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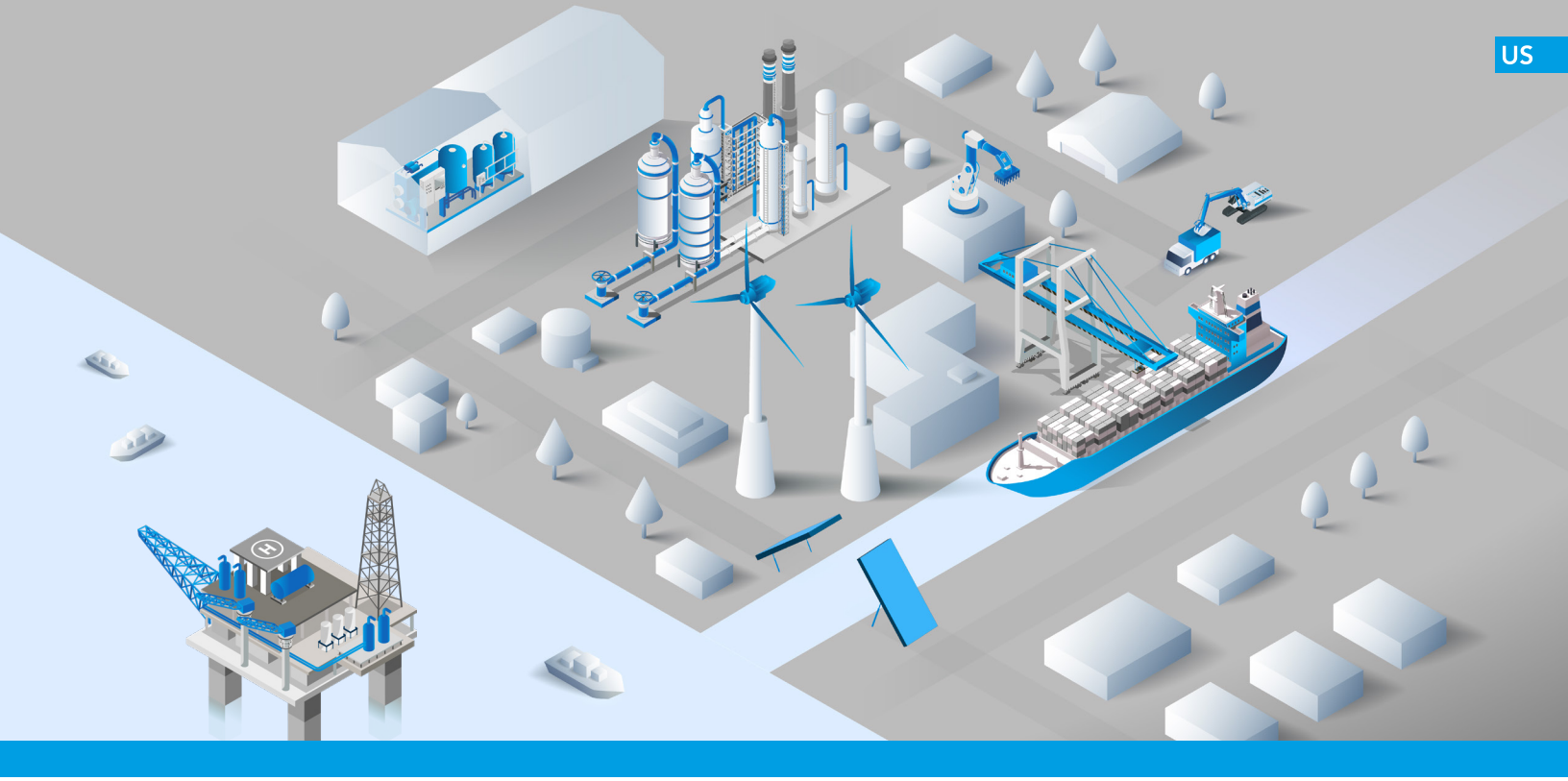


Fluid technology solutions

KRACHT®
FLUID TECHNOLOGY AND SYSTEMS

KRACHT®

FLUID TECHNOLOGY AND SYSTEMS

Content

Pump Technology

I General overview

We are one of the leading German manufacturers of pumps for the marine, renewable energy, process technology, lubricating oil technology and hydraulics sectors. In addition to our standard products, we develop special pumps for a wide range of fluid technology applications in close cooperation with our customers. The aim is to offer our customers the highest level of reliability and efficiency.

I Key facts

> Displacement	0.1 ... 3 150 cm^3/rev
> Temperature range	-50 ... 220 °C / -58 ... 428 °F
> Maximum pressure	315 bar / 4 569 psi

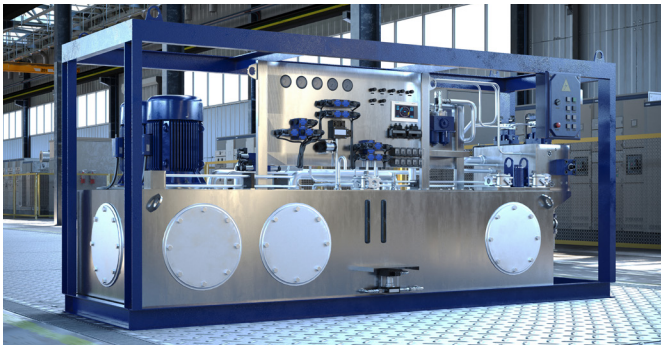
I Applications

Our gear pumps can be used to pump fluids that have a certain lubricity. These fluids include, among others, oils, brake fluid, diesel, skydrol, paints, polyol + isocyanate, adhesives, resins, greases, silicones, lacquers, wax, antifreeze and solvents.

> Marine applications

> Renewable energy

> Process technology



> Lubricating oil technology

Transfer pumps

General

Our gear pumps are external gear pumps and are used as transfer pumps in the chemical and plastics industries, in marine applications, general fluid transfer, in lubricating oil technology, in fuels and within renewable energies. The pump housings are made of cast iron, spheroidal cast iron and stainless steel, the gear parts are made from high-quality steel. A wide range of sealing variants is available for the most diverse requirements.

KF

Gear pumps KF are used to pump a wide range of fluids. The pumps impress in particular with their wide range of variants, which can be combined as required and also extended at a later date thanks to their modular design. The pumps are also great for media with low lubricating properties.

> Displacement	0.5 … 3 150 cm^3/rev
> Temperature range	-40 … 200 °C / -40 … 392 °F
> Maximum pressure	25 bar / 363 psi

Characteristics

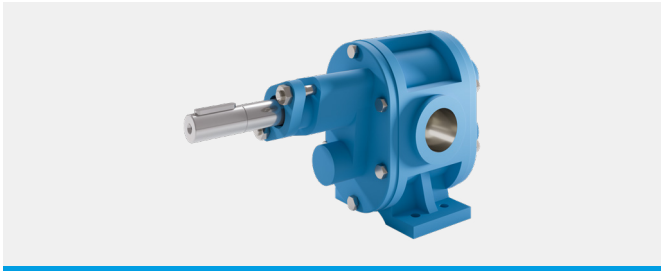
Nominal sizes	0.5 · 0.8 · 1 · 1.6 · 2 · 2.5 · 3 · 4 · 5 · 6 · 8 · 10 · 12 · 16 · 20 · 25 · 32 · 40 · 50 · 63 · 80 · 100 · 112 · 125 · 150 · 180 · 200 · 250 · 315 · 400 · 500 · 630 · 730 · 1000 · 1250 · 1500 · 3150
Speed	… 3 600 rpm
Viscosity	1.4 … 100 000 cSt

Applications

	Lubricating oil supply for marine gearboxes, wind turbines and compressors
	Pre- and main lubrication of diesel engines
	Oil delivery in filter systems
	Fuel delivery

BT

BT and BTH (BTH with heating jacket) series pumps are low speed gear pumps for pumping a wide range of medium to high viscosity fluids, provided they ensure a certain minimum lubrication, do not contain solid particles and are chemically compatible.



