EN

Marine products

KRACHT®
FLUID TECHNOLOGY AND SYSTEMS

KRACHT®

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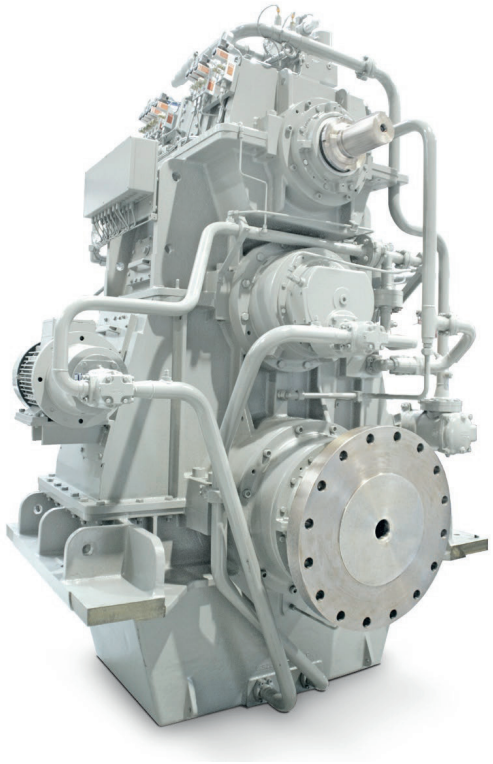
Content

Gear pumps for lubricating oil systems

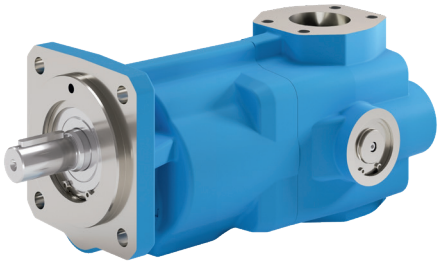
I Gear lubrication

Characteristics and versions

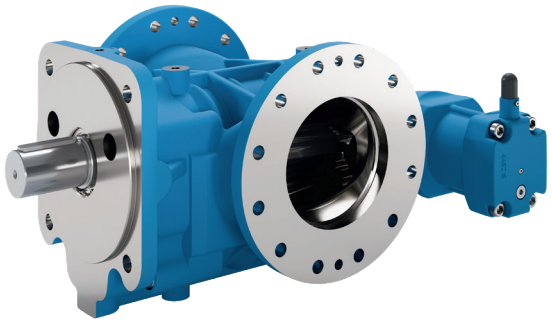
- Inspection certificate EN10204-3.2 from classification authorities upon request
- Noise optimized for air containing oils
- Working pressure … 315 bar; ISO oils up to VG 460
- Outboard bearing for direct mounting on the gearbox and for absorption radial forces
- With nozzle in shaft end for gear lubrication
- 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)
- Complete pump unit with electric motor



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



Gear pump with universal valve



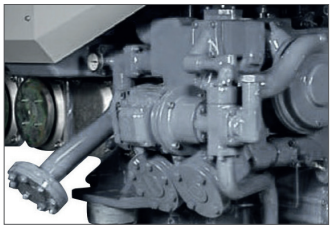
Gear pump unit with pressure relief valve

Gear pumps for lubricating oil systems

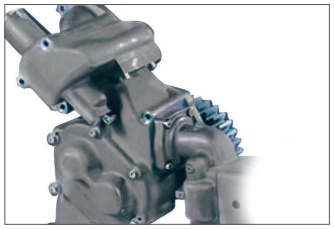
Engine lubrication

Characteristics and versions

- Version as pre-lubrication pump units with high efficiency motors (**1**)
- Versions with electrical or mechanical drive (**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



1 Pre-lubrication pump units with high efficiency motor



2 Version with electrical or mechanical drive

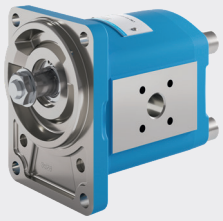
Gear pumps KF

> Displacement	0.5 … 3 150 cm^3/rev
> Temperature range	-40 … 200 °C
> Maximum pressure	120 bar

