Gear Pumps

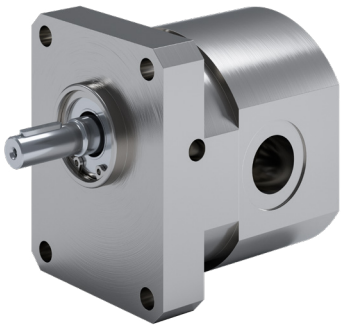
KRACHT®

- Gear Pumps
- Flow Measurement
- Hydraulics
- Valves

Gear Pumps

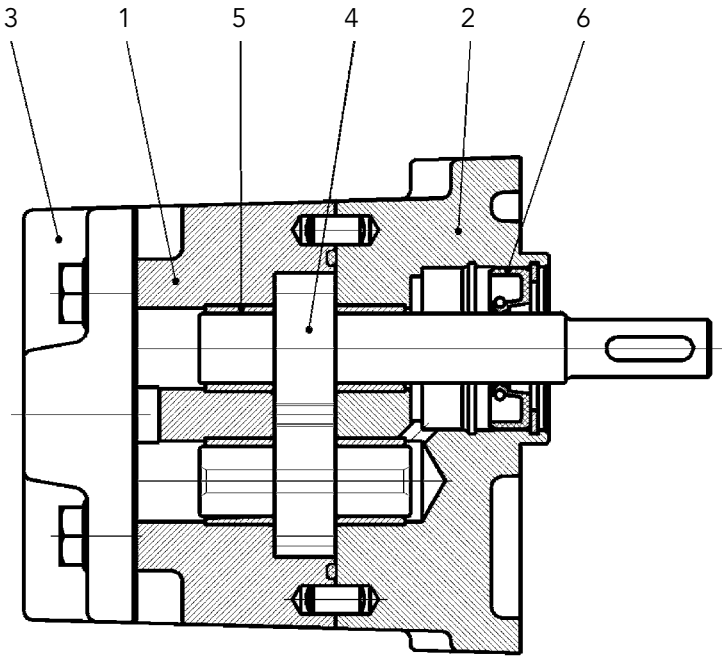
KF 0

with magnetic coupling



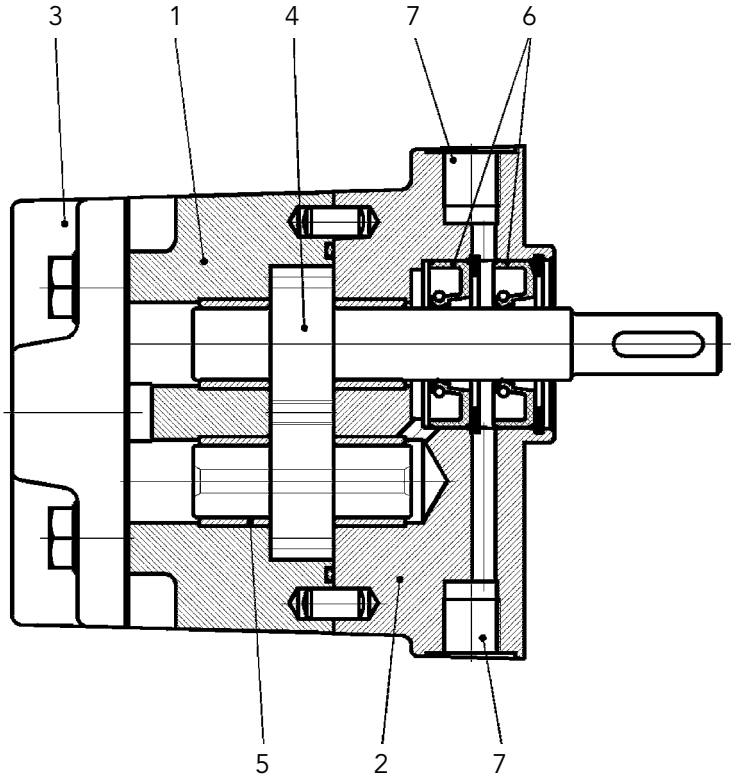
Construction

Flange pump with rotary shaft seal



1 Housing
2 Flange cover
3 Cover plate
4 Gearing
5 Bearing bush
6 Rotary shaft seal

Flange pump with double rotary shaft seal and threaded Connection for quench



1 Housing
2 Flange cover
3 Cover plate
4 Gearing
5 Bearing bush
6 Double rotary shaft seal
7 Connection for quench

Description

KF 0 – a pump for process engineering.
In numerous technical processes dosing liquids is the focus of the task. PUR components, softeners, re-sins, lacquers, paints are just some of the most impor-tant liquids with a broad application range.

The accuracy, evenness and reproducibility with which these products can be processed are also decisive for the quality of the final product.

The gear pump size KF 0 is especially suitable for these applications.The KF 0 is an external gear pump with flow rates of 0.5 cm^3/rev to 4 cm^3/rev.

The grading of the total of 8 nominal sizes makes it easier to set the desired dosing ratios.
The fine gearing with a high number of teeth guarantees a low-pulsation volume flow.

