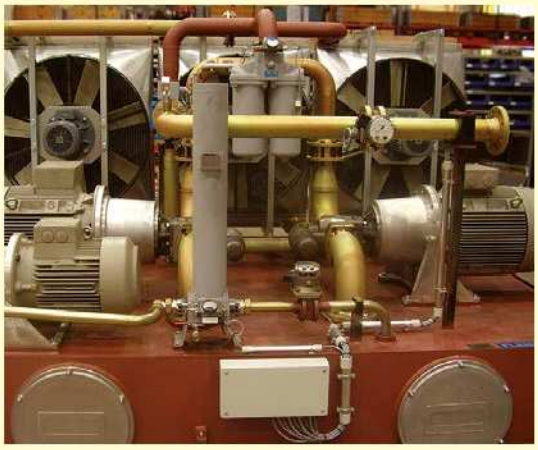
In this case, the new valves offer a simple and economically attractive solution for pressure relieving in the event of a fault caused by a blocked pressure line in your system.

Steimel offers a useful option that contributes to system safety and saves costs.

MODEL EXAMPLES

For general machine construction, engineering

e.g. lubricating pump in an oil supply system with filter and oil coolers



For the dyestuff and lacquer industry

e.g. binders pump (resins) according to ATEX with double GLRD (mechanical seal), quench recipient and temperature control

For the chemical industry, petrochemistry

e.g. solvent pump according to ATEX with magnetic coupling and temperature control

For the chocolate industry

e.g. feed pump in chocolate or cocoa mass systems

SALES

PUMPS

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QUALITY MANAGEMENT

Steimel is certified acc. to ISO 9001:2008 / ISO 14001. The appropriate certificates are available on the website www.steimel.com in the download area.

For approvals we work together with *Germanischer Lloyd*, *Lloyds Register of Shipping*, *Bureau Veritas*, *Det Norske Veritas*, *American Buro of Shipping* and other institutions.

SALES AND SERVICE WORLDWIDE

■ Support from our sales partners

Our sales and service staff is acting globally. We are supported by a wide network of partners who are active in their regions. As a manufacturer, we are in any case your contact for all questions and suggestions.

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COMPETENCE AND PASSION.