

KRACHT

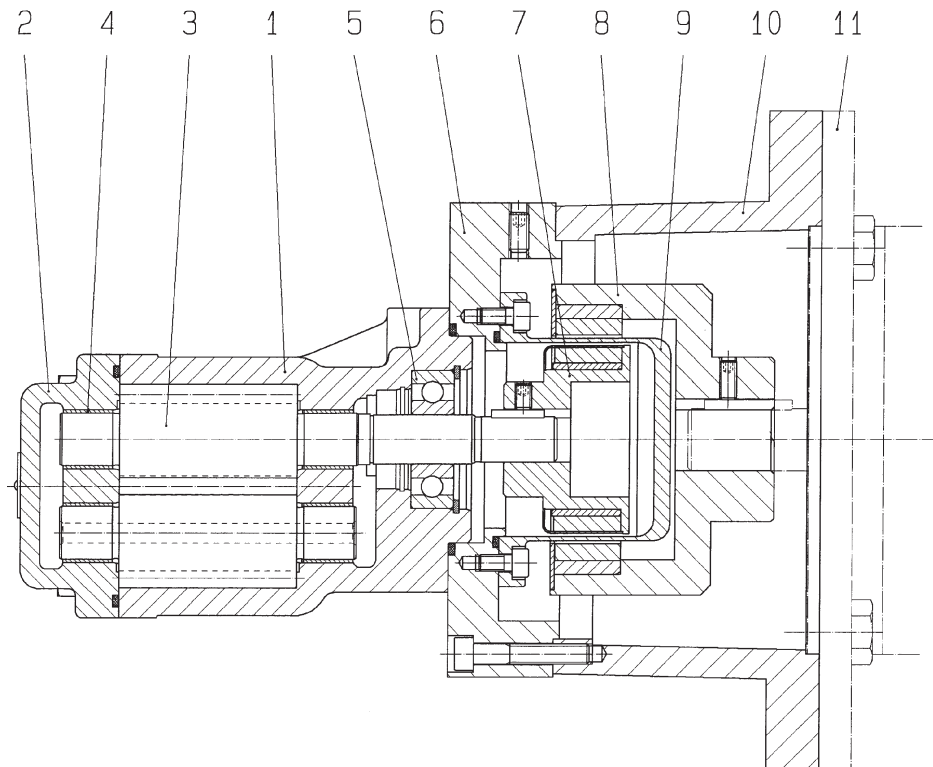


Gear Pumps

KF 2.5 ... 200

with magnetic coupling

Construction



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

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 ... 200 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)
	Gear	16 Mn Cr 5
	Bearing bushes	Multicomponent plain bearings, leaded, DU® P10 Plastic plain bearing, Non-ferrous metal-free, Iglidur®X Babbitt plain bearing (on request) Multicomponent plain bearings unleaded, DP4™ (on request)
	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	MS.46, MS.60: 1.4571 MS.75:... MS.165 1.4571 or Hastelloy Ab MS.75: PEEK* AB MS.110: oxide ceramics*
	Outer rotor	Hub made of 355J2G3 (St 52) Magnet made of Sm2Co17 or NdFeB

* on request (no eddy current loss, high energy efficiency and economy, internal cooling options are not necessary)

Characteristics

Fixing type	flange
Connection type	KF2.5 ... 25 pipe thread, flange connection KF32 ... 200 flange connection
Direction of rotation	clockwise or anticlockwise
Mounting position	optional

Allocation Differential Pressure - Viscosity

Bearing	$\Delta_p \text{ max (bar)}$		
	$v \geq 1.4 \text{ mm}^2/\text{s}$	$v \geq 6 \text{ mm}^2/\text{s}$	$v \geq 12 \text{ mm}^2/\text{s}$
Multicomponent plain bearings leaded (standard) DU, P10	3	12	25
Multicomponent plain bearings unleaded DP4			
Plastic plain bearing Iglidur® X	-	6	10
Babbitt plain bearing TEGO® V738			

