

# KRACHT®

- | Gear Pumps
- | Flow Measurement
- | Hydraulics
- | Valves

Gear Pumps

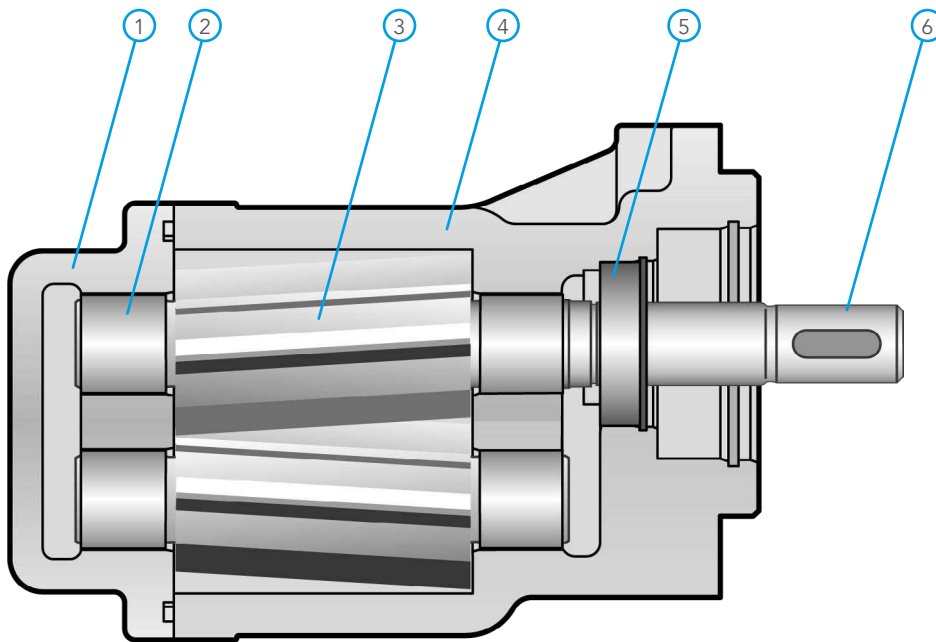
**KF-F 2.5 ... 630**

for fuels



## Description

### I Construction



- 1 End cover
- 2 Plain bearing bushes
- 3 Gear unit
- 4 Housing
- 5 Shaft seal
- 6 Drive shaft end

### I Description

The Type KF-F transfer pumps were developed specifically for use with fuels, especially for marine fuels. These need to be critically considered, especially regarding the lubricity. And above all, those with low sulphur. Diesel fuels (MGO/DMA) exhibit low lubricity, which cannot be determined through the viscosity. Special methods are available for determining the tribological properties.

The HFRR test acc ISO 12156 is a recognised method for measuring the lubricity of diesel fuels. The characteristic value determined using this method is referred to as Wear Scar Diameter (WSD) and increases with decreasing lubricity. This characteristic value is stated by the fuel manufacturers and can be included when assessing the stability of components.

The KF-F fuel pumps are durable up to a WSD value of 520 µm, which is the minimum lubricity of MGO and DMA according to ISO 8217.

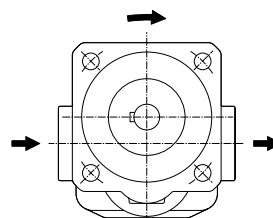
Furthermore, the pumps exhibit extremely good efficiency, especially at high speeds.

The KF-F pumps can be used without restrictions for pumping fuels with low sulphur content, MGO/DMA (gas oil) acc ISO 8217 (see working characteristics).