> Displacement	6.9 … 1 056 cm^3/rev
> Temperature range	-10 … 220 °C / 14 … 428 °F
> Maximum pressure	8 bar / 116 psi

Characteristics

Nominal sizes BT	1 · 2 · 3 · 4 · 5 · 6 · 7
Nominal sizes BTH	1/55 · 1/105 · 2/100 · 2/130 · 3/150
Speed	… 750 rpm
Viscosity	76 … 30 000 cSt
Bearing	without bearing bushes (sizes 0 … 4)
	with iron bearing bushes (sizes 1 … 7)
	with bronze bushings (sizes 1 … 7)

Applications

	Pumping of bitumen
	Pumping of paints/inks/varnishes
	Pumping of resin
	Pumping of glue
	Pumping of wax

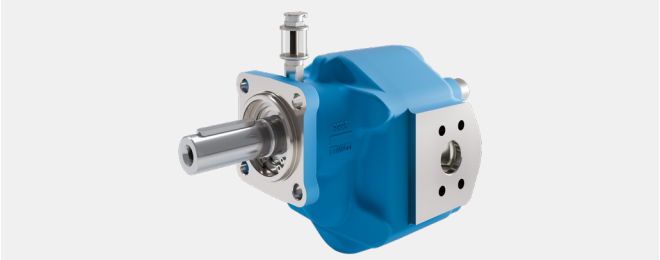
Process pumps

General

Dosing fluids is the main task in numerous process engineering processes. Polyol, isocyanate, plasticizers, resins and adhesives are some of the most important fluids with a wide range of applications. Discover our standard and custom pump solutions for your dosing applications.

DT

The DuroTec® gear pumps are primarily designed for multi-component systems in process technology. This pump offers a reliable alternative wherever liquids with hard fillers have to be processed, where standard pumps do not achieve satisfying service lives.



> Displacement	3.0 … 250 cm^3/rev
> Temperature range	-20 … 150 °C / -4 … 302 °F
> Maximum pressure	150 bar / 2 176 psi

Characteristics

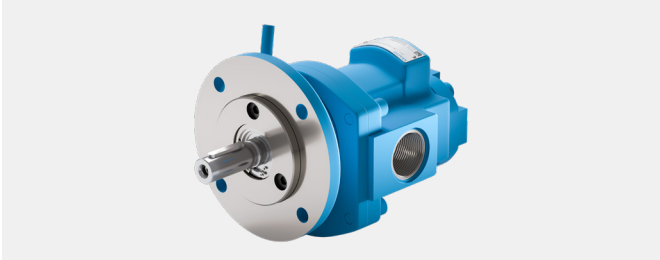
Nominal sizes	3 · 5.5 · 6.3 · 8 · 11 · 16 · 22 · 63 · 100 · 125 · 150 · 200 · 250
Speed	… 1 500 rpm
Viscosity	30 … 50 000 cSt

Applications

	Hot melt adhesive systems and in 1 C, 2 C or multi-component dosing systems

KF coated

Dosing fluids is the main task in numerous process engineering processes. The accuracy, uniformity and reproducibility with which these fluids can be processed are decisive for the quality of the end product. The process pump KF coated is particularly well-suited for these applications.



> Displacement	4.6 … 24.8 cm^3/rev
> Temperature range	-10 … 200 °C / 14 … 392 °F
> Maximum pressure	60 bar / 870 psi

Characteristics

Nominal sizes	4 · 8 · 11 · 16 · 20 · 24
Speed	… 2 000 rpm
Viscosity	12 … 15 000 cSt

Applications

	As a dosing pump for PU components, plasticizers, resins, adhesives, lacquers, paints etc.

Process pumps

ADP

The ADP is a high precision external gear metering pump. With extremly small clearances and an optimal gear geometry the ADP has a very high volumetric efficiency also at difficult combinations e.g. high pressure together with low turning speed and low viscosities. The main parts of the pump are made of stainless steel. Because of that a wide range of fluids can be pumped.

> Displacement	0.1 … 20 cm^3/rev
> Temperature range	-20 … 200 °C / -4 … 392 °F
> Maximum pressure	200 bar / 2 901 psi

Characteristics

Nominal sizes	0.1 · 0.3 · 0.6 · 1.2 · 1.8 · 2.4 · 3.0 · 4.8 · 6.0 · 12.0 · 20.0
Speed	… 200 rpm
Viscosity	ν_{min} 1.0 cSt (depending on pressure and speed)

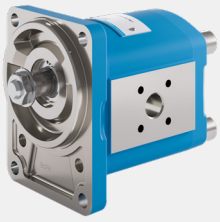
Applications

	Metering of polyols and isocyanates in polyurethane plants
	Metering of resin and hardener in two and multi-components plants
	Lubricating oil metering

Hydraulic pumps

KP

High pressure gear pumps KP are preferably used in oil hydraulic systems. The main components include the housing and the flange cover. They can withstand high dynamic loads which means they are insensitive to pressure peaks and continuous vibrations. Thanks to their design and the materials used, the pumps are ideal for deployment under the toughest operating conditions.



> Displacement	1.4 … 300 cm^3/rev
> Temperature range	-20 … 150 °C / -4 … 302 °F
> Maximum pressure	315 bar / 4 569 psi

Characteristics

Nominal sizes	KP 0	1 · 2 · 3 · 4 · 6 · 8
	KP 1	3 · 4 · 5.5 · 6.3 · 8 · 11 · 14 · 16 · 19 · 22
	KP 2	20 · 25 · 28 · 32 · 40 · 50 · 62
	KP 3	63 · 71 · 82 · 100 · 112 · 125
	KP 5	160 · 200 · 250 · 300
Speed	… 4 000 rpm	
Viscosity	1.2 … 1400 cSt	

Applications

	Mobile and stationary plants
	Construction and agricultural machinery, municipal and special vehicles

Options

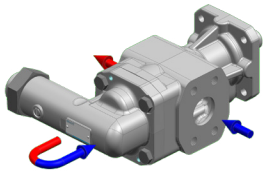
Versions

- ATEX version
- Stainless steel version
- Motor-pump unit (electrically / mechanically driven)
- Noise-optimised version
- Outboard bearing to absorb radial forces
- Low temperature version
- Vacuum version
- Multiple pumps
- Heating jacket
- Follower plate pump

Valve options

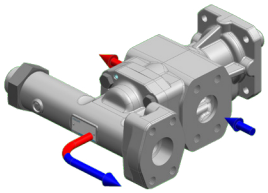
D-valve D15/D25

Gear pumps of the KF series can optionally be equipped with a directly controlled pressure relief valve (D-valve D15/D25). The built-up pressure relief valve is a direct operated valve with a rising characteristic. It is used to protect the pump from short-term, impermissible pressure peaks. It must not be operated permanently as overpressure protection, as the valve or pump may overheat due to its design.
If the valve responds over a longer period of time, valves with a separate tank connection, such as the T-valve (T-15/25) or valves in pipe construction such as the SPV valve, should be used.



