

Fixed displacement axial piston pump type K61N

Product documentation



Open circuit,
for the power take-off of commercial vehicles

Nominal pressure $p_{\text{nom max}}$: 400 bar

Geometric displacement V_{max} : 108 cm³/rev



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Printing date / document generated on: 11.12.2018

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Overview of fixed displacement axial piston pump type K61N

Fixed displacement axial piston pumps have a constant geometric displacement and convey a constant flow rate depending on the rotation speed.

The axial piston pump type K61N is designed for open circuits in mobile hydraulics and operates on the bent axis principle.

The pump is fitted mainly to the power take-off on commercial vehicle transmissions.

Features and benefits:

- Optimised power-to-weight ratio
- Slim design
- Long lifetime
- Quiet operation over the complete speed range
- Low heat generation

Intended applications:

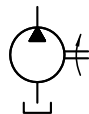
- Municipal trucks
- Fire trucks
- Loading cranes and elevating work platforms
- Tipper trucks and skip trucks
- Suction dredgers and sewer cleaning vehicles



Fixed displacement axial piston pump type K61N

2 Available versions, main data

Circuit symbol:



Order coding examples:

K61N	- 064	R	-N	-DL4	-L35	-S0	S	-0	00
									Accessories Table 9 Accessories
									Special equipment Table 8 Special equipment
									Connections Table 7 Connections
									Connection cover Table 6 Connection cover
									Flange version Table 5 Flange version
									Shaft version Table 4 Shaft version
									Seals Table 3 Seals
									Rotation direction Table 2 Rotation direction
									Nominal size Table 1 Nominal size

Basic type

Table 1 Nominal size

Coding	Geometric displacement (cm ³ /rev)	Nominal pressure p _{nom} (bar)
012	12.6	400
017	17.0	400
025	25.4	400
034	34.2	400
040	41.2	400
047	47.1	400
056	56.0	400
064	63.6	400
084	83.6	400
108	108.0	400

Table 2 Rotation direction

Coding	Description
R	Clockwise
L	Anticlockwise

Table 3 Seals

Coding	Description
N	NBR

Table 4 Flange version

Coding	Description	Designation/standard
DL4	Flange	ISO 7653

Table 5 Shaft version

Coding	Description	Designation/standard
L35	Parallel key splined shaft	Similar DIN ISO 14 (HGV) B8x32x34.9

Table 6 Connection cover

Coding	Description
S0	Standard, 40°

Table 7 Connections

Coding	Description
S	Standard, DIN EN ISO 228-1

Table 8 Special equipment

Coding	Description
0	Standard version

Table 9 Accessories

Coding	Description
00	Without accessories

3 Parameters

3.1 General

General information

Designation	Fixed displacement axial piston pump
Design	Axial piston pump based on bent axis design
Mounting	Mounting flange according to DIN ISO 7653
rotation direction	Clockwise or anticlockwise
Change of rotating direction	Turning the connection cover of the pump by 180° (see Chapter 4, "Dimensions") Tightening torque of the four screws on the end: Nominal size 012 ... 064: 70 Nm 084, 108: 100 Nm
Connections	<ul style="list-style-type: none"> ▪ Suction port ▪ Pressure connection ▪ Drain port
Material	Pump housing: Aluminium connection cover: Steel
Tightening torques	See Chapter 4, "Dimensions"
Installation position	Any (for installation information see Chapter 5, "Assembly, operation and maintenance recommendations")
Hydraulic fluid	Hydraulic oil: in accordance with DIN 51 524 part 2 and 3; ISO VG 10 to 68 in accordance with DIN 51 519 Viscosity range: min. approx. 10, max. approx. 700 mm ² /s Optimal operating range: approx. 20 – 40 mm ² /s Also suitable for biologically degradable hydraulic fluids type HEES (synthetic ester) at operating temperatures up to approx. +70°C.
Cleanliness level	ISO 4406 <hr/> 19/17/14
Temperatures	Ambient: approx. -40 to +60°C, oil: -25 to +80°C, pay attention to the viscosity range! Start temperature: down to -40°C is permissible (observe start-viscosity!), as long as the steady-state temperature is at least 20K higher for subsequent operation. Biologically degradable pressure fluids: note manufacturer specifications. With consideration for the seal compatibility, not above +70°C.

Commissioning

Choose a suction line which is as large as possible (also see nominal width selection [Chapter 2, "Available versions, main data"](#) in Table 6). Flexible hoses must be attached with two strong hose clamps. Do not use a screen on the suction side. Before the initial commissioning, all lines must be flushed with the fluid provided for this purpose. The pump housing must be filled up at the upper drain port.

i NOTE

Ensure cleanliness when filling!

