

Marine Products



KRACHT

Gear pumps, flow measurement, hydraulics and valves for marine applications – with an extremely high level of reliability and economy



We provide solutions for

Engines

- · Main and pre-lubrication pumps, hydraulic manifolds, pressure relief valves
- Fuel pumps
- Pressure relief and regulation valves for lubricating oil and fuel circuits
- Flow meters for lubricating oil and fuel measurement

Gearboxes

- Lubricating oil gear pumps (mechanically or electrically driven)
- Pressure relief valves for lube oil monitoring
- Hydraulic manifolds and pressure valves for clutch control

Compressors

- Lubricating oil gear pumps
- Oil pressure control valves

Fuel oil supply module

- Fuel pumps and valves
- Flow meters for fuel consumption measurement

Propellers and thrusters

- Low pressure gear pumps for lubrication
- Motor-pump assemblies for stern tube seal lubrication
- High pressure gear pumps for controllable pitch propeller operation (CPP)

Valve remote control systems

- Valve position indicator VOLUMEC
- Valve position measuring instrument VOLUTRONIC[®]

In close cooperation with our customers, we have developed specific solutions for a wide range of fluid engineering challenges.

6

cl

cl

Benefit from our developments! Talk to us, we are happy to advise you.



Your global partner for fluid solutions – since 1911.

Marine

Gear pumps for lubricating oil systems

I Gear lubrication

Characteristics and versions

- Inspection certificate EN10204-3.2 from classification authorities upon request
- Noise optimized for air containing oils
- Working pressure ... 315 bar; ISO oils up to VG 460
- Outboard bearing for direct mounting on the gearbox and for absorption radial forces (Fig. 1)
- With nozzle in shaft end for gear lubrication
- High efficiency over large speed ranges
- High cold start viscosities at high idling speed
- Low temperature version ambient temperature down to -50°C
- Versions in EN-GJL-250 (grey cast iron) and EN-GJS-400-15 (spheroidal cast iron)
- With SAE shaft and SAE connection flanges
- Optionally with flanged pressure valve / pressure relief valve / universal valve
- (universal valve = changing direction of rotation consistent discharge flow) (Fig. 2)
- Complete pump unit with electric motor (Fig. 3)



Electrically driven pump KF 3/112 Mechanically driven pumpe KF 3/63

Fig. 1



Gear pump with universal valve

Fig. 2



Gear pump unit with pressure relief valve

Fig. 3

I Engine lubrication (Main lubrication and pre-lubrication pumps)

Characteristics and versions

- Version as pre-lubrication pump units with high efficiency motors (Fig. 1)
- Versions with electrical or mechanical drive (Fig. 2) as main or pre-lubrication pump with integrated pressure relief valve
- Displacement volume according to customer requirements (special pumps)
- Pumps with outboard bearing for withstanding radial forces (pinion gear drive)
- High efficiency over large speed ranges
- Noise optimized for air containing oils

Gear pumps

Displacement	0.5 3 150 cm ³ /rev	
Δρ	50 bar	
Speed	3 600 rpm	
Viscosity	1.4 20 000 mm ² /s	
Seals	Single radial lip-type seal	
	Mechanical seal	
	Magnetic coupling	
Option	More than 500 special versions	



Fig. 1



Fig. 2

High pressure gear pump

Special pump

Main lubrication pump with integrated pressure control valve and driving gear

Displacement	3 200 cm ³ /rev	
Working pressure	25 bar	
Speed	3 600 rpm	
Option	Pressure control valve	

	G
Pre-lubrication pump Gear pump with pressure relief valve	

High pressure gear pumps

Displacement	1.5 300 cm ³ /rev	
Δр	315 bar	
Speed	4 000 rpm	
Viscosity	30 5 000 mm ² /s	
Seal	Single radial lip-type seal	
Material	Spheroidal cast iron (EN-GJS-400)	



Gear pumps for marine fuels

I Fuel pump KFF

Characteristics and versions

- Inspection certificate EN 10204-3.2 from all classification authorities upon request
- For marine diesel (MDO), heavy fuel oil (HFO) and marine gas oil (MGO) (Fig. 1)
- Optional with magnetic coupling for a high level of operational security and long life (Fig. 2)
- Special execution for low viscous and low sulphur fuels