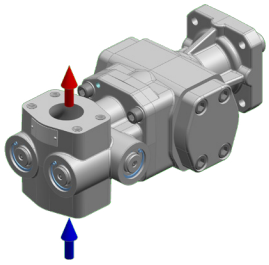
T-valve T15/T25

The T-valve is an attached, directly controlled pressure relief valve with separate tank connection. To dissipate heat, the handled fluid flowing out via the T-valve is fed directly into the storage tank. Thanks to adapted damping, the valve offers very good control characteristics and outstanding dynamics with vibration-free operation at all operating points of the pump.



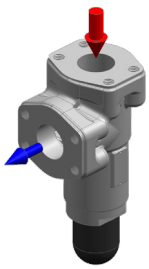
Universal valve

Pumps with universal valve pump to the same pressure connection even when the direction of rotation of the drive shaft changes. This property guarantees lubrication of the gearing mechanisms in pendulum mode, for instance, in wind turbines and marine propulsion systems.



SPV/DV-valve

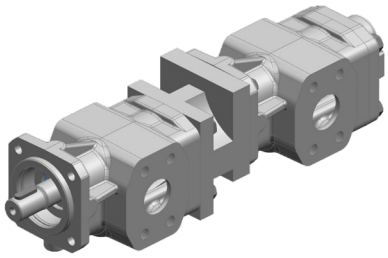
The SPV valve is a directly controlled pressure relief valve for installation in pipelines and is used to protect hydraulic circuits.
DV series valves are hydraulically pilot-controlled and are available as DV B pressure relief valves, DV S pressure stage control valve and DV R pressure control valves.



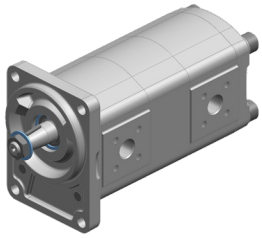
Options

Multiple pumps KF/KP

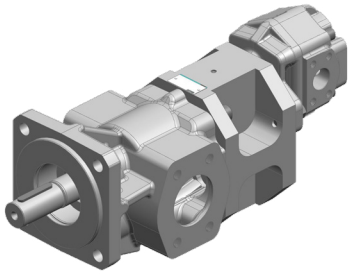
Gear pump KF
+ Gear pump KF



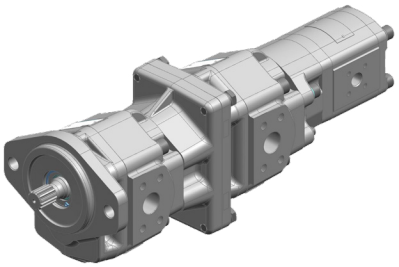
High pressure gear pump KP
+ High pressure gear pump KP



Gear pump KF
+ High pressure gear pump KP

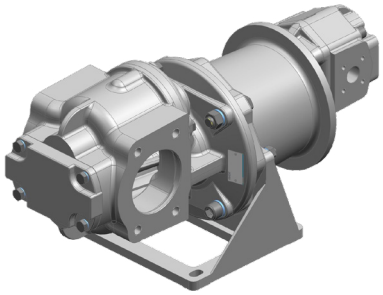


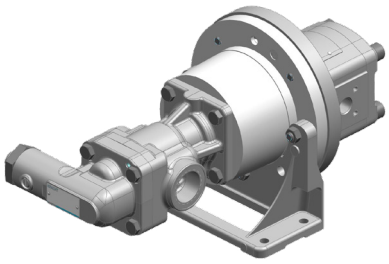
High pressure gear pump KP
+ High pressure gear pump KP
+ High pressure gear pump KP



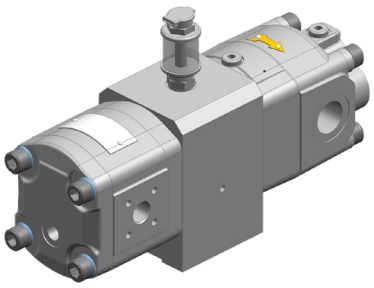
Multiple combinations KF/KP + KM

Gear pump KF
+ High pressure gear motor KM





High pressure gear pump KP
+ High pressure gear motor KM



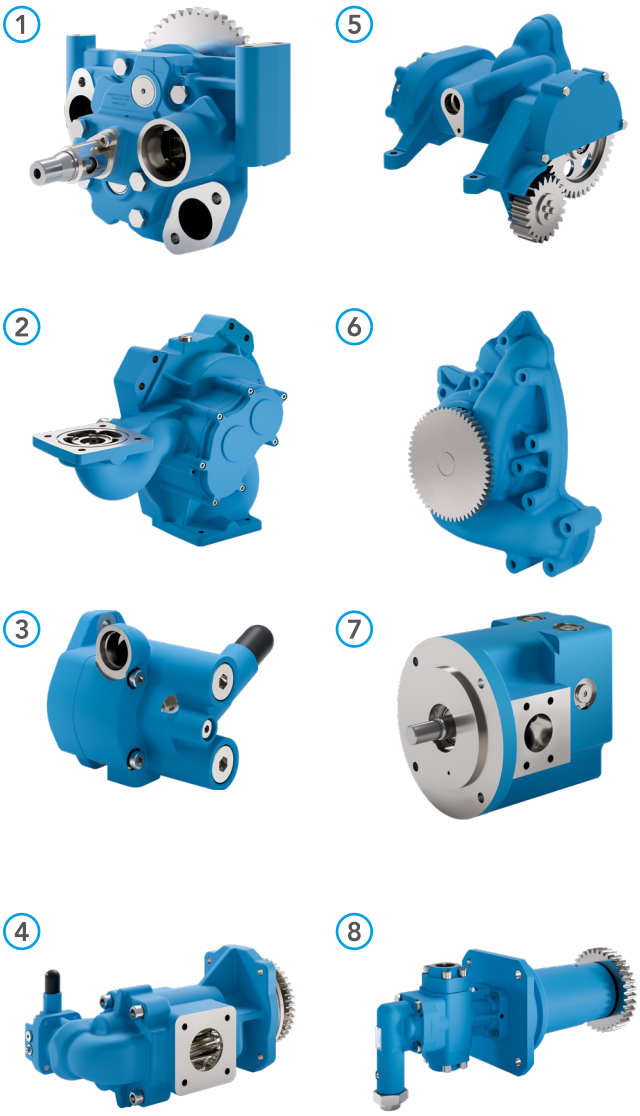
Special pumps

I SOP

In addition to our standard products, we develop special pumps in close cooperation with our national and international customers. They provide specific solutions for the most diverse fluid technology applications. Feel free to get in touch with us. We would be glad to advise you.

Example solutions

1 Two-stage lubricating oil pump of a diesel engine
2 Pre-lubrication pump of a dual fuel diesel engine
3 Direct driven diesel oil pump
4 Direct driven main lubricating oil pump with control valve
5 Direct driven main lubricating oil pump for installtion in the engine sump
6 Internal gear pump for gear lubrication
7 Gear pump for the lubrication of wind power gears
8 Pumps with heavy-duty outboard bearing



Fluid measurement technology

I General overview

Fluid measurement technology: that means highly dynamic and highly precise volume and flow measurement, evaluated in an application-oriented method, from simple display devices to intelligent controller solutions. The powerful electronics process the signals supplied by the flow meter and ensures that to ensure the processes are precisely monitored, regulated and controlled. For example in process technology as a controller unit for dosing and mixing systems or as flexible measuring and recording electronics for differentiated applications in test bench construction.

I Key facts

> Measuring range	0.003 ... 65 000 l/min 0.0008 ... 17 171 gal/min
> Temperature range	-60 ... 400 °C / -76 ... 752 °F
> Maximum pressure	480 bar / 6 962 psi

I Applications

Our gear, screw, turbine and coriolis mass flow meters, as well as, electronics are perfect for metering and consumption measuring in the following industries: chemical, paint and varnish, hydraulics, process and test bench technology.