All gear parts and the bearing bushes are protected even in the standard design by a special coating against wear and corrosion, so that even filled media up to a specific grain size and hardness of the filled material can be conveyed. Because of the backlash di-mensioning in combination with precise production the KF 0 has very good volumetric efficiency over a wide pressure range.

Various types of seals, such as rotary shaft seals and double rotary shaft seals can be selected depending on the task, whereby the latter version enables operations with quench (quench chamber)
to prevent the pumping medium from hardening or crystallising.

In combination with a flow meter and the electronics the KF 0 can be extended to a highly precise dosing unit.

Characteristics

Fixing type		flange
Pipe connection		threaded ports
Direction of rotation		clockwise **or** anticlockwise
Mounting position		arbitrary (see dim. sheets)
Weight	kg	2.2

Working Characteristics

Displacement (cm^3/rev)	V_g	0.5 / 0.8 / 1.0 / 1.6 / 2.0 / 2.5 / 3.0 / 4.0
Working pressure Inlet port	$p_{e\ min}$ $p_{e\ max}$	–0.4 bar (–0.6 bar short for starting status) 2 bar
Working pressure Outlet port	$p_{n\ min}$	120 bar (depending on the pumping medium, viscosity and displacement)
Speed	n	3000 1/min (dependent by viscosity)
Viscosity	ν_{min} ν_{max}	= 10 mm^2/s = 20 000 mm^2/s
Media temperature	$\vartheta_{m\ max}$	= 90 °C NBR = 150 °C FKM = 200 °C PTFE (rotary shaft seal)
Ambient temperature	$\vartheta_{u\ min}$ $\vartheta_{u\ max}$	= –20 °C = 60 °C

Available Pump Types

Pump type	Available sizes	Housing material	Bearing	Bearing material	Gear	Shaft seal	Non-ferrous metals
KF0/.../100	0.5 / 0.8 / 1.0 / 1.6 / 2.0 / 2.5 / 3.0 / 4.0	EN-GJL-250	Bearing bush	Steel ETG 100, chemically nickel plated with SiC inclusions	Steel 1.7139 chemically nickel plated with SiC inclusions	Rotary shaft seal NBR, FKM, PTFE	yes
KF0/.../107	0.5 / 0.8 / 1.0 / 1.6 / 2.0 / 2.5 / 3.0 / 4.0	EN-GJL-250	Bearing bush	Steel ETG 100, chemically nickel plated with SiC inclusions	Steel 1.7139 chemically nickel plated with SiC inclusions	Double rotary shaft seal NBR, FKM, PTFE	yes
KF0/.../212	0.5 / 1.0 / 2.0 / 4.0	EN-GJS-600 nitro carbonized; Flange cover EN-GJS-600 tenifer nitrided	Bearing bush	Steel ETG 100, chemically nickel plated with SiC inclusions	Tool steel, nitrided	Double rotary shaft seal FKM, FEP	yes

Technical Data max. permissible working pressure in dependence on viscosity

Nominal size	Permissible working pressure in bar for viscosity			
	10 mm²/s	30 mm²/s	100 mm²/s	> 500 mm²/s
0.5	10	30	50	60
0.8	15	40	60	70
1.0	15	40	60	70
1.6	20	60	80	100
2.0	20	60	80	100
2.5	30	60	100	120
3.0	30	60	100	120
4.0	40	80	120	120

The values are valid for the speed range n = 1000 ... 3000 1/min.
Then max. working pressures must be reduced for speeds < 1000 1/min

