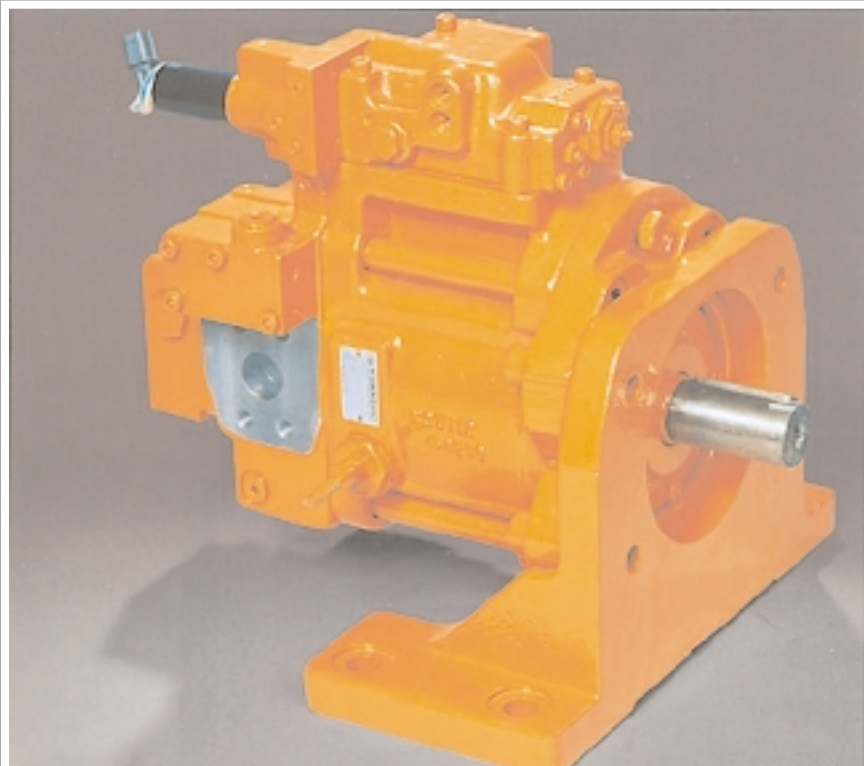




# K3VG series Axial Piston Pumps Installation Manual



# KAWASAKI AXIAL PISTON PUMPS

POWER, EFFICIENCY, QUALITY & RELIABILITY COME TOGETHER

**K**awasaki engineers developed our original KV Series axial piston pump in 1968. Since then, we have been at the leading edge in the development of these technologies, so as to satisfy the demanding needs of our customers.

The present K3V pump design was first introduced during 1987. The primary application for this pump was in earth-moving and construction industries where today more than 700,000 units have been supplied. The outstanding reliability and reputation of Kawasaki Pumps in this critical market sector is well known. This success led to the 1992 introduction of the industrial variant, the **K3VG Series Pump**. The K3VG Pump was designed to specifically satisfy the industrial market where noise, efficiency, controllability and extended pump life were considered to be essential.

Kawasaki industrial series piston equipment is the preferred choice where continuous, reliable, and efficient operation of critical plant equipment is necessary.



*Shield Boring Machine  
Pump Used: K3VG63*



*Forging Pump  
Pump Used: K3VG280DT*



*Windlass Winch  
Pump Used: K3VG112*

All over the world, K3VG Pumps are used on tunneling equipment, crushers and shredders, stacker/reclaimers, continuous casting equipment, rolling and hot strip mills, forging presses and manipulators, extrusion and scrap presses, hydraulic deck machinery and fishing equipment, and various other applications.

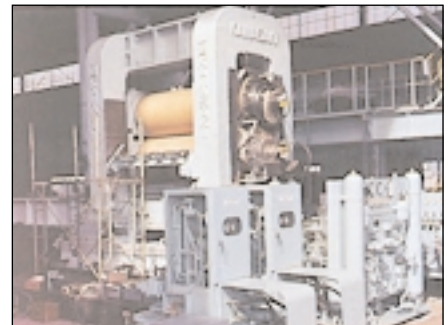
K3VG Pumps are offered with a wide variety of control options. Pressure, flow and combination controls for regulating pump displacement are available in both hydro-mechanical and electro-hydraulic form.

The K3VG Pump design features hydrostatic bearing techniques together with specially selected bearings, which provides an inherently strong and reliable pumping system.

A modular design concept has enabled this pump series to be continuously adapted to the changing and discerning needs of our customers. This concept also allows product availability and service to be matched to customer requirements.

