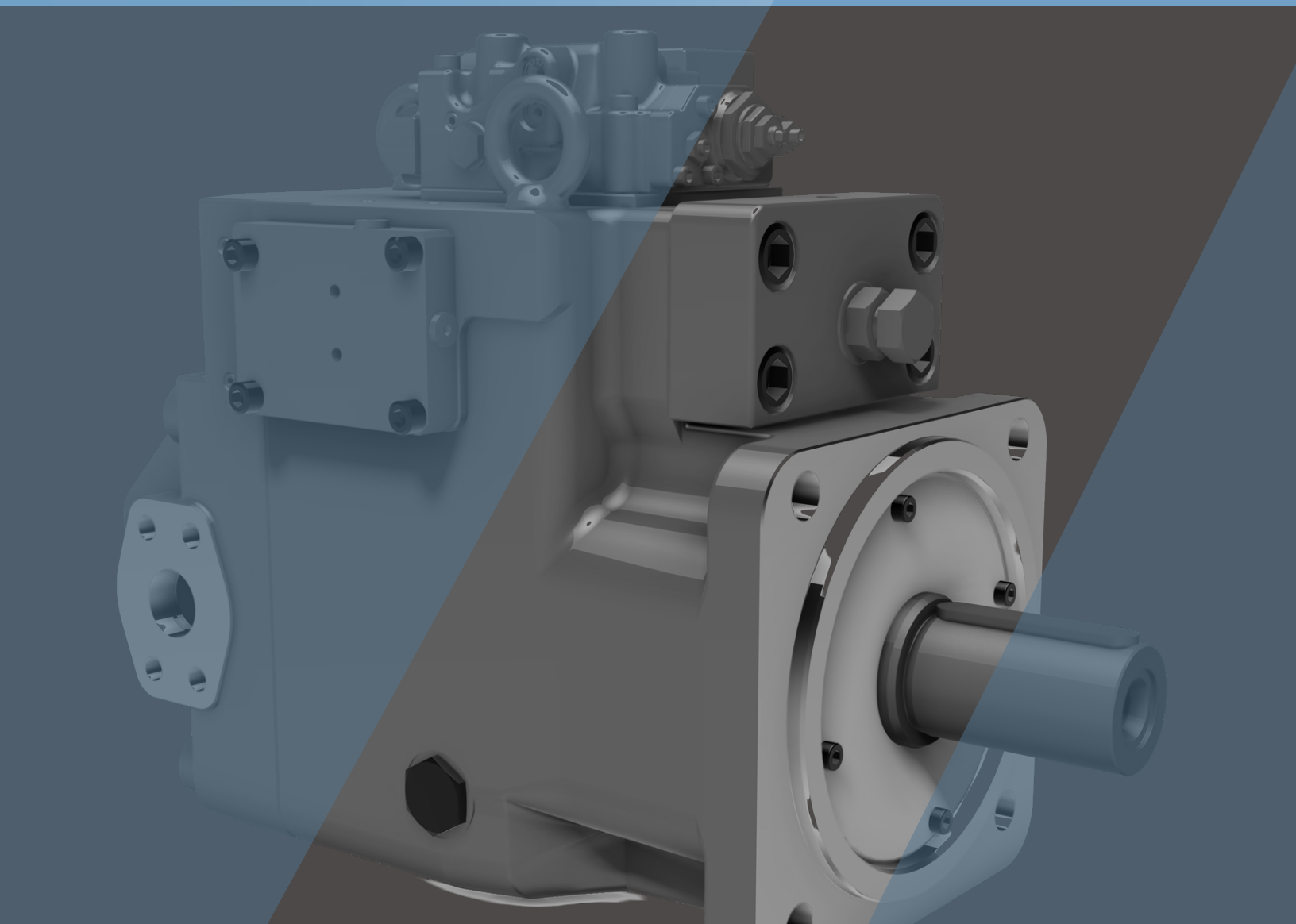
Kawasaki
Powering your potential

# Swash Plate Type Axial Piston Pump
# K7VG Series



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# Applications/Product Usage

**The following must be taken into consideration before use.**

1. The operating condition of the products shown in this catalog varies depending upon each application. Therefore, the product suitability must be judged by the designer of the hydraulic system and/or the person who finalizes the technical specifications of the machine after analysis and testing. The product specification shall be determined based on the latest catalog and technical documents. The system must be designed taking into account the possibility of machine failure to ensure that all safety, warning, and application requirements are met.

2. For the proper use of the products, descriptions given in the SAFETY PRECAUTIONS must be observed.

3. The technical information in this catalog represents typical characteristics and performance of the products as of the published date.

4. If the intended use of the products is included in the following, please consult with Kawasaki in advance.
   (1) Use the product in the operating conditions or environments other than those described in the technical documents.
   (2) Use the product in the nuclear sector, aviation sector, medical sector, and/or food sector.
   (3) Use the product in applications which may cause substantial harm to others and their property, and especially in applications where ensuring safety is a requirement.

5. The information described in this catalog is subject to change without notice. For the latest information, please contact Kawasaki.

# Safety Precautions

**Before using the product, you MUST read this catalog and MUST fully understand how to use the product. To use the product safely, you MUST carefully read all Warnings and Cautions in this catalog.**

## 1. Cautions related to operation


- Use the personal protective equipment to prevent injury when the product is in operation.


- Some components are heavy. Handle the product carefully not to hurt your hands and lower back.


- Do not step on, hit or drop , or apply strong force to the product, as these actions may cause operation failure, product damage, or oil leakage.


- Wipe off any oil on the product or the floor completely, as oil can create slippery conditions that may cause drop of the product and personal injury.

## 2. Warnings and cautions related to installation and removal of the product


- Installation, removal, piping, and wiring must be done by a qualified technician.


- Make sure that the hydraulic power unit is turned off and that the electric motor or engine has completely stopped before starting installation or removal. You must also check that the system pressure has dropped to zero.


- Make sure that the power source is turned off before installing electric components to reduce the risk of electric shock.


- Clean the threads and the mounting surface to prevent damage or oil leakage. Inadequate cleaning may cause insufficient torque and broken seals.


- Use the designated bolts and fasten them with prescribed torque when installing the product. Use of undesignated bolts, and excessive or insufficient tightening torque may induce operation failure, damage, or oil leakage.

## 3. Warnings and cautions for operation


- Always equip the product with explosion or ignition protection if it is used in potentially explosive or combustible atmospheres.


- Shield rotary parts, such as the motor and pump shaft, to avoid injury.


- Stop operation immediately, and take proper measures when the abnormality such as unusual noise, oil leakage, and smoke is found. Continuing operation under such condition may bring about damage, a fire hazard, or injury.


- Make sure that all pipes, hoses, and connecting points with pipes or hoses, are correctly connected and tightened before starting operation.


- Use the product under the operating conditions and limitations described in the catalog, drawings, and specification sheets.


- Do not touch the product in operation. to reduce the risk of skin burn.


- Use the proper hydraulic oil and maintain the filtration at the recommended level to prevent premature wear and damage.

## 4. Cautions related to maintenance


- Never modify the product without approval from Kawasaki.


- Disassembly of the product may void the warranty.


- Keep the product clean and dry when storing or transporting.


- The seals may need to be replaced if the product has been stored for an extended period of time.


- Making adjustments of this product will result in the warranty being null and void.

# Conversion Factors and Formula

## Conversion Factors

| | Formula | Note |
|---|---|---|
| **Displacement** | 1 $cm^3$ = 0.061 $in^3$ | |
| **Pressure** | 1 MPa = 145 psi | |
| **Flow** | 1 L/min = 0.264 gpm | US gallon |
| **Torque** | 1 Nm = 0.74 lbf ft | |
| **Power** | 1 kW = 1.341 hp | |
| **Weight** | 1 kg = 2.205 lb | |

## Formula

| | Metric system | | Imperial system | |
|---|---|---|---|---|
| **Output flow** | Q = q x N x $\eta_v$ / 1000 | L/min | Q = q x N x $\eta_v$ / 231 | gal/min |
| **Input torque** | T = q x ΔP / 2$\Pi$ / $\eta_m$ | Nm | T = q x ΔP / 24$\Pi$ / $\eta_m$ | lbf ft |
| **Input power** | L = T x N / 9550 = Q x ΔP / 60 / $\eta_t$ | kW | L = T x N / 5252 = Q x ΔP / 1714 / $\eta_t$ | hp |

# MEMO

# K7VG Series

## Swash Plate Type Axial Piston Pump

### General Descriptions

#### Reliable High-Pressure and Long-Life Type

This series of high-pressure, swash-plate type pumps was developed for general industrial machinery use and is based upon our long and rich experience. The adoption of the high-load bearings and friction-free contacting mechanism of shoes has achieved high reliability and long life.

#### Low Noise

The unique compact and rigid housing construction in addition to the semi-cylindrical swash-plate and its anti-vibration supporting mechanism has both reduced noise and pressure pulsations

#### High Efficiency and High Self-Priming Capability

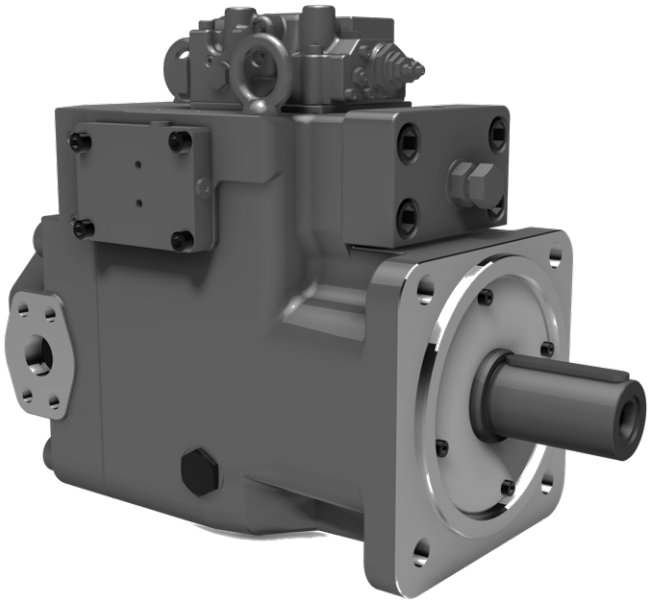
The spherical valve plate and improved hydraulic balance provide stable cylinder rotation, thus achieving high efficiency even in a low-pressure and low-speed operating range. Additionally the shortened radius of the cylinder port reduces the peripheral fluid velocity thereby enabling its high self-priming speed capability.

#### Varieties of Control Methods

Good varieties of hydraulic and electrical control methods are available. The flow control, pressure control, horsepower control, and the combination of these are standardized and available.

#### Auxiliary Gear Pump

Various sizes of auxiliary pumps can be attached the rear SAE throughdrive mounting interface. Accordingly, there is no need for a separate pump unit as a control pressure source or as a medium-pressure system pressure source. Hydraulic units can thus be made compact.



