

Transfer Gear Pumps KF 1/4 – KF 1/24 coated

Description

The central element in numerous technical processes is the metering of liquids. PUR components, plasticisers, resins, adhesives, laquers and paints are just a few of the important liquids with a broad application spectrum.

The accuracy, uniformity and reproducibility with which these liquids can be processed is also decisive for the quality of the final product.

Ideal for these applications is the KRACHT gear pump KF 1/4 – KF 1/24 coated.

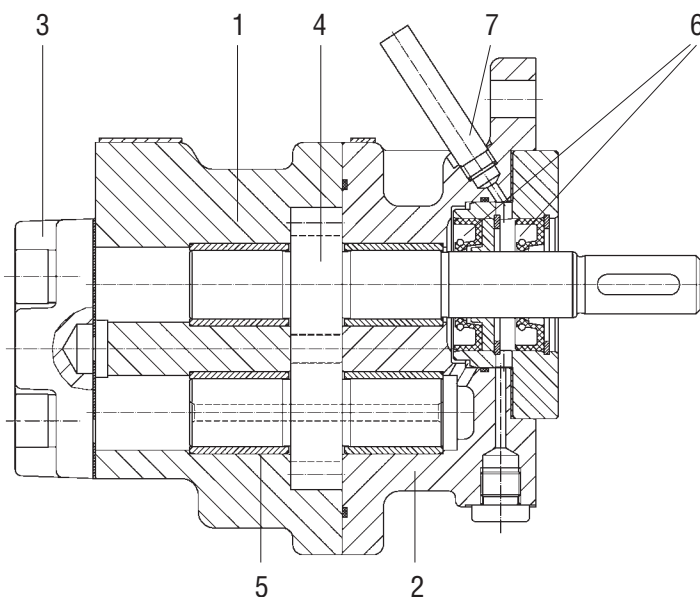
The KF 1/4 – KF 1/24 coated are external gear pumps with a discharge volume of 4 cm³/r to 24 cm³/r.

All gear parts and bearing bushes are protected against wear and corrosion by means of a special coating, so that also filled media up to a certain particle size and hardness of the fillers can be pumped.

Guide values in this respect are a maximum particle size of 30 µm and a Mohs hardness of 6.

The double rotary shaft seals enable operation with sealing liquid (quench) to prevent hardening or crystallising of the pumped medium. On request the KF 1/4 – KF 1/24 coated can be supplied with a magnetic drive.

Construction



- 1 Housing
- 2 Flange cover
- 3 End cover
- 4 Gear
- 5 Plain bearing bush
- 6 Shaft end sealing
- 7 Port for liquid sealing

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General Characteristics

Mounting:	Flange type
Pipe connection:	Threaded ports
Direction of rotation:	cw or ccw
Fitting position:	optional
Weight:	refer to dim. sheets

Materials

Housing:	Cast iron GG 25
Shafts and Gears:	Steel 1.7139 nickel plated (with SiC inlets)
Bearing bushes:	Steel ETG 100 nickel plated (with SiC inlets)
Seals:	FKM, PTFE

Operation Characteristics

Operating pressure:	Inlet port
	$p_{e \min} = -0.4 \text{ bar}$ (-0.6 bar for short time, e.g. start up)
	$p_{e \max} = 1 \text{ bar}$ for FKM-rotary shaft sealing 5 bar for PTFE-rotary shaft sealing
	Outlet port
	$p_{e \max} = 50 \text{ bar}$ (depends on viscosity)
Speed:	$n = 200 \dots 2000 \text{ rpm}$ (depends on viscosity)
Viscosity:	$v_{\min} = 12 \text{ mm}^2/\text{s}$ $v_{\max} = 15\,000 \text{ mm}^2/\text{s}$ (higher viscosities on request)
Fluid temperature:	$\delta_{m \min} = -10 \text{ }^\circ\text{C}$ $\delta_{m \max} = +150 \text{ }^\circ\text{C}$ for FKM-rotary shaft sealing $+200 \text{ }^\circ\text{C}$ for PTFE-rotary shaft sealing
Ambient temperature:	$\delta_{u \min} = -20 \text{ }^\circ\text{C}$ $\delta_{u \max} = +60 \text{ }^\circ\text{C}$