Discharge Flow / Input Power

Speed n = 1450 1/min / Viscosity = 34 mm²/s

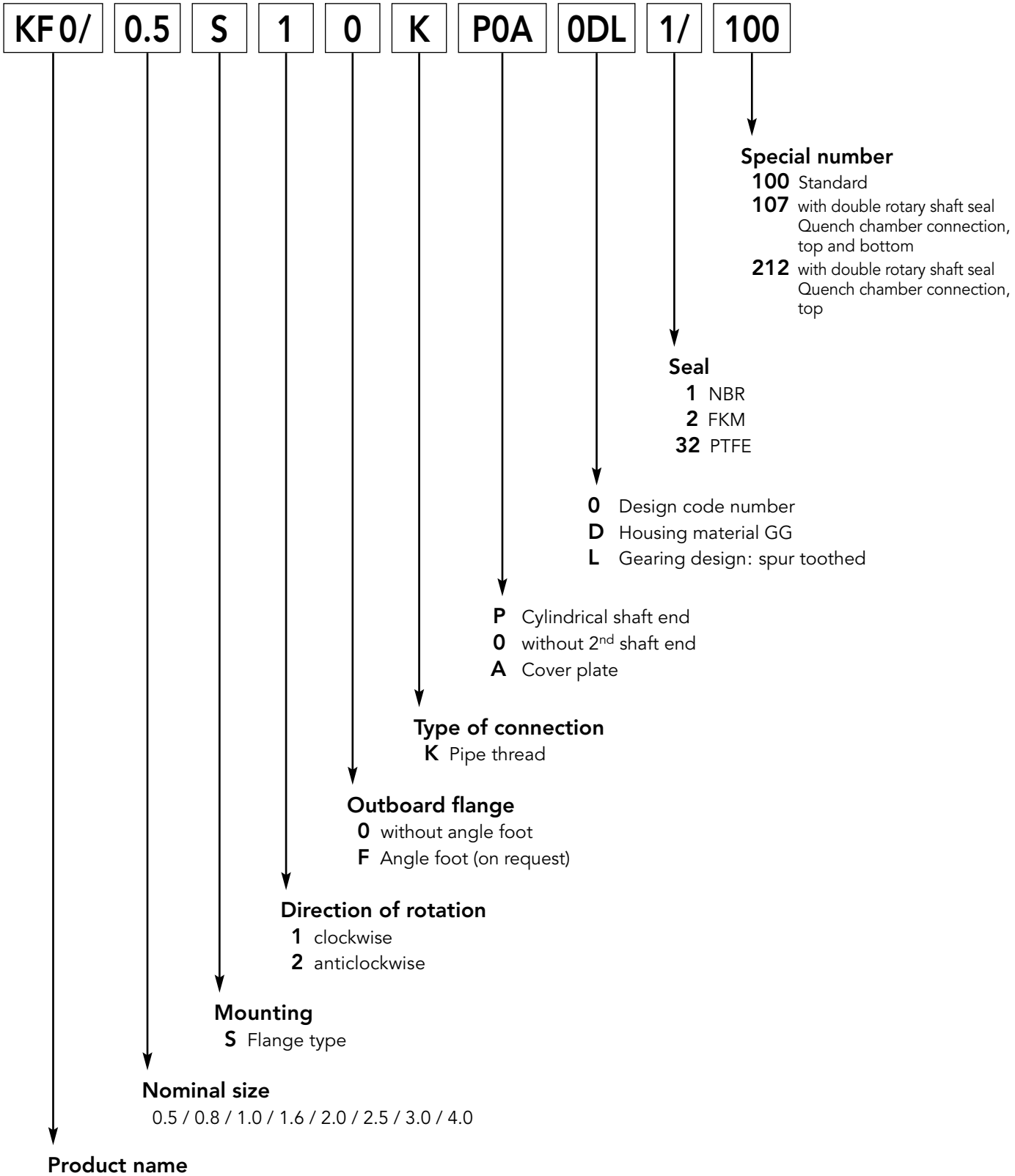
Discharge flow Q in l/min	Pressure p in bar								Nominal size	Pressure p in bar								Input power P in KW
	5	10	20	40	60	80	100	120		5	10	20	40	60	80	100	120	
	0.7	0.6	0.5	–	–	–	–	–	**0.5**	0.06	0.07	0.09	–	–	–	–	–	
	1.1	1.1	1.0	0.8	–	–	–	–	**0.8**	0.06	0.08	0.11	0.17	–	–	–	–	
	1.4	1.3	1.3	1.1	–	–	–	–	**1.0**	0.07	0.08	0.12	0.19	–	–	–	–	
	2.2	2.2	2.0	1.8	1.5	–	–	–	**1.6**	0.08	0.12	0.18	0.31	0.45	–	–	–	
	2.8	2.7	2.6	2.3	2.0	–	–	–	**2.0**	0.09	0.13	0.20	0.35	0.50	–	–	–	
	3.5	3.4	3.3	3.0	2.7	–	–	–	**2.5**	0.09	0.14	0.22	0.39	0.55	–	–	–	
	4.2	4.2	4.0	3.7	3.5	–	–	–	**3.0**	0.10	0.15	0.24	0.42	0.60	–	–	–	
	5.6	5.5	5.4	5.0	4.7	4.3	–	–	**4.0**	0.12	0.17	0.29	0.53	0.76	0.99	–	–	

Speed n = 1450 1/min / Viscosity = 120 mm²/s

Discharge flow Q in l/min	Pressure p in bar								Nominal size	Pressure p in bar								Input power P in KW
	5	10	20	40	60	80	100	120		5	10	20	40	60	80	100	120	
	0.7	0.7	0.6	0.5	–	–	–	–	**0.5**	0.06	0.07	0.09	0.12	–	–	–	–	
	1.1	1.1	1.1	1.0	0.9	–	–	–	**0.8**	0.06	0.08	0.10	0.16	0.21	–	–	–	
	1.4	1.4	1.4	1.3	1.2	–	–	–	**1.0**	0.08	0.09	0.12	0.17	0.23	–	–	–	
	2.3	2.2	2.2	2.1	2.0	1.8	–	–	**1.6**	0.08	0.11	0.16	0.27	0.38	0.50	–	–	
	2.8	2.8	2.8	2.7	2.6	2.5	–	–	**2.0**	0.09	0.12	0.20	0.34	0.49	0.64	–	–	
	3.5	3.5	3.4	3.3	3.2	3.0	2.9	–	**2.5**	0.09	0.14	0.22	0.38	0.55	0.71	0.88	–	
	4.2	4.2	4.2	4.1	3.9	3.8	3.7	–	**3.0**	0.10	0.15	0.24	0.43	0.61	0.80	0.98	–	
	5.7	5.6	5.6	5.5	5.3	5.2	5.0	4.9	**4.0**	0.12	0.17	0.29	0.53	0.76	0.99	1.23	1.46	