Housing and Cover: Spheroidal cast iron (EN-GJS-400-15)	
2.5 630 cm ³ /rev	
p _{max} = 12 bar at 1.2 mm ² /s p _{max} = 25 bar at 12 mm ² /s	
200 3 600 rpm	
Rotary shaft lip-type seal FKM Mechanical seal FKM Magnetic coupling	

Fuel characteristics

Viscosity	1.2 20 000 mm ² /s (depending on pressure, speed and lubricity)	
Lubricity HFRR-test * (according to ISO 12156)	WSD \leq 520 μm (meet the requirements of ISO 8217 for marine fuels)	

* 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.



Gear Pump KFF with magnetic coupling (pump unit)

Fig. 2



Redundant gear pump units **KF**

Fig. 1

Fuel oil supply modules



Fuel oil supply modules are used for the supply for diesel engines and tied into fuel system between day tank and the engine.

Our components:

- Feeder pump KF
- Booster pump KF
- Flow meter VC 5 Booster
- Pressure relief valve SPV

Multiple pumps Hydraulic manifolds

I Multiple pumps

Characteristics and versions

- Opposite direction of flow possible
- Different sizes and types together with KRACHT pumps combinable (KF + KF / KP + KF / KP + KP)
- Acceptance of classification authorities upon request
- Hydraulically separated



Low pressure gear pump KF + Low pressure gear pump KF



Low pressure gear pump KF + High pressure gear pump KP



High pressure gear pump **KP** + High pressure gear pump **KP**

I Hydraulic manifolds for gearbox clutch operation

Versions according to customer specifications

- Complete hydraulic controls of clutches
- Purely mechanical versions possible
- Adjustable pressure curves
- Optional with manual emergency override



Pressure build-up curves





Marine

Valves for lubricating oil systems

- I Pressure regulation and control valves
- I Pressure relief valves
- I Directional control valves

Pressure relief valves SPV/SPVF

- Inspection certificate EN 10204-3.2 from classification authorities upon request
- Directly operated pressure relief valve
- For protecting lubricating oil systems with tank connection
- Applicable for pretension of lubricating oil systems
- ATEX version available
- EN-GJL-300 (GG 30) or EN-GJS-400 (GGG 40)

Flow rate	800 l/min	
Pressure setting	30 bar	
Viscosity	1.2 2 000 mm ² /s	



Pressure relief valve SPVF

Directional control valves

WL

with inspection certificate according to EN 10204-3.1

Nominal Size	Flow rate	Nominal pressure	Media temperature
04	20 l/min	320 bar	-30 80 °C
06	80 l/min	320 bar	-30 80 °C
10	140 l/min	350 bar	-30 80 °C
16	250 l/min	350 bar	-30 80 °C
20/25	700 l/min	350 bar	-30 80 °C



Directional control valves **WL**

Pressure valves

DV

- For pressure regulation in various applications in hydraulic, lubricating oil and fuel systems
- Control oil connections allow external pressure control or relief
- Available with inspection certificate EN 10204-3.2 from classification authorities

Flow rate	5 000 l/min
Nominal pressure	max. 210 bar
Viscosity	4 2 000 mm ² /s

Pressure stage control valve $\ensure{DV S}$

Control valve, e.g. as a coupling control valve for large gears for switching between two or three pressure stages with a magnetic directional control valve.





Pressure valve **DV**



Pressure relief valve DV B

Pressure control valve

Pressure regulation of, e.g., lubricating oil circuits in gears

hydraulic signal pressure.

and diesel engines with external

DV R

Pressure relief valve or pressure retention valve for lubricating oil, fuel and hydraulic systems (optionally with internal magnetic 2-2 directional control valve for reduced pressure circulation).