Technical Data

Size	Nominal Displacement	Geometrical Displacement V_G cm^3/r	Operating Pressure p_b bar	Max. Pressure p_{\max} bar	Permitted forces ($n = 1450 \text{ 1/min}$)		Moment of Inertia (without coupling) $\times 10^{-4}$ J Kgm ²
					F_{radial} N	F_{axial} N	
1/	4	4.6	50	60	500	100	0.2
	8	8.3					0.35
	11	11.3					0.45
	16	16.6					0.65
	20	20.5					0.75
	24	24.8		0.87			
				50			

Kinematic viscosity ν [mm ² /s]	<	300	400	500	1000	2000	3000	6000	10000	20000	30000
Maximum speed N_{\max} 1/min	≥	1500	1250	1000	750	600	500	400	300	200	100

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Discharge Flow

At speed $n = 1450 \text{ min}^{-1}$														
Operating pressure p (bar)														
Discharge flow Q l/min	2	6	10	14	18	20	22	25	30	35	40	45	50	Nominal size
	6.6	6.4	6.2	6.0	5.8	5.7	5.6	5.5	5.3	5.0	4.8	4.5	4.3	1/4
	12.0	11.7	11.4	11.1	10.8	10.7	10.5	10.3	9.9	9.6	9.2	8.8	8.5	1/8
	16.1	15.9	15.6	15.2	14.8	14.6	14.4	14.2	13.8	13.4	13.0	12.6	12.1	1/11
	23.8	23.4	23.0	22.7	22.3	22.1	21.9	21.6	21.1	20.6	20.2	19.7	19.2	1/16
	29.4	29.0	28.6	28.2	27.8	27.6	27.4	27.1	26.2	26.1	25.6	25.1	24.6	1/20
	35.6	35.2	34.8	34.4	34.0	33.8	33.6	33.3	32.8	32.3	31.8	31.3	30.8	1/24

Power Input

At speed $n = 1450 \text{ min}^{-1}$														
Operating pressure p (bar)														
Power input P kW	2	6	10	14	18	20	22	25	30	35	40	45	50	Nominal size
	0.10	0.16	0.21	0.26	0.31	0.33	0.36	0.40	0.47	0.53	0.60	0.66	0.73	1/4
	0.20	0.28	0.36	0.45	0.54	0.58	0.62	0.69	0.80	0.90	1.00	1.10	1.20	1/8
	0.22	0.33	0.38	0.55	0.65	0.71	0.77	0.85	0.99	1.12	1.26	1.40	1.53	1/11
	0.25	0.40	0.55	0.70	0.85	0.93	1.00	1.12	1.31	1.50	1.69	1.88	2.07	1/16
	0.27	0.37	0.65	0.85	1.05	1.15	1.25	1.40	1.65	1.90	2.10	2.40	2.60	1/20
	0.29	0.54	0.78	1.03	1.30	1.40	1.50	1.70	2.00	2.30	2.60	2.90	3.20	1/24

The ratings refer to mineral oil with a viscosity of $34 \text{ mm}^2/\text{s}$.

The dispersion of the discharge flow Q as specified in the table may be $+2.5\%$ up to 5% .