All pumps are rigorously tested and documented before shipment and are fully warranted.

**Kawasaki K3VG Axial Piston Pumps** - where power, efficiency, quality, and reliability come together.



*Skin Pass Mill  
Pump Used: K3VG112*



*Cargo Winch  
Pump Used: K3VG180*

## INTERIOR FEATURES AND BENEFITS

### Wide Variety of Pump Options:

A large selection of pump displacements is available. The maximum and minimum displacement can be manually adjusted on all pumps.

A pressure cut-off valve can be integrated with the horsepower control.

The modular design provides extreme flexibility.

An optional confluent block is available for tandem pump arrangements.

### Rigid Casing:

The rigid casing design ensures that all internal forces are well supported, thereby improving pump reliability and minimizing noise emission.

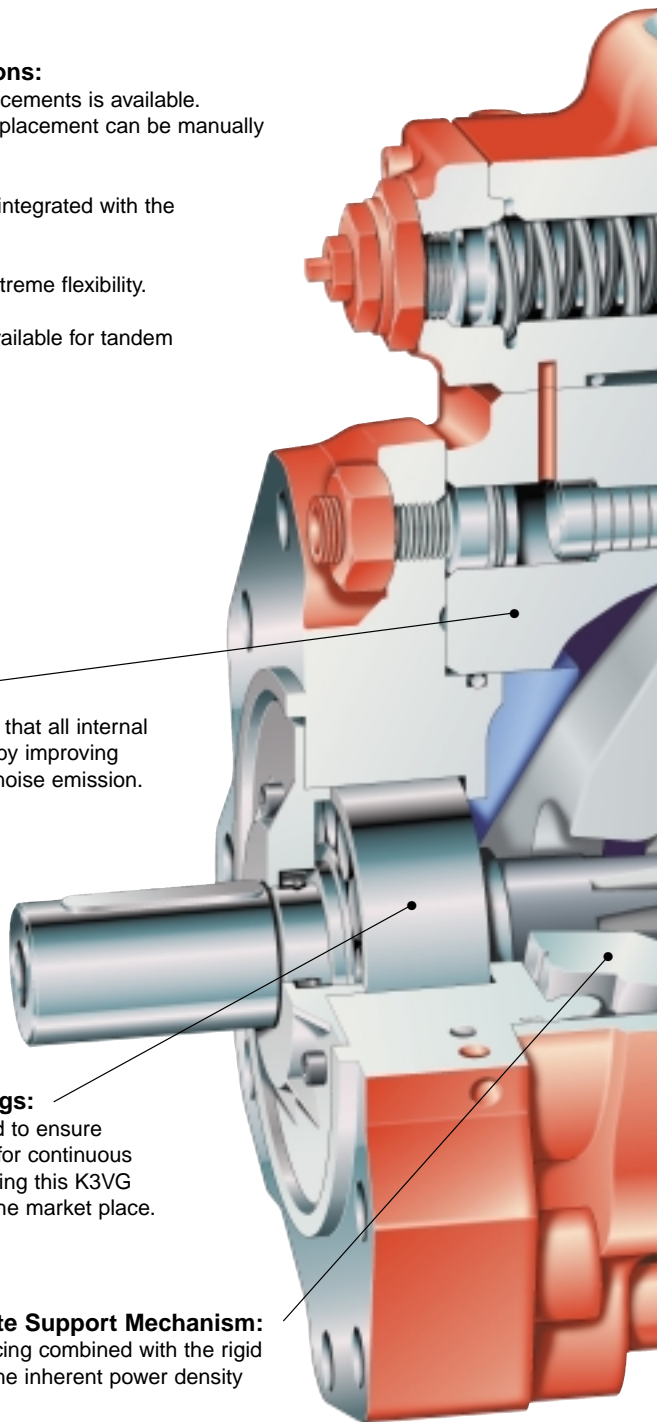
### High Load Capacity Bearings:

