



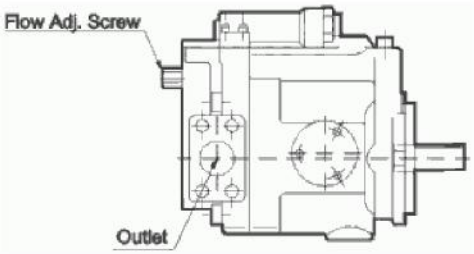

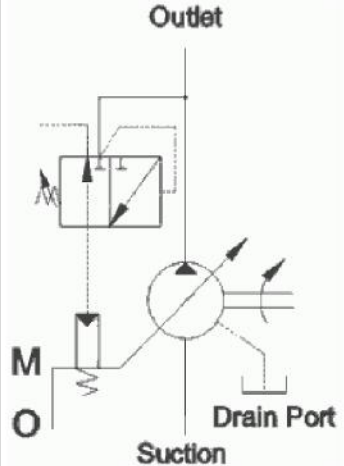
### Features:

1. Combining special internal designs and strict engineering disciplines has reduced noise level to new lows in whole pressure zones.
2. Depending on variety of application needs multiple optional unique control methods are available, it does not only reduce a number of unnecessary hoses, pipes and control valves but also increase efficiency and save horsepower, and cost.
3. Less capacity reservoirs can be selected and applied because of performances of low pressure loss and less head generation.
4. Wide application ranges: it is very suitable for machine tools, plastic injection molding machines, forging machines and other industrial machines etc..
5. Mounting flanges are made to SAE A or B 2-bolt (V15.18, 38 types) and SAE-C 2 & 4-bolt (HV-50.HV-70 types).

## Ordering Code

HV	38	A	4	R	S	F	-20
Series No	Displacement cc/rev (in <sup>3</sup> /rev)	Control Type	Pressure Compensating Range bar(PSI)	Rotation	Port Position	Mounting	Design No. Shaft Option Flange Option
HV Variable Volume Piston Pump	15(0.9) 18(1.1) 23(1.4) 38(2.3) 50(3.1) 70(4.3)	Standard	1:8~70(115-1000)	R:Clockwise(CW)	S:Side port	F:FlangeMounting	20: PT(Rc) Flange kits, Straight Key
		A:Pressure Compensating(manual)					
		Option					
		B:Pressure Compensating Type Pilot					
		(Remote Control)					
		C:TwoPressure-Two FLow					
		D:Solenoid Cut-Off Control Type					
DV Variable Volume Piston Pump	15(0.9) 18(1.1) 23(1.4) 38(2.3)	Control Type	2:15~140(210-2000)	L:Counter Clockwise(CCW)	R:Axial port	L:Foot Mounting	2090:NPT Flange Kits,Straight Key
		Control Type					
		E:Two Pressure Cut-Off Control Type					
		F:Two Pressure,Two Flow Control					
		Type by Solenoid Valve					
		G:Two Pressure,Two Flow Control					
		Type by Solenoid Valve					
		H:Power Maching Control					
		HL:Load Sensing Compensator					
		HJ:Electro-Hydraulic Proportional					
		Load Sensing Type					
		DV Series available in A,B,C,D,H and HL type only					
							30:PT(Rc) Flange Kits,SAE B (13 Tooth)
							3080:PF(G) Flange Kits,SAE B (13 Tooth)
							3090:NPT Flange Kits,SAE B (13 Tooth)

## Standard Type

Symbol	Size	External View	Performance Curve	Hydraulic Circuit	Description
A	15				Pressure Compensating Type(Manual)
	18				When the pressure reaches the value set with the compensator.
	23				The flow is reduced automatically and the set pressure is maintained.
	38				
	50				
	70				
	100				The Pressure and flow are controlled automatically