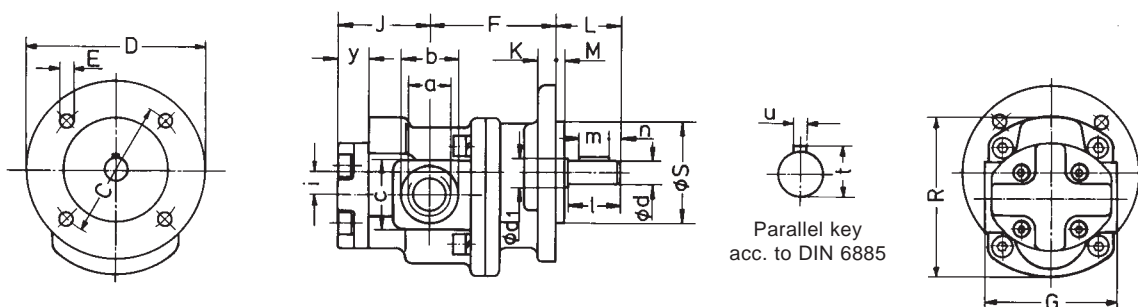
At viscosities of $<30 \text{ mm}^2/\text{s}$: Reduction of discharge flow.

The drive motor output must be selected 20% higher than the data for P as specified in the table.

For viscosity of $>100 \text{ mm}^2/\text{s}$, the power input must be increased.

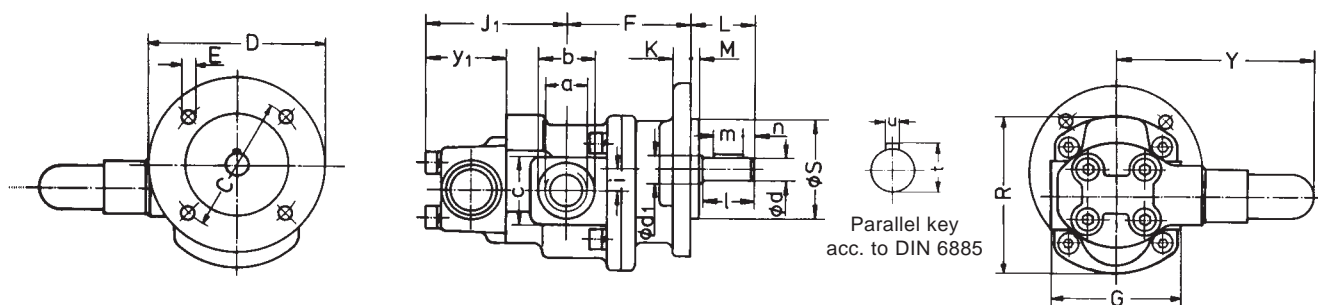
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Dimensions



Size	Nom. displacement	Inlet and outlet ports Pipe thread																	Shaft end						Approx. weight kg			
		a	b	c	C	D	E	F	G	J ₁	K	L	M	R	S _{h6}	i	y	d ₁	d _{k6}	l	m	n	t	u				
1/	4	G 1/2	16	deep	90	110	9	64	85	38	11	40	5	100	65	15,5	20	16	14	30	20	5	16	5	3.0			
	8	G 3/4	17					36		40																70	57	3.7
	11	G 3/4	17					36		40																70	57	3.75
	16	G 3/4	17					36		40																70	57	3.8
	20	G 3/4	17					36		40																80	57	4.1
	24	G 3/4	17					36		40																80	57	4.2

