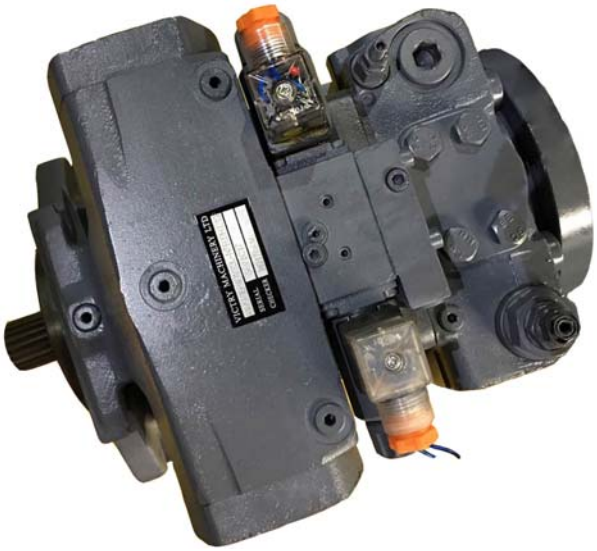
Rexroth A4VG Pump

Hydraulic Piston Pump Model: A4VG40, A4VG56, A4VG71, A4VG90, A4VG125, A4VG180, A4VG250

Nominal pressure 400 bar

Peak pressure 450

Control device: NV, HD3, HW, DG, DA1, DA2, EP3, EP4, EZ1, EZ2, etc.



Features and Benefits

The A4VG axial piston variable pump in swash plate design for hydrostatic closed circuit transmissions.

Flow is proportional to drive peed and displacement and is infinitely variable.

Output flow increases with the swivel angle of the wash plate from 0 to its maximum value.

Flow direction change smoothly when the wash plate is moved through the neutral position.

A wide range of highly adaptable control devices is available for different control and regulating functions.

The pump is equipped with two pressure-relief valves on the high pressure ports to protect the hydrostatic transmission (pump and motor) from overload.

The high-pressure relief valves also function as boost valves.

The maximum boost pressure is limited by a built-in boost pressure relief valve.

The integral pressure cut-off is standard.

A4VG Pump Technical Data

Table of values (theoretical values)

Rexroth A4VG pump			A4VG40	A4VG56	A4VG71	A4VG90	A4VG125	A4VG180	A4VG250
Displacement	Vg max	cm3	40	56	71	90	125	180	250
boost pump (20 bar)	Vgp	cm3	8.6	11.6	19.6	19.6	28.3	39.8	52.5
Speed	conti.	rpm	4000	3600	3300	3050	2850	2500	2400
limited maximum	limited	rpm	4200	3900	3600	3300	3250	2900	2600
Intermittent max.	Min.	rpm	5000	4500	4100	3800	3450	3000	2700
	Nmin	rpm	500	500	500	500	500	500	500
Flow		l/min	160	202	234	275	356	450	600
Power	400 bar	kW	107	134	156	183	237	300	400
Torque	400 bar	Nm	255	356	451	572	795	1144	1590
	100 bar	Nm	63.5	89	112.8	143	198.8	286	398
Moment of inertia	JGR	kgm2	0.0038	0.0066	0.0097	0.0149	0.0232	0.0444	0.0983
Angular acceleration	α	rad/s2	30000	24000	21000	18000	14000	11000	6700
Filling capacity	V	L	1.1	1.5	1.3	1.5	2.1	3.1	6.3
Weight approx.	m	kg	31	38	50	60	80	101	156

Control units:

NV – version without control unit

The mounting surface for the control unit is machined and is sealed with the standard seal for control units and a cover plate. This version is ready for retrofitting to control units (HD, HW, EP, EZ). When used directly for "DA" control and in combinations with "DA" control, the appropriate adjustments must be made to the spring assembly of the control cylinder and control plate.

DA –Hydraulic Control, Speed Related

The DA control is an engine speed-dependent or automotive, type control system. The built-in DA regulating cartridge generates a pilot pressure that is proportional to pump (engine) drive speed. This pilot pressure is directed to the positioning cylinder of the pump by a solenoid actuated 4/3 way directional valve. The hydraulic piston pump displacement is infinitely variable in each direction of flow, and is influenced by both pump drive speed and discharge pressure. Increasing pump drive speed generates a higher pilot pressure from the DA cartridge, with a subsequent increase in pump flow and/or pressure.