Option

Symbol	Size	External View	Performance Curve	Hydraulic Circuit	Description
B	15				<p>Pressure Compensating Type</p> <p>The pressure can be controlled according to the pilot pressure</p> <p>The flow can be controlled manually.</p>
	18				
	23				
	38				
	50				
	70				
C	15				<p>Two Pressure-Two Flow Control Type</p> <p>By means of the sequence valve, two stage flow rate can be obtained and each flow rate has the different pressure eventually enabling energy zone.</p>
	18				
	23				
	38				
	50				
	70				
D	15				<p>Solenoid cut off Control Type.</p> <p>An unloading Solenoid valve is used to minimize the lost energy when the pump output is not required.</p> <p>Heat generated is very small.</p>
	18				
	23				
	38				
	50				
	70				
E	15				<p>Two Pressure cut off Control Type</p> <p>By means of ON OFF control of solenoid valves, two different pressure compensating types can be obtained.</p>
	10				
	23				
	38				
	50				
	70				
F	15				<p>Two Pressure-Two Flow Control Type by Solenoid Valve</p> <p>Actuators can be shifted slowly (high pressure low flow) and quickly (low pressure high flow) by switching directions of solenoid control valve.</p> <p>This type of applied to actuator requiring operations to shift speed from high to low or low high.</p> <p>pressure "P1,P2" and flow "q1,q2" can be adjusted optionally</p>
	18				
	23				
	38				
	50				
	70				
G1	15				<p>Multi stage &amp; Single stage Pressure Control Type (With Cylinder)</p> <p>Actuators can be shifted slowly ( high pressure low flow) and Quickly (low pressure high flow) by switching directions of solenoid control valve.</p>
	18				
	23				
	38				
	50				
	70				
H	15				<p>POWER MATCHING CONTROL</p> <p>An ideal energy conservation system, "Power matching system" can be directional control valves with this control system.</p>
	18				
	23				
	38				
	50				
	70				
HL	15				<p>Load Sensing Compensator. The HL compensator is used for load sensing circuits and is a true load sensor.</p> <p>This is the B compensator with a pin, the pin prevents pilot flow from entering the circuit which will eliminate creeping of the load.</p> <p>The HL compensator will let the pump deliver a constant flow rate to the circuit by providing an adjustable F across the customer's orifice or valve.</p> <p>The Pump will operate at 17.2-27.5 bar (250-400 PSI) above Load Pressure.</p>
	18				
	23				
	38				
	50				
	70				
HU	15				<p>Electro-Hydraulic Proportional Load Sensing Type.</p> <p>This is an energy saving type control which regulates the pump flow and load pressure to be at absolute minimum necessary level to operate the actuator.</p>
	18				
	23				
	38				
	50				
	70				
100	15				<p>Pressure Compensating Type</p> <p>The pressure can be controlled according to the pilot pressure</p> <p>The flow can be controlled manually.</p>
	18				
	23				
	38				
	50				
	70				

## **Operating Data**

### **Fluid Recommendations**

In case hydraulic pressure is under 70 bar, use hydraulic oil which is corresponding to ISO VG32-60 in viscosity grade or wear resisting hydraulic oil.

In case hydraulic pressure is over 70 bar, use wear resisting hydraulic oil which is corresponding to ISO VG32-68 in viscosity grade.

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### **Viscosity and Operating Temperature**

Oil viscosity ranging from 15 cSt to 400 cSt and oil temperature from 0°C to 60 °C are recommended.

### **Installation and Mounting**

Eccentricity between the driving shaft and pump shaft should be under 0.05 TIR, and operate the pump in such a way that the pump shaft is not subjected to orthogonal force. If centering between the driving shaft and pump shaft is incorrect, the bearing and oil seal may be damaged, noise and vibration may occur, which cause trouble with the pump.

Avoid driving the pump in the lateral direction by belt, chain or gears. (This may cause noise and damage the bearing.)

The pump can be operated with its shaft mounted perpendicularly.

### **Piping Work**

Use parallel thread pipe joints for the suction inlet and discharge outlet. Do not use taper thread piping joints or air may intrude or abnormal noise be produced.

In case where steel pipes are used, lay the piping with care so as not to put force on the pump.

Eccentricity of a pump being forced by piping may cause serious trouble with noise.

### **Drain Piping**

Lay the drain piping independently not joined with other return lines, in such a way that the pump internal pressure is under 0.35 bar.

Lay the oil return piping under the oil level of the tank and as far as possible from suction piping, (refer under table )

### **Start-Up**

Before starting the pump, fill the pump case with hydraulic oil using the drain charging port on the pump body.