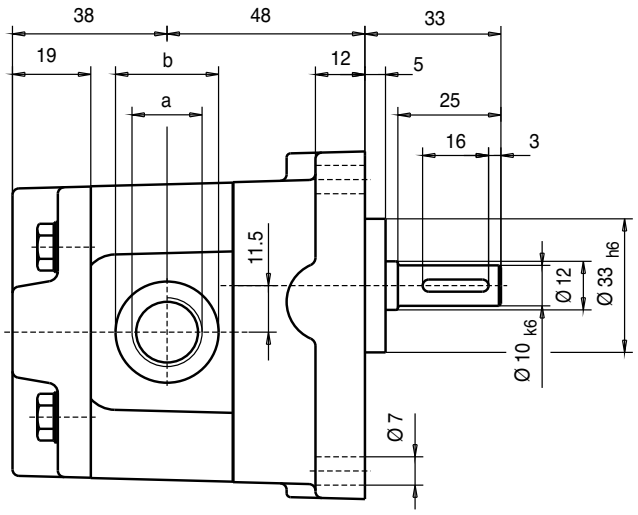
Type Key

Ordering example

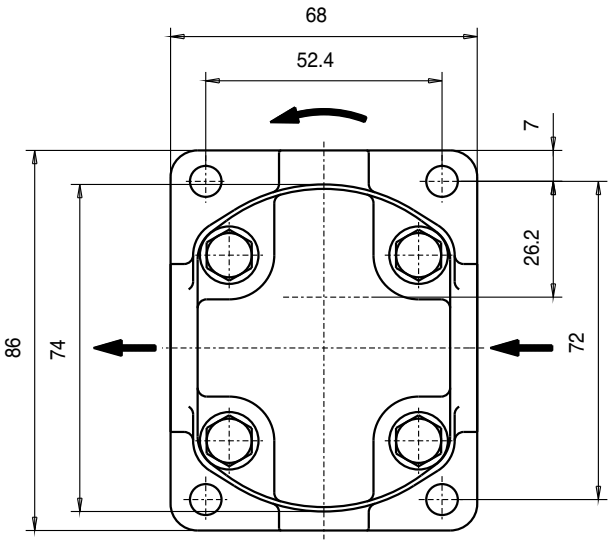


Dimensions Special Number 100

KF 0/.S.0K P0A 0DL./100

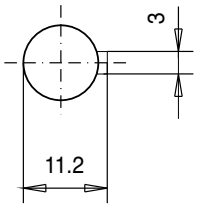


Direction of rotation shown:
clockwise



Suction and pressure connection are the same size

Feather key
A 3 x 3 x 16
DIN 6885

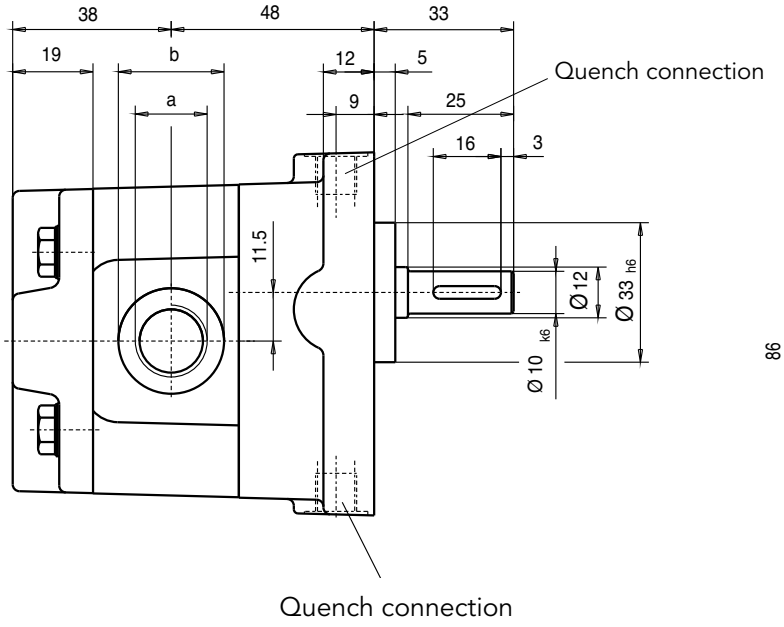


Vg cm^3/rev	Flow volume / nominal size							
	0.5	0.8	1.0	1.6	2.0	2.5	3.0	4.0
a	G 3/8 – 13 deep			G 1/2 – 15 deep				
b	25			29				

