Solutions for Mobile Hydraulics

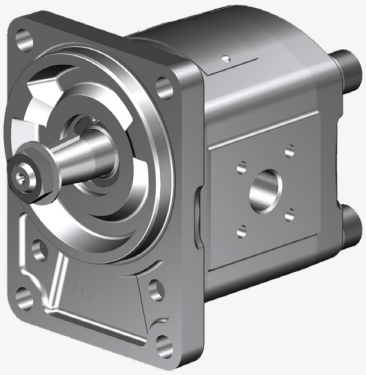
KRACHT®

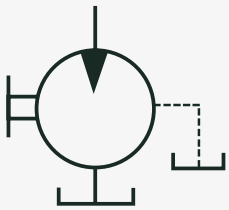
Your fluid solution partner

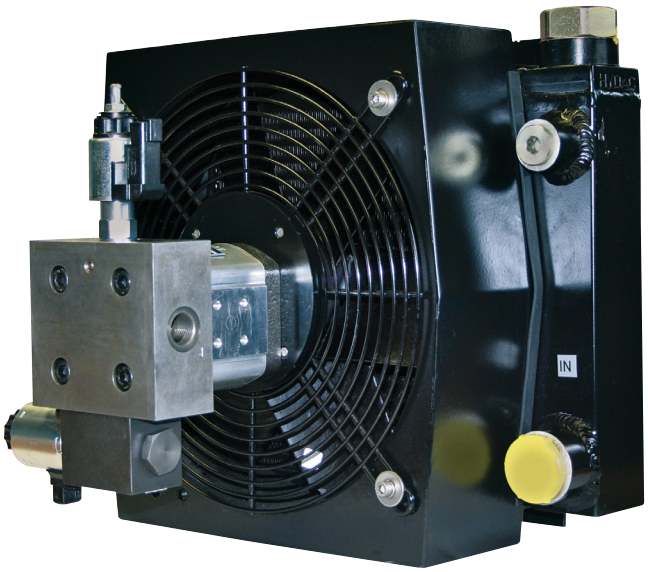
Content

Hydraulic motors KM

The demand for reduced noise, reduced emissions and energy savings on mobile machines require alternative solutions for cooling systems.
Beside the standard series of hydraulic gear motors KRACHT designs solutions for these demands together with the vehicle engineers.
The KRACHT solutions offers the system designer the best options due the individual cooling.
Fan drive motors can be adapted or modified to every cooler brand in the market.
Available in ATEX II 2GD c IIC (T3) on request.





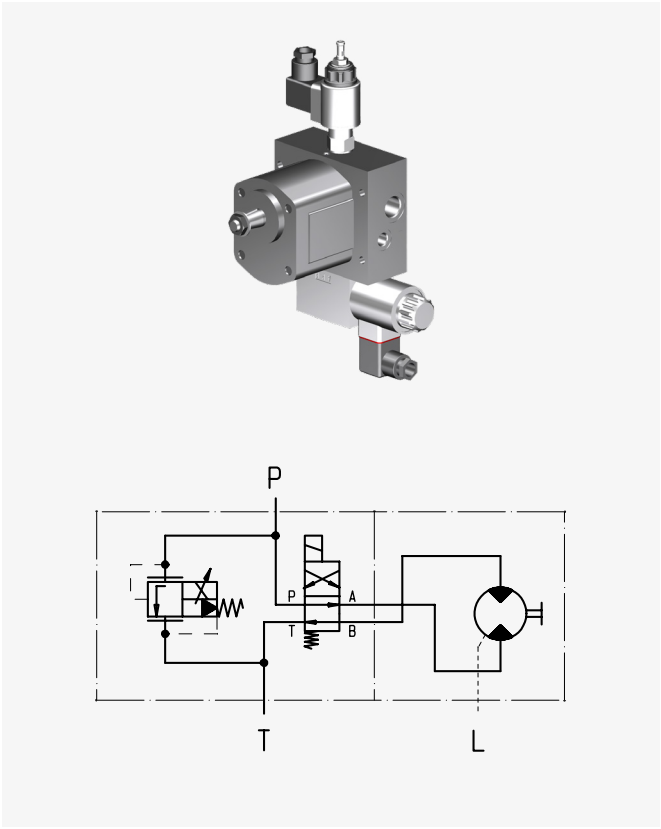


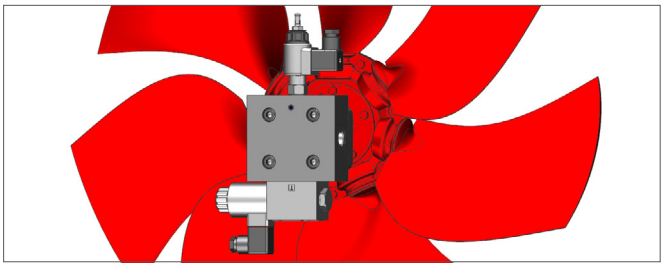
Fan drive

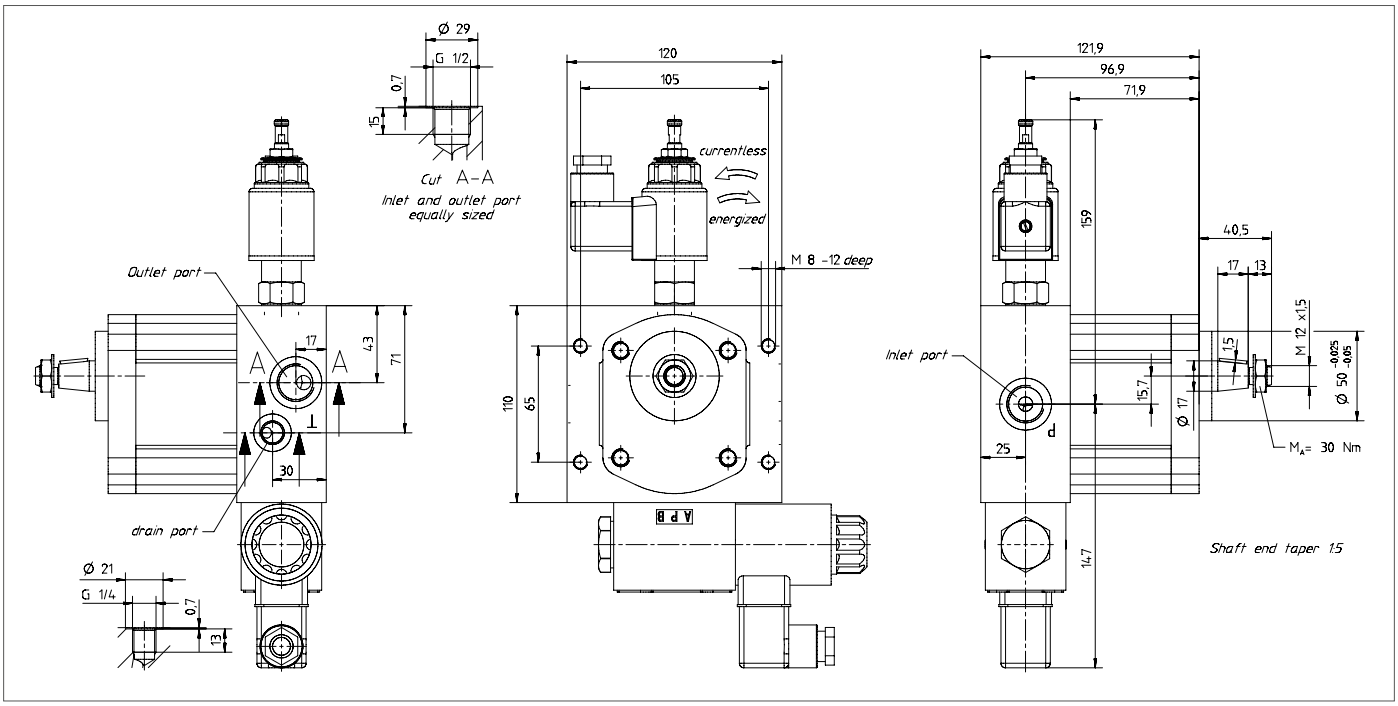
I KM 1 with proportional valve and reversible unit – „space optimized"

For cooler combinations of water and oil cooler the use of a proportional valve is the best choice.
The shown proportional valve includes a mechanical and electrical adjustable pressure relief valve and the reversible function.
The proportional valve is acting due to the signal of the temperature sensor of the vehicle – different solenoids are available.
KRACHT always recommends to use the version which is without current fully open – in the case of a broken cable the motor will run with the maximum speed to avoid an overheating of the machine – fail-safe function.
The reverse function can be acting independent from the temperature.
Different solenoid function are available due to the rotation.
Optional with anti-cavitation valve.

TYPE code:
KM1/… + SOV 4 . 0222 A







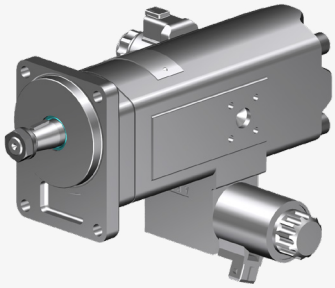
Dimensions in mm

Fan drive

I KM 1 with proportional valve and reversible unit – “standard”

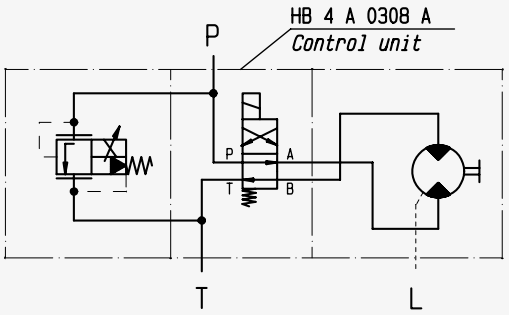
The KM 1 version with proportional valve can be combined with the reverse function.
The reverse function can be acting independent from the temperature.
Different solenoid function are available due to the rotation.

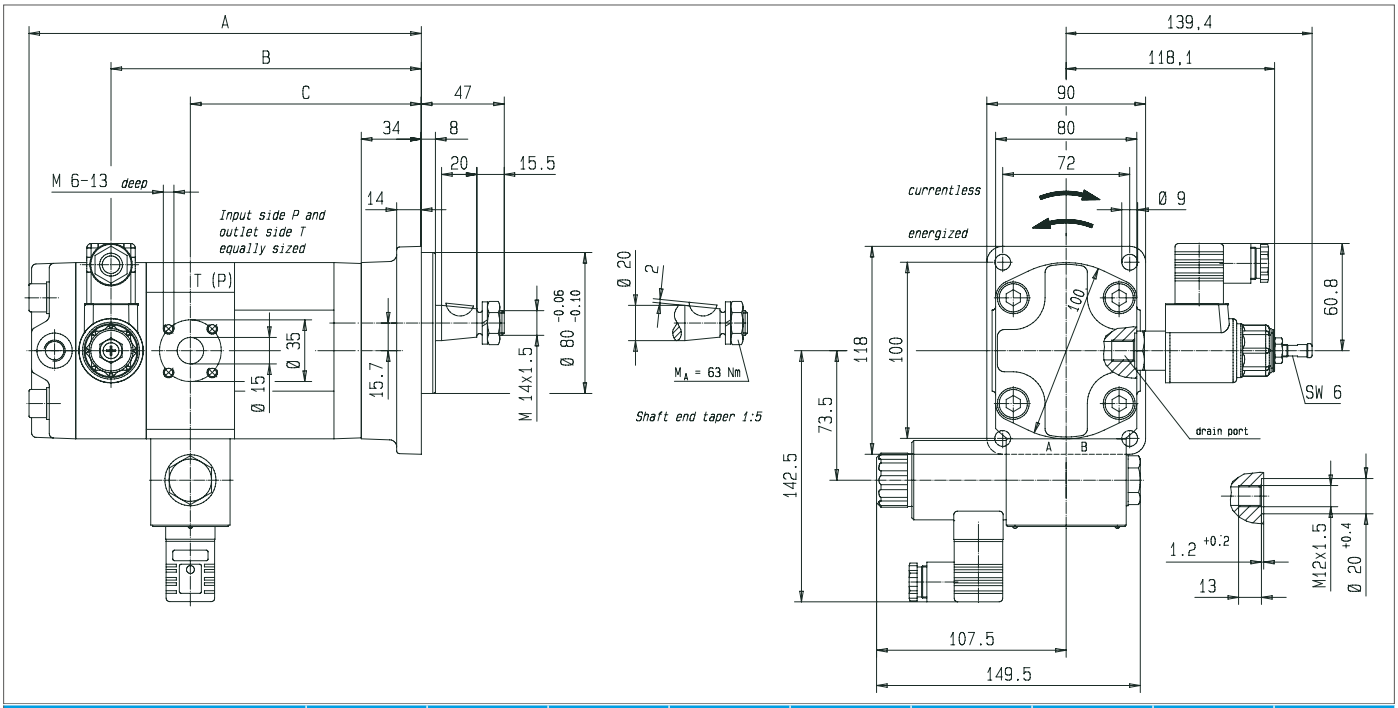
TYPE code:
KM 1/… + HB 4 A 308 A + SOV 4 . 0216 A



