

MICRO-Axial piston pumps

Type AKP30

up to 300 bar

0,012 to 0,016 cm³/rev

Features

- Low noise level
- Wide speed range
- Continuous self lubrication and cooling through the suction flow
- Usable also in adverse ambient conditions
- Can be operated at high temperatures

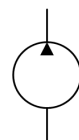


Applications

- Oil and gas: directional drilling systems
- Hydraulic systems with small deliveries

Design

- Design with 2 or 3 pistons
- Valve controlled on pressure and suction side (not usable as motor)
- Swash shaft with amply dimensioned rolling bearings
- Rotating wobble plate
- Submerged pump, suction side open to tank, no shaft seal
- Small mounting dimensions
- Interface for the direct fitting of the WITTENSTEIN motor type MSSIO32H-040D-D42S-HAOTHN



Technical data

Hydraulic fluid	mineral oil according to DIN 51524 (other fluids on request)
Fluid temperature range	-20 to 175 °C
Ambient temperature range	-30 to 175 °C
Viscosity range	3 to 500 mm ² /s
Max. operating pressure	300 bar
Displacement volume	0,012 to 0.016 cm ³ /rev
Operation pressure at suction port	open to tank, no shaft seal, up to 2000 bar ambient pressure
Suction strainer	104 µm
Filtration (recommendation)	according to NAS 1638, class 6 resp. ISO/DIN 4406 17/15/12
Axial force onto driving shaft	not allowed
Radial force onto driving shaft	not allowed
Rotation speed range	100 to 5000 min ⁻¹
Direction of rotation	any
Weight	see overview "Product information"
Materials	housing: steel pump head: high-strength steel

Type AKP30

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0,012 to 0,016 cm³/rev

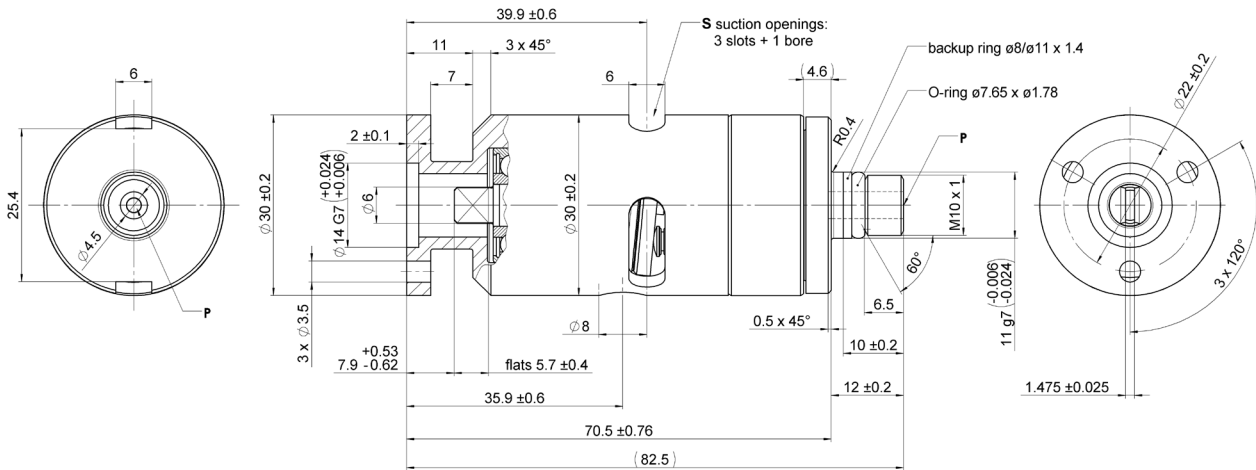
Type code

Example	AKP	30	-	0,012	-	300	-	V	-	A		04
MICRO-Axial piston pumps												Design 00 ... 99 For internal purposes
Size		30										Index Please leave blank For internal purposes
Displacement volume [cm ³ /rev]				see overview „product information“								Design revision For internal purposes
Max. operating pressure [bar]				300								
Seal material				V FKM other seal materials on request								

Product information

size	displacement volume [cm ³ /U]	max. operating pressure [bar]	number of pistons	weight [kg]	max. torque [Nm]	max. power [kW]	part No.
30	0,012	300	3	0,29	0,081	0,042	on request
30	0,016	300	2	0,29	0,153	0,080	4520438

Dimensional drawing



Calculation of driving motor power

$$P = \frac{p \cdot V_g \cdot n \cdot k}{\eta_t \cdot 600 \cdot 10^3}$$

P = driving power [kW]
 p = operating pressure [bar]
 V_g = displacement volume [cm³/rev]
 n = speed [rpm]
 η_t = overall efficiency approx. 0,55

k = pulsation factor
 - with 2 pistons: k approx. 1,60
 - with 3 pistons: k approx. 1,05

