

Зміст

Kawasaki-K3VR

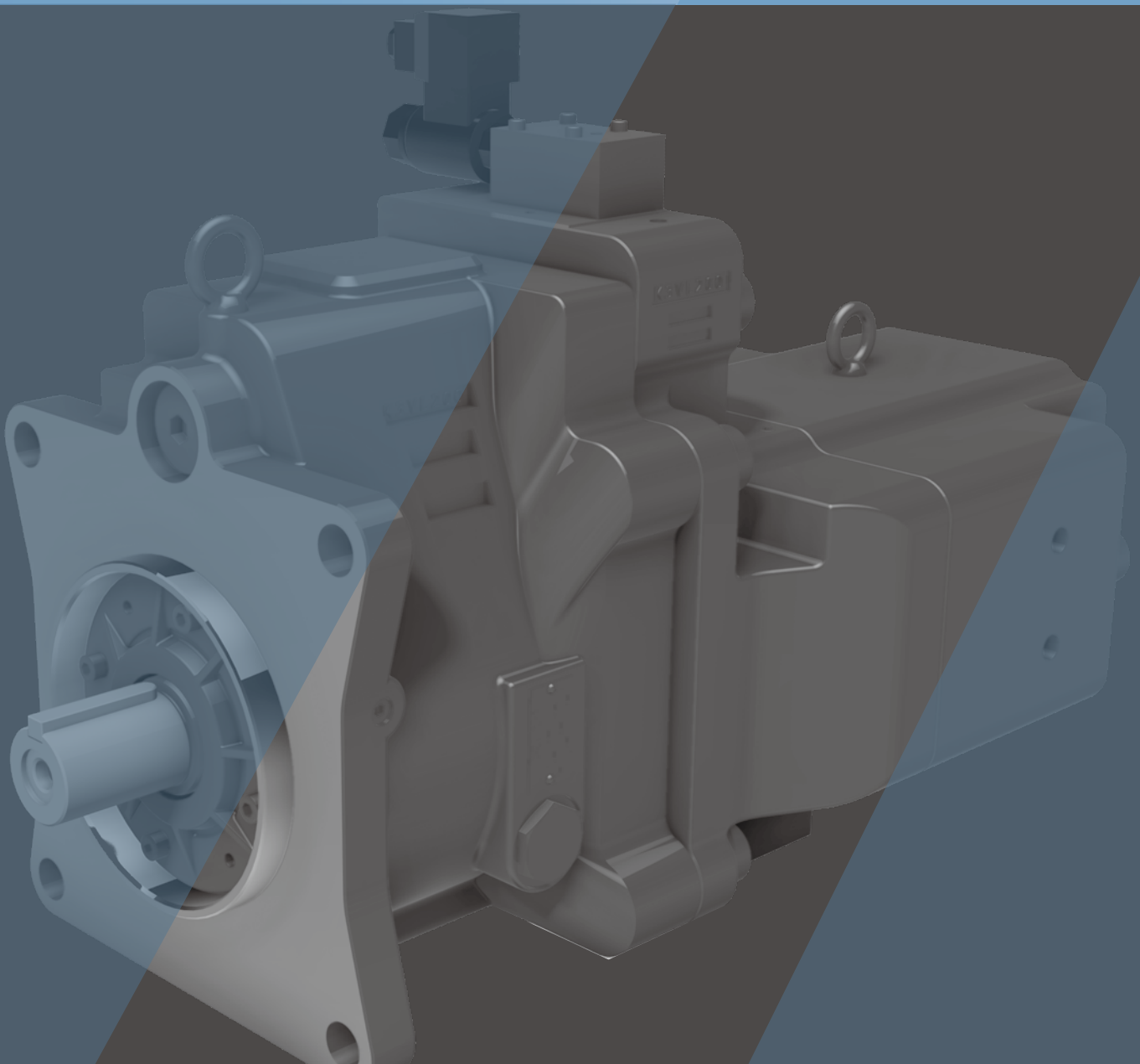
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Kawasaki-K8V

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Swash-plate Axial Piston Pump
for Speed Control

K3VR/K3VL Eco Servo 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.

Handling Precautions

1. Operating Fluid and Temperature Range

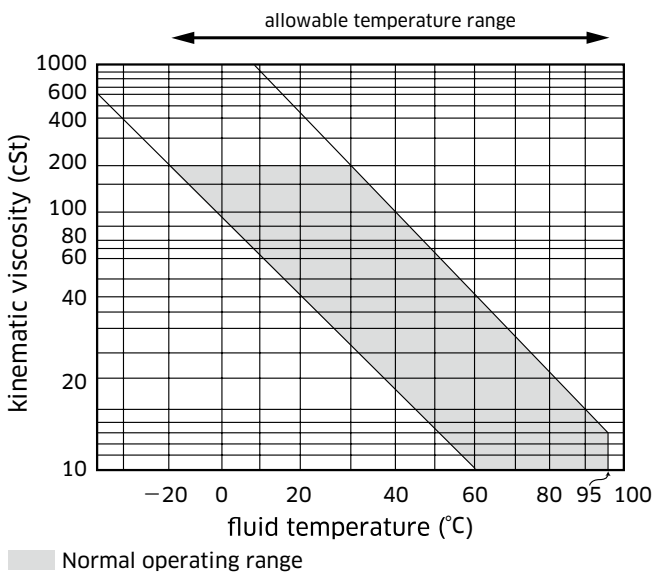
1) Operating Fluid

Values shown in this catalog are based upon using mineral oil based anti-wear hydraulic fluid. To ensure optimal performance use of mineral oil based anti-wear hydraulic fluid is recommended.

2) Viscosity and temperature range

To minimize both oil and seal deterioration, a maximum operating temperature of 60°C should be considered. Please note that the regulator may become slow to respond when operating at low temperatures (below 20°C) in extreme cold environments. At such low temperature it is strongly suggested that a warm up cycle is introduced until an operating temperature of 20°C is achieved.

	Normal operating range	Allowable range
Viscosity [mm ² /s(cSt)]	10 to 200	10 to 1,000
Fluid temperature [°C (°F)]	-20 to +95 (-4 to +203)	



2. Filtration and Contamination Control

1) Filtration of working oil

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 with the tank's breather is also recommended.

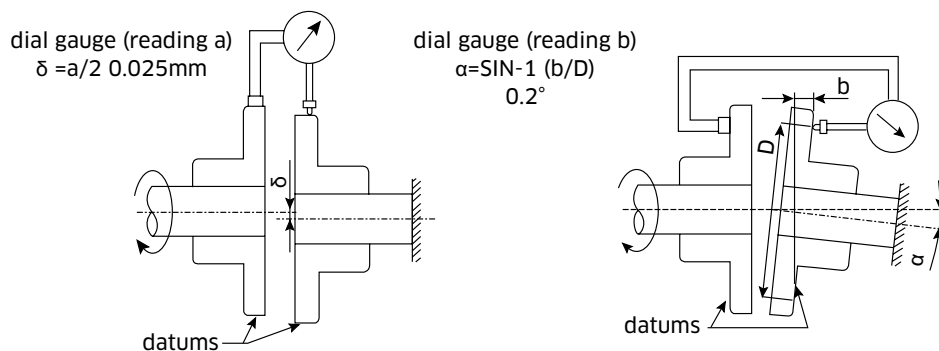
2) Suggested acceptable contamination level

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).

3. Drive Shaft Coupling

Alignment between the prime mover and the pump shaft should be within 0.05 mm TIR*. In case the pump is directly coupled to the engine flywheel, use a flexible coupling.

*TIR = Total Indicator Reading



4. Oil Filling and Air Bleeding

1) 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 insufficient. The pump contains bearings and high-speed sliding parts including pistons with shoes and a spherical bush that need to be continuously lubricated. Part seizure or total premature failure will occur very quickly if this procedure is not rigidly followed.

2) Air bleeding

Run the pump unloaded for a period to ensure that all residual air within the system is released.

3) Long term out of usage

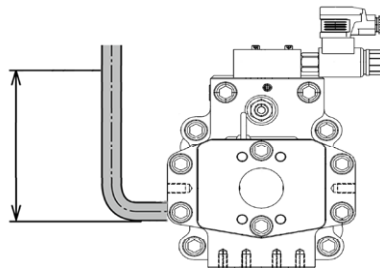
It is undesirable to leave the pump out of use for a long period e.g. a year or more. In such a situation it is recommended that the pump is run for a short period on a more frequent basis even if it is just unloaded. With regard to a pump held in storage then rotating the shaft on a frequent basis is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

5. Drain Piping

1) Installation of 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.

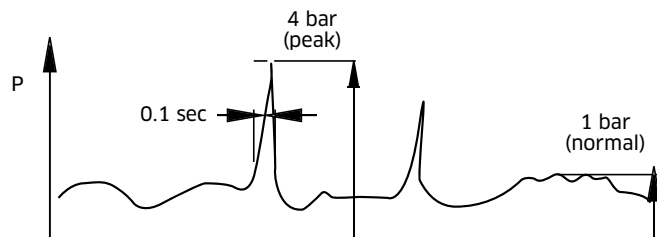
The external drain must be higher than the uppermost part of the pump casing.



Cautions

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 must be larger in size than the drain port to minimise pressure in the pump case. The pump case pressure must not exceed 1 bar as shown in the illustration below. (Peak pressure must never exceed 4 bar.)



2) Size of drain hose or drain pipe

The internal bore size of the drain hose or drain pipe must be larger than that of the drain port. Arrange the drain line as short as possible.

6. Mounting the Pump Above the Tank

Do not mount the speed control pump above a tank.

The oil level in the tank should be upper than the uppermost part of the pump casing.

7. Shaft Loading and Bearing Life

Although Eco Servo Series pumps are equipped with bearings that can accept some external thrust and radial forces, application of such loads will affect bearing life. Depending on the load magnitude, the load position, and the load orientation, bearing life may be significantly reduced.

Conversion Factors, Formula and Definition

◆ Conversion Factors

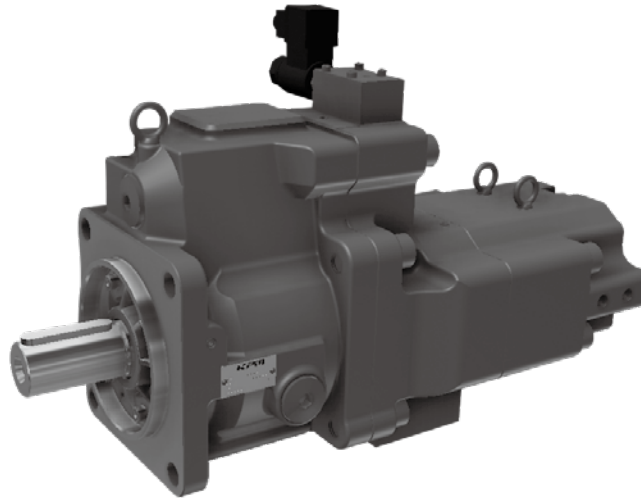
	Formula	Note
Displacement	$1 \text{ cm}^3 = 0.061 \text{ in}^3$	
Pressure	$1 \text{ MPa} = 145 \text{ psi}$	
Flow	$1 \text{ L/min} = 0.264 \text{ gpm}$	US gallon
Torque	$1 \text{ Nm} = 0.74 \text{ lbf ft}$	
Power	$1 \text{ kW} = 1.341 \text{ hp}$	
Weight	$1 \text{ kg} = 2.205 \text{ lb}$	

◆ Formula

	Metric system		Imperial system	
Output flow	$Q = q \times N \times \eta_v / 1000$	L/min	$Q = q \times N \times \eta_v / 231$	gal/min
Input torque	$T = q \times \Delta P / 2\pi / \eta_m$	Nm	$T = q \times \Delta P / 24\pi / \eta_m$	lbf ft
Input power	$L = T \times N / 9550 = Q \times \Delta P / 60 / \eta_t$	kW	$L = T \times N / 5252 = Q \times \Delta P / 1714 / \eta_t$	hp

Eco Servo Series

Swash-plate Axial Piston Pump



■ General Descriptions

The K3VR/K3VL Eco Servo series Swash Plate Type Axial Piston Pumps are designed to satisfy the industrial market where a medium/high pressure variable displacement pump for speed control is required.

■ Features

For motor speed control

When combined with the servo motor, it achieves high precision operation in the whole rotation speed range.

Variable capacity

The large/small displacements can be switched by the electric signal. This enables smaller driving torque at high pressure.

Built-in suction valve (K3VR)

The built-in large capacity suction valve enables easy configuration of the closed circuit for various systems.

Low pulsation and low noise

Low pulsation and low noise operation is possible by utilising the features of the piston pump that can operate even at low speed.

Wide line-up

For open/closed circuits, wide flow rate range/wide power range.

1

Ordering Code

1-1 Pump Options - Closed Circuit

1	2	3		4	5	6	7	8		9	10	11
K3VR	200	P	-	1	M	K	M	L	-	024D	0	(Blank)

- NOT AVAILABLE ● AVAILABLE

1. K3VR Series Pump - Closed Circuit

K3VR Series, Variable Displacement, Axial Piston

22	45	80	140	200
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2. Pump Size

Maximum Displacement	cm ³ /rev	22.0	45.0	80.0	140.0	200.0
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3. Hydraulic Fluid Type

P	Polyol ester & Mineral oil	●	●	●	●	●
W	Water Glycol (Nitrile Seal & Nitrile Shaft Seal)	●	●	●	●	●

4. Interface of suction valve

1	With suction valve	●	●	●	●	●
0	Without suction valve	●	●	●	●	●

5. Direction of Rotation

M	Bi-directional	●	●	●	●	●
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6. Mounting Flange & Shaft

K	SAE keyed with SAE mounting, Auxiliary port (drain, air bleeder) : UNF thread	●	●	●	●	●
J	ISO (JIS) keyed with SAE mounting, Auxiliary port (drain, air bleeder) : G thread	●	●	●	●	●

7. Porting Thread Type

M	Metric Thread	●	●	●	●	●
S	UNF Thread	●	●	●	●	●

1-1 Pump Options - Closed Circuit (cont)

1	2	3		4	5	6	7	8		9	10	11
K3VR	200	P	-	1	M	K	M	L	-	024D	0	(Blank)

22	45	80	140	200
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8. Minimum displacement (cm³/rev)

0	Fixed displacement stopper	-	30	25	70	-
1	Fixed displacement stopper	-	17	22	60	30
2	Fixed displacement stopper	-	11	20	35	50
3	Fixed displacement stopper	-	25	18	78	80
4	Fixed displacement stopper	-	8	10	50	70
5	Fixed displacement stopper	-	4.5	15	27.5	100
6	Fixed displacement stopper	-	-	40	20	90
7	Fixed displacement stopper	-	-	30	55	60
8	Fixed displacement stopper	-	-	-	-	-
9	Fixed displacement stopper	-	-	-	-	-
N	Without 2-position control (without valve block)	●	●	●	●	●
L	Variable Minimum displacement setting (Low set)	●	●	●	●	●
H	Variable Minimum displacement setting (High set)	●	●	●	●	●

9. Control solenoid voltage

115A	115V AC 50/60Hz DIN43650 plug	●	●	●	●	●
230A	230V AC 50/60Hz DIN43650 plug	●	●	●	●	●
012D	12V DC DIN43650 plug	●	●	●	●	●
024D	24V DC DIN43650 plug	●	●	●	●	●

10. Solenoid type

0	Minimum displacement at voltage application	●	●	●	●	●
1	Maximum displacement at voltage application	●	●	●	●	●
2	Minimum displacement at voltage application with Psv port	●	●	●	●	●
3	Maximum displacement at voltage application with Psv port	●	●	●	●	●

11. Series No.

Blank		-	●	●	●	●
-01		●	-	-	-	-

1-2 Pump Options - Open Circuit

1	2	3	4	5	6	7	8	9		10	11		12		13
K3VL	200	/B	-	1	N	R	K	M	-	20	S	-	024D	-	0

- NOT AVAILABLE ◐ NOT AVAILABLE IN COUNTER CLOCK-WISE ● AVAILABLE

1. K3VL Series Pump - Open Circuit

K3VL Series, Variable Displacement, Axial Piston

45	80	140	200
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2. Pump Size

Maximum Displacement	cm ³ /rev	45.0	80.0	140.0	200.0
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3. Design Series

/B	Series	●	●	●	●
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4. Hydraulic Fluid Type

-	Mineral oil, Nitrile seal + Viton shaft seal	●	●	●	●
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5. Circuit Type

1	Open Circuit	●	●	●	●
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6. Auxiliary pump mounting interface

0	Without auxiliary pump	◐	◐	◐	◐
A	SAE-A	●	●	●	●
B	SAE-B	●	●	●	●
C	SAE-C	-	●	●	●
D	SAE-D	-	-	●	●
E	SAE-E	-	-	-	●
N	With steel cover (auxiliary pump attachable)	●	●	●	●
R	Rear port type (auxiliary pump unattachable)	●	●	●	●

7. Direction of Rotation

R	Clockwise Rotation	●	●	●	●
L	Counter Clockwise Rotation	●	●	●	●

1-2 Pump Options - Open Circuit (cont)

1	2	3	4	5	6	7	8	9		10	11		12		13
K3VL	200	/B	-	1	N	R	K	M	-	20	S	-	024D	-	0

45	80	140	200
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8. Mounting Flange & Shaft

K	SAE keyed with SAE mounting, Auxiliary port (drain, air bleeder) : UNF thread	●	●	●	●
J	ISO (JIS) keyed with SAE mounting, Auxiliary port (drain) : G thread, (air bleeder) : UNF thread	●	●	●	-

9. Porting Thread Type

M	Metric Thread	●	●	●	●
S	UNF Thread	●	●	●	●

10. Minimum displacement (cm³/rev)

1 st digit code	0	Fixed displacement stopper	30	25	70	-
	1	Fixed displacement stopper	17	22	60	30
	2	Fixed displacement stopper	11	20	35	50
	3	Fixed displacement stopper	25	18	78	80
	4	Fixed displacement stopper	8	10	50	70
	5	Fixed displacement stopper	4.5	15	27.5	100
	6	Fixed displacement stopper	-	40	20	90
	7	Fixed displacement stopper	-	30	55	60
	8	Fixed displacement stopper	-	-	-	-
2 nd digit code	0	With 2-position control	●	●	●	●
	1	Without 2-position control	●	●	●	●

11. Design Code

S	Valve plate for exclusive use	●	●	●	●
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12. Control solenoid voltage

115A	115V AC 50/60Hz DIN43650 plug	●	●	●	●
230A	230V AC 50/60Hz DIN43650 plug	●	●	●	●
012D	12V DC DIN43650 plug	●	●	●	●
024D	24V DC DIN43650 plug	●	●	●	●

13. Solenoid type

0	Minimum displacement at voltage application	●	●	●	●
1	Maximum displacement at voltage application	●	●	●	●
2	Minimum displacement at voltage application with Psv port	●	●	●	●
3	Maximum displacement at voltage application with Psv port	●	●	●	●

2 Technical Information

2-1 Specifications

Closed Circuit							
Pump Model			K3VR22	K3VR45	K3VR80	K3VR140	K3VR200
Displacement		cc/rev	22	45	80	140	200
Pressure ratings	Rated	bar	320				
	Peak	bar	350				
Speed ratings	Max. for self priming * ¹	rpm	1,500	1,500	1,500	1,500	1,500
	Max. * ²	rpm	1,800	1,800	1,800	1,800	1,800
Case drain pressure	Rated	bar	1				
	Peak	bar	4				
Weight * ³		kg	30	46	48	91	201
Amount of oil in casing		cm ³	500	800	1,300	2,200	4,400
Fluid Type	Type * ⁴		Anti-wear type mineral hydraulic fluid				
	Temperature range		-20°C to +95°C				
	Viscosity range * ⁵		10 cSt to 1,000 cSt				
	Cleanness		-/18/15(ISO 4406) or class9(NAS 1638)				
Filtration	Suction line		150-mesh				
	Return line		Nominal 10 μm				

Open Circuit						
Pump Model			K3VL45	K3VL80	K3VL140	K3VL200
Displacement		cc/rev	45	80	140	200
Pressure ratings	Rated	bar	320			
	Peak	bar	350			
Speed ratings	Max. for self priming * ¹	rpm	2,700	2,400	2,200	1,900
	Max. * ²	rpm	3,250	3,000	2,500	2,200
Case drain pressure	Rated	bar	1			
	Peak	bar	4			
Weight * ³		kg	25	35	65	95
Amount of oil in casing		cm ³	600	800	1,500	2,000
Allowable input torque		Nm	225	400	710	1,000
Fluid Type	Type * ⁴		Anti-wear type mineral hydraulic fluid			
	Temperature range		-20°C to +95°C			
	Viscosity range * ⁵		10 cSt to 1,000 cSt			
	Cleanness		-/18/15(ISO 4406) or class9(NAS 1638)			
Filtration	Suction line		150-mesh			
	Return line		Nominal 10 μm			

*1 : Suction pressure should be kept at 0MPa (0bar) and above at suction flange port (steady state). (Maximum speed is limited when the suction pressure is less than 0MPa (0bar). Consult us for details.)

*2 : Boost pressure should be kept at 1 bar and above.

*3 : Dry condition, with standard regulator, and without auxiliary pump.

*4 : Consult us for use with other kinds of working fluid.

*5: For viscosity of 200 cSt to 1000cSt, warming up operation is necessary before full-scale operation.

2-1 Specifications (cont)

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.

2-2 Technical Data

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 206 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
Maximum Pressure (bar)	320
Recommended Temperature Range (deg C)	20 - 60
Cavitation susceptibility	○
Expected life expectancy compared to mineral oil	100%

○ recommended

Pump Start Up Precautions

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.

Precautions on acceleration and deceleration of servo-motor and its maximum speed:

- Make time setting of acceleration and deceleration ($0 \leftrightarrow \pm 1500\text{min}^{-1}$) of the servo motor to 100ms and above.
- The maximum speed is 1800min^{-1} , but in case of is exceeding 1500min^{-1} , designing must be so made that boost pressure of about 0.2MPa may occur in the suction valve circuit (refilling port) or at the suction port, utilising the boost circuit, tank head pressure.

End of Life

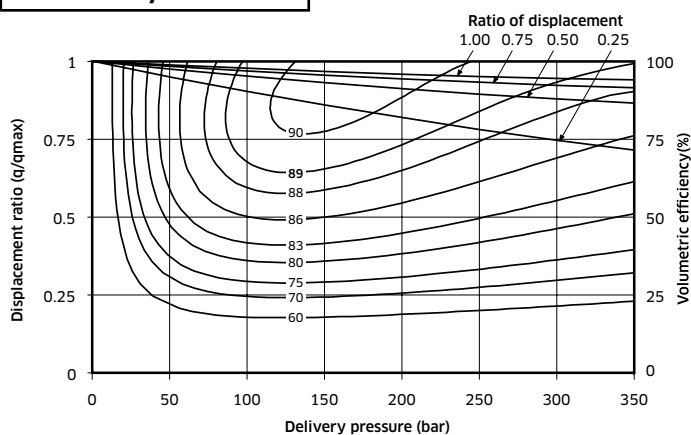
The pump unit, hydraulic fluid and packaging must be disposed of carefully to avoid pollution to the environment. The pump unit must be completely empty upon disposal, it must be disposed of according to national regulations and you must also follow safety information for disposal of the hydraulic fluid.

All individual parts of the pump unit must be recycled. Separate the pump unit parts according to: cast parts, steel, aluminium, non-ferrous metal, electronic waste, plastic, and seals.