Dimensions in mm

Dimensions Special Number 107

KF 0/.S.0K P0A 0DL./107



Direction of rotation shown:
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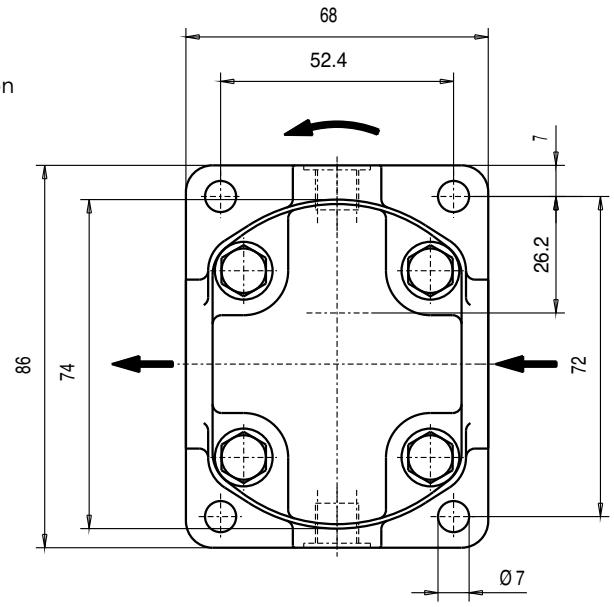
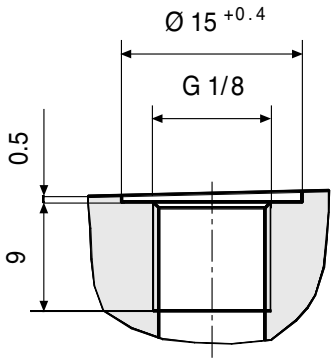


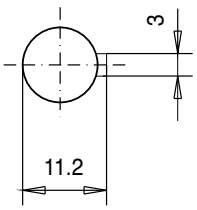
Mounting positon: horizontal

Suction and pressure connection are the same size

Quench connection



Feather key
A 3 x 3 x 16
DIN 6885

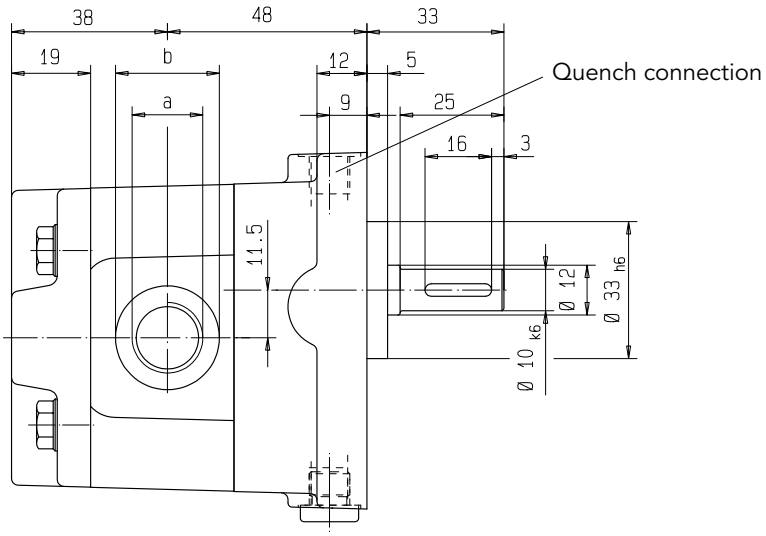


Vg cm³/rev	Flow volume / nominal size							
	0.5	0.8	1.0	1.6	2.0	2.5	3.0	4.0
a	G ⅜ – 13 deep			G ½ – 15 deep				
b	25			29				