Calculation of driving motor torque

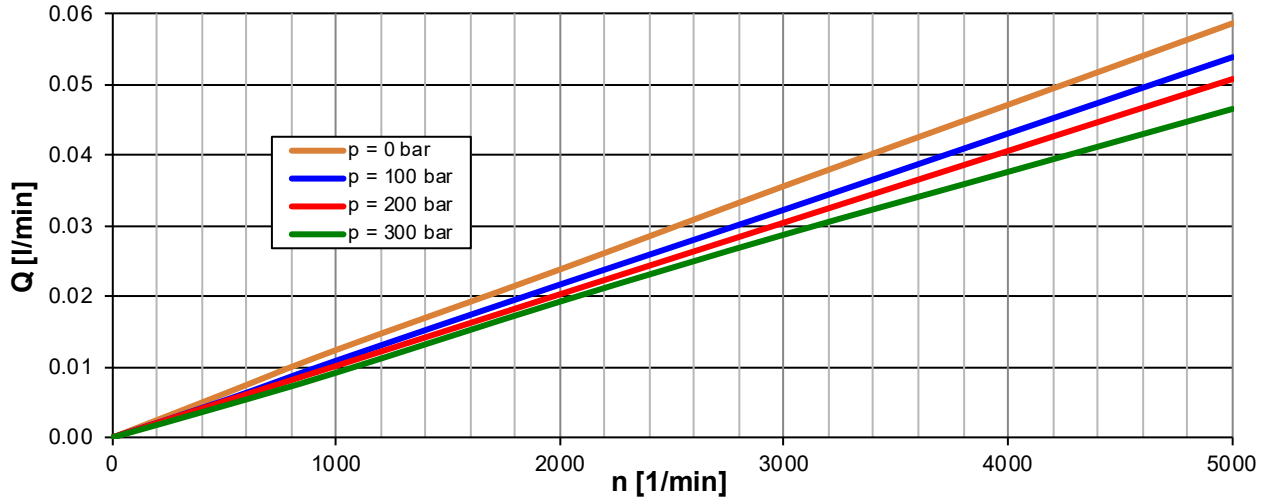
$$M = \frac{p \cdot V_g}{62,8 \cdot \eta}$$

M = torque [Nm]
 V_g = displacement volume [cm³/rev]
 η = overall efficiency approx. 0,55

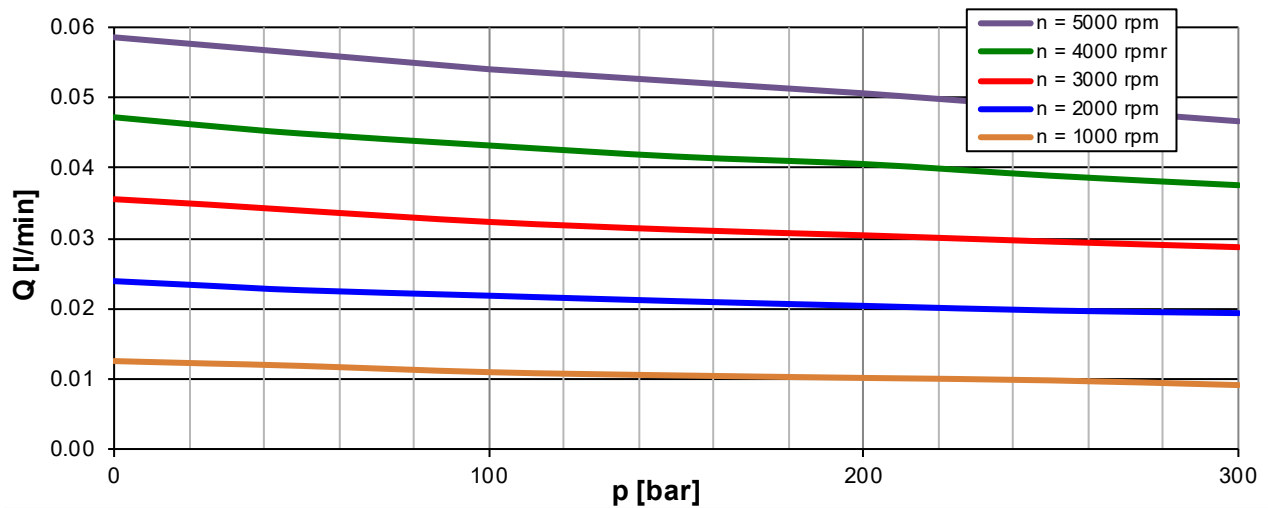
Characteristics AKP30-0,012

($v = 30 \text{ mm}^2/\text{s}$, $T = 40^\circ\text{C}$)