Characteristics

Δp	… 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

High pressure gear pumps KP

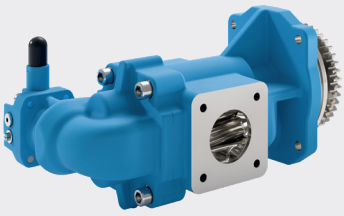


> Displacement	1.4 … 300 cm^3/rev
> Temperature range	-20 … 150 °C
> Maximum pressure	315 bar

Characteristics

Δp	… 315 bar
Speed	… 4 000 rpm
Viscosity	30 … 5 000 mm^2/s
Seals	Single radial lip-type seal

Special pumps SOP



> Displacement	… 3 200 cm^3/rev
> Speed	… 3 600 rpm
> Maximum pressure	25 bar

Characteristics

Option	Pressure control valve

Gear pumps for marine fuels

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) (**1**)
- Optional with magnetic coupling for a high level of operational security and long life (**2**)
- Special execution for low viscous and low sulphur fuels

Characteristics

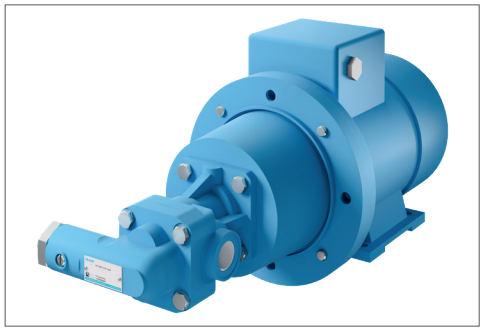
Displacement	2.5 … 630 cm^3/rev
Working pressure	p_{max} = 12 bar at 1.2 mm^2/s p_{max} = 25 bar at 12 mm^2/s
Speed	200 … 3 600 rpm
Seals	Rotary shaft lip-type seal FKM Mechanical seal FKM Magnetic coupling

Fuel characteristics

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

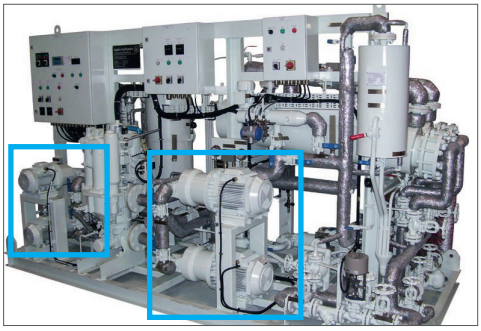
* The HFRR test acc. ISO 12156 is a recognised method for measuring the lubricity of diesel fuels. The characteristic value determined using this method is referred to as Wear Scar Diameter (WSD) and increases with decreasing lubricity. This characteristic value is stated by the fuel manufacturers and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

1 Redundant gear pump units KF



2 Gear Pump KFF with magnetic coupling (pump unit)

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.

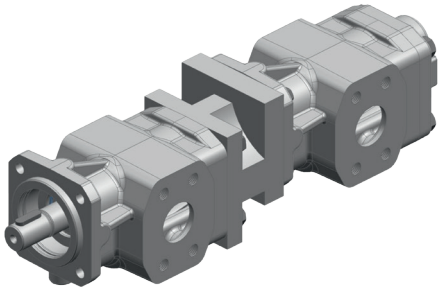
Our components:
- Feeder pump KFF
- Booster pump KFF
- Flow meter VC 5 Booster
- Pressure relief valve SPV

Multiple pumps / Hydraulic manifolds

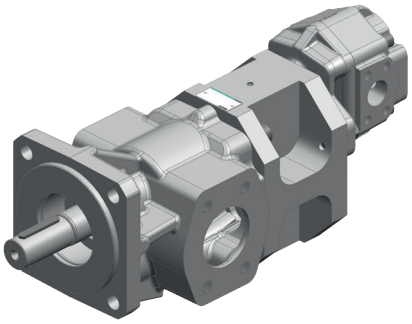
Multiple pumps

Characteristics and versions

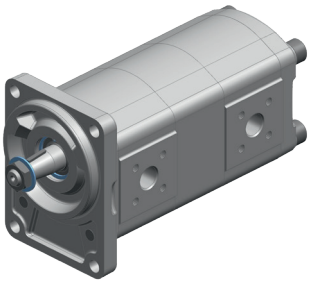
- Opposite direction of flow possible
- Different sizes and types together with KRACHT pumps combinable (KF + KF / KP + KF / KP + KP)
- Acceptance of classification authorities upon request
- Hydraulically separated