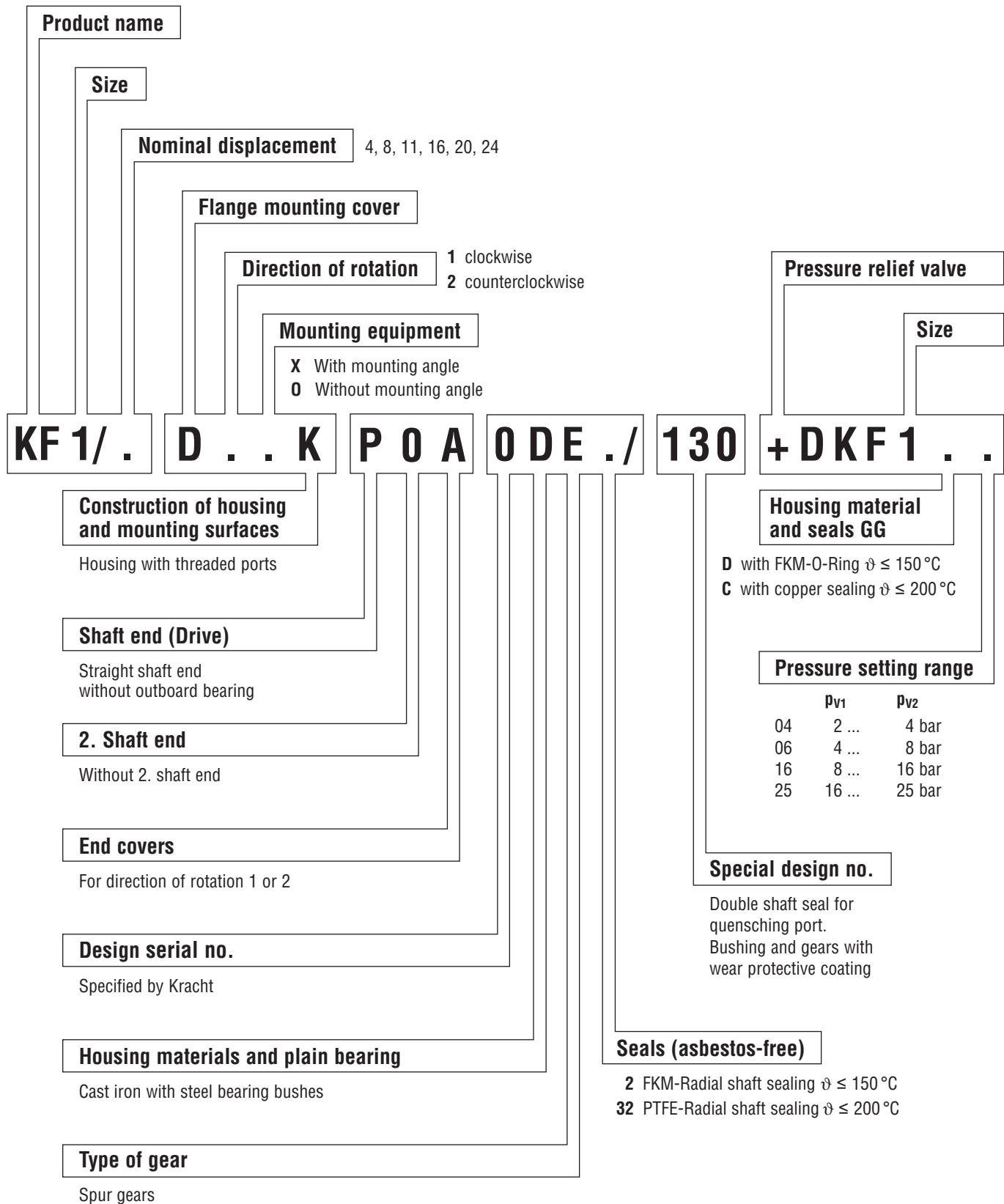
Dimensions with Pressure Relief Valve



Size	Nom. displacement	Inlet and outlet ports Pipe thread																	Shaft end						Approx. weight kg				
		a	b	c	C	D	E	F	G	J ₁	K	L	M	R	S _{h6}	Y	i	y ₁	d ₁	d _{k6}	l	m	n	t		u			
1/	4	G 1/2	16	deep	90	110	9	64	85	68	11	40	5	100	65	134	15,5	50	16	14	30	20	5	16	5	3.8			
	8	G 3/4	17					36		40																	70	87	4.5
	11	G 3/4	17					36		40																	70	87	4.56
	16	G 3/4	17					36		40																	70	87	4.6
	20	G 3/4	17					36		40																	80	87	4.9
	24	G 3/4	17					36		40																	80	87	5.0