Reverse operation

Pressure
Flow rate





Nominal motor displacement (cm³/rev)	5.5	6.3	8	9.6	11	14	16	19	22
A	213.2	214.6	217.4	220.2	222.4	227.4	230.8	235.8	241.6
B	166.7	168.7	170.9	173.7	175.9	180.9	184.3	189.3	195.1
C	121.7	123.1	125.9	128.7	130.9	135.9	139.3	144.3	150.1

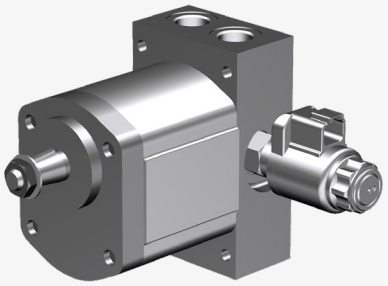
Dimensions in mm

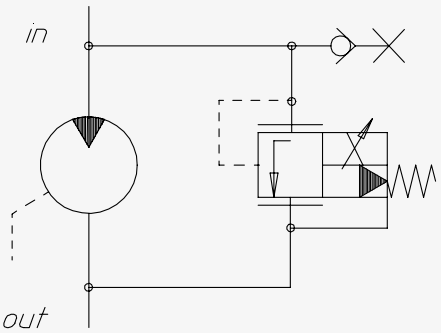
Fan drive

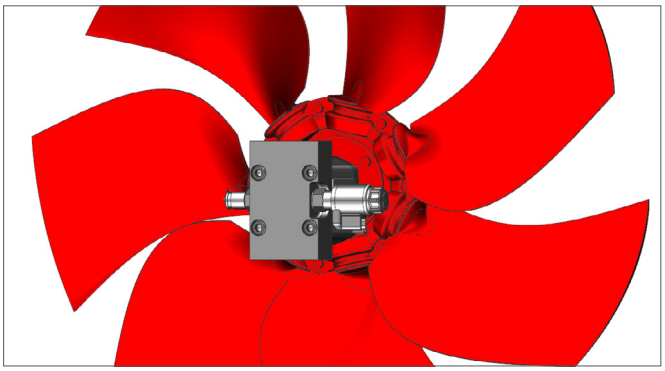
I KM 1 with proportional valve – "space optimized"

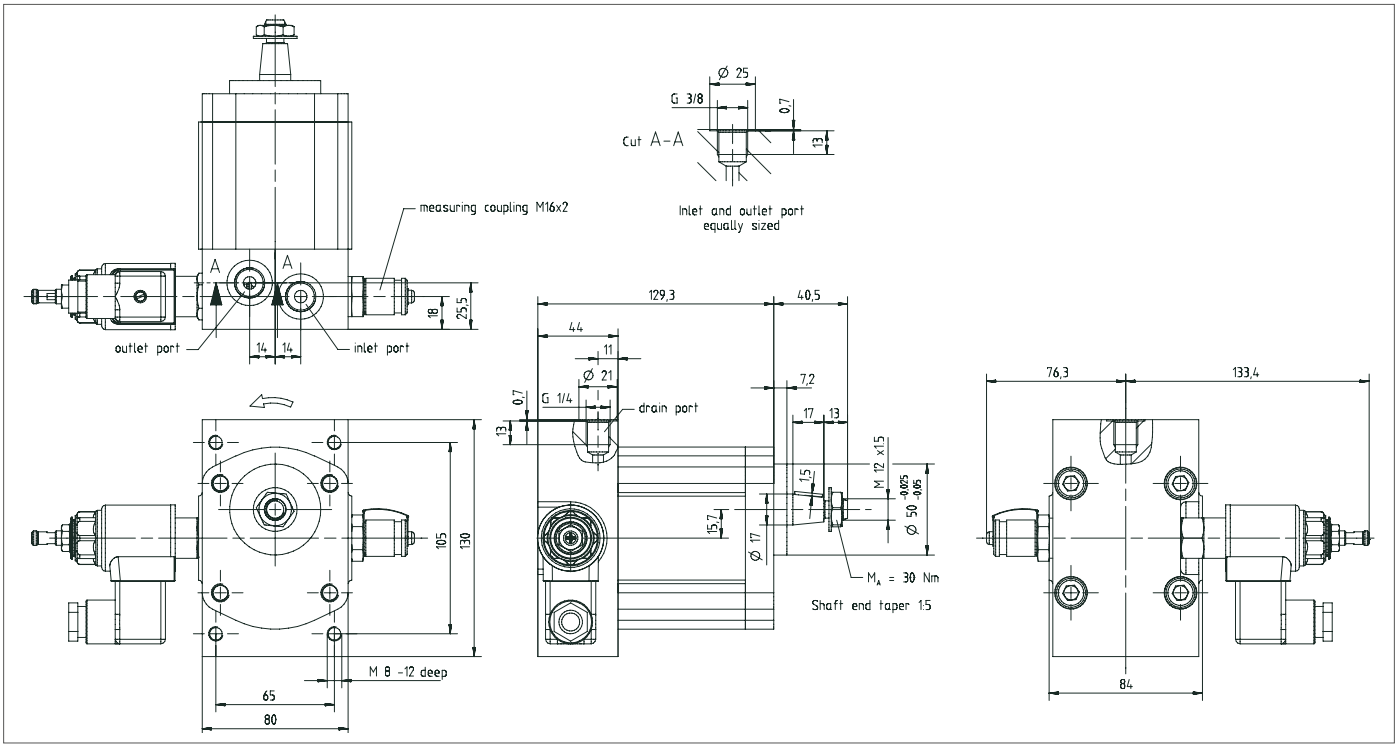
For cooler combinations of water and oil cooler the use of a proportional valve is the best choice.
The shown proportional valve includes a mechanical and electrical adjustable pressure relief valve.
The proportional valve is acting due to the signal of the temperature sensor of the vehicle – different solenoids are available.
KRACHT always recommends to use the version which is without current fully open – in the case of a broken cable the motor will run with the maximum speed to avoid an overheating of the machine – fail-safe function.

TYPE code:
KM1/… + SOV 4 . 0217 A









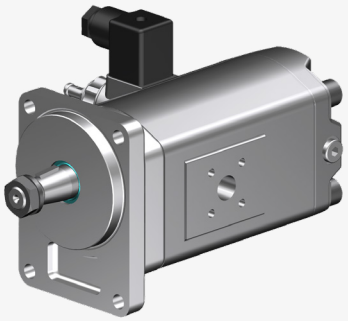
Dimensions in mm

Fan drive

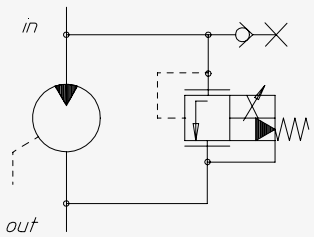
I KM 1 with proportional valve – “standard”

For cooler combinations of water and oil cooler the use of a proportional valve is the best choice.
The shown proportional valve includes a mechanical and electrical adjustable pressure relief valve.
The proportional valve is acting due to the signal of the temperature sensor of the vehicle – different solenoids are available.
KRACHT always recommends to use the version which is without current fully open – in the case of a broken cable the motor will run with the maximum speed to avoid an overheating of the machine – fail-safe function.
Optional with anti-cavitation valve.

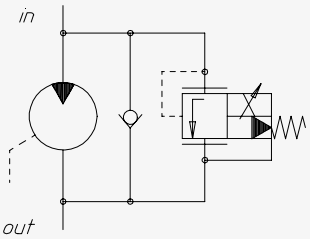
TYPE code:
KM1/... + SOV 4 . 0216 A



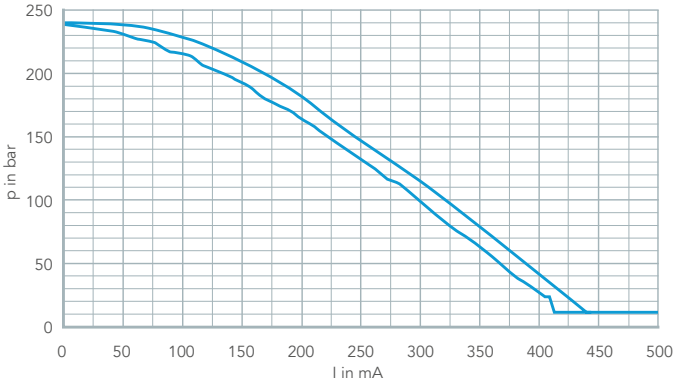
without check valve

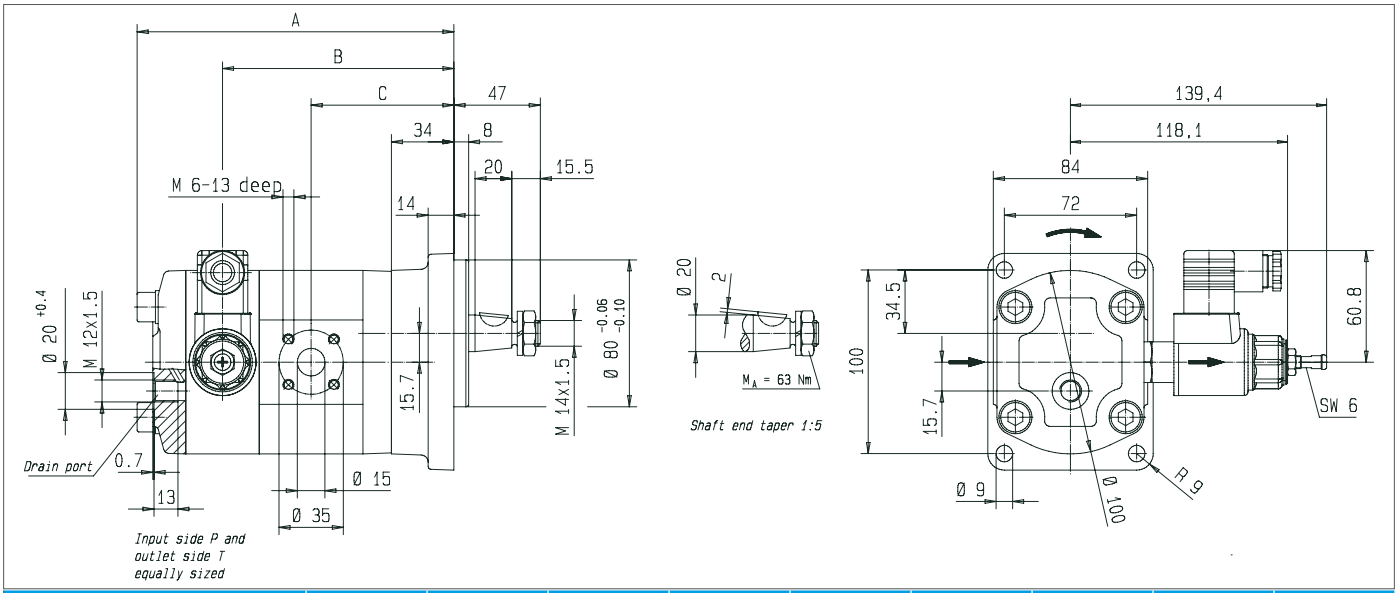


with check valve



Pressure curve





Nominal motor displacement (cm³/rev)	5.5	6.3	8	9.6	11	14	16	19	22
A	163.2	164.6	167.4	170.2	172.4	177.4	180.8	185.8	191.6
B	116.7	118.1	120.9	123.9	125.9	130.9	134.3	139.3	145.1
C	73.1	73.8	75.2	76.6	77.7	80.2	81.9	84.4	87.3

