

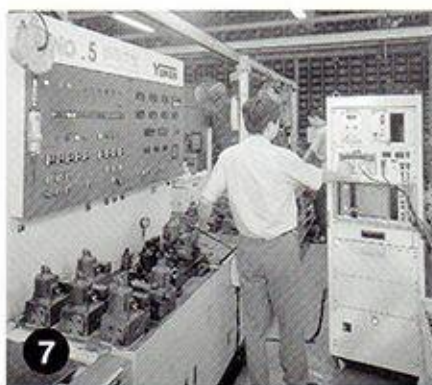
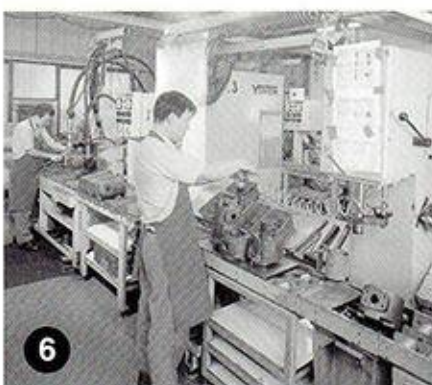


HYDRAULIC EQUIPMENT

A

HYDRAULIC PUMPS





1. Front View of the Main Factory

2. Front View of 2nd Factory

3. Power Unit Assembly Line

4. Horizontal Machining Centers

5. Processing Production Line (2nd Factory)

6. Vane Pumps Test Bench

7. Proportional Electro-Hydraulic Controls Test Bench

8. Solenoid Valves Assembly Line

Brief Introduction

The main factory of Yuken Hydraulics (T.W.) Co., Ltd., is located at No. 12 7th Rd., Taichung Industrial Park, Taichung, Taiwan. the area is 9,543 m². 2nd factory is located at No. 6, 7th Rd, the area is 5,623 m².

"To improve Technology, to improve Quality, to strengthen Service, and to satisfy Customers" are our consistent quality promises. In order to keep our promises, we have a strong focus on the promotion of automation and computerization covering sales, design, operations, production management and even quality control, to ensure quality of our products and services. All our employees pursue the organization's Goal - "To work hard, to ameliorate, and to grow perpetually."

As the domestic market was getting saturated gradually, we started exploring overseas market since July, 1996. The achievement has been remarkable. Our market is not only in Asia but also North America, Europe, Middle East and Africa.

- March, 1997, Yuken Hydraulics (T.W.) Co., Ltd., was awarded ISO-9002 certificate and built up international-level quality system.
- January, 1998, We open our second factory located at No.6 7th Rd., Taichung Industrial Park, Taichung, Taiwan, area is 5,623 m².
- February, 2002, Yuken Hydraulics (T.W.) Co., Ltd., was awarded CSA-C/US certificate, to strengthen our competition in North American market.
- May, 2002, Yuken Hydraulics (T.W.) Co., Ltd., was awarded ISO-9001 certificate and scaled new heights of quality system.
- October, 2002, Organization simplified, management institutionalized.
- June, 2003, Production line readjusted, equipment reinforced, production rationalized, striding into a new milestone.
- April, 2005, Proportional Valve was awarded CE certificate.
- November, 2005, Solenoid Valve was awarded CE certificate.
- November, 2008, Solenoid Valves with monitoring switches were patented in Taiwan.
- March, 2009, Solenoid Valves with monitoring switches were patented in China.
- June, 2010, Solenoid Valves with monitoring switches were awarded CE certificate.
- December, 2011, 2nd factory's expansion is finished.

Yuken Hydraulics (T.W.) Co., Ltd. has been leading the Industry here in Taiwan. We will increase technical cooperation with our parent company, Yuken Kogyo Co., Ltd. in the future. We will build an efficient and comprehensive sales network both in domestic and overseas market. Concurrently, we will train our talented people extensively to upgrade quality continuously. All our efforts are to achieve our goal - to grow perpetually!

- Name : **Yuken Hydraulics (T.W.) Co., Ltd.**
- Main Factory : No. 12, 7th Road, Taichung Industrial Park, Taichung, Taiwan.
Tel: 886-4-2359-3077 (Rep.)
Fax: 886-4-2359-2500
Website: <http://www.yuken.com.tw>
- Taichung Office: No. 12, 7th Road, Taichung Industrial Park, Taichung, Taiwan.
(Sales Dept) Tel: 886-4-2359-3077 (Rep.)
Fax: 886-4-2359-8813
- Taipei Office : No. 18-1, Wun Hua 5th Road, Guei Shan Township, Taoyuan County, Taiwan.
(Sales Dept) Tel: 886-3-328-3628 (Rep.)
Fax: 886-3-328-3242
- Established : 1, May, 1969
- Paid in Capital : NTS 90,000,000 (as of January, 2004)
- Line of Business : • Manufacture & sales of Hydraulic Pumps, Pressure Control Valves, Flow Control Valves, Directional Control Valves, Modular Valves, Proportional Electro-Hydraulic Control Valves, Electro-Hydraulic Servo Valves, Power Unit, Hydraulic Cylinders, Hydraulic Motors & Associated Products.
• Design, manufacture & installation of Hydraulic systems.
- Licensor : **YUKEN KOGYO CO., LTD.**

Group of Components



Hydraulic Pumps

Pressure Control Valves

Flow Control Valves

Directional Control Valves

Check Valves

Proportional Electro-Hydraulic Control

A Hydraulic Pump

1 MPa = 10.2 kgf/cm²

Pump Type	Max. Pressure MPa	Nominal Displacement cm ³ /rev										Page
		1	2	5	10	20	50	100	200	500		
ARL1 Series Variable Piston Pumps	7				ARL1						9	
AML1 Series Motor-Pumps	7				AML1						12	
ML1 Series Electric Motors	-	ML1 (0.75 / 1.5 / 2.2 kw)										15
AR Series Variable Piston Pumps	16				AR16	AR22					16	
50T 150T Single Pumps	7					50T	150T				20	
PV2R S-PV2R Series Single Pumps	21 (17.5/16/14)					PV2R1	PV2R2 S-PV2R2	PV2R3 S-PV2R3	PV2R4 S-PV2R4		24	
PV2R S-PV2R Series Double Pumps	21 (17.5/16/14)					PV2R1	PV2R2 S-PV2R2	PV2R3 S-PV2R3	Small Volume Pumps		38	
							PV2R2 S-PV2R2	PV2R3 S-PV2R3	PV2R4 S-PV2R4	Large Volume Pumps		
A ₁₆ SR3, A ₂₂ SR4 Series Piston & Vane Pumps	21 (17.5/16/14)				A16	A22	Piston Pump				48	
								PV2R3 S-PV2R3	PV2R4 S-PV2R4	Vane Pump		
SVPF Series Variable Vane Pump	7				SVPF-12	20	30	40			51	
SVPDF Series Double Variable Vane Pump	7					SVPDF-30	40				52	
							SVPDF-30	40				
								SVPDF-40	40			

B Pressure Control Valves

Valve Type	Max. Pressure MPa	Max. Flow L/min										Page
		1	2	5	10	20	50	100	200	500	1000	
Remote Control Relief Valves	25	DT-01										53
Direct Type Relief Valves	21			DT-DG-02								53
Pilot Operated Relief Valves	25					BT-BG-03		06	10			53
Low Noise Type Pilot Operated Relief Valves	25					S-BG-03		06				53
Solenoid Controlled Relief Valves	25					BST-03		06	10			57
Low Noise Type Solenoid Controlled Relief Valves	25					S-BSG-03		06				57
H & HC Type Pressure Control Valves	21					HT/HCT HG/HCG-03		06	10			61
Pressure Reducing (and Check) Valves	21					RT/RCT RG/RCG-03		06	10			67
Unloading Relief Valves	21					BUCG-06						72
Balancing Valves	14					RBG-03						73

C Flow Control Valves

Valve Type	Max. Pressure MPa	Max. Flow L/min										Page
		1	2	5	10	20	50	100	200	500	1000	
Flow Control (and Check) Valves	21					FG FCG-02		03	06 *	10 *	*Yuken Kogyo Models	74
(One Way) Restrictors	21					SRCT SRG/SRCG-03		SRCT SRG/SRCG-06	SRCT-10			77
Throttle (and Check) Modules	25					TC1G TC2G-01						80
Needle Valves	35					GCT GTCR-02						81

D Directional Control Valves 1 MPa = 10.2 kgf/cm²

Valve Type	Max. Pressure MPa	Max. Flow L/min															Page
		1	2	5	10	20	50	100	200	500	1000	2000	8000				
Solenoid Operated Directional Valves	7	DSGL-01															84
Solenoid Operated Directional Valves	31.5	DSG-01 03															86
Solenoid Valves with Monitoring Switch-DSGS	31.5	DSGS-01 03															92
Solenoid Controlled Pilot Operated Directional Valves	31.5	DSHG-04 06 10															94
Solenoid Valves with Monitoring Switch-DSHGN	25	DSHGN-03 04 06															99
Pilot Operated Directional Valves	31.5	DHG-04 06 10															104
Manually Operated Directional Valves	25 (21)	DMT-03 DMG-03															107
Mechanically Operated Directional Valves	21 (25)	DCT-01 DCG-01 03															109
Mechanically Operated Directional Valves with Monitoring Switch-DCGS	21 (25)	DCTS-01 DCGS-01 03															112
Logic Valves with Monitoring Switch-LDLS	30	LDLS-16 25 32 40 50															115
Check Valves	21	CIT-03 06 10															119
		CRT-03 CRG-03 06 10															
Pilot Controlled Check Valves	25	CPT/CPG CPDT/CPDG-03 06 10															121
Poppet Type Directional Valves	21	LVT-03 LVG-03															123
Prefill Valves	25	PF-80 PDF-80 90 100 125 150 PF-20(PF-300)															124

E Proportional Electro-Hydraulic Controls

Valve Type	Max. Pressure MPa	Max. Flow L/min										Page
		1	2	5	10	20	50	100	200	500	1000	
Proportional Electro-Hydraulic Pilot Relief Valves	25	EDG-01										131
Proportional Relief Valves	25			EBG-03					06	10 *	* Yuken Kogyo Models	133
Power Saving Valves	25	EFBG-03							06	10		135
Power Saving Valves 10Ω~10Ω	25	EFBG-03										141
Power Saving Valves High Performance	25	ELFBG ELFBG-03							06			143
Proportional Electro-Hydraulic Directional and Flow Control Valves	25	EDFG-01				EDFHG-03		04	06			149
Power Amplifiers	-	AME-D2-H1 (Yuken Kogyo Models)		AMN-D-20T		AMN-D-L-20T		SK1115-※-30T		AMN-W-10T		156

F Other Valves

Valve Type	Max. Pressure MPa	Max. Flow L/min															Page
		1	2	5	10	20	50	100	200	500							
Lift Valves	21	LVST-03															165
Air Bleed Valves	21	AVT-03-05 AVT-03-20															166
Automatic Shut Off Valves	21	DAS-03-20															166

G Modular Base Plates

Series Number	Max. Pressure MPa	Max. Flow L/min				Page
		0	20	40	60	
Base Plates	31.5	MMC-01 MMC-03				167

* As for the products other than those listed in this catalogue, please consult with our engineers for your requirement.

General Information

Design Standard

The distinctive features of Yuken Standard products is as shown below.

Feature	Domestic Standard	Remarks
Port Tapping	Rc(=PT)	Taper Pipe Thread (ISO 7/1)
Port Tapping (Partial)	G(=PF)	Straight Pipe Thread (ISO 228/1)
Pressure Gauge Tapping	Rc(=PT)	Taper Pipe Thread (ISO 7/1)
Mounting Bolts	Metric	General Purpose Thread (ISO 261)
Mounting Dimensions	Metric	
Conduit Entry	G(=PF)	Straight Pipe Thread (ISO 228/1)
Solenoid Voltages AC/DC	Domestic voltage	Voltage and frequency change according to country
Frequency	50/60 Hz	
Electronic Amplifier Input Supply	Domestic voltage 50/60 Hz	
Graphic Symbol	ISO Standard	ISO 1219
Valve Port Size	Inch	

Design Number

Yuken products have factory applied Design numbers, the key to which is as follows.

Example: 4222T68

42 22 T68

Major Design No. _____ Design No. for modified products in Taiwan
Minor Design No. _____ Omitted: Domestic standard

Design numbers are subject to change. But installation dimensions and specifications remain unchanged for variation in second digit of design numbers (Minor Design No.).

Hydraulic Fluids

Type of hydraulic fluids

- Petroleum base oil-Please use anti-wear type hydraulic oil or R & O (Rust and Oxidation inhibitor) type hydraulic oil equivalent to ISO VG 32 or 46. Do not use VG 68 hydraulic oils in winter; it will cause suction failure or cavitation.
- Fire resistant or other special fluids-Please consult with our sales engineers for your requirement.

Fluid viscosity and temperature range

Please use hydraulic fluids in a range which satisfies the conditions of both viscosity and temperature (specified in table.)