> Marine applications

> Renewable energy

> Process technology

> Fuels

Gear type flow meters

General

Our gear type flow meters are suited for the most demanding tasks in fluid measurement technology. Our expertise guarantees functional solutions for standard or special applications.

VC

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

> Measuring range	0.003 … 700 l/min 0.0008 … 185 gal/min
> Temperature range	-60 … 210 °C / -76 … 410 °F
> Maximum pressure	480 bar / 6 962 psi

Characteristics

Nominal sizes	0.025 · 0.04 · 0.1 · 0.2 · 0.4 · 1 · 3 · 5 · 12 · 16
Typical measurement accuracy	up to +/- 0.3% of the measured value from a viscosity of 20 cSt
Measured value resolution	… 160 000 Imp/l … 605 666 Imp/gal
Viscosity	… 2 500 000 cSt

Applications

Fuel consumption measurement
Characteristic curve generation of hydraulic components
Gear oil filling
Indirect, volumetric cylinder stroke measurement
Ratio measurement in 2- and multi-component dosing systems
Micro-flow measurement and micro-dosing

Product characteristics

- High-precision measurement with outstanding reproducibility
- Wide measuring ranges with sizes graduated to meet specific requirements
- Application-optimized specification
- Low pressure drop
- Any flow direction
- No flow conditioners nesessary

Encoder version with maximised measurement resolution

Compared with standard sensors, encoders are capable of generating considerably more pulses, thus increasing measurement resolution by orders of magnitude. Encoder-equipped VC flow meters generate up to 2 500 pulses per revolution and can recognise the direction of flow.
Encoders, like the standard versions, send square-wave signals to the electronics.

> Measuring range	0.02 … 80 l/min 0.005 … 21 gal/min
> Temperature range	-20 … 80 °C / -4 … 176 °F
> Maximum pressure	480 bar / 6 962 psi

Characteristics

Nominal sizes	0.04 · 0.2 · 1
Typical measurement accuracy	up to +/- 0.3% of the measured value from a viscosity of 20 cSt
Measured value resolution	… 13 157 896 Imp/l … 49 808 055 Imp/gal
Viscosity	… 2 500 000 cSt

Applications

Process technology
Test bench construction

- Wide temperature range
- High working pressure
- Low noise emission
- High-response measurement
- Electronics in EMC compliant design
- RoHS compliant

Gear type flow meters

VCA

Precise flow meters made of aluminum

> Measuring range	0.02 … 200 l/min 0.005 … 53 gal/min
> Temperature range	-10 … 80 °C / 14 … 176 °F
> Maximum pressure	240 bar / 3 481 psi

Characteristics

Nominal sizes	0.04 · 0.1 · 0.2 · 2 · 5
Typical measurement accuracy	up to +/- 1.0 % of the measured value from a viscosity of 20 cSt
Measured value resolution	… 25 000 Imp/l … 94 635 Imp/gal
Viscosity	… 4 000 cSt

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

Screw type flow meters

General

Our screw type flow meters incorporate robustness, high-precision measuring accuracy, good handling, as well as, durability and economy. Further advantages include: less sensitivity to fluid contamination, pulsation free measuring and low pressure drop.

SVC

Our screw type flow meters SVC are suitable for highly viscous media with abrasive fillers.

> Measuring range	0.4 … 3 750 l/min 0.11 … 991 gal/min
> Temperature range	-40 … 210 °C / -40 … 410 °F
> Maximum pressure	480 bar / 6 962 psi

Characteristics

Nominal sizes	4 · 10 · 40 · 100 · 250
Typical measurement accuracy	up to +/- 0.2% of the measured value from a viscosity of 20 cSt
Measured value resolution	… 15 686 Imp/l … 59 378 Imp/gal
Viscosity	… 2 500 000 cSt

Applications

- Fuel consumption measurement
- Dosing systems
- Process technology
- Test bench construction

Encoder version with maximised measurement resolution

Compared with standard sensors, encoders are capable of generating considerably more pulses, thus increasing measurement resolution by orders of magnitude. Encoder-equipped SVC flow meters generate up to 2 500 pulses per revolution and can recognise the direction of flow. Encoders, like the standard versions, send square-wave signals to the electronics.

> Measuring range	1.0 … 150 l/min 0.26 … 40 gal/min
> Temperature range	-20 … 80 °C / 4 … 176 °F
> Maximum pressure	250 bar / 3 626 psi

Characteristics

Nominal size	10
Typical measurement accuracy	up to +/- 0.2% of the measured value from a viscosity of 20 cSt
Measured value resolution	… 247 463 Imp/l … 936 749 Imp/gal
Viscosity	… 2 500 000 cSt (depending on flow)

Applications

- Process technology
- Test bench construction

Product characteristics

- > High-precision measurement with outstanding reproducibility
- > Pulsation-free measuring principle
- > Very low pressure drop
- > Any flow direction
- > Wide temperature range
- > High working pressure

- > High-response measurement
- > Very low noise emission
- > Electronics in EMC compliant design
- > RoHS compliant
- > IO-Link version with internal calculation of measured values

IO-Link version with internal calculation of measured values

General

Flow meters VC/SVC with IO-Link technology are based on standard flow meters with one or two sensors. Unlike standard or encoder versions which always send a square wave signal to the electronics, IO-Link devices have the added capability of internally computing concrete measurement values. Therefore, these flow meters lend themselves for use in classic PLC and in IO-Link infrastructures.
Thanks to its international standardisation (IEC 61131-9), the IO-Link technology offers point-to-point connectivity with continuous monitoring between any desired control layer and the VC/SVC-IO-Link assembly. Handling and startup is made easy by the associated IODD (IO Device Description) file.
The VC/SVC-IO-Link assembly directly delivers all measured values with units. In the preset SIO mode (standard input output), the volume counter gives square-wave signals if the IO-Link mode is not enabled by an IO-Link master. This provides downward compatibility of the VC-IO-Link assembly with the standard square-wave signal.

Communication of the IO-Link assembly

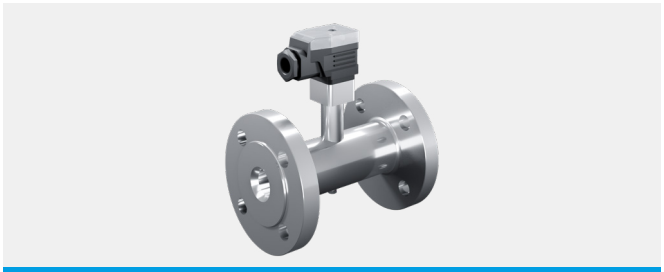
SIO mode
– Same output of the two square-wave signals as in standard pre-amplifier

IO-Link mode
Signal output as described in the IODD according to the following units:
– number of pulses
– litres / gallons
…

Turbine flow meters

TM

Our turbine flow meters TM are proven and widely used measuring devices in industrial flow measurement technology. The instruments provide reliable, continuous and accurate measurement of fluids flowing under pressure in closed pipes. Thanks to the stainless steel design, the flow meters are suitable for a variety of even aggressive media.