Low pressure gear pump KF
+ Low pressure gear pump KF



Low pressure gear pump KF
+ High pressure gear pump KP

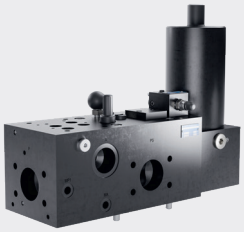


High pressure gear pump KP
+ High pressure gear pump KP

Hydraulic manifolds for gearbox clutch operation

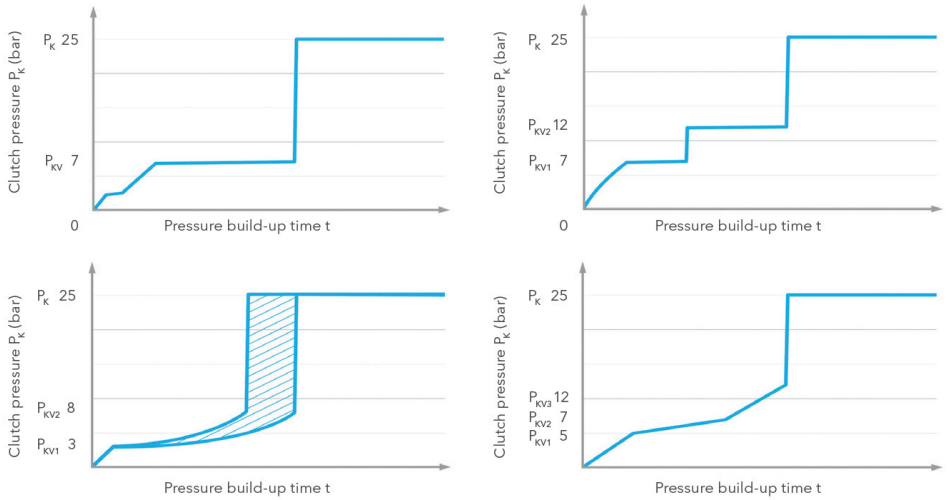
Versions according to customer specifications

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



> Volume flow	… 3 000 l/min
> Temperature range	-30 … 200 °C
> Nominal pressure	… 480 bar

Pressure build-up curves



Valves for lubricating oil systems

General

Pressure relief valves prevent system overloads. Depending on the operating pressure, volume flow, viscosity etc., appropriate valve solutions are available for all framework conditions, be it for rapid buffering of pressure peaks or extreme flow-off requirements.

SPV/SPVF

The SPV/SPVF pressure relief valve is a directly controlled slide valve for installation in pipelines and is used to safeguard low-pressure hydraulic circuits. The line connection can be made using SAE flanges (3000 psi) or Whitworth pipe threads (G).

> Volume flow	40 … 800 l/min
> Temperature range	-40 … 220 °C
> Nominal pressure	… 30 bar

Characteristics

Viscosity	1.2 … 1 000 m^2/s
Applications	Protection of low-pressure hydraulic circuits

Product characteristics

- > 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)

WL

Our directional control valves have the task to direct the hydraulic fluid in a specific direction and thereby connecting or shutting off the relevant connections. This controls the movement of the actuators in a hydraulic system.