Type of Components	Viscosity Range	Temperature Range
Hydraulic Pumps	20 ~ 400 mm ² /s ★ 1	0 ~ 70°
Pressure Control Valves	15 ~ 400 mm ² /s ★ 2	-15 ~ +70°
Flow Control Valves	FG, FCG : 20 ~ 200 mm ² /s Other : 15 ~ 400 mm ² /s	
Directional Control Valves	15 ~ 400 mm ² /s	
Proportional Electro-Hydraulic Control Valves	EBG : 15 ~ 400 mm ² /s EFBG : 20 ~ 200 mm ² /s	

- ★ 1. When starting the pumps at low speed, maximum viscosity is restricted. (see table above right).
★ 2. If the valve is provided with a vent restrictor (ex.: A-BSG-03), the viscosity range should be 15-200 mm²/s.

Control of contamination

Contamination of the hydraulic fluids may cause any damage to the products or shorten the life of the products, therefore, please maintain the degree of contamination level lower than NAS Class Numbers as shown on the table 1 below

① The suction port line must have a reservoir type filter of 100 μm (150 mesh) and the filter should be installed minimum 50 mm higher than the bottom of the reservoir.

② The return line must have a line filter.

Line type filter ratings

Type of Components	Line Type Filter
Pump's Suction Port	100μm
Circuit System	Piston Pumps: below 10μm E series components: below 20μm Other components: below 25μm

Limit of contamination

Type of Components	NAS Class No.
Piston Pumps	10 or less
E series components	11 or less
Other components	12 or less

General Information

■ Limitation of general properties of fluids

● Limit of fluid purity

Characteristics ¹	Value changed
Specific gravity (15/4°C)	0.05
Colour	2
Flash point (°C) COC	60
Total acid number (mg KOH/g)	0.2
Viscosity (cSt)	10 ~ 15

■ High-pressure specialized hydraulic fluid

Manufacture	Brand
Mobil	Mobil DTE 25
Shell	Shell Tellus Oil 46
China Oil	Aw46, LPS 46

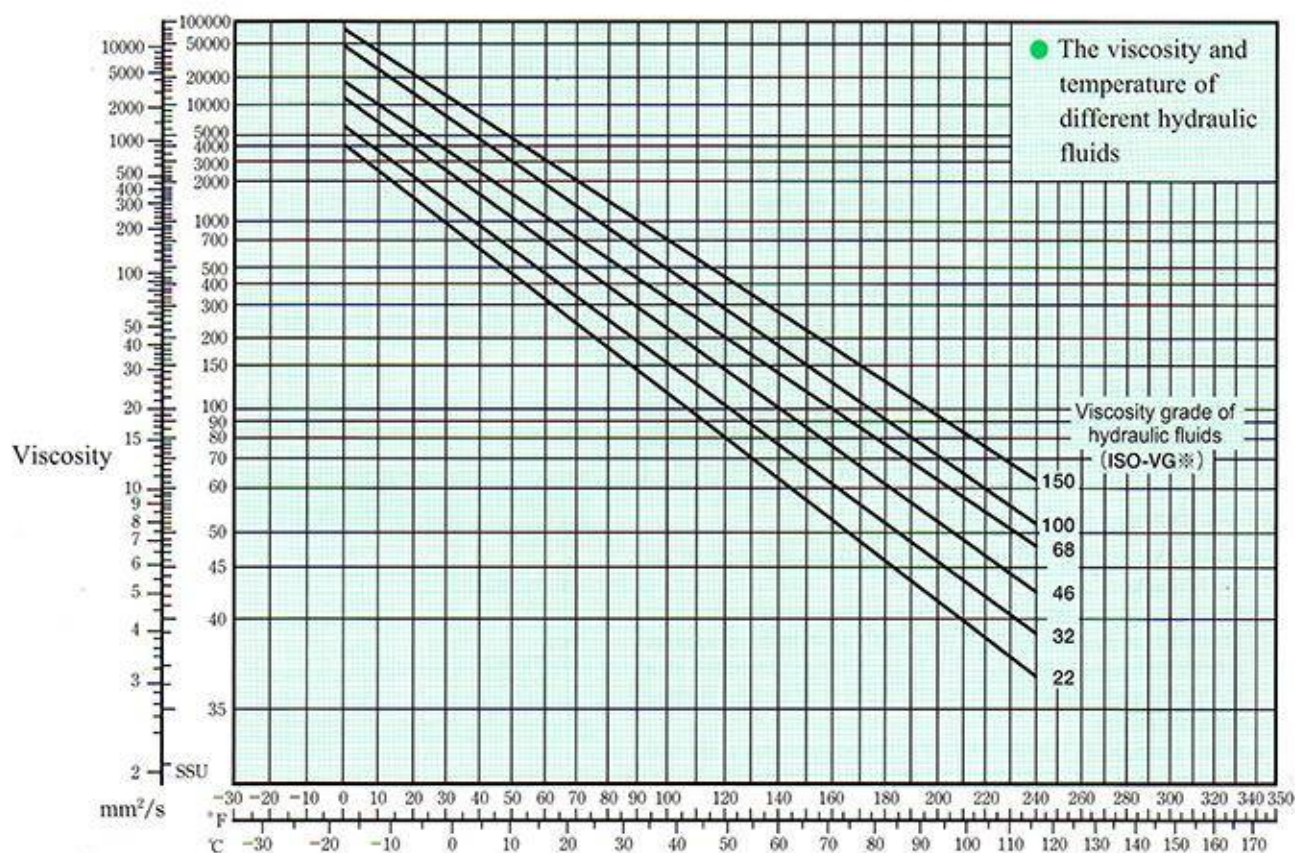
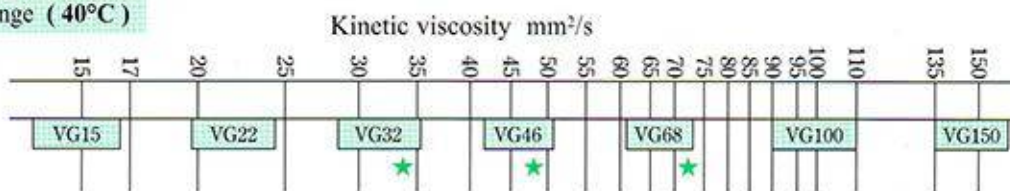
● Limit of water content

Applicable conditions	Limit
Fluid becomes milky with water contained.	To be replaced immediately.
Systems in which operating fluid circulates and returns to reservoir and which are not to be stopped for a long period of time.	1000ppm
System with long piping lines in which operating fluid in circuits does not completely circulate.	500ppm
Systems to be stopped for a long period of time (Safety systems) or systems in which operating fluid in circuits moves little, and precision control systems.	300ppm

■ Viscosity of hydraulic fluids

Viscosity range (40°C)

● ISO
Viscosity
grade
(ISO VG)



General Information

Instructions for hydraulic pump

1. Mounting

When installing piston pumps the filling port should be positioned upwards. When (S)-PV2R Single and Double Vane Pumps are operated below 1200 r/min; we recommend the suction port upwards to suck oil easily.

2. 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 (Total Indicator Reading) and maximum permissible misangular is less than 0.2°.

3. Suction Pressure

★ 1 kPa = 0.01 kgf/cm² = 7.5 mmHg

Model		Suction Pressure Range		
		Min		Max.
		Petroleum base oils	Water containing phosphate esters	
Piston Pumps	ARL1 AR※	-16.7 kPa	—	+50 kPa
Single Pumps	50T 150T	-20 kPa	-16 kPa	+140 kPa
PV2R Single Vane Pumps	(S)-PV2R1 (S)-PV2R2 (S)-PV2R3 (S)-PV2R4	-20 kPa	-16 kPa	+30 kPa
PV2R Double Vane Pumps	(S)-PV2R12 (S)-PV2R13 (S)-PV2R23 (S)-PV2R24 (S)-PV2R34	-20 kPa		
		-20 kPa		
		-20 kPa ★		

- Make sure that the height of the pump suction port is within 1m from the oil level in the reservoir.
- Please follow the instructions of catalogue to choose suitable caliber of suction port pipes; otherwise, it might lead to dangerous cavitation. We suggest the suction port flow rate under 1 m/s.

★ For some displacement of pumps, the Min. suction pressure is restricted by the rotation speed. Please refer to Table 1.

● Table 1: The limitation of Min. suction pressure for specific displacement of hydraulic pumps.

The following hydraulic pumps with rotation speed 1700 r/min are restricted by the Min. suction pressure. (Min. suction pressure of other hydraulic pumps is -150 mmHg)

Model No.	Min. Suction Pressure kPa	
	1700 r/min Below	1700-1800 r/min
(S)-PV2R3-116	-20	0
(S)-PV2R4-237	-20	-13.3
(S)-PV2R※3-※-76	-20	-6.7
(S)-PV2R※3-※-94	-20	-6.7
(S)-PV2R※3-※-116	-20	0
(S)-PV2R※4-※-237	-20	-13.3
(S)-PV2R34-76-※	-20	-6.7
(S)-PV2R34-94-※	-20	-6.7
(S)-PV2R34-116-※	-20	0
(S)-PV2R34-116-237	-20	0

4. Instructions of Piping

- ① 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.
- ② 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.

5. 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 (14.5 PSI) and surge pressure of less than 0.5 MPa (72.5 PSI). Length of piping should be less than 1 m, and the pipe end should be submerged in oil.

Recommended Drain Piping Size:

Model	Piping Fitting Size	Internal Dia. of Pipe
ARL1, AR※	3/8 (Internal Dia. more than Ø8.5)	more than Ø10

6. Hydraulic Pumps Starting

- Before first starting, fill pump case with clean operating oil via the filling port.
- In order to avoid air blockage when starting pumps after long time shut down, to set up air bleeding valve on the discharge sides in advance or to loose discharge piping connection area for bleeding the air in the pipes. To the best of pumps' starting with no loading.
- When temperature is under 15°C in winter or viscosity is 200~400 mm²/s (1000SSU~1800SSU), please refer to the following instructions to start pumps in order to make better internal lubrication, and it will help the suction of the pump and extend the pump's life.
- Starting instructions: to start running pumps for 5 seconds, and then stop it for 10 seconds. To repeat this process 10 times, and then keep it running.

● Table 2: Max. viscosity list of starting at low rotation speed

Model	Rotation speed of starting r/min	Max. viscosity mm ² /s
PV2R1 (S)-PV2R12 (S)-PV2R13 (S)-PV2R14	750	100
	950	200
50T (S)-PV2R2 (S)-PV2R23 (S)-PV2R24	600	100
	950	200

ARL1 Series Variable Piston Pumps

Max. Pressure 7 MPa



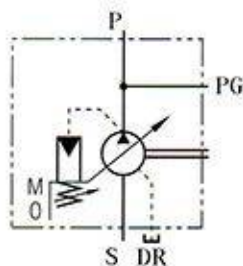
- **High Efficiency:** With long-term reliable technology of A & AR series piston pumps, Yuken designs high efficiency pressure control piston pumps.
- **Smaller in Size and Lighter in Mass:**
ARL1 is 40% smaller than A series and 30% lighter than A series.
- **Low Noise:** Pressure 7 MPa, speed 1500 r/min, one meter horizontally away from pump head cover, the noise level is as low as 55 dB(A) standards for ARL1-16 at the full cut-off.
- **There is no flow adjustment screw in ARL1 series,** please choose it according to the displacement.

Model Number Designation

ARL1 - 16 - F R 01 S - 10					
Series Number		Design Number			
Nominal Displacement		Suction Port Position (View from shaft end)			
6 : 6.2 cm ³ /rev		S: Side Port (Normal)			
8 : 8.5 cm ³ /rev		A: Downwards			
12 : 12.3 cm ³ /rev		Piston Pump Control Type			
16 : 16.3 cm ³ /rev		01: Pressure Compensator Control Type			
Type of Mounting		Direction of Rotation (View from the shaft end)			
F: Flange Mounting		R: Clockwise (Normal)			
L: Foot Mounting					

★ : To use foot mounting type, the direction of suction port can only be chosen S type.