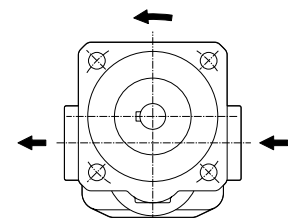
### Direction of Rotation

The following should be note for direction of rotation:

- when looking at the pump shaft end, the direction of pumping is from left to right if the shaft rotates clockwise.
- when looking at the pump shaft end, the direction of pumping is from right to left if the shaft rotates counterclockwise.



suction side    pressure side  
pump running cw



pressure side    suction side  
pump running ccw

## Technical data

### I Materials

|                   |  |
|-------------------|--|
| Housing and cover | EN-GJS-400-15 (GGG 40)   |
| Gear              | Steel 1.7139   |
| Bearing           | Multi-layer friction type bearing  |
| Shaft end seals   | Rotary shaft lip-type seal FKM<br>Mechanical seal FKM<br>Magnetic coupling |
| O-rings           | FKM  |

### I Properties of fuels

|   |   |
|---|---|
| Viscosity                                       | $v_{\min} = 1,2 \text{ mm}^2/\text{s}$<br>$v_{\max} = 20\,000 \text{ mm}^2/\text{s}$ (dependent on pressure, speed and lubricity) |
| Lubricity HFRR-test<br>(according to ISO 12156) | WSD $\leq 520 \mu\text{m}$ (meet the requirements of ISO 8217 for marine fuels)   |

### I Characteristics

|                              |   |
|------------------------------|---|
| Nominal sizes                | 2,5 ... 630   |
| Direction of rotation        | right <b>or</b> left  |
| Fixing type                  | flange (DIN ISO 3019)   |
| Pipe connection              | KF-F 2,5 ... 25 Whitworth-pipe thread, SAE flange<br>KF-F 32 ... 630 SAE flange   |
| Drive shaft end              | ISO R 775 short-cylindrical   |
| Fuel temperature             | -10 ... 150 °C  |
| Ambient temperature          | -20 ... 60 °C   |
| Working pressure inlet port  | see chart page 5  |
| Working pressure outlet port | $p_{\max} = 12 \text{ bar}$ at $v = 1,2 \text{ mm}^2/\text{s}$ für 2,5 ... 630 $\text{cm}^3$<br>$p_{\max} = 25 \text{ bar}$ at $v \geq 12 \text{ mm}^2/\text{s}$ (dependent on viscosity)   |
| Driving Speed                | 2,5 ... 63 $\text{cm}^3$ $n = 200 \dots 3600 \text{ rpm}$<br>80 ... 180 $\text{cm}^3$ $n = 200 \dots 3000 \text{ rpm}$<br>200 $\text{cm}^3$ $n = 200 \dots 2500 \text{ rpm}$<br>250 ... 630 $\text{cm}^3$ $n = 200 \dots 2000 \text{ rpm}$<br>(observe the restricted drive speed for higher viscosities) |
| Volumetric efficiency        | strongly dependent to drive speed, viscosity and pressure Example:<br>6 bar, 2 $\text{mm}^2/\text{s}$ , 1450 rpm: $\eta > 70\%$<br>6 bar, 2 $\text{mm}^2/\text{s}$ , 3600 rpm: $\eta > 90\%$  |