> Volume flow	… 700 l/min
> Temperature range	-30 … 80 °C
> Nominal pressure	… 350 bar

Characteristics

Viscosity	13 … 400 mm^2/s

Product characteristics

- > With inspection certificate according to EN 10204-3.1

Valves for lubricating oil systems

I 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

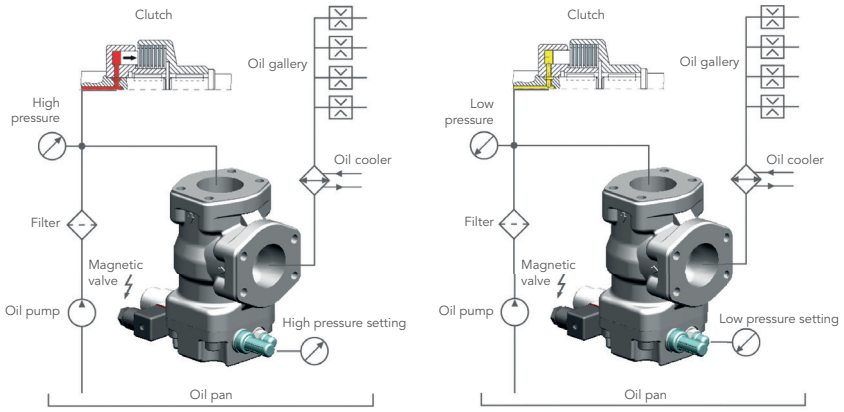
Characteristics

Viscosity	4 … 2 000 mm²/s

> Volume flow	800 … 1 800 l/min
> Temperature range	-15 … 150 °C
> Nominal pressure	… 210 bar

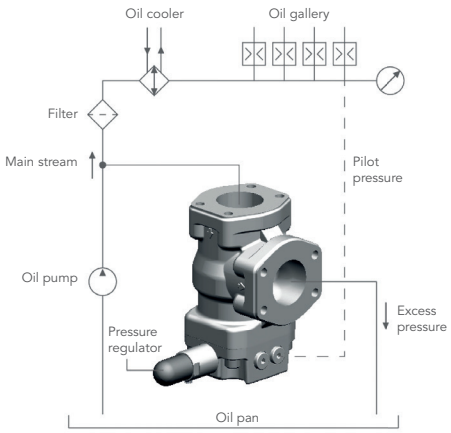
Pressure stage control valve DV S

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.



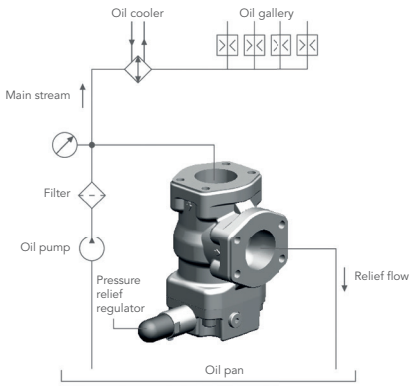
Pressure control valve DV R

Pressure regulation of, e.g., lubricating oil circuits in gears and diesel engines with external hydraulic signal pressure.



Pressure relief valve DV B

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

Gear type flow meters VC

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

Application-optimized specifications with differing clearances, bearing variants and materials.

> Measuring range	0.003 … 700 l/min
> Temperature range	-60 … 210 °C
> Maximum pressure	480 bar

Characteristics

Measuring ratio	1 : 300
Viscosity	… 2 500 000 mm^2/s
Typical measurement accuracy	up to +/- 0.3% of the measured value from a viscosity of 20 mm^2/s
Measured value resolution	… 160 000 Imp/l
Electrical output	2 incremental signals, 90° out of phase
Option	ATEX version
Applications	– Measuring of fuel consumption – Curve tracing of hydraulic components – Filling of gear lubricants – Indirect, volumetric cylinder stroke measurement – Measurement of extremely small volumes

Product characteristics

> High-precision measurement with outstanding reproducibility
> Maximized measured value resolution when using the encoder
> IO-Link technology available
> Wide measuring ranges with sizes graduated to meet specific requirements
> Application-optimized specifications
> Low pressure drop
> No calming sections necessary
> Any flow direction
> Wide temperature range
> High working pressure
> Low noise emission
> High-response measurement
> ATEX/IECEx versions
> Electronics in EMC compliant design
> RoHS compliant

Flow meters for control and regulation of fuel and oil systems

Gear type flow meters VCA

VCA 0.04 … VCA 5 – Aluminium

Precise flow meters made of aluminium

> Measuring range	0.02 … 200 l/min
> Temperature range	-10 … 80 °C
> Maximum pressure	240 bar