2-3 Performance Data

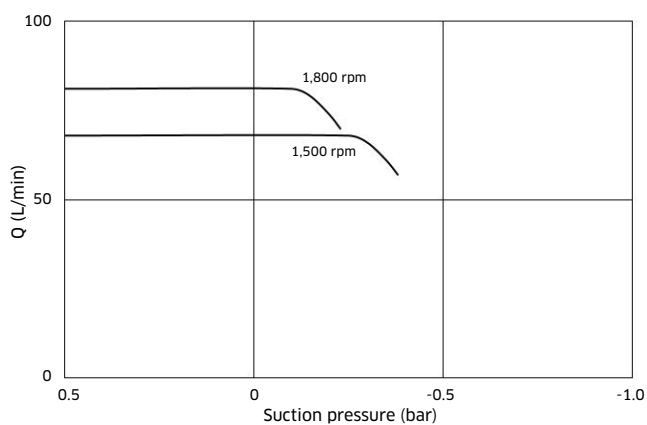
◆ Pump Efficiency (%)

K3VR45/K3VL45

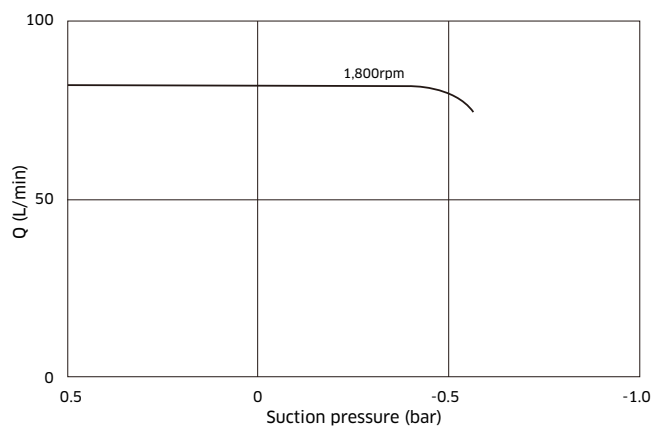


◆ Self Priming Capability

K3VR45



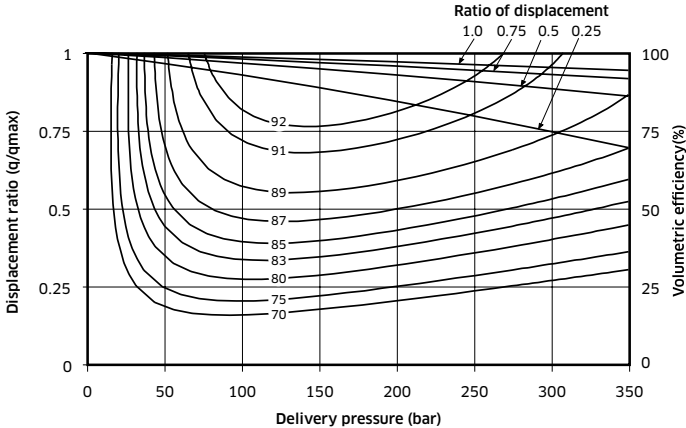
K3VL45



2-3 Performance Data (cont)

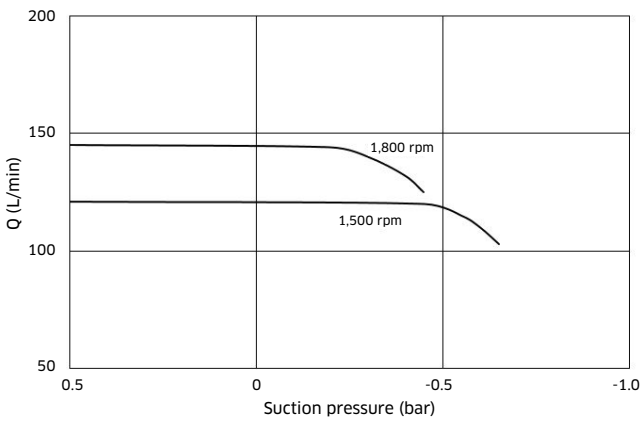
◆ Pump Efficiency (%)

K3VR80/K3VL80

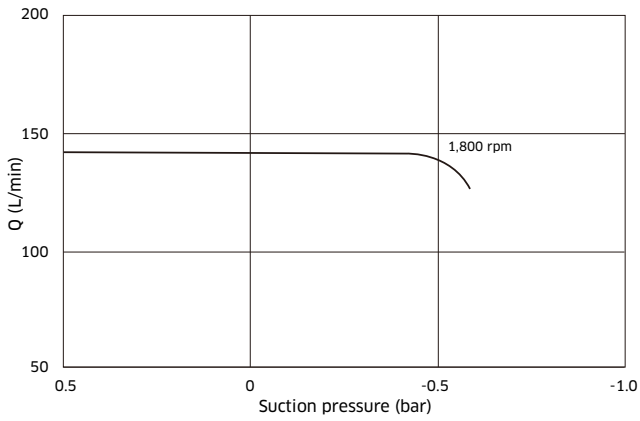


◆ Self Priming Capability

K3VR80



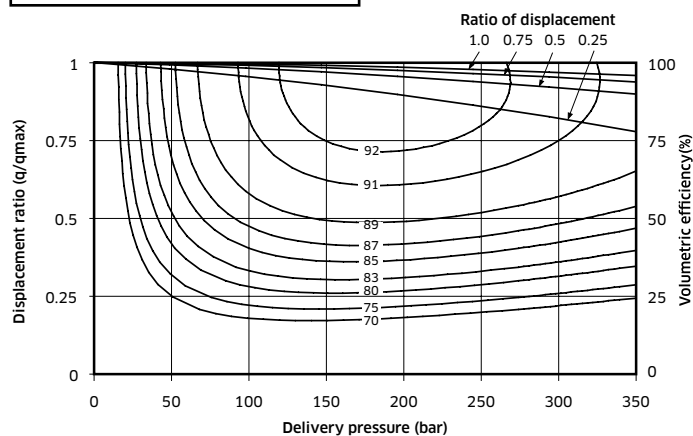
K3VL80



2-3 Performance Data (cont)

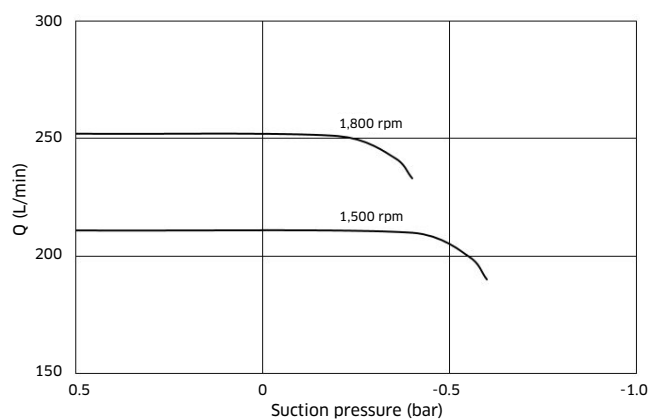
◆ Pump Efficiency (%)

K3VR140/K3VL140

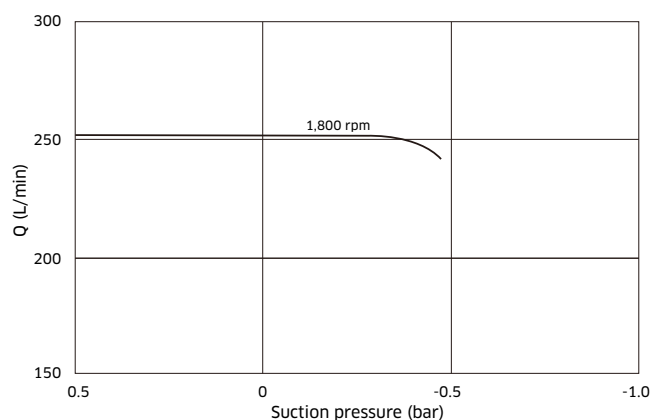


◆ Self Priming Capability

K3VR140



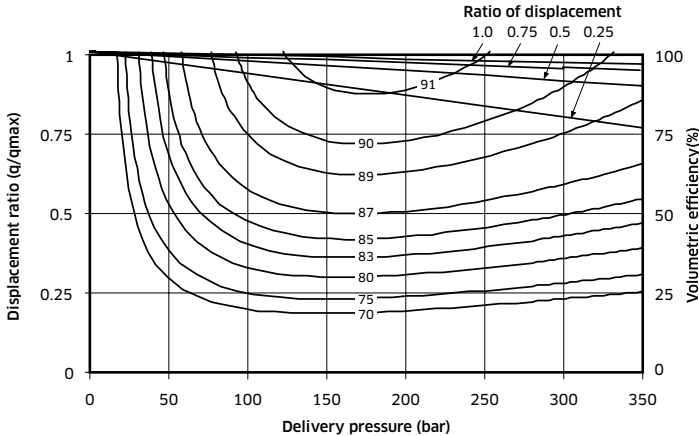
K3VL140



2-3 Performance Data (cont)

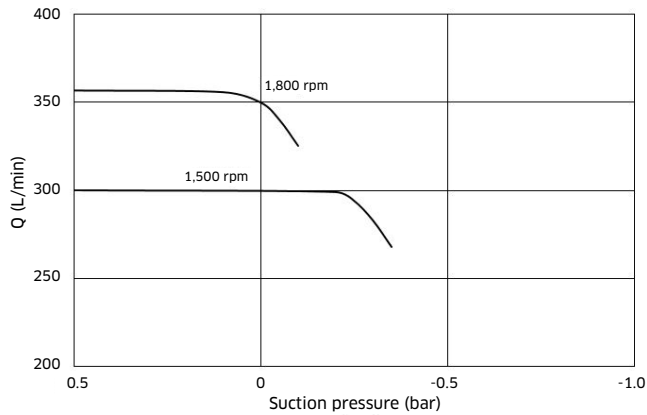
◆ Pump Efficiency (%)

K3VR200/K3VL200

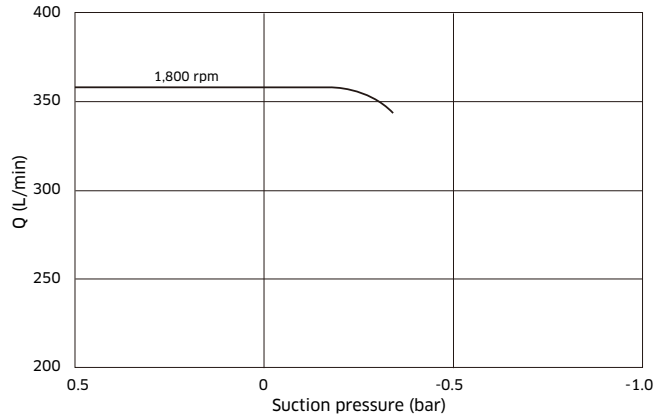


◆ Self Priming Capability

K3VR200



K3VL200

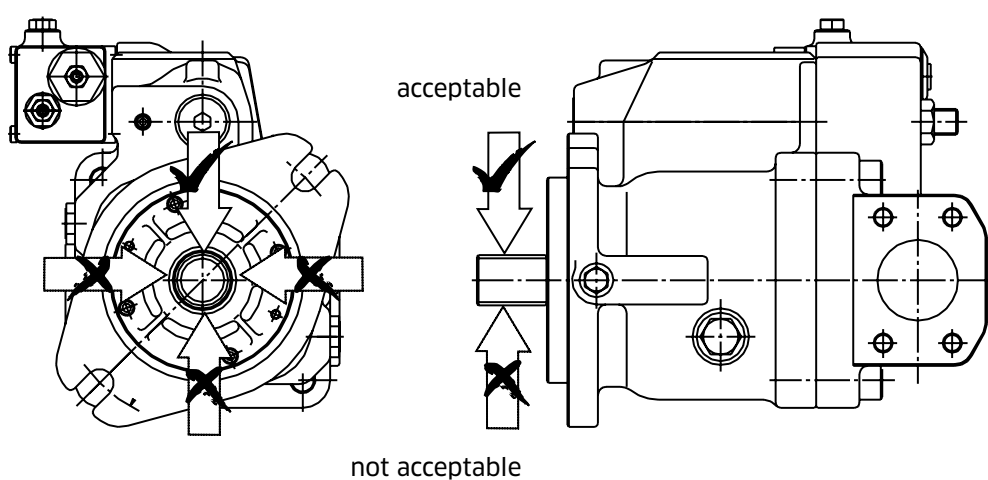


2-4 Radial Loading Capacity

No axial shaft loading possible, radial loading is achievable but in specific orientation:-

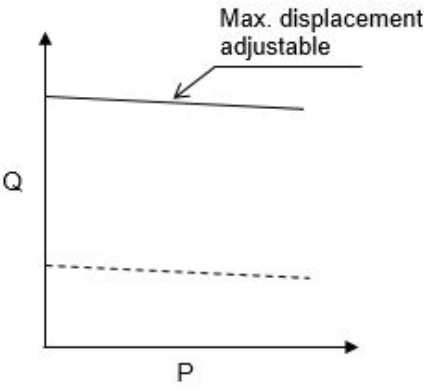
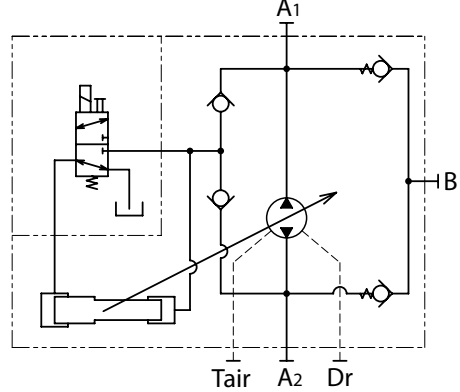
Radial shaft loading can be allowed provided that its orientation is such that the front bearing takes the additional load (see diagram below).

Note: In this case bearing life will be reduced.

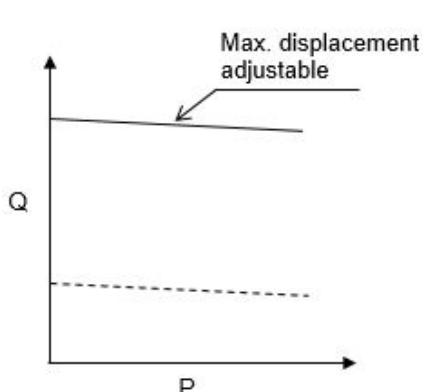
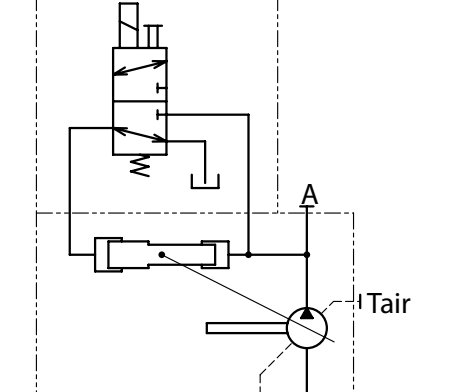


2-5 Functional Description of Regulator

◆ Closed Circuit

Regulator Code	Control Curves	Hydraulic Circuit
<p>2-position control</p> <p>Electric command signal of the solenoid valve switches between the two (maximum or minimum) pump discharge displacement. This enables lower torque at high pressure.</p> <p>Note: Two solenoid options. Minimum or Maximum displacement with electrical signal.</p>		

◆ Open Circuit

Regulator Code	Control Curves	Hydraulic Circuit
<p>2-position control</p> <p>Electric command signal of the solenoid valve switches between the two (maximum or minimum) pump discharge displacement. This enables lower torque at high pressure.</p> <p>Note: Two solenoid options. Minimum or Maximum displacement with electrical signal.</p>		

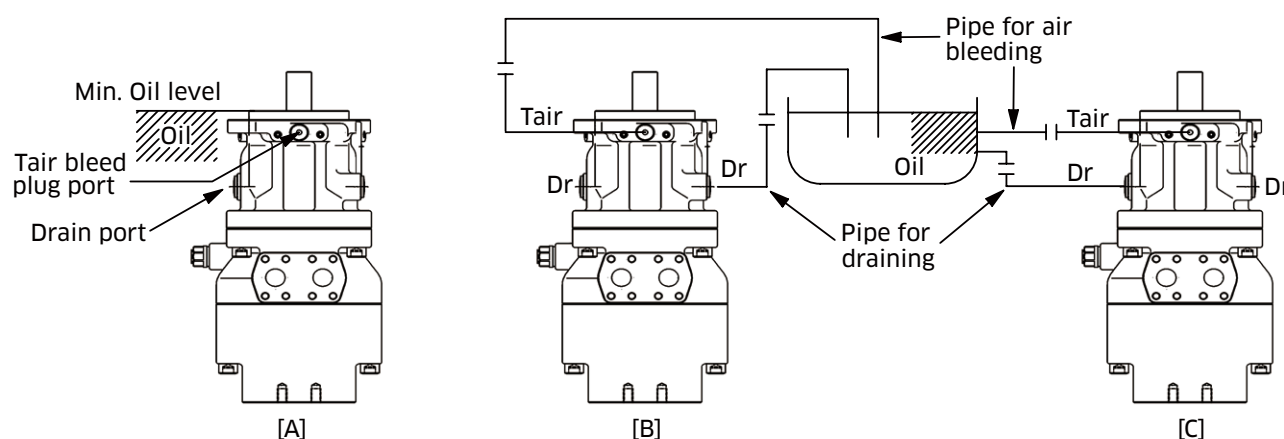
2-6 Installation

Direction of Installation

Install the pump with the drive shaft horizontal as a rule.

Precautions for vertical installation (with the shaft end upward) are the following:

- 1) Confirm the oil level in the tank to be higher than the pump mounting flange.
- 2) If the oil level is lower than the pump mounting flange, or can be lower below the flange face caused by the fluctuation of the tank oil level, supply oil into the pump casing through the air bleeder port.
- 3) When installing the pump outside the tank, piping of both drain port and air bleeder port should be connected to the oil tank. If the piping for draining or air bleeding is above the oil level, fill the casing, drain piping, and air bleed piping with oil before starting the pump (refer to fig.[B] and [C] below).



External load to shaft end

Apply neither radial nor thrust external load to the shaft end of the pump as a rule. If there is possibility of such load being applied through any of belts, gears or the like, consult us about the specifications.

Removal of rust preventive coating

Since rust preventive coating is applied to the shaft end in advance, remove it with detergent liquid before use. When using detergent liquid, take care so that detergent liquid does not splash on the oil seal portion.

Fit dimensions of the drive shaft and the coupling

Connect the coupling with the drive shaft by interference-fit, using the screw threads provided on the shaft end. Do not tap the coupling or the shaft end for fitting. In pulling out the coupling as well, use the coupling puller so that internal bearings can be prevented from receiving impact.

Length of the drive shaft engagement with the coupling

For the shaft dimensions on the coupling end, refer to those shown in the dimensional outline drawing. As to the length of engagement, so to make arrangement the whole parallel portions of the key and the spline engage with the key way and the counterpart spline as far as possible.

2-6 Installation (cont)

Connection and centering for the pump

For connection of the pump drive shaft and the prime mover shaft, use flexible coupling such as a flexible shaft coupling or a chain coupling as a rule (do not use a tire type coupling).

Method of centering and datum:

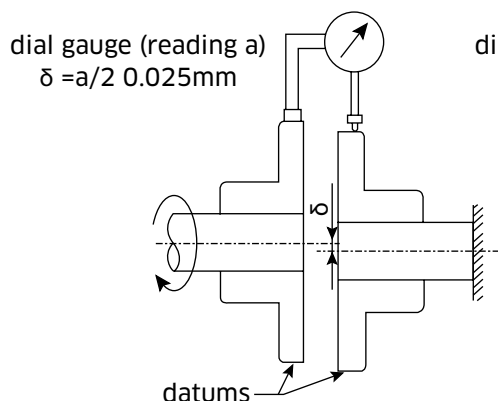
In connecting the two shafts by means of a coupling, even if the coupling is of a flexible type, align both the shaft centers as precisely as possible, in order to lengthen the life of the shaft coupling and to reduce excessive load to the shafts, bearings, etc. A typical method of centering is shown in the following figure.

(Couplings are usually provided with datum faces for centering)

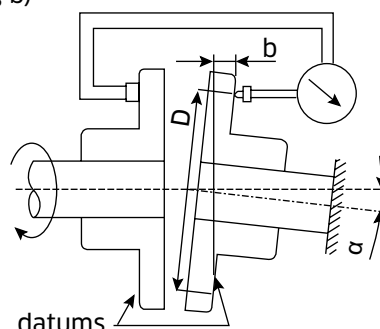
As the standard for centering, the following values are recommendable.

Parallel misalignment $\delta \leq 0.025\text{mm}$ (Dial gauge reading: $a \leq 0.05\text{mm}$)

Angular misalignment $\delta \leq 0.2^\circ$



dial gauge (reading b)
 $\alpha = \text{SIN}^{-1} (b/D)$
 0.2°



Tightening of pump mounting screw

For pump mounting, use either hexagon screws or hexagon socket head cap screws with recommended tightening torque shown in the following table. Recommended bolt strength class is 10.9 or above to JIS. Be sure to use washers for mounting.

Pump size	22	45	80	140	200
Mounting screw	M12	M12	M16	M16	M20
Tightening torque (Nm)	98	98	235	235	435

2-6 Installation (cont)

◆ Moment of Inertia and Torsional Stiffness

Frame Size	Moment of Inertia		Torsional Stiffness (N·m/rad)
	I (kg·m ²)	GD ² (kgf·m ²)	
K3VR22	2.09×10^{-3}	$8.36 \cdot 10^{-3}$	2.20×10^{-4}
K3VR45/K3VL45	3.85×10^{-3}	$1.54 \cdot 10^{-2}$	3.59×10^{-4}
K3VR80/K3VL80	7.30×10^{-3}	$2.92 \cdot 10^{-2}$	4.83×10^{-4}
K3VR140/K3VL140	2.02×10^{-2}	$8.06 \cdot 10^{-2}$	9.33×10^{-4}
K3VR200/K3VL200	4.58×10^{-2}	$1.83 \cdot 10^{-1}$	1.54×10^{-3}

2-6 Installation (cont)

◆ Displacement Switching Solenoid Valve Specification (Type-0, Type-1)

Minimum operation pump pressure : 10 bar

Electrical Specification : see tables below

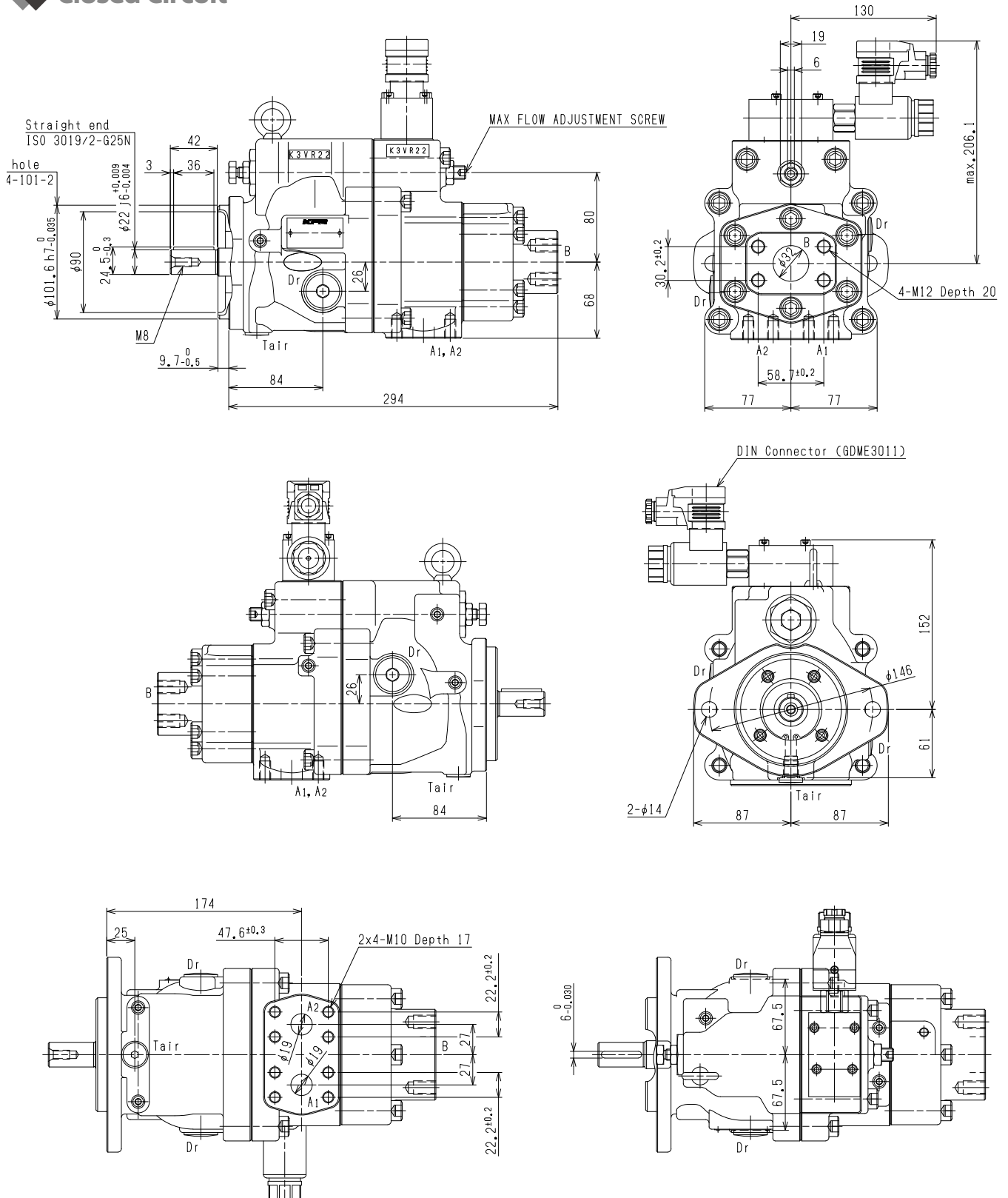
	DC Coil with ISO/DIN 43650, From A connector		AC Coil with ISO/DIN 43650, From A connector	
	12V	24V	115V	230V
Maximum Coil Temperature at 68°F (20°C) Ambient	218°F (105°C)		218°F (105°C)	
Arc Suppression	Standard		Standard	
Power Consumption (cold) - at rated voltage	22 watts		22 watts	
Maximum Ambient Temperature	122°F		122°F	
Voltage/Frequency	12VDC	24VDC	115 VAC 50/60 Hz	230 VAC 50/60 Hz
Operating Voltage Range	+/- 10% nominal		+/- 10% nominal	
Duty Cycle Rating	100%		100%	
Connector	ISO/DIN 43650, Form A, 3-pin		ISO/DIN 43650, Form A, 3-pin	
Connector Environment Rating	IP65/IP67		IP65/IP67	
Coil Nut Torque	0.5 Nm		0.5 Nm	