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Type Key



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Power Consumption

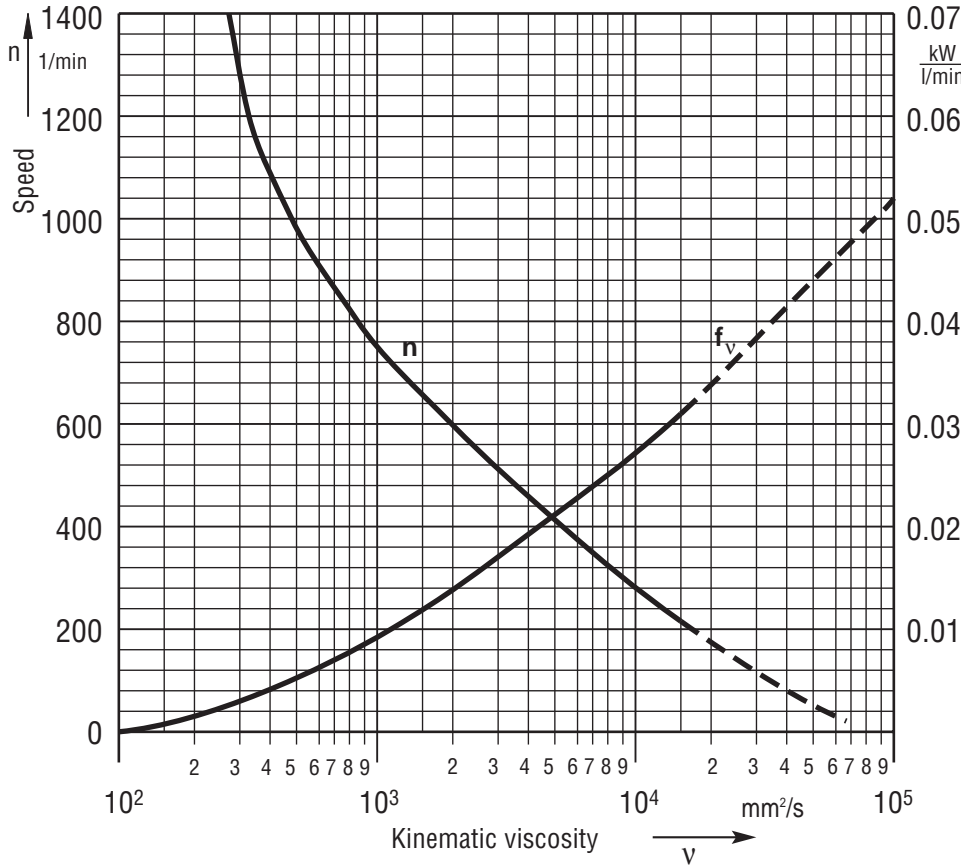


Chart: $n, f_v = f(v)$

Note:
To determine the power consumption, always take the max. operating viscosity at starting state into consideration. The power of the drive motor should be selected 20% higher than the value determined.

Calculation of Power Consumption

$$P_{1Pu} = P_{tab} \cdot \frac{n}{1450} + f_v \cdot Q$$

P_{1Pu} = Power input, pump (kW)

P_{tab} = Power input acc. to table (kW)

n = Speed (1/min)
Observe dependance of viscosity

f_v = Viscosity factor $\left[\frac{\text{kW}}{\text{l/min}} \right]$
see chart

Q = Discharge flow(l/min) mit $Q = \frac{V_g \cdot n}{1000}$

V_g = Geometrical displacement (cm³)

Example: Pump Type KF1/.

Viscosity $v = 3000 \text{ mm}^2/\text{s}$

Operating pressure $p = 16 \text{ bar}$

with $P_{tab} = 4.7 \text{ kW}$

$n = 500 \text{ 1/min}$

$f_v = 0,017 \frac{\text{kW}}{\text{l/min}}$

$Q = 50 \text{ l/min}$

then

$$P_{1pu} = \left(4.7 \cdot \frac{500}{1450} + 0.17 \cdot 50 \right) \text{ kW}$$

$$P_{1Pu} = 2.47 \text{ kW}$$

Motor power output: $P_{2Mot} = 1.2 \cdot P_{1Pu} = 2.96 \text{ kW}$

Select helical geared motor

Size 100 L with

$P = 3.0 \text{ kW}$

$n = 490 \text{ 1/min}$