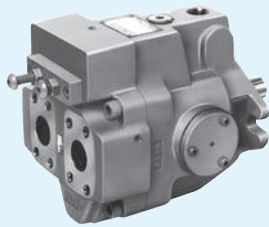


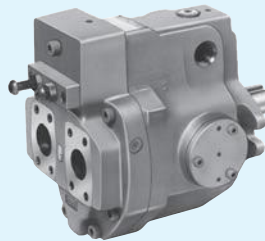
Series Variable Displacement Piston Pumps



A37



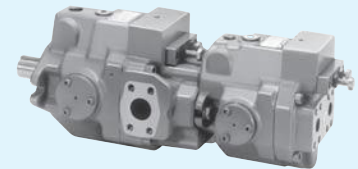
A16



A56


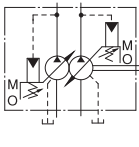
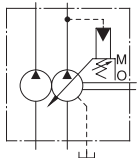


A10



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“A”Series Variable Displacement Piston Pumps

Pump Type	Graphic Symbol	Geometric Displacement cm ³ /rev							Maximum Operating Pressure MPa	Page						
		1	2	5	10	20	50	100			200	300				
Single Pumps ^{★1}																
Double Pumps		Outboard Pump														
		Inboard Pump														
Variable/Fixed Double Pumps		Outboard Pump														
		Inboard Pump														

★1 Various control types are available such as pressure compensator type. Refer to page 29 and 30.

★2 The maximum operating pressure for each double pump depends on its combination of pumps. Contact us for details.

Hydraulic Fluids

Hydraulic Fluids

Use petroleum based oils such as anti-wear type hydraulic oils equivalent to ISO VG-32 or 46. The recommended viscosity range is from 20 to 400 mm²/s and temperature range is from 0 to 60°C, both of which have to be satisfied for the use of the above hydraulic oils.

Control of Contamination

Due caution must be paid to maintaining control over contamination of the operating oil which can otherwise lead to breakdowns and shorten the life of the unit.

Please maintain the degree of contamination within NAS Grade 10.

The suction port must be equipped with at least a 100 μm (150 mesh) reservoir type filter and the return line must have a line type filter of under 10 μm.

Instructions

Mounting

When installing the pump the filling port should be positioned upwards.

Alignment of Shaft

Employ a flexible coupling whenever possible, and avoid any stress from bending or thrust.

Maximum permissible misalignment is less than 0.1 mm TIR and maximum permissible misangular is less than 0.2°.

Suction Pressure

Permissible suction pressure at inlet port of the pump is between -16.7 and +50 kPa.

For piping to the suction port, use the pipes of the same diameter as that of the specified pipe flange to be used. Make sure that the height of the pump suction port is within one metre from the oil level in the reservoir.

Hints on Piping

When using steel pipes for the suction or discharge ports, excessive load from the piping to the pump generates excessive noise.

Whenever there is fear of excessive load, please use rubber hoses.

Suction Piping

In case the pump is installed above the oil level, the suction piping and suction line filter should be located lower than the pump position to prevent air in the suction line.

When using steel pipes for the suction or discharge ports, excessive load from the piping to the pump generates excessive noise.

Whenever there is fear of excessive load, please use rubber hoses.

Drain Piping

Install drain piping according to the chart and ensure that pressure within the pump housing should be maintained at a normal pressure of less than 0.1 MPa and surge pressure of less than 0.5 MPa.

Length of piping should be less than 1 m, and the pipe end should be submerged in oil.

[Recommended Drain Piping Size]

Model	Fitting Size	Inside Dia. of Pipe
A10, A16, A22	3/8 [Inside Dia. 8.5 mm or more]	10 mm or more
A37, A45	1/2 [Inside Dia. 12 mm or more]	12 mm or more
A56, A70, A90, A100, A145	3/4 [Inside Dia. 16 mm or more]	19 mm or more

Bleeding Air

It may be necessary to bleed air from pump case and outlet line to remove causes of vibration. An air bleed valve (Model Number ST1004-*-10*, Page 265) is recommended for this purpose.

Starting

Before first starting, fill pump case with clean operating oil via the filling port.

In order to avoid air blockage when first starting, adjust the control valves so that the discharged oil from the pump is returned direct to the reservoir or the actuator moves in a free load.

[Volume of Pre-fill Oil Required]

Model	Volume cm ³
A10	370
A16/A22	600
A37/A45/A56	1200
A70	2100
A90/A100	2500
A145	3300

Setting Discharge Pressure and Delivery

At the time of shipment, the unit has been preset to maximum delivery and minimum discharge pressure.

Adjust the preset delivery and pressure to meet your system requirements.

Adjustment of Discharge Pressure

Turning the adjustment screw clockwise, increases pressure.

[Volume adjusted by each full turn of the pressure adjustment screw]

Model Numbers	Adjustment Volume MPa
A10-FR01B	2.9
A10-FR01C/H	5.4
A16/A22/A37/A56- *-R-01-B	3.5
A16/A22/A37/A56- *-R-01-C	6.5
A16/A37/A56- *-R-01-H	7.9
A70/A90/A100/A145- *-R01B	2.3
A70/A90/A100/A145- *-R01C	3.2
A70/A90/A100/A145- *-R01H	4.0
A70/A90/A100/A145- *-R01K	4.7

Adjustment of Delivery

Turning the flow adjustment screw clockwise, decreases delivery.

[The minimum adjustable flow and adjustable volume of each full turn of the delivery adjustment screw]

Model	Adjustable volume with each full turn of the adjustment screw cm ³ /rev	Minimum adjustment flow cm ³ /rev
A10	1.1	2.0
A16	1.4	4.0
A22	2.0	6.0
A37	2.9	10
A56	3.9	12
A70	4.4	36
A90	4.8	56
A100	5.2	62
A145	7.2	83