3

Dimensions

3-1 K3VR22 Installation

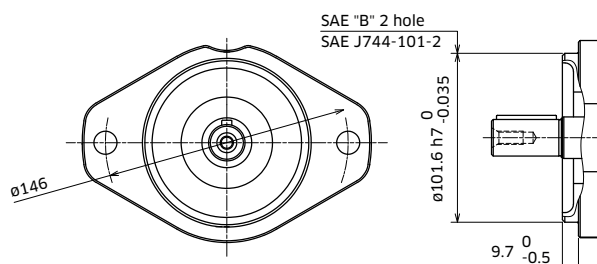
◆ Closed Circuit



3-1 K3VR22 Installation (cont)

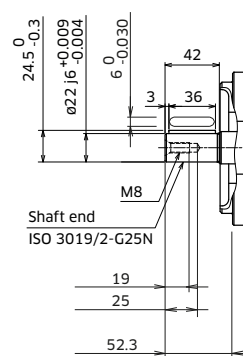
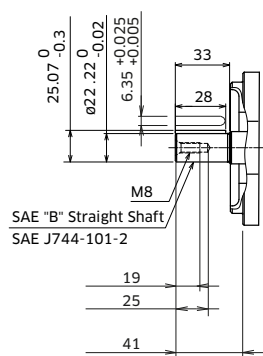
◆ Mounting Flange and Shaft Options

Closed Circuit (K3VR22)



SAE 'B' Straight Shaft - Option 'K'

ISO (JIS) Straight Shaft - Option 'J'
(with SAE Mount)



◆ Porting Details

Closed Circuit (K3VR22)

Main SAE Flanged Ports

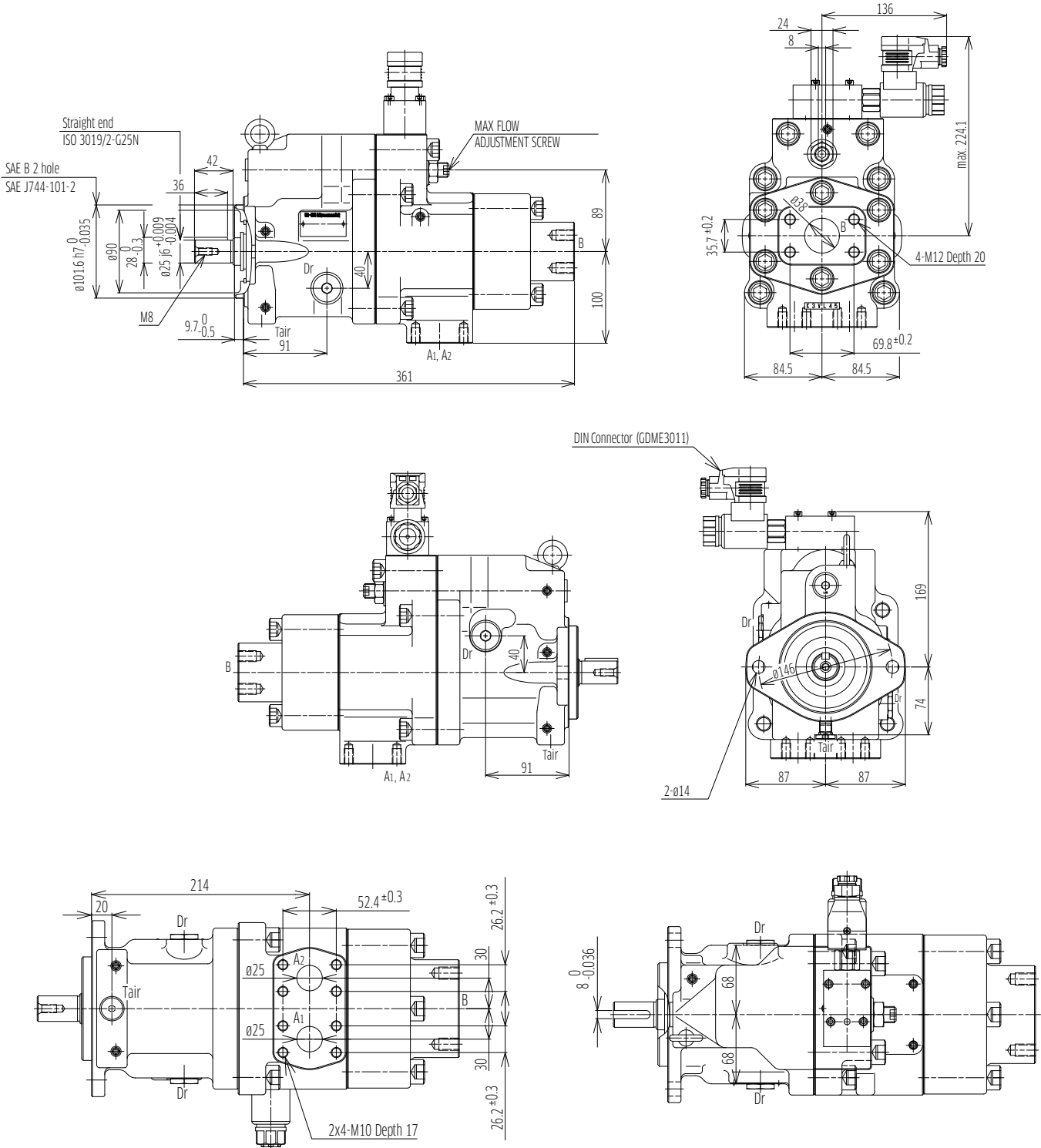
Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNF Threaded Version ('S' in position 7 of model code)				
A1, A2	Suction, Delivery Port	SAE J518C Std pressure (code 61) ¾"	40	¾-16UNC-2B x 18 mm
B	Supply Port	SAE J518C Std pressure (code 61) 1¼"	60	7/16-14UNC-2B x 24 mm
Metric Threaded Version ('M' in position 7 of model code)				
A1, A2	Suction, Delivery Port	SAE J518C Std pressure (code 61) ¾"	57	M10 x 17
B	Supply Port	SAE J518C Std pressure (code 61) 1¼"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 6 of model Code)			
Dr	Drain Port (x2)	¾ -16UNF -2B -14.3	98
T _{air}	Air Bleeder Port	7/16 -20UNF -2B -11.5	12
ISO Version ('J' in position 6 of model code)			
Dr	Drain Port (x2)	G½ -19	110
T _{air}	Air Bleeder Port	G¼ -15	36

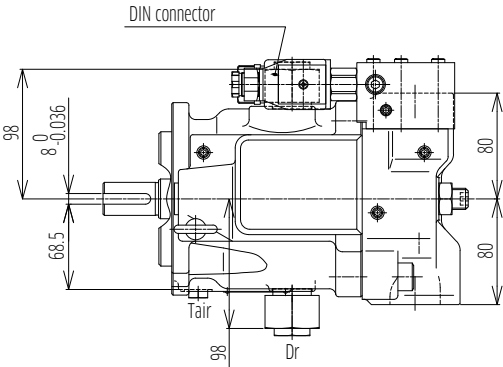
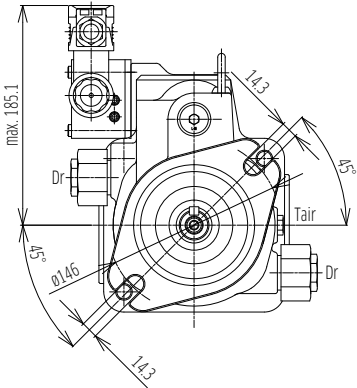
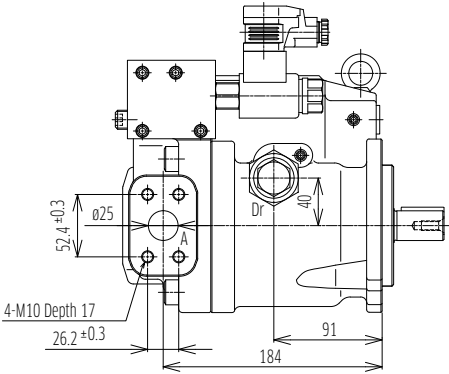
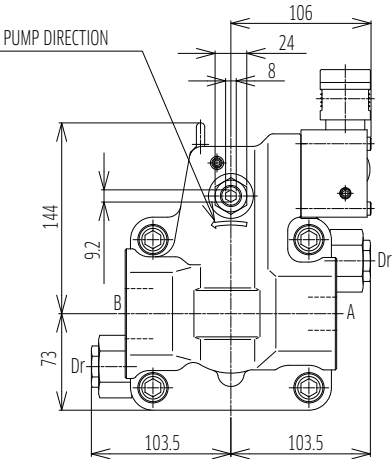
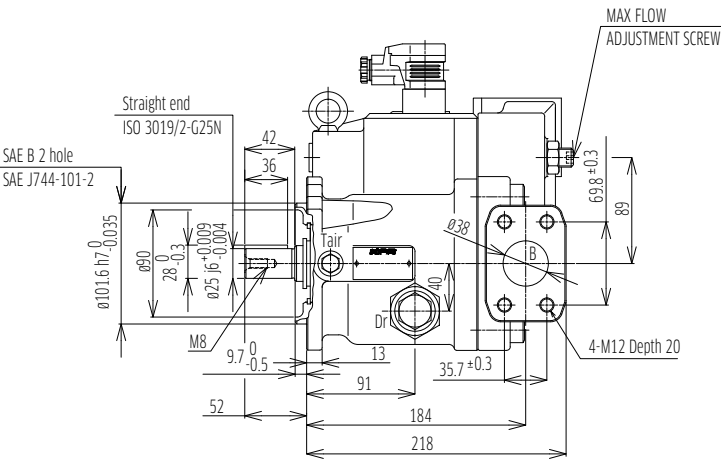
3-2 K3VR45/K3VL45 Installation

◆ Closed Circuit (K3VR45)



3-2 K3VR45/K3VL45 Installation (cont)

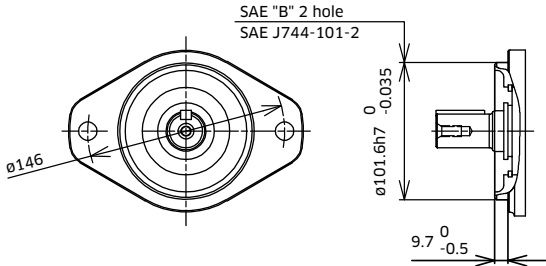
◆ Open Circuit (K3VL45)



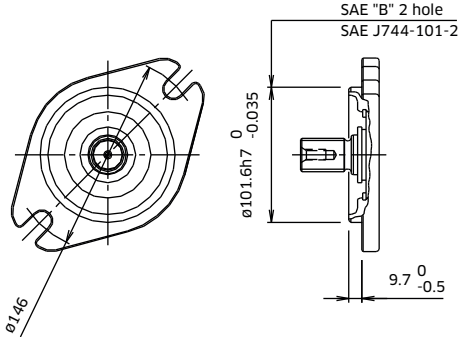
3-2 K3VR45/K3VL45 Installation (cont)

◆ Mounting Flange and Shaft Options

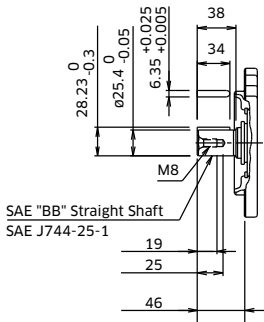
Closed Circuit (K3VR45)



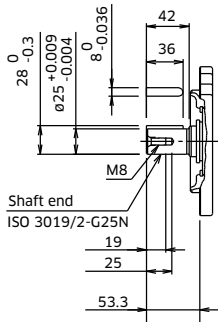
Open Circuit (K3VL45)



SAE 'BB' Straight Shaft - Option 'K'



ISO (JIS) Straight Shaft - Option 'J' (with SAE Mount)



3-2 K3VR45/K3VL45 Installation (cont)

◆ Porting Details

Closed Circuit (K3VR45)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNF Threaded Version ('S' in position 7 of model code)				
A1, A2	Suction, Delivery Port	SAE J518C Std pressure (code 61) 1"	57	¾ -16UNC -2B x 18 mm
B	Supply Port	SAE J518C Std pressure (code 61) 1½"	98	½ -13UNC -2B x 22 mm
Metric Threaded Version ('M' in position 7 of model code)				
A1, A2	Suction, Delivery Port	SAE J518C Std pressure (code 61) 1"	57	M10 x 17
B	Supply Port	SAE J518C Std pressure (code 61) 1½"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 6 of model code)			
Dr	Drain Port (x2)	¾ -16UNF-2B -14.3	98
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12
ISO Version ('J' in position 6 of model code)			
Dr	Drain Port (x2)	G½ -19	110
Tair	Air Bleeder Port	G¼ -15	36

Open Circuit (K3VL45)

Main SAE Flanged Ports

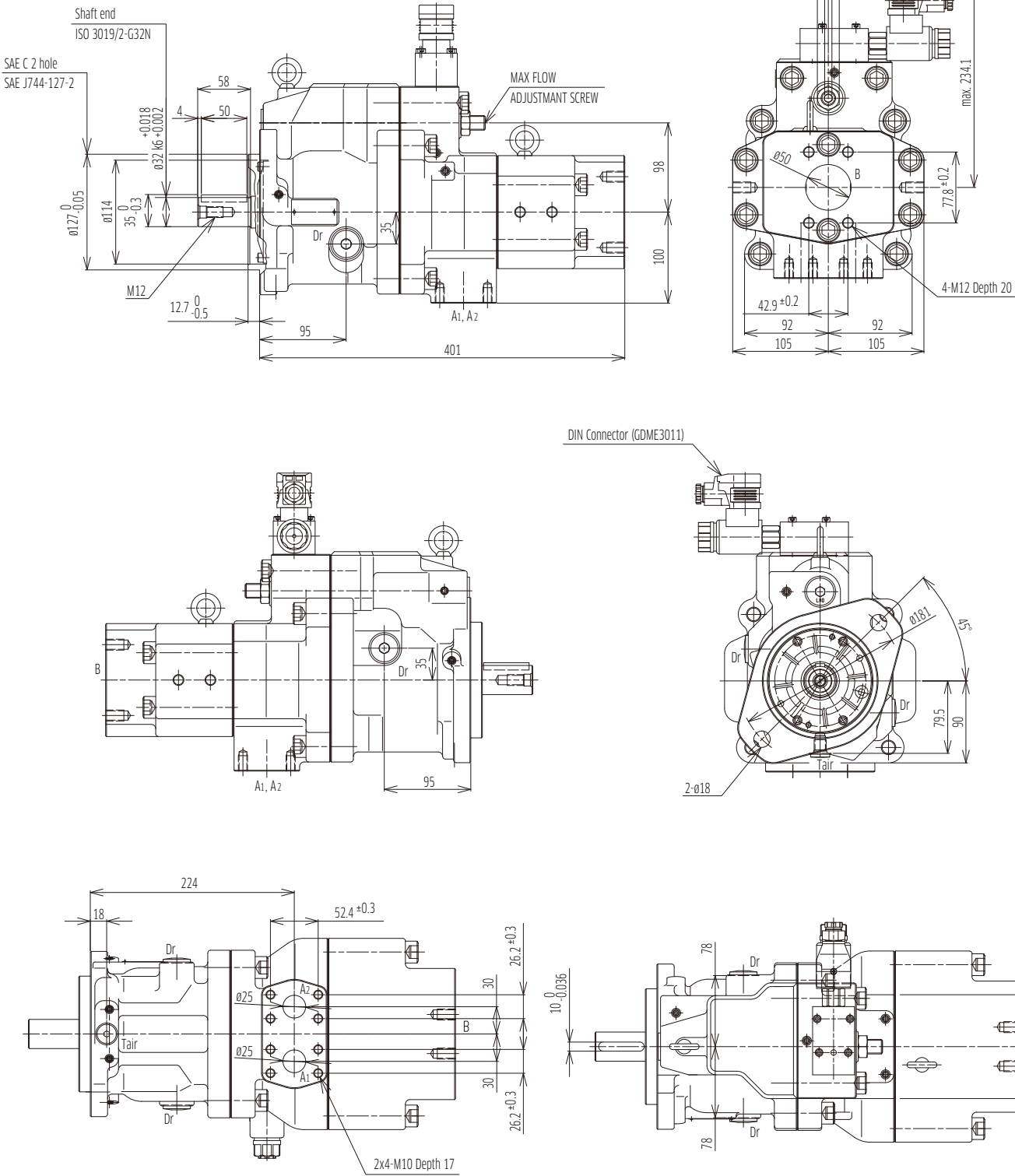
Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNF Threaded Version ('S' in position 9 of model code)				
A	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	¾ -16UNC-2B x 18 mm
B	Suction Port	SAE J518C Std pressure (code 61) 1½"	98	½ -13UNC-2B x 22 mm
Metric Version ('M' in position 9 of model code)				
A	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	M10 x 17
B	Suction Port	SAE J518C Std pressure (code 61) 1½"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 8 of model)			
Dr	Drain Port (x2)	¾ -16UNF -2B -14.3	98
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12
ISO Version ('J' in position 8 of model code)			
Dr	Drain Port (x2)	G½ -19	108
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12

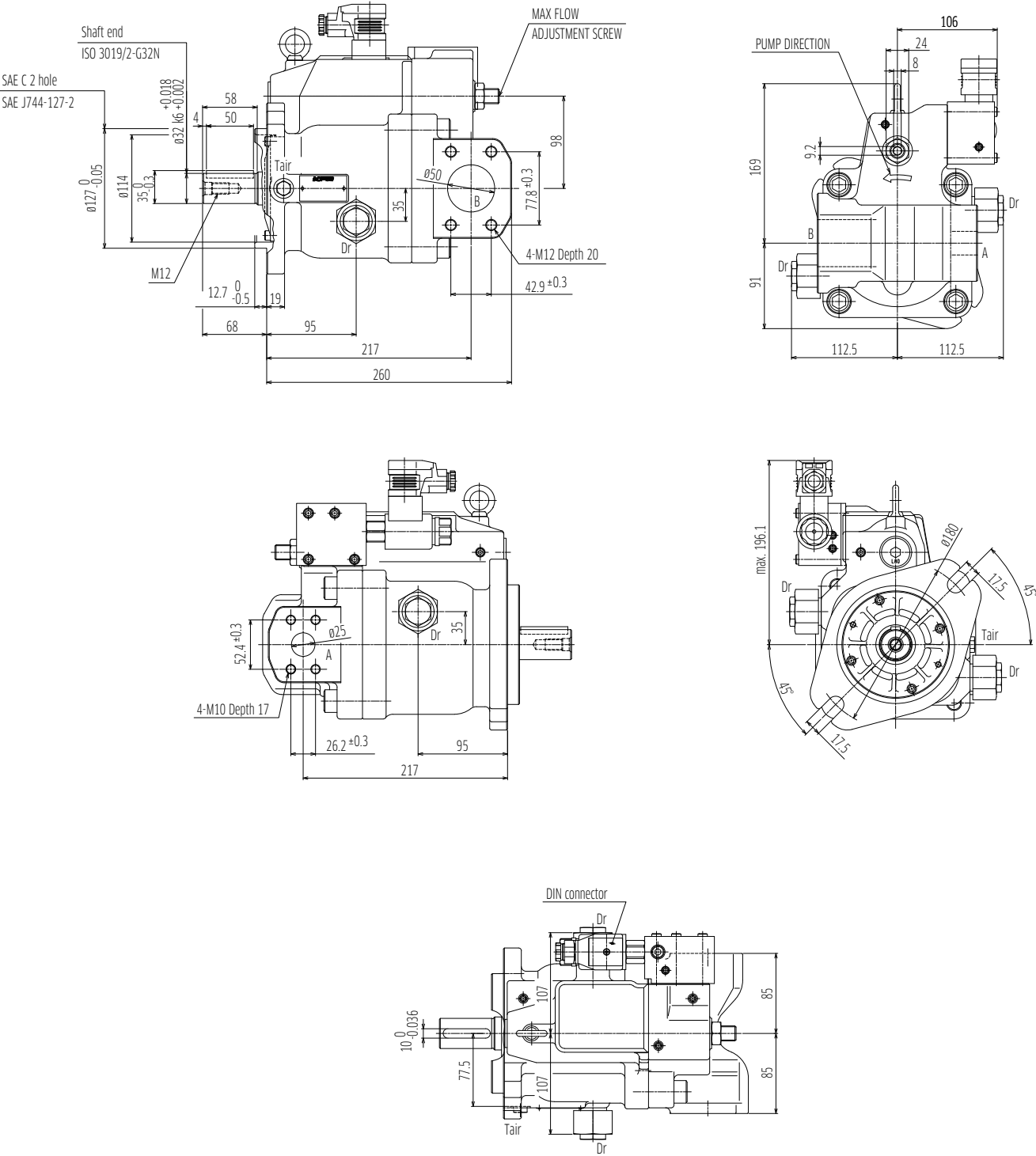
3-3 K3VR80/K3VL80 Installation

◆ Closed Circuit (K3VR80)



3-3 K3VR80/K3VL80 Installation (cont)

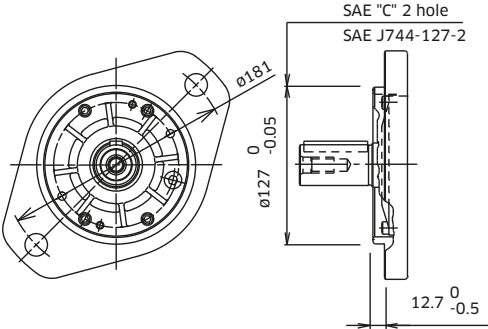
◆ Open Circuit (K3VL80)



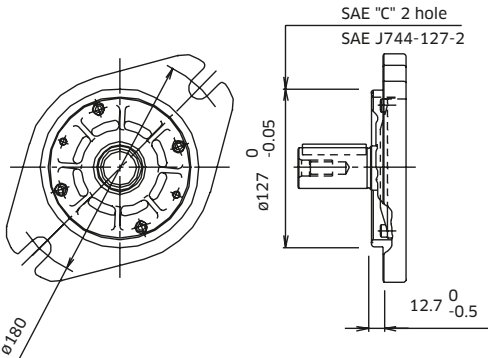
3-3 K3VR80/K3VL80 Installation (cont)

◆ Mounting Flange and Shaft Options

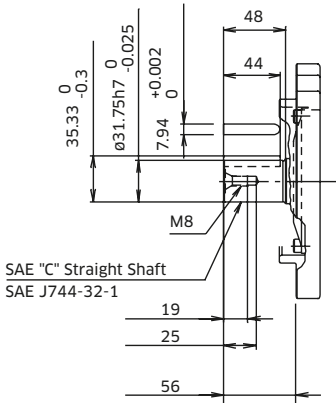
Closed Circuit (K3VR80)



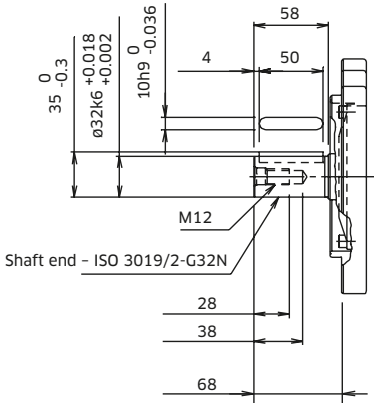
Open Circuit (K3VL80)