Characteristics

Measuring ratio	1 : 200
Viscosity	… 4 000 mm^2/s
Typical measurement accuracy	up to +/- 1.0 % of the measured value from a viscosity of 20 mm^2/s
Measured value resolution	… 25 000 Imp/l
Applications	– Lubrication oil control – Fuel consumption measurement – Cylinder stroke measurement

Product characteristics

- > Precise measurements with outstanding reproducibility
- > Low pressure drop
- > Any flow direction
- > No flow conditioners nesessary
- > Wide temperature range
- > High working pressure
- > Low noise emission
- > High-response measurement
- > Electronics in EMC compliant design
- > RoHS compliant

Gear type flow meters VC Booster

Booster units are used to condition fuels in order to make them usable for combustion engines with regard to purity, pressure and viscosity. These systems are operated under the toughest conditions. The components used must withstand dirt, heat and pressure pulsations. Here, the gear type flow meter VC Booster guarantees the highest precision under the most severe conditions.

> Measuring range	1 … 160 l/min
> Temperature range	-40 … 150 °C
> Maximum pressure	240 bar

Product characteristics

- > 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

Flow meters for control and regulation of fuel and oil systems

Screw type flow meters SVC

SVC 4 ... 250 – Spheroidal cast iron

Particularly suitable for highly viscous media with abrasive fillers.

> Measuring range	0.4 … 3 750 l/min
> Temperature range	-40 … 210 °C
> Maximum pressure	480 bar