Dependent on the selected pump operating characteristics, increasing system pressure (i.e. machine load) causes the pump to swivel back towards a smaller displacement. Engine overload (anti-stall) protection is achieved by the combination of this pressure-related pump de-stroking, and the reduction of pilot pressure as the engine speed drops.

Any additional power requirement, such as implement hydraulic, may result in further engine pull down.

These cause a further reduction in pilot pressure and therefore pump displacement. Automatic power division and full utilization of available power is thus achieved for both the vehicle transmission and the implement hydraulics, with priority given to the implement hydraulics. To provide controllable reduced vehicle speed operation when high engine speeds are required for fast implement hydraulics, various inching options are available. The DA regulating cartridge can also be used in pumps with conventional control devices, such as EP, HW or HD, to provide an engine anti-stall function, or as a combination of automotive and displacement control functions.

EP - Electric Control, With Proportional Solenoid

The electrical energy is converted to a force acting on the control spool. The spool then directs control oil in and out of the stroking piston to stroke the pump as required. A feedback lever, connected to the stroking piston, maintains the pump flow for any given current within the control range.

HD – proportional control, hydraulic, pilot-pressure related

The pilot signal, which originates from an external, remote source, is pressure only. Flow is negligible as the pilot signal is only acting on the spool of the control valve. This spool then directs control oil into and out of the stroking cylinder to adjust pump displacement as required. A feedback lever, connected to the stroking piston, maintains the pump flow for any given pilot signal.

DG – hydraulic control, direct operated

The stroke cylinder of the pump is directly supplied with control pressure by switching a pilot pressure on or off at ports X1 or X2. In this way, the wash plate and thus the displacement can be adjusted between Vg = 0 and Vg max. A different flow direction is associated with each port.

HW –Hydraulic Control, Mechanical Servo

A feedback lever, connected to the stroking piston, maintains the piston pump flow for any given position of the control lever between 0° and 29°. The switch contact in the neutral position switch is closed when the control lever on the HW control unit is in its neutral position. The switch opens if the control lever is moved out of neutral in either direction. The neutral position switch provides a safety function for drive units that require zero flow under certain operating conditions. (e.g. starting diesel engines).

EZ –Electric Two-Point Control, With Switching Solenoid

By energizing or de-energizing a control current to either switching solenoid a or b, the stroke cylinders of the pump are supplied with control pressure by the EZ control unit. In this way, the swash plate and thus the displacement is switchable without intermediate settings from Vg = 0 to Vg max. Each direction of through put flow is assigned to a solenoid.

Details regarding the choice of hydraulic fluid

The correct choice of hydraulic fluid requires knowledge of the operating temperature in relation to the ambient temperature: in a closed circuit the circuit temperature. The hydraulic fluid should be chosen so that the operating viscosity in the operating temperature range is within the optimum range (vopt) - the shaded area of the selection diagram. We recommended that the higher viscosity class be selected in each case. Example: At an ambient temperature of X °F (X °C) an operating temperature of 140 °F (60 °C) is set in the circuit. In the optimum operating viscosity range (vopt; shaded area) this corresponds to the viscosity classes VG 46 or VG 68; to be selected: VG 68.

Please note: The case drain temperature, which is affected by pressure and speed, is always higher than the circuit temperature.

Hydraulic fluid

Before starting project planning, please refer to our data sheets RE 90220 (mineral oil), RE 90221 (environmentally acceptable hydraulic fluids) and RE 90223 (HF hydraulic fluids) for detailed information regarding the choice of hydraulic fluid and application conditions. The variable piston pump A4VG is unsuitable for operation with HFA, HFB and HFC. If HFD or environmentally acceptable hydraulic fluids are being used, the limitations regarding technical data and seals mentioned in RE 90221 and RE 90223 must be observed. When ordering, please indicate the used hydraulic fluid.

Limits of viscosity range

The maximum hydraulic fluid temperature of 115 °C must not be exceeded locally either (e.g. in the bearing area).

The temperature in the bearing area is - depending on pressure and speed - up to 5 K higher than the average case drain temperature.