Do not operate the pump at full speed right away. Instead, turn the motor input switch on and off several times so as to extract air from the piping, then operate it continuously.

At the start, be sure to reduce the pressure or operate it unloaded.

### **Shaft Rotation**

Shaft rotation is clockwise viewed from the end of pump shaft. In case revolution is required, indicate it by Model No.

### **Suction Pressure**

Adjust suction pressure to within – 125mmHg.

High suction pressure may cause cavitation, damage of parts, noise and vibration which greatly shorten the life of pumps.

### **Filtration**

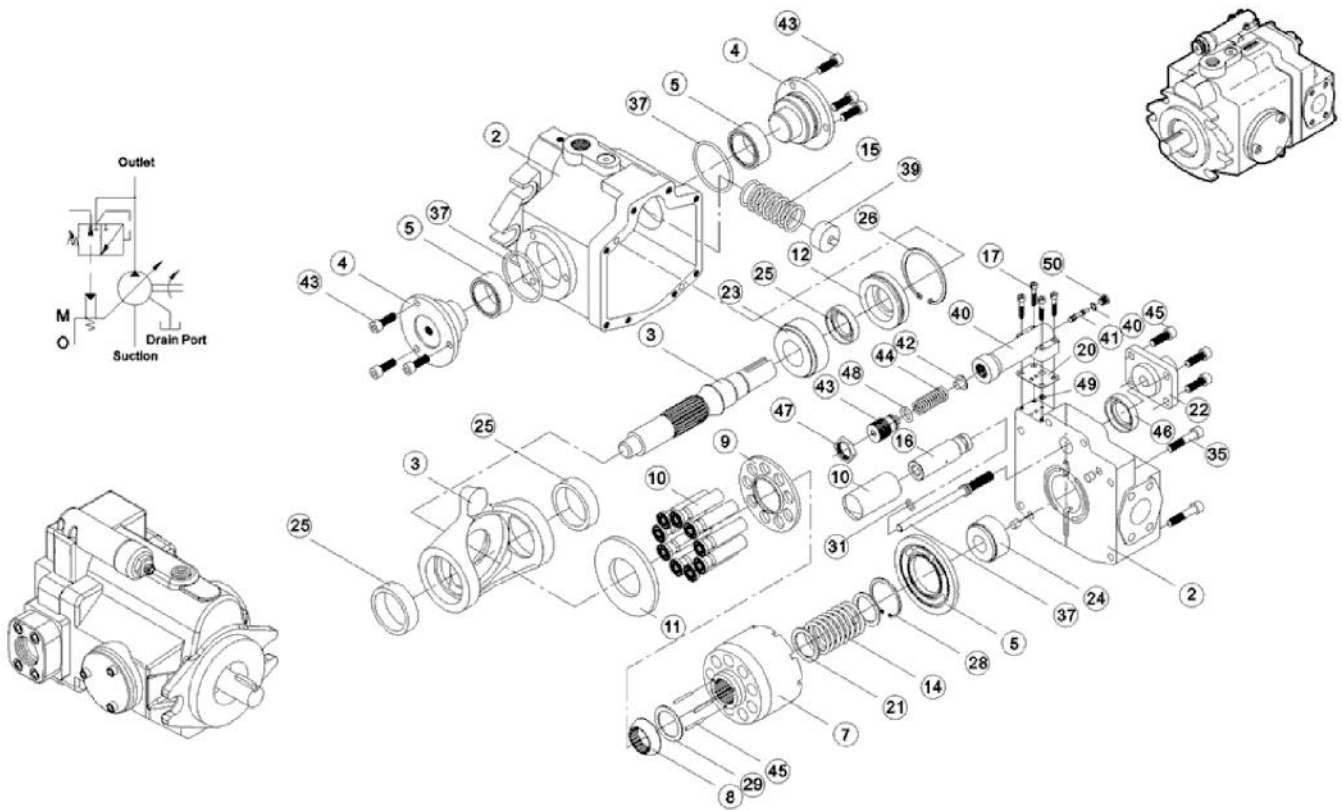
Deterioration of the hydraulic oil may cause trouble with the pump and shorten its life. Carefully control the quality of the oil so as to maintain the deterioration of the oil within Grade NAS 9.