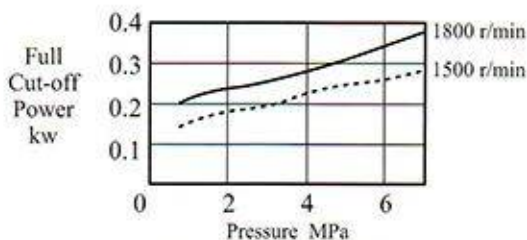
Graphic Symbol



Specifications

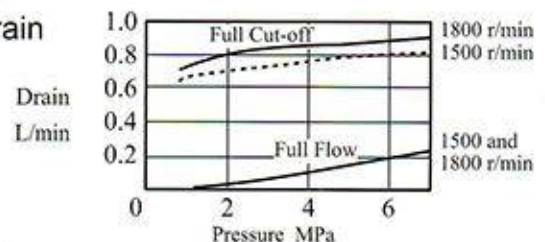
Model No.	Nominal Displacement cm ³ / rev	Minimum Pressure Adj. MPa	Max. Pressure MPa	Shaft Speed Range r / min		Mass kg
				Max	Min.	
ARL1-6-※R01※-10	6.2	1.2	7	1800	600	Flange Mtg 6.8 Foot Mtg 9.0
ARL1-8-※R01※-10	8.5					
ARL1-12-※R01※-10	12.3					
ARL1-16-※R01※-10	16.3					

Full Cut-off Power

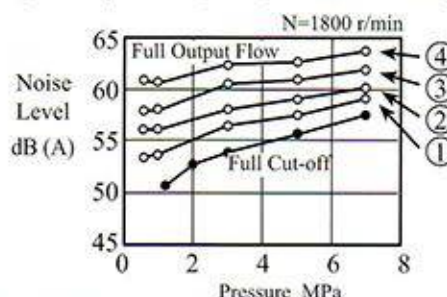
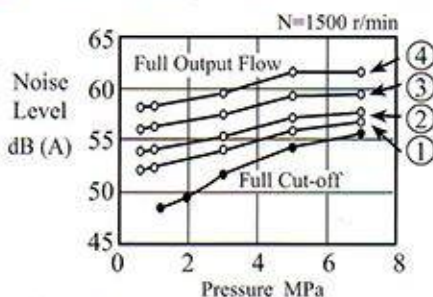


The above characteristics are based on fluid viscosity 32 mm²/s (ISO VG32 Oils, 40°C)

Drain



Noise Level (One meter horizontally away from pump head cover)



The above characteristics are based on fluid viscosity 32 mm²/s (ISO VG32 Oils, 40°C)

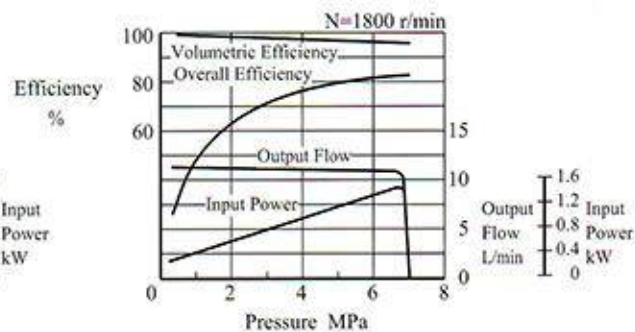
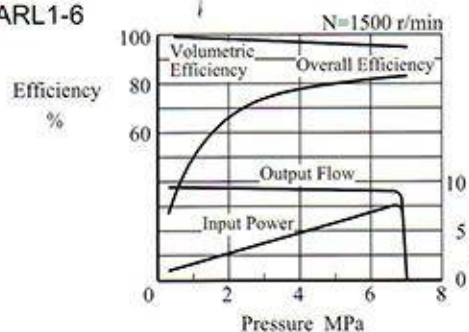
NO	Model No.
①	ARL1-6
②	ARL1-8
③	ARL1-12
④	ARL1-16

ARL1 Series Variable Piston Pumps

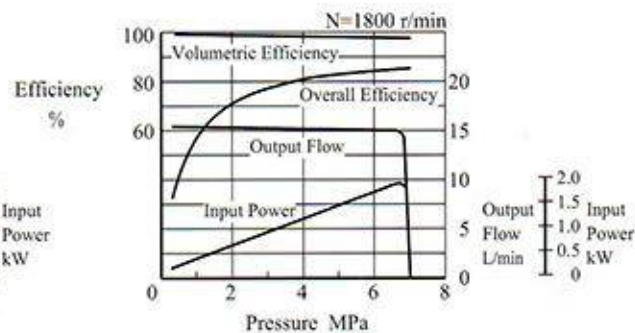
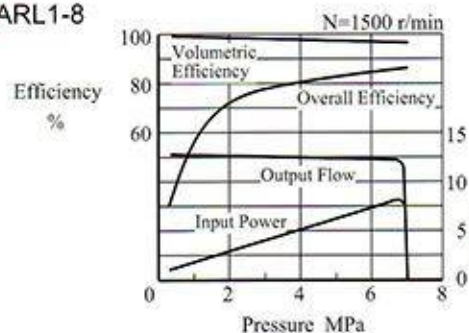
Max. Pressure 7 MPa

Performance Characteristic Curve

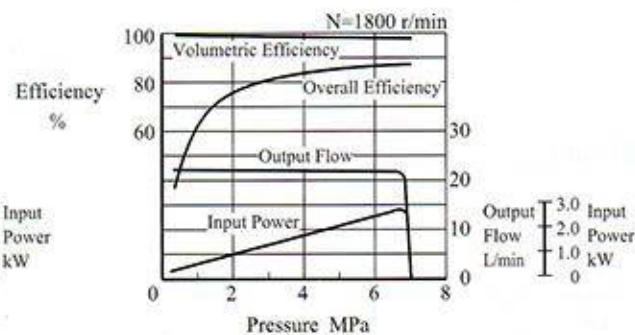
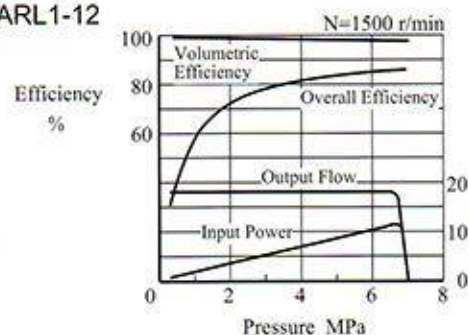
ARL1-6



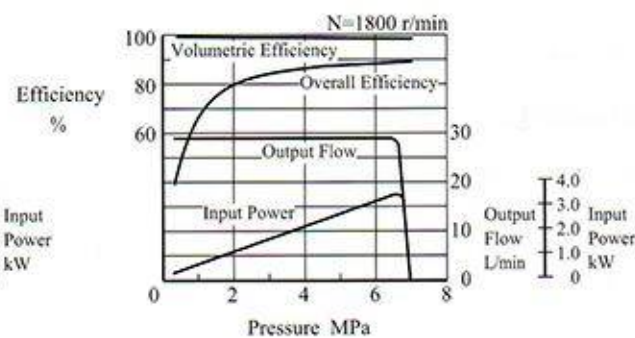
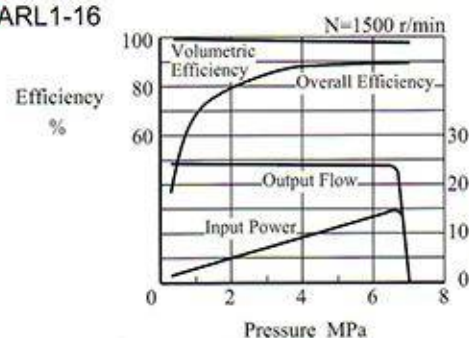
ARL1-8



ARL1-12



ARL1-16

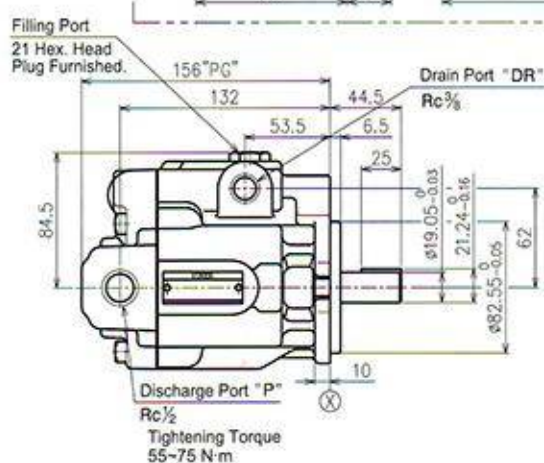
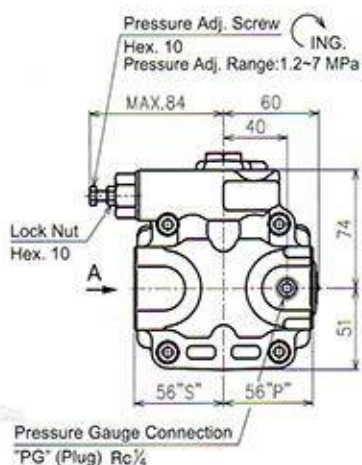
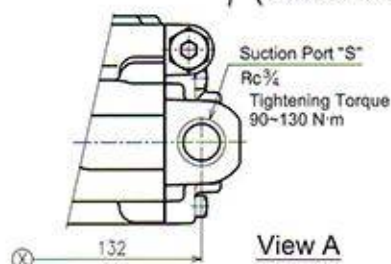


The above characteristics are based on fluid viscosity 32 mm²/s (ISO VG32 Oils, 40°C)

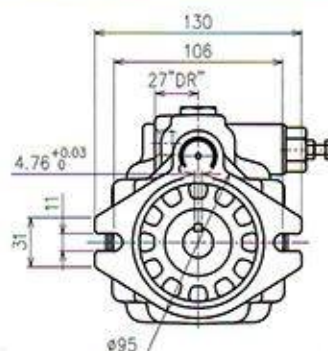
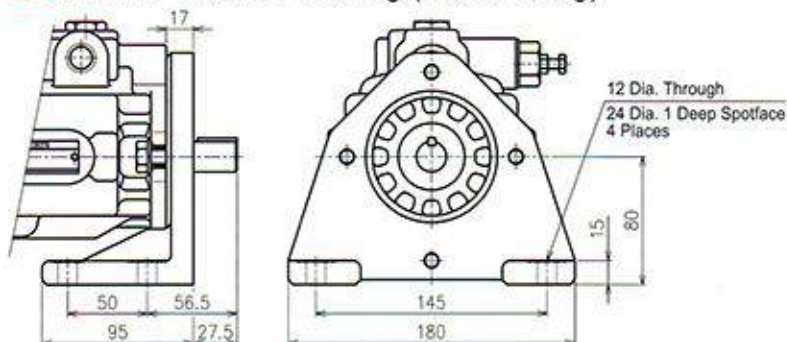
ARL1 Series Variable Piston Pumps

Max. Pressure 7 MPa

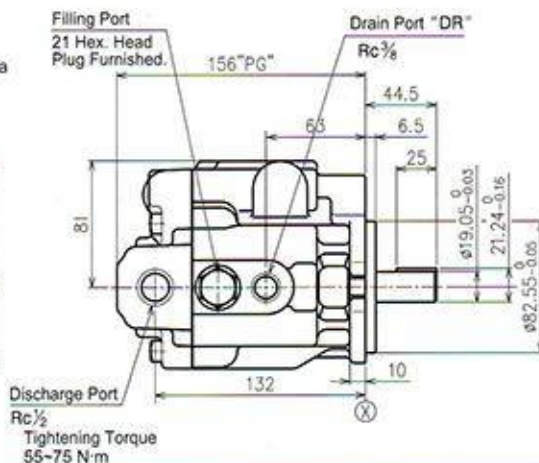
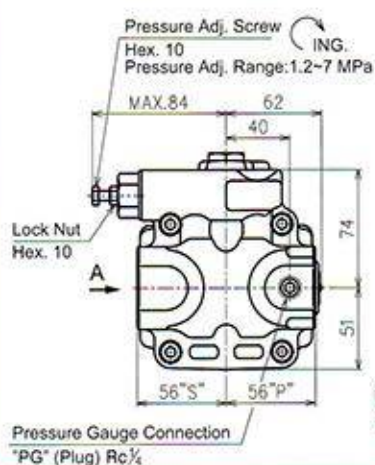
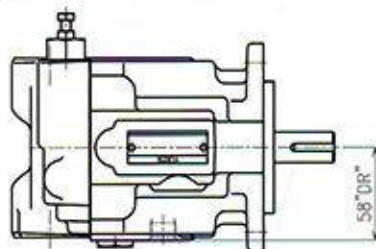
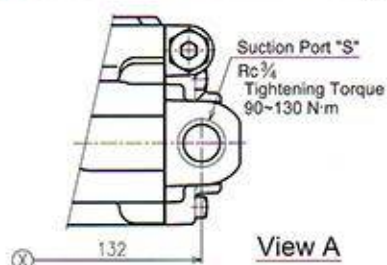
■ ARL1-※-FR01S-Flange Mtg
(Mass: 6.8kg)



■ ARL1-※-LR01S-Foot Mtg (Mass: 9.0kg)



■ ARL1-※-FR01A-Flange Mtg(Mass: 6.8kg)

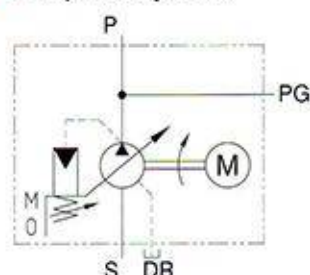


AML1 Series Motor-Pumps

Max. Pressure 7 MPa



Graphic Symbol



- ARL1 series Variable Piston Pumps with the characteristic, high efficiency, beautiful, light and low noise combined with ML1 series Electric Motors to make compact Power Unit more valuable.
- Smaller in size and lighter in mass. Electric Motors with light and beautiful aluminum bodies to be combined with ARL1, the size is 40% smaller and the mass is 20% lighter than ARM series.
- Low noise: low noise electric motors combined with low noise ARL1 hydraulic pumps; therefore, the working noise of AML1 series is very low.
- ARL1 is flow rate fixed pumps with non-adjustable flow control. Please choose AML1 series according to the displacement.