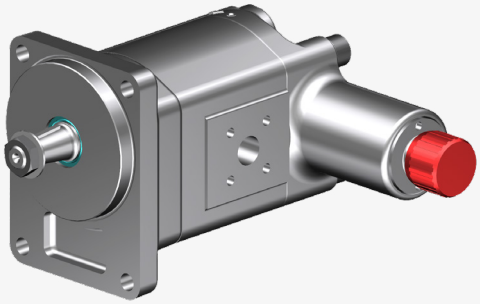
Dimensions in mm

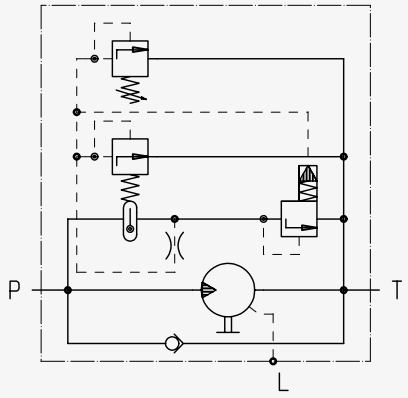
Fan drive

I KM 1 with thermostatic, pressure relief and non-return valve

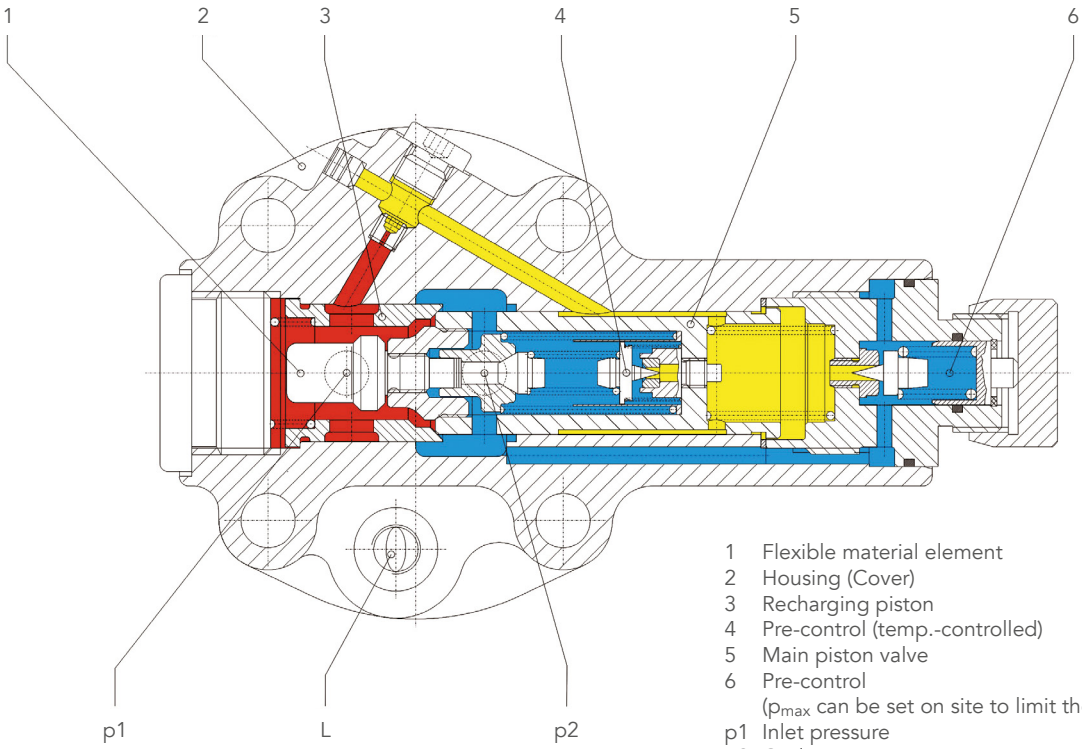
The thermostatic valve is a precontrolled pressure relief valve with temperature dependent pressure control and mounted on the KM 1 motor.
The basic principle is that the pressure setting of the valve automatically changes depending on the temperature via a built-in flexible material element which controls the motor speed.
The speed of the motor follows the oil temperature, different starting points can be chosen.
Cooling only when it's needed.
Thermostatic valve type TKM is used for oil-aircoolers – for combi coolers proportional version is available.

TYPE code:
KM 1/… + TKM 1 D1D..





Construction



1 Flexible material element
2 Housing (Cover)
3 Recharging piston
4 Pre-control (temp.-controlled)
5 Main piston valve
6 Pre-control
(p_{max} can be set on site to limit the maximum fan speed)
p1 Inlet pressure
p2 Outlet pressure
L Leak oil

Fan drive

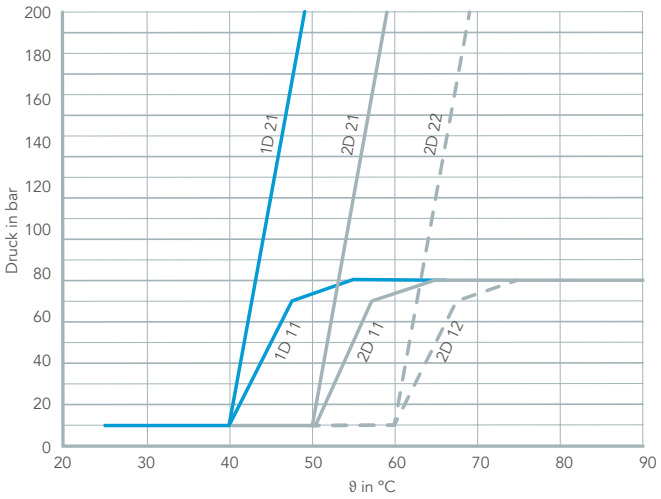
KM 1 with thermostatic, pressure relief and non-return valve

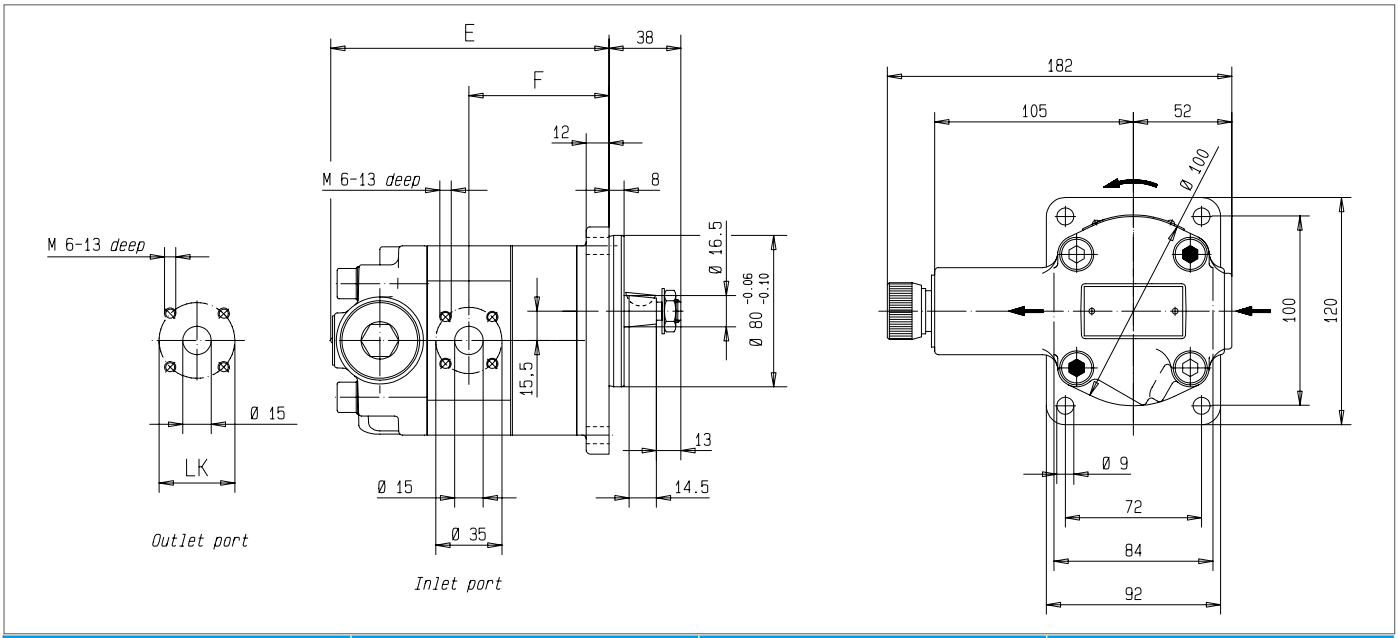
Type code

TKM	**Thermostatic valve for KM hydraulic motor**
1	**Size** 1 for KM 1 2 for KM 2
D	**Function** D Diagram 1 Pressure-temperature control
1D	**Control** 1D Flexible material element 40 … 60°C 2D Flexible material element 50 … 70°C
11	**Pressure temperature characteristic curve** 1D / 2D 11 40°C low pressure / 50°C low pressure 12 / 60°C low pressure 21 40°C high pressure / 50°C high pressure 22 / 60°C high pressure
A	**Design code number** A (internally allocated)
.	**max. pressure control (mechanically set)** 20 to 200 bar
E	**Oil discharge** A internal E external
00/	**Rate of flow (l/min)** 00 for TKM.D..
S	**Modification** S…

Pressure temperature characteristic curve

	Control
1D	1D 40 … 60°C control range max. 90°C
2D	2D 50 … 70°C control range max. 90°C



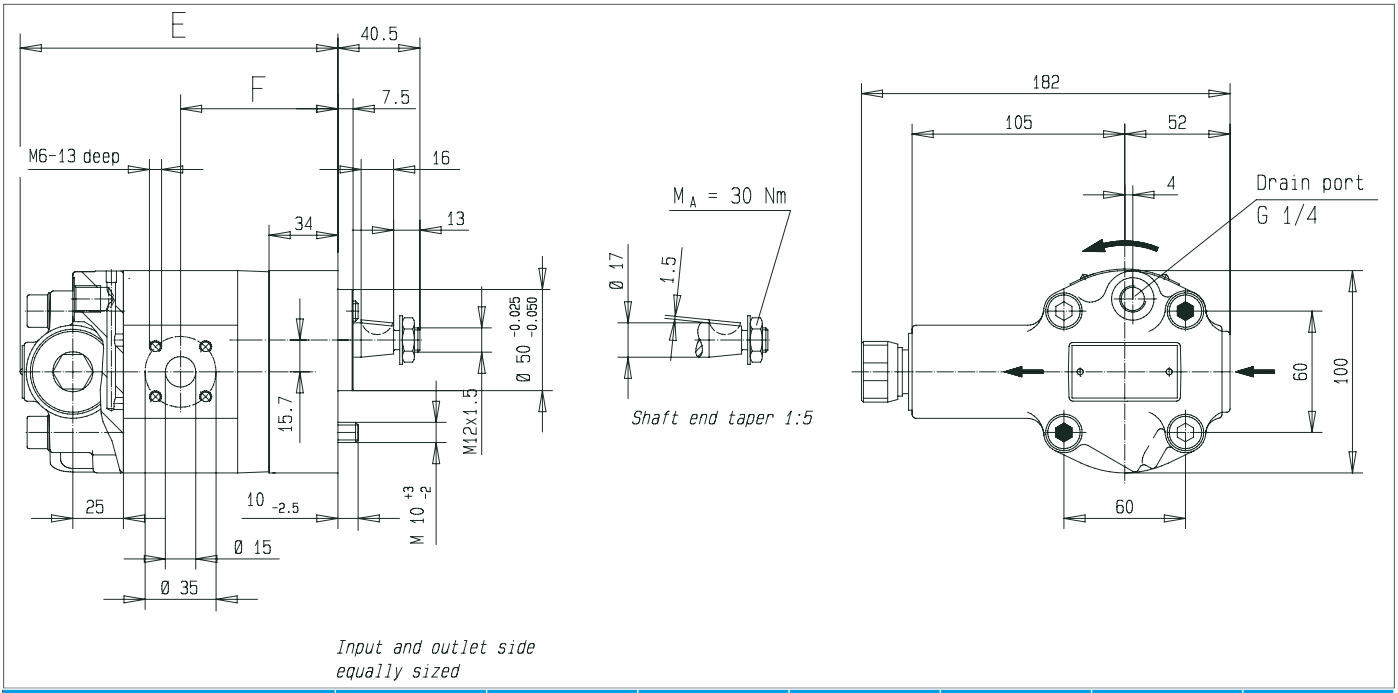


Nominal motor displacement in cm³/rev	4	5.5	8
E	137.0	147.0	147.0
F	69.0	74.0	74.0
LK	35.0	40.0	40.0