Working Characteristics

Nominal sizes	$V_g =$	2.5 / 4 / 5 / 6 / 8 / 10 / 12 / 16 / 20 / 25 / 32 / 40 / 50 / 63 / 80 / 100 / 112 / 125 / 150 / 180 / 200 cm ³ /r	
Working pressure Inlet port Pressure ranges	$p_{e \text{ min}}$ $p_{e \text{ max}}$ $p_{e \text{ max}}$ $p_{e \text{ max}}$ $p_{e \text{ max}}$	- 0.4 bar, vacuum facility - 0.92, standstill -1.0 bar 16 bar (pressure range 1) 25 bar (pressure range 2) 40 bar (pressure range 3) 60 bar (pressure range 4)	
Working pressure Outlet port	$p_{n \text{ max}}$	25 bar see allocation differential pressure - viscosity (page 3)	
Speed	KF 2.5... 63 KF 80... 180 KF 200	n_{min} n_{max} n_{min} n_{max} n_{min} n_{min}	= 200 1/min = 3600 1/min = 200 1/min = 3000 1/min = 200 1/min = 2500 1/min
Viscosity	v_{min} v_{min} v_{min} v_{max} v_{max}	= 1.4 mm ² /s (max. 3 bar) = 6 mm ² /s (max. 12 bar) = 12 mm ² /s (max. working pressure) = 5000 mm ² /s (without flushing) = 1000 mm ² /s (with flushing)	
Media temperature pump	$\vartheta_{m \text{ min}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$	= - 10 °C = 130 °C (EPDM) = 100 °C (CR) = 100 °C (HNBR) = 130 °C (FKM), temperature range A = 150 °C (FKM), temperature range B = 130 °C (FEP), temperature range A = 200 °C (FEP), temperature range A	
Media temperature magnetic coupling	$\vartheta_{m \text{ max}}$ $\vartheta_{m \text{ max}}$	= 150 °C - temperature range A = 300 °C - temperature range B	
Ambient temperature	$\vartheta_{u \text{ min}}$ $\vartheta_{u \text{ max}}$	= - 20 °C (FKM = - 15 °C) = 60 °C	
Nominal torque magnetic coupling (at 20°C and $p_{e \text{ max}} = 25 \text{ bar}$)	MSA 46 MSA 60 MSB 60 MSA 75 MSB 75 MSC 75 MSB 110	3 Nm 7 Nm 14 Nm 10 Nm 24 Nm 40 Nm 60 Nm	MSC 110 95 Nm MSB 135 100 Nm MSC 135 145 Nm MSD 135 200 Nm MSC 165 210 Nm MSD 165 280 Nm

Selection Assistance

Pump	Coupling-size	Perm. power consumption [kW] at n=750 1/min	Motor-size	Perm. power consumption [kW] at n=1000 1/min	Motor-size	Perm. power consumption [kW] at n=1500 1/min	Motor-size	Perm. power consumption [kW] at n=3000 1/min	Motor-size
KF 2.5...25	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	
MSB 75	0.75	100	1.1	90	1.5	90	3.0	100	
	1.1	100	1.5	100	2.2	100	4.0	112	
MSC 75	1.5	112	2.2	112	3.0	100	5.5	132	
	2.2	132	3.0	132	4.0	112	7.5	132	
KF 32...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
	MSB 75	0.75	100	1.1	90	1.5	90	3.0	100
		1.1	100	1.5	100	2.2	100	4.0	112
	MSC 75	1.5	112	2.2	112	3.0	100	5.5	132
2.2		132	3.0	132	4.0	112	7.5	132	
MSB 110	3.0	132	4.0	132	5.5	132	11.0	160	
	4.0	160	5.5	132	7.5	132	15.0	160	
MSC 110	5.5	160	7.5	160	11.0	160	18.5	160	
	–	–	–	–	–	–	–	–	
KF 100...200	MSC 75	1.5	112	2.2	112	3.0	100	5.5	132
		2.2	132	3.0	132	4.0	112	7.5	132
	MSB 110	3.00	132	4.0	132	5.5	132	11.0	160
		4.00	160	5.5	132	7.5	132	15.0	160
	MSC 110	5.50	160	7.5	160	11.0	160	18.5	160
		–	–	–	–	–	–	22.0	180
MSC 135	7.50	160	11.0	160	15.0	160	30.0	200	
	–	–	–	–	18.5	180	37.0	200	
MSD 135	11.00	180	15.0	180	22.0	180	45.0	225	
MSD 165	15.00	200	18.5	200	30.0	200	–	–	
	–	–	22.0	200	–	–	–	–	

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

Sealing no.