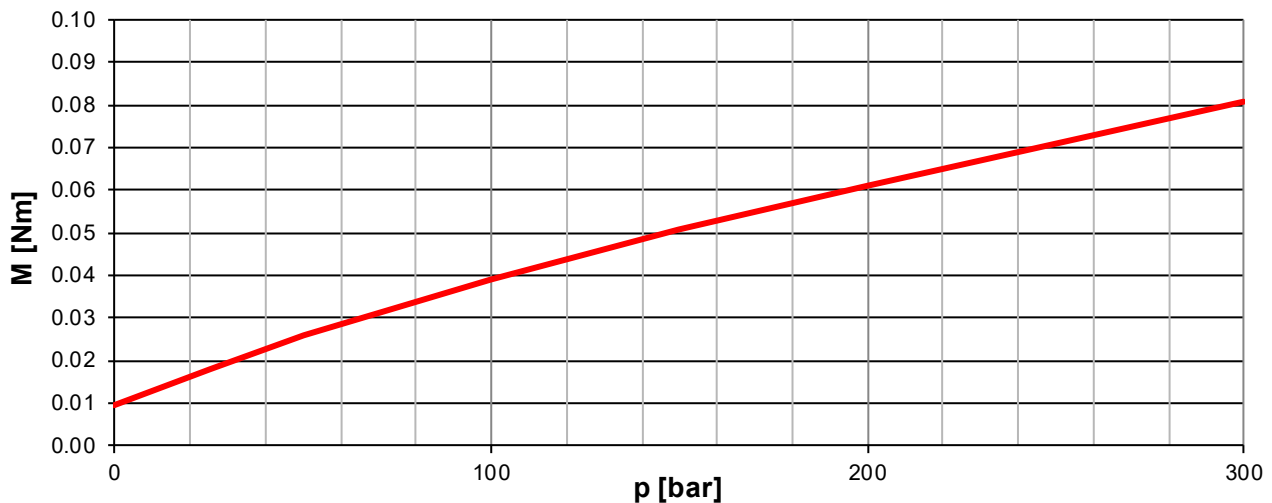
flow rate as a function of rotation speed

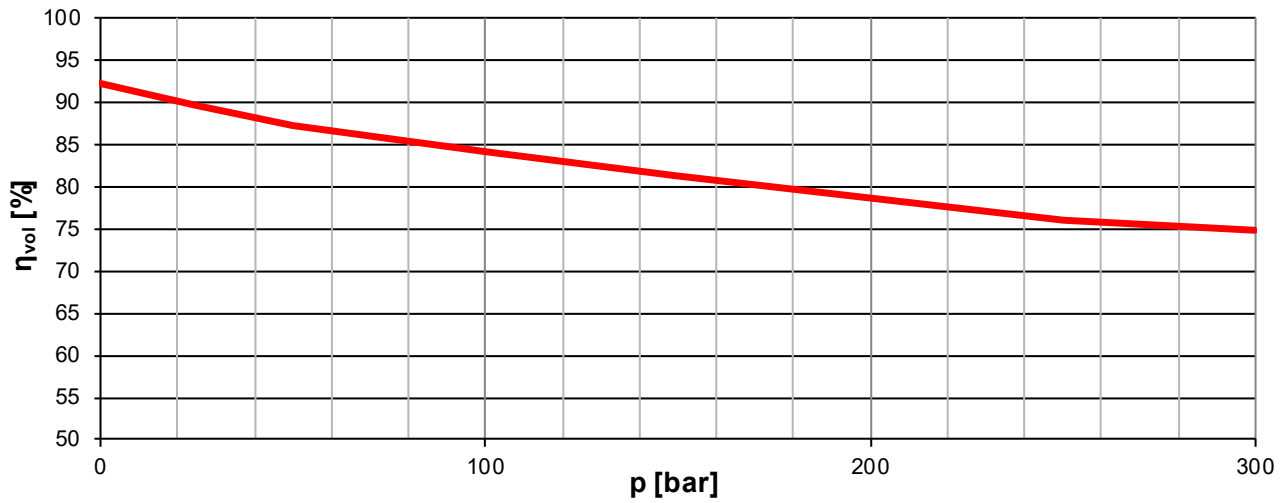
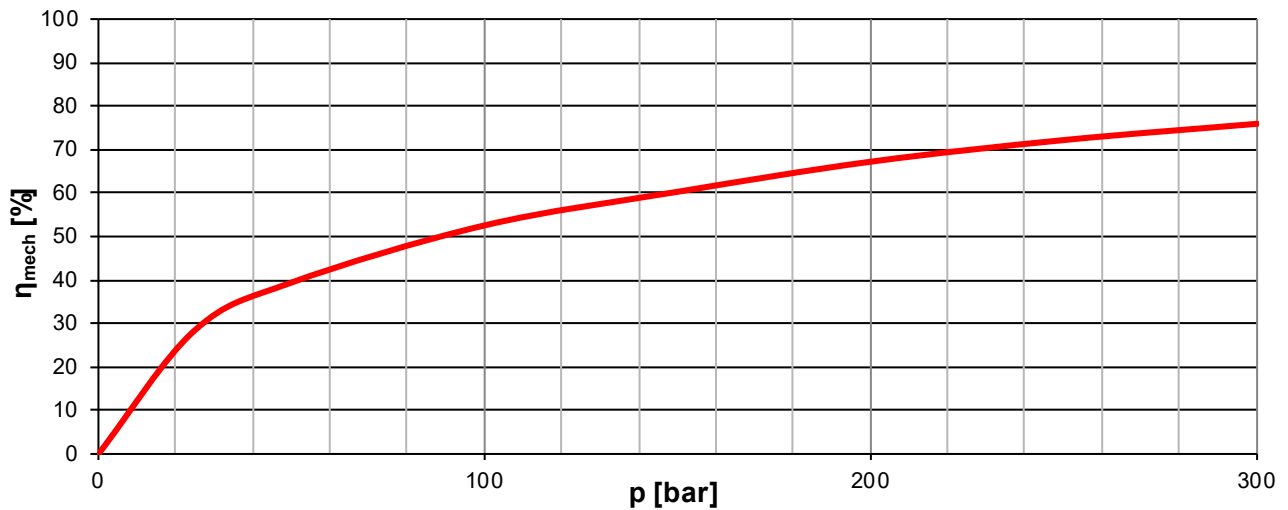
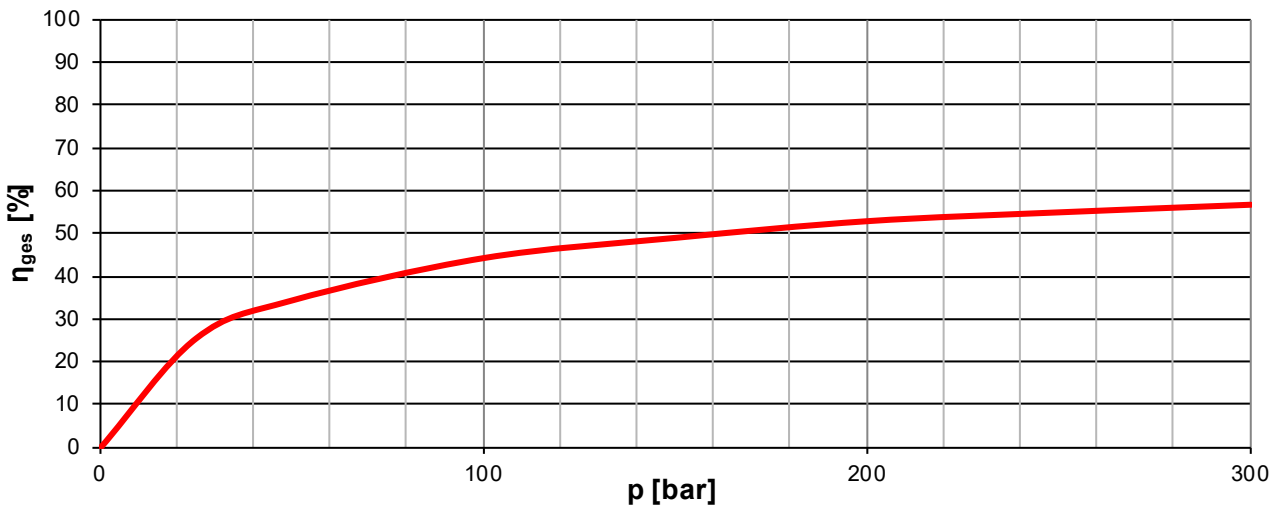