Dimensions in mm

Fan drive

KM 1 with thermostatic, pressure relief and non-return valve



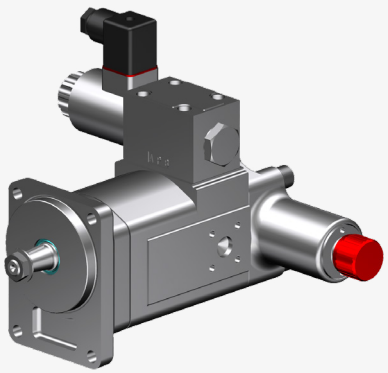
Nominal motor displacement (cm³/rev)	5.5	8	11	14	16	19	22
E	147.7	151.9	156.9	161.9	165.3	170.3	176.1
F	73.1	75.2	77.7	80.2	81.9	84.4	87.3

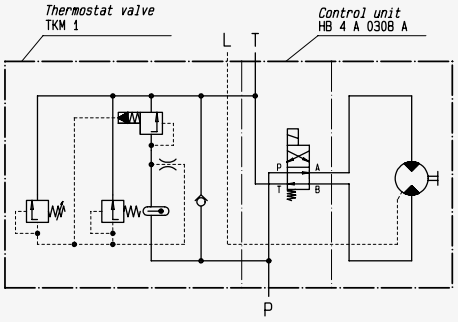
Dimensions in mm

Fan drive

I KM 1 with thermostatic, pressure relief, non-return valve and reversible unit

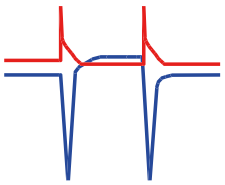
The version with thermostatic valve type TKM can be added with the reversible unit. The reverse function is used to clean the cooler by blowing against the cooler. The temperature control is working independent from the rotation.
To reverse the unit the solenoid valve has to be switched.
While construction the normal rotation should be specified to decide the currentless operation of the motor.
A charging valve is fitted as a non-return valve. Cavitations will be prevented.
This version is also available with ON-OFF function as well with „right / stop / left" function.





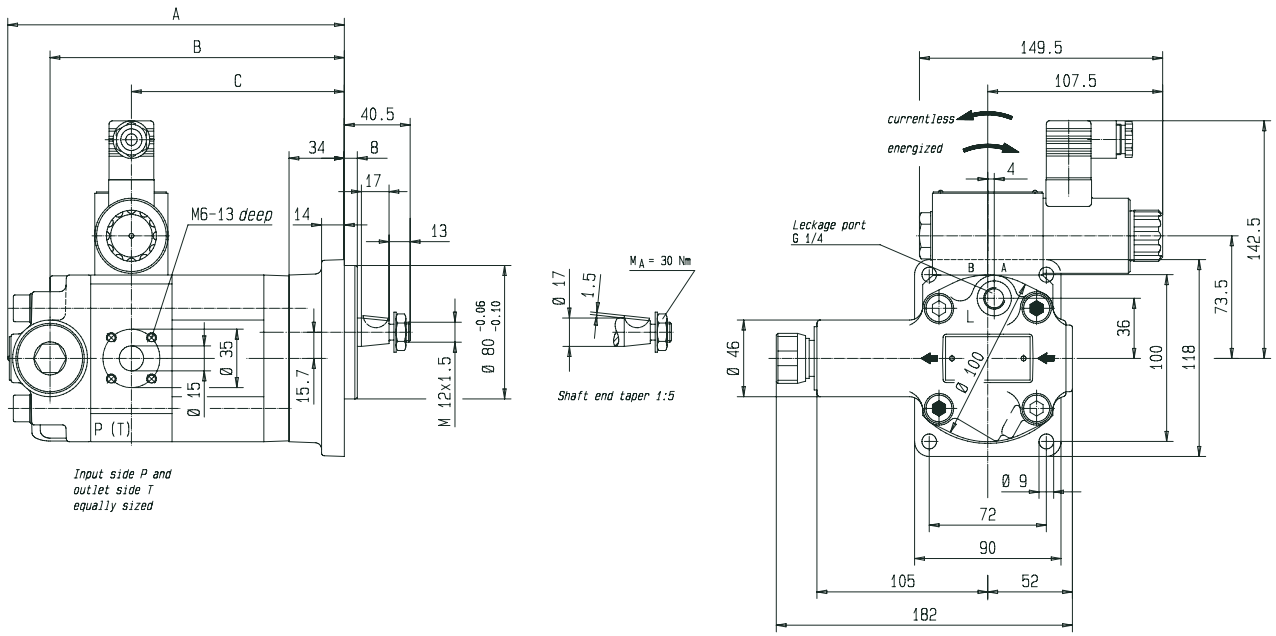
TYPE code:
KM 1/... + HB4 A 308 A + TKM 1 D.D...

Reverse operation



Pressure
Flow rate

Currentless clockwise



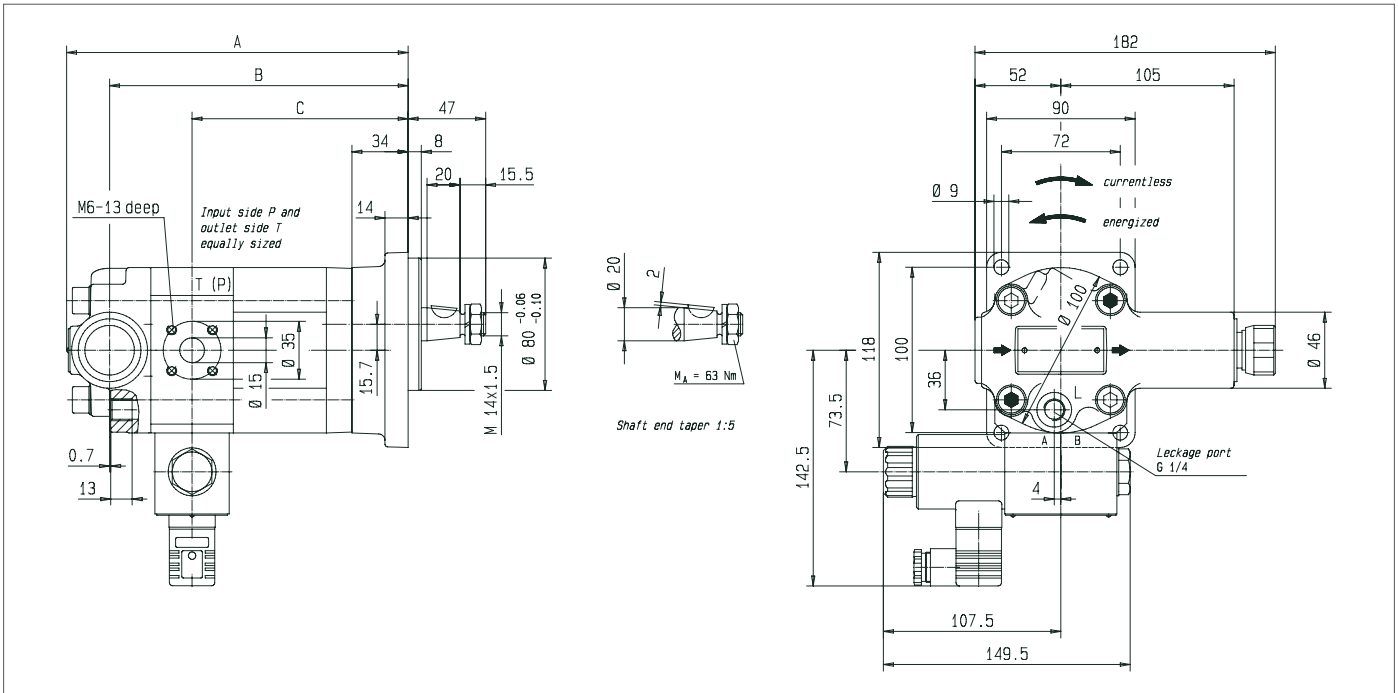
Nominal motor displacement (cm³/rev)	5.5	8	9,6	11	14	16	19	22
A	197,7	201,9	204,7	206,9	211,9	215,3	220,3	226,1
B	171,7	175,9	178,7	180,9	185,9	189,3	194,3	200,1
C	121,7	125,9	128,7	130,9	135,9	139,3	144,3	150,1

Dimensions in mm

Fan drive

KM 1 with thermostatic, pressure relief, non-return valve and reversible unit

Currentless counter-clockwise



Nominal motor displacement (cm³/rev)	5.5	8	9.6	11	14	16	19	22
A	197.7	201.9	204.7	206.9	211.9	215.3	220.3	226.1
B	171.7	175.9	178.7	180.9	185.9	189.3	194.3	200.1
C	121.7	125.9	128.7	130.9	135.9	139.3	144.3	150.1

Dimensions in mm

Fan drive

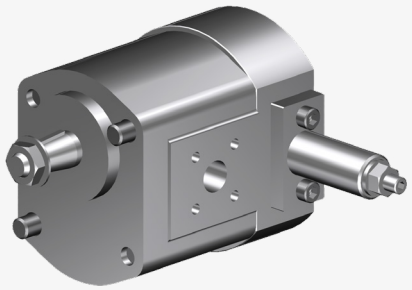
I KM 1 with pressure and non-return valve

The series KM 1 is available with a mechanical adjustable pressure relief valve in the end cover of the hydraulic motor.
This pressure relief valve can be delivered pre-adjusted to the operating pressure.
With this pressure relief the maximum speed of the fan can be limited, overflow will bypass.
A recharging valve is fitted as a non-return valve. Cavitation will be prevented.
Please remind that this pressure relief valve works only in one direction – clockwise or counter-clockwise.

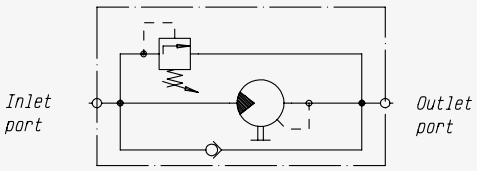
TYPE code:
KM 1/... + SOV 4 B 0173 A – without drain port
KM 1/... + SOV 4 E 0173 A – with drain port

Available for all versions of the KM 1 series.