Applications :

- NC Lathes
- MC machines
- High efficiency special machines

Model Number Designation

AML1	- 16	- S	- 0.75	- 380	- A	- 1010
Series Number	Nominal Displacement	Suction Port Position	Electric Motors	Power Source	Frequency	Design No.
AML1	6 : 6.2 cm ³ / rev 8 : 8.5 cm ³ / rev 12 : 12.3 cm ³ / rev 16 : 16.3 cm ³ / rev	Suction Port Position (View from shaft end) S: Side port (Normal) A: Downwards	0.75 : 0.75 KW (Note 1) 1.5 : 1.5 KW 2.2 : 2.2 KW	None:200/200/220V(Normal) 400:400/400/440V	None: 50 / 60 / 60 Hz(Normal)	10
				220:220V 380:380V	A : 50 Hz B : 60 Hz D : 50 / 60 Hz	1010

Note 1: 12 and 16 displacement pumps are not suitable for 0.75 KW electric motors.

Note 2: Please contact us for other voltage of the power sources.

Specifications: (No. of Poles: 4P . Isolation Level : F)

Model No.	Power Source (V)	Frequency (Hz)		Rated Electric Flow (A)		Rotation Speed (r/min)		Starting Electric Flow (A)	
ML1-0.75-10	200	50	60	3.70	3.40	1410	1700	17.0	15.5
	220	-	60	-	3.35	-	1720	-	17.5
ML1-0.75-400-10	400	50	60	1.82	1.62	1420	1710	9.3	8.6
	440	-	60	-	1.62	-	1720	-	9.8
ML1-0.75-220-D-1010	220	50	60	3.52	3.35	1420	1720	18.7	17.3
ML1-0.75-380-D-1010	380	50	60	2.02	1.75	1420	1720	10.7	10.0
ML1-1.5-10	200	50	60	6.30	6.00	1410	1700	34.5	30.0
	220	-	60	-	5.60	-	1720	-	33.6
ML1-1.5-400-10	400	50	60	3.44	3.10	1420	1710	21.7	19.6
	440	-	60	-	3.02	-	1720	-	21.7
ML1-1.5-220-D-1010	220	50	60	6.27	5.62	1420	1720	37.6	35.6
ML1-1.5-380-D-1010	380	50	60	3.56	3.35	1420	1720	21.6	20.6
ML1-2.2-10	200	50	60	9.60	9.00	1410	1700	49.5	44.5
	220	-	60	-	8.50	-	1720	-	50.2
ML1-2.2-400-10	400	50	60	5.07	4.56	1420	1710	31.2	27.3
	440	-	60	-	4.41	-	1720	-	29.5
ML1-2.2-220-D-1010	220	50	60	9.15	8.45	1420	1720	57.4	50.1
ML1-2.2-380-D-1010	380	50	60	5.48	4.99	1420	1720	32.1	28.3

Note 3: Construction of the Case: Anti-foam sealed, the outside case can cool down automatically (Refer to IP54 JC4, EN60034-1:2010).

Ambient Environment Installing Place: Indoors, Elevation: Under 1000 m

Temperature: -20°C~40°C, Non-Corrosive: Explosive air or steam

Humidity: Related temperature under 100% will not become dew.

AML1 Series Motor-Pumps

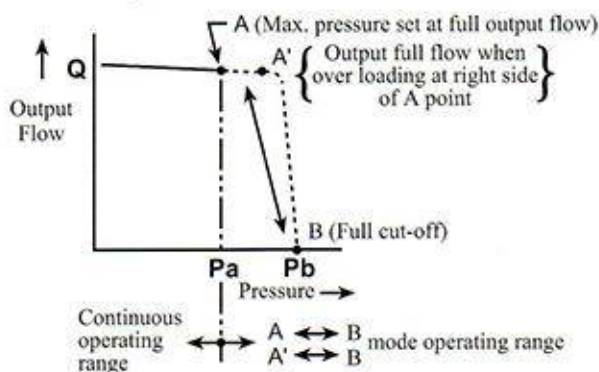
Max. Pressure 7 MPa

Piston Pumps and Electric Motor Specifications

Model No.	Geometric Displacement	Min. Adj. Flow	Max. Operating Pressure	Electric Motors	Suitable Pressure Range		Mass kg
	cm³/rev			MPa	MPa	KW	
AML1-6※-0.75-※-※-10/1010	6.2	1.2	7	0.75KW x 4P	Under 5.0	Under 4.1	19.8
AML1-6※-1.5-※-※-10/1010				1.5KW x 4P	Under 7.0	Under 7.0	24.8
AML1-8※-0.75-※-※-10/1010	8.5			0.75KW x 4P	Under 3.6	Under 3.0	19.8
AML1-8※-1.5-※-※-10/1010				1.5KW x 4P	Under 7.0	Under 7.0	24.8
AML1-12※-1.5-※-※-10/1010	12.3				Under 5.0	Under 4.0	
AML1-12※-2.2-※-※-10/1010				16.3	2.2KW x 4P	Under 7.0	Under 7.0
AML1-16※-2.2-※-※-10/1010	Under 6.0					Under 5.0	

Pressure Range

The below diagram is included allowable loading capacity of motor pumps. Please choose suitable motor pumps according to the information.



Unit : MPa

Model No.	50Hz		60Hz	
	Pa	Pb	Pa	Pb
AML1-6※-0.75-	3.8	7	2.9	7
AML1-6※-1.5-	--	7	6.9	7
AML1-6※-2.2-	--	7	--	7
AML1-8※-0.75-	2.7	3.5	2.1	3.5
AML1-8※-1.5-	6.3	7	4.9	7
AML1-8※-2.2-	--	7	--	7
AML1-12※-1.5-	4.2	7	3.4	7
AML1-12※-2.2-	6.4	7	5.2	7
AML1-16※-1.5-	3.3	7	2.6	7
AML1-16※-2.2-	4.9	7	3.9	7

- Pa: A point (When full output flow) Max setting pressure.
- Pb: B point (When full cut-off operated) Max setting pressure.

[50Hz]

Nominal Displacement	Model No.	Pressure Range (MPa)						
		1	2	3	4	5	6	7
6	AML1-6※-0.75-							
	AML1-6※-1.5-							
	AML1-6※-2.2-							
8	AML1-8※-0.75-							
	AML1-8※-1.5-							
	AML1-8※-2.2-							
12	AML1-12※-1.5-							
	AML1-12※-2.2-							
16	AML1-16※-1.5-							
	AML1-16※-2.2-							

Pa Pb

[60Hz]

Nominal Displacement	Model No.	Pressure Range (MPa)						
		1	2	3	4	5	6	7
6	AML1-6※-0.75-							
	AML1-6※-1.5-							
	AML1-6※-2.2-							
8	AML1-8※-0.75-							
	AML1-8※-1.5-							
	AML1-8※-2.2-							
12	AML1-12※-1.5-							
	AML1-12※-2.2-							
16	AML1-16※-1.5-							
	AML1-16※-2.2-							

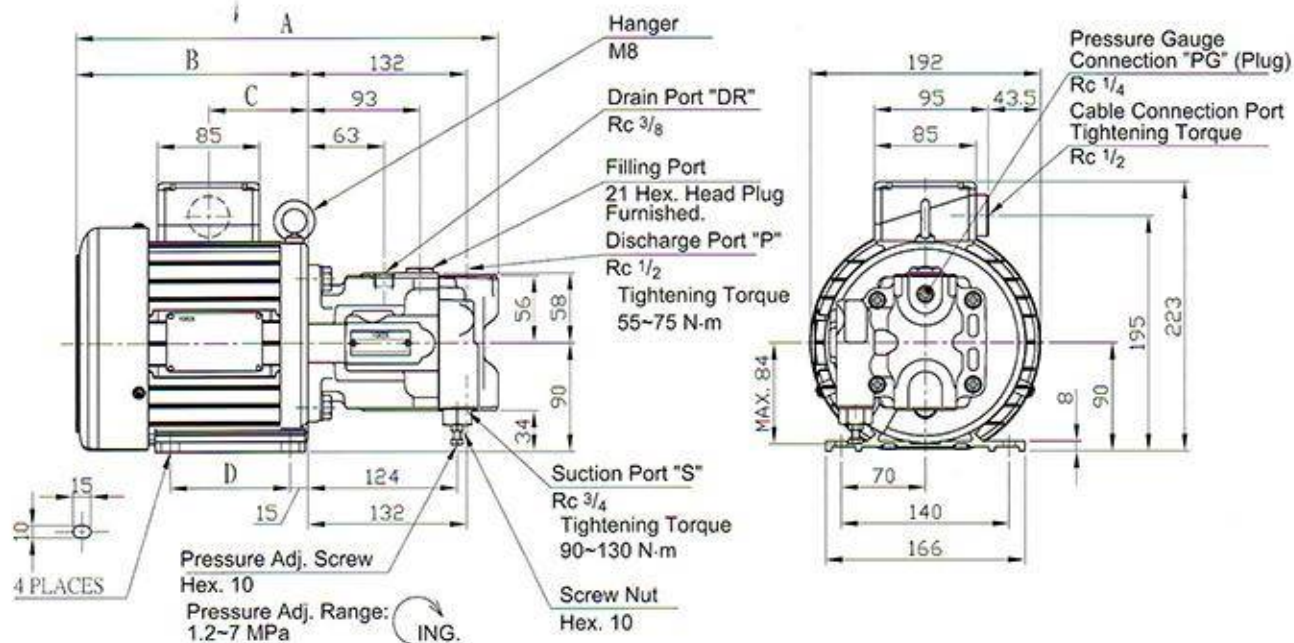
Pa Pb

- Continuous operating range: The pressure range of full output flow
- A↔B operating range: Included pressure range of full cut-off operating

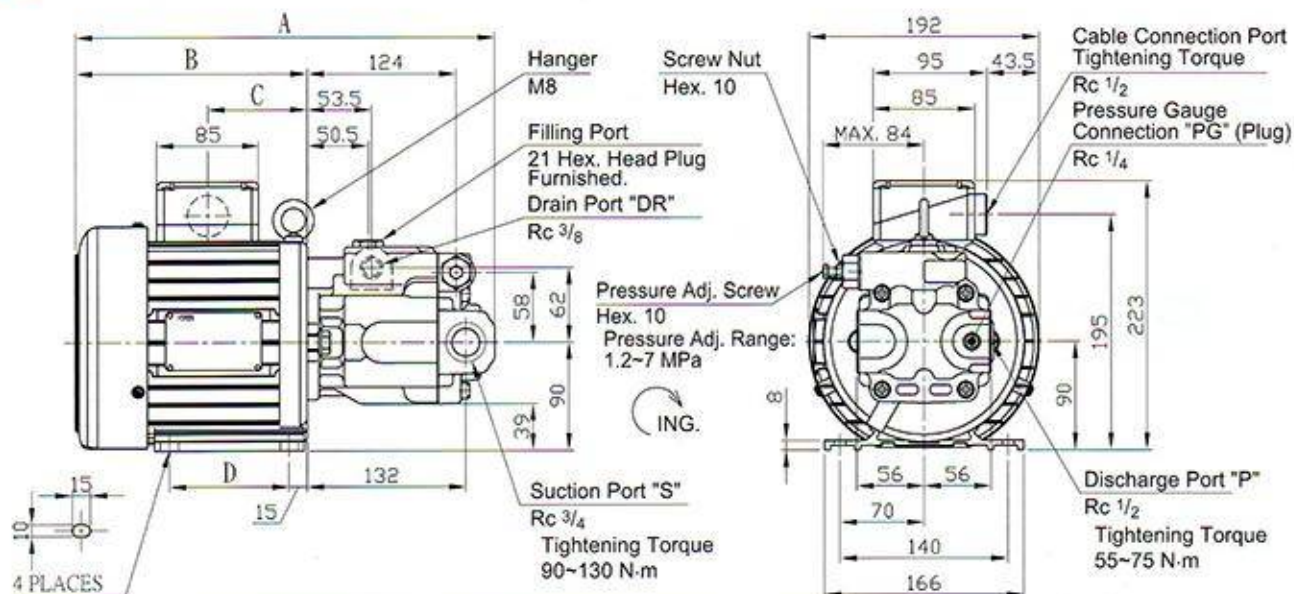
AML1 Series Motor-Pumps

Max. Pressure 7 MPa

■ AML1-※A-※-10/1010 :



■ AML1-※S-※-10/1010 :



Model No.	Size (cm)				Mass kg
	A	B	C	D	
AML1-0.75-10 /1010	351.5	193.5	83	100	19.8
AML1-1.5-10 /1010	381.7	223.7	113	125	24.8
AML1-2.2-10 /1010	411.5	253.5	143	125	27.3

ML1 Series Electric Pumps



Graphic Symbol



- Compact ML1 electric motors with high standard silicon steel have high efficiency than the ordinary electric motors and the total length is 40-50mm shorter than the standard electric motors.
- ML1 electric motors are made by light and beautiful aluminum pressed bodies. The mass is 16-35% lighter than the standard electric motors.
- Low noise: Precision-balanced adjustment, low vibration, and low noise.
- ML1-0.75/(0.75KW) was awarded CCC certificate in China.