Flow meters for control and regulation of fuel and oil systems

I Gear type flow meters

VC VC 0.025 ... VC 16 – Spheroidal cast iron VC 0.025 ... VC 5 – Stainless steel

Measuring range	0.001 700 l/min	
Measuring ratio	1:300	
Maximum pressure	480 bar	
Viscosity	2 500 000 mm²/s	
Fluid temperature	-60 220°C	
Measuring accuracy	± 0.3% deviation from measured value	
Sensor resolution	62.5 40 000 Imp./I	
Electrical output	2 incremental signals 90° out of phase	
Options	ATEX version	
	Significantly increased measured value resolution	
Applications	 Measuring of fuel consumption Curve tracing of hydraulic components Filling of gear lubricants Indirect, volumetric cylinder stroke measurement Measurement of extremely small volumes 	



Gear type flow meter VC

VCA VCA 0.04 ... VCA 5 – Aluminium

Measuring range	0.02 200 l/min	
Measuring ratio	1 : 200	
Maximum pressure	240 bar	
Viscosity	4 000 mm ² /s	
Fluid temperature	-10 80 °C	
Measuring accuracy	± 1 % deviation from measured value	
Electrical output	1 incremental signal	
Applications	 Lubrication oil control Measuring of fuel consumption Cylinder stroke measurement 	



Gear type flow meter VCA

I Gear type flow meter

VC 5 BOOSTER for fuel consumption measurement in fuel supply modules

- Space-optimized design
- Inline version
- Detached electronics for secure evaluation outside the hot areas
- Housing material spheroidal cast iron (GJS 400)
- SAE 1" connection
- Usable for all marine fuels

Measuring range	1 160 l/min	
Maximum pressure	240 bar	
Media temperature	150°C	
Ambient temperature	80°C	



Gear type flow meter VC 5 BOOSTER

I Screw type flow meters

SVC

SVC 4 ... 250 – Spheroidal cast iron

Measuring range	0.4 3 750 l/min	
Measuring ratio	1 : 150	
Maximum pressure	480 bar	
Viscosity	2 500 000 mm²/s	
Fluid temperature	-40 220°C	
Measuring accuracy	± 0.2 % deviation from measured value	
Sensor resolution	54.8 3921.6 Imp./l	
Options	ATEX version	
	Significantly increased measured value resolution	
Applications	– Measuring of fuel consumption	



Screw type flow meter svc

Marine

Flow meters for complete fuel consumption measurement



Individual customer solutions on request

I Valve position indicators for valve remote control systems



Channel I Channel II



Valve position indicator VOLUMEC

Valve position measuring instrument **VOLUTRONIC®**

Design	Gear type volume counter	Gear type volume counter
Max. flow rate	Size 02: 4 l/min Size 04: 7 l/min Size 5: 150 l/min	0.25 up to 10 l/min
Max. working pressure	Size 02 / 04: 200 bar Size 5: 300 bar	160 bar
Display	Mechanical	By downstream electronic
Current-independent display	Yes	_
Current-independent position detection	Yes	No
Leakage detection	Yes	By downstream electronic
Reset function	At slipping coupling	By downstream electronic
Calibration to actuator size	By gear reducing	By downstream electronic
Flow direction	To be defined	A-B / B-A
Error message	No	By downstream electronic

160 bar
By downstream electronic possible
-
No
By downstream electronic possible
By downstream electronic possible
By downstream electronic possible
A-B / B-A
By downstream electronic possible

Hydraulic manifolds

Description

HB 4 0311

- Double pilot operated check valve for holding the actuator position
- Two pressure relief valves for limiting the pressure caused by increased temperature
- Throttle valve in port A for speed regulation of the actuator
- Check valve for filling the piping to avoid wrong indications when temperature fluctuates



HB 4 0324

- Check valve in P for holding the actuator position when switching parallel actuators
- Check valve in T to avoid indicator fluctuations due to pressure pulsation
- One temperature pressure relief valve for limiting the pressure caused by increased temperature
- Throttle valve in port A for speed regulation of the actuator
- Check valve for filling the piping to avoid wrong indications when temperature fluctuates



Schematics



Your partner since 1911

I More than 100 years of experience make us stand out as a reliable partner.

We are a leading German manufacturer of gear pumps, flow measurement, hydraulics and valves. More than 350 employees worldwide design, produce and sell products in both standard versions as well as special solutions tailor-made to customer wishes.

These high-quality components are used for gear lubrication, for instance in wind power plants and ship gears, in dosing and mixing plants e.g. for manufacturing PU foams, and in test bench technology. Our hydraulic components are defined by their performance and economic efficiency in stationary and mobile plants.

Reliability and high-quality standards are just as important a part of the corporate philosophy as fairness to customers, suppliers and employees alike.