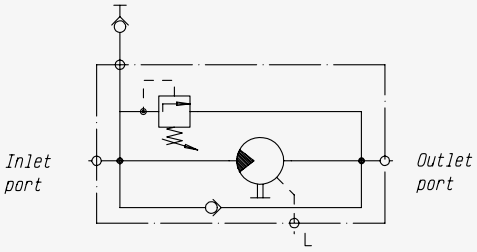
Pressure setting: 24 to 240 bar

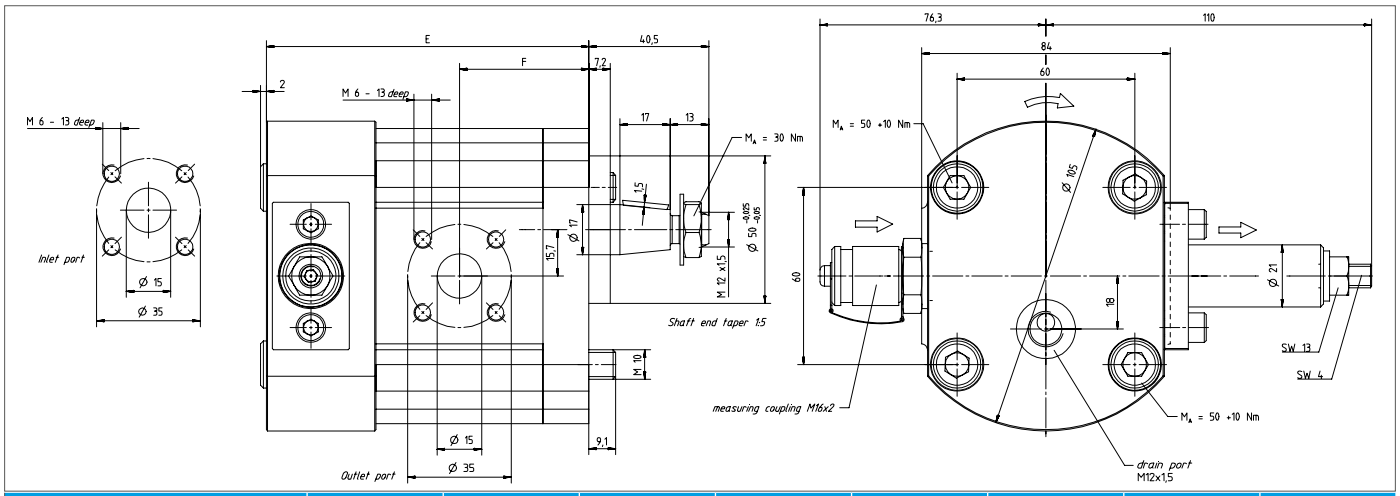


Internal leak oil



External leak oil





Nominal motor displacement (cm³/rev)	5.5	6.3	8	11	14	16	19	22
E	102.2	103.6	103.9	108.9	113.9	117.3	122.3	128.1
F	39.1	39.8	41.2	43.7	46.2	47.9	50.4	53.3

Dimensions in mm

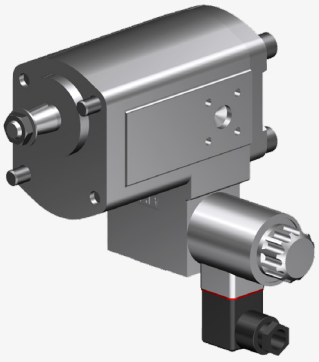
Fan drive

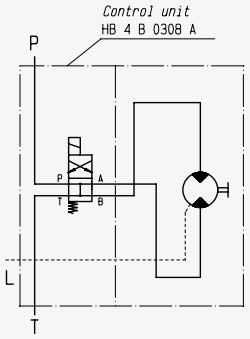
I KM 1 with ON-OFF function, both directions possible

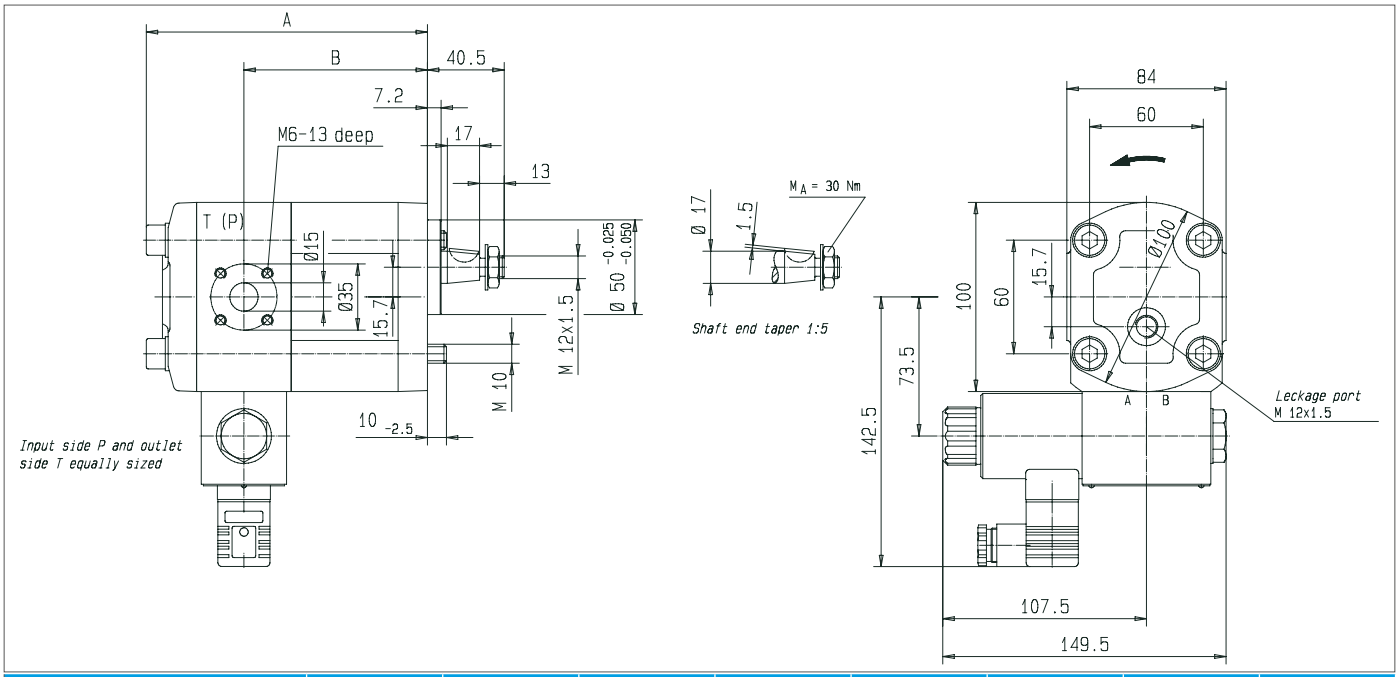
The series KM 1 is available with an ON - OFF function to run the hydraulic motor in one direction.
The enclosed solenoid valve can be switched on to bypass the flow around the motor.

TYPE code:
KM 1/… + HB 4 B 308 A

Available for all versions of the KM 1 series







Nominal motor displacement (cm³/rev)	5.5	6.3	8	11	14	16	19	22
A	139.2	140.6	143.4	148.4	153.4	156.8	161.8	167.6
B	87.7	89.1	91.9	96.9	101.9	105.3	110.3	116.1

Dimensions in mm

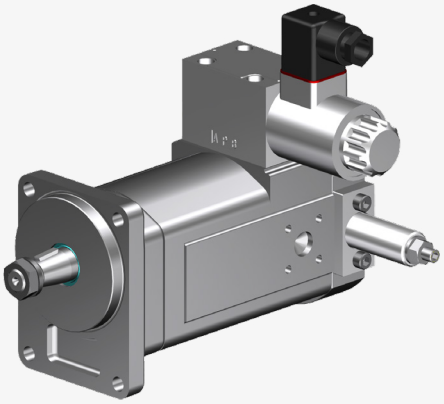
Fan drive

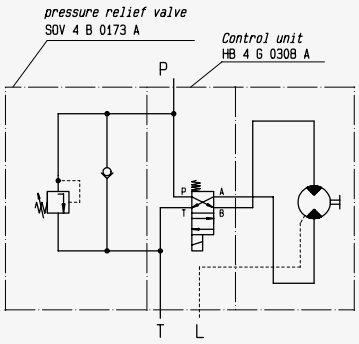
I KM 1 with pressure relief, non-return valve and reversible unit

The series of hydraulic motors KM 1 can be added with a reversible function including a pressure relief valve. With the reverse function the rotation of the motor can be switched by the solenoid valve DURING operation, the pressure relief valve works independent from the rotation.
This pressure relief valve can be delivered pre-adjusted to the operating point.
A recharging valve is fitted as a non-return valve. Cavitations will be prevented.
The relief valve works in both directions.

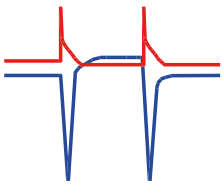
TYPE code:
KM 1/… + HB 4 G 0308 A + SOV 4 B 0173 A

Available for all versions of the KM 1 series.

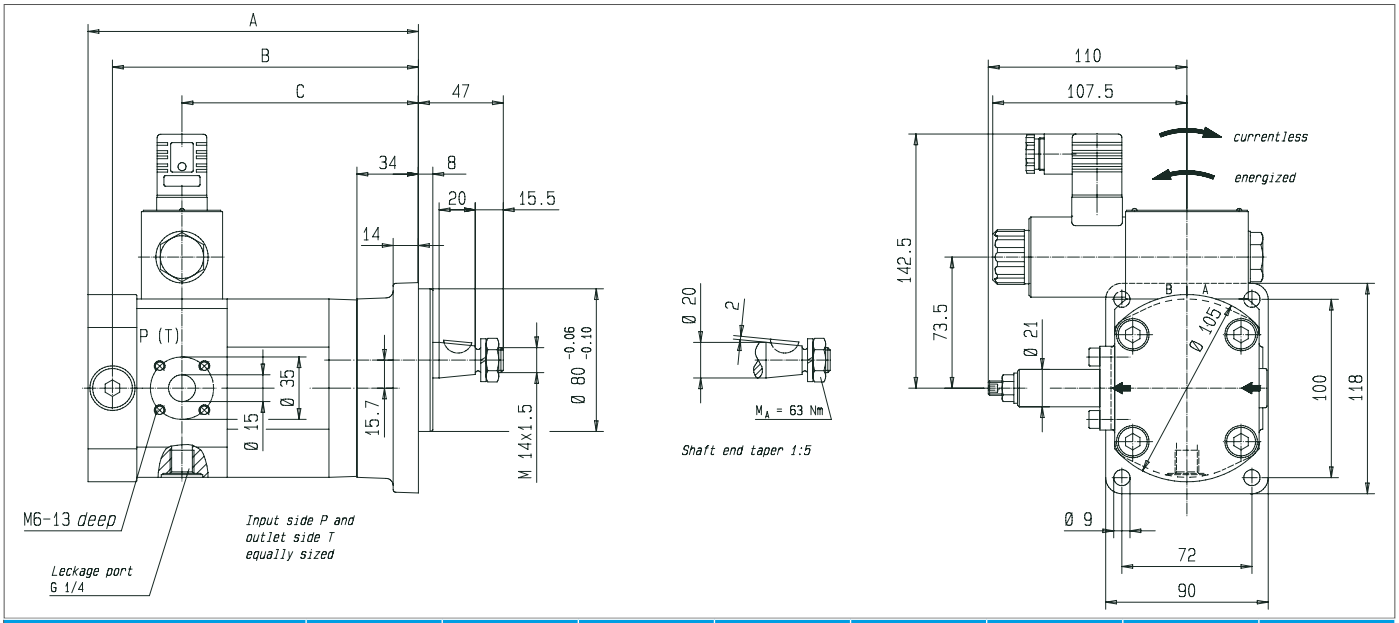




Reverse operation



Pressure
Flow rate



Nominal motor displacement (cm³/rev)	5.5	8	9.6	11	14	16	19	22
A	173.7	177.9	180.7	182.9	187.9	191.3	196.3	202.1
B	160.2	164.4	167.2	169.4	174.4	177.8	182.8	188.6
C	121.7	125.9	128.7	130.9	135.9	139.3	144.3	150.1