Be sure to attach a suction filter of 150 mesh to the suction side and a line filter of 25 to the return line of the discharge side.

### **Max. Working Pressure**

Operation period at maximum working pressure should be under 10% of one cycle and the retaining period should be under 6 seconds.

# Assembly



**Ordering Code -HV Piston Pumps Cartridge Kits**

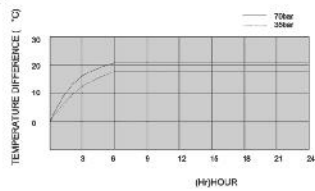
HV	38	R	KW	Detail Part No. and Q'ty
Series No.	Displacement	Rotation	Kits Code	
Variable Volume Piston Pump	15 cc/rev	R: Clockwise	KT	#(5)x1
	16 cc/rev		KU	#(6,7)x9,(8)x1
	23cc/rev		L: Counter- Clockwise	KV
	38cc/rev			
	50cc/rev	KW		#(4),(5),(8),(9),(14),(21),(28)x1#(21)x2,#(18)x3,#(6,7)x9
	70cc/rev			
	100cc/rev	#(6,7)Size 8 x 7pcs,Size 16~36 x 9pcs,Size 46~100x11pcs		

**Parts List:**

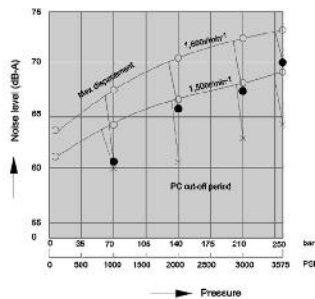
No.	Part Name	No.	Part Name
1	Pump Housing	26	Snap Ring
2	Rear Cover	27	Snap Ring
3	Shaft	28	Snap Ring
4	Cylinder barrel(Cylinder block)	29	Oil Ring
5	Valve pipe	30	Oil Ring
6	Piston	31	Oil Ring
7	Shoe	32	Pin
8	Shoe holder	33	Expander Plug
9	Barrel holder	34	Machine Screw
10	Swash plate	35	Hexagon Socket Head Screw
11	Thrust Bush	36	Flow Adjusting Bolt
12	Seal holder	37	Spring Holder
13	Gasket	38	Hexagon Socket Head Screw
14	Spring C	39	Body
15	Sping S	40	Spool
16	Control Piston	41	Holder
17	Guide	42	Plunger
18	Needle	43	Spring
19	Key	44	Retainer
20	Nut	45	Pressure Adjusting Bolt
21	Retainer	46	Nut
22	Plug	47	O-Ring
23	Ball Bearing	48	O-Ring
24	Needle bearing	49	O-Ring
25	Oil seal	50	Plug

# Performance Data

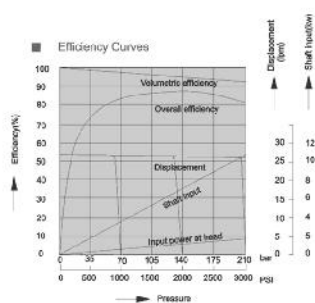
## CONDITIONS



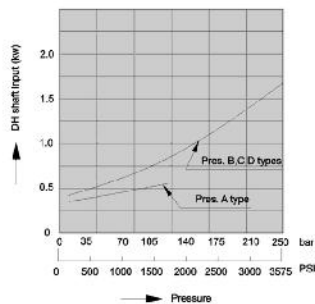
## NOISE LEVEL



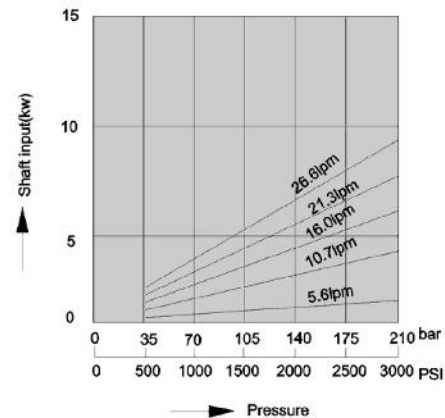
## EFFICIENCY CURVES



## INPUT POWER AT FULL CUT-OFF



## INPUT POWER CURVES



## DRAIN CURVE