1911	Registration in the trade register under the name "Hillebrand & Kracht OHG"
1971	Construction of today's company premises on a total area of over 50.000 square meters
1983 1993	Sale through the Swedish group BAHCO through Investment- holding Industrievarden to the COMAC Group
1992	Purchase of a gear manufacturer in Hungary, now KRACHT Hidraulik Kft.
1995	First certification according to DIN EN ISO 9001, KRACHT Hidraulik Kft., Budapest according to DIN EN ISO 9002 by Lloyd`s Register Quality Company
1996	KRACHT is once again in private ownership
1999	Mr. Peter Zahn becomes 100% proprietor of KRACHT GmbH
2000	First certification according to DIN EN ISO 14001
2002	Mr. Heiko Zahn is appointed as Second Managing Partner
2003	Certification based on the ATEX Directive 2014/34/EU
2008	In New York, USA the KRACHT Corporation is founded
	Establishment of the subsidiary in Shanghai, China
2011	Opening of the in-house health centre on a area of approximately 300 square meters
October 2011	The company KRACHT has existed for 100 years
2012	In December, KRACHT was certified by the German Federal Department of Aviation (LBA) and now has the status "known consignor"
2015	KRACHT is certified according to AEOF
2016	Construction of the 3.500 square meter logistics center



Certificate of incorporation of today's Kracht GmbH

KRACHT

Machinery

I Housing and cover production

The main components of our products comprise the housing and the cover. These components are manufactured in all sizes from casts (GG-25 to GGG-40) as well as from stainless steel or aluminium. The dimensional accuracy of the components in the entire material spectrum lies in the μ m-range.

All housings and covers are fabricated completely on our modern horizontal Mazak machining centres. The constant coolant temperature stabilization, a cooling system for the ball roller spindles and a linear system for all axes guarantees the precision and high quality.

I Gear production

Since our components are highly complex and high requirements are placed on the quality of the workpieces, the manufacture of gearing poses a special challenge.

We are perfectly up to the challenge.

We manufacture our products on modern gear hobbing machines, generating grinding machines, profile grinders and on external cylindrical and internal cylindrical grinders. Prefabricated rotating blanks are prepared and machined on CNC-gear hobbing machines with vertical workpiece axis. The external cylindrical machining is undertaken on CNC-angular plunge-cut tables. This grinding technology is highly versatile and its enormous productivity simultaneously impressive. We are capable of grinding nearly any workpiece contours with one, single grindstone – in one, single clamping restraint. After completing the external To reduce the clamping and setup times, all the machines are equipped with multi-palettes and have machine-monitoring systems for fully-automatic machining. The machining tools in use are ceramic, CBN or TIN coated.

cylindrical machining, the gear sections are conclusively ground on CNC-tooth profile sharpening machines with the generation grinding method.

The measuring equipment integrated in the machinery facilitates measuring all relevant tooth dimensions. That greatly reduces



the setup times when setting up new machining jobs.



Kracht guarantees the highest product quality. As part of the quality process, the function and working parameters are tested according to DIN EN 10204.

KRACHT GmbH, Werdohl certified according to DIN EN ISO 9001 DIN EN ISO 14001 ATEX 2014/34/EU

Marine

Main ideas

I Fair – reliable – competent

We have been developing, designing and manufacturing high-quality products for more than 100 years. Special solutions are implemented in close cooperation with our customers. Just in time performance and full comprehensive service are our top priorities.



Marine

Sales

International



We are ready to support you around the world with the professional mastery of specific applications and complete solutions. A closely woven network of subsidiaries and distributors guarantees expert advice and optimal customer service.

Czech Republic Denmark Germany Hong Kong Indonesia

Australia

Austria

Belgium

Canada

China

Finland

France

Holland

Hungary India

Italy

Japan

Korea

Brazil

Luxembourg

Malaysia

New Zealand

Norway

Poland

Portugal

Russia

Singapore

Slovakia

Slovenia

South Africa

Spain

Sweden

Switzerland

Taiwan

Turkey

United Arab Emirates

United Kingdom

USA



Notes





Notes



I 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.

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.

Valves

Pressure, quantity and flow valves in pipe and plate construction. Directional control and proportional valves according to Cetop. Hydraulic manifolds.