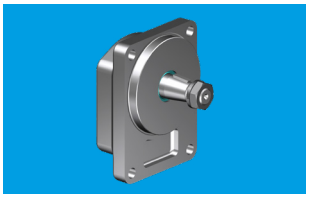
Dimensions in mm

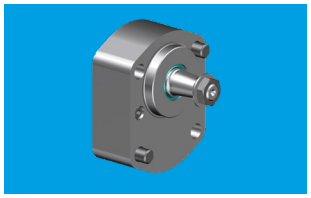
Fan drive

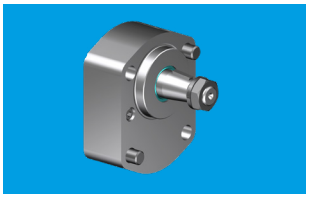
I KM 1 fan drive combinations

Outboard bearing

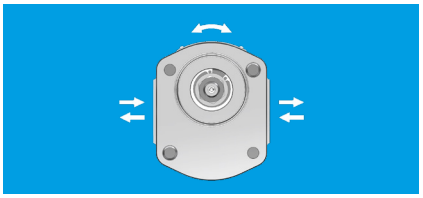

Taper 1:5, Ø 17 mm

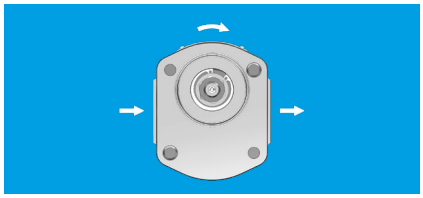

Taper 1:5, Ø 20 mm

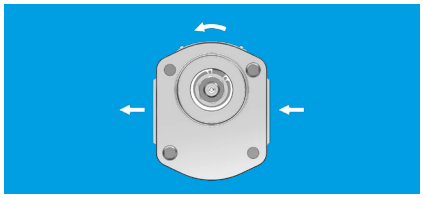

Taper 1:5, Ø 17 mm


Taper 1:5, Ø 20 mm

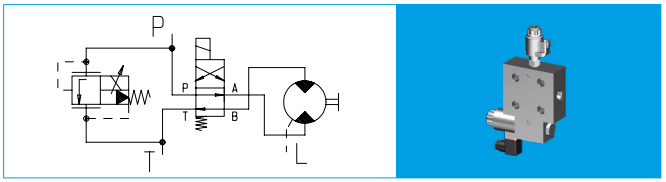
Direction of rotation

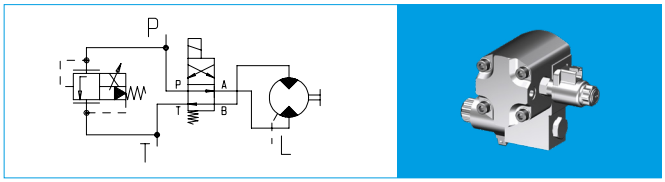

Both

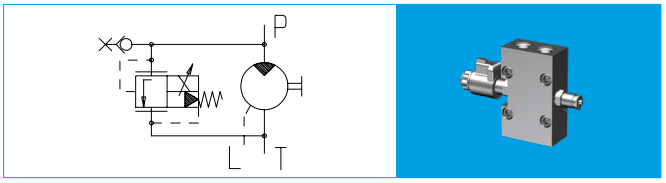

Clockwise

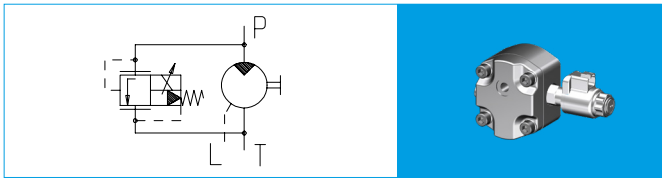

Counter-clockwise

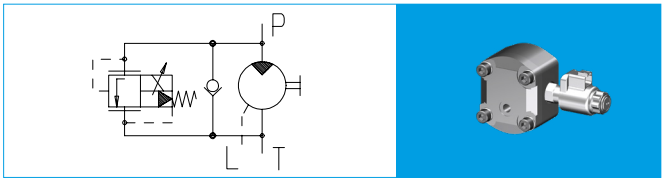
Function

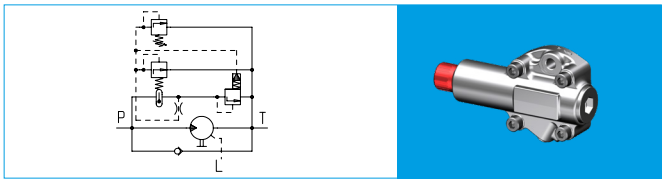

KM 1 „space optimized" with proportional valve and reversible unit

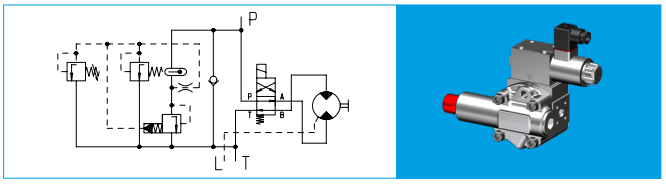

KM 1 "standard" with proportional valve and reversible unit

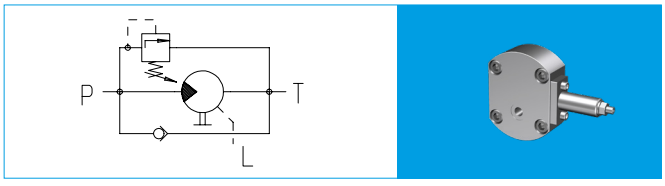

KM 1 "space optimized" with proportional valve

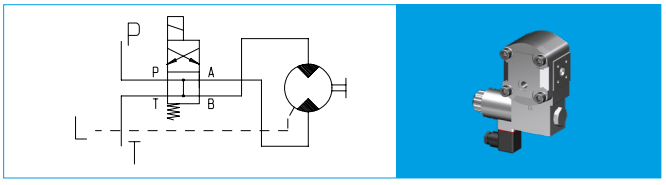

KM 1 "standard" with proportional valve

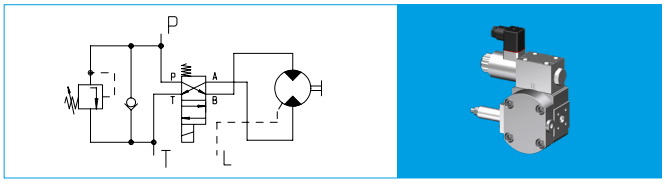

KM 1 with non-return valve


KM 1 with thermostatic, pressure relief and non-return valve


KM 1 with thermostatic, pressure relief, non-return valve and reversible unit


KM 1 with pressure and non-return valve

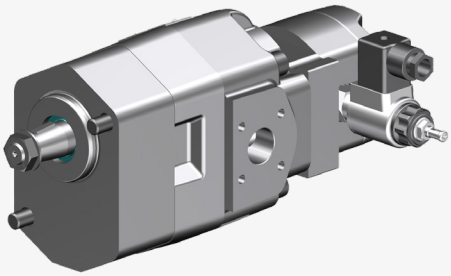

KM 1 with ON-OFF function

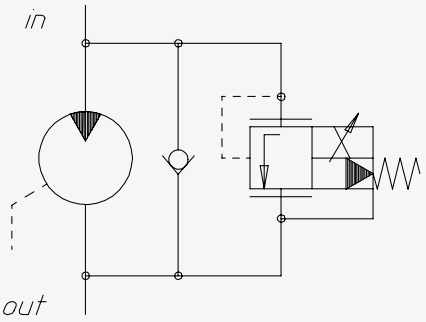

KM 1 with pressure relief, non-return valve and reversible unit

Fan drive

I KM 2 with proportional valve with outboard bearing and anti-cavitation valve

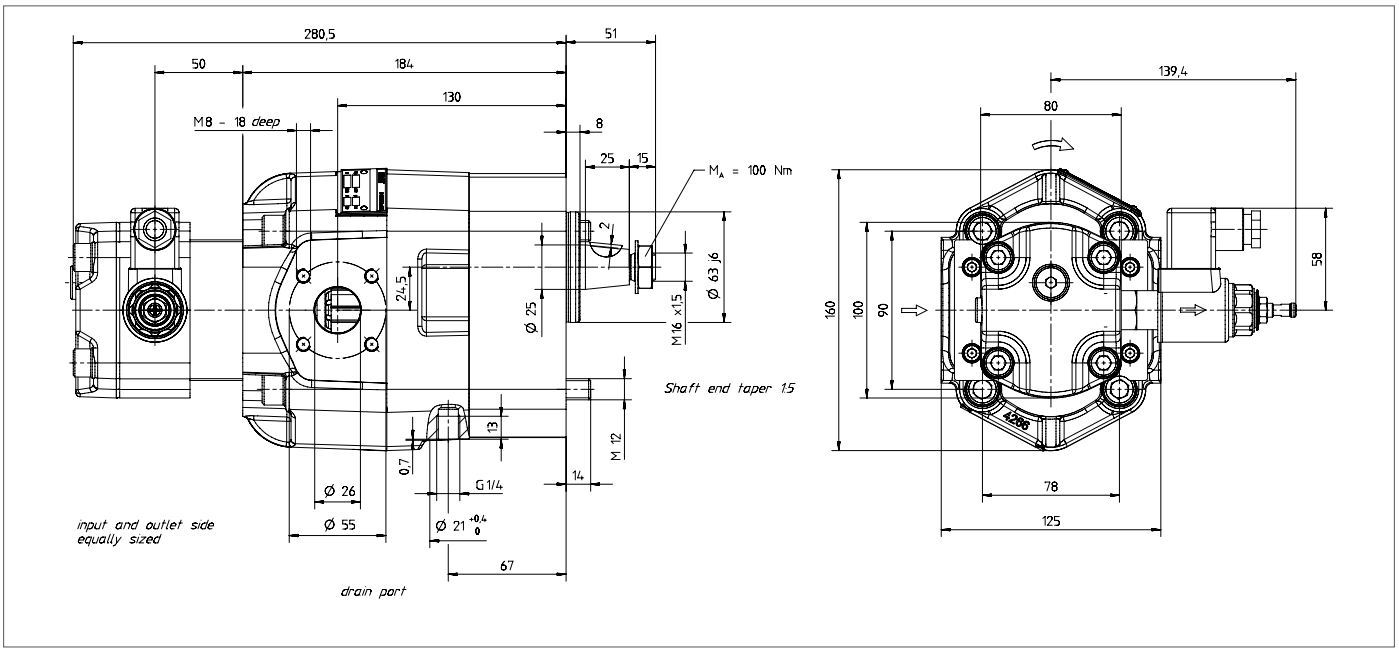
For cooler combinations of water and oil cooler the use of a proportional valve is the best choice.
The shown proportional valve includes a mechanical and electrical adjustable pressure relief valve.
The proportional valve is acting due to the signal of the temperature sensor of the vehicle – different solenoids are available.
KRACHT always recommends to use the version which is without current fully open – in the case of a broken cable the motor will run with the maximum speed to avoid an overheating of the machine – fail-safe function.