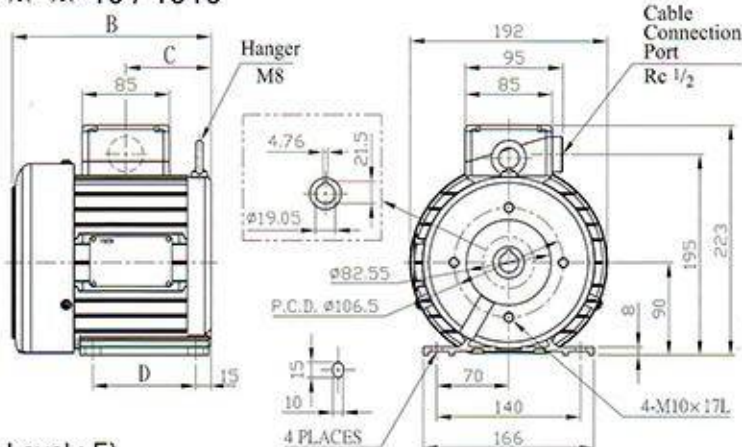
Model Number Designation

ML1 Series Number	- 0.75 Electric Motors	- 380 Power Source	- A Frequency	- 1010 Design No.
ML1	0.75 : 0.75 KW 1.5 : 1.5 KW 2.2 : 2.2 KW	None:200/200/220V(Normal) 400:400/400/440V	None: 50/60/60 Hz(Normal)	10
		220:220V 380:380V	A : 50 Hz B : 60 Hz D : 50 / 60 Hz	1010

Note 1: Please contact us for other voltage of power sources.

ML1-※-※-10 / 1010

Model	Size(cm)				Mass kg
	A	B	C	D	
ML1-0.75-※-※-10 / 1010	351.5	193.5	83	100	13.0
ML1-1.5-※-※-10 / 1010	381.7	223.7	113	125	18.0
ML1-2.2-※-※-10 / 1010	411.5	253.5	143	125	20.5



Specifications: (No. of Poles: 4P . Isolation Level : F)

Model	Power Source (V)	Frequency (Hz)		Rated Electric Flow (A)		Rotation Speed (r/min)		Starting Electric Flow (A)	
ML1-0.75-10	200	50	60	3.70	3.40	1410	1700	17.0	15.5
	220	-	60	-	3.35	-	1720	-	17.5
ML1-0.75-400-10	400	50	60	1.82	1.62	1420	1710	9.3	8.6
	440	-	60	-	1.62	-	1720	-	9.8
ML1-0.75-220-D-1010	220	50	60	3.52	3.35	1420	1720	18.7	17.3
ML1-0.75-380-D-1010	380	50	60	2.02	1.75	1420	1720	10.7	10.0
ML1-1.5-10	200	50	60	6.30	6.00	1410	1700	34.5	30.0
	220	-	60	-	5.60	-	1720	-	33.6
ML1-1.5-400-10	400	50	60	3.44	3.10	1420	1710	21.7	19.6
	440	-	60	-	3.02	-	1720	-	21.7
ML1-1.5-220-D-1010	220	50	60	6.27	5.62	1420	1720	37.6	35.6
ML1-1.5-380-D-1010	380	50	60	3.56	3.35	1420	1720	21.6	20.6
ML1-2.2-10	200	50	60	9.60	9.00	1410	1700	49.5	44.5
	220	-	60	-	8.50	-	1720	-	50.2
ML1-2.2-400-10	400	50	60	5.07	4.56	1420	1710	31.2	27.3
	440	-	60	-	4.41	-	1720	-	29.5
ML1-2.2-220-D-1010	220	50	60	9.15	8.45	1420	1720	57.4	50.1
ML1-2.2-380-D-1010	380	50	60	5.48	4.99	1420	1720	32.1	28.3

Note 3: Construction of the Case: Anti-foam sealed, The outside case can cool down automatically (Refer to IP54 J4, EN60034-1:2010).

Ambient Environment

Installing Place: Indoors, Elevation: Under 1000 m

Temperature: -20°C~40°C, Non-Corrosive: Explosive air or steam

Humidity: Related temperature under 100% will not become dew.

AR Series Variable Piston Pumps Max. Pressure 16 MPa

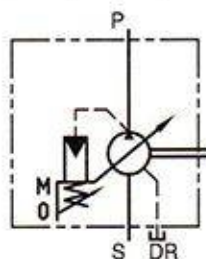


- Low noise and high efficiency.
- Options for Axial port and Side port.
- To save the piping of the tank and the space.

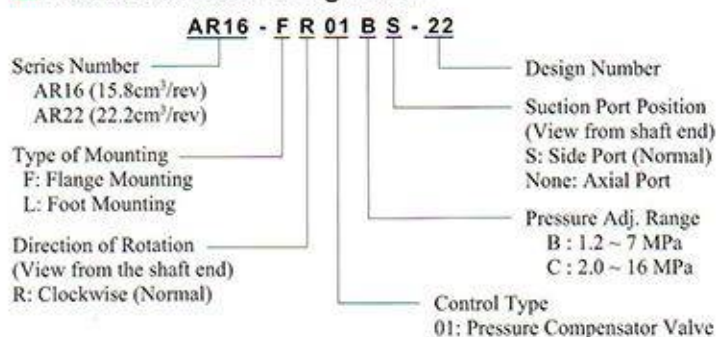
Applications:

- NC lathes, MC machines, Pipe-bending machines, Blow moulding machines, High efficiency special machines and Small hydraulic punching machines.

Graphic Symbol



Model Number Designation



Specifications

Model No.	Geometric Displacement cm ³ /rev	Min. Adj. Pressure MPa	Max Operating Pressure MPa	Rotation Speed Range r/min		Min. Adj. Flow cm ³ /rev	Mass kg	
				Min.	Max.		Flange Mounting	Foot Mounting
AR16※-※R01※-22	15.8	1.2	16	1800	600	AR16 : 6	12.3	14.5
AR22※-※R01※-22	22.2							
AR16※-※R01※S-22	15.8					AR22 : 8.5	13.0	15.5
AR22※-※R01※S-22	22.2							

- **Adjustment of Pressure**
Turning the pressure adjustment screw clockwise, increases pressure.
Volume adjusted by each full turn of the pressure adjust screw. Please tighten the screw after adjusting.

Model No.	Adjustment Volume MPa
ARL1-FR01	1.5
AR16/AR22-FR01B	2.9
AR16/AR22-FR01C	5.4

- **Adjustment of Flow (Only for AR pumps)**
Turning the flow adjustment screw clockwise, decreases flow.
Volume adjusted by each full turn of the flow adjust screw. Please tighten the screw after adjusting.

Model No.	Adjustable volume with each full turn of the adjustment screw cm ³ /rev	Minimum Adjustable flow cm ³ /rev
AR16	1.5	6.0
AR22	2.1	8.5

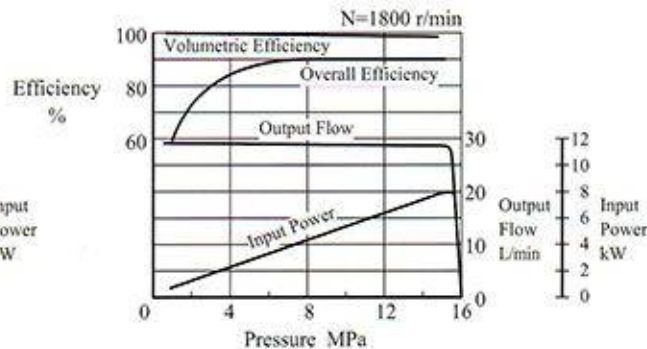
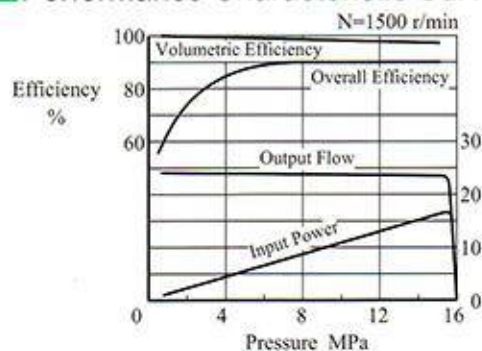
Please tighten the screw after adjusting

AR Series Variable Piston Pumps Max. Pressure 16 MPa

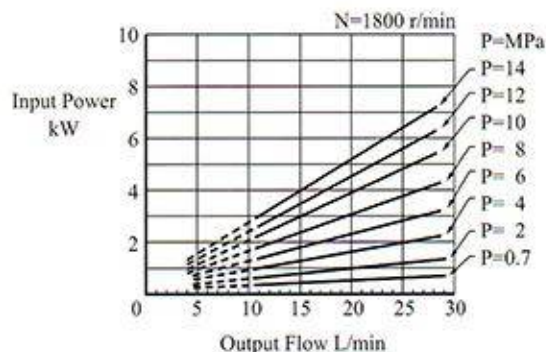
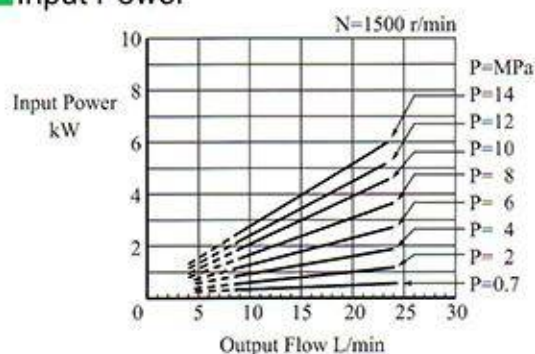
AR 16 Performance Characteristic Curve

Typical Pump Characteristics of "AR16" at Viscosity 20 mm²/s (ISO VG32 oils, 50°C)

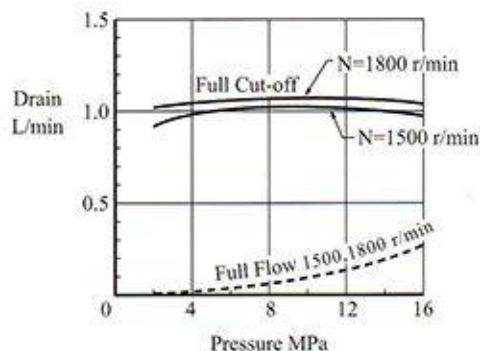
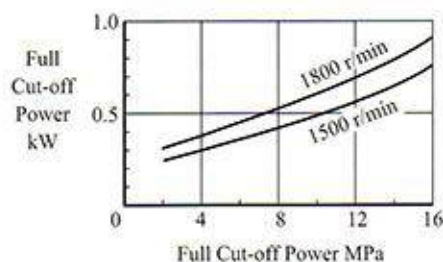
Performance Characteristic Curve



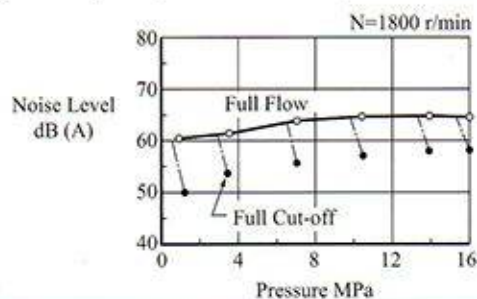
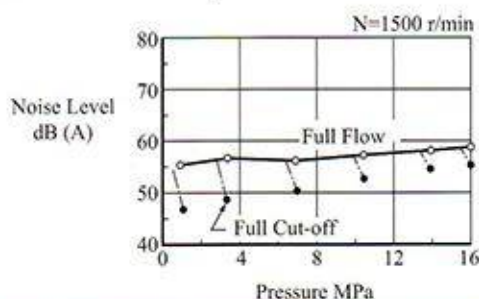
Input Power



Full Cut-off Power



Noise Level (One meter horizontally away from pump head cover)

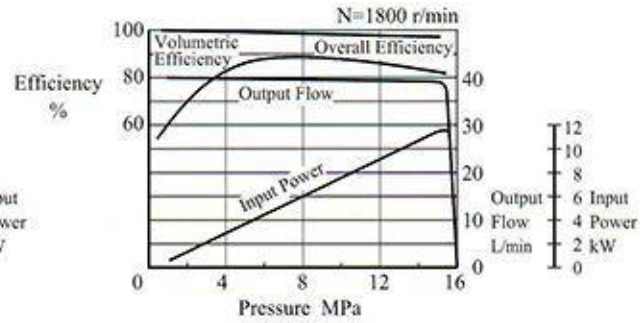
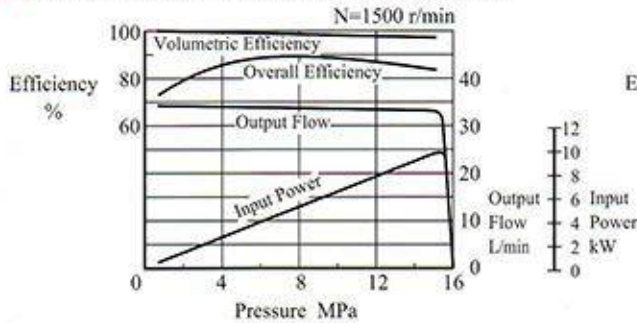