Before the first start-up, check the rotation direction of the drive and pump. When starting up and during the first few minutes, the main pressure-limiting valve should be set to 50 bar or less.

Pressure and delivery flow

Operating pressure

see [Chapter 2, "Available versions, main data"](#)

Geometric displacement

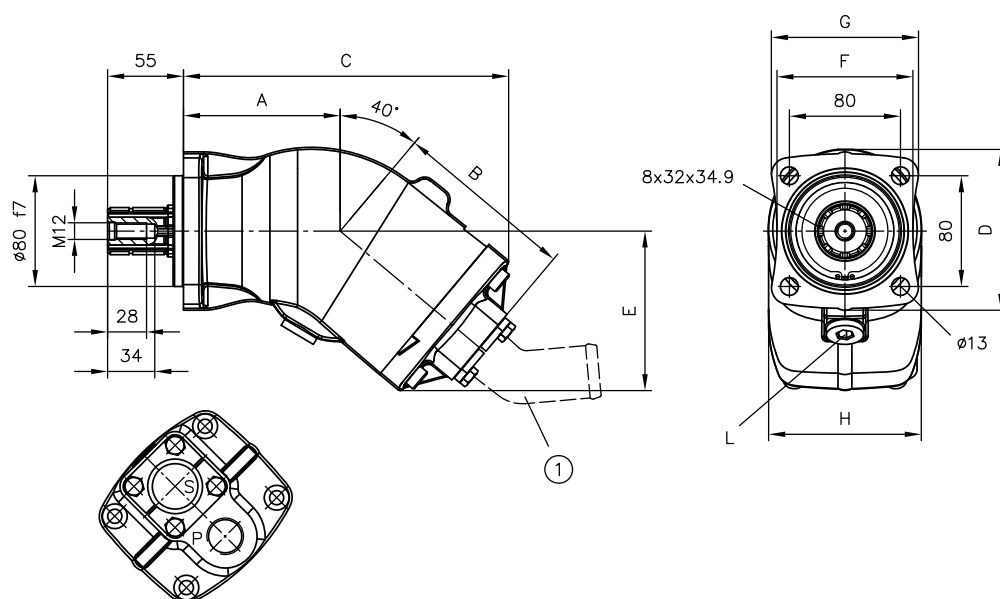
see [Chapter 2, "Available versions, main data"](#)

Additional parameters

Designation		Nominal size									
		012	017	025	034	040	047	056	064	084	108
Absolute inlet pressure required in open circuit	bar	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
max. rotation speed, continuously (n_{nom})	rpm	2300	2300	2300	2300	1900	1900	1900	1900	1600	1600
max. rotation speed, briefly (n_{max})	rpm	3000	3000	3000	3000	2500	2500	2500	2500	2100	2100
Flow rate at 500 rpm	lpm	6.3	8.5	12.7	17.1	20.6	23.5	28.0	31.8	41.5	54.0
Flow rate at 1000 rpm	lpm	12.6	17.0	25.4	34.2	41.2	47.1	56.0	63.6	83.6	108.0
Flow rate at 1500 rpm	lpm	18.9	25.5	38.1	51.3	61.8	70.6	84.0	95.4	125.4	162.0
Required drive torque at 100 bar	Nm	21	28	43	57	69	79	94	107	140	181
Drive power at 250 bar and 1,500 rpm	kW	8	11	17	23	27	31	37	42	55	71
Weight torque	Nm	6.0	6.0	6.5	6.5	11.5	11.5	11.5	11.5	18.0	18.0

4 Dimensions

All dimensions in mm, subject to change.



1 Suction intake

Ports (ISO 228-1) (BSPP)

P	Pressure connection G 3/4 (nominal size K61N-012...064)
	Pressure connection G 1 (nominal size K61N-084...108)
S	Flange suction port
L	Drain port G 1/2

Nominal size	A	B	C	D	E	F	G	H
012	97	116	206	115	102	98	106	97
017	97	116	206	115	102	98	106	97
025	97	116	206	115	102	98	106	97
034	97	116	206	115	102	98	106	97
040	113	131	235	118	115	98	106	111
047	113	131	235	118	115	98	106	111
056	113	131	235	118	115	98	106	111
064	113	131	235	118	115	98	106	111
084	122	147	264	127	133	98	106	118
108	122	147	264	127	133	98	106	118

5.1 Intended use

This product is intended exclusively for hydraulic applications (fluid technology).

The user must observe the safety measures and warnings in this documentation.

Essential requirements for the product to function correctly and safely:

- All information in this documentation must be observed. This applies in particular to all safety measures and warnings.
- The product must only be assembled and put into operation by qualified personnel.
- The product must only be operated within the specified technical parameters. The technical parameters are described in detail in this documentation.
- The operating and maintenance manual of the components, assemblies and the specific complete system must also always be observed.