Rexroth A4VG pump part number and model			
R902063240	A4VG125HWD3L/32R-NZF02F071K	R902131523	A4VG71DA1D8/32R-NSF02F021BP
R902072787	A4VG28DGDT1/32R-NSC10F045S	R902131609	A4VG125EP4DT1/32R-NZF02F001BP
R902074032	A4VG90HWDT1/32L-NZF02F001S	R902131820	A4VG250HD3D1/32R-NZD10F011D
R902080089	A4VG56HWD2/32R-NZC02F003S	R902131969	A4VG56EP4D1/32L-NAC02F075SP
R902081217	A4VG180NVDT1/32R-NZD02F021S	R902133053	A4VG125HD3DMT1/32R-NZF02F001D
R902085521	A4VG71DA2D7/32R-NZF02F021SP	R902133113	A4VG125EP3DM1/32R-NAF02F071DP
R902085522	A4VG125DA2D7/32R-NZF02F021SP	R902133354	A4VG125HD3D1/32R-NSF02F021D
R902085703	A4VG71HWD2/32R-NZF02F071P	R902134324	A4VG250HD3D1/32L-NSD10F041D
R902085891	A4VG71HWDT1/32R-NAF02K041E	R902134481	AA4VG140EP4D1/32R-NXF63F071DP
R902088221	A4VG90HWD2/32R-NZF02F071S	R902136132	A4VG125HD3D2/32R-NAF02F021S
R902089470	A4VG71DA1D2/32R-NSF02F011PP	R902136173	A4VG71DA1D2/32R-NZF02F021SQ
R902090711	AA4VG71NVDMT1/32L-NSF52F001D	R902136204	A4VG125HD9MT1/32R-NSF02F041S
R902092401	AA4VG180DWD1/32L-NSD52F071D	R902136209	A4VG125EP0MT1/32R-NSF02F021SP
R902096442	A4VG71DA1D2/32R-NAF02F001DQ	R902136259	A4VG125HD9MT1/32R-NSF02XXX1S
R902099864	A4VG28DGDT1/32R-NSC10K043E	R902136267	A4VG140HD9MT1/32R-NSF02F021S
R902099930	AA4VG250DWDMT1/32L-NSD60F071S	R902136370	A4VG180HD3DM1/32L-NSD02F021D
R902106041	A4VG90HWD1/32R-NAF02F021P	R902137498	AA4VG180EP4D1/32R-NSD60F071DP
R902108182	A4VG56HWDT1/32R-NZC02F016K	R902138600	A4VG180EP4DT1/32L-NZD02F001PP
R902110502	A4VG125DE1D1/32R-NZF02F071FP	R902138673	AA4VG105EP3D1/32R-NXFXXF021FC
R902111154	A4VG40HD3D2/32R-NZC02F023S	R902138976	A4VG180HD3DM1/32R-VSD02F001P
R902111163	A4VG40HD3D1/32R-NSC02F025S	R902146055	A4VG140EP4D1/32L-NSF02F001FP
R902111178	A4VG40HD3DT1/32L-NAC02F043D	R902146062	A4VG125EP3D1/32L-NZF02F001FP
R902111724	A4VG56EP4DM1/32R-NSC02F025PH	R902148231	A4VG40HD3DM1/32R-NSC02F046P
R902111872	A4VG56HD3D1/32R-NSC02F003D	R902148350	AA4VG250EP4DMT1/32R-NSD60F001DRP
R902111873	A4VG56HD3D1/32L-NSC02F005D	R902148549	AA4VG250EP4DT1/32L-NSD60F071DRP
R902111874	A4VG56HD3DM1/32L-NSC02F00XD	R902148574	AA4VG250EP4DT1/32L-NSD60F071DRP
R902111985	A4VG56HD3DT1/32L-NAC02F043D	R902148634	A4VG56HD3DT1/32L-NZC02F003P
R902112689	A4VG90HWDT1/32R-NZF02F021S	R902148645	A4VG250EP4DT1/32L-NZD10N001EP
R902112943	A4VG28DA1D8/32R-NZC10F015DP	R902149552	A4VG125EP4D1/32R-NAF02F021SP
R902113140	A4VG71EP4D1/32R-NSF02F011FP	R902150598	AA4VG125DGX1/32R-NSF52F69XF
R902113146	A4VG71EP4D1/32L-NSF02F001PP	R902151174	A4VG56DWDT1/32R-NTC02F045D
R902113204	A4VG71HD3D1/32R-NZF02F001S	R902151243	A4VG71HD3D2/32L-NZF02F001D
R902113237	A4VG71HD3DT1/32L-NZF02F041D	R902153005	A4VG125EZ2D1/32R-NZF02F001DP
R902113246	A4VG71HD3DT1/32L-NSF02F001D	R902153107	A4VG125HWDL1/32R-NZF02F021S
R902113374	AA4VG71HD3DMT1/32L-NSF52F041D	R902153146	A4VG90HD3D1/32R-NZF02F021F