flow rate as a function of pressure



torque as a function of pressure

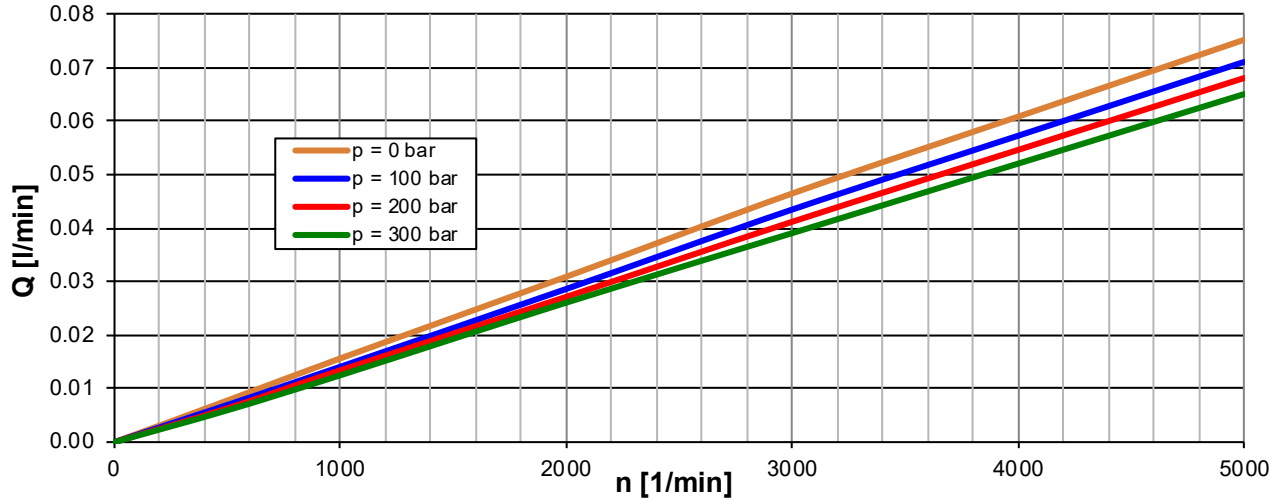


volumetric efficiency as a function of pressure**mechanical efficiency as a function of pressure****overall efficiency as a function of pressure**

