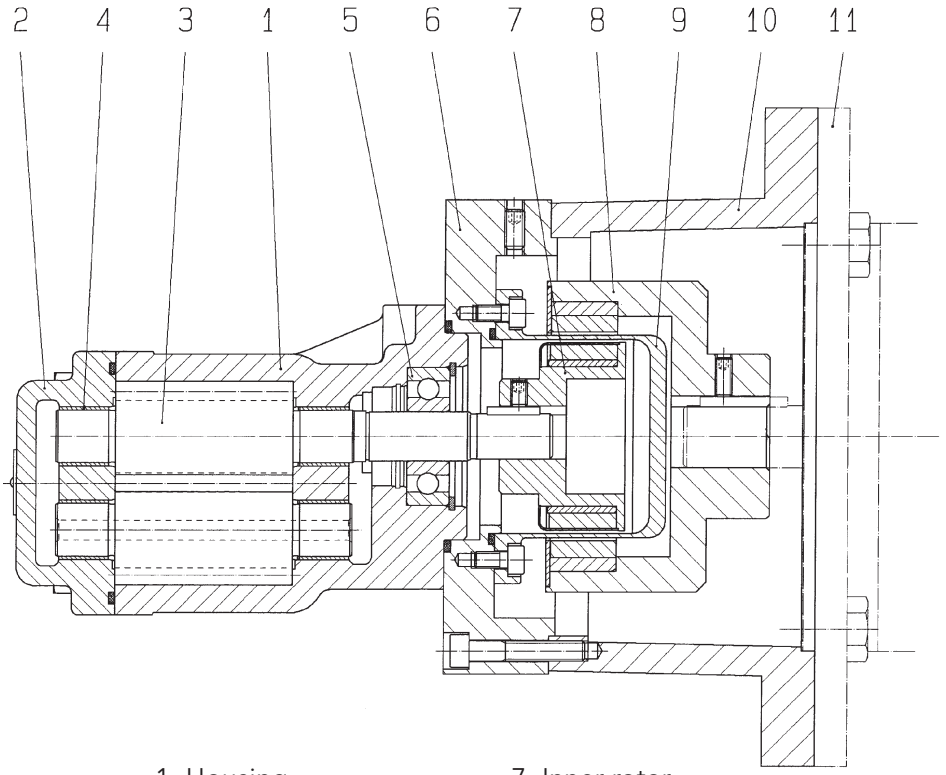
KRACHT®

Transfer Gear Pumps

KF 2.5 ...112

with magnetic coupling

Construction



1 Housing
2 Cover
3 Gear
4 Plain bearing bush
5 Outboard bearing
6 Adapter flange
7 Inner rotor
8 Outer rotor
9 Split case
10 Bell housing
11 Driven motor

Function

Conventional sealing gaskets are pushed to their limits with different applications. Typical applications are found in polyurethane facilities, refrigerating machines and vacuum facilities. For these applications, you have the possibility to equip the KF 2,5 ... 112 with a magnetic coupling.

The magnetic coupling serves as a shaft seal and for the transmission of the torque. The outer rotor of the magnetic coupling is assembled on the engine shaft and the inner rotor is assembled directly on the pumping shaft. The torque is transmitted through the magnetic forces between the outer and inner rotor. Between the two rotors, you have the split case which hermetically seals the pump.

The magnetic coupling is used when an absolute sealing is required between the pumping room and the atmosphere, for example, in the case of a dosage of isocyanate, where the contact with air would lead to an unwanted cure of the medium. It can be used in vacuum operation – for example, filling brake fluid – in which an intrusion of air into the system is steadily prevented.

Also, a leak-free operation is ensured when operating in closed systems with high pressure on the pump inlet side. The magnetic coupling is predestined for dispensing dangerous and health hazardous mediums.