> Measuring range	4.6 … 65 000 l/min 1.22 … 17 171 gal/min
> Temperature range	-30 … 400 °C / -22 … 752 °F
> Maximum pressure	400 bar / 5 802 psi

Characteristics

Measuring range	0.275 … 4 000 m^3/h 4.6 … 65 000 l/min 1.22 … 17 171 gal/min
Nominal sizes	0.275 · 0.55 · 1.1 · 2.2 · 4 · 8 · 16 · 34 · 68 · 135 · 270 · 550 · 1100 · 1900 · 2700 4000
Typical measurement accuracy	up to ± 0.5% of the measured value

Applications

	Flow measurement of water, cooling lubricants, emulsions and other lubricant and non-lubricant media

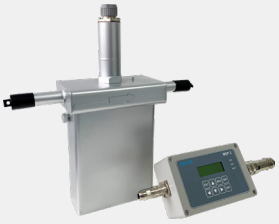
Product characteristics

- > Very large measuring range
- > Very low pressure drop
- > High working pressure
- > Low noise emission
- > Electronics in EMC compliant design
- > RoHS compliant

Coriolis mass flow meters

CMM

Coriolis mass flow meters CMM are used to measure and control the mass flow of fluids. Compared to all other flow meters, they offer the great advantage that the mass flow is measured independently of the material properties. This means that multi-phase substances can also be measured without interference. A wide range of nominal sizes ensures highly accurate measurements.



> Measuring range	3.0 … 300 000 kg/h 6.61 … 661 387 lbs/h
> Temperature range	-40 … 200 °C / -40 … 392 °F
> Density range	400 … 1 300 kg/m^3 882 … 2 866 lbs/m^3

Characteristics

Nominal sizes	0.15 · 0.5 · 1 · 3 · 6 · 14 · 40 · 80 · 160 · 300

Applications

	Measurement and metering of highly viscous fluids (no influence of viscosity)
	Measurement and metering of aggressive fluids
	Measurement and control of the concentration in quality control and in the mixing process
	Measurement of the custody transfer of liquid gases (LPG, LNG)
	Measurement of components in mixtures based on mass, density and temperature measurement (normalized volume of pure ethyl alcohol, API normal volume, oil-water content)

Product characteristics

- > Very large measuring range
- > Very low pressure drop
- > High working pressure
- > Low noise emission
- > Electronics in EMC compliant design
- > RoHS compliant

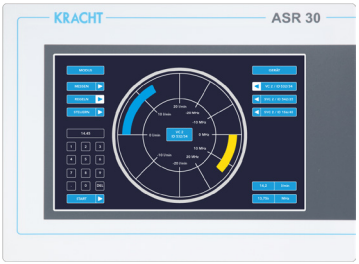
Electronics

General

The powerful electronics process the signals supplied by the flow meter and ensures that to ensure the processes are precisely monitored, regulated and controlled. It is used, for instance, in process technology as a control unit for dosing and mixing systems or as flexible measuring and recording electronics for differentiated applications in test bench technology for use.

Control unit ASR 30

The ASR 30 is a control unit which can be operated via touch screen. In addition, the unit can be expanded with manual operating units. This allows the implementation of numerous fluid technology applications. Standardised programs are available for various applications. The ASR 30 programming can be optimally adapted to the respective application.



Plug-on display SD 1

The SD 1 plug-on display is a universally applicable local display for all volume counter series (VC, SVC, TM) with Hirschmann plugs. The display can show either flow rate or volume.

Applications

- Flow control
- Dosing
- Fuel consumption measurement
- Cylinder stroke measurement and monitoring
- Display and monitoring of added amounts
- Display and monitoring of differential amounts
- Display and monitoring of mixing ratio
- Display and control of mixing ratio

Control unit AS 8

The AS 8 control unit processes incremental input signals from the flow meters. The input signals are filtered in the unit, converted, and computed into the physical sizes of flow rate or volumes.

Special solutions

General

We are your reliable partner for application-oriented special solutions. We design, develop and produce customised solutions for highest demands – precise and top quality. Feel free to get in touch with us.

Gear type flow meter 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 0.26 … 42 gal/min
> Temperature range	-40 … 150 °C / -40 … 302 °F
> Maximum pressure	240 bar / 3 481 psi

VOLUMEC

The valve position indicator VOLUMEC is an interlinking unit with the connection hole pattern for directly controlled NG 06 directional control valves. In detail, the module comprises a valve block, volume counter and display unit. Mounted on a connection plate and completed with a directional control valve, the VOLUMEC is used to control hydraulically operated ship valves for ballast, cargo or stripping systems, to measure and display the adjustment travel of the valve.
The control module is designed for installation in deck boxes. The display of the volumetrically detected valve position can be read visually directly on site or electrically via potentiometer or limit switches.

> Measuring range	4 … 150 l/min 1.06 … 39.6 gal/min
> Maximum pressure	300 bar / 4 351 psi

VOLUTRONIC®

The VOLUTRONIC® valve position indicator differs from the mechanical VOLUMEC by its electronic signal processing. Two incremental signals with a 90 ° phase offset are transmitted to the control, which enables the direction to be displayed in addition to the flow volume. The VOLUTRONIC® valve position measuring instrument can be used for a wide range of actuator sizes and travel speeds.

> Measuring range	0.25 … 10 l/min 0.07 … 2.6 gal/min
> Maximum pressure	160 bar / 2 321 psi

	VOLUMEC	VOLUTRONIC®
Version	Gear type volume counter	Gear type volume counter
Display	Mechanical	By downstream electronic
Current-independent display	Yes	–
Current-independent position detection	Yes	No
Leakage detection	Yes	By downstream electronic

Valve Technology

I General overview

When it comes to reliable valves, then we are the right partner for you. We offer more than 100 years of experience in the development, production and worldwide distribution of valves for a wide variety of industrial requirements. Depending on the operating pressure, flow rate, viscosity, etc., appropriate valve solutions are available for all conditions.

I Key facts

> Volume flow	… 3 000 l/min … 793 gal/min
> Temperature range	-40 … 220 °C / -40 … 428 °F
> Maximum pressure	480 bar / 6 962 psi

I Applications

Our pressure relief, pressure control, pressure stage control and universal valves as well as hydraulic manifolds are for the toughest mobile and stationary requirements.

> Marine applications

> Fuels

> Renewable energy

> Process technology

Pressure relief valves

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 10.57 … 211 gal/min
> Temperature range	-40 … 220 °C / -40 … 428 °F
> Nominal pressure	… 30 bar / … 435 psi

Characteristics	
Nominal sizes	10 · 20/25 · 32/40 · 50 · 80
Viscosity	1.2 … 1 000 cSt
Applications	Protection of low pressure hydraulic circuits

HV/HVF

The HV/HVF pressure relief valve is a pilot operated slide valve for installation in pipelines and thus serves to safeguard medium pressure hydraulic circuits up to max. 160 bar. The pipe connection can be made using SAE flanges (3000 psi) or Whitworth pipe threads (G). Thanks to the spool pilot control, the valve can also be used for higher viscosities.

> Volume flow	50 … 350 l/min 13.21 … 92 gal/min
> Temperature range	-20 … 80 °C / -4 … 176 °F
> Nominal pressure	… 160 bar / … 2 321 psi

Characteristics	
Nominal sizes	10 · 25 · 40
Viscosity	13 … 600 cSt
Applications	Protection of medium pressure hydraulic circuits

DV B

The DV B pressure relief valves are hydraulically pilot controlled valves. The control oil can be discharged either internally or externally. As standard, all designs are equipped with a measuring port and a connection for external control oil regulation. Typical applications are oil hydraulics and lubrication technology.
On request, the DV B pressure relief valve is also available with an additional 2/2-directional control valve (e.g. for pressure-minimized circulation).