SAE 'C' Straight Shaft - Option 'K'



ISO (JIS) Straight Shaft - Option 'J' (with SAE Mount)



3-3 K3VR80/K3VL80 Installation (cont)

◆ Porting Details

Closed Circuit (K3VR80)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
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UNF Threaded Version ('S' in position 7 of model code)

A1, A2	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	3/8-16UNC-2B x 18 mm
B	Suction Port	SAE J518C Std pressure (code 61) 2"	98	1/2-13UNC-2B x 22 mm

Metric Threaded Version ('M' in position 7 of model code)

A1, A2	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	M10 x 17
B	Suction Port	SAE J518C Std pressure (code 61) 2"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
------	-----------	-----------	------------------------

SAE Version ('K' in position 6 of model code)

Dr	Drain Port (x2)	3/4 -16UNF -2B -14.3	98
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12

ISO Version ('J' in position 6 of model code)

Dr	Drain Port (x2)	G1/2 -19	110
Tair	Air Bleeder Port	G3/4 -15	36

Open Circuit (K3VL80)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
------	-----------	-----------	------------------------	----------------

UNF Threaded Version ('S' in position 9 of model code)

A	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	3/8-16UNC-2B x 18 mm
B	Suction Port	SAE J518C Std pressure (code 61) 2"	98	1/2-13UNC-2B x 22 mm

Metric Version ('M' in position 9 of model code)

A	Delivery Port	SAE J518C Std pressure (code 61) 1"	57	M10 x 17
B	Suction Port	SAE J518C Std pressure (code 61) 2"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
------	-----------	-----------	------------------------

SAE Version ('K' in position 8 of model code)

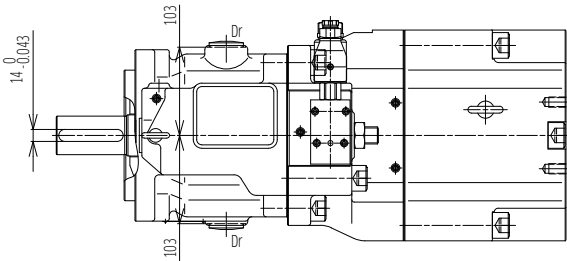
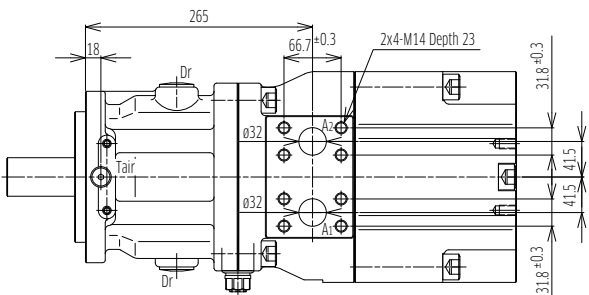
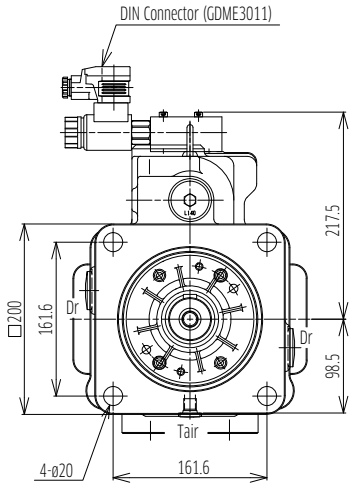
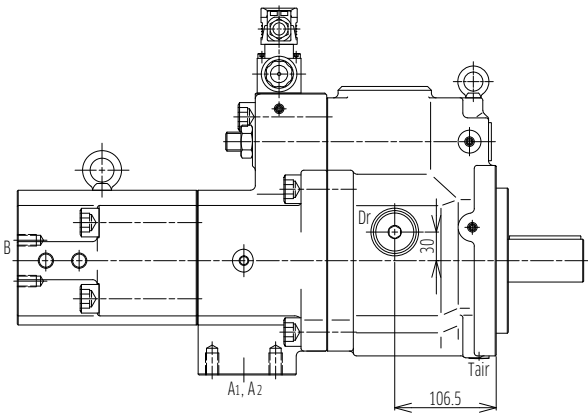
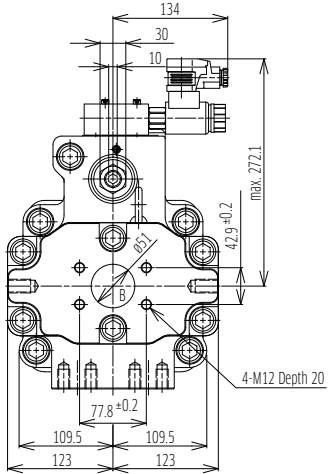
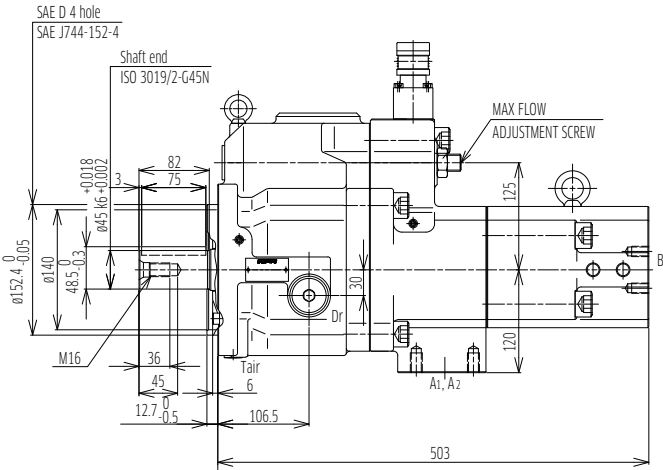
Dr	Drain Port (x2)	3/4 -16UNF -2B -14.3	98
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12

ISO Version ('J' in position 8 of model code)

Dr	Drain Port (x2)	G1/2 -19	108
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12

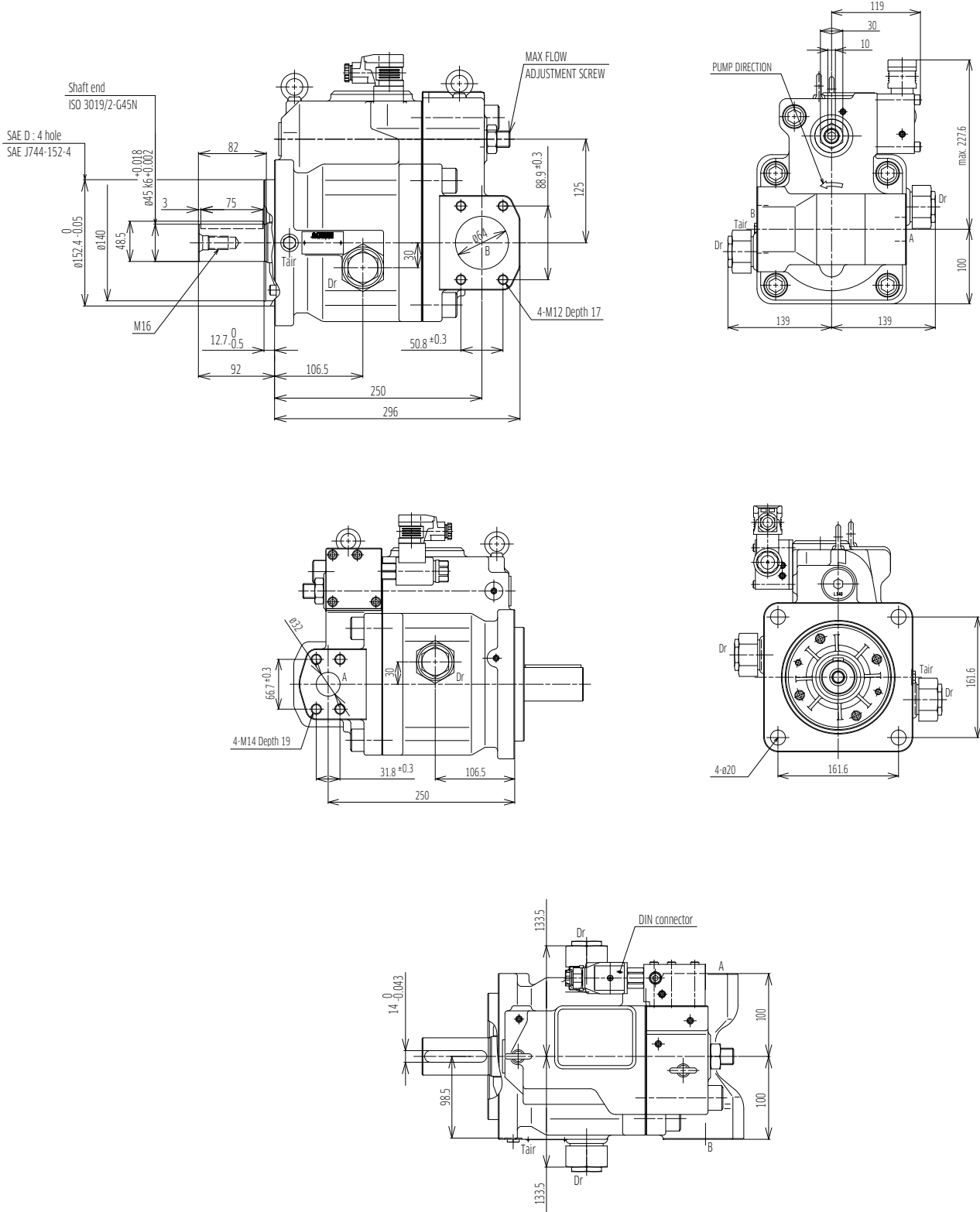
3-4 K3VR140/K3VL140 Installation

◆ Closed Circuit (K3VR140)



3-4 K3VR140/K3VL140 Installation (cont)

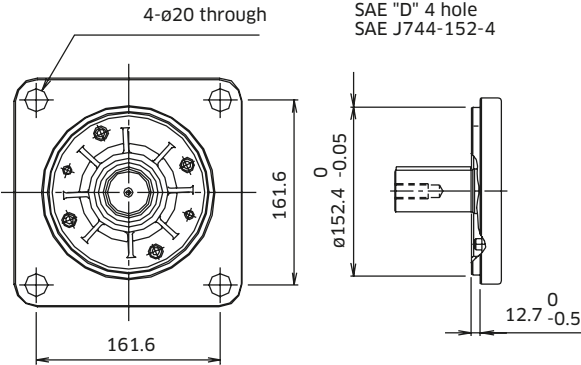
◆ Open Circuit (K3VL140)



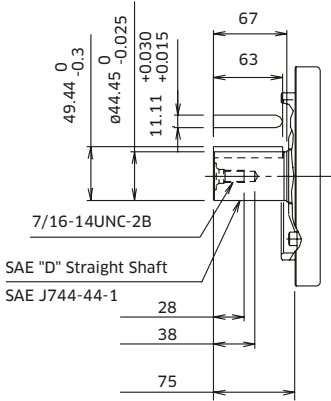
3-4 K3VR140/K3VL140 Installation (cont)

◆ Mounting Flange and Shaft Options

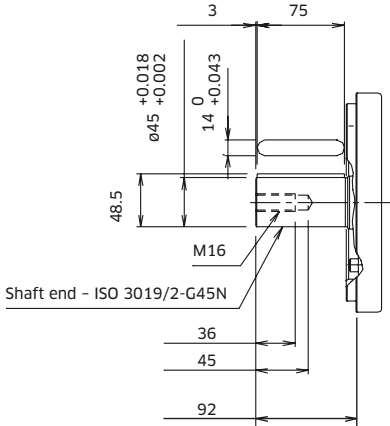
Closed Circuit (K3VR140)/Open Circuit (K3VL140)



SAE 'D' Straight Shaft - Option 'K'



ISO (JIS) Straight Shaft - Option 'J' (with SAE Mount)



3-4 K3VR140/K3VL140 Installation (cont)

◆ Porting Details

Closed Circuit (K3VR140)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNF Threaded Version ('S' in position 7 of model code)				
A1, A2	Delivery Port	SAE J518C high pressure (code 62) 1¼"	157	½ -13UNC -2B x 22 mm
B	Suction Port	SAE J518C Std pressure (code 61) 2½"	98	½ -13UNC -2B x 22 mm
Metric Threaded Version ('M' in position 7 of model code)				
A1, A2	Delivery Port	SAE J518C high pressure (code 62) 1¼"	157	M14 x 23
B	Suction Port	SAE J518C Std pressure (code 61) 2½"	98	M12 x 20

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 6 of model code)			
Dr	Drain Port (x2)	1¼ -12UNF -2B -19	167
T _{air}	Air Bleeder Port	7/16 -20UNF -2B -14	12
ISO Version ('J' in position 6 of model code)			
Dr	Drain Port (x2)	G ¾ -20	170
T _{air}	Air Bleeder Port	G ¾ -15	36

Open Circuit (K3VL140)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNF Threaded Version ('S' in position 9 of model code)				
A	Delivery Port	SAE J518C high pressure (code 62) 1¼"	157	½ -13UNC -2B x 22 mm
B	Suction Port	SAE J518C Std pressure (code 61) 2½"	98	½ -13UNC -2B x 22 mm
Metric Threaded Version ('M' in position 9 of model code)				
A	Delivery Port	SAE J518C high pressure (code 62) 1¼"	157	M14 x 19 *
B	Suction Port	SAE J518C Std pressure (code 61) 2½"	98	M12 x 17

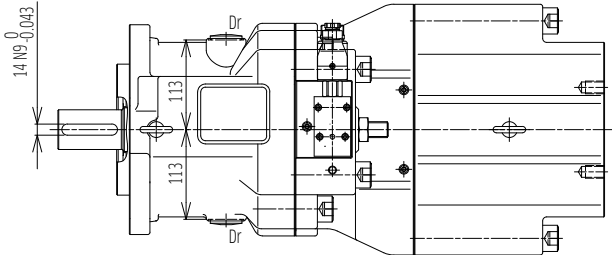
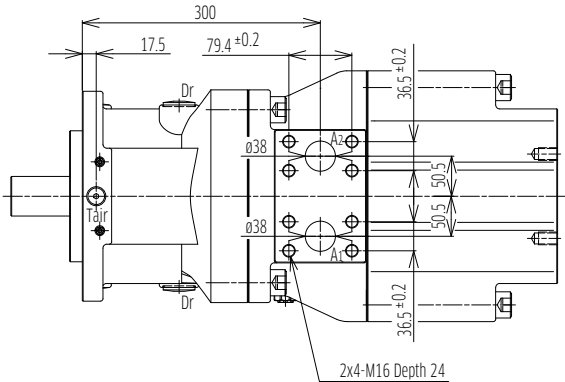
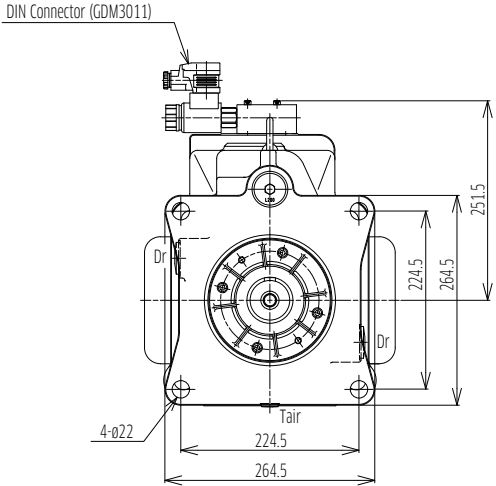
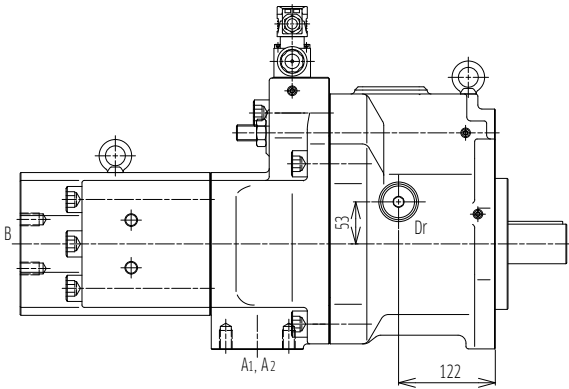
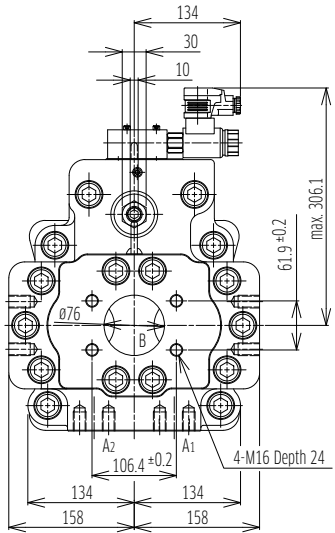
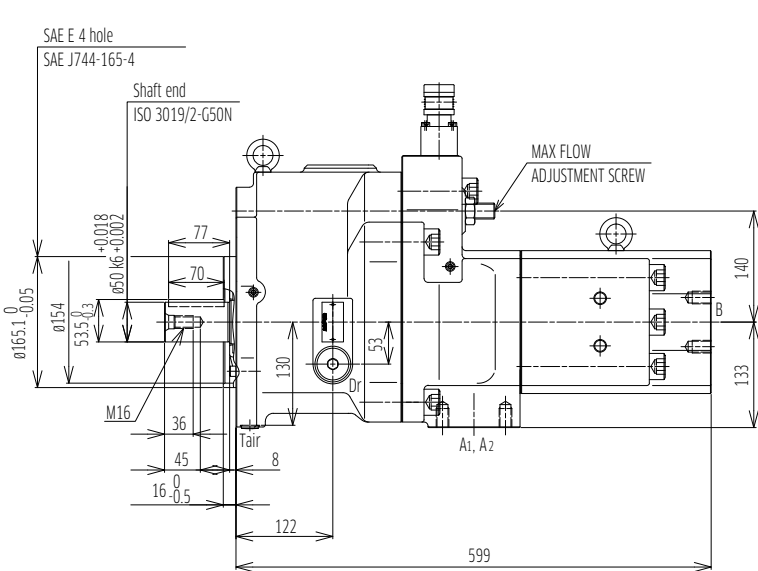
* Note: ISO 6162 quotes M12

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 8 of model code)			
Dr	Drain Port (x2)	1¼ -12UNF -2B -19	167
T _{air} *	Air Bleeder Port	7/16 -20UNF -2B -14	12
ISO Version ('J' in position 8 of model code)			
Dr	Drain Port (x2)	G ¾ -20	167
T _{air}	Air Bleeder Port	7/16 -20UNF -2B -14	12

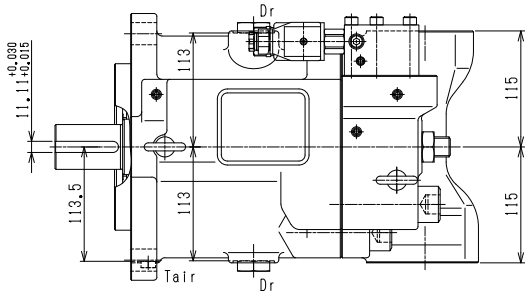
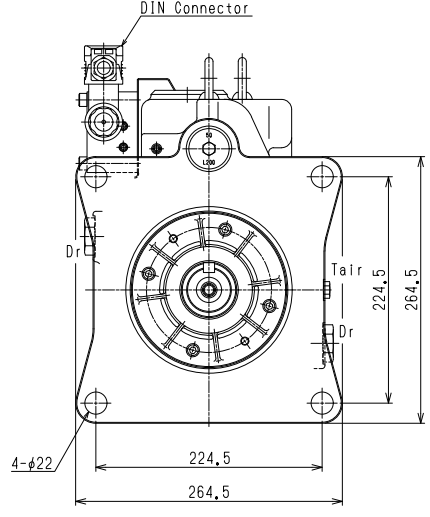
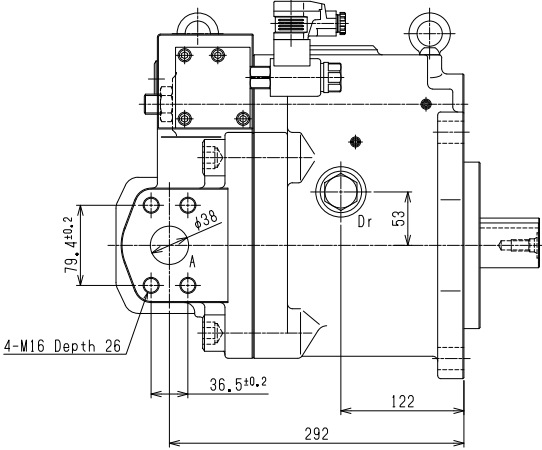
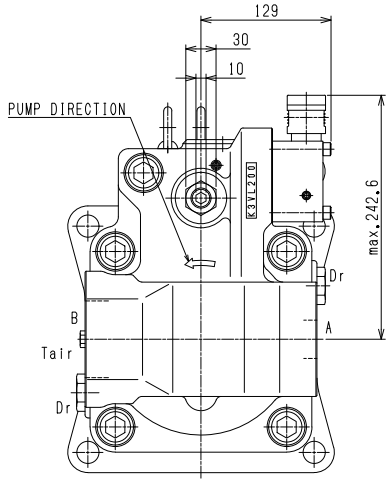
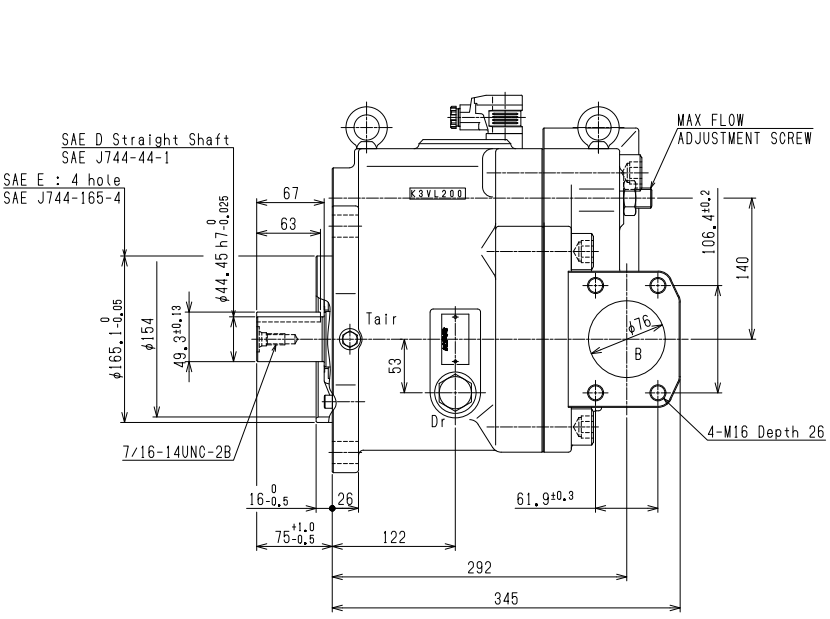
3-5 K3VR200/K3VL200 Installation

◆ Closed Circuit (K3VR200)



3-5 K3VR200/K3VL200 Installation (cont)

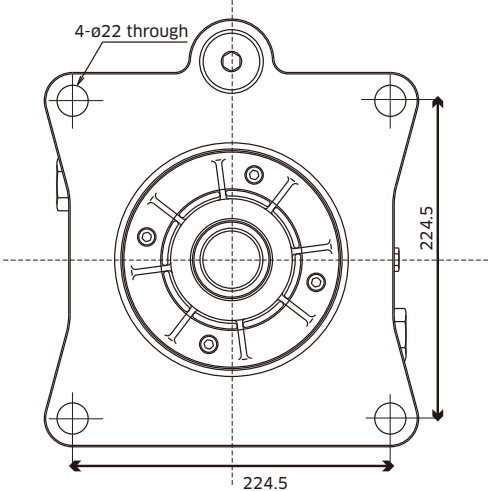
◆ Open Circuit (K3VL200)



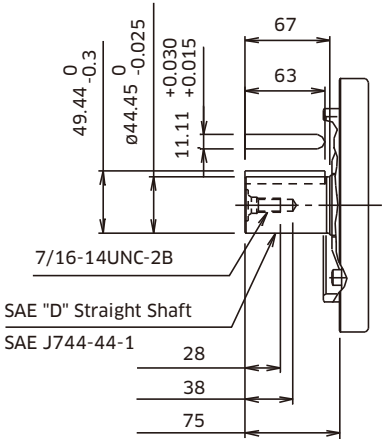
3-5 K3VR200/K3VL200 Installation (cont)