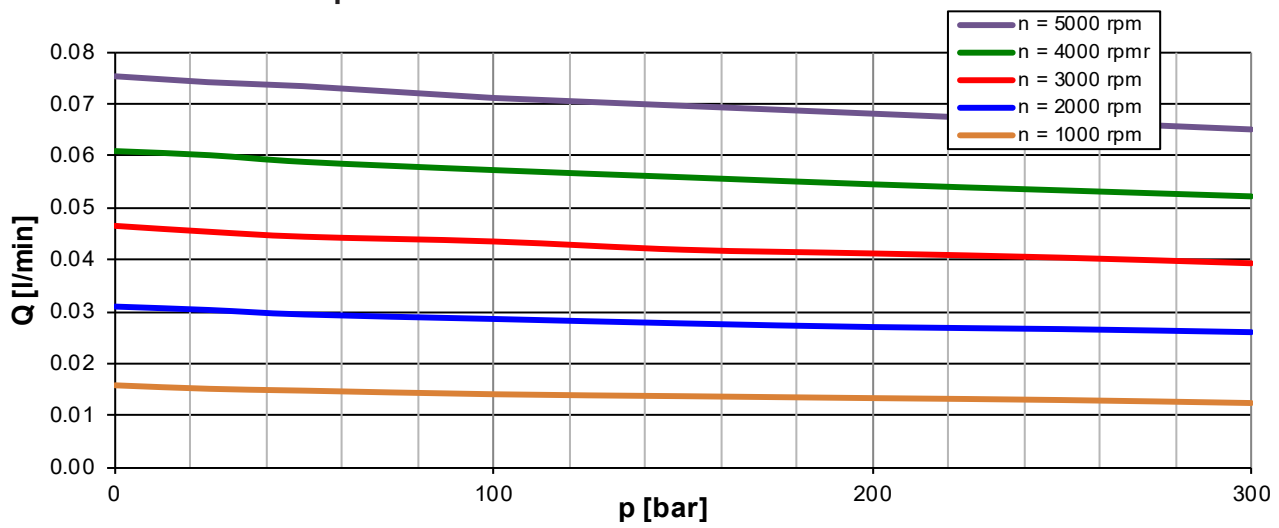
Characteristics AKP30-0,016

($v = 30 \text{ mm}^2/\text{s}$, $T = 40^\circ\text{C}$)

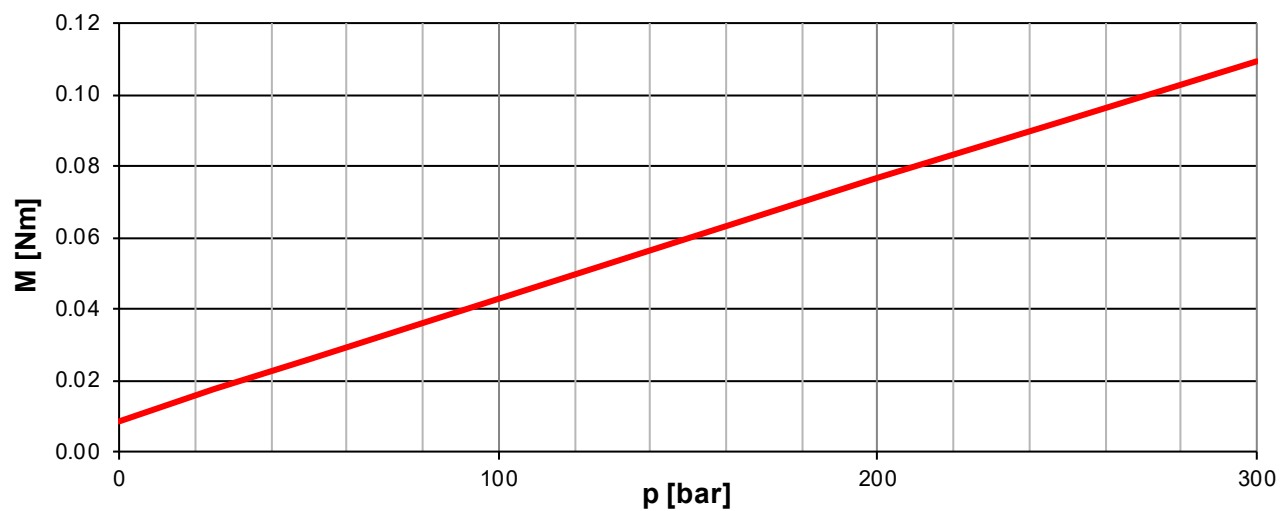
flow rate as a function of rotation speed