- 10 Magnetic coupling without flushing, O-rings EPDM
- 11 Magnetic coupling without flushing, O-rings FKM
- 12 Magnetic coupling without flushing, O-rings CR
- 15 Magnetic coupling with flushing, O-rings FKM
- 16 Magnetic coupling without flushing, O-rings HNBR
- 21 Magnetic coupling without flushing, O-rings FEP
- 25 Magnetic coupling with flushing, O-rings CR
- 27 Magnetic coupling with flushing, O-rings HNBR
- 28 Magnetic coupling with flushing, O-rings EPDM
- 29 Magnetic coupling with flushing, O-rings FEP

Special number for special versions

- 158 SAE 3/4 connections for KF 2.5...12, SAE 1 connections for KF 16...25
- 197 Noise-optimized version for aeriferous oils and vacuum
- 232 SAE 2 connection for KF 50...80, SAE 2 1/2 connections for KF 100...112, SAE 3 connections for KF 125...150, SAE 3 1/2 connections for KF 180...200
- 273 Noise-optimized version for aeriferous oils and vacuums, babbitt bearing, $\Delta p_{max} = 10$ bar
- 304 Bearing bushings Iglidur® X, $\Delta p_{max} = 10$ bar
- 317 Noise-optimized version for aeriferous oils and vacuum, bearing bushings Iglidur® X, $\Delta p_{max} = 10$ bar
- 363 Version for low-viscous media (only in connection with material GJS), bearing bushings Iglidur® X, $v_{min} = 4$ mm²/s at $\Delta p_{max} = 10$ bar, SAE 3/4 connections for KF 2,5...12, SAE 1 connections for KF 16...25
- 391 Noise optimized version for aeriferous oils and vacuum

Option pressure relief valve (safety valve)

- no specification** with cover, without pressure relief valve
- D15 adjustable between 0 – 15 bar
- D25 adjustable between 15 – 25 bar

Ordering example

KF 40 R G 15 /... - D15 - GJS + MSC75 - A 2

Housing and cover material

ohne Angabe EN-GJL-250 (GG-25)
GJS EN-GJS-400-15 (GGG 40)

Coupling size / torque

MSA 46	3 Nm	MSB 75	24 Nm	MSB 135	100 Nm
MSA 60	7 Nm	MSC 75	40 Nm	MSC 135	145 Nm
MSB 60	14 Nm	MSB 110	60 Nm	MSD 135	200 Nm
MSA 75	10 Nm	MSC 110	95 Nm	MSC 165	210 Nm
				MSD 165	280 Nm

Fixing type

G DIN flange with outboard bearing

max. temperature of the magnetic coupling

A 150 °C
B 300 °C

Direction of rotation

R clockwise
L anticlockwise

Pressure ranges magnetic coupling

1 16 bar
2 25 bar
3 40 bar*
4 60 bar*
* only in connection with housing material GJS

Nominal size Vg

2.5/4/5/6/8/10/12/
16/20/25/32/40/50/
63/80/100/112/125/
150/180/200 cm³

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

Gear pump	KF2.5 ... 200 with magnetic coupling
In Ex-area max. suitable for category	⊕ II 2G ck IIC TX
Perm. working pressure inlet port in bar	see working characteristics
Perm. working pressure outlet port in bar	see working characteristics
Perm. viscosity in mm ² /s	12... 1000 (only with flushing)
Perm. mounting position	optional
Perm. media temperatures in °C	- 10 ... + 80
Perm. ambient temperatures in °C	-20 ... +60 (FKM = -15... +60°C)
Comments	Not suitable for dust-Ex. The temperature on the split case must be monitored with a temperature sensor.

ATEX-Design

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

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) T2 (300 °C) T3 (200 °C) T4 (135 °C)

Product Portfolio

Gear Pumps

Gear 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, turbine and screw type 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...200 with magn. coupl./GB/02.15

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