◆ Mounting Flange and Shaft Options

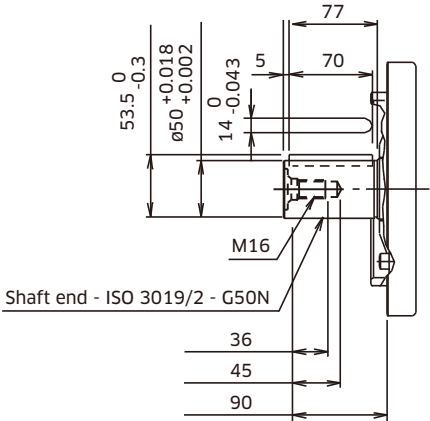
Closed Circuit (K3VR200)/Open Circuit (K3VL200)



SAE 'D' Straight Shaft - Option 'K'



ISO (JIS) Straight Shaft - Option 'J'
(with SAE Mount) *Only for K3VR



3-5 K3VR200/K3VL200 Installation (cont)

◆ Porting Details

Closed Circuit (K3VR200)

Main SAE Flanged Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNC Threaded Version ('S' in position 7 of model code)				
A1, A2	Delivery Port	SAE J518C high pressure (code 62) 1½"	235	⅝ -11UNC -2B x 25mm
B	Suction Port	SAE J518C Std pressure (code 61) 3"	235	⅝ -11UNC -2B x 25mm
Metric Threaded Version ('M' in position 7 of model code)				
A1, A2	Delivery Port	SAE J518C high pressure (code 62) 1½"	235	M16 x 24
B	Suction Port	SAE J518C Std pressure (code 61) 3"	235	M16 x 24

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 6 of model code)			
Dr	Drain Port (x2)	1⅙ -12UNF -2B -19	170
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12
ISO Version ('J' in position 6 of model code)			
Dr	Drain Port (x2)	G ¾ -20	170
Tair	Air Bleeder Port	G ¼ -15	36

Open Circuit (K3VL200)

Main SAE Flanged Ports

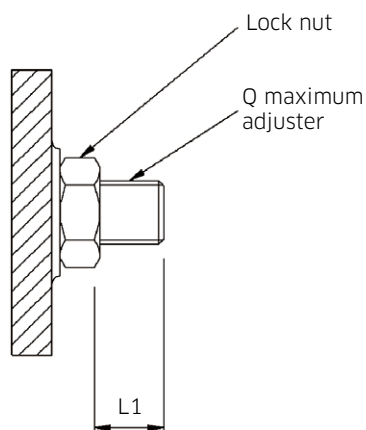
Des.	Port Name	Port Size	Tightening Torque (Nm)	Flange Threads
UNC Threaded Version ('S' in position 9 of model code)				
A	Delivery Port	SAE J518C high pressure (code 62) 1½"	235	⅝ -11UNC -2B x 25mm
B	Suction Port	SAE J518C Std pressure (code 61) 3"	235	⅝ -11UNC -2B x 25mm
Metric Threaded Version ('M' in position 9 of model code)				
A	Delivery Port	SAE J518C high pressure (code 62) 1½"	235	M16 x 24
B	Suction Port	SAE J518C Std pressure (code 61) 3"	235	M16 x 24

Auxiliary Ports

Des.	Port Name	Port Size	Tightening Torque (Nm)
SAE Version ('K' in position 8 of model code)			
Dr	Drain Port (x2)	1⅙ -12UNF -2B -19	170
Tair	Air Bleeder Port	7/16 -20UNF -2B -14	12

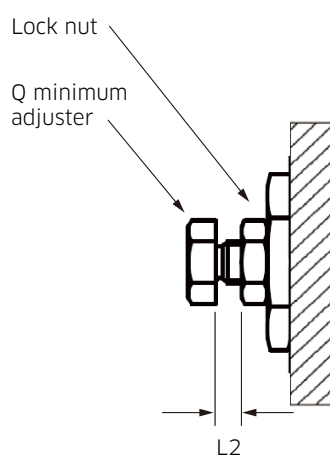
3-6 Calibration of Regulators

◆ Maximum displacement



Maximum displacement adjustment	Pump	K3VR22	K3VR45 K3VL45	K3VR80 K3VL80	K3VR140 K3VL140	K3VR200 K3VL200
Adj. screw Allen key size	mm	6	8	8	10	10
Displacement change per turn	cm ³	3.1	4.9	6.0	12.0	15.3
Adjustable range of displacement	cm ³	11-22	16-45	35-80	70-140	100-200
Length of adjustment range (L1)	mm	4.6-10.7	0.5-12.1	0.5-15.0	1.0-16	8.9-25.3
Lock nut size	mm	19	24	24	30	30
Lock nut tightening torque	Nm	57	128	128	235	235

◆ Minimum displacement



Minimum displacement adjustment	Pump	K3VR22	
	Setting	Low	High
Adj. screw Allen key size	mm	17	
Displacement change per turn	cm ³	2.7	
Adjustable range of displacement	cm ³	4-11	11-18
Length of adjustment range (L2)	mm	5.2-1.3	5.2-1.3
Lock nut size	mm	17	
Lock nut tightening torque	Nm	30	

NOTES

Conversion Table

Pressure	
bar	psi
1	14.5
Flow	
l/min	gal/min
1	0.264 US
1	0.219 UK
Length	
mm	inch
25.4	1
Torque	
Nm	lbf.ft
1	0.737
Power	
kW	hp
1	1.341
Mass	
kg	lbs
1	2.2

NOTES

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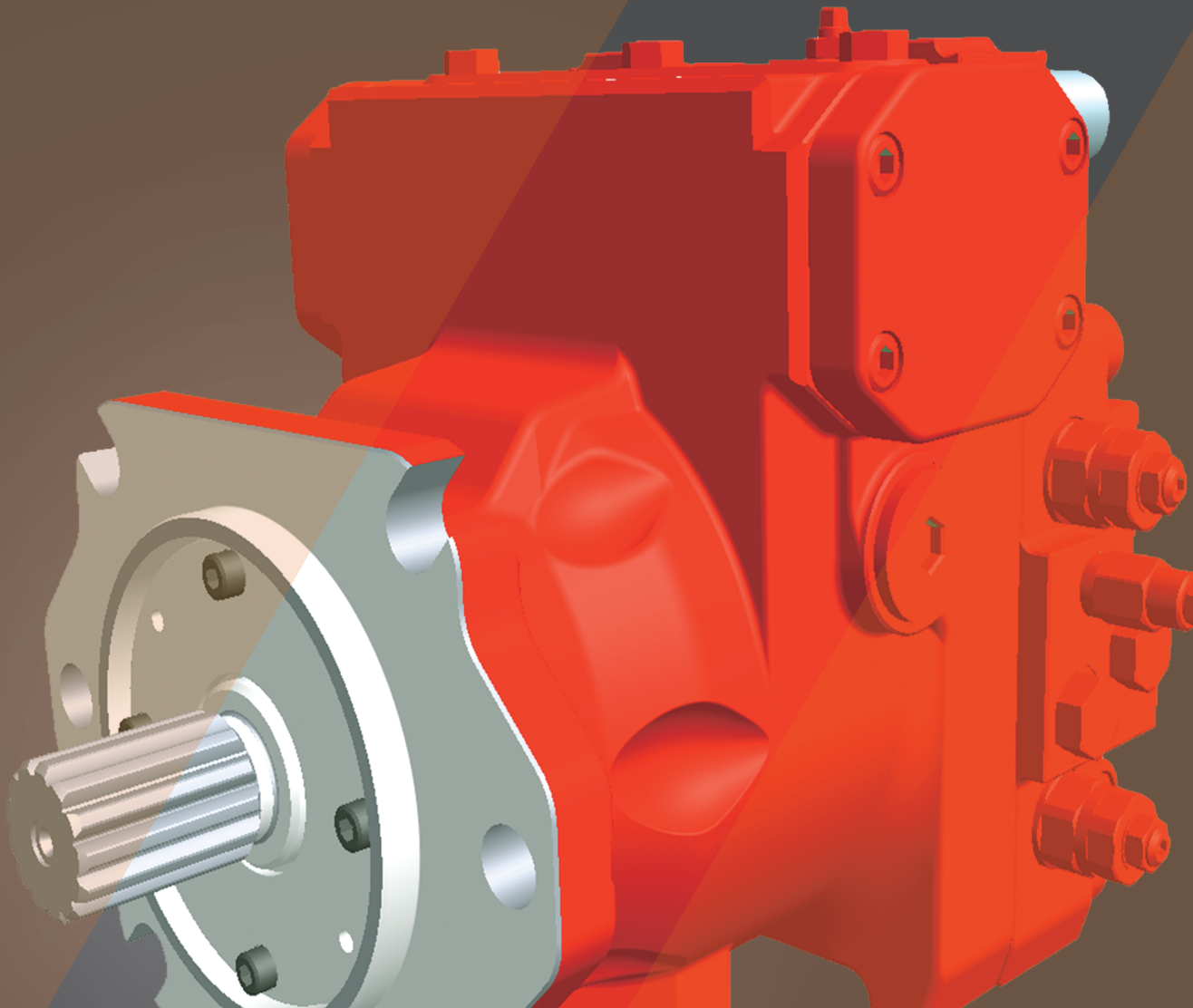
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QR code
Precision Machinery
Business Division Website

Closed Loop
Swash Plate Type Axial Piston Pump
K8V Series



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I . 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 products are intended to use in the following, please consult with Kawasaki in advance.
 - (1) Use the product under 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.

II. 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.

III. Handling Precautions

1. Operating Fluid and Temperature Range

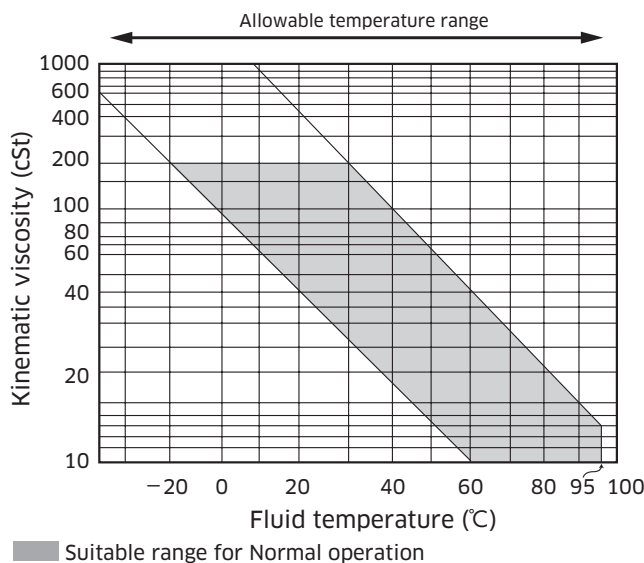
1) Operating fluid

Values shown in this catalog are based upon using mineral oil based anti-wear hydraulic fluid. To ensure optimal performance use of mineral oil based anti-wear hydraulic fluid is recommended.

2) Viscosity and temperature range

To minimize both oil and seal deterioration, a maximum operating temperature of 60°C should be considered. Please note that the regulator may become slow to respond when operating at low temperatures (below 20°C) in extreme cold environments. At such low temperature it is strongly suggested that a warm up cycle is introduced until an operating temperature of 20°C is achieved.

	Suitable range for Normal operation	Allowable range
Viscosity [mm ³ /s(cSt)]	10 to 200	10 to 1,000
Fluid Temperature [°C (°F)]	-20 to +95 (-4 to +203)	



2. Filtration and Contamination Control

1) Filtration of working oil

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.

2) Suggested acceptable contamination level

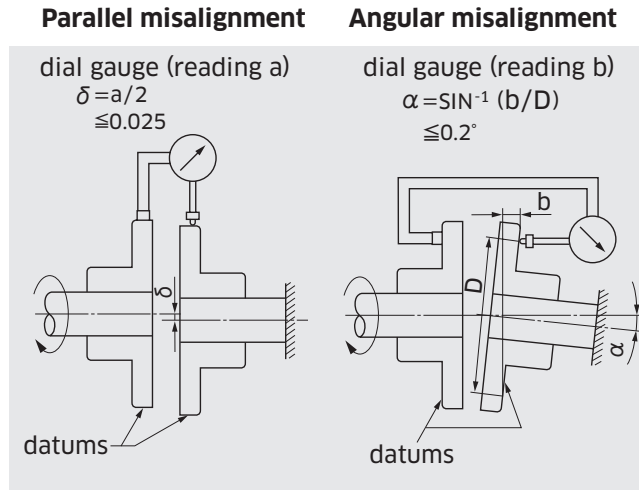
The relationship between contamination level and pump life is very difficult to predict as it depends on the type and nature of the contaminant present in the system. Sand or Silica in particular, due to its abrasive nature, does significantly reduce the expected life of a pump. Based on the precondition 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).

III. Handling Precautions

3. Drive Shaft Coupling

Alignment between the prime mover and the pump shaft should be within a tolerated margin, that is, parallel misalignment within 0.05mm TIR* and angular misalignment within 0.2° TIR*. In case the pump is directly coupled to the engine flywheel, use a flexible coupling.

*TIR = Total Indicator Reading



4. Oil Filling and Air Bleeding

1) 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 insufficient. The pump contains bearings and high-speed sliding parts including pistons with shoes and a spherical bush that need to be continuously lubricated. Part seizure or total premature failure will occur very quickly if this procedure is not rigidly followed.

2) Air bleeding

Run the pump unloaded for a period to ensure that all residual air within the system is released.

3) Long term out of usage

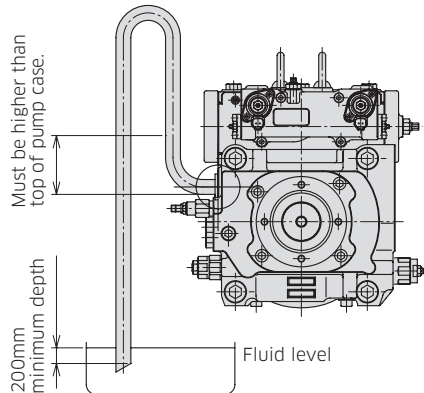
It is undesirable to leave the pump out of use for a long period e.g. a year or more. In such a situation it is recommended that the pump is run for a short period on a more frequent basis even if it is just unloaded. With regard to a pump held in storage then rotating the shaft on a frequent basis is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

III. Handling Precautions

5. Drain Piping

1) Installation of drain line

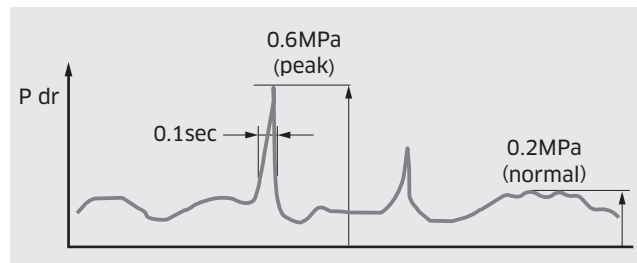
It is the preferred option to mount the pump with the case drain piping initially rising above the pump before continuing to the tank. Do not connect the drain line to the inlet line.



Cautions

- A) Inlet and drain pipes must be immersed by 200 mm minimum from the lowest level under operating conditions.
- B) Height from the oil level to the centre of the shaft must be within 1 meter maximum.
- C) 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 must be larger in size than the drain port to minimize pressure in the pump case. The pump case pressure must not exceed 0.2 MPa as shown in the illustration below. (Peak pressure must never exceed 0.6 MPa.)



2) Size of drain hose or drain pipe

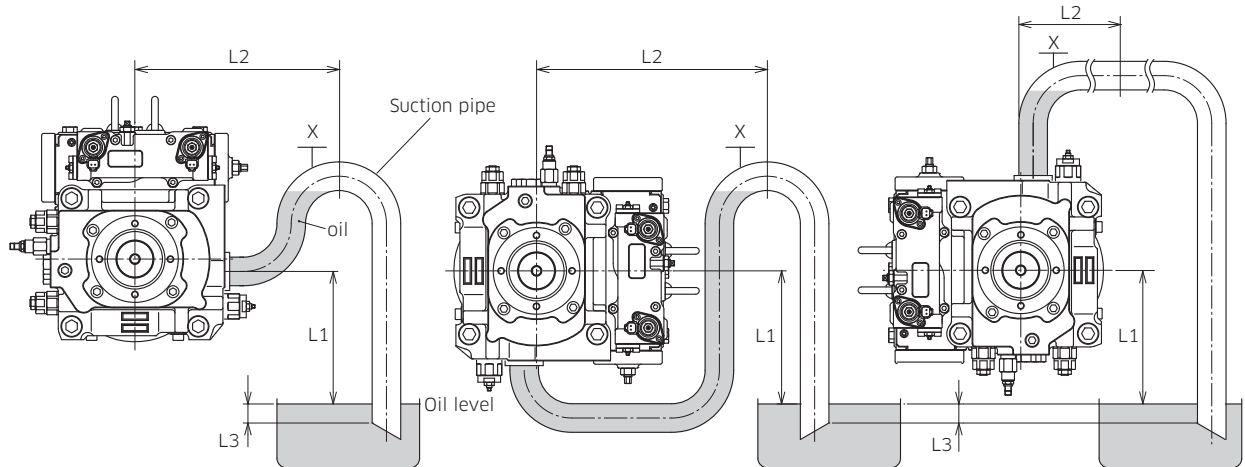
The internal bore size of the drain hose or drain pipe must be larger than that of the drain port. Arrange the drain line as short as possible.

III. Handling Precautions

6. Mounting the Pump Above the Tank

Install the suction pipe for the charge pump as shown in the following figures and fill the pump side of the suction pipe (colored sections in the figures) with oil before starting the pump. Adjust the suction pressure so that -0.02 MPa or higher pressure is obtained at the suction port.

installing conditions: $L1 \leq 1\text{m}$, $L2 \geq L1$, $L3 \geq 200\text{mm}$



X : Air release and oil filling port

7. Shaft Loading and Bearing Life

Although K8V pumps are equipped with bearings that can accept some external radial forces, exertion of external radial loads will affect bearing life. Depending on the load magnitude, the load position, and the load orientation, bearing life may be influenced and reduced.

Consult with Kawasaki for further details.

8. Minimum Boost Pressure

The K8V series pump requires the minimum boost pressure of 2.0 MPa in the low pressure line in order to provide stable control. In addition, setting value of the charge pressure should be lower than that of the low pressure relief valve.

9. Minimum effective pressure

In order to maintain stable control characteristics, ensure the effective pressure of main pump more than 1 MPa during continuous operation.

IV. Conversion Factors, Formula and Definition

◆ Conversion Factors

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

◆ Formula

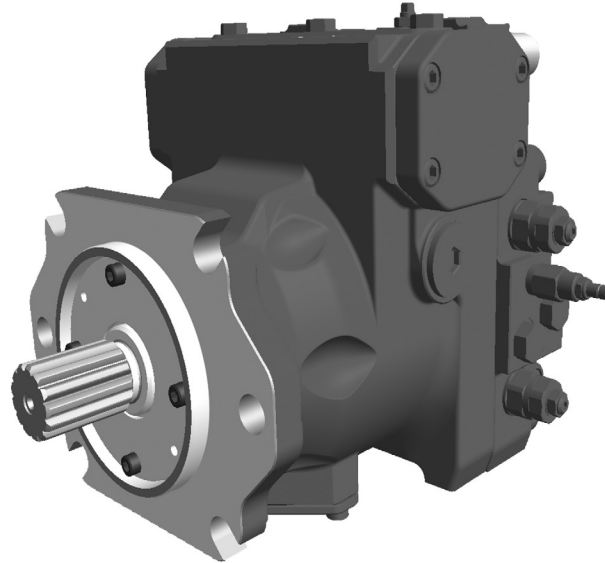
	Metric system		Imperial system	
Output flow	$Q = q \times N \times \eta_v / 1000$	L/min	$Q = q \times N \times \eta_v / 231$	gal/min
Input torque	$T = q \times \Delta P / 2\pi / \eta_m$	Nm	$T = q \times \Delta P / 24\pi / \eta_m$	lbf-ft
Input power	$L = T \times N / 9550 = Q \times \Delta P / 60 / \eta_t$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

◆ Definition

q	= Pump displacement / rev.	$\text{cm}^3 (\text{in}^3)$
L	= Input power	kW (hp)
N	= Speed	$\text{min}^{-1} (\text{rpm})$
N_{max}	= Maximum speed at maximum displacement	$\text{min}^{-1} (\text{rpm})$
ΔP	= $P_{\text{high}} - P_{\text{low}}$ (Differential pressure)	MPa (psi)
P_{high}	= High pressure	MPa (psi)
P_{low}	= Low pressure	MPa (psi)
P_{rated}	= Rated pressure	MPa (psi)
P_{peak}	= Peak pressure	MPa (psi)
P_c	= charge pressure	MPa (psi)
T	= Input torque	Nm (lbf-ft)
T_{max}	= Maximum input torque	Nm (lbf-ft)
η_v	= Pump volumetric efficiency	
η_m	= Pump mechanical efficiency	
η_t	= Pump total efficiency	

K8V Series

Closed Loop Swash Plate Type Axial Piston Pump



■ Specifications

Size: 71, 90, 125
 Rated Pressure: 42 MPa
 Peak Pressure: 50 MPa

■ General Descriptions

The K8V series are variable displacement axial piston pumps for closed loop systems, with superior overall efficiency, stability, and control characteristics.

The K8V pumps are applicable for a wide range of applications, including industrial vehicles such as construction machinery, agricultural equipment with hydrostatic drive systems, and other closed loop applications. Also, this pump can be used in combination with M7V series motors for high pressure closed loop applications.

The K8V series with a range in pump size from 71 to 130 cm³/rev are equipped with electric or hydraulic pilot displacement control. The K8V series pumps, having the integrated components required for a closed system, such as a charge pump, high and low pressure relief valves, and a cut-off valve, enable a compact closed loop system.

■ Features

- Swash plate type, variable displacement axial piston pump for closed loop system
- High overall efficiency
- Suitable for wide range of applications
- Precise flow control
- High stability
- Excellent reliability
- Various integrated valves
- Bypass function for emergency towing

1

Ordering Code

1-1 Pump Options

Model Code **K8V 125 B R D1 A1 A B B X X X X - P1 D C B A 01**

1. K8V Series Pump
K8V Series, Variable Displacement,
Axial Piston, Closed Loop Pump

2. Size

Pump Size	71	90	125
	●	●	●

3. Model Code

B Series B	71	90	125
	●	●	●

4. Direction of Rotation

	71	90	125
R Clockwise	●	●	●
L Counterclockwise	●	●	●

5. Mounting Flange and Shaft

	71	90	125
C1 SAE C Mount & SAE C Shaft (14T-12/24DP)	●	—	—
D1 SAE D Mount & SAE D Shaft (13T-8/16 DP)	—	●	●
D2 SAE D Mount & SAE F Shaft (15T-8/16 DP)	—	—	●

6. Through Drive

	71	90	125
A1 SAE A, 2 bolt, Through Drive (9T-16/32 DP)	●	●	●
B1 SAE B, 2 bolt Through Drive (13T-16/32 DP)	●	●	●
B2 SAE BB, 2 bolt, Through Drive (15T-16/32 DP)	●	●	●
C1 SAE C, 2/4 bolt, Through Drive (14T-12/24 DP)	●	●	●
C2 SAE CC, 2/4 bolt, Through Drive (17T-12/24 DP)	—	●	●
D1 SAE D, 2/4 bolt Through Drive (13T-8/16 DP)	—	●	●
AJ SAE A, 2 bolt, Through Drive (9T-16/32 DP) Covered with Steel Plate	●	●	●
BJ SAE B, 2 bolt, Through Drive (13T-16/32 DP) Covered with Steel Plate	●	●	●
BK SAE BB, 2 bolt, Through Drive (15T-16/32 DP) Covered with Steel Plate	●	●	●
CJ SAE C, 2/4 bolt, Through Drive (14T-12/24 DP) Covered with Steel Plate	●	●	●
CK SAE CC, 2/4 bolt, Through Drive (17T-12/24 DP) Covered with Steel Plate	—	●	●
DJ SAE D, 2/4 bolt, Through Drive (13T-8/16 DP) Covered with Steel Plate	—	●	●
X Without Through Drive	●	●	●

7. Thread Type (Suction/Delivery)

Type of Threaded Port	Thread Type for Flange Port	71	90	125
A UNF	Metric	●	●	●
C UNF	UNF	●	●	●

8. Charge Pump

	71	90	125
A 20 cm ³	●	●	—
B 28 cm ³	●	●	●
X Without Integrated Charge Pump	●	●	●

9. Stroking Speed Control Orifice

	71	90	125
A Φ 0.8	●	—	●
B Φ 1.0	●	●	●
C Φ 1.2	●	●	●
D Φ 1.4	—	●	—
X Without Orifice Available Only with Code X of Pressure Cut-off Valve [16]	●	●	●

10. Mechanical Stroke Limiter

	71	90	125
X Without Mechanical Stroke Limiter	●	●	●

11. Filtration System

	71	90	125
B Remote Pressure Filtration With Ports For External Charge Circuit Filter	●	●	●
X Without Pressure Filtration	●	●	●

13. Special Features

	71	90	125
X Without Any Special Feature	●	●	●

12. Swivel Angle Sensor

	71	90	125
X Without Swivel Angle Sensor	●	●	●

● : Available
— : Not available

1. Ordering Code

1-2 Regulator Options

Model Code ¹ **K** ² **8V** ³ **125** ⁴ **B** ⁵ **R** ⁶ **D** ⁷ **1** ⁸ **A** ⁹ **1** ¹⁰ **A** ¹¹ **B** ¹² **B** ¹³ **X** ¹⁴ **X** ¹⁵ **X** ¹⁶ **X** ¹⁷ **X** ¹⁸ **X** - **P1** **D** **C** **B** **A** **01**

14. Control Option

		71	90	125
P1	Electronic Proportional Displacement Control (24V)	●	●	●
P2	Electronic Proportional Displacement Control (12V)	●	●	●
P3	Hydraulic Proportional Displacement Control	●	●	●

15. High Pressure Relief Valve

		71	90	125
K	20 MPa	●	●	●
L	25 MPa	●	●	●
A	30 MPa	●	●	●
B	35 MPa	●	●	●
C	40 MPa	●	●	●
D	45 MPa	●	●	●
E	50 MPa	●	●	●
S	Customized Pressure Setting for Special Case	●	●	●

16. Pressure Cut-Off Valve

		71	90	125
J	15 MPa	●	●	●
K	20 MPa	●	●	●
L	25 MPa	●	●	●
A	30 MPa	●	●	●
B	35 MPa	●	●	●
C	40 MPa	●	●	●
D	42 MPa	●	●	●
S	Customized Pressure Setting for Special Case	●	●	●
X	Without Cut-Off Valve	●	●	●

Note: The pressure setting of cut-off valve must be at least 5MPa lower than the pressure setting of high pressure relief valve.