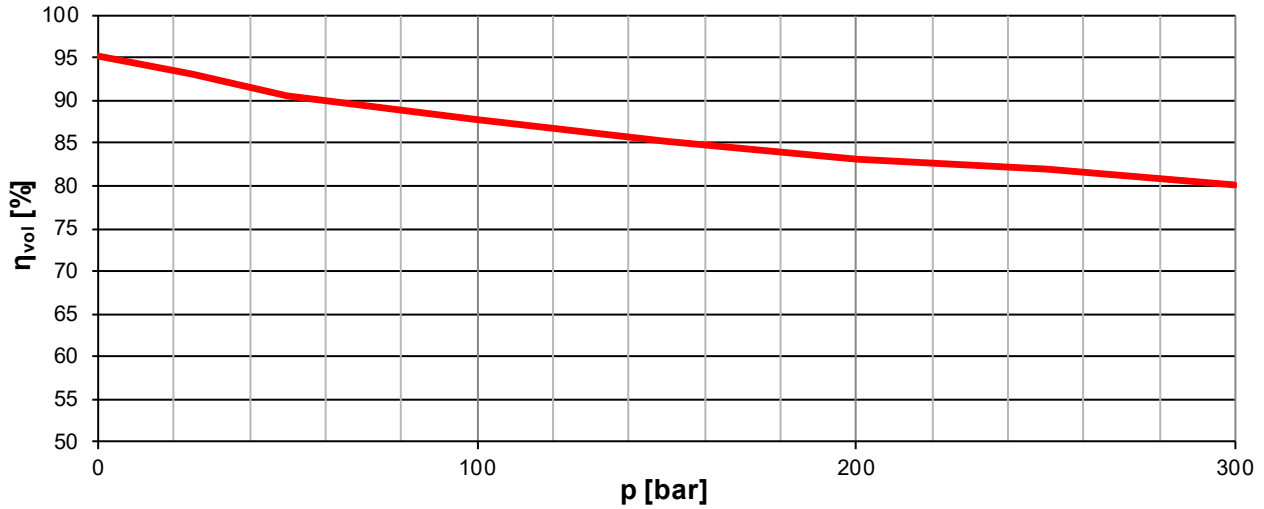
flow rate as a function of pressure



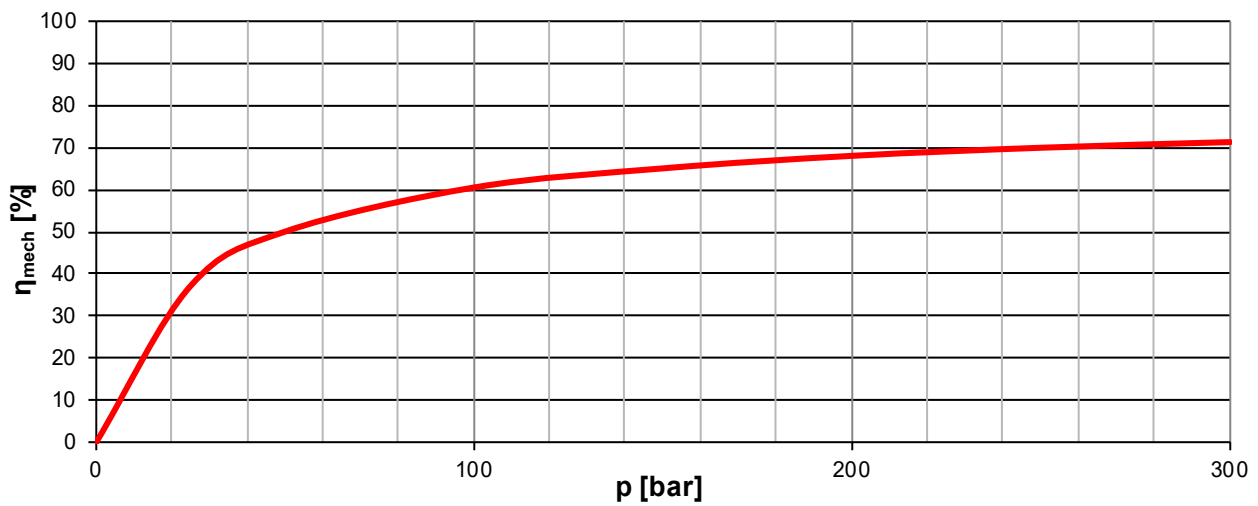
torque as a function of pressure



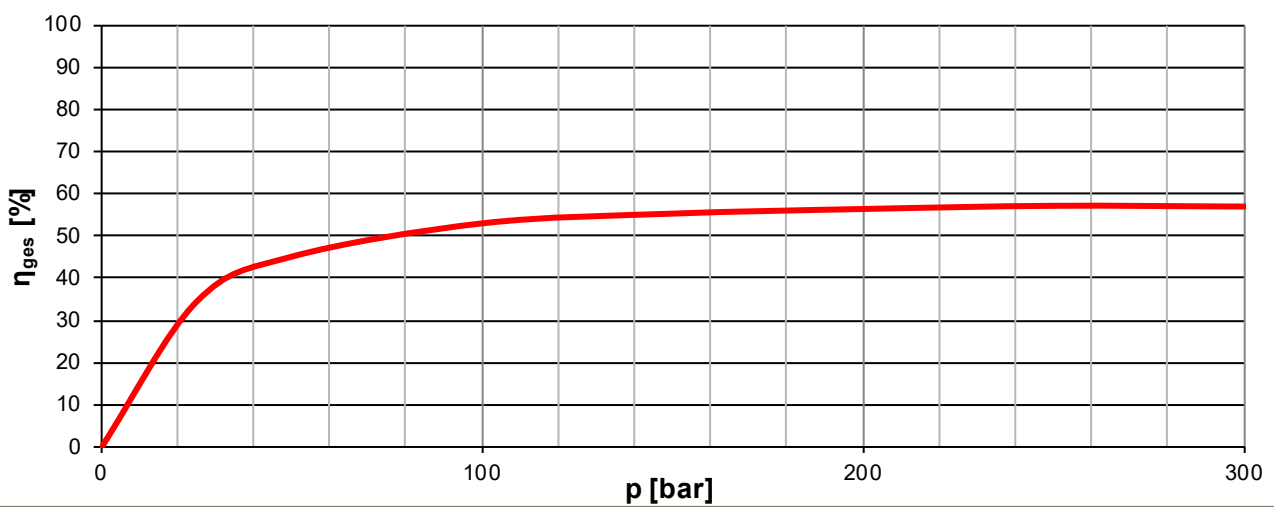
volumetric efficiency as a function of pressure