### Features

**5075 PSI(350 bar)**

**Long Bearing Life**

**ISO Mount and Shaft**

**Optional Throughdrive**

**High Reliability**

**High Efficiency**

**Low Noise**

**Highly Responsive Controls**

# 1-1 Pump Options

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **K7VG** | **265** | **-** | **3** | **N** | **N** | **R** | **H** | 1 | N | H1 | (Blank) | (Blank) | **-4** |

– NOT AVAILABLE ● AVAILABLE

**1. K7VG Series Pump**

| |
|---|
| K7VG Series, Variable Displacement, Axial Piston, Open Loop Pump |

**2. Pump Size**

| | | 180 | 265 |
|---|---|---|---|
| Maximum Displacement | $in^3/rev$ | 11.0 | 16.5 |
| | $cm^3/rev$ | 180 | 270 |

**3. Hydraulic Fluid Type**

| | | | |
|---|---|---|---|
| – | Mineral Oil | ● | ● |
| W | Water Glycol | ● | ● |
| P | Polyol Ester | ● | ● |

**4. Circuit Type**

| | | | |
|---|---|---|---|
| 3 | Open Circuit | ● | ● |

**5. Through Drive & Porting**

| | | | |
|---|---|---|---|
| N | Steel Cover, No Through Drive | ● | ● |
| A | SAE-A Through Drive | ● | ● |
| B | SAE-B Through Drive | ● | ● |
| C | SAE-C Through Drive | ● | ● |
| CC | SAE-CC Through Drive | ● | ● |
| D | SAE-D Through Drive | ● | ● |

**6. Mounting Bracket/Port Flange**

| | | | |
|---|---|---|---|
| 0 | Without bracket, With flange | ● | ● |
| F | With bracket, With flange | ● | ● |
| B | With bracket, Without flange | ● | ● |
| N | Without bracket, Without flange | ● | ● |

**7. Direction of Rotation**

| | | | |
|---|---|---|---|
| R | Clockwise rotation | ● | ● |

**8. Series Type**

| | | | |
|---|---|---|---|
| – | Standard Series | ● | ● |
| H | High Speed Series | – | ● |

**14. Tilt monitor & other accessories**

| | | | |
|---|---|---|---|
| Blank | With tilt indicator | ● | ● |
| -0* | Without tilt indicator | ● | ● |
| -2* | With 1,000-1,200 rpm resonator | ● | ● |
| -3* | With 1,500-1,800 rpm resonator | ● | ● |
| -4 | 1,000-1,200 rpm resonator & tilt indicator | ● | ● |
| -6 | 1,500-1,800 rpm resonator & tilt indicator | ● | ● |

# 1-2 Regulator Options

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | **9** | **10** | **11** | **12** | **13** | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K7VG | 265 | - | 3 | N | N | R | H | **1** | **N** | **H1** | **(Blank)** | **(Blank)** | -4 |

**9. Regulator Type**

| | Mount Location | | 180 | 265 |
|---|---|---|---|---|
| | Top | Side | | |
| 0 | Cover Plate | Cover Plate | ● | ● |
| 1 | Torque limiter | Cover Plate | ● | ● |
| 4 | Cover Plate | Direct acting pressure compensator | ● | ● |
| 5 | Torque limiter | Direct acting pressure compensator | ● | ● |
| 7 | Torque limiter with load sensing & remote pressure compensator | Cover Plate | ● | ● |
| C* | Cover Plate | Remote pressure compensator | ● | ● |
| D* | Torque limiter | Remote pressure compensator | ● | ● |
| E* | Cover Plate | Load sensing compensator | ● | ● |
| F* | Torque limiter | Load sensing compensator | ● | ● |

**10. Top Mounted Flow Control Type**

| | | | |
|---|---|---|---|
| 0 | No flow control | ● | ● |
| 1 | No flow control (type 4 only) | ● | ● |
| N | Negative flow control | ● | ● |
| P | Positive flow control | ● | ● |
| E | Electrical displacement control (required Pilot pressure source) | ● | ● |
| L | Load sensing (type 7 only) | ● | ● |

**11. Top Mounted Torque Limiter**

| | | | |
|---|---|---|---|
| 00 | None (type 0, 4, C, E only) (type 5, 7 is available as option) | ● | ● |
| H# | High setting range | ● | ● |
| M# | Medium setting range | ● | ● |

**See power band setting codes on page 9 & 11**

**12. Pressure Control - Additional Code**

| | | | |
|---|---|---|---|
| Blank | Standard | ● | ● |
| 3 | Always for types C, D, E & F* | ● | ● |

**13. Additional Pressure Control Options**

| | | | |
|---|---|---|---|
| Blank | Standard | ● | ● |
| 0 | None(regulator type C & D only)* | ● | ● |
| 1 | R4 plugged (regulator type E & F only)* | ● | ● |

**Reference Regulator Combination Chart**

| 9. Regulator Type | 10. Top Mounted Flow Control Type: 0 | 1 | N | P | E | L |
|---|---|---|---|---|---|---|
| 0 | ● | – | ● | ● | ● | – |
| 1 | ● | – | ● | ● | ● | – |
| 4 | – | ● | – | – | – | – |
| 5 | ● | – | ● | ● | ● | – |
| 7 | ● | – | ● | ● | ● | ● |
| C* | ● | – | – | – | – | – |
| D* | ● | – | ● | ● | ● | – |
| E* | ● | – | – | – | – | – |
| F* | ● | – | ● | ● | ● | – |

*Non Standard Options - Contact KPM

# 2-1 Technical Data

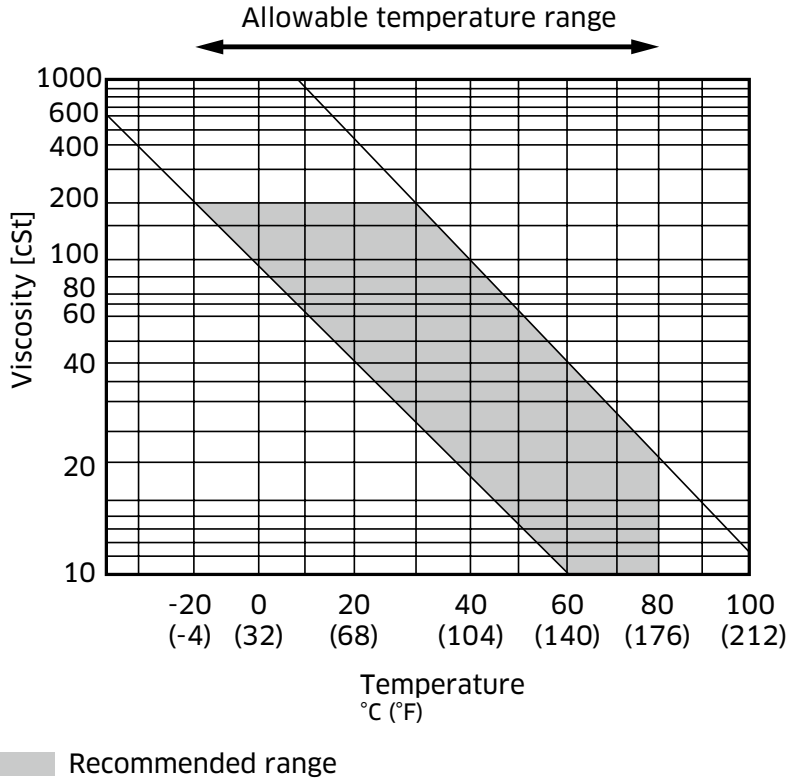
For applications outside the following parameters, please consult KPM.

## Hydraulic Data

**Pressure Fluid** Mineral oil, polyol ester and water glycol.

Use a high quality, anti-wear, mineral based hydraulic fluid when the pressure exceeds 210 bar. In applications where fire resistant fluids are required consult KPM.

## Fluid selection



# 2-1 Technical Data (cont)

## Filtration & Contamination Control

### Filtration

The most important means to prevent premature damage to the pump and associated equipment and to extend its working life, is to ensure that hydraulic fluid contamination control of the system is working effectively.

This begins by ensuring that at the time of installation that all piping, tanks etc. are rigorously cleaned in a sanitary way. Flushing should be provided using an off line filtration system and after flushing the filter elements should be replaced.

A full flow return line filter of 10 micron nominal should be utilised to prevent contaminant ingress from the external environment, a 5 to 10 micron filter within the tank's breather is also recommended.

## Suggested Acceptable Contamination Level

The relationship between contamination level and pump life is very difficult to predict as it depends on the type and nature of the contaminant present in the system. Sand or Silica in particular, due to its abrasive nature, does significantly reduce the expected life of a pump. Based on the precondition that there is no significant presence of Silica type substances then a minimum Cleanliness level of -/18/15 ISO 4406 or SAE AS 4059E Table 1 Class 9 (NAS 1638 Class 9 ).

## Working Fluid Types

### Anti-Wear Type Hydraulic fluid

It is generally recommended to use an anti-wear hydraulic fluid like mineral oil when the operating pressure exceeds 210 bar.

### Fire-resistant Fluids

Some kind of fire-resistant fluids require special materials for seals, paint and metal finishing. Please consult KPM and provide details of the particular fluid specification and the working conditions so that any special requirements can be ascertained.

In general, fire-resistant fluids have a low viscosity index and their viscosity also changes significantly with operating temperature and service life. For this reason, the circuit should be provided with an adequately sized cooler or forced cooling so that temperatures can be stabilised. Due to the inherent water content of some of these fluids the minimum allowable suction pressure will be higher than that of an equivalent mineral oil and so needs to be fully evaluated by KPM. The following table provides an overview of the precautions and characteristics that can be expected with these types of fluids.

| Fluid Type / Parameter | Mineral Oil | Polyol Ester | Water Glycol |
|---|---|---|---|
| **Maximum Pressure psi(bar)** | 5,075 (350) | 5,075 (350) | 3,045 (210) |
| **Recommended Temperature Range F(C)** | 68 - 140 (20 - 60) | 68 - 140 (20 - 60) | 50 - 122 (10 - 50) |
| **Cavitation susceptibility** | ○ | △ | △ |
| **Life expectancy compared to mineral oil** | 100% | 50 - 100% | 20 - 80% |

○ recommended △ usable (higher density)

# 2-1 Technical Data (cont)

## Pump Start Up Precautions

### Pump Case Filling

Be sure to fill the pump casing with oil through the drain port, filling only the suction line with oil is totally in sufficient. The pump contains bearings and high-speed sliding parts including pistons with shoes and spherical bushes that need to be continuously lubricated. Part seizure or total premature failure will occur very quickly if this procedure is not rigidly followed.

### Piping & Circuit Checking

Check to see that the piping and full hydraulic circuit is completed and that any gate valves etc. are open.

### Direction of Rotation

Check to ensure that direction of rotation is correct and that the inlet and delivery lines are connected correctly.

### Start Up

Jog start the motor and check once more for correct rotation. Run the pump unloaded for a period to ensure that all residual air within the system is released. Check for external leakage, abnormal noise and vibrations.

### Case Drain Pressure

Please ensure, that the maximum steady state drain line pressure at the pump casing does not exceed 1 bar. (Maximum peak pressure 4 bar). A suitable drain line hose must be selected and return directly back to the tank and terminate below the oil level.

### Long Term Out of Usage

It is undesirable to leave the pump out of use for a long period e.g. a year or more. In such a situation it is recommended that the pump is run for a short period on a more frequent basis even if it is just unloaded. With regard to a pump held in storage then rotating the shaft on a frequent basis is sufficient. If the pump is left out for more than the suggested time it will require a service inspection.

# 2-2 Specifications

For applications outside of the following parameters please contact KPM.

| Pump Model | | K7VG180 | K7VG265 |
|---|---|---|---|
| Displacement | $in^3$ ($cm^3$/rev) | 11.0 (180) | 16.5 (270) |
| Rated Pressure | psi (bar) | 5,075 (350) | |
| Peak Pressure | psi (bar) | 5,800 (400) | |
| Maximum Self Priming Speed | rpm | 1,800 | 1,500 (H:1600) |
| Maximum Boosted Speed | rpm | 2,200 | 1,500 (H:1900) |
| Weight | lb (kg) | 318 (145) | 496 (225) |

## Moments of Inertia

| Frame Size | 180 | 265 |
|---|---|---|
| Moment of Inertia GD2 (kgf.m2) | $1.70x10^{-1}$ | $4.98x10^{-1}$ |
| Torsional stiffness (N·m/rad) | $2.07x10^{5}$ | $5.47x10^{5}$ |

# 2-2 Specifications (cont)

**#1** Maximum allowable shaft torques are based on achieving an infinite life for a coupling assembly that is lubricated and completely clamped and utilises the full spline/key length as engagement.

The following points therefore need to be fully considered:-

**i)** Lubrication of shaft couplings should be in accordance with the coupling manufacturers instructions.

**ii)** The maximum allowable input shaft torque is based on ensuring an infinite life condition by limiting the resultant combined shaft bending and torsional stress.

**iii)** This allowable input shaft torque can be further increased dependant on the resultant surface stress at the spline interface which is highly dependant on coupling selection and the provision of adequate spline lubrication.

If you have an application that requires higher input torque please consult KPM.

**#2** Allowable through drive torques are based on the achieving an infinite life for a fully lubricated coupling and full spline engagement with a mineral oil based anti-wear hydraulic fluid.