Materials

Pump	Housing and cover	EN-GJL-250 (GG 25) EN-GJS-400-15 (GGG 40) on request
	Gearing	16 Mn Cr 5
	Bearing bushes	DU, optional Iglidur (Sealing number 12, 16)
	Seals	EPDM, CR, HNBR, FKM, FEP
Magnetic coupling	Inner rotor	Hub made of stainless steel 1.4571 Magnets made of Sm2Co17 Magnet covering made of stainless steel 1.4571
	Split case	Flange made of stainless steel 1.4571 Pod made of stainless steel 1.4571 (From construction size 75; alternatively of Hastelloy In ceramics (Zr02Mg0) on request)
	Outer rotor	Hub made of 355J2G3 (St 52) Magnet made of Sm2Co17 or NdFeB

Characteristics

Fixing type		flange
Connection type	KF 2,5 ... 25 KF 32 ... 112	pipe thread flange connection
Direction of rotation		clockwise or anticlockwise
Mounting position		horizontal, vertikal (shaft end facing downward)

Working Characteristics

Nominal sizes	V_g =	2.5 / 4 / 5 / 6 / 8 / 10 / 12 / 16 / 20 / 25 / 32 / 40 / 50 / 63 / 80 / 100 / 112 cm^3/r
Working pressure Inlet port	Working	
	$p_{e\ min}$	– 0.4 bar / – 5.8 psi, vacuum facility – 0.92 bar / – 13.3 psi
	$p_{e\ max}$	16 bar / 232 psi (1)
	$p_{e\ max}$	25 bar / 363 psi (2)
	$p_{e\ max}$	40 bar / 580 psi (3)
	Standstill	
	$p_{e\ min}$	– 1 bar / – 15 psi
	$p_{e\ max}$	16 bar / 232 psi (1)
	$p_{e\ max}$	25 bar / 363 psi (2)
	$p_{e\ max}$	40 bar / 580 psi (3)
Working pressure Outlet port	$p_{n\ max}$	DU bearing: 25 bar / 363 psi Iglidur bearing: 10 bar / 145 psi up to p_e
Speed	n_{min}	= 200 1/min
	n_{max}	= 3000 1/min
Viscosity	ν_{min}	= 10 cSt
	ν_{max}	= 5000 cSt
Media temperature pump	$\vartheta_{m\ min}$	= – 10 °C / 14 °F
	$\vartheta_{m\ max}$	= 130 °C / 266 °F (EPDM)
	$\vartheta_{m\ max}$	= 100 °C / 212 °F (CR)
	$\vartheta_{m\ max}$	= 100 °C / 212 °F (HNBR)
	$\vartheta_{m\ max}$	= 130 °C / 266 °F (FKM), magnet material NdFeB
	$\vartheta_{m\ max}$	= 150 °C / 302 °F (FKM), magnet material SmCo
	$\vartheta_{m\ max}$	= 200 °C / 392 °F (FEP), magnet material SmCo
Media temperature magnetic coupling	$\vartheta_{m\ max}$	= 130 °C / 266 °F magnet material NdFeB
	$\vartheta_{m\ max}$	= 250 °C / 482 °F magnet material Sm2Co17
Ambient temperature	$\vartheta_{u\ min}$	= – 20 °C / – 4 °F
	$\vartheta_{u\ max}$	= 60 °C / 140 °F

Nominal torque magnetic coupling				
	MSA 46/6	3 Nm	MSB 75/10	20 Nm
	MSA 60/8	7 Nm	MSC 75/10	30 Nm
	MSB 60/8	14 Nm	MSB 110/16	50 Nm
	MSA 75/10	10 Nm	MSC 110/16	80 Nm

Selection Assistance

Pump	Coupling size	Stat. cut-off torque at 20 °C / 68 °F [Nm]	Permitted power consumption [kW] at n = 750 1/min	Motor size	Permitted power consumption [kW] at n = 950 1/min	Motor size	Permitted power consumption [kW] at n = 1450 1/min	Motor size
KF 2.5-25	MSA 46	3	–	–	0.18	**71**	0.18	**63**
							0.25	**71**
	MSA 60	7	0.18	**80**	0.25	**71**	0.37	**71**
			0.25	**80**	0.37	**80**	0.55	**80**
	MSB 60	14	0.37	**90**	0.55	**80**	0.75	**80**
			0.55	**90**	0.75	**90**	1.1	**90**
	MSB 75	24	0.75	**100**	1.1	**90**	1.5	**90**
			1.1	**100**	1.5	**100**	2.2	**100**
KF 32-112	MSB 75	24	0.75	**100**	1.1	**90**	1.5	**90**
			1.1	**100**	1.5	**100**	2.2	**100**
	MSC 75	40	1.5	**112**	2.2	**112**	3.0	**100**
			2.2	**132**	3.0	**132**	4.0	**112**
	MSB 110	60	3.0	**132**	4.0	**132**	5.5	**132**
	MSC 110	95	4.0	**160**	5.5	**132**	7.5	**132**
			5.5	**160**	7.5	**160**	11.0	**160**