AR Series Variable Piston Pumps Max. Pressure 16 MPa

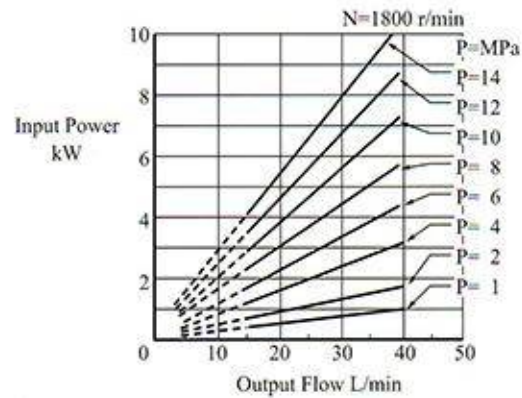
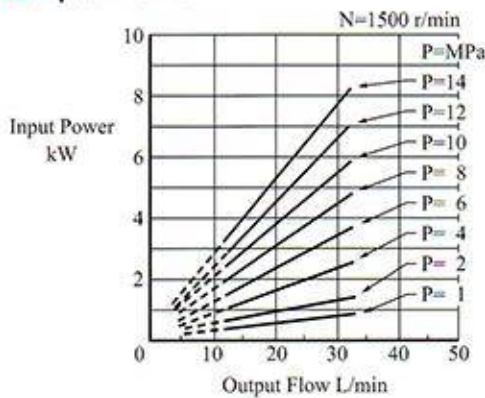
AR 22 Performance Characteristic Curve

Typical Pump Characteristics of "AR22" at Viscosity 20 mm²/s (ISO VG32 oils, 50°C)

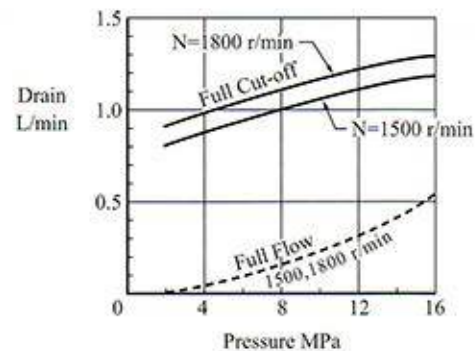
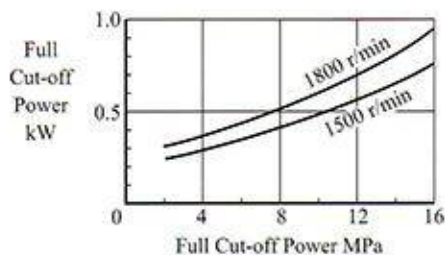
Performance Characteristic Curve



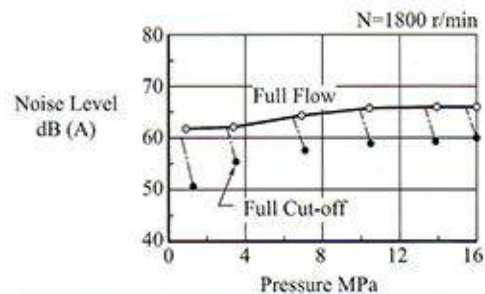
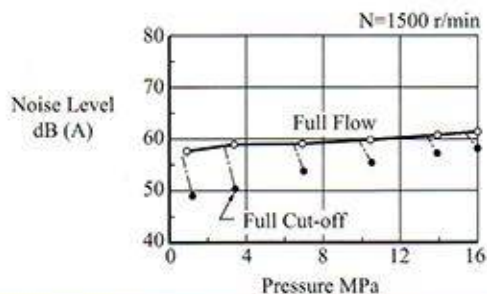
Input Power



Full Cut-off Power



Noise Level (One meter horizontally away from pump head cover)



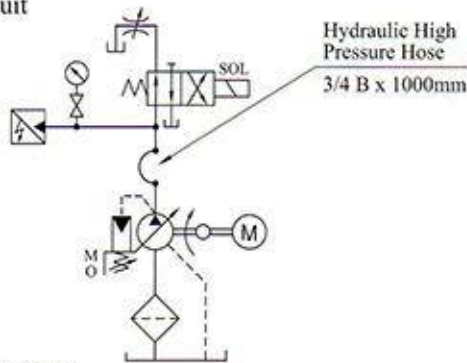
AR Series Variable Piston Pumps

Response Characteristics

Response characteristics change in accordance with circuits and operating conditions. Please see below testing results.

■ Test Circuit and Conditions

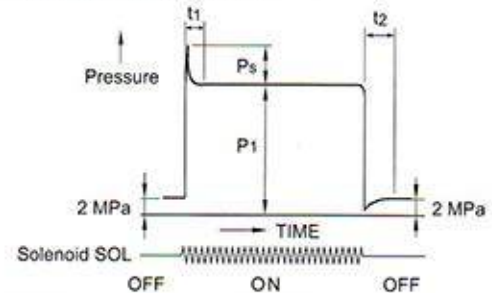
- Circuit



- Conditions

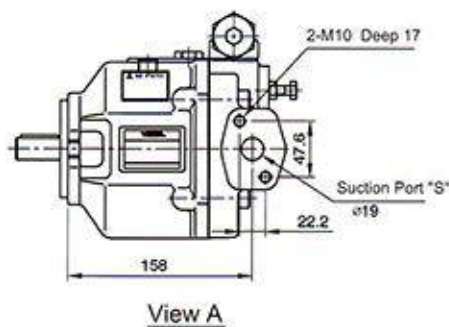
Drive Speed: 1500 r/min
Hydraulic Fluid: ISO VG32 oil
Oil Temperature: 50 °C
Viscosity: 20 mm²/s

■ Result of Measurement

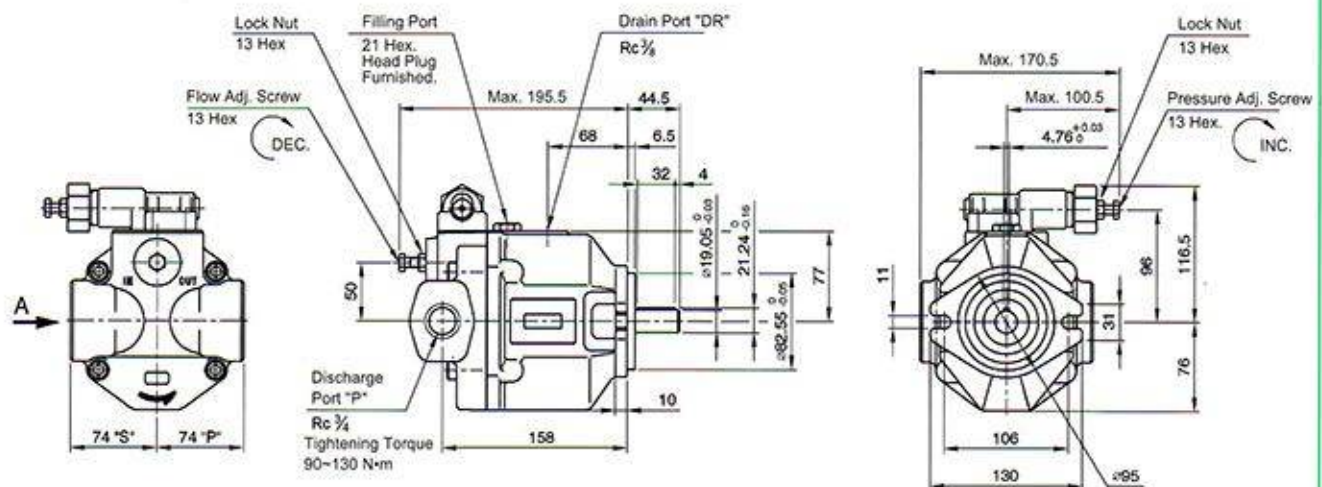
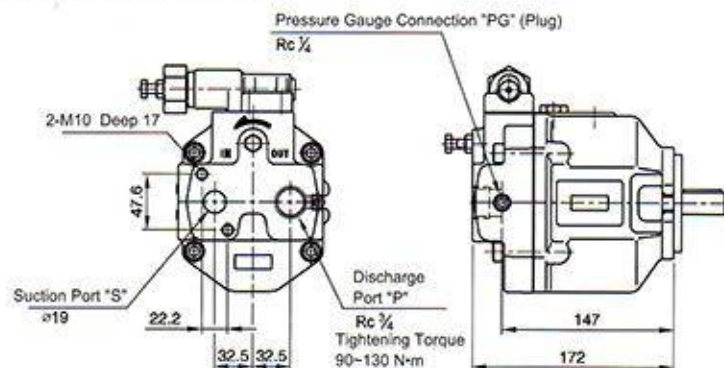


Model	Full Cut-off Pressure MPa	Response Time ms		Overshoot Pressure MPa
	P1	t ₁	t ₂	P _s
AR16	16	60	65	Under 5.6
AR22		70	70	Under 7.3

■AR※-FR01※S-22



■AR※-FR01※-22



Single Vane Pumps

Max. Pressure 7 MPa

These pumps are widely used as a source of hydraulic power, owing to their features of stable performance and robust construction with a wide range of displacement.

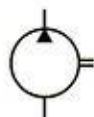


Specifications

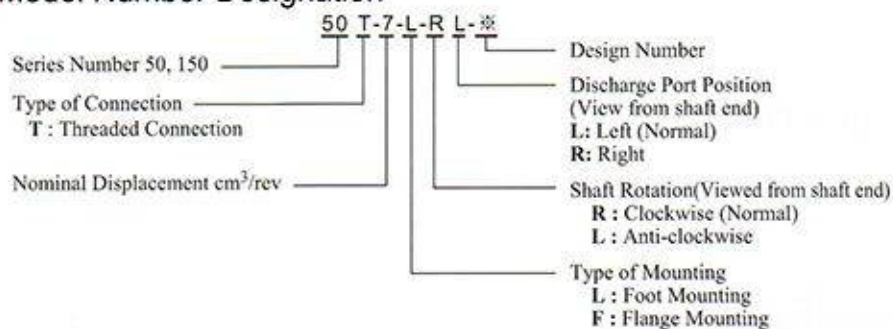
Model No.	Geometric Displacement cm ³ /rev	Max. Pressure MPa (kgf/cm ²)	Shaft Speed Range r/min	Mass kg	
				Flange Mtg	Foot Mtg
50T-7-※-※-※-30	6.8	7 (70)	* 800~2000	9	10.5
50T-12-※-※-※-30	11.6		* 600~2000		
50T-17-※-※-※-30	16.5		* 600~1800		
50T-23-※-※-※-30	22.9				
50T-26-※-※-※-30	25.9				
50T-36-※-※-※-30	36.0				
150T-48-※-※-※-40	47.7	7 (70)	600~1500	25	26
150T-61-※-※-※-40	61.1				
150T-75-※-※-※-40	74.9				
150T-94-※-※-※-40	93.6		600~1200		
150T-116-※-※-※-40	115.6				

*For starting at low speed, the maximum viscosity is limited. Please refer to page 8 for details (Table 2).

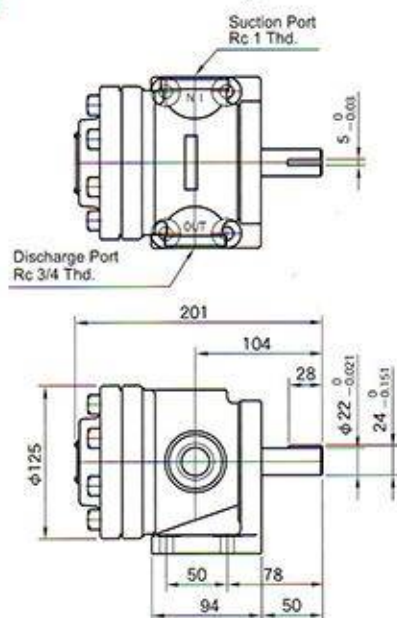
Graphic Symbol



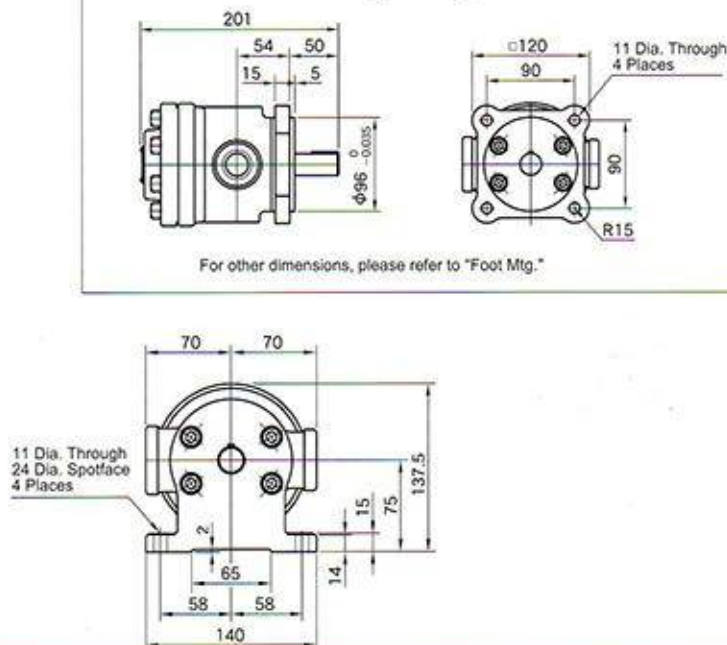
Model Number Designation


50 T

Foot Mtg.