mechanical efficiency as a function of pressure



overall efficiency as a function of pressure



MICRO-Axial piston pumps

Type AKP103/105

up to 500 bar

0.1 to 0.3 cm³/rev

Features

- High volumetric efficiency (also by very low speed rates)
- Low noise level
- Wide speed range
- Continuous self lubrication and cooling through the suction flow
- Small mounting dimensions
- Automatic venting by raising and lowering the pressure or by switching the motor on and off several times
- Venting time can be shortened essentially through a pre-filling

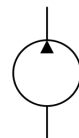


Design

- Offshore
- Oil and gas
- Oceanographic research devices, ROVs
- Handling systems
- Hydraulics systems with small displacements
- Usable even in unfavourable ambient conditions
- Small power units

Applications

- Design with 3 or 5 pistons
- Valve controlled on pressure and suction side (not usable as motor)
- Wobble shaft with amply dimensioned rolling bearings
- Rotating wobble plate



Technical data

Hydraulic fluid	mineral oil according to DIN 51524 (other fluids on request)
Fluid temperature range	-20 to 80 °C
Ambient temperature range	-30 to 50 °C
Viscosity range	5 to 220 mm ² /s
Max. operating pressure	500 bar
Operating pressure suction side	-0.2 bar to 0.5 bar gauge pressure
Filtration (recommendation)	according to NAS 1638 class 6 resp. ISO/DIN 4406 17/15/12
Axial force onto driving shaft	can't be taken up
Radial force onto driving shaft	on request
Max. rotation speed	5000 rpm
Direction of rotation	any
Installation position	according to mounting drawing
Weight	see overview "Product information"
Materials	housing: aluminium anodised pump head: steel browned

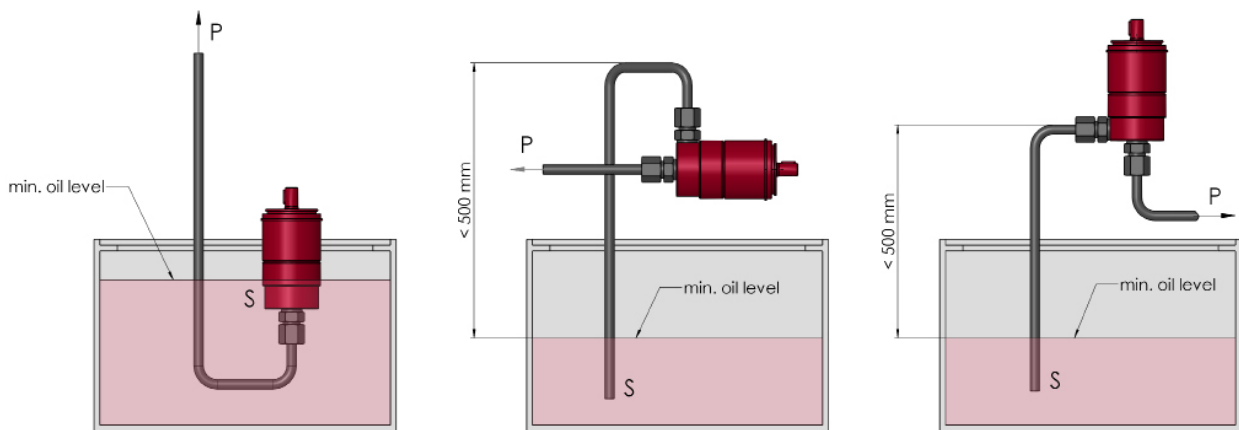
Type AKP103/105

up to 500 bar
0.1 to 0.3 cm³/rev

Type code

Example	AKP 103 - 0,1 - 500 - V - A	00
MICRO-Axial piston pumps		Design 00 ... 99 For internal purposes
Size	103 105	
Displacement volume [cm³/rev]	See overview „product information“	Index Please leave blank For internal purposes
Max. operating pressure [bar]	See overview „product information“	Design revision For internal purposes
Seal material	V FKM other seal materials on request	

Mounting



Suction filter recommended

Product information

size	displacement volume [cm ³ /rev]	max. operating pressure [bar]	max. rotation speed [rpm]	number of pumping elements	weight [kg]	max. torque [Nm]	max. power [kW]	part no.
103	0.1	500	5000	3	0.9	1.05	0.55	3678021
105	0.3	500	5000	5	0.9	2.99	1.57	3678024

Note: The flange (part no. 3683105) has to be ordered seperately!