R902117080	A4VG56EP4D1/32L-NSC02F025SP	R902153187	A4VG250HD3DT1/32R-NSD10F001D
R902118298	A4VG71EP3DT1/32R-NAF02F071FP	R902153216	A4VG125HD3DMT1/32L-NZF02F021F
R902118457	A4VG125HWD2/32R-NZF02F071S	R902153228	A4VG90EP4D1/32R-NZF02F001SP
R902119026	A4VG71EP4D1/32L-NZF02F001SP	R902154025	A4VG125HD3DM1/32R-NSF02F041B
R902119294	A4VG71EP4D1/32R-NAF02F071PP	R902154045	A4VG140EP4DT1/32L-NAF02F021SX
R902119321	A4VG250DA2D2/32R-NSD10F001DP	R902154054	A4VG140EP4DT1/32L-NAF02K691EX
R902120195	A4VG71EP3D1/32R-NSF02F071PP	R902154356	A4VG90EP4DT1/32L-NSF02F001SX
R902120242	A4VG40EP3D2/32R-NSC02F003PP	R902154366	A4VG71HD3DT2/32R-NZF02F021F
R902120398	A4VG125DA2D8/32R-NTF02F071FP	R902154520	A4VG180HWD7/32R-NSD02F021S
R902122244	A4VG56EP3D2/32R-NSC02F025PP	R902154798	A4VG90HD3DMT1/32L-NZF02F071S
R902122404	A4VG71EP4DT1/32R-NZF02F001SP	R902154950	A4VG71EP4DM1/32R-NZF02F001FX
R902122767	AA4VG90EP4D1/32L-NSF52K021EP	R902155505	A4VG125EP4D1/32L-NAF02F001DP
R902122809	A4VG90HD3DM1/32L-NZF02F07XD	R902155530	A4VG250EP4D1/32L-NTD10F001DP
R902122874	A4VG90HD3DT2/32L-NZF02F021S	R902155611	A4VG250EP4DM1/32L-NZD10K073EP
R902123351	A4VG125EP4DT1/32R-NTF02F071BP	R902155647	A4VG250EP4DT1/32L-NTD10F021SP
R902125116	A4VG125EP4D1/32R-NSF02F021DP	R902155675	A4VG180EP4DM1/32L-NSD02F00XBP
R902125209	A4VG125HD3D1/32R-NZF02F001D	R902155728	A4VG140EP4DM1/32R-VZF02F001PP
R902125252	A4VG125HD3D2/32R-NTF02F691P	R902155734	A4VG180EP4DM1/32L-NZD02K023EP
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R902125968	A4VG125EP0MT1/32R-NSF02F691SP	R902155815	A4VG56EZ2DM1/32R-NSC02F003FP
R902125975	A4VG140HD9MT1/32R-NSF02F691S	R902155874	A4VG180EP4DT1/32R-NZD02F011SP
R902125976	A4VG125HD9MT1/32R-NSF02F691S	R902155900	A4VG180EP4DT1/32R-NZD02F011DP
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R902128461	A4VG250HD3D1/32R-NSD10F021S	R902157706	A4VG56DA1D4/32R-NZC02F025SP
R902128467	A4VG250HD3D1/32R-NSD10F691D	R902157987	A4VG71NVDT1/32R-NZF02F021S
R902128469	A4VG250HD3D1/32L-NSD10F001D	R902157988	A4VG56NVDT1/32R-NZC02F025S
R902128479	A4VG250HD3D1/32L-NZD10F001S	R902158141	A4VG180EP4D1/32R-NZD02F691SP
R902128480	A4VG250HD3D1/32R-NZD10F001D	R902158201	A4VG250HD3D1/32R-NSD10F071D
R902128482	A4VG250HD3DT1/32L-NZD10F001S	R902158365	A4VG90HD3DT1/32L-NZF02F021S
R902129162	A4VG125HD3DMT1/32L-NZF02F01XD	R902158391	A4VG180EP4DM1/32L-NSD02N003EP
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R902129723	A4VG180EP4D1/32R-NSD02F001DP	R902159323	A4VG90EP4DM1/32R-NZF02F071SP
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R902129920	A4VG180EP4MT1/32L-NSD02F071SP	R902159726	A4VG180DWDMT1/32R-NSD02F001D
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R902131079	A4VG250EP4D1/32R-NSD10F021DP	R902159902	A4VG90EZ2D1/32R-NAF02F071BP
R902131364	A4VG250HD3D1/32L-NSD10F071D	R902159912	A4VG56EP4DT2/32R-NZC02F025SP
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