TYPE code: KM 2/... + SOV 4 B 0216 A

Flow rate
Q_{max} = 60 l/min

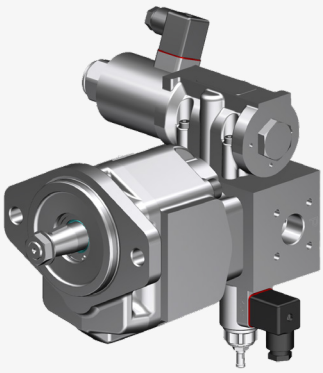


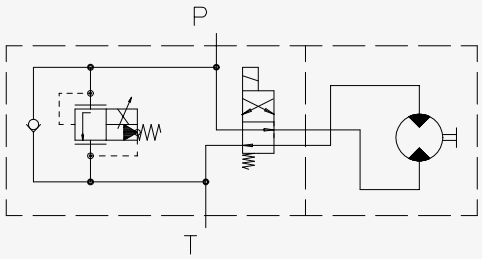
Dimensions in mm

Fan drive

I KM 2 with proportional valve and reversible unit

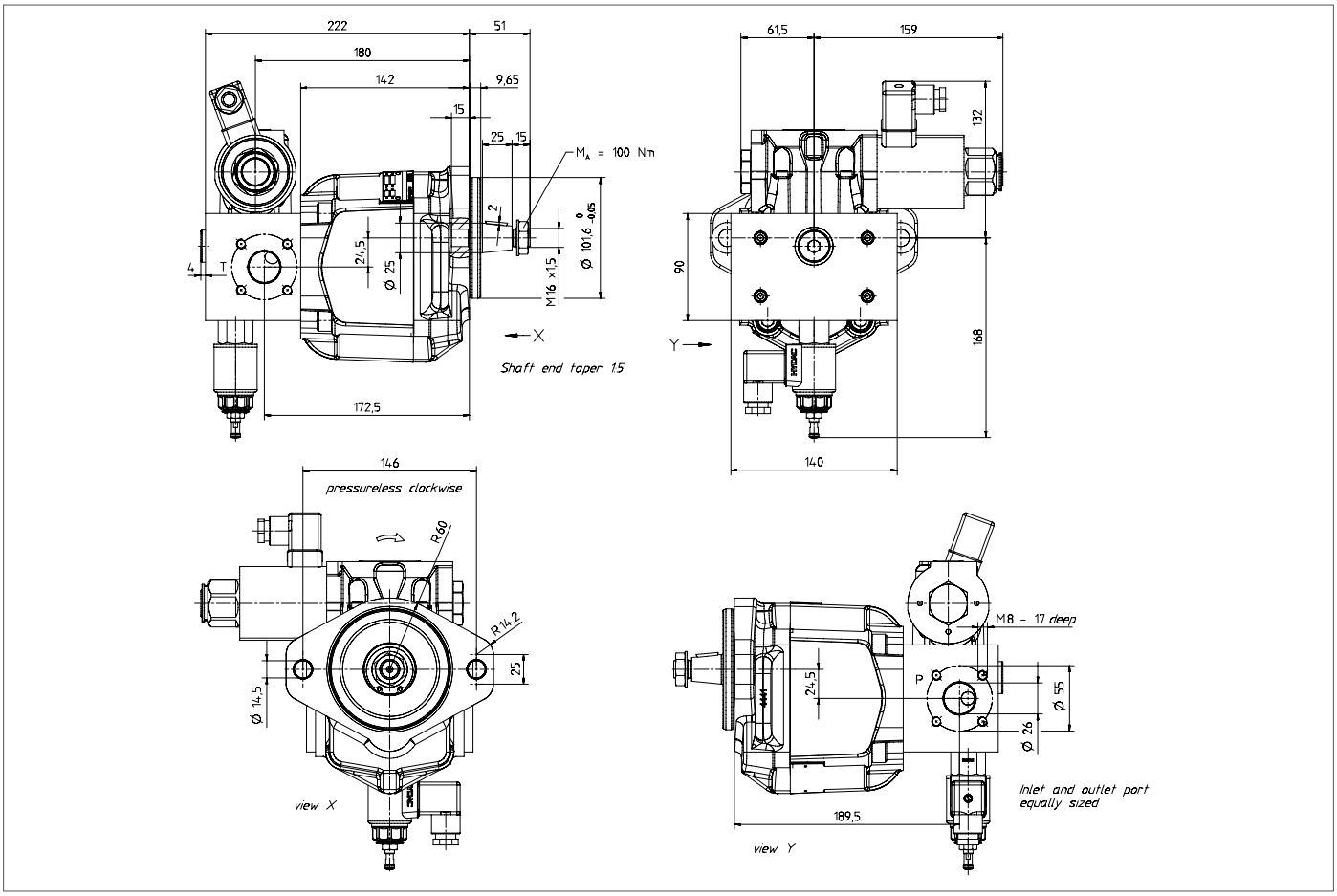
For cooler combinations of water and oil cooler the use of a proportional valve is the best choice.
The shown proportional valve includes a mechanical adjustable
pressure relief valve and an electrical adjustment of the flow and the
reversible function.
The proportional valve is acting due to the signal of the temperature
sensor of the vehicle – different solenoids are available.
KRACHT always recommends to use the version which is without current fully open – in the case of a broken cable the motor will run with the maximum speed to avoid an overheating of the machine – fail-safe function.
The reverse function can be acting independent from the temperature.
Different solenoid function are available due to the rotation.
Optional with anti-cavitation valve.





TYPE code:
KM 2/... + SOV 4 B 0253 A

Flow rate
Q_{max} = 120 l/min



Dimensions in mm

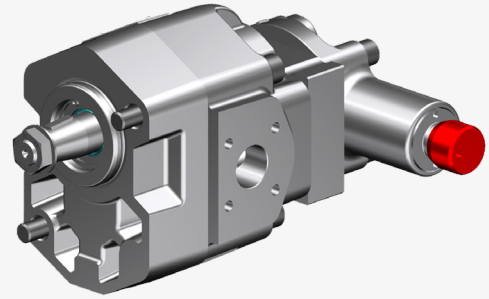
Fan drive

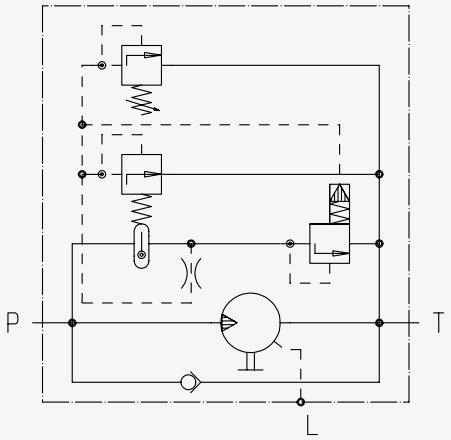
I KM 2 with thermostatic valve and pressure relief valve

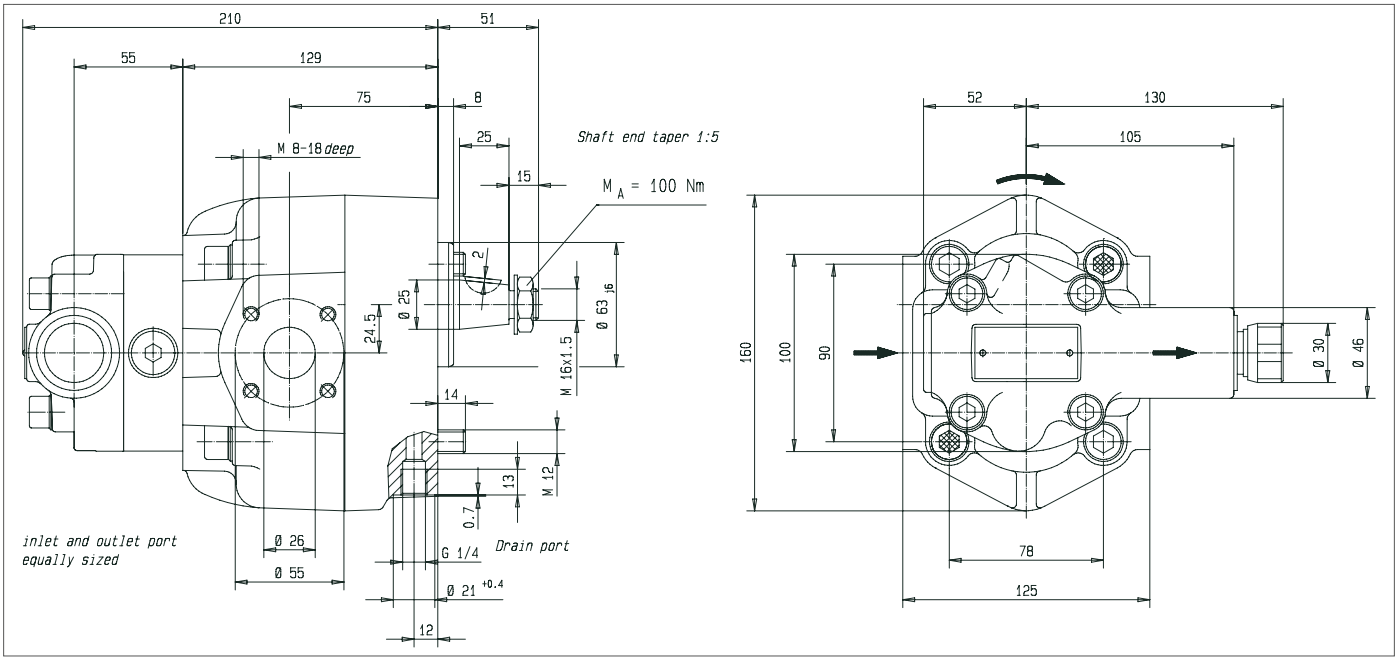
The thermostatic valve is a precontrolled pressure relief valve with temperature dependent pressure control and mounted on the KM 2 motor.
The basic principle is that the pressure setting of the valve automatically changes depending on the temperature via a built-in flexible material element and this controls the motor speed.
The speed of the motor follows the oil temperature, different start points can be chosen.
Thermostatic valve type TKM is used for oilair coolers – for combi coolers proportional version is available.

TYPE code:
KM 2/... + TKM 2 D1D 22 A 200 A00/S03

Flow rate
Q_{max} = 80 l/min







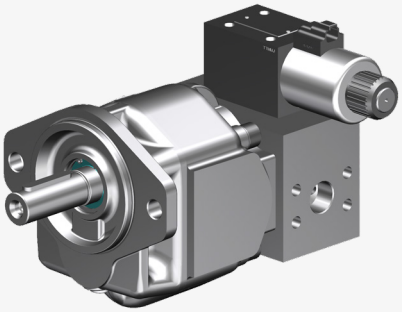
Dimensions in mm

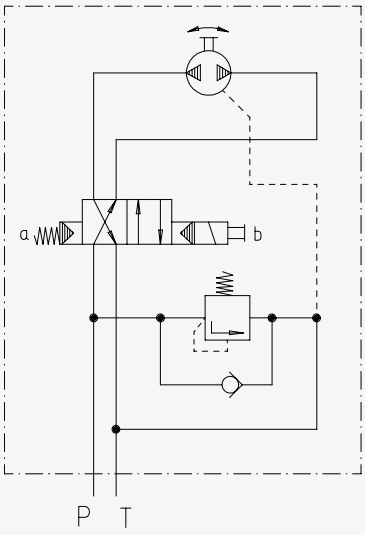
Fan drive

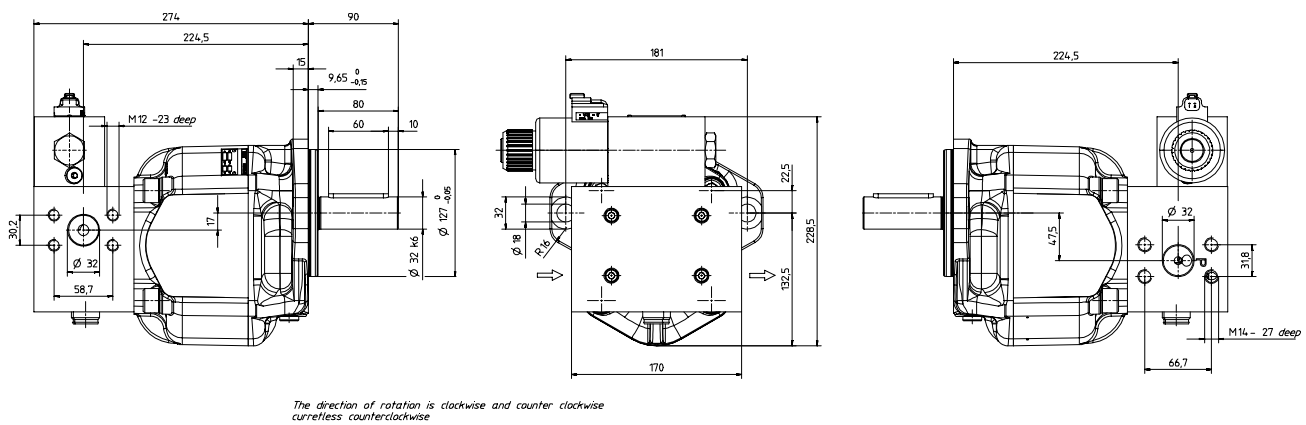
I KM 3 with pressure relief valve and reversible unit

The series of hydraulic motors KM 3 can be added with a reversible function including a pressure relief valve. With the reverse function the rotation of the motor can be switched by the solenoid valve DURING operation, the pressure relief valve works independent from the rotation.
This pressure relief valve can be delivered pre-adjusted to the operating point (fixed pressure setting).
A recharging valve is fitted as a non-return valve. Cavitations will be prevented.
The relief valve works in both directions.