17. Low Pressure Relief Valve

		71	90	125
B	2.5 MPa	●	●	●
S	Customized Pressure Setting for Special Case	●	●	●
X	Without Low Pressure Relief Valve	●	●	●

18. Design Code

**	01 ~
----	------

● : Available
 — : Not available

2

Technical Information

2-1 Specifications

Size		71	90	125		
Displacement	Main pump	cm ³	71	90	130	
	Charge pump	cm ³	20	20	28	
Pressure, main	Rated	MPa	42			
	Peak	MPa	50			
Pressure, charge	Rated	MPa	2.5			
	Peak	MPa	4.0			
Allowable case pressure		MPa	0.2 continuous / 0.6 peak			
Speed	Charge pump 20cm ³ , or without Charge pump	Rated* ¹	min ⁻¹	3,300	3,050	2,850
		Maximum* ² (intermittent)	min ⁻¹	4,100	3,800	3,450
		Minimum	min ⁻¹	500	500	500
	Charge pump 28cm ³	Rated* ¹	min ⁻¹	3,050	3,050	2,850
		Maximum* ² (intermittent)	min ⁻¹	3,450	3,450	3,450
		Minimum	min ⁻¹	500	500	500
Case volume		L	2.5	3.0	4.0	
Temperature range		°C	-20 to +95 (case drain: 115 maximum, intermittent)			
Viscosity range		cSt	10 to 1,000			
Maximum contamination level			ISO 4406 -/18/15			
Allowable through drive torque	Nm	SAE A	123	123	123	
		SAE B	395	395	395	
		SAE BB	455	575	640	
		SAE C	475	575	725	
		SAE CC	-	575	830	
		SAE D	-	605	870	
Mass		kg	60	75	97	
Moment of inertia		kg · m ²	8.71 × 10 ⁻³	1.21 × 10 ⁻²	2.35 × 10 ⁻²	
Torsional stiffness		Nm/rad	7.97 × 10 ⁴	1.46 × 10 ⁵	2.04 × 10 ⁵	
Coating			Red synthetic resin primer			

* 1 : maximum allowable speed for continuous operation.

* 2 : maximum allowable speed for limited operating period and duty. Exceeding this value will result in a reduced service life or the destruction of the pump.

Note: Operation above the maximum values or below the minimum values may result in a loss of function, a reduced service life or the destruction of the pump.

■ Allowable maximum input torque

	SAE C (Ordering code[5]: C1)	SAE D (Ordering code[5]: D1)	SAE F (Ordering code[5]: D2)
Spline specification	14T DP=12/24	13T DP=8/16	15T DP=8/16
Allowable and maximum input torque (Nm)	600	1,470	2,255
Pump size	K8V71	K8V90/125	K8V125 (Combination pump)

Input shaft splines conform to SAE J744.

Involute splines conform to ANSI B92.1a, 30° pressure angle, side fit.

Two mounting options are available each for the K8V125.

If a combination pump of the K8V125 requires the input torque higher than the allowable maximum input torque of D1 (1470Nm), D2 option must be chosen.

Proper lubrication is required to reduce friction and wear of the shaft.

2. Technical Information

2-1 Specifications

◆ Relief Valve

1. High pressure relief valve

High pressure relief valves (two valves) are equipped to protect the pump from being overloaded.

The high pressure relief valves act to protect the pump from pressure spikes in dynamic control situations and are not equipped for continuous operation.

The settings of the high pressure relief valves are shown in the table below.

Pressure settings

Code[15]	Pressure setting (MPa)
K	20
L	25
A	30
B	35
C	40
D	45
E	50
S	Customized pressure setting for a special case Please contact Kawasaki.

Note:

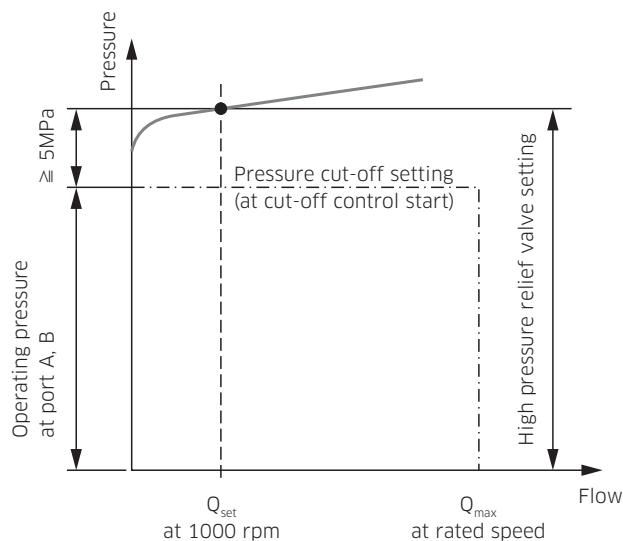
The allowable setting range of the high pressure relief valve is from 20 MPa to 50 MPa, and the customized pressure must be set within this range. For the customized pressure setting contact Kawasaki with the required pressure setting value. The pressure of the high pressure relief valve is factory preset at 40 MPa, if not specified.

2. Low pressure relief valve

Low pressure relief valve is equipped to control the pressure for charge line and servo line.

The pressure setting of an integrated low pressure relief valve is preset at 2.5 MPa at the factory.

Do not adjust the pressure of the low pressure relief valve, as it may reduce the controllability of the pump.



High pressure relief valve setting diagram

◆ Pressure Cut-off

Pressure cut-off is the function which adjusts the pump displacement to the neutral position when the pressure reaches its pressure setting.

The pressure cut-off is set lower than high pressure relief valve setting, so that the maximum pump pressure is controlled by the pressure cut-off valve, whereas the high pressure relief valve acts to the pressure spike.

The cut-off pressure must be set at least 5 MPa lower than the setting of the high pressure relief valves.

The allowable setting range of the cut-off pressure is from 15 MPa to 42 MPa.

2. Technical Information

2-1 Specifications

◆ Charge Pump

Charge flow is required on all K8V pumps applied in closed circuit systems. The charge pump supplies flow to replenish, cool and filter oil, provide charge pressure and servo pressure, and flow for system control and auxiliary functions.

The standard size of integrated charge pumps as follows;

K8V71/90: 20 cm^3/rev

K8V125: 28 cm^3/rev

If the pump is required a lot of flushing flow or continuously operating at low speed or at high temperature, the pump control characteristics might be unstable due to lack of supply from the integrated charge pump. Although the typical integrated charge pump sizes of K8V71/90 are 20 cm^3/rev , 28 cm^3/rev can be selected if necessary.

Pressure and flow for charge circuit can be supplied by an external auxiliary pump.

An auxiliary pump for charge circuit can also be mounted on the back of main pump using through drive mounting.

In case the auxiliary pump is used for charge circuit, connect the charge pump delivery line to port C so that the flow is provided to the low pressure line and servo line. The integrated low pressure relief valve can be used in this case. If the integrated low pressure relief valve is not used, provide an appropriate relief valve in the system.

2. Technical Information

2-1 Specifications

Filtration of Charge Pump

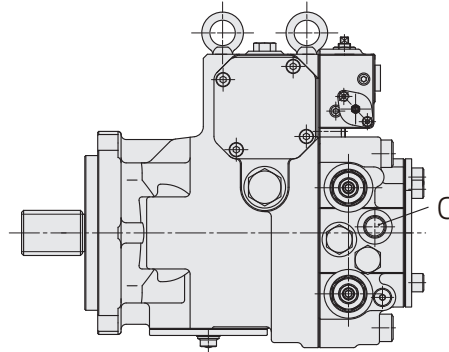
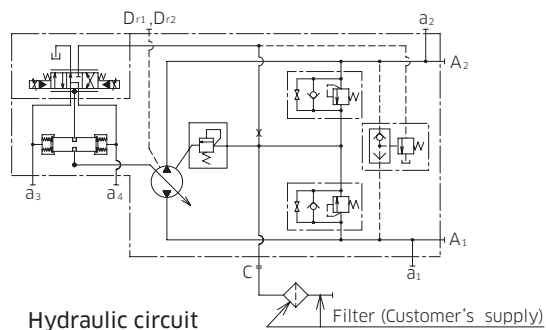
Filtration of the hydraulic fluid reduces premature wear, and enhances the reliability and productivity of the products. To ensure the cleanliness of the working fluid is essential to optimize function of the machine, and extend the service life.

Filtration system

1) External filtration system / External supply (Ordering code [11] : X)

This option is for a pump without an integrated charge pump. External charge pump supply comes from port C.

Filter arrangement should be made separately.



2) Remote filtration system (Ordering code [11] : B)

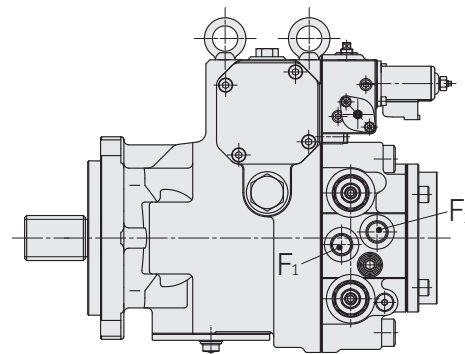
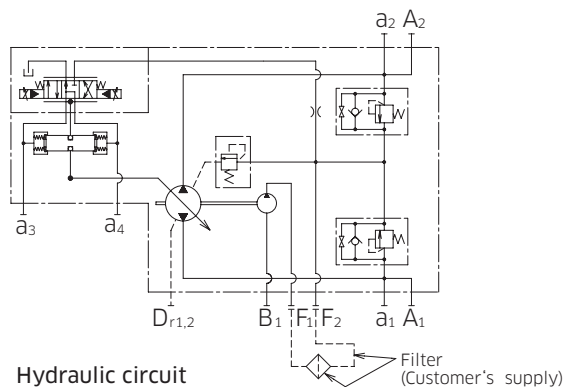
This is for a pump equipped with an integrated charge pump and ports for external charge circuit filter. The filter will be located in the discharge (pressure) line of the charge pump, as shown in the hydraulic circuit below.

Filters with bypass are not recommended.

Filter arrangement should be made separately, as the filter is not included in the delivery contents.

Charge pressure outlet: Port F_1

Charge pressure inlet: Port F_2



2. Technical Information

2-2 Functional Description of Regulator

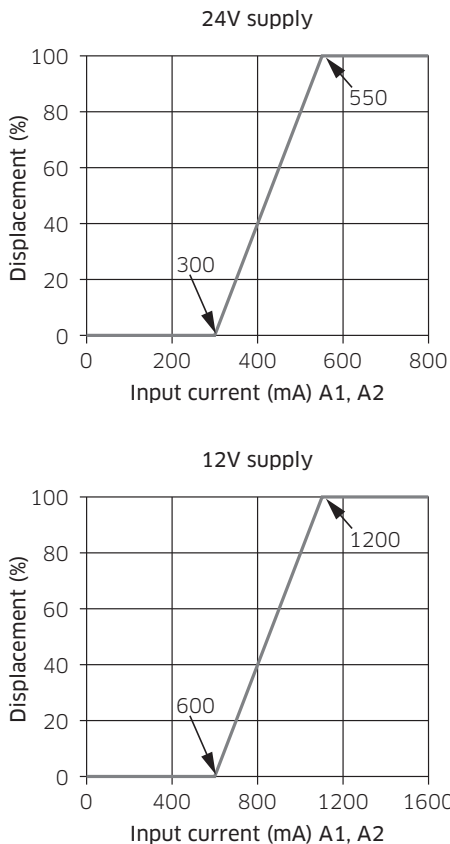
◆ Electric Proportional Control (Ordering code [14] : P1, P2)

Pump delivery flow can be proportionally controlled by the input current to the electric proportional reducing valve equipped on the regulator.

The input current of the electric proportional reducing valve signals the control spool in a regulator to stroke, and to supply pressure to the servo piston. The pump displacement varies with the stroke of the servo piston.

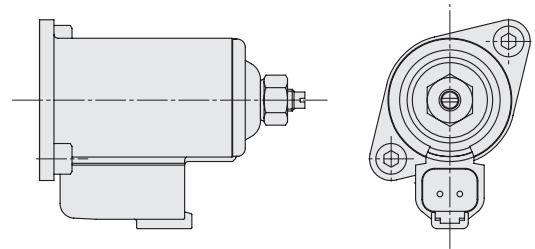
The feedback lever, connected with the servo piston at the one end, moves with the stroke of the servo piston. This movement causes the sleeve of the control spool which is connected to the other end of the feedback lever to stroke, and closes the flow passage to the servo piston. Consequently, the stroke of the servo piston stops, and the pump displacement becomes proportional to the input current.

Control characteristics



The above figures is the control characteristics of electric proportional control. The control characteristics of electric proportional control is not adjustable.

● Electrical specifications

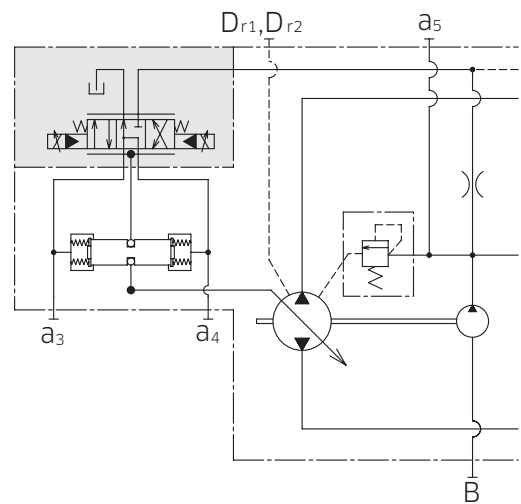


Connector type

TYCO ELECTRONICS JAPAN DT04-2P
Rated Current and Coil Resistance
For 24 V supply: 0.7 A, 15 Ω (at 20°C)
For 12 V supply: 1.6 A, 3.3 Ω (at 20°C)

Recommended dither condition
85 Hz, 200 mAp-p for 24 V
85 Hz, 600 mAp-p for 12 V

(Note)
Electric displacement control regulator requires the minimum servo pressure is 2.0 MPa.



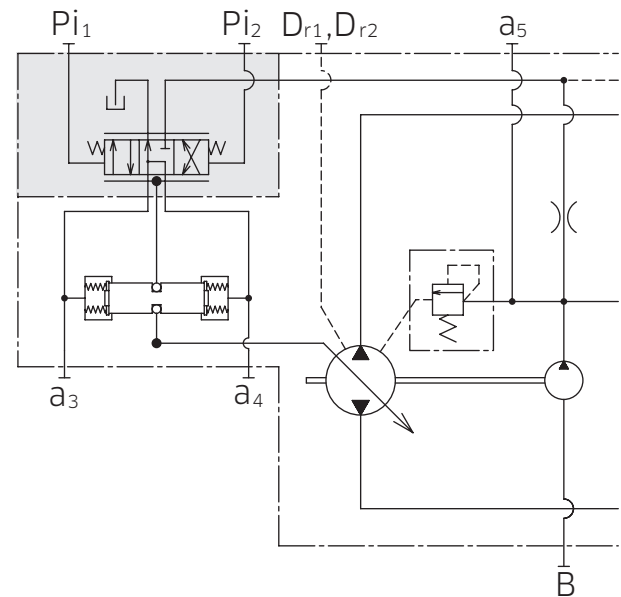
Hydraulic circuit

2. Technical Information

2-2 Functional Description of Regulator

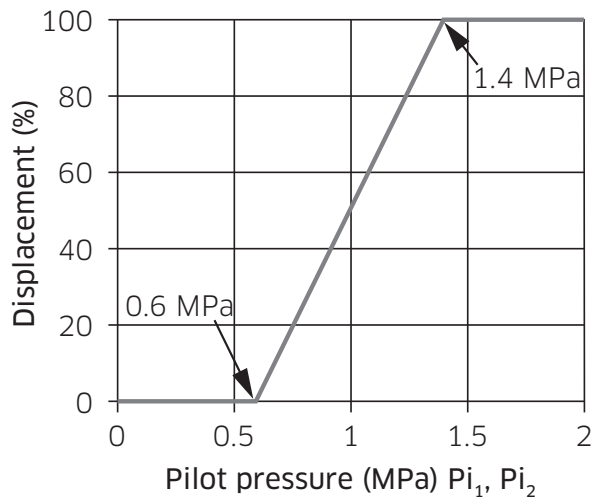
◆ Hydraulic Pilot Displacement Control (Ordering code [14] : P3)

Pump delivery flow can be proportionally controlled by the external pilot pressure supply. The external pilot pressure signals the control spool in a regulator to stroke, and to supply pressure to the servo piston. The pump displacement varies with the stroke of the servo piston. The feedback lever, connected with the servo piston at the one end, moves with the stroke of the servo piston. This movement causes the sleeve of the control spool which is connected with the other end of the feedback lever to stroke, and closes the flow passage to the servo piston. Consequently, the stroke of the servo piston stops, and the pump displacement becomes proportional to the external pilot pressure.



Hydraulic circuit

Control characteristics



The above figure is the standard control characteristic of hydraulic pilot displacement control. If non standard control characteristics is required, please contact Kawasaki.

2. Technical Information

2-2 Functional Description of Regulator

◆ Mechanical Stroke Limiter

Mechanical stroke limiter is available for option. By an adjusting screw the maximum displacement can be adjusted infinitely to the required displacement setting.

This option is under development. For details contact Kawasaki.

◆ Stroking Speed Control Orifice

Pump stroking speed (response) can be adjusted by changing the control orifice which is integrated in the servo line. The available control orifices and those response (for reference) are shown in the table below.

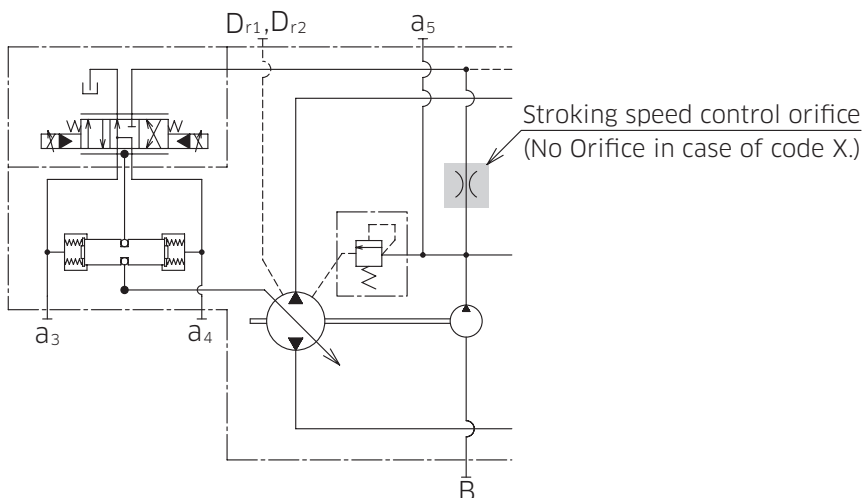
The typical orifice size used is as below;

K8V71: Φ 1.0

K8V90: Φ 1.2

K8V125: Φ 1.0

	Code [9]	Orifice size	Stroking time	
			Neutral to Max.	Max. to Neutral
K8V71	A	Φ 0.8	2.0 to 3.0 sec	0.3 to 1.0 sec
	B	Φ 1.0	1.5 to 2.0 sec	
	C	Φ 1.2	1.0 to 1.5 sec	
K8V90	B	Φ 1.0	2.0 to 2.5 sec	0.5 to 1.5 sec
	C	Φ 1.2	1.5 to 2.0 sec	
	D	Φ 1.4	1.0 to 1.5 sec	
K8V125	A	Φ 0.8	4.0 to 5.0 sec	0.5 to 1.5 sec
	B	Φ 1.0	3.0 to 4.0 sec	
	C	Φ 1.2	2.0 to 3.0 sec	



3 Dimensions

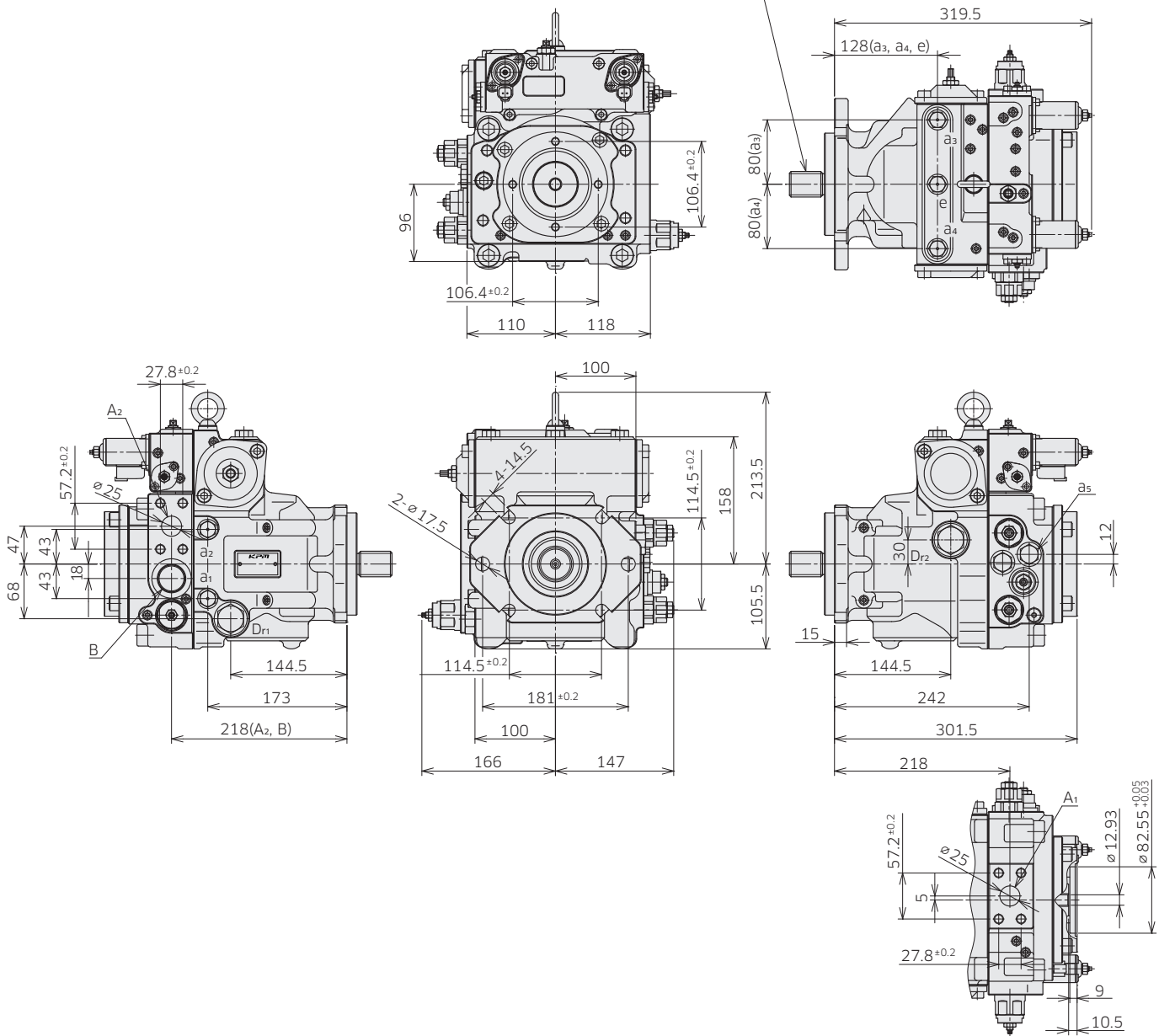
3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V71

Model Code : K8V 71 B R C1 A1 * A * X X X X - P1 * * * A * *

SAE "C" 30° Involute Spline Shaft
SAE J744-32-4 14T 12/24 DP



(Note) See port details for thread size on port A1 and A2.