Flange Mtg.

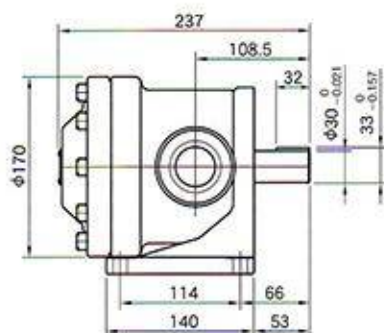
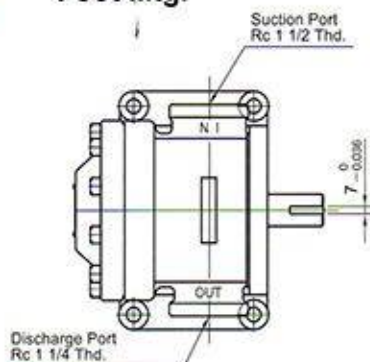


Single Vane Pumps

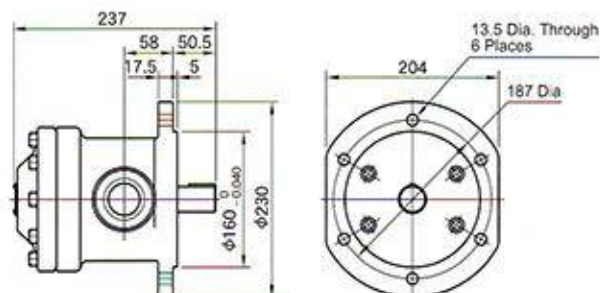
Max. Pressure 7 MPa

150 T

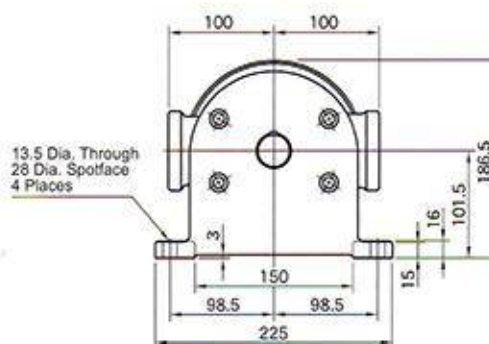
Foot Mtg.



Flange Mtg.

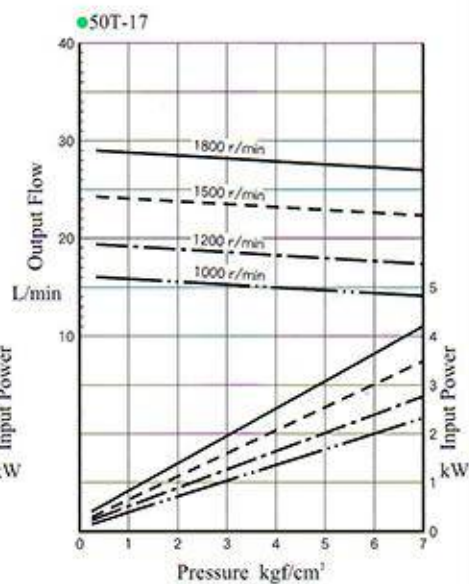
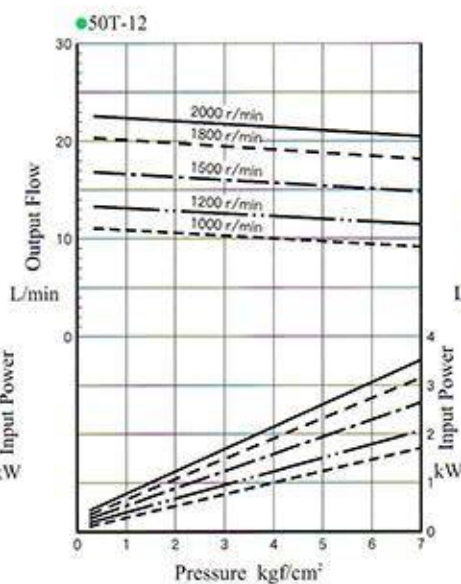
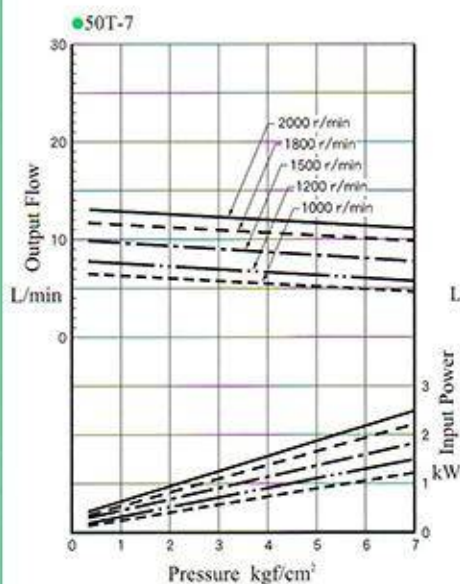


For other dimensions, please refer to "Foot Mtg."



Pressure—Output Flow · Input Power Characteristics

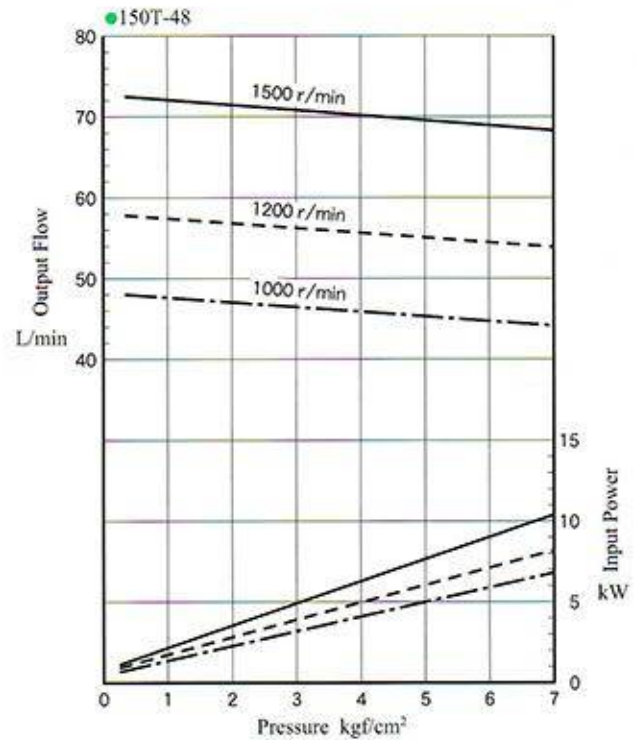
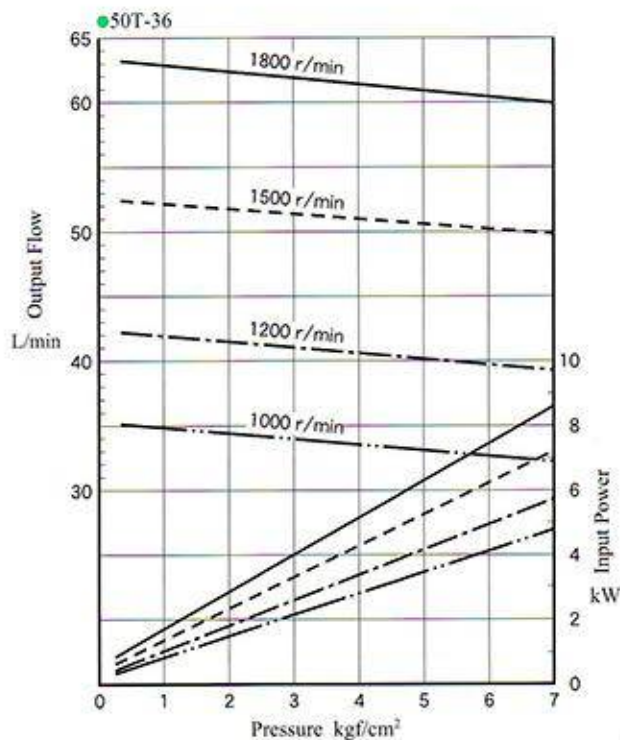
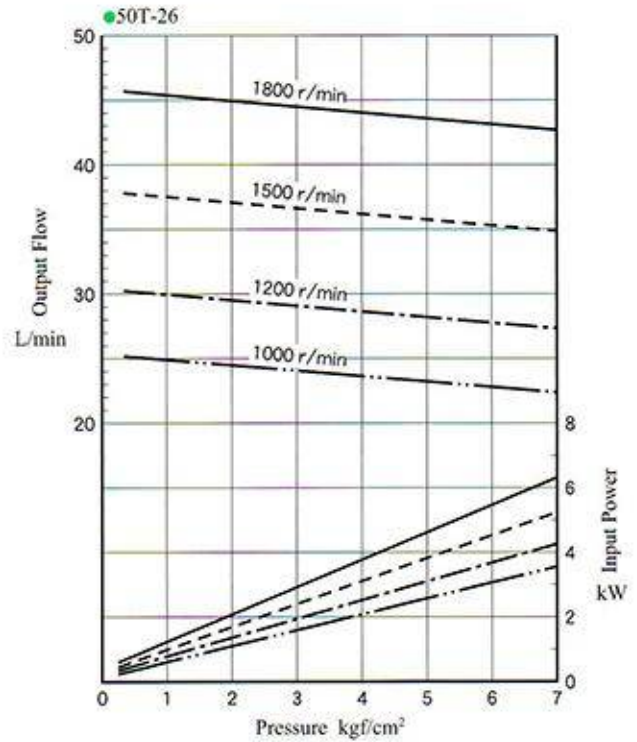
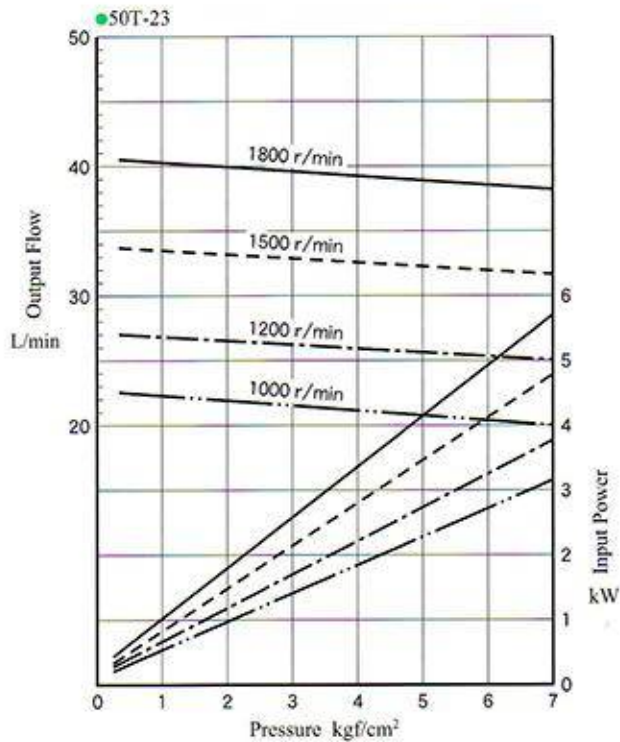
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C) 1 MPa=10.2 kgf/cm²