Calculation of driving motor power

$$P = \frac{p \cdot V_g \cdot n \cdot k}{\eta_t \cdot 600 \cdot 10^3}$$

P = driving power [kW]
 p = operating pressure [bar]
 V_g = displacement volume [cm³/rev]
 n = speed [rpm]
 η_t = overall efficiency approx. 0.75

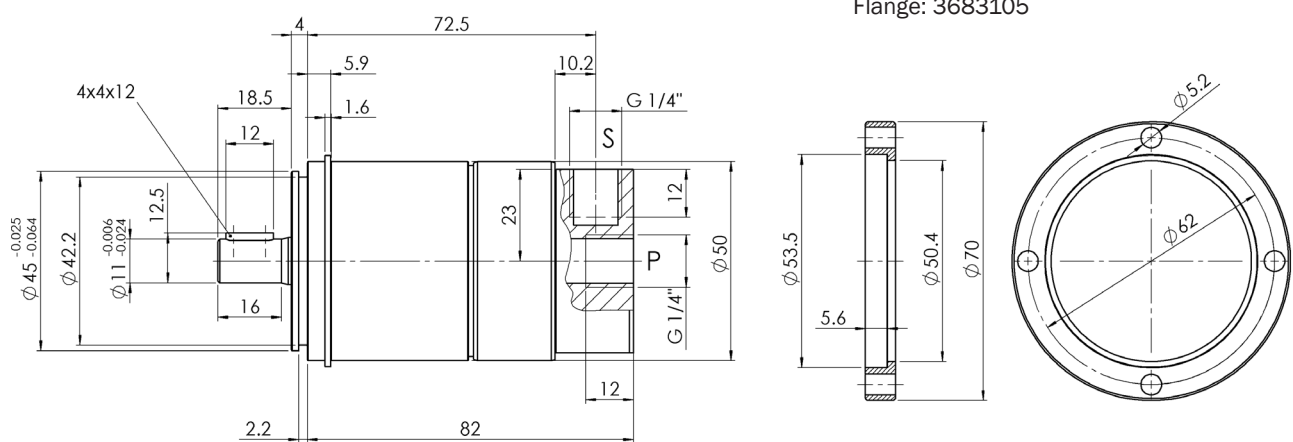
k = pulsation factor
 - with 3 pumping elements: k approx. 1.05
 - with 5 pumping elements: k approx. 1.02

Calculation of driving motor torque

$$M = \frac{p \cdot V_g}{62.8 \cdot \eta_t}$$

M = torque [Nm]

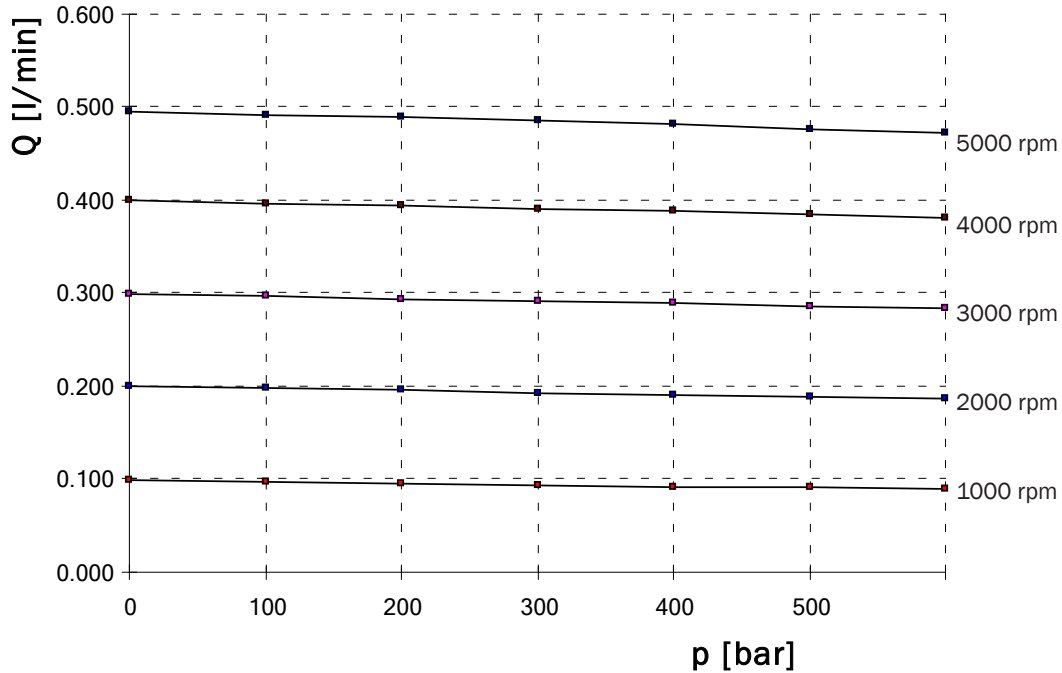
Dimensional drawings



Characteristics

($v = 30 \text{ mm}^2/\text{s}$, $T = 40 \text{ }^\circ\text{C}$)

AKP103



AKP105