TYPE code: KM 3/... + SOV 4 A 0250 A







Dimensions in mm

High pressure gear motors

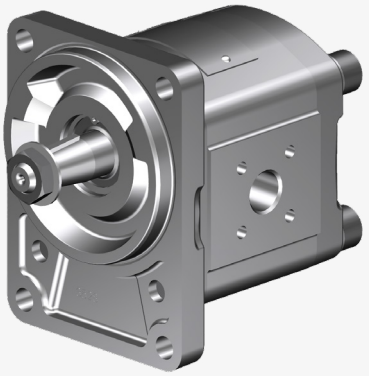
I KM – with hydraulic axial clearance compensation

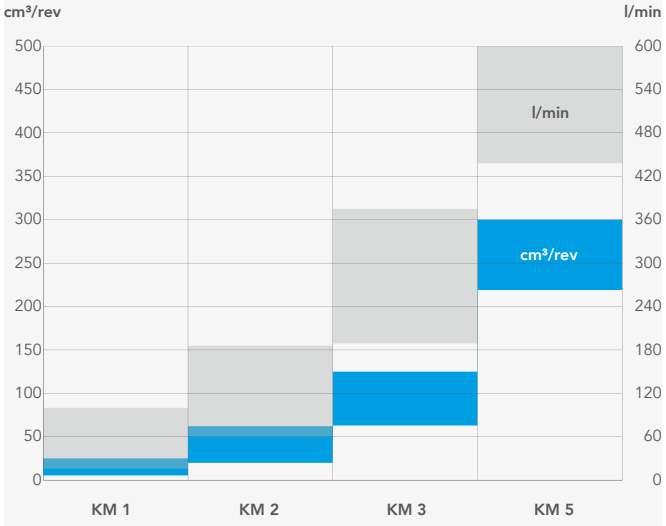
Characteristics

Displacement	4 … 300 cm³/rev
Working pressure	… 315 bar
Speed	… 4 000 1/min
Viscosity	10 … 1000 mm²/s
Media temperature	-20 … 150 °C

Designs in aluminium, cast iron, spheroidal cast iron or as flow dividers

KM 1





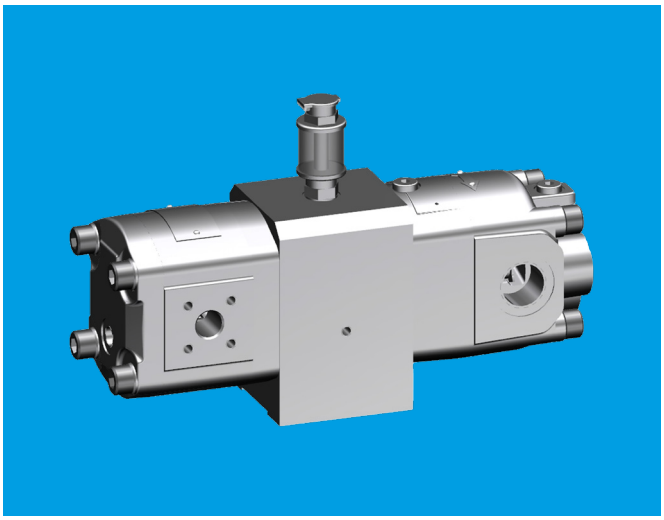
Technical details

Motor	Displacement	Speed	Working pressure	Design / Option
KM 1	4 … 25 cm³/rev	500 … 4 000 1/min	… 280 bar	– Aluminium housing (… 4NL) – Front and end covers made of cast iron – ATEX protection up to T4 on request – The valve function can be temperature or proportionally controlled
KM 2	20 … 62 cm³/rev	500 … 3 000 1/min	… 315 bar	– Optionally with bronze sleeve bearing – Available in spheroidal cast iron (EN-GJS-600) – Optionally also with valve function – temperature controlled
KM 3	63 … 125 cm³/rev	500 … 3 000 1/min	… 280 bar	– Made completely of cast iron (EN-GJL-300) – Also with bronze sleeve bearing – Available in spheroidal cast iron (EN-GJS-600)
KM 5	219 … 300 cm³/rev	800 … 2 000 1/min	… 100 bar	– Made completely of cast iron (EN-GJL-300)

Multiple combinations

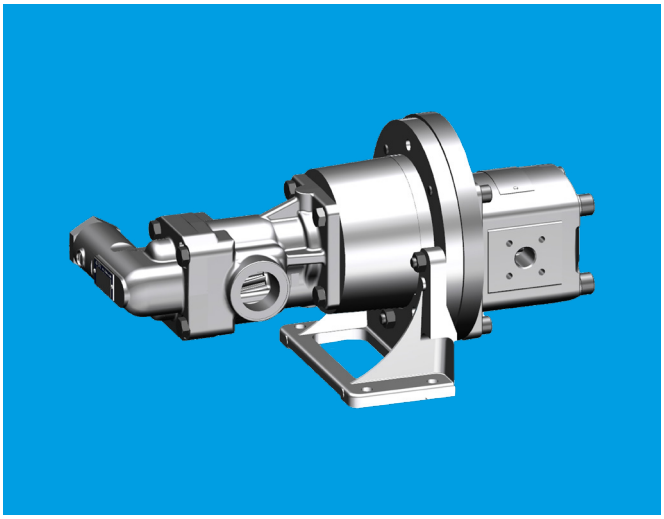
KM + KF/KP

The hydraulic motors of the series KM with high pressure pumps of series KP and lube oil pumps of series KF.



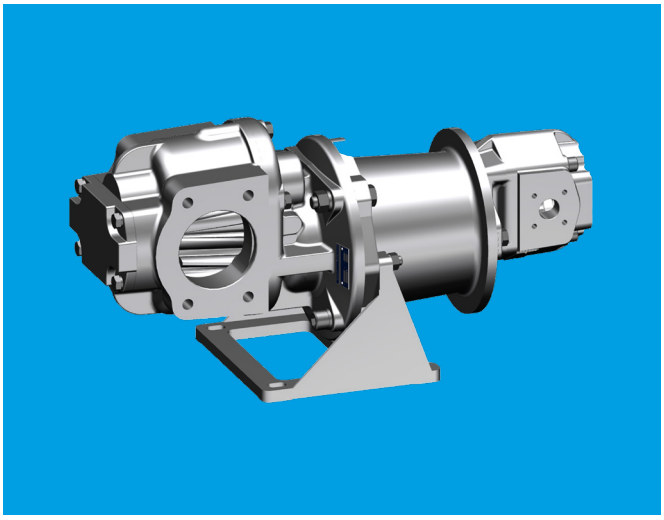
Typical application of a hydraulic driven high pressure pump used on tank vehicles for pumping fuel.

Hydraulic motor KM 1 + Gear pump KP 1



Typical application of hydraulic driven lube oil pumps used on excavators for lube oil for cooling systems.

Gear pump KF 25 + Hydraulic motor KM 1



Gear pump KF 6/400 + Hydraulic motor KM 2

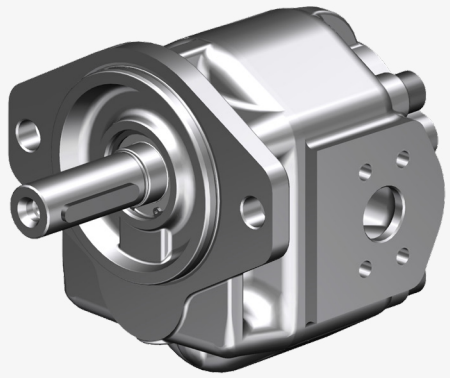
High pressure gear pumps

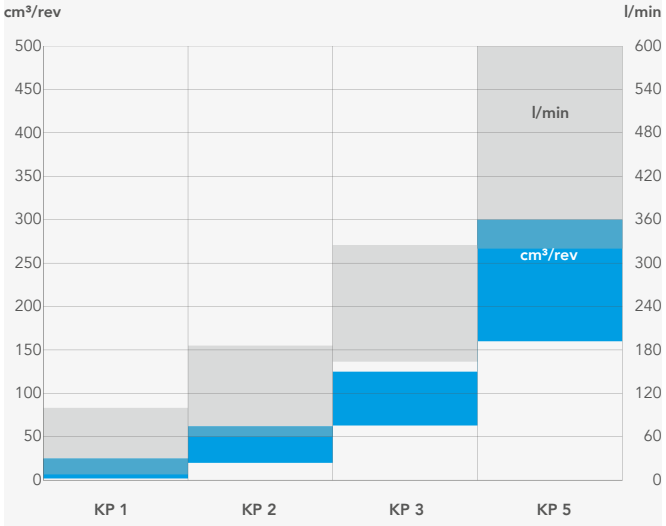
I KP – with hydraulic axial clearance compensation

Characteristics

Displacement	2.0 … 300 cm³/rev
Working pressure	… 315 bar
Speed	… 4 000 1/min
Viscosity	10 … 600 mm²/s
Media temperature	-20 … 150 °C

KP 5





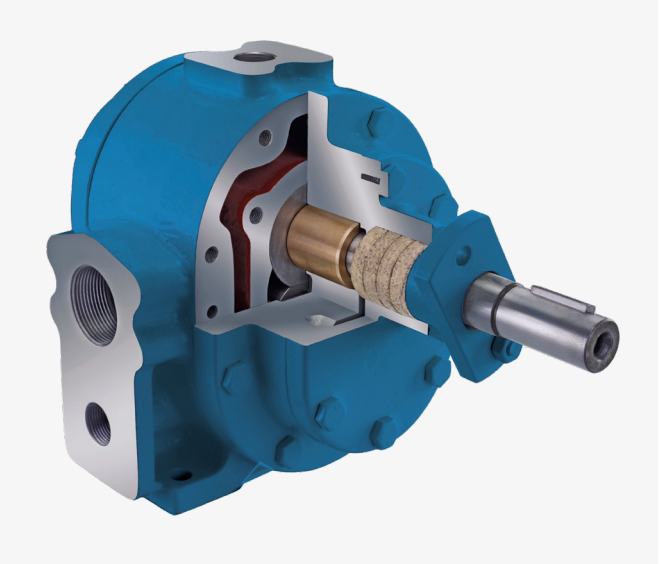
Technical details

Pump	Displacement	Speed	Working pressure	Design / Option
KP 1	2.0 … 25 cm³/rev	500 … 4 000 1/min	… 280 bar	– Aluminium housing (… 4NL) – Front and end covers made of cast iron – Optionally completely cast iron (… 2KL) e.g. for mining or HFC media – Available with all ship approvals – ATEX protection up to T4 on request
KP 2	20 … 62 cm³/rev	500 … 3 000 1/min	… 315 bar	– Made completely of cast iron (EN-GJL-300) – Optionally with bronze sleeve bearing – Also available in spheroidal cast iron (EN-GJS-600) – Available with all ship approvals – ATEX protection up to T3 on request
KP 3	63 … 125 cm³/rev	500 … 2 600 1/min	… 280 bar	– Made completely of cast iron (EN-GJL-300) – Also available with bronze sleeve bearing in spheroidal cast iron – Available with all ship approvals – ATEX protection up to T3 on request
KP 5	160 … 300 cm³/rev	800 … 2 000 1/min	… 100 bar	– Made completely of cast iron (EN-GJL-300)

Asphalt gear pumps

BTH

In the case of fluids which require elevated temperatures to flow i. e. bitumen, wax etc. the BTH series pump should be used. In this model the housing is double walled to provide a heating chamber. The pump chamber is heated by circulating heat transfer fluid or steam through the jacket.



Characteristics

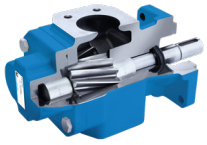
Displacement	97 … 1056 cm³/rev
Working pressure	… 8 bar
Speed	100 … 750 1/min
Viscosity	76 … 30 000 mm²/s
Media temperature	-10 … 220 °C

Notes

Product Portfolio

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.

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.

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