Notes:

### Rated Pressure

Pressure at which life and durability will not be affected.

### Peak Pressure

The instant allowable surge pressure as defined by BS ISO 2944:2000. Life and durability however will be shortened.

### Maximum Self Priming Speed

Values are valid for an absolute suction pressure of 1 bar. If the flow is reduced and the inlet pressure is increased the speed may also be increased.

### Maximum Boosted Speed

Values stated are the absolute maximum permitted speed for which an increased inlet pressure will be required.

### Weight

Approximate dry weights, dependant on exact pump type.

### Hydraulic Fluid

Mineral anti wear hydraulic fluid - for other fluid types please consult KPM.

### Viscosity Range

If viscosity is in range 200 to 1,000 cSt, then warming up is necessary before commencing full scale running.

# 2-3 Functional Description of Regulators

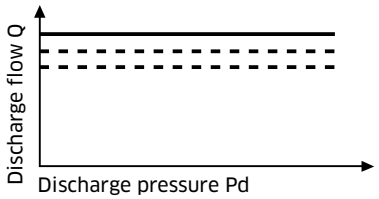
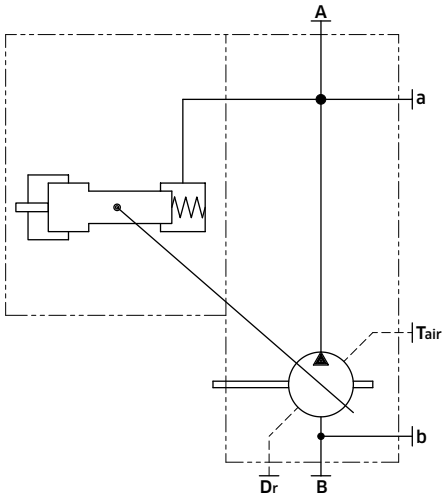
| Key to Hydraulic Circuit Annotations | |
|---|---|
| **Annotation** | **Description** |
| A | Main pump delivery |
| a | Gauge port main pump delivery |
| B | Main pump suction |
| b | Suction gauge port |
| Dr | Drain |
| Pi | Pilot pressure |
| Pc | Remote pilot port, pressure compensator |
| $P_L$ | Load sensing port |
| Tair | Air Bleeder port |
| Psv | Pressure assist port |

# 2-3 Functional Description of Regulators (cont)

**Regulator Code :** 0 0

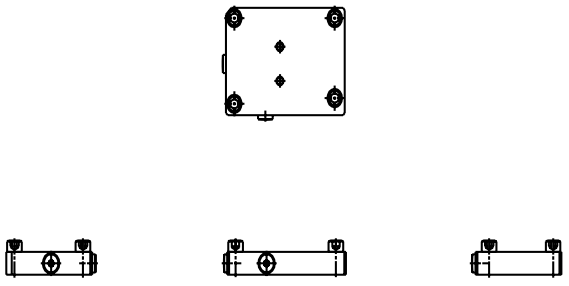
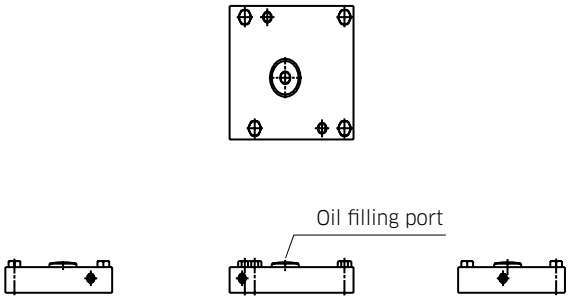
**Control type : Stepless Manual Displacement Control**

The pump is supplied without a regulator. The discharge flow can be steplessly adjusted by manually turning adjustment screws on the pump. This adjustment provision is a standard feature on all K7VG pumps providing a means to limit the maximum and minimum displacement.

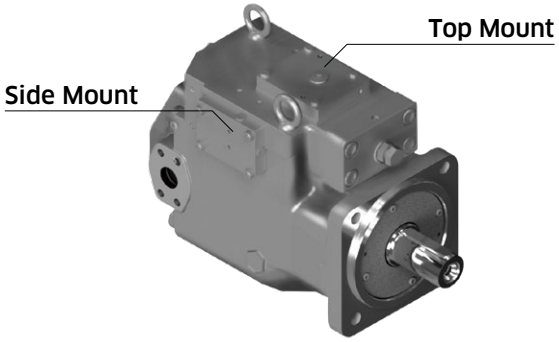
| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |





| Side Mount | Top Mount |
|---|---|
|  |  |



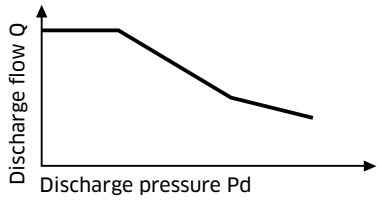
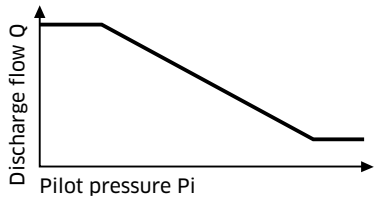
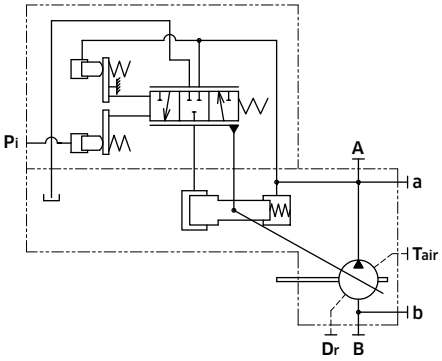
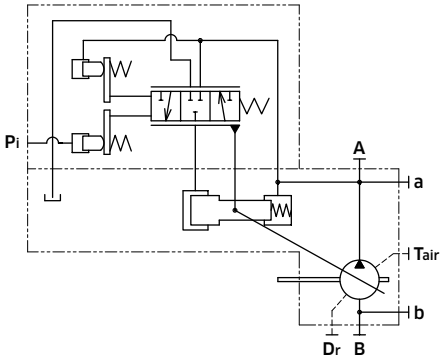


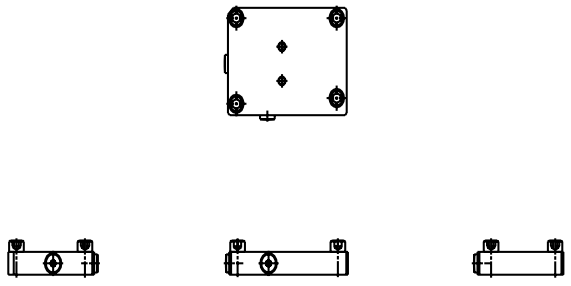
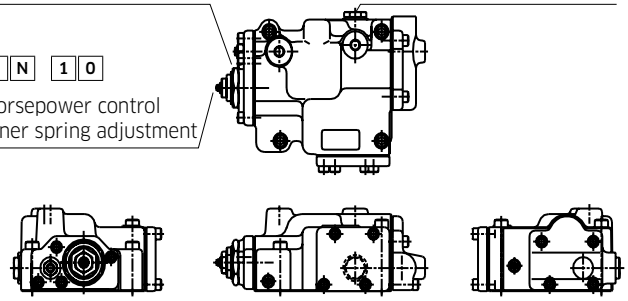
# 2-3 Functional Description of Regulators (cont)

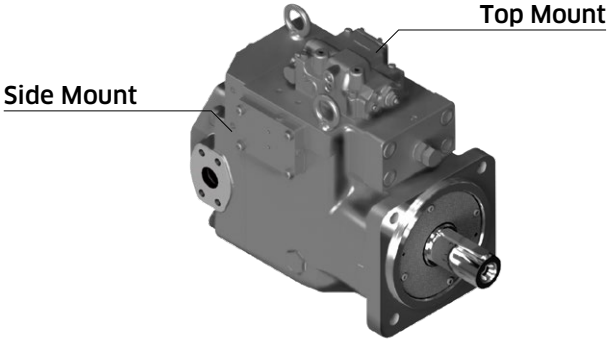
**Regulator Code :** 0 N 1 N 1 0

**Control type : Power and Negative Displacement Control**

In response to a rise in delivery pressure, the swash plate tilting angle is decreased, limiting the input torque. Thsi regulator prevents excessive load against the prime mover. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in a decrease in flow, hence the Negative control.

| Control Curves | Hydraulic Circuit |
|---|---|
| 1 N 1 0<br>  <br><br>0 N 1 N<br>  <br> | 0 N<br>  <br><br>1 N 1 0<br>  <br> |

| Side Mount | Top Mount |
|---|---|
|  | 1 N 1 0<br>Horsepower control<br>outer spring adjustment<br>1 N 1 0<br>Horsepower control<br>inner spring adjustment<br>0 N 1 N<br>Pilot port for<br>displacement control (Pi)<br>  |

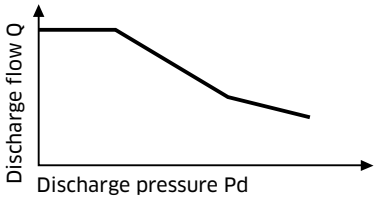
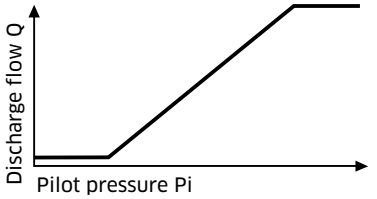
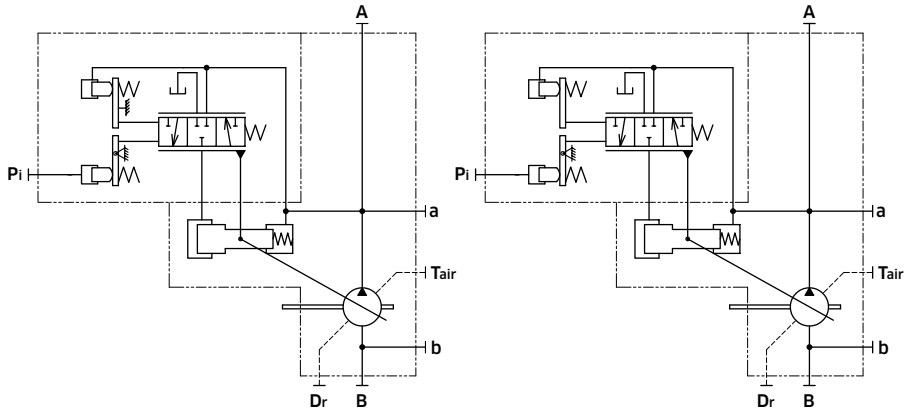


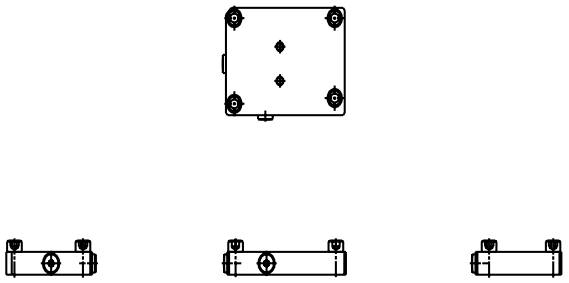
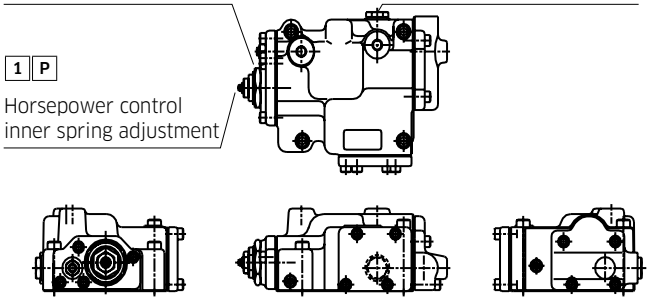
# 2-3 Functional Description of Regulators (cont)