3. Dimensions

3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V71 Port Details

Main flanged ports

Des	Port name	Port size	Flange thread	Tightening torque (Nm)
-----	-----------	-----------	---------------	------------------------

UNF thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (Code 62) 1"	7/16-14UNC-2B-17-21.5	69
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Metric thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (Code 62) 1"	M12-17	98
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Auxiliary port

Des	Port name	Port size	Tightening torque (Nm)
Dr ₁ , Dr ₂	Drain port	1-1/16-12UN-2B-19 (ISO 11926-1 : 1995)	170
a ₁ , a ₂ , a ₃ , a ₄	Gauge port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
B	Inlet port	1-5/16-12UN-2B-19 (ISO 11926-1 : 1995)	300
a ₅	Gauge port	3/4-16UNF-2B-15 (ISO 11926-1 : 1995)	98
e	Air vent port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
F ₁	External filter port (out)	3/4-16UNF-2B-15 (ISO 11926-1 : 1995)	98
F ₂	External filter port (in)	3/4-16UNF-2B-15 (ISO 11926-1 : 1995)	98
C	External charge pressure supply port	3/4-16UNF-2B-15 (ISO 11926-1 : 1995)	98
Pi ₁ , Pi ₂	Pilot port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59

3. Dimensions

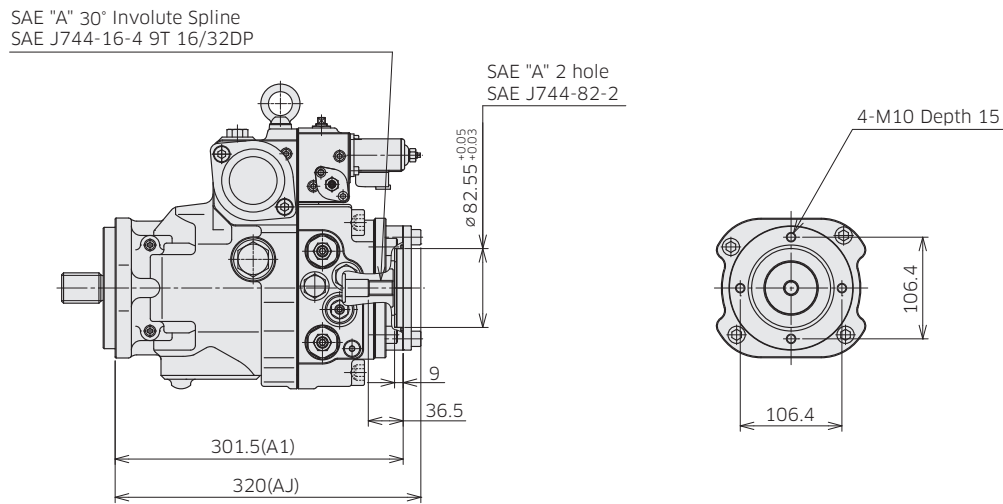
3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V71 Through Drive Options

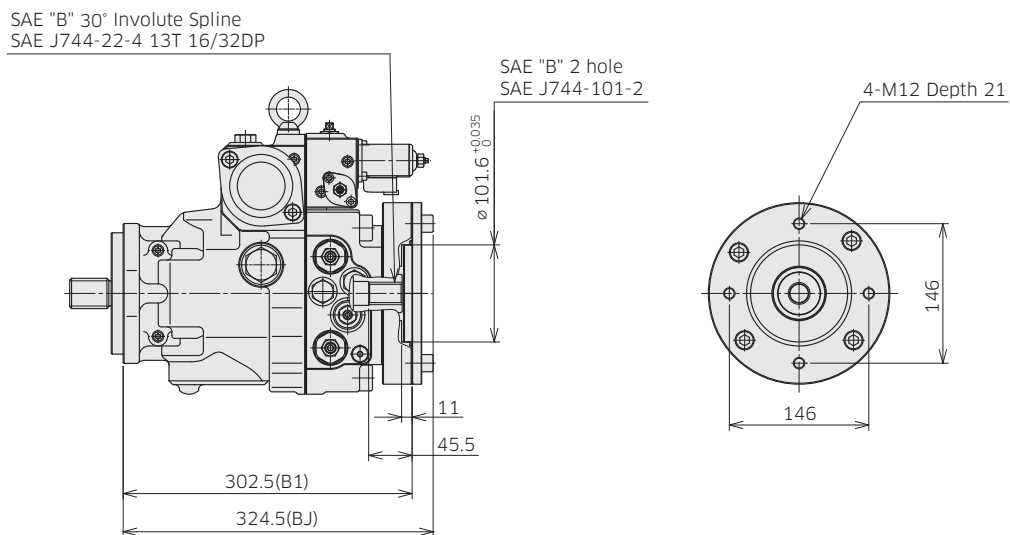
Through Drive SAE A

Ordering Code '6.Through Drive' : A1, AJ



Through Drive SAE B

Ordering Code '6.Through Drive' : B1, BJ



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

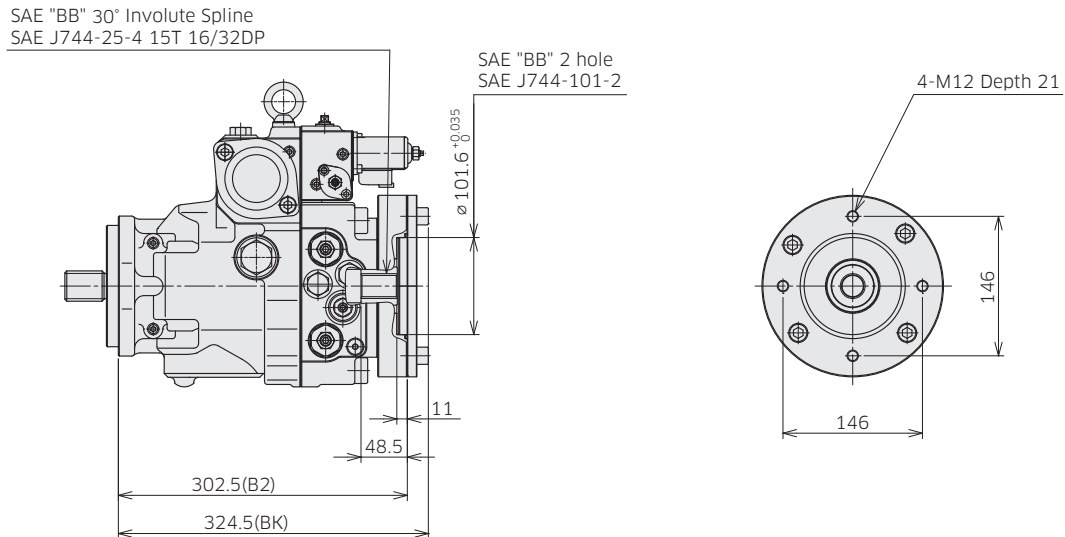
3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V71 Through Drive Options

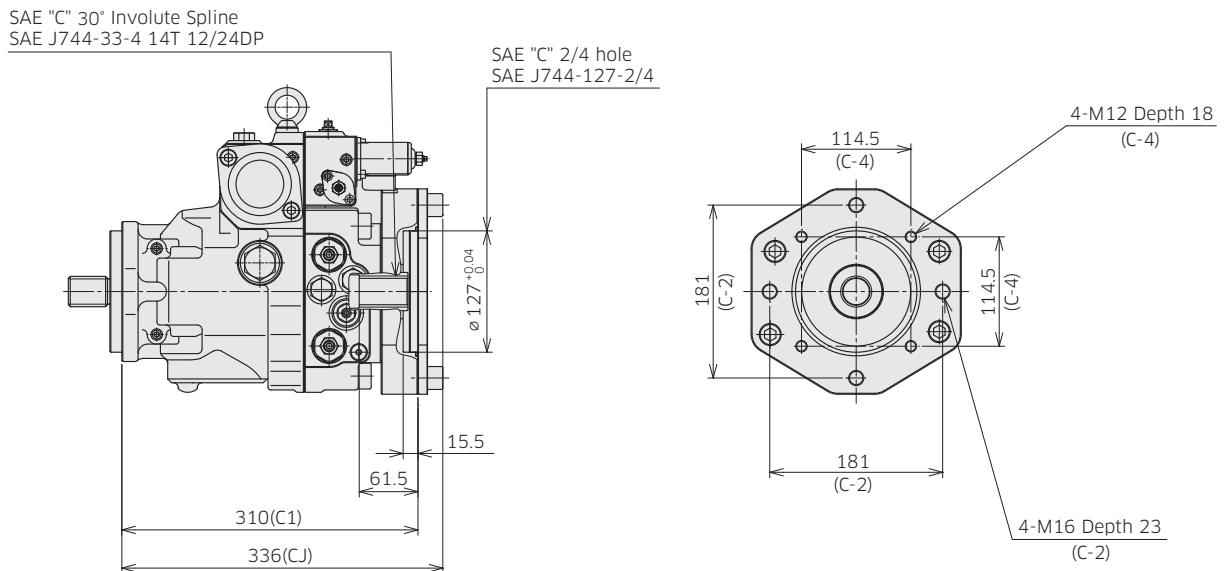
Through Drive SAE BB

Ordering Code '6.Through Drive' : B2, BK



Through Drive SAE C

Ordering Code '6.Through Drive' : C1, CJ



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

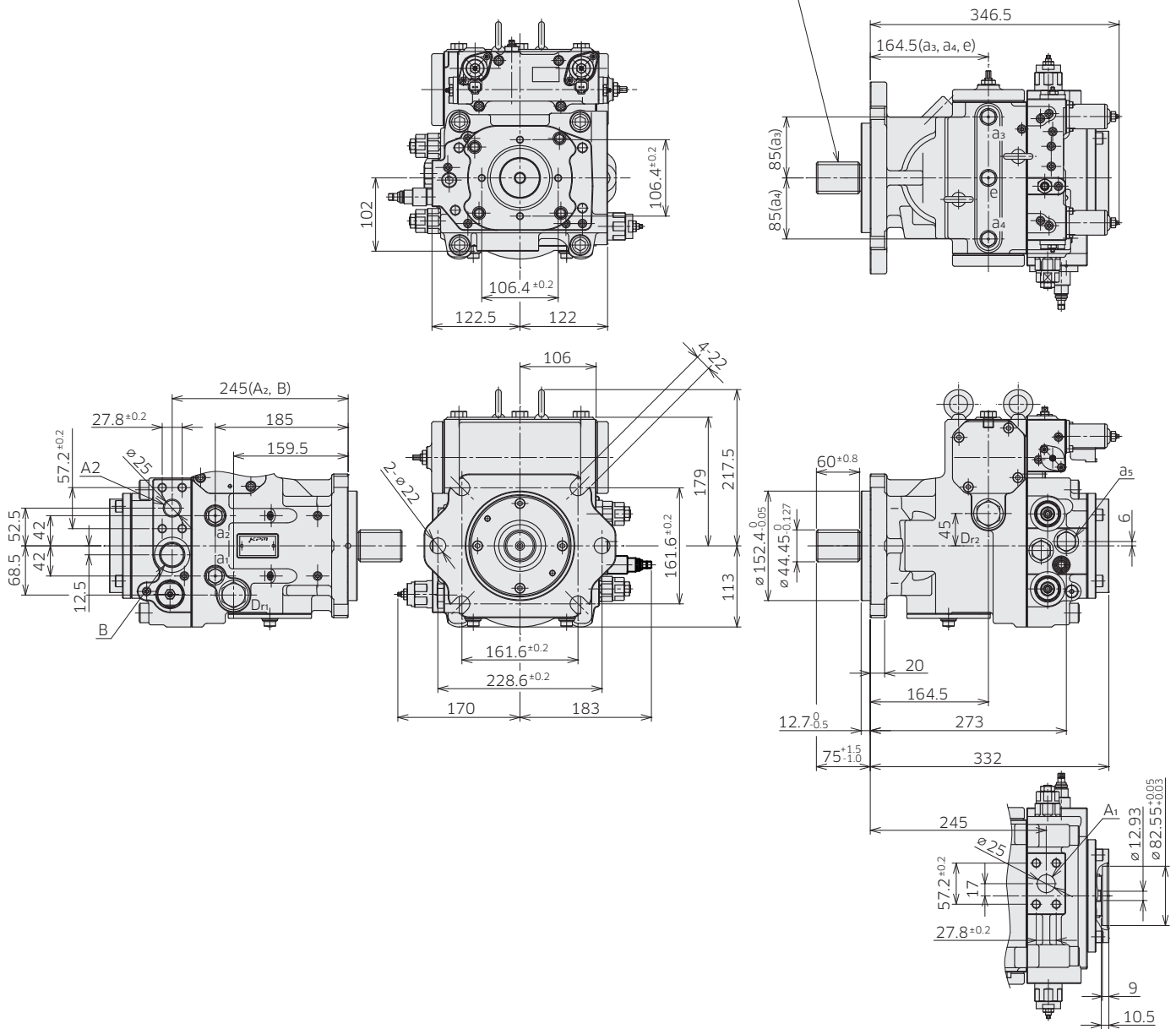
3-1 Installation Dimensions

* Dimensions in mm.

◆ K8V90

Model Code : K8V 90 B R D1 A1 * A * X X X X - P1 * * * A * *

SAE "D" 30° Involute Spline Shaft
SAE J744-44-4 13T 8/16 DP



(Note) See port details for thread size on port A1 and A2.

3. Dimensions

3-1 Installation Dimensions

◆ K8V90 Port Details

Main flanged ports

Des	Port name	Port size	Flange thread	Tightening torque (Nm)
-----	-----------	-----------	---------------	------------------------

UNF thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (code 62) 1"	1/2-13UNC-2B-19/24	69
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Metric thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (code 62) 1"	M12-17	98
---------------------------------	---------------	--------------------------------------	--------	----

Auxiliary port

Des	Port name	Port size	Tightening torque (Nm)
Dr ₁ , Dr ₂	Drain port	1-1/16-12UN-2B-19 (ISO 11926-1 : 1995)	170
a ₁ , a ₂ , a ₃ , a ₄	Gauge port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
B	Inlet port	1-5/16-12UN-2B-19 (ISO 11926-1 : 1995)	300
a ₅	Gauge port	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
e	Air vent port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
F ₁	External filter port (out)	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
F ₂	External filter port (in)	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
C	External charge pressure supply port	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
Pi ₁ , Pi ₂	Pilot port	9/16-18UNF-2B-12.7 (ISO 11926-1:1995)	59

3. Dimensions

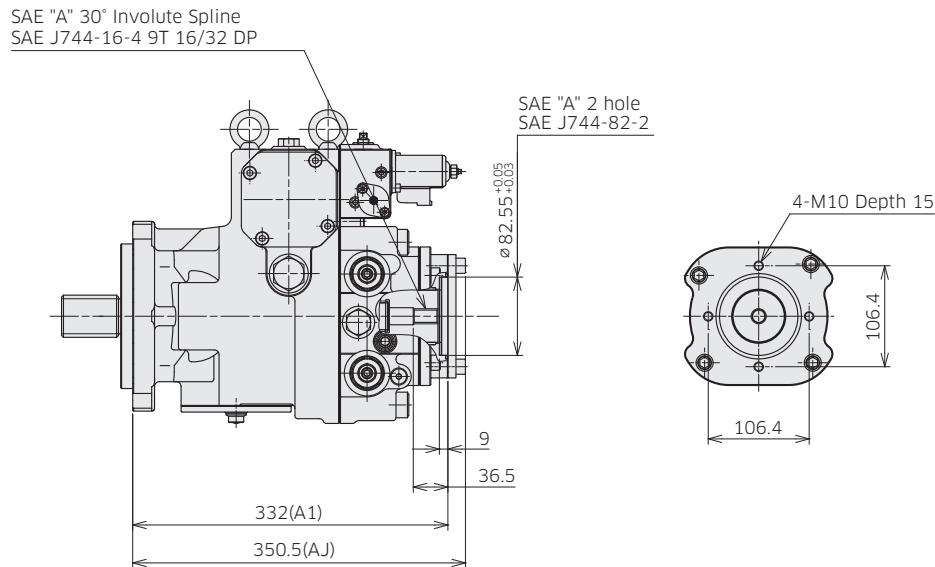
3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V90 Through Drive Options

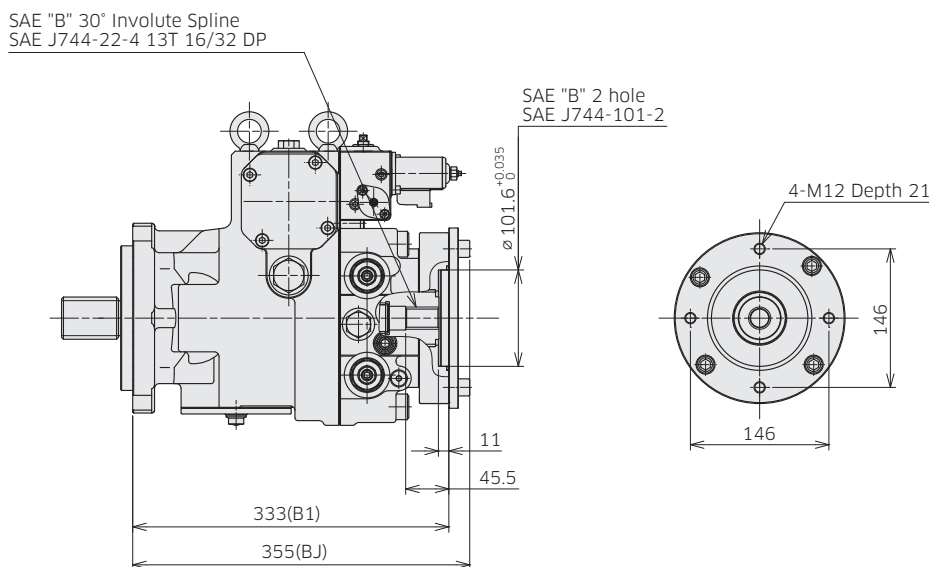
Through Drive SAE A

Ordering Code '6.Through Drive' : A1, AJ



Through Drive SAE B

Ordering Code '6.Through Drive' : B1, BJ



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

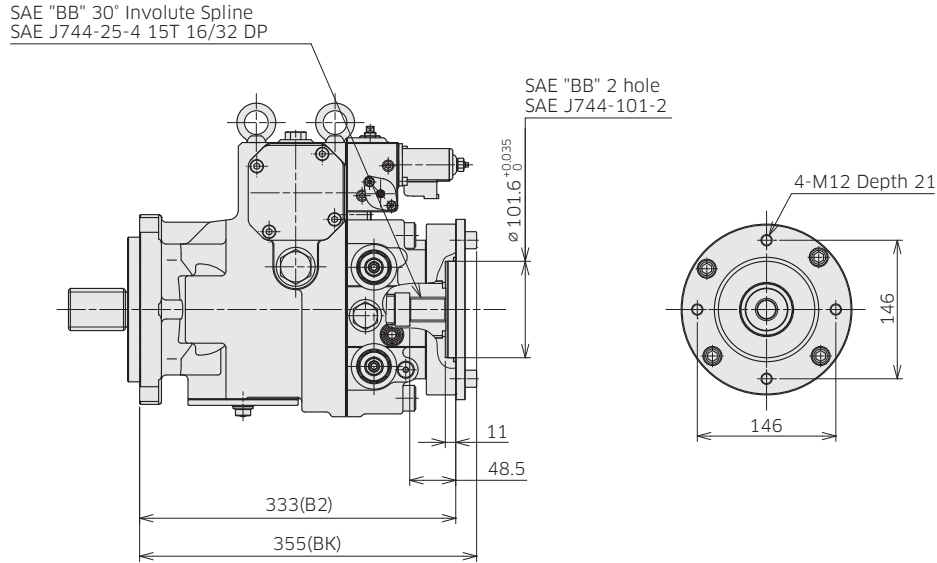
3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V90 Through Drive Options

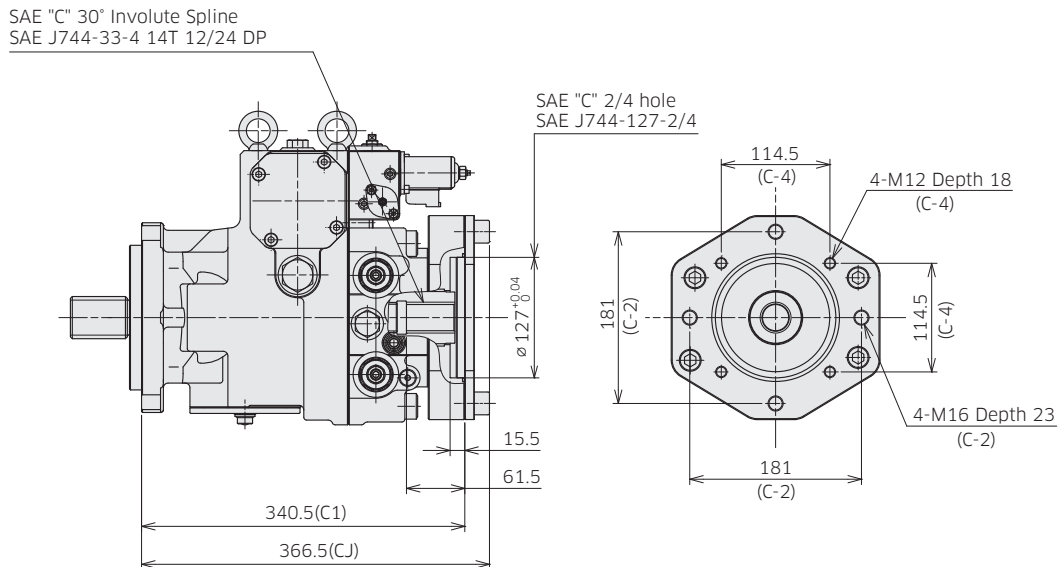
Through Drive SAE BB

Ordering Code '6.Through Drive' : B2, BJ



Through Drive SAE C

Ordering Code '6.Through Drive' : C1, CJ



involute spline according to ANSI B92.1a, 30° pressure angle, full root, side fit

3. Dimensions

3-1 Installation Dimensions

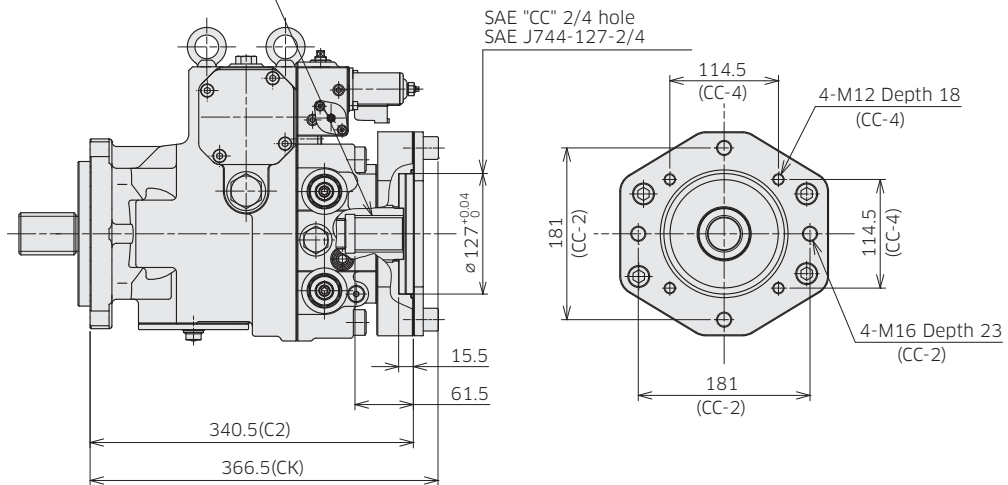
*Dimensions in mm.