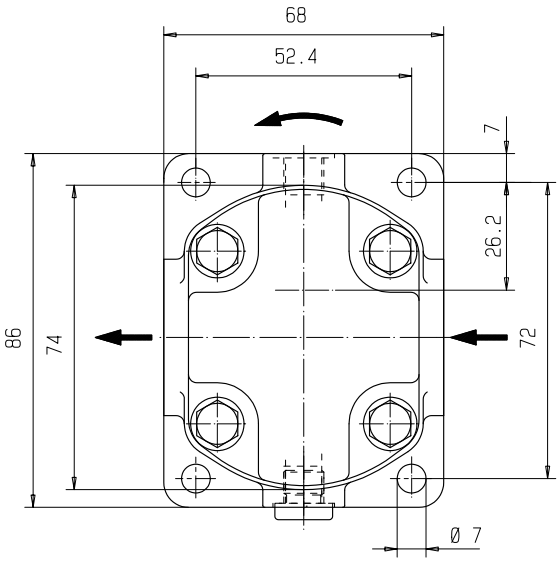
Dimensions in mm

Dimensions Special Number 212

KF 0/.S.0K P0A 0DL./212

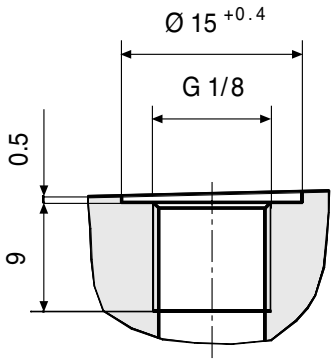


Direction of rotation shown:
clockwise

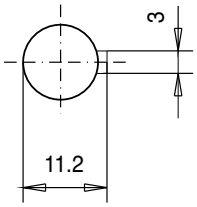


Suction and pressure connection are the same size

Quench connection



Feather key
A 3 x 3 x 16
DIN 6885

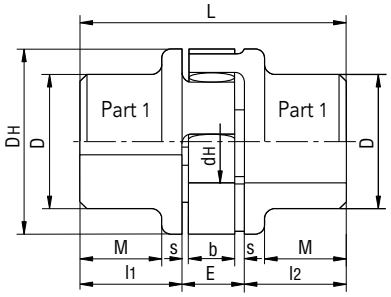


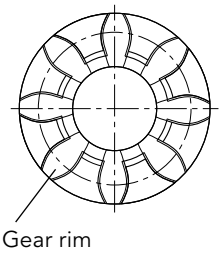
Vg cm³/rev	Flow volume / nominal size			
	0.5	1.0	2.0	4.0
a	G ⅜ – 13 deep		G ½ – 15 deep	
b	25		29	

Dimensions in mm

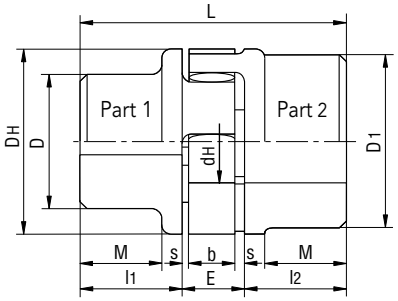
Accessory Couplings

Version A





Version B



	Ordering code	Coupling size	Hub material (AL)		Finished bore				Dimensions									
			Weight	Moment of inertia	min.		max.											
			kg	kgm^2	Part 1	Part 2	Part 1	Part 2	l1/l2	E	s	b	L	M	DH	D	D_1	dh
Version A	**RA 14-Z 11/..-Z 11/..**	**14**	0.045	0.000006	6	–	16	–	11	13	1,5	10	35	–	30	30	–	10
	RA 19-Z 25/..-Z 25/..	**19**	0.117	0.000023	6	–	19	–	25	16	2	12	66	20	41	32	–	18
Version B	**RA 19/24-Z 25/..-Z 25/..**	**19/24**	0.129	0.000033	6	19	19	24	25	16	2	12	66	20	41	32	41	18
	RA 24/28-Z 30/..-Z 30/..	**24/28**	0.29	0.00014	9	24	22	28	30	18	2	14	78	24	56	40	56	27

Type Key KF Coupling

Ordering example

RA 19 - Z 25/10 - Z 25/14

Coupling size	Pump side cylindrical	Motor side cylindrical
	coupling hub lengt and hub bore	

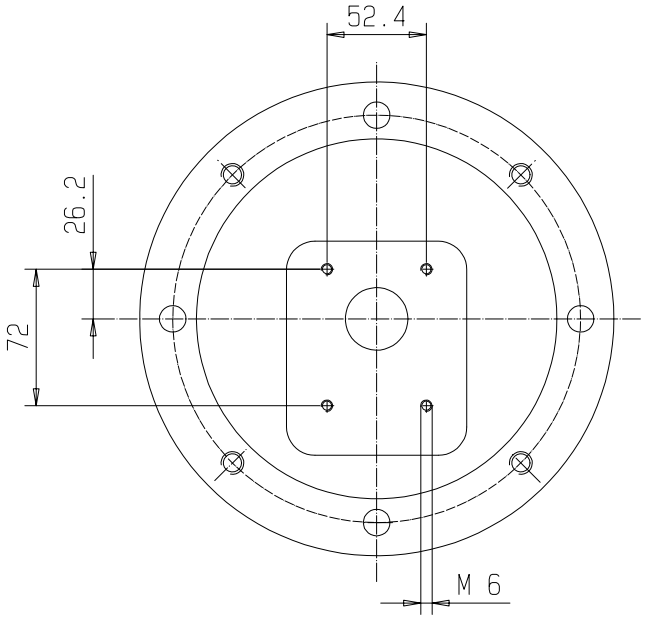
Working temperature:
–20 °C to +80 °C (– 4 °F to 176 °F)
(short duration temperature peaks
up to 120 °C / 248 °F are permissible).

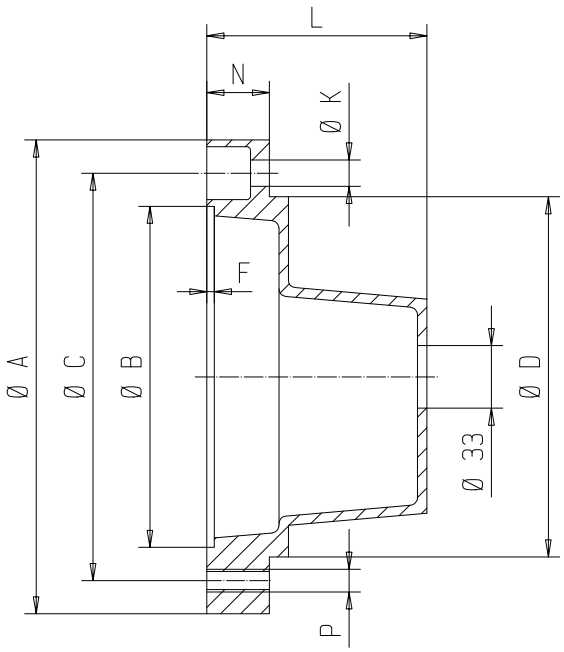
Weights and mass moments of inertia refer to max. finish machined bore without slot.
Finish-machined bores to ISO Fit H7,
parallel key slots in accordance with DIN 6886 Sh.1.