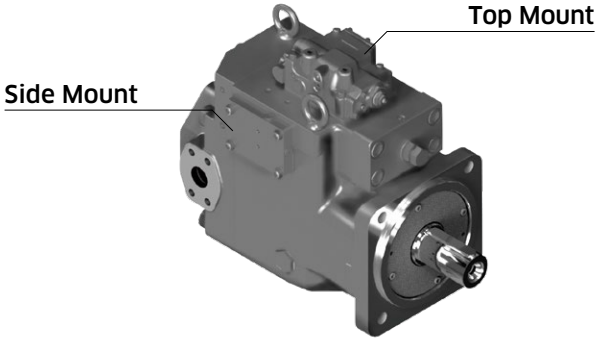
**Regulator Code :** 0 P 1 P

**Control type : Horsepower and Positive Flow Control**

This regulator combines the Horsepower Control with Positive Flow Control. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in an increase in flow, hence the Positive control.

| Control Curves | Hydraulic Circuit |
|---|---|
| 1 P<br>  <br><br>0 P 1 P<br>  <br> | 0 P<br>1 P<br>  <br> |

| Side Mount | Top Mount |
|---|---|
|  | 1 P Horsepower control outer spring adjustment<br>0 P 1 P Pilot port for displacement control (Pi)<br>1 P Horsepower control inner spring adjustment<br>  |

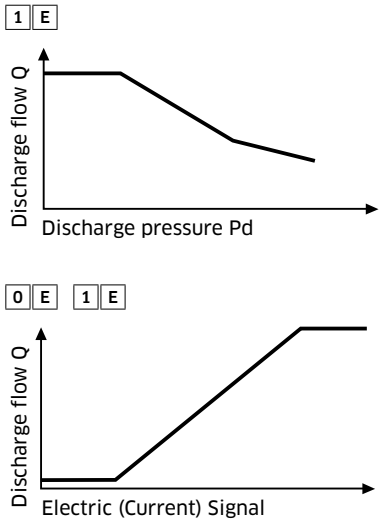
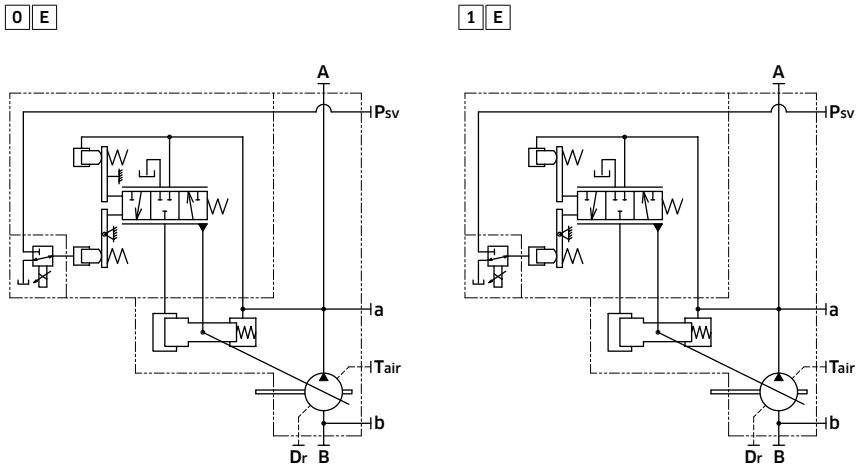


# 2-3 Functional Description of Regulators (cont)

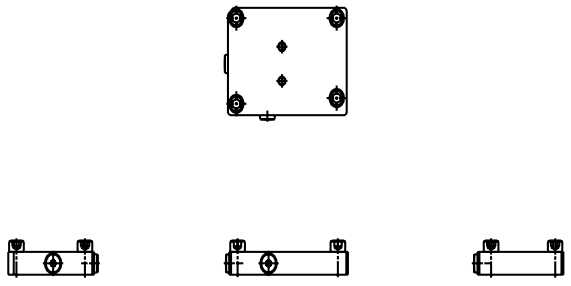
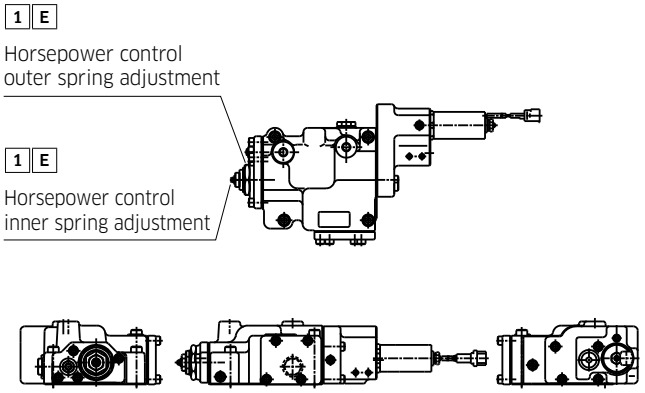
**Regulator Code :** 0 E 1 E

**Control type : Horsepower and Electric Flow Control**

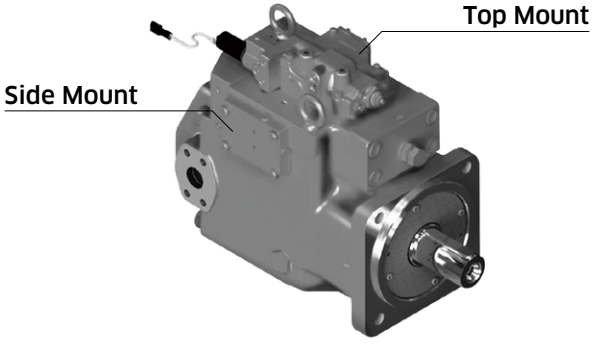
This regulator combines the Horsepower Control with Electric Flow Control. A proportional reducing valve is added to the regulator so the discharge flow can be infinitely adjusted within the range of the pump. An increase in electric signal to the proportional reducing valve will result in an increase in flow. This regulator requires an amplifier to provide the electric signal.

| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |



| Side Mount | Top Mount |
|---|---|
|  |  |



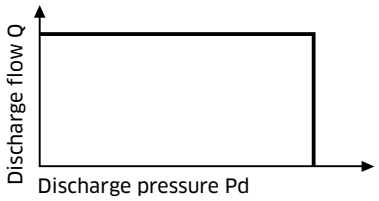
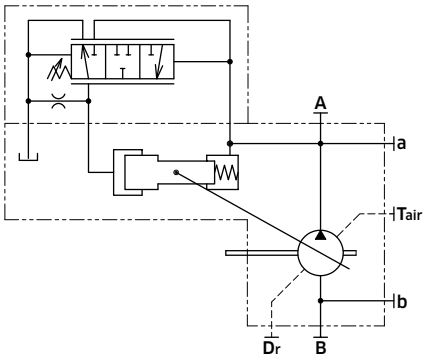


# 2-3 Functional Description of Regulators (cont)

**Regulator Code :** 4 1

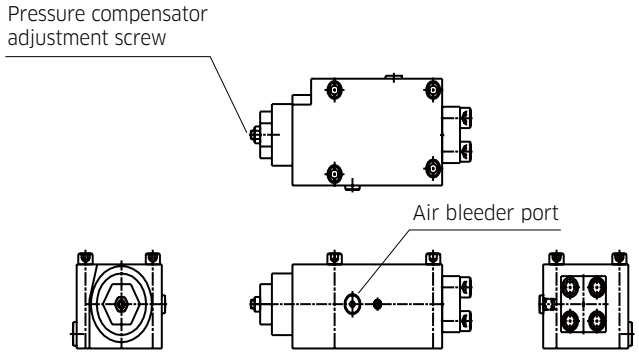
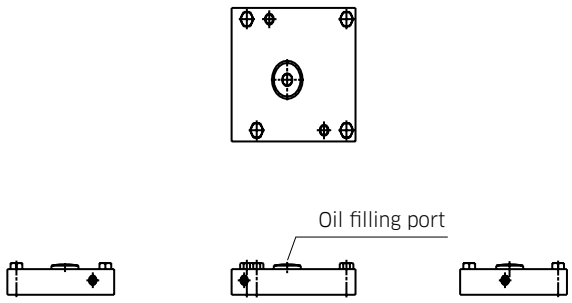
**Control type : Pressure Cutoff Control**

This regulator maintains a constant pressure regardless of the discharge flow. It is imperative that a safety relief valve is installed in the circuit.

| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |

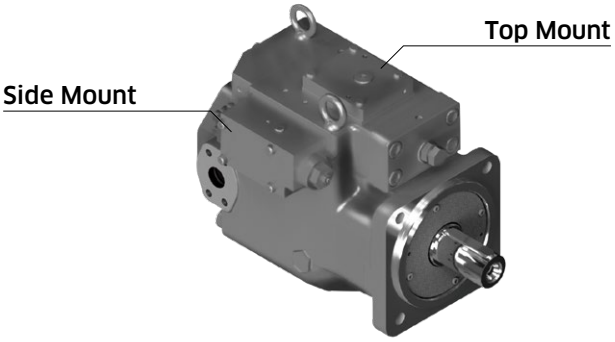




| Side Mount | Top Mount |
|---|---|
|  |  |





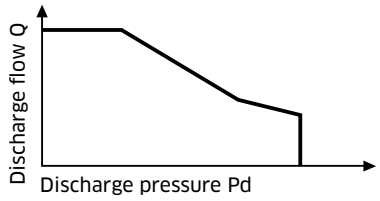
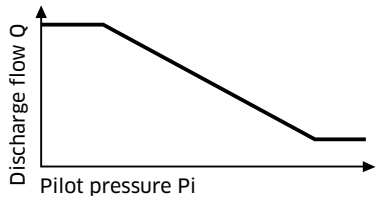
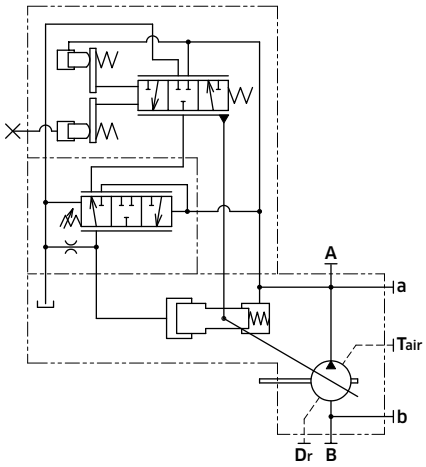
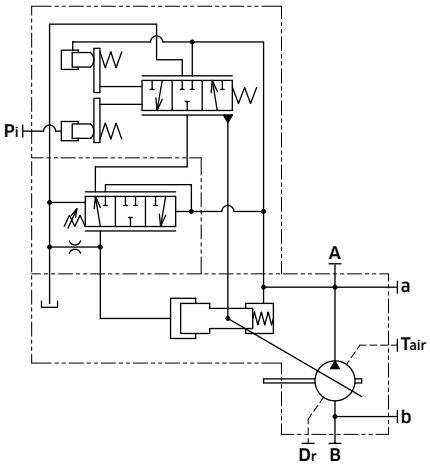


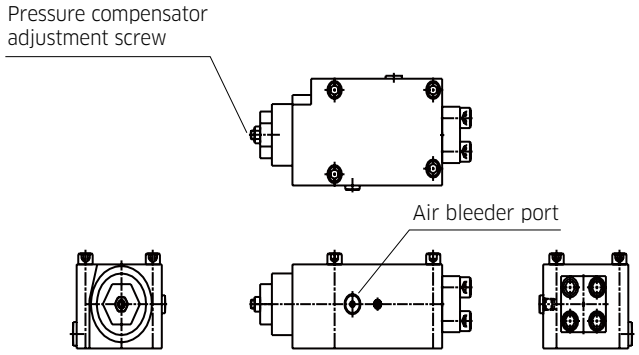
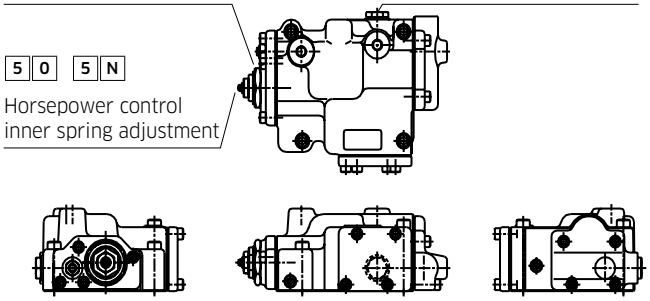
# 2-3 Functional Description of Regulators (cont)