The values stated in the table refer to a maximum media temperature of 80 °C / 176 °F.
At media temperatures > 80 °C / 176 °F 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

KF 12 R G 10 - D15 - MSB 75/10 A 1 - 200

Motor flange
200 External diameter (in mm)

Max. permitted pressure in the split case
1 16 bar / 232 psi
2 25 bar / 363 psi
3 40 bar / 580 psi

Max. temperature of the magnetic coupling
A 150 °C / 302 °F
B 300 °C / 572 °F

Coupling size
MSA 46/6
MS. 60/8
MS. 75/10
MS. 110/16

A = 1 Magnet row
B = 2 Magnet rows
C = 3 Magnet rows

Option pressure relief valve (safety valve)
D 15 adjustable between 0 – 15 bar / 0 – 218 psi
D 25 adjustable between 15 – 25 bar / 218 – 363 psi

Sealing no. for magnetic coupling
10 EPDM sealing without flushing
11 FKM sealing without flushing
12 CR sealing without flushing
15 FKM sealing and flushing
16 HNBR sealing without flushing
21 FEP sealing without flushing
22 FKM sealing and flushing (ATEX)

Fixing type **G** DIN flange with outboard bearing

Direction of rotation **R** clockwise
L anticlockwise

Nominal size 2.5 / 4/ 5 / 6 / 8 / 10 / 12 / 16 / 20 / 25 / 32 / 40 / 50 / 63 / 80 / 100 / 112

Product name

ATEX-Design

Permitted Medias

Mineral oil
according to DIN 51524/25

Engine oil
according to DIN 51511

Other medias on request.

Operating instructions / Basics

- The media must ensure a certain minimum amount of lubrication, not contain any solid matter and be chemically compatible. Benzins, solvents, etc. are never permitted.
- In electrostatic chargeable fluids, it is important to follow the instructions provided by the respective fluid manufacturer in order to prevent electrostatic charges.
- The operator must comply with the flash point, minimum ignition temperature and media-specific properties.
- Never have explosive mixtures inside the device.
- Dry running is not permissible.

ATEX-Characteristics

Transfer gear pump	KF 2.5 ...112 with magnetic coupling
In Ex-area max. suitable for category	Ⓔx II 2G T4
Perm. working pressure inlet port	– 0.92 ... + 40 bar / – 13 ... + 580 psi
Perm. working pressure outlet port	40 bar / 580 psi but max. 10 bar / 145 psi over working pressure inlet port (max. 25 bar / 363 psi depending on type of bearing)
Perm. viscosity	12 ... 5000 cSt
Max. speed (affected by viscosity)	3000 rpm
Perm. mounting position	arbitrary
Perm. media temperatures	– 10 ... + 80 °C / +14 ... +176 °F
Perm. ambient temperatures	– 20 ... + 60 °C / – 4 ... +140 °F
Comments	Not suitable for dust-Ex. The temperature on the split case must be monitored with a temperature sensor. Pressures > 25 bar / 363 psi only after approval from Kracht

ATEX-Design

Additional information for the product design in explosion-proof version according to ATEX 95/100 a:

Medium:	Please provide us with the safety data sheet and the technical data sheet for the medium.
Device group I:	☐ M2
Device group II:	☐ 2G, 2D, 3G, 3D
Explosion group:	☐ IIA ☐ IIB ☐ IIC (only for 2G or 3G)
Temperature level:	☐ T1 (450 °C / 842 °F) ☐ T2 (300 °C / 572 °F) ☐ T3 (200 °C / 392 °F) ☐ T4 (135 °C / 275 °F)

Product Portfolio

Transfer Pumps

Transfer pumps for lubricating oil supply equipment, low pressure filling and feed systems, dosing and mixing systems.

Mobile Hydraulics

Single and multistage high pressure gear pumps, hydraulic motors and valves for construction machinery, vehicle-mounted machines.

Flow Measurement

Gear and turbine flow meters and electronics for volume and flow metering technology in hydraulics, processing and laquering technology.

Industrial Hydraulics / Test Bench Construction

Cetop directional control and proportional valves, hydraulic cylinders, pressure, quantity and stop valves for pipe and slab construction, hydraulic accessories for industrial hydraulics (mobile and stationary use).

Technology Test benches / Fluid Test benches.

KF 2.5...112 with magn. coupl. / USA / 08.11

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