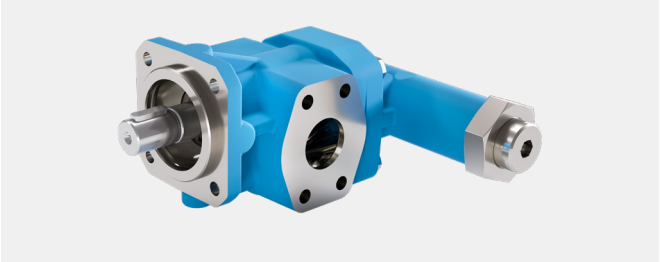
Characteristics	
Nominal sizes	50 · 80
Viscosity	4 … 1 000 cSt

> Volume flow	800 … 1 800 l/min 211 … 476 gal/min
> Temperature range	-15 … 150 °C / 5 … 302 °F
> Nominal pressure	… 210 bar / … 3 046 psi

Pressure relief valves

D-valve

Gear pumps of the KF series can optionally be equipped with a directly controlled pressure relief valve (D-valve D15 / D25). The built-up pressure relief valve is a direct operated valve with a rising characteristic. It is used to protect the pump from short-term, impermissible pressure peaks. It must not be operated permanently as overpressure protection, as the valve or pump may overheat due to its design.
If the valve responds over a longer period of time, valves with a separate tank connection, such as the T-valve (T-15/25) or valves in pipe construction such as the SPV valve, should be used.

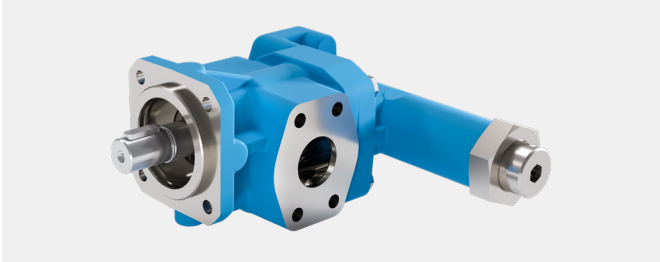


> Displacement	2.5 … 630 cm^3/rev
> Temperature range	-40 … 200 °C / -40 … 392 °F
> Nominal pressure	… 25 bar / … 363 psi

Characteristics	
Viscosity	1.4 … 100 000 cSt
Appliations	System protection of lubrication systems

T-valve

The KF gear pumps can optionally be equipped with the T-valve. The T-valve is an attached, directly controlled pressure relief valve with separate tank connection. To dissipate heat, the handled fluid flowing out via the T-valve is fed directly into the storage tank. Thanks to adapted damping, the valve offers very good control characteristics and outstanding dynamics with vibration-free operation at all operating points of the pump.



> Displacement	32 … 80 cm^3/rev
> Temperature range	-40 … 200 °C / -40 … 392 °F
> Nominal pressure	… 25 bar / … 363 psi

Characteristics	
Viscosity	12 … 5 000 cSt
Applications	System protection of lubrication systems

DBD

The DBD pressure relief valve is a directly controlled poppet valve for installation in pipelines or as a cartridge valve. The valve is used for pressure protection of hydraulic systems up to p_{max} = 400 bar (5 802 psi). The housing has two connections with Whitworth pipe threads for pipe mounting. Without the housing, the valve cartridge can also be screwed into the specified bore contour in any body instead.

Characteristics	
Nominal sizes	06 · 08 · 10 · 20
Viscosity	10 … 600 cSt

> Volume flow	… 200 l/min … 53 gal/min
> Temperature range	-20 … 80 °C / -4 … 176 °F
> Nominal pressure	… 400 bar / … 5 802 psi

Pressure control valves

DV R

The pressure control valve DV R is a pilot-controlled pressure relief valve with external hydraulic activation. It allows for the system pressure to be controlled irrespective of the pressure losses occurring between the valve and the point of the external control oil tap. Typical applications include pressure control in lubricating grease circuits in diesel engines.

> Volume flow	800 … 1 800 l/min 211 … 477 gal/min
> Temperature range	-15 … 150 °C / 5 … 302 °F
> Nominal pressure	… 210 bar / … 3 046 psi

Characteristics	
Nominal sizes	50 · 80
Viscosity	4 … 1 000 cSt

Pressure stage control valves

DV S

The pressure stage control valve DV S is a pilot-control pressure relief valve with several parallel pilot valves set at two different pressures. The pressure stage switch valve has an integrated directional control valve. This valve is used to switch different pressure stages (upstream pressure) on and off. The control oil drain is internal or external. A typical application is clutch control in ship gearboxes.

> Volume flow	800 … 1 800 l/min 211 … 477 gal/min
> Temperature range	-15 … 150 °C / 5 … 302 °F
> Nominal pressure	… 210 bar / … 3 046 psi

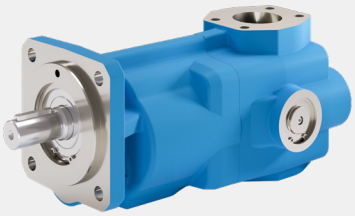
Characteristics	
Nominal sizes	50 · 80
Viscosity	4 … 1 000 cSt

Universal valves

U-valves

The gear pumps KF can be optionally equipped with the universal valve. Pumps with universal valves pump to the same pressure connection even when the direction of rotation of the drive shaft changes. Thanks to its principle of operation, the pressure and intake connections remain the same for any drive direction. This property guarantees lubrication of the gearing mechanisms in oscillation mode, for instance, in wind power and marine propulsion systems.

Characteristics	
Viscosity	12 … 100 000 cSt
Applications	Wind turbines
	Marine

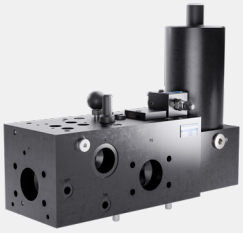


> Displacement	2.5 … 112 cm^3/rev
> Temperature range	-40 … 200 °C / -40 … 392 °F
> Nominal pressure	… 25 bar / … 363 psi

Hydraulic manifolds

HB

Our hydraulic manifolds are custom-made control units for driving and working hydraulics for mobile work machines such as road and construction machines, municipal vehicles and agricultural equipment, or applications in the field of stationary hydraulics. The product range includes all necessary hydraulic functional elements and their designs (mono and sandwich blocks, installation and structural elements). It is topped off with integrated electronic sensors, controls and actuating elements.



> Volume flow	… 3 000 l/min … 793 gal/min
> Temperature range	-30 … 200 °C / -22 … 392 °F
> Nominal pressure	… 480 bar / … 6 962 psi

Applications

- Road and construction machinery
- Municipal vehicles and agricultural machinery
- Water jet cutting machines
- Clutch-operated manual gears
- Gear control

Special valves

General

In addition to our standard products, we develop special valves in close cooperation with our national and international customers, which offer specific solutions for a wide range of fluid technology applications.

Directional control valves

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 … 185 gal/min
> Temperature range	-30 … 80 °C / -22 … 176 °F
> Nominal pressure	… 350 bar / … 5 076 psi

Characteristics

Nominal sizes	6 · 10 · 16 · 25
Viscosity	13 … 400 cSt

Drive Technology

I General overview

The drive components meet and exceed all mobile and stationary hydraulic requirements. Our high pressure gear motors, for example, convert hydraulic into mechanical power. The cylinders are used in numerous fields of application in oil and working hydraulics.

I Key facts

> Displacement	5.5 … 300 cm^3/rev
> Temperature range	-20 … 150 °C / -4 … 300 °F
> Maximum pressure	315 bar / 4 569 psi

I Applications

Our innovative drive components include high pressure gear motors, fan drives, multiple combinations and cylinders for mobile and stationary applications. In addition, we develop and manufacture individual drive solutions according to customer specifications.