◆ K8V90 Through Drive Options

Through Drive SAE CC

Ordering Code '6.Through Drive' : C2, CJ

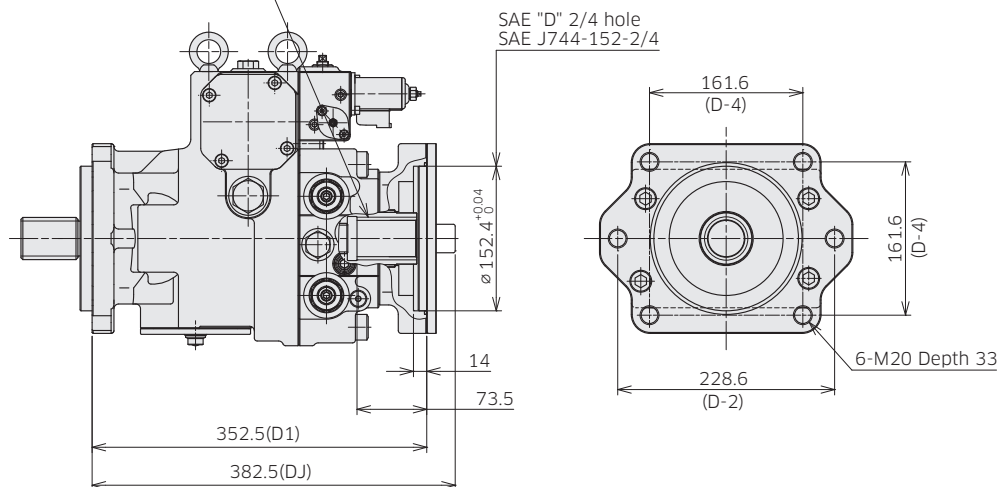
SAE "CC" 30° Involute Spline
SAE J744-38-4 17T 12/24 DP



Through Drive SAE D

Ordering Code '6.Through Drive' : D1, DJ

SAE "D" 30° Involute Spline
SAE J744-47-4 13T 8/16 DP



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

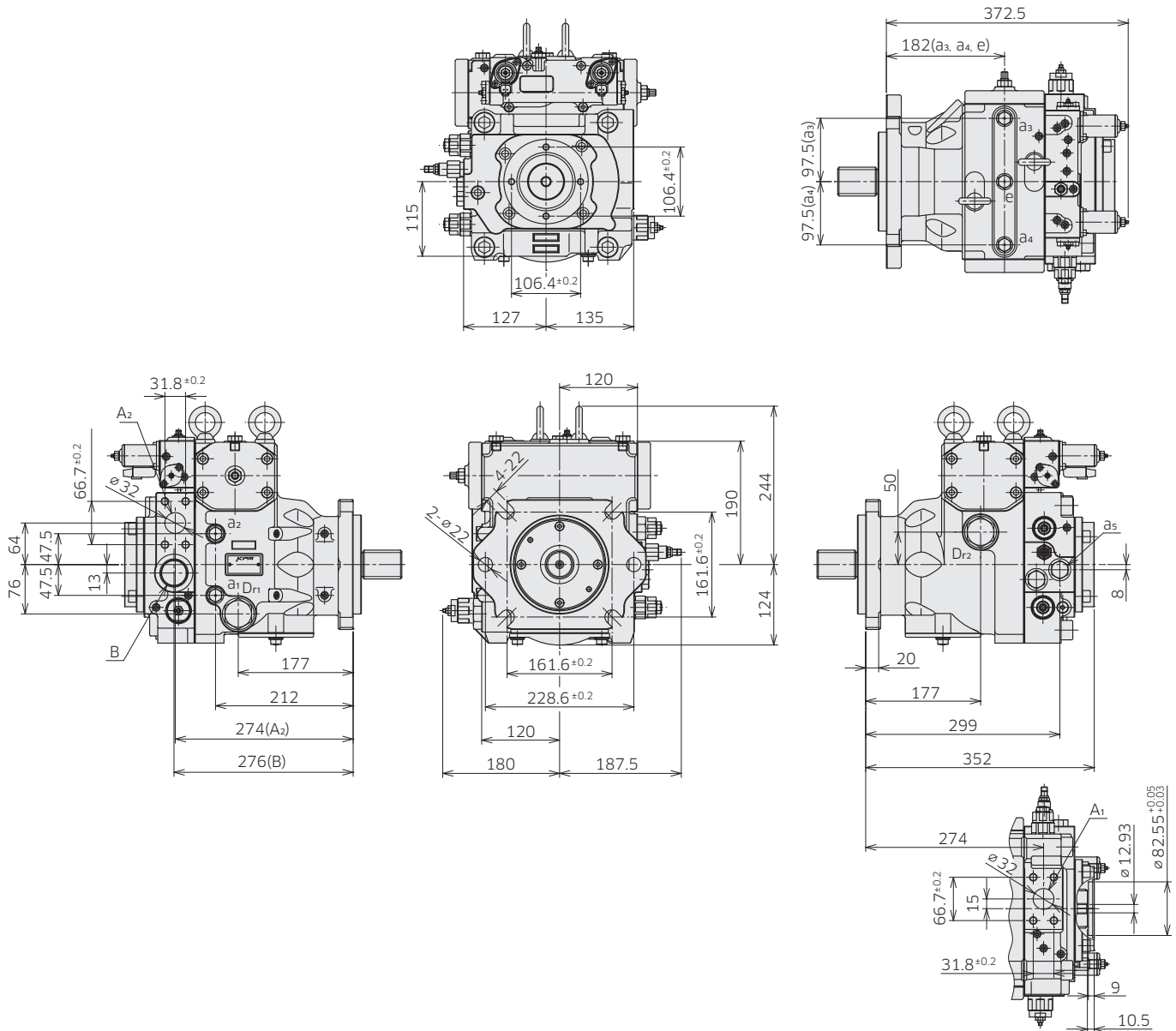
3. Dimensions

3-1 Installation Dimensions

*Dimensions in mm.

◆ K8V125

Model Code : K8V 125 B R D1 A1 * B * X X X X - P1 * * * A * *



(Note) See port details for thread size on port A1 and A2.

3. Dimensions

3-1 Installation Dimensions

*Dimensions in mm.

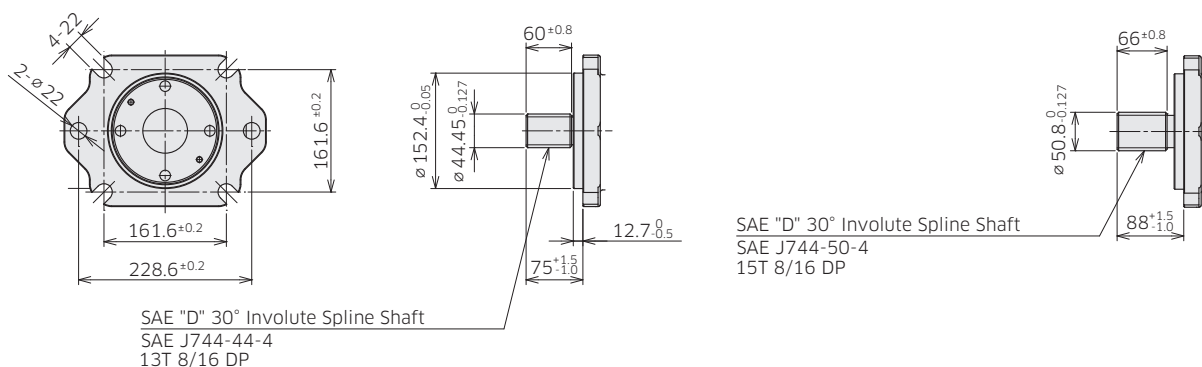
◆ K8V125 Mounting Flange and Shaft Options

SAE D Spline Shaft

Ordering Code '5.Mounting Flange and Shaft' : D1

SAE F Spline Shaft

Ordering Code '5.Mounting Flange and Shaft' : D2



◆ K8V125 Port Details

Main flanged ports

Des	Port name	Port size	Flange thread	Tightening torque (Nm)
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UNF thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (code 62) 1-1/4"	1/2-13UNC-2B-19/24	98
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Metric thread version

A ₁ , A ₂	Pressure port	SAE J518C high pressure (code 62) 1-1/4"	M14-19	157
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Auxiliary port

Des	Port name	Port size	Tightening torque (Nm)
Dr ₁ , Dr ₂	Drain port	1-5/16-12UN-2B-19 (ISO 11926-1 : 1995)	300
a ₁ , a ₂ , a ₃ , a ₄	Gauge port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
B	Inlet port	1-5/8-12UN-2B-24 (ISO 11926-1 : 1995)	350
a ₅	Gauge port	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
e	Air vent port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59
F ₁	External filter port (out)	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
F ₂	External filter port (in)	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
C	External charge pressure supply port	7/8-14UNF-2B-16.7 (ISO 11926-1 : 1995)	143
Pi ₁ , Pi ₂	Pilot port	9/16-18UNF-2B-12.7 (ISO 11926-1 : 1995)	59

3. Dimensions

3-1 Installation Dimensions

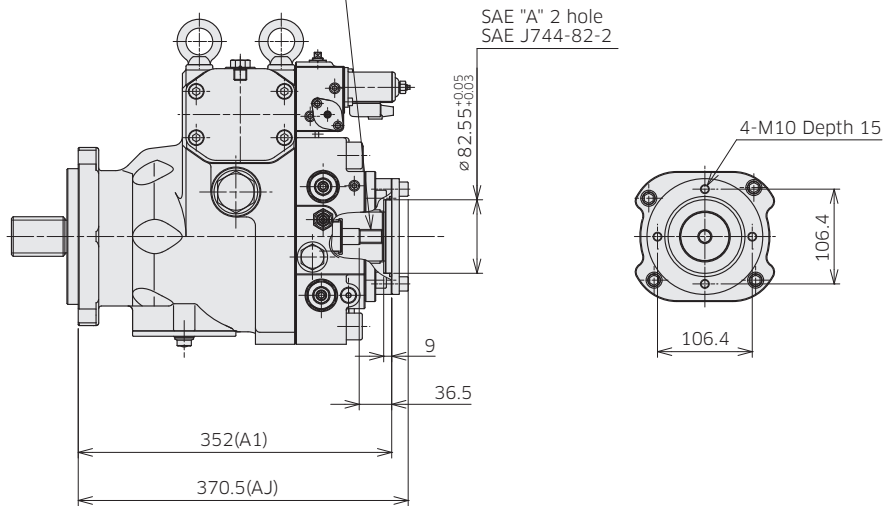
*Dimensions in mm.

◆ K8V125 Through Drive Options

Through Drive SAE A

Ordering Code '6.Through Drive' : A1, AJ

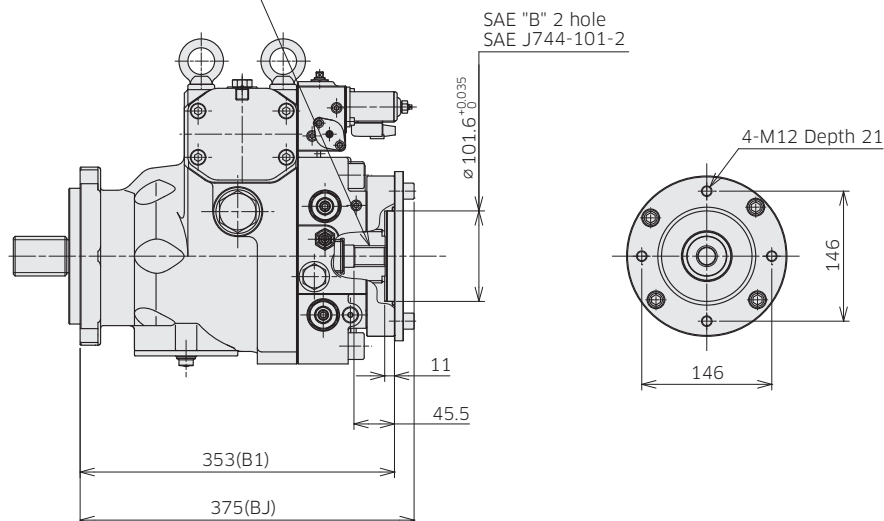
SAE "A" 30° Involute Spline
SAE J744-16-4 9T 16/32 DP



Through Drive SAE B

Ordering Code '6.Through Drive' : B1, BJ

SAE "B" 30° Involute Spline
SAE J744-22-4 13T 16/32 DP



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

3-1 Installation Dimensions

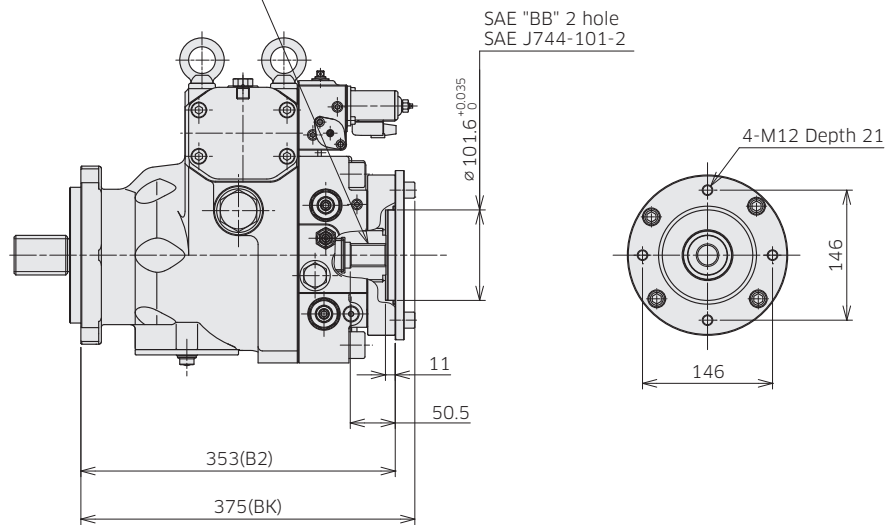
*Dimensions in mm.

◆ K8V125 Through Drive Options

Through Drive SAE BB

Ordering Code '6.Through Drive' : B2, BK

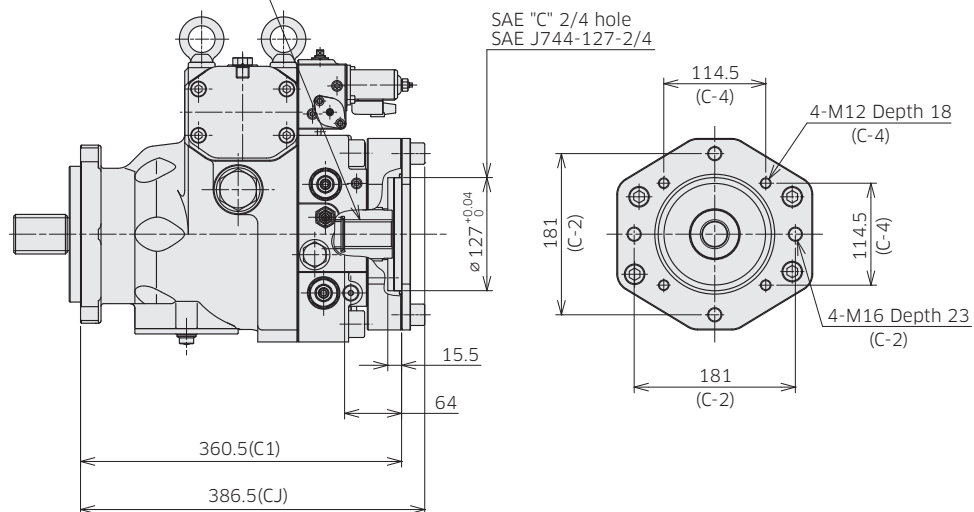
SAE "BB" 30° Involute Spline
SAE J744-25-4 15T 16/32 DP



Through Drive SAE C

Ordering Code '6.Through Drive' : C1, CJ

SAE "C" 30° Involute Spline
SAE J744-33-4 14T 12/24 DP



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

3-1 Installation Dimensions

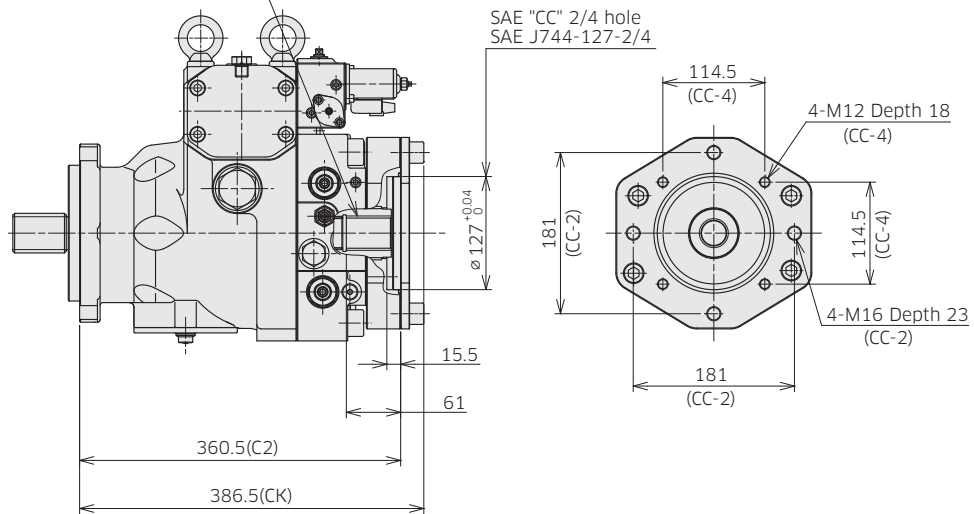
*Dimensions in mm.

◆ K8V125 Through Drive Options

Through Drive SAE CC

Ordering Code '6.Through Drive' : C2, CK

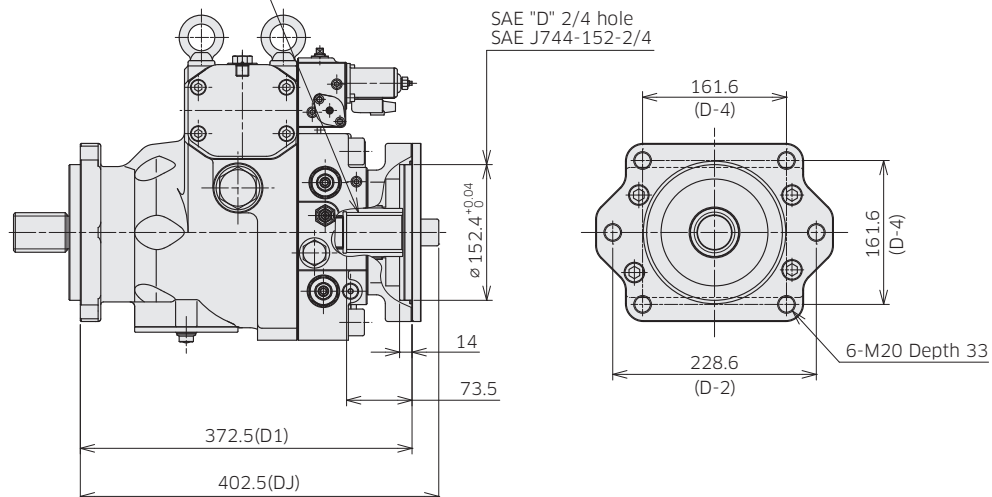
SAE "CC" 30° Involute Spline
SAE J744-38-4 17T 12/24 DP



Through Drive SAE D

Ordering Code '6.Through Drive' : D1, DJ

SAE "D" 30° Involute Spline
SAE J744-47-4 13T 8/16 DP



Involute spline according to ANSI B92.1a, 30° pressure angle, flat root, side fit

3. Dimensions

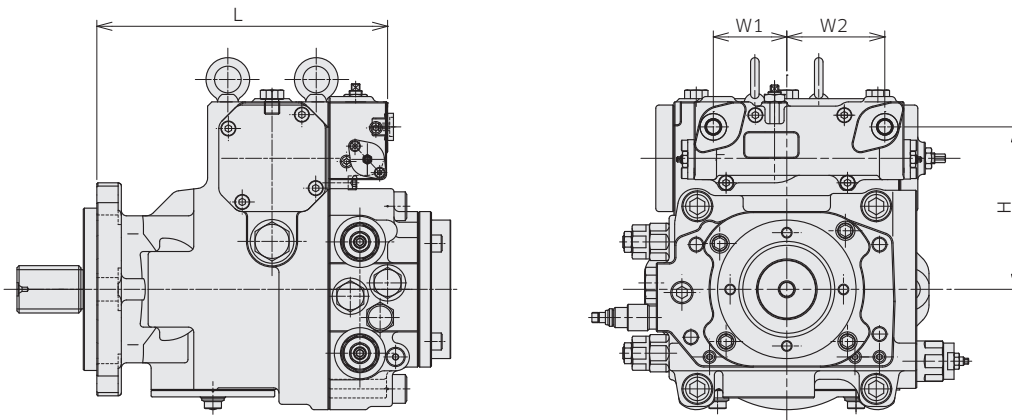
3-1 Installation Dimensions

◆ Hydraulic Pilot Displacement Control

K8V71 Model Code : K8V 71 B R C1 A1 C A C X X X X - P3 * * * A * *

K8V90 Model Code : K8V 90 B R D1 A1 C A C X X X X - P3 * * * A * *

K8V125 Model Code : K8V 125 B R D1 A1 C A B X X X X - P3 * * * A * *



(Dimensions : mm)

	L	W1	W2	H
K8V71	246	69	92	139
K8V90	273	69	92	152.5
K8V125	299	69	92	167.5

3. Dimensions

3-2 Installation of Auxiliary Pumps

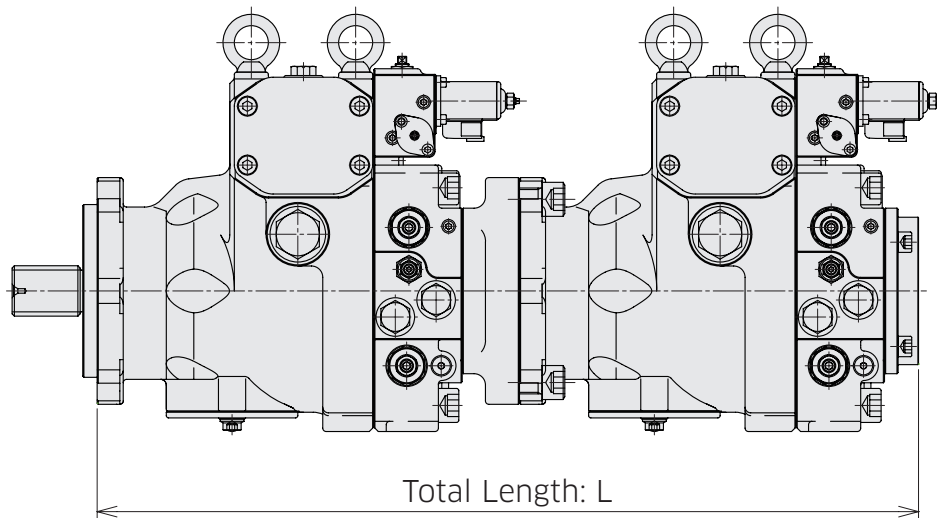
■ Allowable mass moment for combination pump

K8V series allows combination of multiple pumps using through drive mounting. Any pump up to the same size of the first pump may be mounted to the first pump.

In case of tandem configuration comprising of two pumps of the same rated size the allowable maximum dynamic acceleration to the pump unit is 10G. No additional mounting support is necessary in connecting two pumps, but use a 4-bolt mounting on the first pump when installing the pump unit. If the third pump is to be mounted on the rear of the second pump, the pump mass moment at the mounting flange shall be within the rated mass moment. Also, the input torque on the shaft needs to be within the limit of input torque tolerance. (See "Allowable maximum input torque" on page 13)

■ Total length of tandem unit (Dimensions: mm)

First pump	Second pump		
	K8V71	K8V90	K8V125
K8V71	611.5	-	-
K8V90	642	685	-
K8V125	662	704.5	724.5



K8V Inquiry Form

Please go to the page below link. An Inquiry Form which is formed by excel is available at the download section.

https://global.kawasaki.com/en/industrial_equipment/hydraulic/pumps/k8v.html

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