Dimensions in mm

Accessory Bell Housing

KF 0 Aluminum bell housing





Motor size	Bell housing	Coupling	Dimensions									Weight
			A	B	C	D	F	K	L	N	P	kg
63	Z0/140/70	RA14-Z11/10-Z11/11	140	95	115	95	4	9	70	17	M8	0.36
71 S	Z0/160/80	RA19-Z25/10-Z25/14	160	110	130	110	4	9	80	13	M8	0.49
71												
80 S	Z0/200/90	RA19-Z25/10-Z25/19	200	130	165	145	5	11	90	16	M10	0.6
80												
90 S	Z0/200/100	RA19/24-Z25/10-Z25/24	200	130	165	145	4	11	100	27	M10	1.345
90 L												
100 LS	Z0/250/116	RA24/28-Z30/10-Z30/28	250	180	215	190	4	14	116	33	M12	1.4
100 L												
112 M												

Dimensions in mm

Description

With various applications conventional seals come up against their limits. Typical applications can be found in PUR plants, refrigerating installations and vacuum plant. It is possible to fit the KF 0 with a magnetic coupling for these applications.

The magnetic coupling serves as a shaft seal and to transmit the torque. The outer rotor of the magnetic coupling is placed on the motor shaft and the inner rotor directly on the pump shaft. The torque is transmitted between the outer and inner rotors through the magnetic forces.
The split case, which seals the pump hermetically, is located between the two rotors.

The magnetic coupling is used if an absolutely tight seal is required between the pump chamber and the atmosphere, e.g. for dosing isocyanate, where contact with the air would lead to an undesired hardening of the medium. It can be used in vacuum operations, e.g. filling brake liquid, and reliably prevents air penetrating into the system.
Non-leak operations are also guaranteed when used in sealed systems with a high admission pressure on the pump suction side.

The magnetic coupling is predestined for dosing hazardous and harmful media.

Characteristics

Fixing typ	flange
Pipe connection	threaded ports
Direction of rotation	clockwise **or** anticlockwise
Mounting	arbitrary

Working Characteristics

Displacement (cm^3/rev)	V_g	0.5 / 0.8 / 1.0 / 1.6 / 2.0 / 2.5 / 3.0 / 4.0
Working pressure Inlet port	Working $p_{e\,min}$ $p_{e\,max}$	 – 0.4 bar, vacuum facility – 0.92 bar 16 bar (SS1)
	Standstill $p_{e\,min}$ $p_{e\,max}$	 – 1 bar 16 bar (SS1)
Working pressure Outlet port	$p_{n\,max}$	25 bar (SS1)
Speed	n	3000 1/min (affected by viscosity)
Viscosity	ν_{min} ν_{max}	= 10 mm^2/s = 20 000 mm^2/s
Media temperature	ϑ_{min} ϑ_{max}	= – 10 °C = 150 °C FKM, magnet material SmCo
Ambient temperature	$\vartheta_{u\,min}$ $\vartheta_{u\,max}$	= – 20 °C = 60 °C

Materials

Pump	Pump housing	GG 25, DIN 1691
	Gearing	Steel 1.7139 chemically nickel plated with SiC inclusions
	Bearing bushes	Steel ETG 100 chemically nickel plated with SiC inclusions
	Seal	FKM
Magnetic coupling	Inner rotor	Stainless steel 1.4571
	Split case	Stainless steel 1.4571
	Outer rotor	355J2F3 (St 52)
	Magnets	Sm2Co17

Magnetic Coupling Torques

MSA 46/6	3 Nm
MSA 60/8	7 Nm
MSB 60/8	14 Nm

Selection Assistance

Pump	Coupling size	permitted power [kW] at n = 750 1/min	Motor-size	permitted power [kW] at n = 1000 1/min	Motor-size	permitted power [kW] at n = 1500 1/min	Motor-size	permitted power [kW] at n = 3000 1/min	Motor-size
KF 0	MSA 46	0.12	71	0.18	71	0.12	63	0.25	63
		-	-	-	-	0.18	63	0.37	71
		-	-	-	-	0.25	71	0.55	71
	MSA 60	0.18	80	0.25	71	0.37	71	0.75	80
		0.25	80	0.37	80	0.55	80	1.1	80
	MSB 60	0.37	90	0.55	80	0.75	80	1.5	90
		0.55	90	0.75	90	1.1	90	2.2	90