> Mobile hydraulics

> Mobile hydraulics

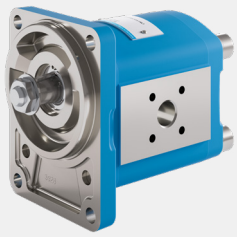
> Industrial hydraulics

> Industrial hydraulics

Hydraulic motors

KM

Our external gear motors KM are suitable for deployment under the toughest operating conditions thanks to their design and the materials used. The main components are the housing and the flange cover. They can be dynamically highly loaded, making them insensitive to pressure peaks and continuous vibrations.



> Displacement 5.5 … 300 cm^3/rev
> Temperature range -20 … 150 °C / -4 … 302 °F
> Nominal pressure … 315 bar / … 4 569 psi

Characteristics

Nominal sizes	KM 1	5.5 · 6.3 · 8 · 9.6 · 11 · 14 · 16 · 19 · 22 · 25
	KM 2	20 · 25 · 28 · 32 · 40 · 50 · 62
	KM 3	63 · 71 · 82 · 100 · 112 · 125
	KM 5	219 · 250 · 300
Speed	… 4 000 rpm	
Viscosity	1.2 … 1 000 cSt	

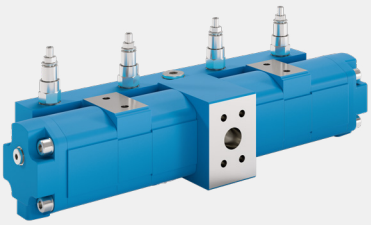
Applications

Mobile and stationary plants
Construction and agricultural machinery, municipal and special vehicles as a fan or other drives

Flow dividers

KM

The flow divider KM is a hydraulic component. It is used for the efficient distribution of pressures and flows. It divides or adds up a total volume flow uniformly or in a fixed division ratio. The consumer pressures are not important. As a result of its design, the flow divider is a proven solution for various dividing tasks.



> Displacement 5.5 … 25.97 cm^3/rev
> Max. Temperature 90 °C / 194 °F
> Nominal pressure … 250 bar / … 3 626 psi

Characteristics

Speed	… 4 000 rpm
Viscosity	10.0 … 600 cSt

Applications

Mobile and stationary plants
Construction and agricultural machinery, municipal and special vehicles

Cylinders

General

We manufacture our cylinders as differential, synchronous, pull or push cylinders and as plunger cylinders. Available with adjustable end position damping, electronic proximity switches, electronic position measuring systems and water cooling.

Hydraulic cylinders CNL

Cylinders of the CNL type series are designed as pure bolted constructions. Cylinder heads and bottoms are made of steel. "Seamless precision steel tubes" according to DIN 2391 are used for the cylinder tubes and high-strength steel is used for the ground, polished and hard-chrome plated piston rods.

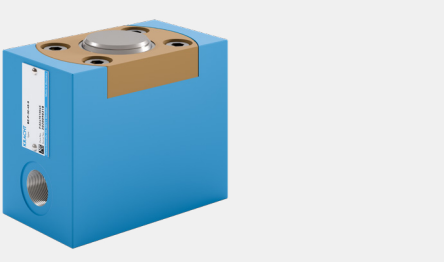
> Nominal pressure … 200 bar / … 2 901 psi
> Piston diameter 40 … 100 mm / 1.57 … 3.94 inch
> Stroke length … 4 000 mm / … 157.48 inch

Characteristics	
Lifting speed	… 0.5 m/s … 1.64 ft/s
Pressure media temperature	-20 … 180 °C -4 … 356 °F
Viscosity	2.8 … 380 cSt
Mounting position	Optional

Applications	
	Differential cylinder
	Synchronised cylinder
	Push or pull cylinder
	Plunger cylinder

Block cylinders BZ

Block cylinders BZ are used for lifting, pressing and clamping in tool, mould and fixture construction as well as in machine tools. With a nominal pressure of 400 bar and a piston diameter of up to 125 mm, we provide precision and safety for a multitude of applications. The compact size as well as various mounting and connection options facilitate problem-free installation even where space is limited.



> Nominal pressure … 400 bar / … 5 802 psi
> Piston diameter 40 … 125 mm / 1.57 … 4.92 inch
> Stroke length … 500 mm / … 19.69 inch

Characteristics	
Lifting speed	… 0.5 m/s … 1.64 ft/s
Pressure media temperature	-20 … 180 °C -4 … 356 °F
Viscosity	2.8 … 380 cSt
Mounting position	Optional

Applications	
	Differential cylinder
	Synchronised cylinder
	Push or pull cylinder
	Plunger cylinder

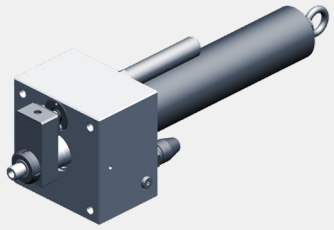
Special solutions

General

As a specialist for hydraulic components, not only do we offer a wide range of standard products, but we also develop precise solutions for complex and individual hydraulic tasks in dialogue with our customers: fast, efficient and economical.

Oscillation cylinder OZ

The OZ-cylinder (oscillating cylinder) is a self-switching operating cylinder with automatic directional control that is independent of the pressure. It is a differential cylinder with a pump connection on the cylinder head and a tank connection on the piston rod. The combination of work equipment and hydraulic control minimises the parts, saves pipework expenses and facilitates a reduction of the construction volume and therefore the costs.



> Nominal pressure … 200 bar / … 2 901 psi
> Piston diameter … 50 mm / … 1.97 inch
> Stroke length … 150 mm / … 5.91 inch

Product characteristics

- Simple construction (automatic reversal is integrated in the cylinder piston)
- Compact design
- No changeover pressure setting required
- Soft reversal
- Differential cylinder in rapid traverse function
- Automatic direction reversal

Fan drives KM 1

Individual cooling through adaptable motors with different valve functions for each cooler brand.

> Standard and space-optimised
> Proportional valve and reversible unit
> Thermostatic and pressure relief valve
> ON-OFF function
> Pressure relief valve and reversible unit

System technology

I General overview

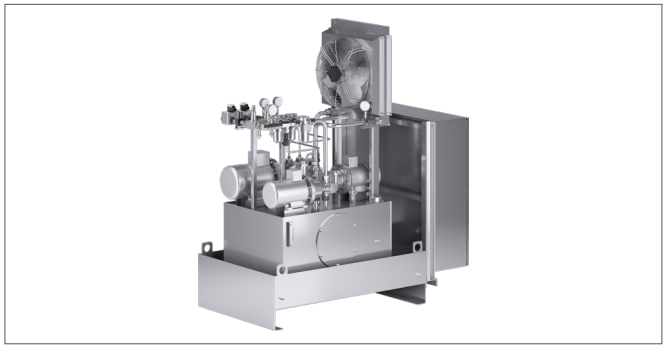
Project planning, design, production and service – everything from a single source for your individual system. We develop systems and plants for a wide variety of applications in numerous industrial sectors.

From the high precision metering system in all volume ranges to an oil supply system developed to meet your needs, we work with you to develop a solution that meets your requirements and quality standards.

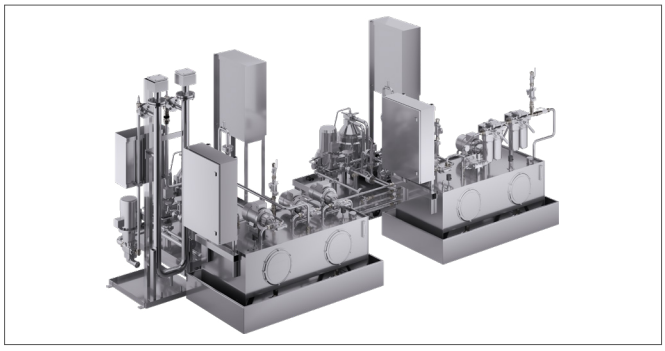
Due to the variety of in-house products and our qualified employees, we guarantee quality and service at the highest level.