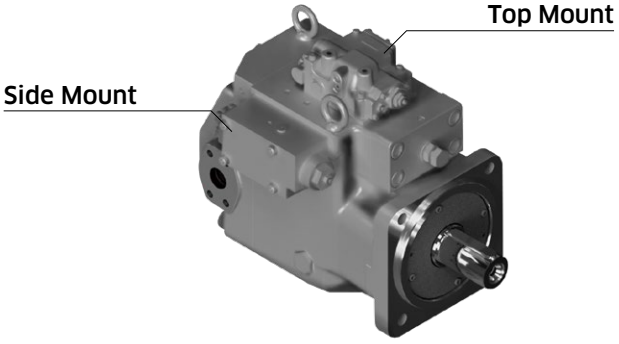
**Regulator Code :** 5 0 5 N

**Control type : Horsepower and Pressure Cutoff / Horsepower, Pressure Cutoff and Negative Flow Control**

This regulator combines the Horsepower Control with Pressure Cutoff Control. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in a decrease in flow, hence the Negative control.

| Control Curves | Hydraulic Circuit |
|---|---|
| 5 0 5 N<br>  <br><br>5 N<br>  <br> | 5 0<br>  <br><br>5 N<br>  <br> |

| Side Mount | Top Mount |
|---|---|
|  <br> | 5 0 5 N<br>Horsepower control outer spring adjustment<br>5 N<br>Pilot port for displacement control (Pi)<br>5 0 5 N<br>Horsepower control inner spring adjustment<br>  |

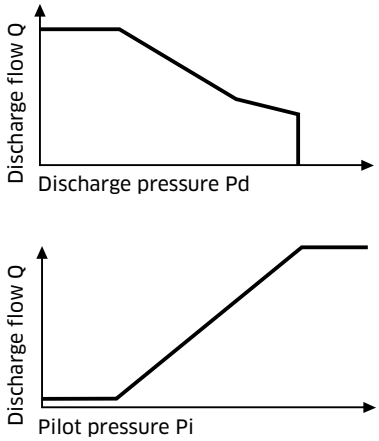
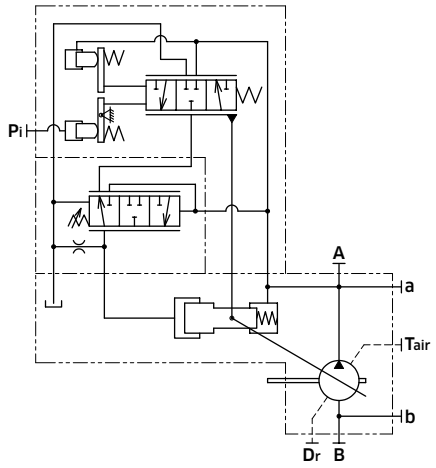


# 2-3 Functional Description of Regulators (cont)

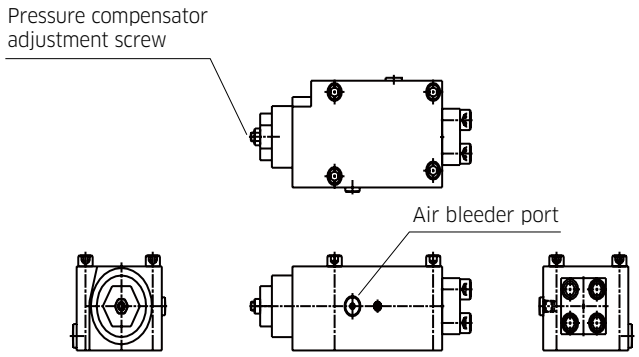
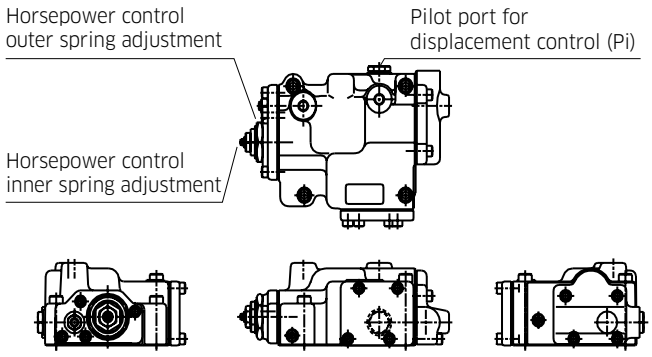
**Regulator Code :** 5 P

**Control type : Horsepower, Pressure Cutoff and Positive Flow Control**

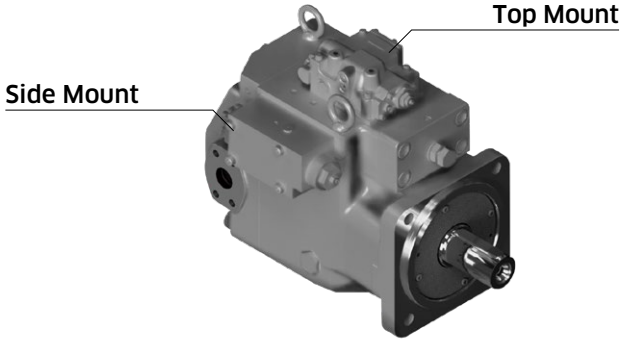
This regulator combines the Horsepower Control with Pressure Cutoff Control. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in an increase in flow, hence the Positive control.

| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |



| Side Mount | Top Mount |
|---|---|
|  |  |



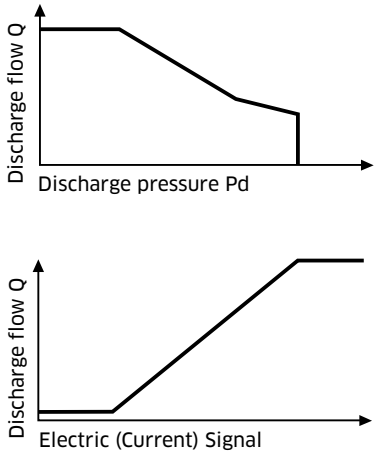
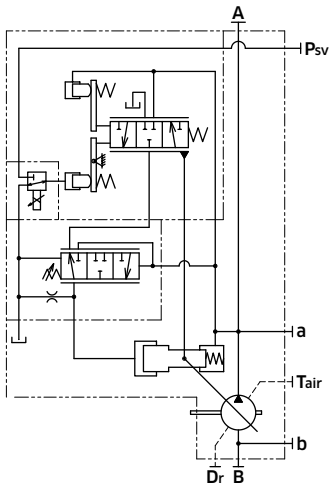


# 2-3 Functional Description of Regulators (cont)

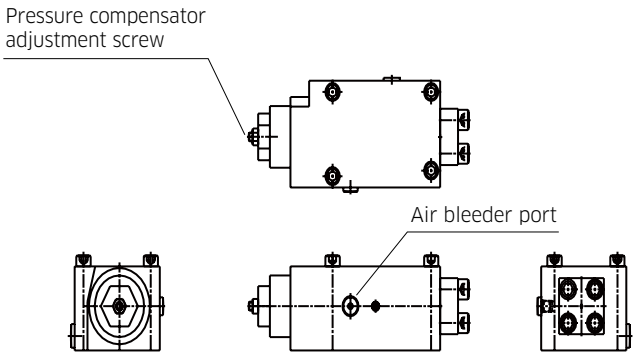
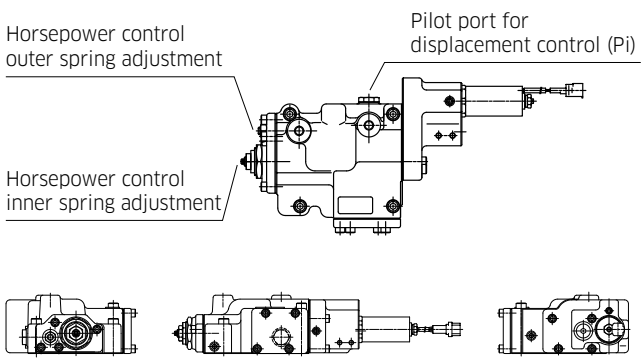
**Regulator Code :** 5 E

**Control type : Horsepower, Pressure Cutoff and Electric Flow Control**

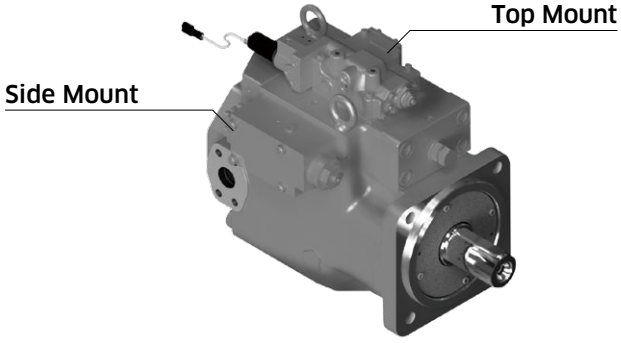
This regulator combines the Horsepower Control with Pressure Cutoff and Electric Flow Control. A proportional reducing valve is added to the regulator so the discharge flow can be infinitely adjusted within the range of the pump. An increase in electric signal to the proportional reducing valve will result in an increase in flow. This regulator requires an amplifier to provide the electric signal.

| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |



| Side Mount | Top Mount |
|---|---|
|  |  |



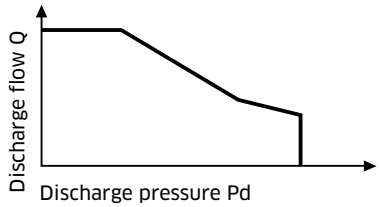
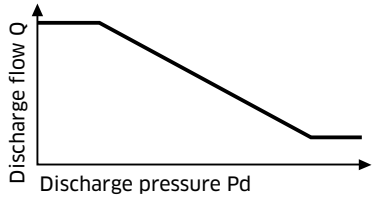
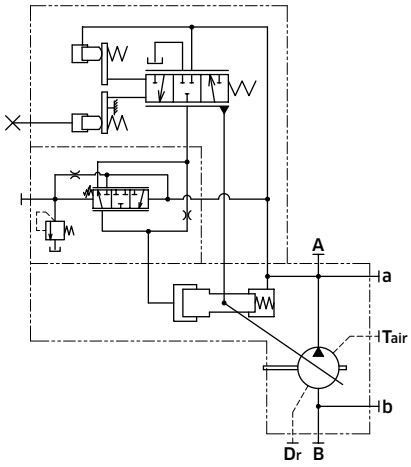
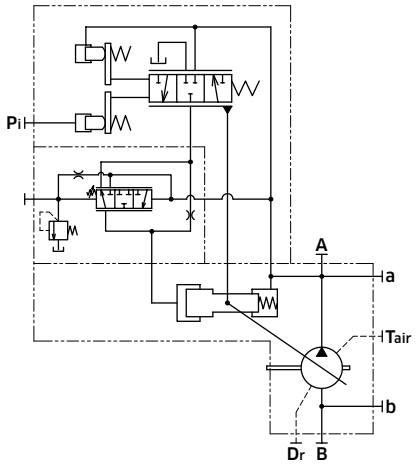


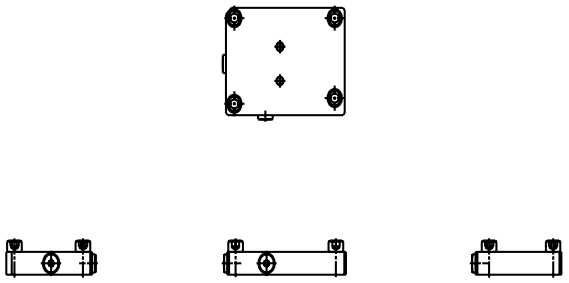
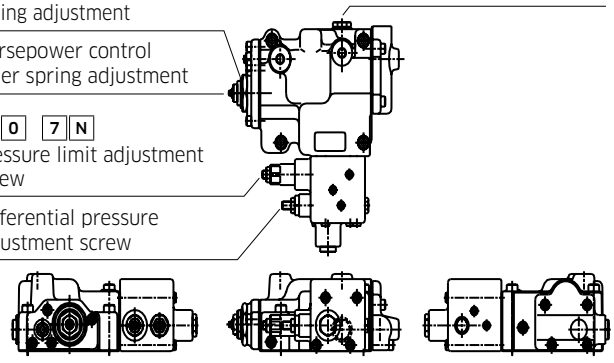
# 2-3 Functional Description of Regulators (cont)