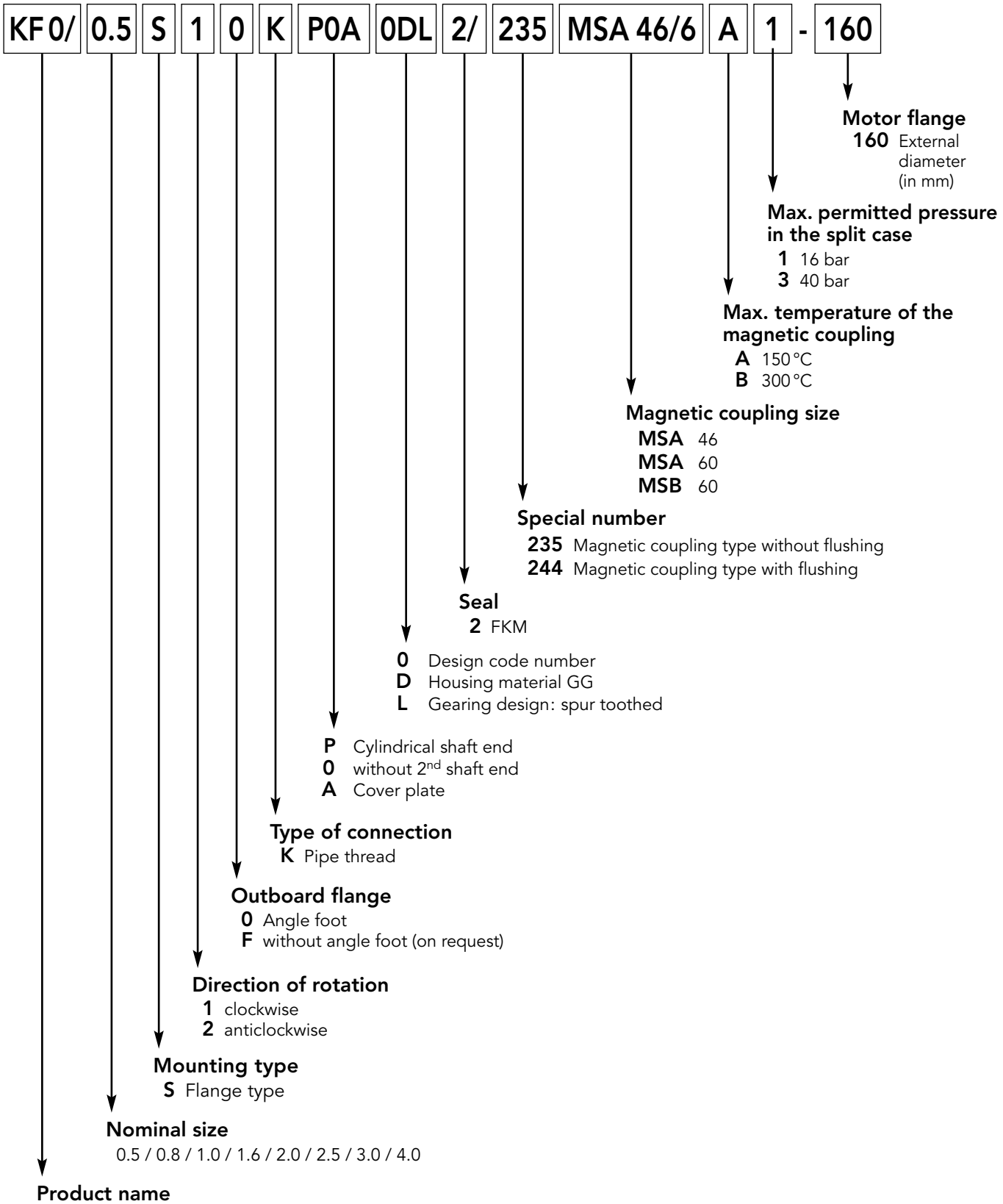
The values stated in the table refer to a maximum media temperature of 80 °C.
At media temperatures > 80 °C are to be selected if necessary stronger magnetic couplings.

To design the magnetic coupling, the following information needs to be available:

- Pump size
- Pump pressure (working and starting pressure)
- Working and starting viscosity
- Precise name of media – required static seals (if possible) – possibly main media characteristics
- Drive motor power
- Speed or speed range
- Switch on type – direct or with frequency inverter
- Media and ambient temperature

Type Key

Ordering example



Notes

Product Portfolio

Gear Pumps

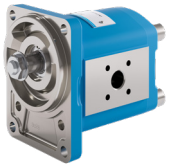
Low and high-pressure gear pumps for lubricating oil, hydraulic, process and test bench applications, fuel and metering systems.

Flow Measurement

Gear, turbine and screw type flow meters and electronics for volume and flow, metering and consumption in the chemical industry, hydraulic, process and test bench technology.

Hydraulics

Single and multistage high-pressure gear pumps, gear motors and valves for construction machinery, municipal vehicles, agricultural vehicles, special vehicles and truck bodies.



Valves

Cetop valves for all requirements stationary and mobile applications. Pressure, switching and stop valves with pipe connection for high flow rates. Special valves.

LLOYD'S REGISTER · LRQA ISO 9001 UKAS MANAGEMENT SYSTEMS 001

LLOYD'S REGISTER · LRQA ISO 14001 UKAS MANAGEMENT SYSTEMS 001

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KF0 – with magnetic coupling/EN/12.2016 – errors and technical changes reserved