If the product can no longer be operated safely:

1. Remove the product from operation and mark it accordingly.
- ✓ It is then not permitted to continue using or operating the product.

5.2 Assembly information

The hydraulic power pack must only be installed in the complete system with standard and compliant connection components (fittings, hoses, pipes, fixtures, etc.).

The product must be shut down correctly prior to dismantling (in particular in combination with hydraulic accumulators).

**DANGER****Risk to life caused by sudden movement of the hydraulic drives when dismantled incorrectly!**

Risk of serious injury or death.

- Depressurise the hydraulic system.
- Perform safety measures in preparation for maintenance.

5.2.1 General information

The K61N fixed displacement axial piston pump is designed for use in an open or semi-closed circuit.

It can be mounted on the usual mounting points (e.g. power take-off gearbox, combustion engine or electric drive, cardan shaft) using a flange mounting.

A change of rotating direction is possible by turning the connection cover. For conversion instructions, please contact HAWE Hydraulik.

During assembly, note the following principles:

- Remove all plastic plugs before operation.
- Avoid installation above the tank (see [Chapter 5.2.3, "Installation positions"](#)).
- Before initial use, fill the pump with hydraulic fluid and bleed. The pump automatically fills via the suction line when the drain ports are opened.
- Never drain the pump.
- Always supply the pump with hydraulic fluid from the start. Even just a short period with insufficient hydraulic fluid can damage the pump. Such damage is not immediately visible once the pump is put into operation.
- Hydraulic fluid which flows back into the tank must not be sucked back in immediately (install baffles!).
- Before first use, run the pump for approx. 10 minutes at max. 50 bar after initial start-up.
- Do not use the entire pressure range of the pump until it has been thoroughly bled and flushed.
- From the start, always keep the temperature within the specified range (see [Chapter 3, "Parameters"](#)). Never exceed the maximum temperature.
- Always comply with the cleanliness level of the hydraulic fluid. In addition, always filter the hydraulic fluid appropriately (see [Chapter 3, "Parameters"](#)).
- Self-installed filters in the suction line must be approved beforehand by HAWE Hydraulik.
- A system pressure-limiting valve must be installed in the pressure line so that the maximum system pressure is not exceeded.

5.2.2 Connections

The nominal width of the connecting lines depends on the specified operating conditions, the viscosity of the hydraulic fluid, the start-up and operating temperatures and the rotation speed of the pump. In principle we recommend the use of hose lines due to the superior damping characteristics.

Pressure connection

The pressure connection for type K61N-012...064 is established via a threaded connection G 3/4 (BSPP), for type K61N-084...108 via a threaded connection G 1 (BSPP).

Suction port

The suction port on all pumps is established via standardised suction intakes with a size which depends on the max. delivery flow of the pump.

The specifications of the max. delivery flow Q_{\max} must be observed. They can be found in the table (see [Chapter , "Suction intake"](#))

The suction intakes can be ordered as an option with the pump.

If possible, route the suction line to the tank on a rising gradient. This allows trapped air to escape. Observe the specifications in Installation positions [Chapter 5, "Assembly, operation and maintenance recommendations"](#). The absolute suction pressure must not fall below 0.85 bar. A hose line should generally be used in preference to a rigid pipe.

Drain port

The K61N pumps have one drain port G 1/2 (BSPP).

The nominal width of the leakage line must not be less than 16 mm. The cross-section is determined by the max. permissible housing pressure.

Integrate the leakage line in the system in such a way as to prevent direct connection with the suction line of the pump. Both drain ports can be used simultaneously.

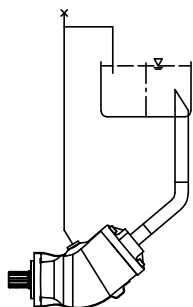
A separate leakage line from the controller to the tank is not required. Observe the specifications in [Chapter 5.2.3, "Installation positions"](#).

5.2.3 Installation positions

The K61N fixed displacement axial piston pump can be mounted in any installation position.

Horizontal installation: (pump below the min. fill level)

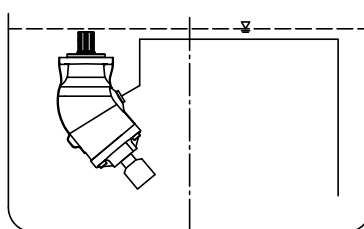
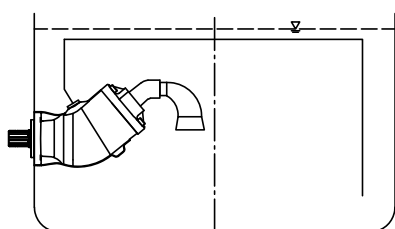
⇒ For horizontal installation, use the uppermost drain port



5.2.4 Tank installation

Tank installation (pump below the min. fill level)

The pump can be operated either with or without a suction intake. It is recommended to use a short suction intake (see [Chapter 6.1, "Accessories, spare parts and separate components"](#)).