## Technical data

### I Operating parameters

| Nominal size | geom. displacement   | Working pressure*<br>at $v \geq 12\text{mm}^2/\text{s}$ | Maximum pressure | Speed range |      | Sound level          |                      |           |
|--------------|----------------------|---|------------------|-------------|------|----------------------|----------------------|-----------|
|              | cm <sup>3</sup> /rev |   |                  | bar         | bar  | $n_{\min}$<br>at rpm | $n_{\max}$<br>at rpm | p = 5 bar |
| 2,5          | 2,55                 | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 4            | 4,03                 | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 5            | 5,05                 | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 6            | 6,38                 | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 8            | 8,05                 | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 10           | 10,11                | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 12           | 12,58                | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 16           | 16,09                | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 20           | 20,10                | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 25           | 25,10                | 25  | 40               | 200         | 3600 | ≤65                  | ≤66                  | ≤67       |
| 32           | 32,12                | 25  | 40               | 200         | 3600 | ≤67                  | ≤68                  | ≤68       |
| 40           | 40,21                | 25  | 40               | 200         | 3600 | ≤67                  | ≤68                  | ≤68       |
| 50           | 50,20                | 25  | 40               | 200         | 3600 | ≤67                  | ≤68                  | ≤68       |
| 63           | 63,18                | 25  | 40               | 200         | 3600 | ≤67                  | ≤68                  | ≤68       |
| 80           | 80,50                | 25  | 40               | 200         | 3000 | ≤67                  | ≤68                  | ≤69       |
| 100          | 101,50               | 25  | 40               | 200         | 3000 | ≤67                  | ≤68                  | ≤69       |
| 112          | 113,50               | 25  | 40               | 200         | 3000 | ≤67                  | ≤68                  | ≤69       |
| 125          | 129,40               | 25  | 40               | 200         | 3000 | ≤70                  | ≤70                  | ≤70       |
| 150          | 155,60               | 25  | 40               | 200         | 3000 | ≤70                  | ≤70                  | ≤70       |
| 180          | 186,60               | 25  | 40               | 200         | 3000 | ≤70                  | ≤70                  | ≤70       |
| 200          | 206,20               | 25  | 40               | 200         | 3000 | ≤70                  | ≤70                  | ≤70       |
| 250          | 245,10               | 25  | 40               | 200         | 3000 | ≤75                  | ≤75                  | ≤75       |
| 315          | 312,90               | 25  | 40               | 200         | 3000 | ≤75                  | ≤75                  | ≤75       |
| 400          | 399,50               | 25  | 40               | 200         | 3000 | ≤77                  | ≤77                  | ≤77       |
| 500          | 496,50               | 25  | 40               | 200         | 3000 | ≤77                  | ≤77                  | ≤77       |
| 630          | 622,50               | 25  | 40               | 200         | 2500 | ≤80                  | ≤80                  | ≤80       |

#### Remark:

\* Working pressure  $p_b$  = perm. sustained pressure  
 For certain working conditions, the minimum or maximum characteristics should not be used.  
 For example, the max. working pressure is not permissible in combination with low speed and low viscosity.

In such limit ranges, please consult us.

Sound level: measured in dB(A) at 1 m distance /  
with drive motor

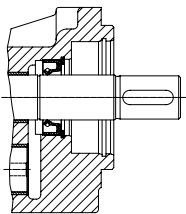
Installation site: Works hall, quiet sound level = 40 dB(A),  
 Pump assembly on rigid fastening angle,  
 Suction and pressure conduits:  
 Hose Measured with transmission oil,  
 Oil viscosity  $v = 34\text{ mm}^2/\text{s}$

## Technical data

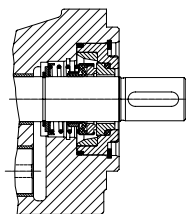
### I Shaft End Seals

|  | Speed         | Pressure inlet port |              |                     |              |                     |                     | Fuel temperature |
|--|---------------|---------------------|--------------|---------------------|--------------|---------------------|---------------------|------------------|
|  |               | bar                 |              |                     |              |                     |                     | °C               |
|  |               | KF-F<br>2,5 ... 63  | KF-F<br>80   | KF-F<br>100 ... 180 | KF-F<br>200  | KF-F<br>250 ... 315 | KF-F<br>400 ... 630 |                  |
| Pump with<br>rotary shaft lip-type seal<br>and<br>double rotary shaft<br>lip-type seal | max. 750 rpm  | -0,4 ... 6,0        | -0,4 ... 6,0 | -0,4 ... 6,0        | -0,4 ... 6,0 | -0,4 ... 5,5        | -0,4 ... 5,0        | -20 ... 150      |
|  | max. 1000 rpm | -0,4 ... 5,0        | -0,4 ... 5,0 | -0,4 ... 5,0        | -0,4 ... 5,0 | -0,4 ... 4,5        | -0,4 ... 4,0        | -20 ... 150      |
|  | max. 1500 rpm | -0,4 ... 4,0        | -0,4 ... 4,0 | -0,4 ... 3,5        | -0,4 ... 3,5 | -0,4 ... 3,0        | -0,4 ... 2,5        | -20 ... 150      |
|  | max. 2000 rpm | -0,4 ... 3,0        | -0,4 ... 3,0 | -0,4 ... 2,5        | -0,4 ... 2,5 | -0,4 ... 2,0        | -0,4 ... 1,5        | -20 ... 150      |
|  | max. 2500 rpm | -0,4 ... 2,5        | -0,4 ... 2,5 | -0,4 ... 2,0        | -0,4 ... 2,0 | –                   | –                   | -20 ... 150      |
|  | max. 3000 rpm | -0,4 ... 2,0        | -0,4 ... 2,0 | -0,4 ... 1,5        | –            | –                   | –                   | -20 ... 150      |
|  | max. 3600 rpm | -0,4 ... 1,5        | –            | –                   | –            | –                   | –                   | -20 ... 150      |
| Pump with<br>mechanical seal   |               | -0,4 ... 10,0       |              |                     |              |                     |                     | -20 ... 150      |
| Pump with<br>magnetic coupling   |               | see page 9          |              |                     |              |                     |                     | -20 ... 150      |