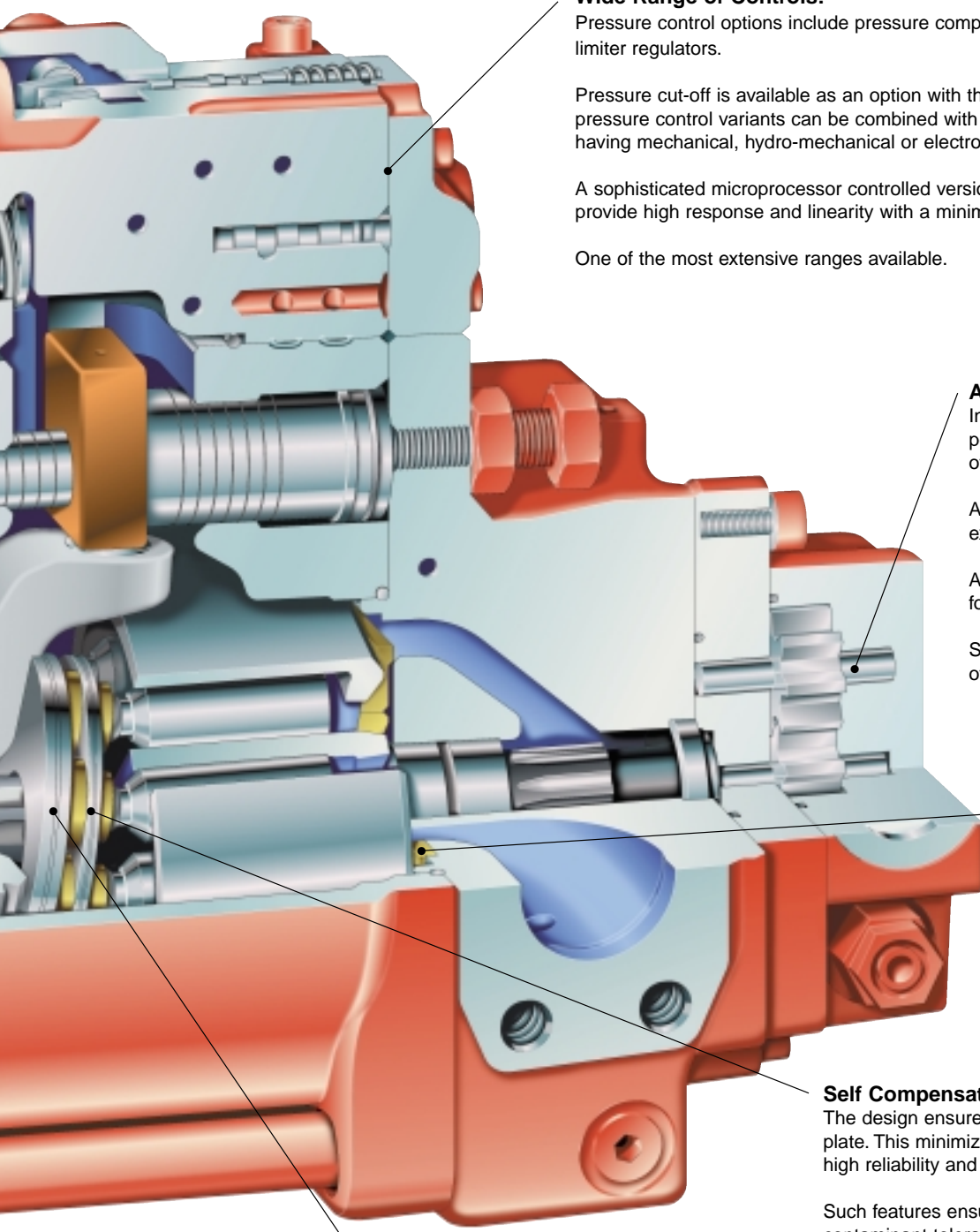
High load bearings are designed to ensure excellent reliability and long life for continuous industrial type applications, making this K3VG unit one of the most reliable in the market place.

### “Half Log” Type Swash Plate Support Mechanism:

The exclusive hydrostatic balancing combined with the rigid support mechanism enhances the inherent power density and reduces noise emission.

This simple and rigid construction ensures a high degree of reliability while maintaining control, responsiveness and quiet operation.





**Wide Range of Controls:**

Pressure control options include pressure compensation and horsepower limiter regulators.

Pressure cut-off is available as an option with the horsepower control. These pressure control variants can be combined with displacement control options having mechanical, hydro-mechanical or electro-hydraulic control input.

A sophisticated microprocessor controlled version (ILIS) is also available to provide high response and linearity with a minimum of hysteresis.

One of the most extensive ranges available.

**Auxiliary Take Off:**

Integral auxiliary gear pumps are available for power assist needs to enhance responsiveness of the control.

All porting is provided internally to eliminate external piping.

A standard auxiliary take off option is also available for provision of the customer's own gear pump.

Simplifies installation and provides a good degree of customer flexibility.