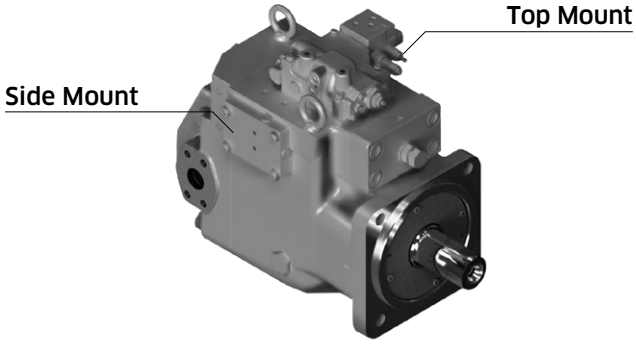
**Regulator Code :** 7 0 7 N

**Control type : Horsepower and Pressure Cutoff / Horsepower, Pressure Cutoff and Negative Flow Control (with Remote Pressure Cutoff Capability)**

This regulator combines the Horsepower Control with Pressure Cutoff Control. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in a decrease in flow, hence the Negative control.

| Control Curves | Hydraulic Circuit |
|---|---|
| 7 0 7 N<br>  <br><br>7 N<br>  <br> | 7 0<br>  <br><br>7 N<br>  <br> |

| Side Mount | Top Mount |
|---|---|
|  | 7 0 7 N<br>Horsepower control outer spring adjustment<br>Horsepower control inner spring adjustment<br>7 0 7 N<br>Pressure limit adjustment screw<br>Differential pressure adjustment screw<br>7 N<br>Pilot port for displacement control (Pi)<br>  |

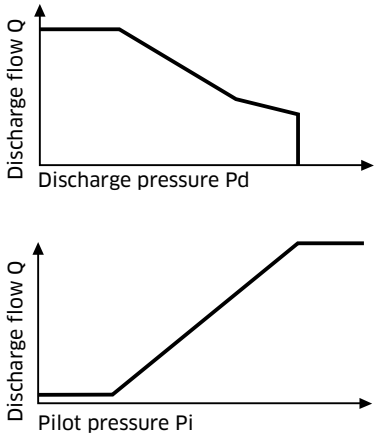
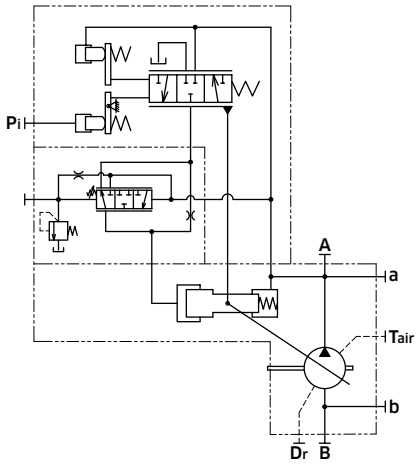


# 2-3 Functional Description of Regulators (cont)

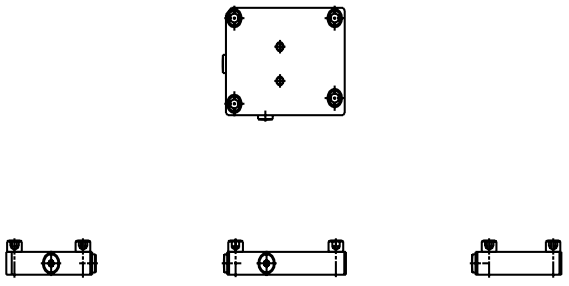
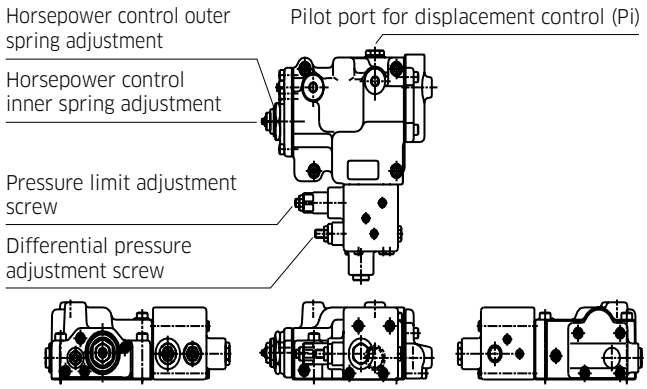
**Regulator Code :** 7 P

**Control type : Horsepower, Pressure Cutoff and Positive Flow Control (with Remote Pressure Cutoff Capability)**

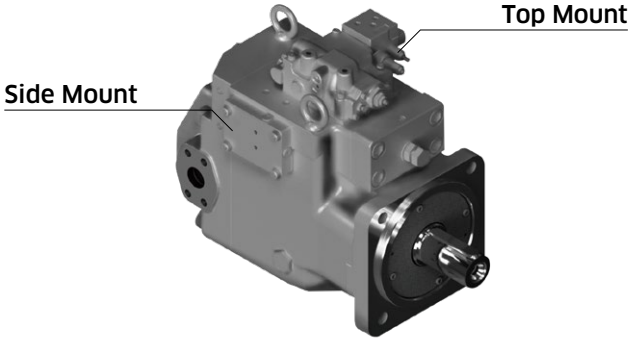
This regulator combines the Horsepower Control with Pressure Cutoff Control. By adding a pilot signal to the Pi port the discharge flow can be infinitely adjusted within the range of the pump. An increase in pilot signal will result in an increase in flow, hence the Positive control.

| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |



| Side Mount | Top Mount |
|---|---|
|  |  |



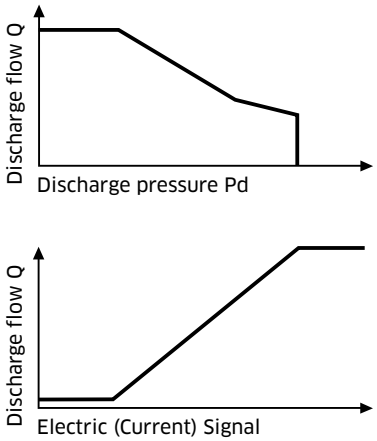
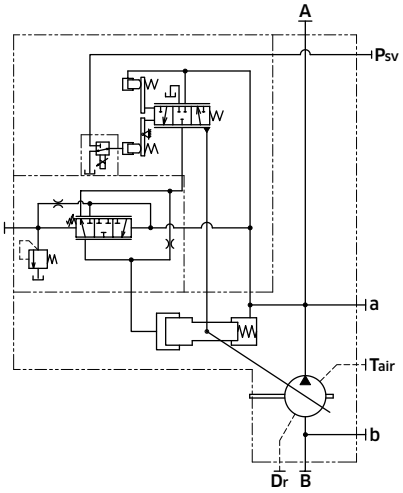


# 2-3 Functional Description of Regulators (cont)

**Regulator Code :** 7 E

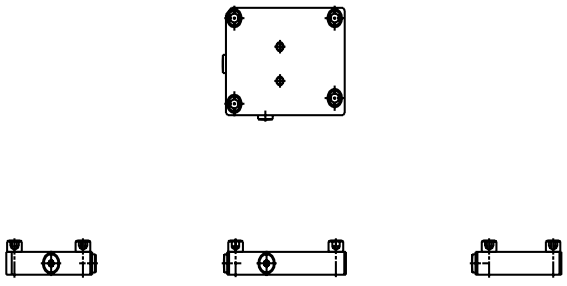
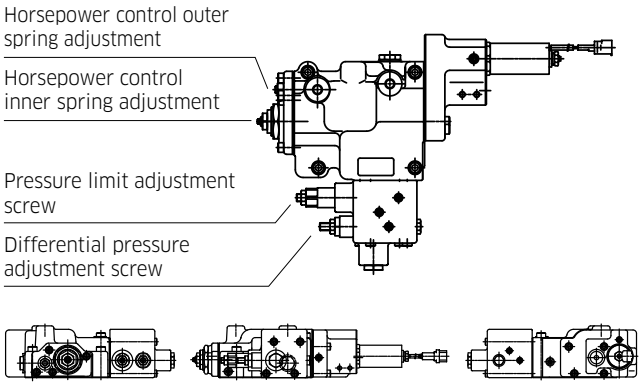
**Control type : Horsepower, Pressure Cutoff and Electric Flow Control (with Remote Pressure Cutoff Capability)**

This regulator combines the Horsepower Control with Pressure Cutoff and Electric Flow Control. A proportional reducing valve is added to the regulator so the discharge flow can be infinitely adjusted within the range of the pump. An increase in electric signal to the proportional reducing valve will result in an increase in flow. This regulator requires an amplifier (refer to page 9) provide the electric signal. By connecting the Pc port to a remote pressure control, variable pump pressure control can be achieved. A subplate can be added to the regulator that will accommodate a "DO3" proportional relief valve for variable Pressure Cutoff Control.

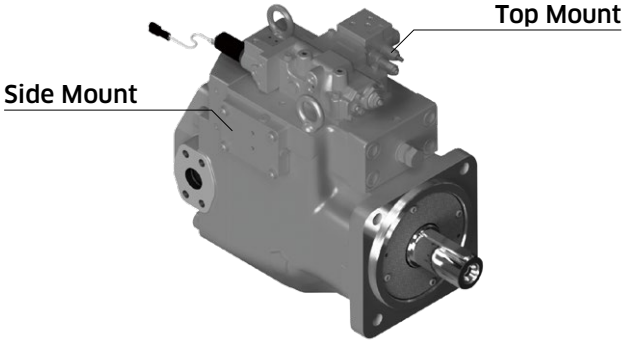
| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |





| Side Mount | Top Mount |
|---|---|
|  |  |



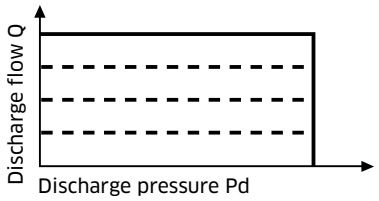
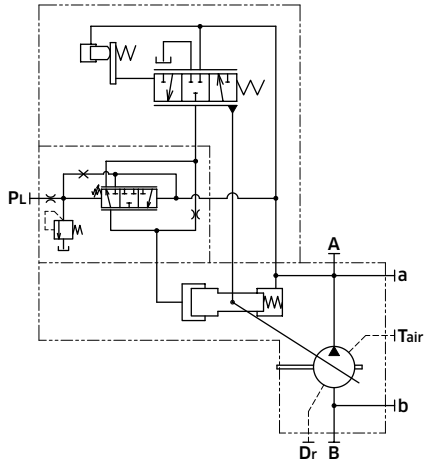


# 2-3 Functional Description of Regulators (cont)

**Regulator Code :** 7 L

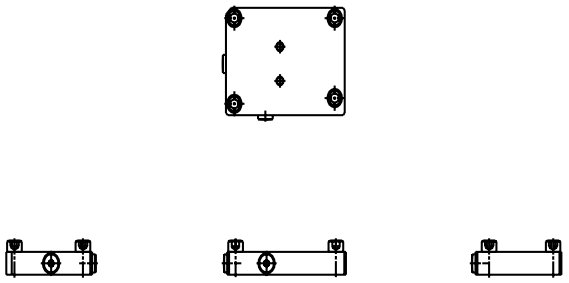
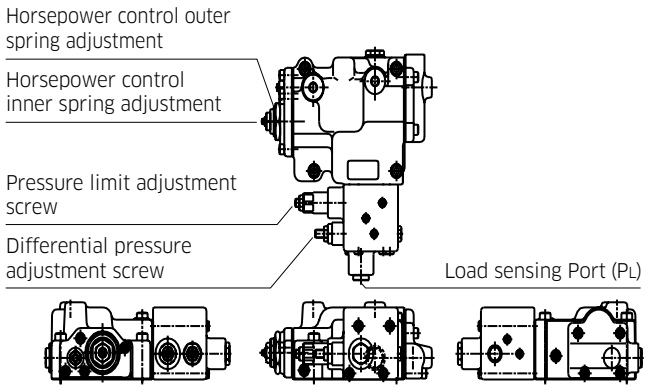
**Control type : Load Sense Control**

This regulator controls the pump displacement to match the flow requirement as a function of load pressure. In addition, there is a Pressure Cutoff Function incorporated into the regulator.