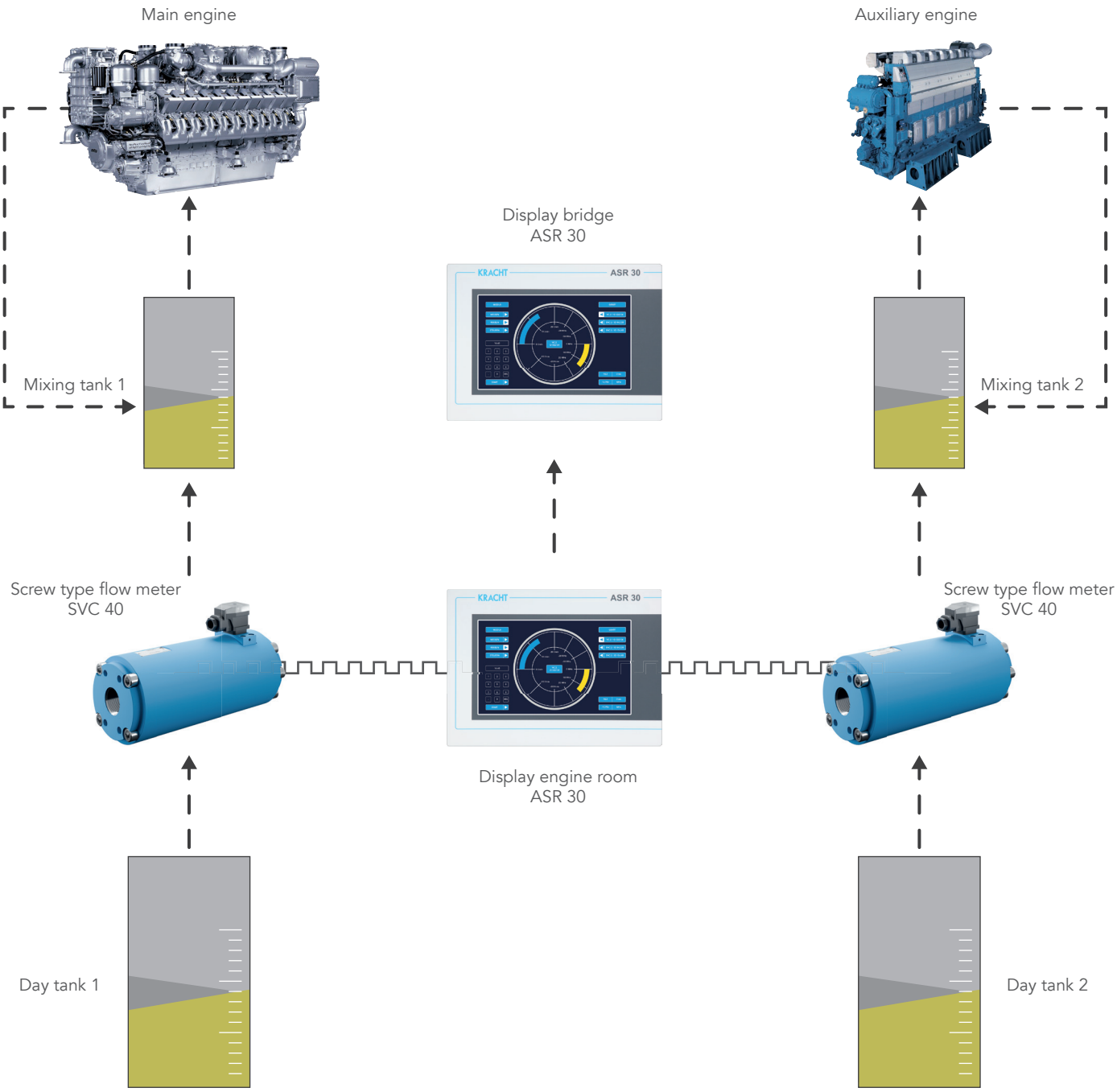
Characteristics

Measuring ratio	1 : 150
Viscosity	… 2 500 000 mm^2/s
Typical measurement accuracy	up to +/- 0.2% of the measured value from a viscosity of 20 m^2/s
Measured value resolution	… 15 686 Imp/l
Options	ATEX version
	Significantly increased measured value resolution
Applications	– Measuring of fuel consumption

Product characteristics

- > High-precision measurement with outstanding reproducibility
- > Pulsation-free measuring principle
- > Maximized measured value resolution when using the encoder
- > IO-Link technology available
- > Very low pressure drop
- > Any flow direction (Encoder versions with preferred direction)
- > Wide temperature range
- > High working pressure
- > Very low noise emission
- > High-response measurement
- > ATEX/IECEx versions
- > Electronics in EMC compliant design
- > RoHS compliant

Flow meters for complete fuel consumption measurement



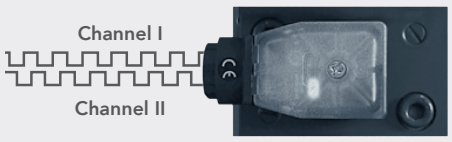
Individual customer solutions on request

Valve position indicators for valve remote control systems

VOLUMEC

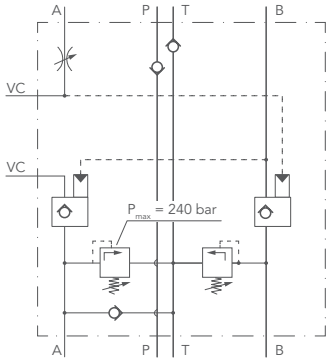
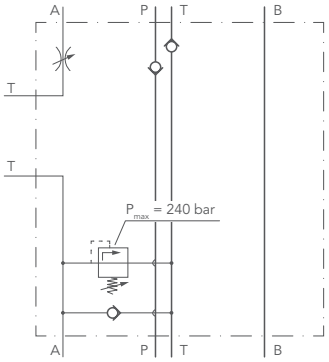
> Measuring range 4 … 150 l/min
> Maximum pressure 300 bar

VOLUTRONIC®



> Measuring range 0.25 … 10 l/min
> Maximum pressure 160 bar

	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 possible
Current-independent display	Yes	–
Current-independent position detection	Yes	No
Leakage detection	Yes	By downstream electronic possible
Reset function	At slipping coupling	By downstream electronic possible
Calibration to actuator size	By gear reducing	By downstream electronic possible
Flow direction	To be defined	A-B / B-A
Error message	No	By downstream electronic possible

Hydraulic manifolds	HB 4 0311	HB 4 0324
Description	> 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	> 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		

Notes

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