**Fully Balanced Spherical Valve Plate:**

Such a design ensures optimum contact of the cylinder block to valve plate which, due to the inherent spherical design, improves self priming capability and at the same time minimizes the resultant bearing reaction force.

This thereby further enhances the pump's high reliability and durability.

**Self Compensating Piston Return Mechanism:**

The design ensures optimum contact of the shoe on the swash plate. This minimizes the effects of shoe abrasion and provides high reliability and long service life.

Such features ensure that this pump has a high degree of contaminant tolerance.

**Friction-free Shoe Contacting Mechanism:**

The hydrostatic design minimizes the necessary contact force, thereby enhancing the reliability and durability of the unit.

## PRESSURE CONTROL OPTIONS

Control Type	Control Curve	Function and Features
Horsepower Control Type		In response to the rise of the delivery pressure, the pump tilting angle is decreased, and the input torque is limited. This function prevents excessive load to the electric motor or prime mover.
Pressure Compensation (Constant) Type		Regardless of the flow change, the circuit pressure is maintained constant. Be sure to install a safety relief valve in the circuit.
Horsepower and Pressure Cut-off Type		This function is a combination of the above two features. Be sure to install a safety relief valve in the circuit.

## FLOW CONTROL OPTIONS

Control Type	Control Curve	Limit of Displacement Range	Function and Features
Stepless Flow Control Type (Manual Control)		50-100%	The discharge flow can be steplessly adjusted by manual control. This adjustment is possible for all regular models.
Positive Flow Control		2.5-100%	Infinitely variable adjustment of the delivery flow is possible by the pilot hydraulic pressure. Delivery flow (Q) will <u>increase</u> with an increase in pilot pressure (Pi). With a directional control valve, unloading and 2-stage discharge flow control are possible.
Negative Flow Control		15-100%	The external pilot pressure can steplessly adjust the maximum flow. Delivery flow (Q) will <u>decrease</u> with an increase in pilot pressure (Pi). With a directional control valve, unloading and 2-stage discharge flow control are possible.
Electric Flow Control		2.5-100%	Infinitely variable adjustment of the delivery flow is possible by varying the pilot voltage (utilizing a solenoid operated pressure reducing valve). Delivery flow (Q) will <u>increase</u> with an increase in electric signal (E). As a pilot source for the solenoid operated proportional pressure reducing valve, our gear pump is available which eliminates redundant external piping. (An exclusive controller is necessary.)
ILIS (Intelligent Linear Servo) Accurate Electro-Hydraulic Servo		0-100%	Our original PID control system with a built-in micro-processor accurately controls output flow. An auxiliary pump unit is available as a control pressure source as standard.

## SPECIFICATIONS

Pump Model		63	112	180	280	180DT	280DT
Displacement	in <sup>3</sup> (cc/rev)	3.84 (63)	6.83 (112)	11.0 (180)	17.1 (280)	22.0 (360)	34.2 (560)
Rated Pressure	psi (Kgf/cm <sup>2</sup> )	5075 (350)	5075 (350)	5075 (350)	5075 (350)	5075 (350)	5075 (350)
Maximum Pressure	psi (Kgf/cm <sup>2</sup> )	5800 (400)	5800 (400)	5800 (400)	5800 (400)	5800 (400)	5800 (400)
Maximum Input Torque	lb-ft (Nm)	232 (314)	412 (559)	665 (902)	1032 (1400)	1330 (1804)	2065 (2800)
Rated Speed	rpm	1800	1800	1800	1200	1800	1200
Maximum Self Priming Speed*	rpm	2600	2200	1850	1600	1850	1600
Maximum Boosted Speed**	rpm	3250	2700	2300	2000	2300	2000
Mass	lb	106	150	190	353	353	661

**\*Steady State Suction Pressure  $\geq$  -1.45 psi**

**\*\*Minimum Recommended Boost Pressure at Suction Port  $\geq$  14.5 psi**

**Operating Temperature Range -4°F ~ 176°F (-20°C ~ 80°C)**

**Hydraulic Fluid:** Mineral Antiwear Hydraulic Fluid  
 10 to 1000 cSt @ 100°F  
 - For fluids over 200 cSt please contact Kawasaki  
 - For other fluid types please contact Kawasaki

**Fluid Cleanliness:** 18/15 ISO/DIS 4406  
 NAS Class 9

**Filtration:** Suction line - 150 mesh  
 Return line - 10  $\mu$ m nominal or better