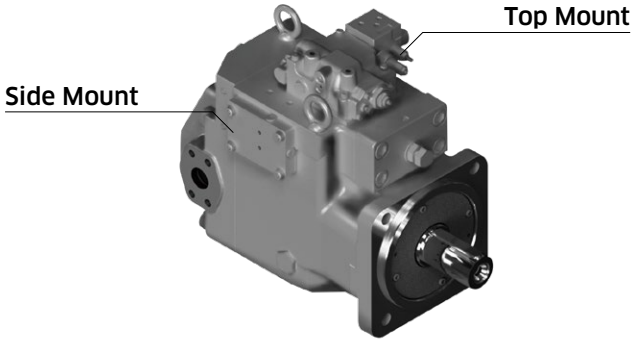
| Control Curves | Hydraulic Circuit |
|---|---|
|  |  |





| Side Mount | Top Mount |
|---|---|
|  |  |





# 2-4 Power Setting Codes

## Horsepower set codes

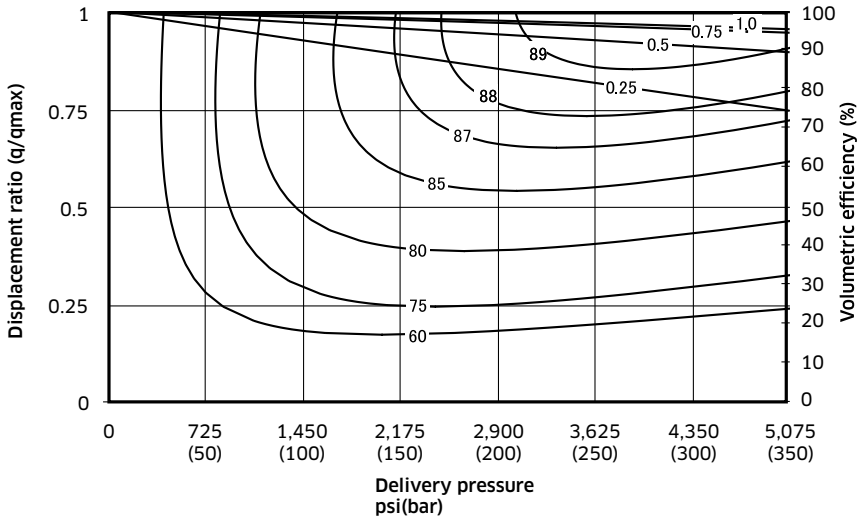
| Motor Power | | K7VG180 | | | | K7VG265 | | | |
|---|---|---|---|---|---|---|---|---|---|
| **hp** | **kw** | **970** | **1150** | **1450** | **1750** | **970** | **1150** | **1450** | **1750** |
| **40** | **29.8** | M4 | – | – | – | – | – | – | – |
| **50** | **37.3** | M2 | M3 | – | – | – | – | – | – |
| **60** | **44.7** | M0 | M2 | M4 | – | M5 | – | – | – |
| **75** | **55.9** | H3 | M0 | M2 | M4 | M3 | M5 | – | – |
| **100** | **74.6** | – | H1 | MA | M1 | H3 | M1 | M4 | – |
| **125** | **93.2** | – | – | H2 | MA | H2 | H3 | M2 | M4 |
| **150** | **111.9** | – | – | – | H2 | – | H1 | H4 | M2 |
| **175** | **130.5** | – | – | – | – | – | – | H2 | H4 |

For lower settings please consult KPM.

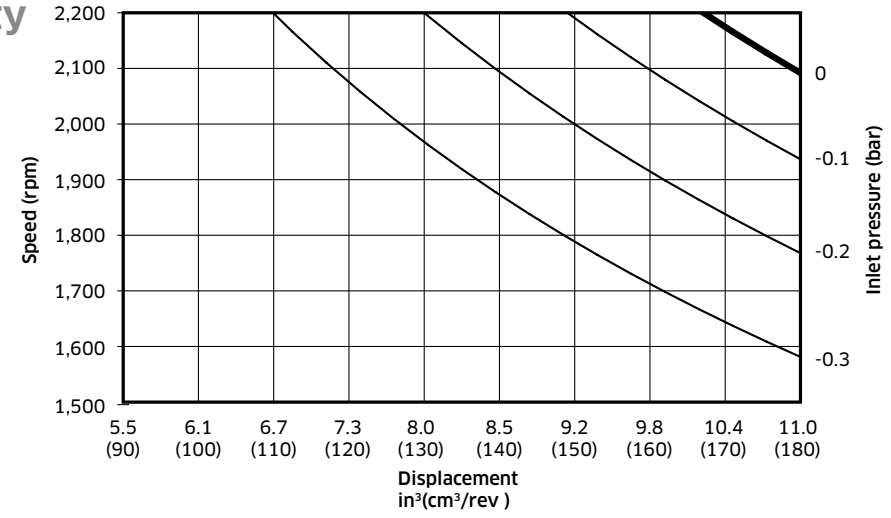
# 2-5 Performance Data

## K7VG180

### Pump Efficiency (%)




### Self Priming Capability




**Performance Note:**

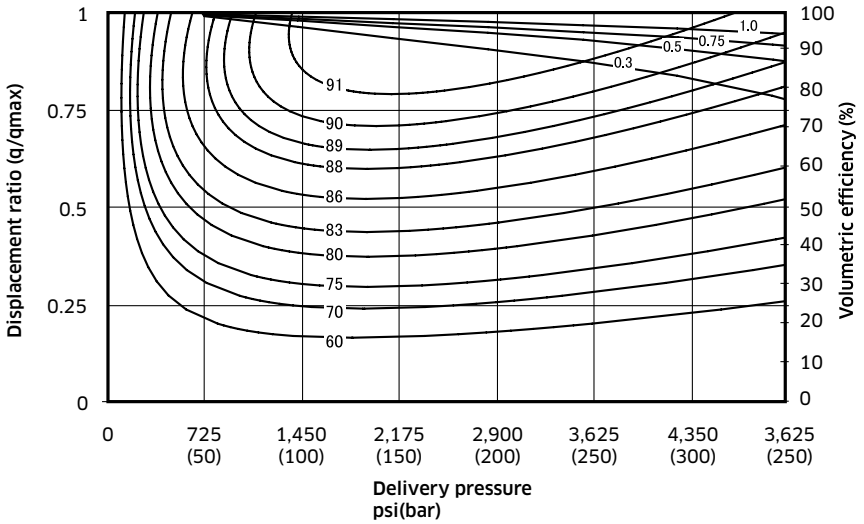
All performance curves are based on the following conditions:

- 1,800 rpm
- ISO VG46 mineral oil
- 122ºF (50ºC) oil temperature
- Atmospheric inlet condition (0 psi/bar)

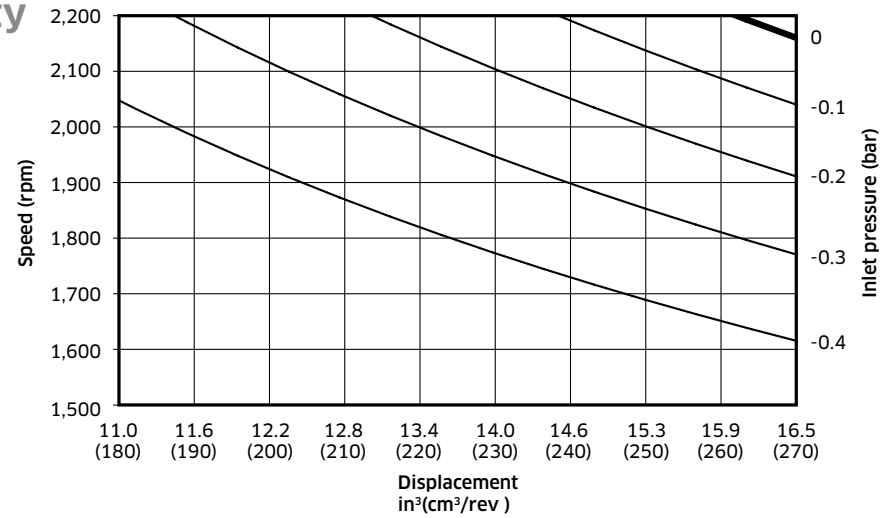
# 2-5 Performance Data (cont)

## K7VG265

### Pump Efficiency (%)




### Self Priming Capability



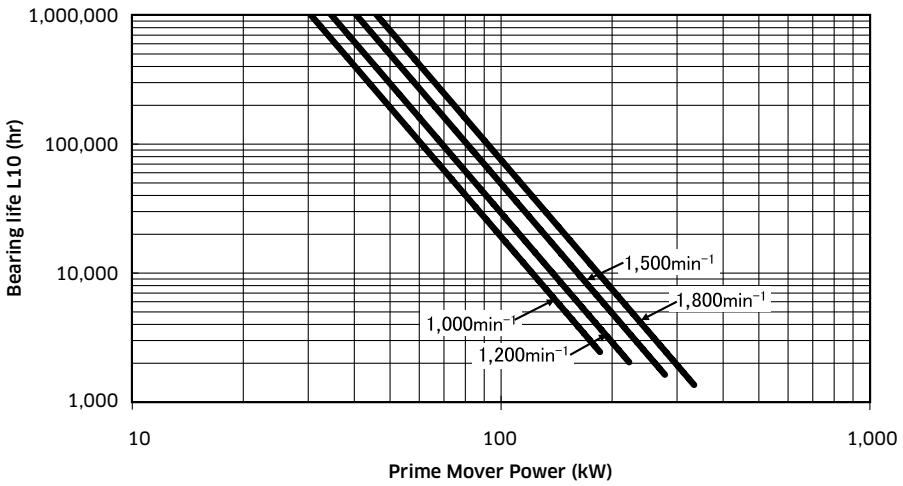

**Performance Note:**

All performance curves are based on the following conditions:

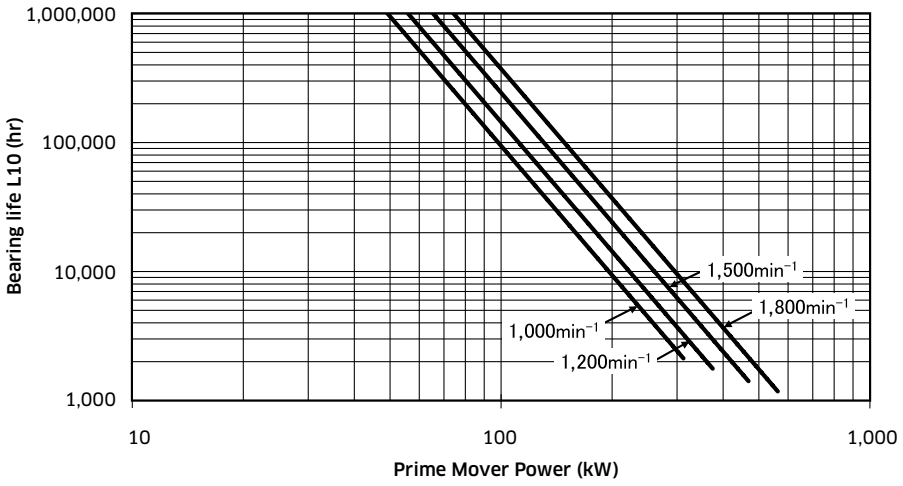
- 1,800 rpm
- ISO VG46 mineral oil
- 122ºF (50ºC) oil temperature
- Atmospheric inlet condition (0 psi/bar)

# 2-6 Bearing Life

## K7VG180




## K7VG265



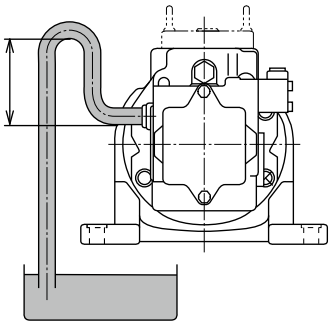
# 2-7 Installation

## Pump Mounting Options

### Drain line

It is the preferred option to mount the pump with the case drain piping initially rising above the pump before continuing to the tank. Do not connect the drain line to the inlet line.