I We also offer:

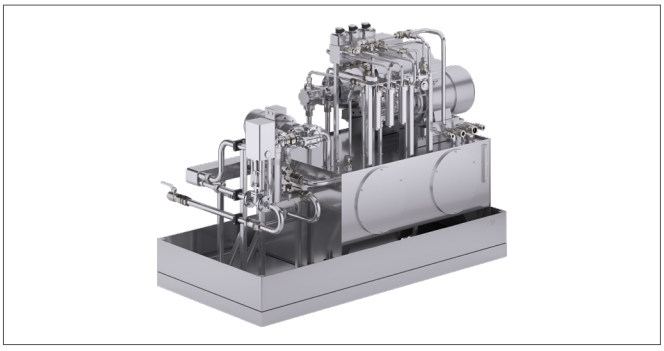
- > **Installation service**
- > **Bringing into service**
- > **Maintenance service**
- > **Remodeling and modernisation**



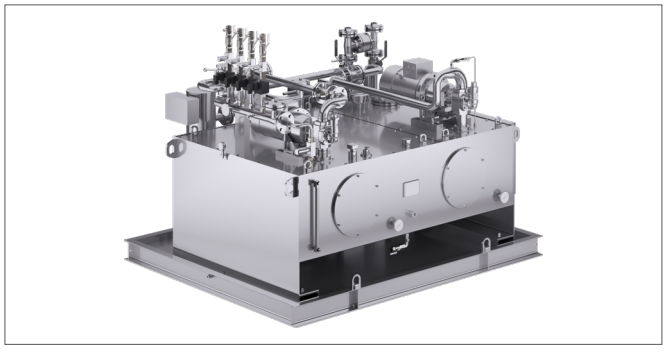
> Oil supply systems



> Dosing and filling systems



> Hydraulic systems



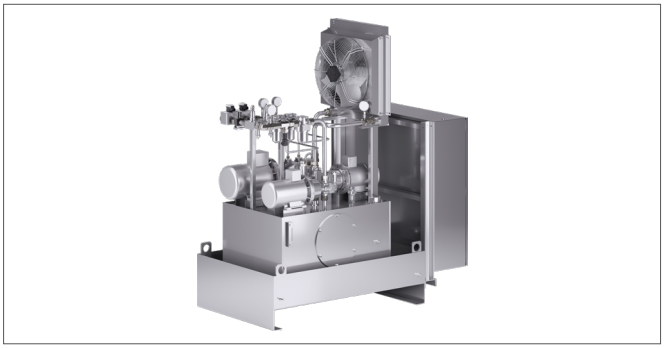
> Test bench construction

> Mounting plate units

Oil supply systems

General

Our oil supply systems are designed and manufactured with the highest standards of quality and reliability. In interaction with our broad and deep product portfolio, individual solutions are created for special customer requirements.



Characteristics

High and low pressure systems
Mounted with or without tank in an oil pan or as a mounting plate
Tank size and flow rate variable according to your needs
CE

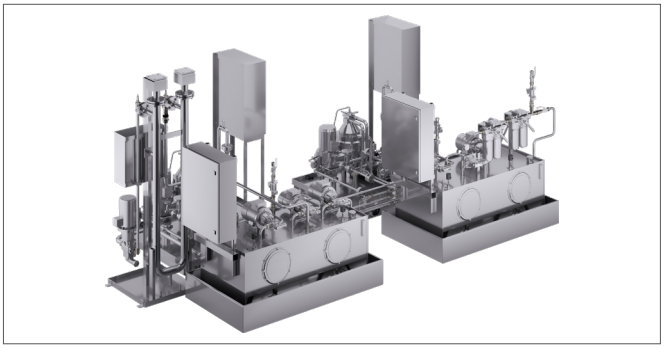
Applications

Gear and drive technology
Turbine and compressor technology
Rolling and power plant technology
Cement industry
Marine applications
Filtering, temperature control and much more

Dosing and filling systems

General

We offer metering systems with highly accurate flow and volume flow measurement for all industrial sectors. The metering systems are used for the high precision filling of end devices with a liquid medium.



Characteristics

Metering accuracy: +/- 0.1 %
Tank size and flow rate variable according to your needs
With or without integrated control
Interfaces: Profibus, Profinet, CAN bus (others on request)

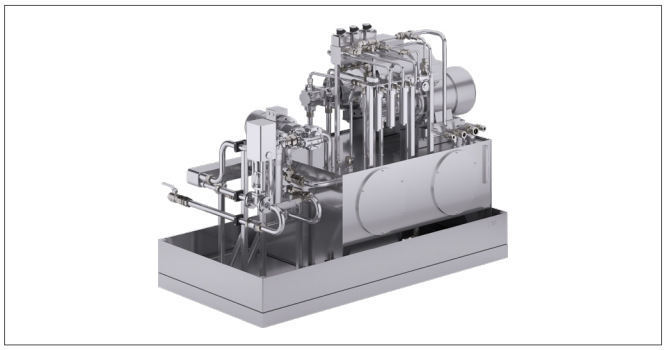
Applications

Automotive industry
Plastics industry
Fuels
Power plant industry
Electrical industry
Chemicals industry

Hydraulic systems

General

Thanks to our many years of expertise, we offer hydraulic systems and hydraulic system solutions for many different branches of industry. We will build the right system for you and find the optimal hydraulic system solution for your requirement profile.



Characteristics

Mounted with or without tank in an oil pan or as a mounting plate
Tank size and flow rate variable according to your needs
CE

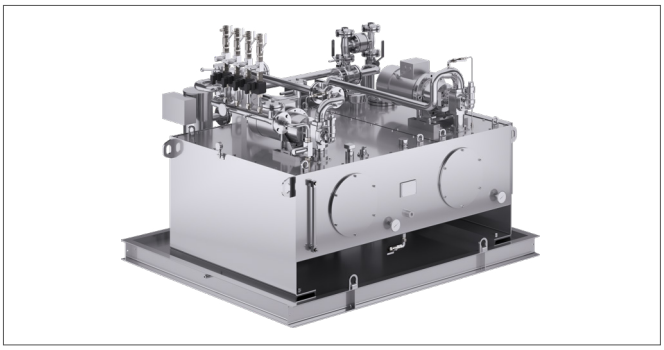
Applications

Metal construction
Foundry technology
Conveyor systems
Steel and hydraulic engineering
Press construction
Special machines

Test bench construction

General

We are manufacturers of hydraulic test benches for the most diverse areas of test bench technology. Test benches are developed and designed according to specifications or specifications created by us. All test sequences are run automatically according to programs developed by us. All processes are visualized, logged and documented.



Applications

Burst pressure test benches
Pulsation test benches
Bearing test benches
Endurance test benches
Hydraulic test benches
Pump test benches
Universal test benches
Cylinder test benches
Valve test benches
Test benches for nozzles
Special test benches

Mounting plate units

I General

We deliver ready-configured mounting plate units for installation in existing oil tanks and machines. The mounting plate units can be individually adapted to customer requirements and can be supplied with all types of pumps, drives (both electric and hydraulic) and also with valve technology.

Characteristics

Plate sizes and design according to customer requirements
In steel and stainless steel
ATEX

Applications

	Gear construction
	Turbine construction

KRACHT®

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Fluid technology solutions/US/08.2022