5.3 Operating instructions

Note product configuration and pressure / flow rate

The statements and technical parameters in this documentation must be strictly observed.
The instructions for the complete technical system must also always be followed.

i NOTE

- Read the documentation carefully before usage.
- The documentation must be accessible to the operating and maintenance staff at all times.
- Keep documentation up to date after every addition or update.

Purity and filtering of the hydraulic fluid

Fine contamination can significantly impair the function of the hydraulic component. Contamination can cause irreparable damage.

Examples of fine contamination include:

- Metal chips
- Rubber particles from hoses and seals
- Dirt due to assembly and maintenance
- Mechanical debris
- Chemical ageing of the hydraulic fluid

i NOTE

Fresh hydraulic fluid from the drum does not always have the highest degree of purity. Under some circumstances the fresh hydraulic fluid must be filtered before use.

Adhere to the cleanliness level of the hydraulic fluid in order to maintain faultless operation.
(also see cleanliness level in [Chapter 3, "Parameters"](#)).

Additionally applicable document: [D 5488/1](#) Oil recommendations

5.4 Maintenance information

Conduct a visual inspection at regular intervals, but at least once per year, to check if the hydraulic connections are damaged. If external leakages are found, shut down and repair the system.

Clean the device surface of dust deposits and dirt at regular intervals, but at least once per year.

6 Other information

6.1 Accessories, spare parts and separate components

Suction intake

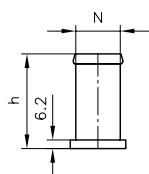
Order coding example:

K61N - 064 R - N - DL4 - L35 - S0 S - 0 00 - A45/50

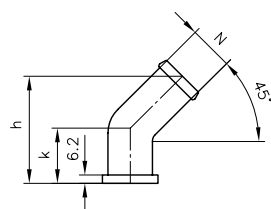
Table of suction intakes (including attachment kit)

Nominal width (N)	Flow rate Q_{max} (lpm)	Geometric shape									
		Straight		45°			90°			Thread	
		A00/..		A45/..			A90/..			A.	
			h		k	h		k	h		h
K61N - 012 ... 064											
32 (1 1/4")	50	●	56	-	--	--	-	--	--	-	-
38 (1 1/2")	65	●	65	●	40	85	●	70	53	-	--
42 (1 5/8")	85	-	--	●	40	85	-	--	--	-	--
45 (1 3/4")	110	-	--	●	40	85	-	--	--	-	--
50 (2")	120	●	65	●	40	96	●	84	53	-	--
64 (2 1/2")	165	-	--	●	40	96	-	--	--	-	--
5 (G 1)	50	-	--	-	--	--	-	--	--	●	29
K61N - 084 ... 108											
38 (1 1/2")	65	●	65	-	--	--	●	70	53	-	--
42 (1 5/8")	85	-	--	●	40	85	-	--	--	-	--
45 (1 3/4")	110	-	--	●	40	85	-	--	--	-	--
50 (2")	120	●	65	●	40	96	●	84	53	-	--
64 (2 1/2")	165	●	90	●	40	96	●	130	108	-	--
75 (3")	260	●	106	●	40	106	-	--	--	-	--
6 (G 1 1/4)	80	-	--	-	--	--	-	--	--	●	29

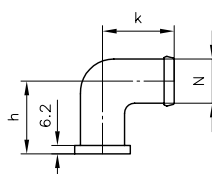
A00/..



A45/..



A90/..



6.2 Planning information

Determination of nominal sizes

Delivery flow	$Q = \frac{V_g \cdot n \cdot \eta_v}{1000} (l/min)$	V_g	= Geom. output volume (cm ³ /rev.)
Drive torque	$M = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}} (Nm)$	Δp	= Differential pressure
Drive power	$P = \frac{2\pi \cdot M \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t} (kW)$	n	= Rotation speed (rpm)
		η_v	= Volumetric efficiency
		η_{mh}	= Mechanical-hydraulic efficiency
		η_t	= Overall efficiency ($\eta_t = \eta_v \cdot \eta_{mh}$)

Further information

Additional versions

- Variable displacement axial piston pump type V60N: D 7960 N
- Variable displacement axial piston pump type V30D: D 7960
- Variable displacement axial piston pump type V30E: D 7960 E
- Variable displacement axial piston pump type V80M: D 7962 M
- Axial piston motors type M60N: D 7960 M