The external drain must be higher than the uppermost part of the pump casing.

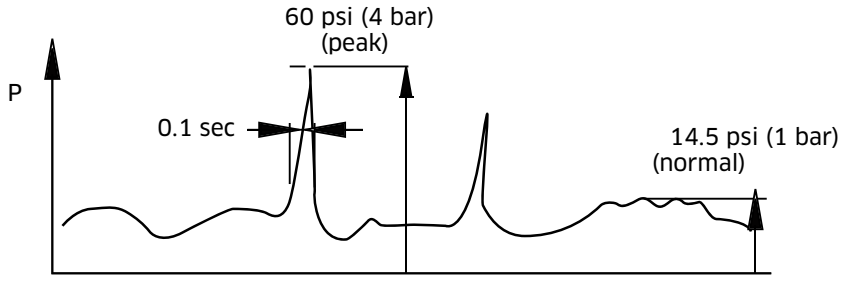


### Cautions

**A)** Height from the oil level to the centre of the shaft must be within 3.3 ft (1 meter) maximum. (consult KPM).

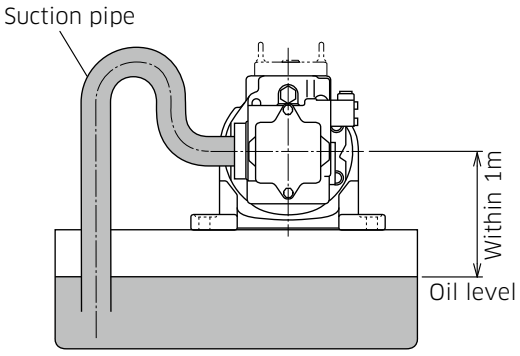
**B)** The oil in the pump case must be refilled when the pump has not been operated for one month or longer.

The uppermost drain port should be used and the drain piping should be equal or larger in size than the drain port to minimise pressure in the pump case. The pump case pressure should not exceed 14.5 psi (1 bar) as shown in the illustration below. (Peak pressure should never exceed 60 psi (4 bar).)




### Mounting the Pump Above the Tank

Suction line



# 2-7 Installation (cont)

### Mounting the Pump Vertically (shaft up)

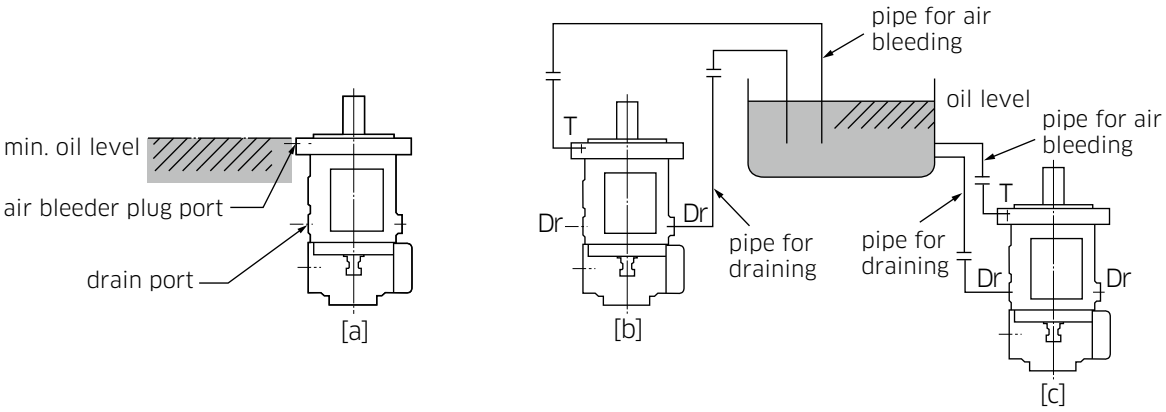
Note: Both the Tair and one case drain port must be used.

For applications requiring vertical installation (shaft up) please remove the Tair bleed plug and connect piping as shown in the illustration below.

When installing the pump in the tank and submerged in the oil, open the drain port and Tair bleed port to provide adequate lubrication to the internal components. See illustration [a].

The oil level in the tank should be higher than the pump-mounting flange as shown in illustration [a] below. If the oil level in the tank is lower than the pump mounting flange then forced lubrication is required through the Tair bleed port 0.6 - 1.2 spm (1 - 2 l/min).

When installing the pump outside the tank run piping for the drain and Tair bleed ports to tank (see illustration [c]). If the drain or Tair bleed piping rise above the level of oil (see illustration [b]) fill the lines with oil before operation.motor to your national standard is not exceeded.



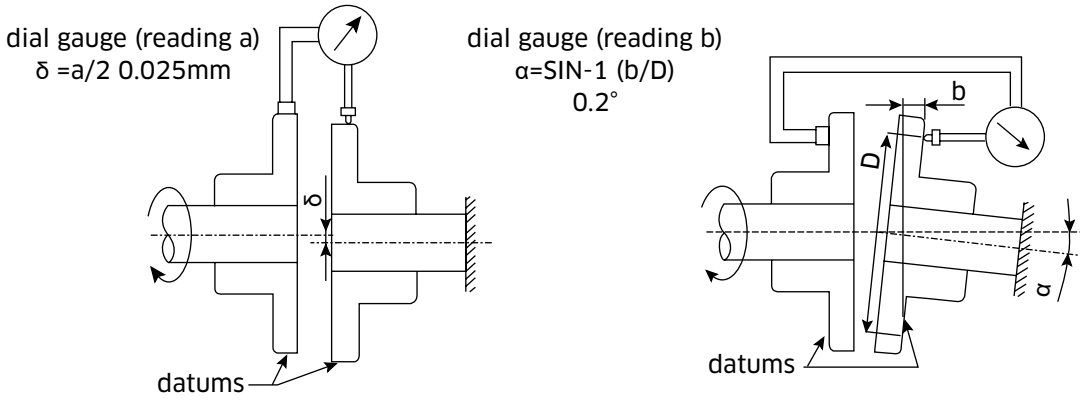
# 2-7 Installation (cont)

## Drive Shaft Coupling

Use a flexible coupling to connect the pump shaft to an engine flywheel or electric motor shaft. Alignment should be within 0.05 mm TIR as shown in the illustration below.

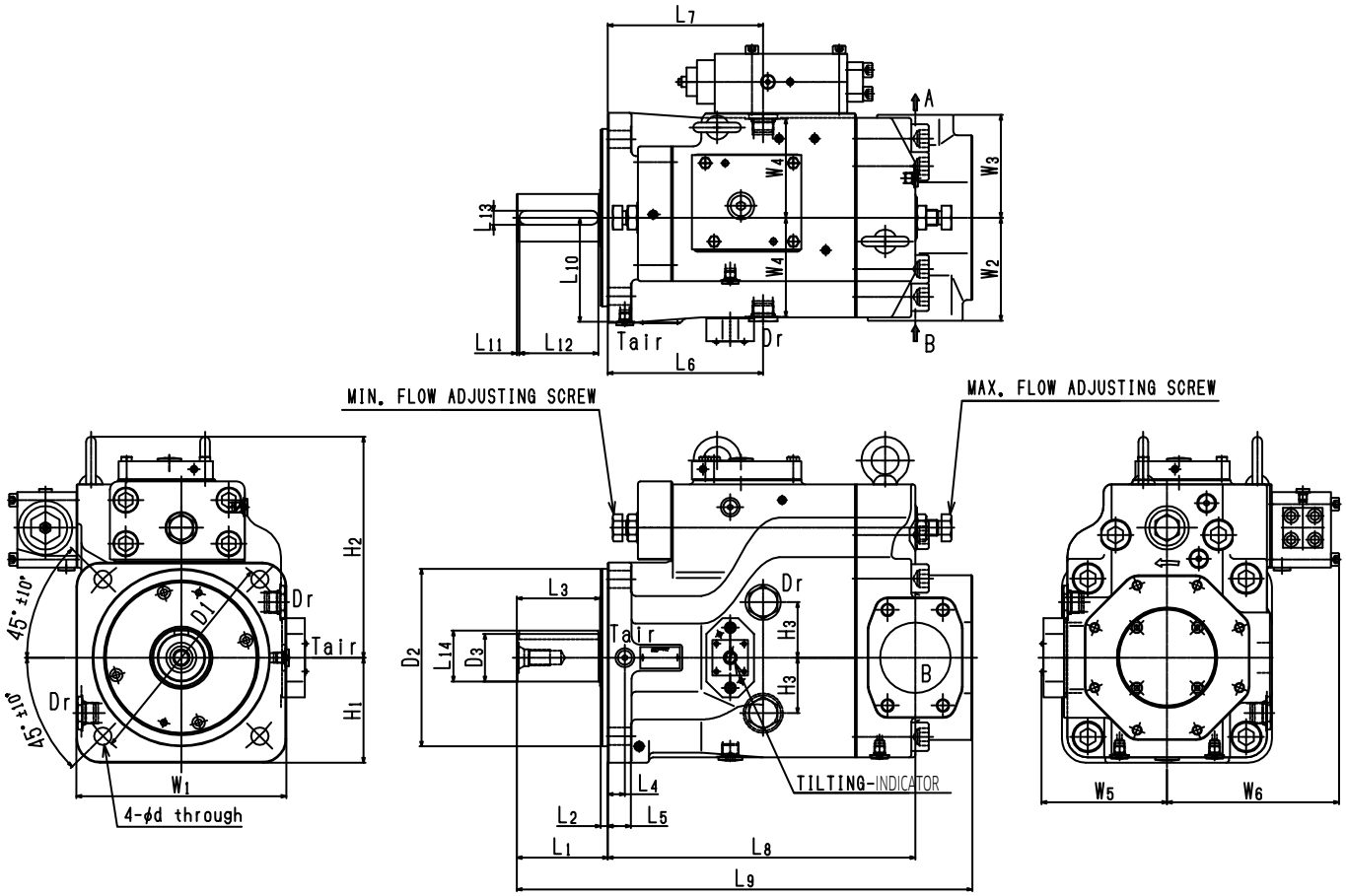
Do not apply any radial or axial loading to the pump shaft. For applications where radial or side loads exist please contact KPM for recommendations.

Do not force the coupling on or off the pump shaft. Use the threaded hole in the end of the pump shaft to fix or remove the coupling.




For engine drives a split type pinch bolt drive flange and flexible coupling is recommended.

# 3-1 Unit Dimensions




| Size | $D_1$ | $D_2$ | $D_3$ | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $L_5$ | $L_6$ | $L_7$ | $L_8$ | $L_9$ | $L_{10}$ | $L_{11}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 180 | 250 | $200\ ^{0}_{-0.072}$ | 50 k6 | 92 | 9 | 82 | 22 | 27 | 191.5 | 150 | 332 | 496 | 117 | 4 |
| 265 | 280 | $224\ ^{0}_{-0.05}$ | 60 k6 | 115 | 9 | 105 | 21.5 | 29 | 196 | 196 | 388 | 575 | 131.5 | 3 |

| Size | $L_{12}$ | $L_{13}$ | $L_{14}$ | $H_1$ | $H_2$ | $H_3$ | $W_1$ | $W_2$ | $W_3$ | $W_4$ | $W_5$ | $W_6$ | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 180 | 75 | 14 | 53.5 | 118 | 252 | 70 | 236 | 121 | 121 | 120 | 151.5 | 207 | 22 |
| 265 | 100 | 18 | 64 | 132.5 | 279 | 70 | 265 | 130 | 130 | 125 | 158.5 | 217 | 22 |

| Identifier | Port Name | PORT SIZE - Depth | |
|---|---|---|---|
| | | K7VG180 | K7VG265 |
| A | Delivery Port | SAE 6,000 psi 1½" | SAE 6,000 psi 1½" |
| B | Suction Port | SAE 2,000 psi 3" | SAE 2,000 psi 3½" |
| Dr | Drain Port | G ¾-20 | G ¾-20 |
| Tair | Air Bleed Port | G ¼-15 | G ¼-15 |

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