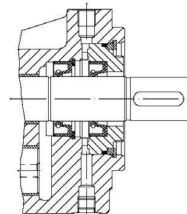
### I Variants



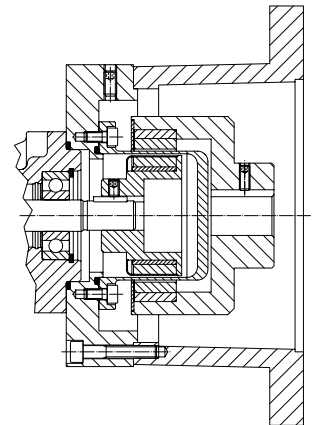
Pump with  
rotary shaft lip-type seal  
Type of seal 2



Pump with mechanical seal  
Type of seal 5



Pump with  
double rotary shaft lip-type seal  
Type of seal 7



Pump with magnetic coupling

## Type key

### Example

|             |           |          |          |          |   |             |   |             |            |
|-------------|-----------|----------|----------|----------|---|-------------|---|-------------|------------|
| <b>KF-F</b> | <b>40</b> | <b>R</b> | <b>F</b> | <b>2</b> | - | <b>/...</b> | - | <b>D 15</b> | <b>GJS</b> |
| 1           | 2         | 3        | 4        | 5        |   | 6           |   | 7           | 8          |

| 1 Product                    |   |
|------------------------------|---|
| 2 Nominal size               |   |
| 2,5 ... 630                  |   |
| 3 Direction of rotation      |   |
| <b>B</b>                     | right and left (Delivery direction changes)           |
| <b>L</b>                     | left  |
| <b>R</b>                     | right   |
| 4 Mounting                   |   |
| <b>F</b>                     | DIN flange without outboard bearing                   |
| <b>G</b>                     | DIN flange with outboard bearing                      |
| <b>W</b>                     | Angle foot without outboard bearing (KFF 2,5 ... 200) |
| <b>X</b>                     | Angle foot with outboard bearing (KFF 2,5 ... 200)    |
| 5 Sealing                    |   |
| <b>2</b>                     | Rotary shaft lip-type seal FKM                        |
| <b>5</b>                     | Mechanical seal with FKM secondary seals              |
| <b>7</b>                     | Double rotary shaft lip-type seal FKM                 |
| <b>40</b>                    | Gleitringsdichtung mit FKM-Nebendichtungen            |
| 6 Special No.                |   |
| <b>158</b>                   | KF-F 2,5 ... 12 SAE 3/4"-connection                   |
| <b>158</b>                   | KF-F 16 ... 25 SAE 1"-connection                      |
| <b>232</b>                   | KF-F 50 ... 80 SAE 2"-connection                      |
| <b>232</b>                   | KF-F 100/125 SAE 2 1/2"-connection                    |
| <b>232</b>                   | KF-F 125/150 SAE 3"-connection                        |
| <b>232</b>                   | KF-F 180/200 SAE 3 1/2"-connection                    |
| 7 Pressure valve             |   |
| <b>D15</b>                   | adjustable from 0 ... 15 bar                          |
| <b>D25</b>                   | adjustable from 15 ... 25 bar                         |
| 8 Housing and cover material |   |
| <b>GJS</b>                   | EN-GJS-400 (GGG 40)                                   |

## Notes

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## I Gear Pumps

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



## I 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.



## I Hydraulics

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



## I Valves

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



# KRACHT®

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