Single Vane Pumps

Max. Pressure 7 MPa

Pressure—Output Flow · Input Power Characteristics

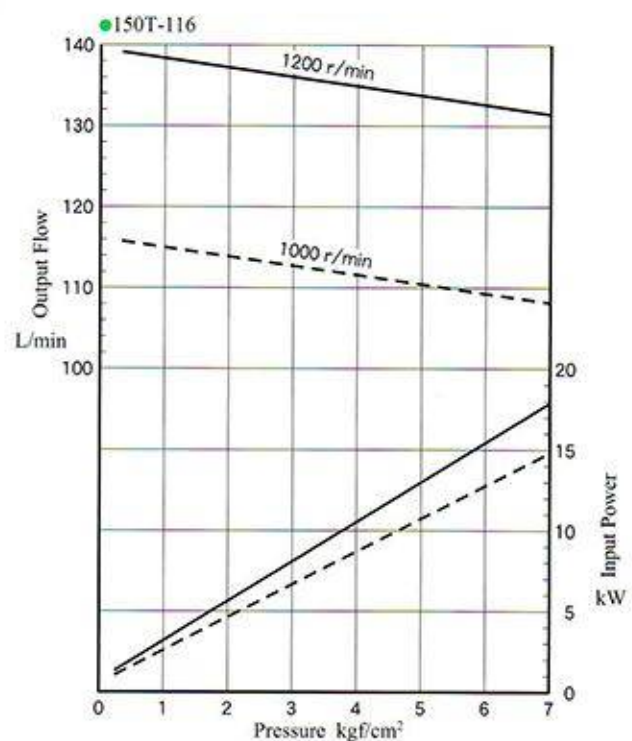
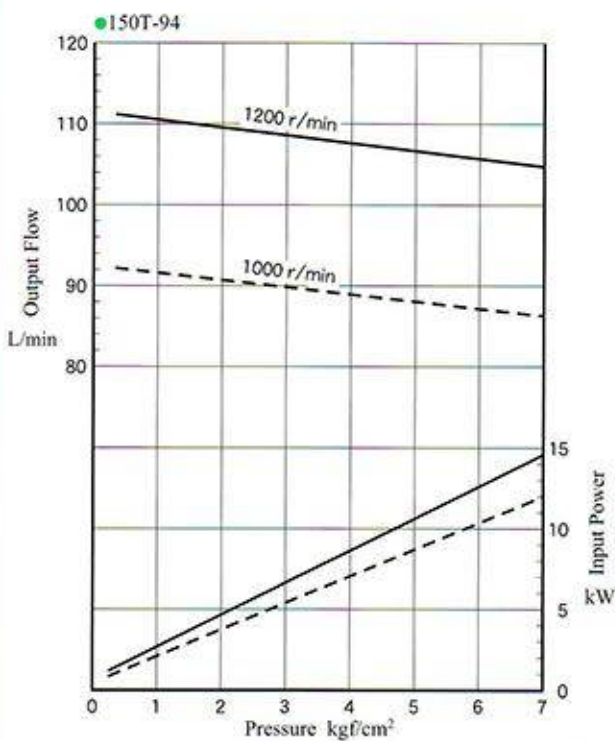
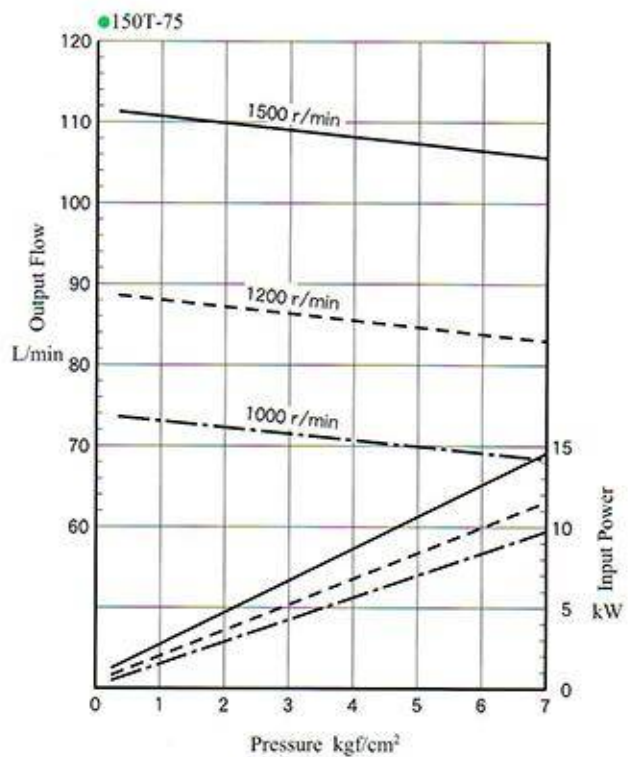
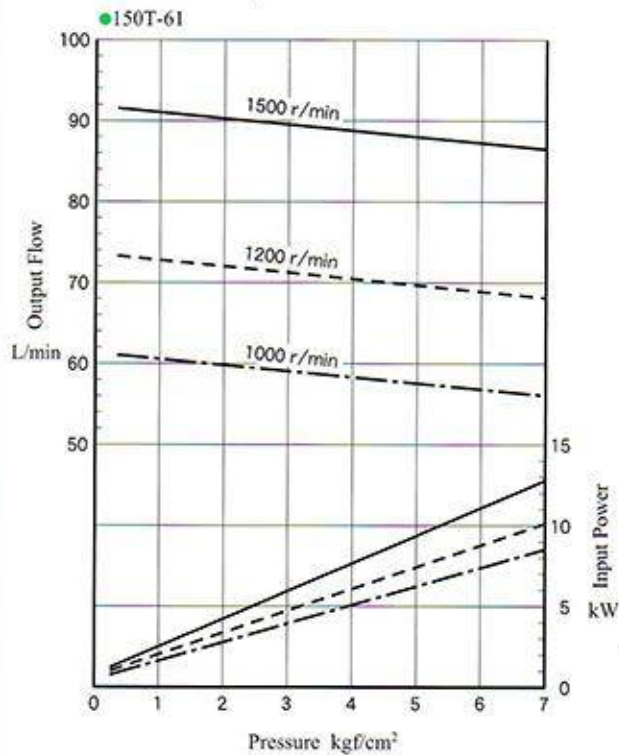
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C) 1 MPa=10.2 kgf/cm²

Single Vane Pumps

Max. Pressure 7 MPa

Pressure—Output Flow • Input Power Characteristics

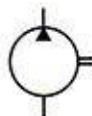
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C) 1 MPa=10.2 kgf/cm²



PV2R Series Single Vane Pumps Max. Pressure 21 MPa



Graphic Symbol



- The pumps with high pressure and high quality, have been developed especially for low noise operation.
- The pumps can be used on various applications including injection moulding machines and machine tools...etc, with output range: 5.8~237 cm³/rev.
- The pump cartridge kit is assembled by screws, so it is easy to assemble and maintain.

Specifications

Model No.	Geometric Displacement cm ³ /rev	Max. Pressure MPa (kgf/cm ²)	Shaft Speed Range r/min	Mass kg	
				Flange Mtg	Foot Mtg
*3 PV2R1- 6-※-※※※※-43	5.8	21 (210)	750~1800	9.0	11.2
*3 PV2R1- 8-※-※※※※-43	8.0				
PV2R1-10-※-※※※※-43	9.4				
PV2R1-12-※-※※※※-43	12.2				
PV2R1-14-※-※※※※-43	13.7				
PV2R1-17-※-※※※※-4326	16.6				
PV2R1-19-※-※※※※-4326	18.6				
PV2R1-23-※-※※※※-4326	22.7				
PV2R1-25-※-※※※※-4326	25.3	16 (160)			
PV2R1-31-※-※※※※-4326	31.0				
PV2R2-26-※-※※※※-41	26.6	21 (210)	600~1800	19.0	23.3
PV2R2-33-※-※※※※-41	33.3				
PV2R2-41-※-※※※※-41	41.3				
PV2R2-47-※-※※※※-41	47.2				
PV2R2-53-※-※※※※-41	52.5				
PV2R2-59-※-※※※※-41	58.2				
PV2R2-65-※-※※※※-41	64.7				
PV2R2-75-※-※※※※-4103	75	16 (160)			
PV2R3-60-※-※※※※-31	59.6	21 (210)	600~1800	36.7	46.7
PV2R3-66-※-※※※※-31	66.3				
PV2R3-76-※-※※※※-31	76.4				
PV2R3-85-※-※※※※-3103	85				
PV2R3-94-※-※※※※-31	93.6				
PV2R3-108-※-※※※※-3103	108	17.5 (175)			
PV2R3-116-※-※※※※-31 *2	115.6	16 (160)			
PV2R3-125-※-※※※※-3103	125	14 (140)			
PV2R4-136-※-※※※※-30	136	17.5 (175)	600~1800	68.5	93.5
PV2R4-153-※-※※※※-30	153				
PV2R4-184-※-※※※※-30	184				
PV2R4-200-※-※※※※-30	201				
PV2R4-237-※-※※※※-30 *2	237				

*1. For starting at low speed of shaft rotation, the maximum viscosity is limited. Please refer to page 8 (Table 2) for details.

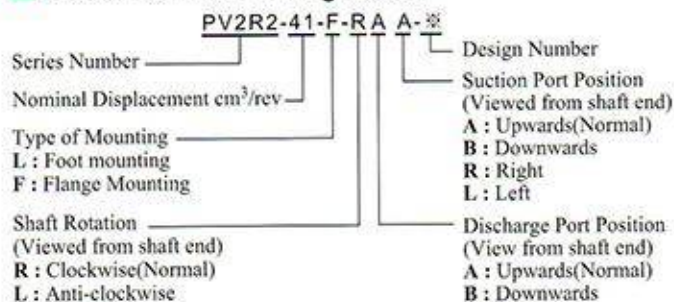
*2. When operating with a shaft speed exceeding 1700rpm, the suction pressure is restricted. Please refer to page 8 (Table 1) for details.

*3. When pressure is over 16 MPa (160 kgf/cm²), raise the speed of shaft rotation to more than 1450 rpm.

● Anti-wear type petroleum hydraulic fluids are recommended to use with these pumps.

● For pressure - output flow & input power characteristics, please refer to page 28-34.

Model Number Designation



* Flange mounting is available for A only

Pipe Flange Kits

Pump Model	Name of Ports	Pipe Flange Kit Model No.
PV2R1	Suction	F5-08-A-10T
	Discharge	F5-04-A-10T
PV2R2	Suction	F5-10-A-10T
	Discharge	F5-06-A-10T
PV2R3	Suction	F5-16-A-10T
	Discharge	F5-10-A-10T
PV2R4	Suction	F5-24-B-10T
	Discharge	F5-12-B-10T

● In Pipe Flange Kit Model No. A: Threaded Connection / B: For Pipe Socket Welding.

● Details of the pipe flange kit please refer to page 50.

● When ordering, please specify pipe flange kit model.

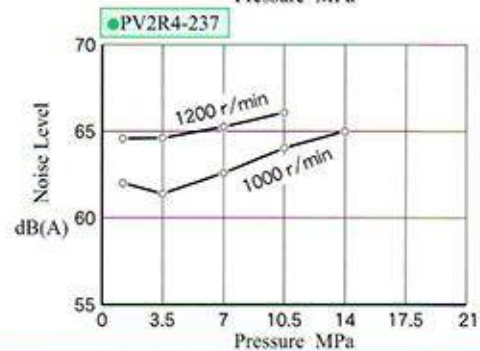
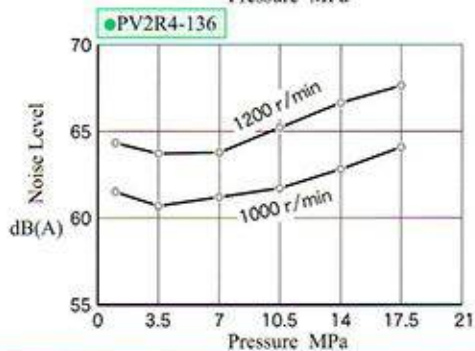
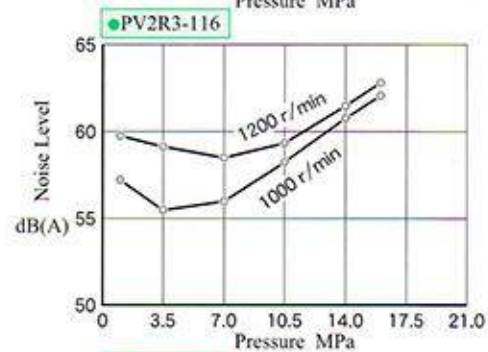
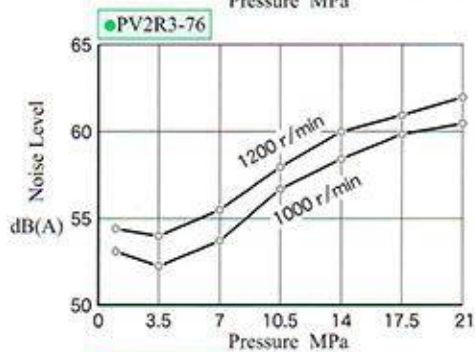
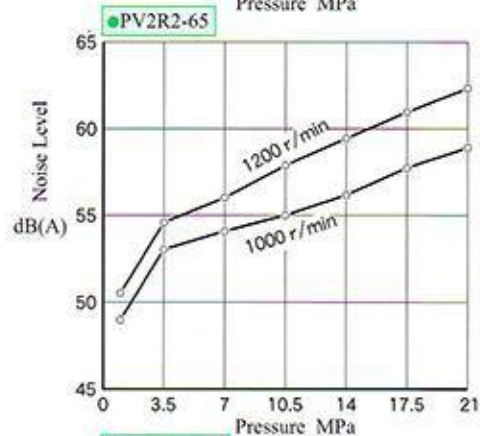
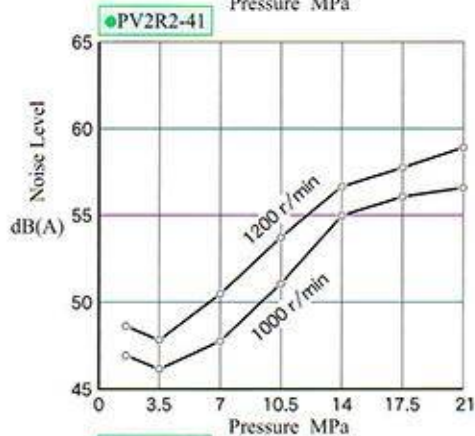
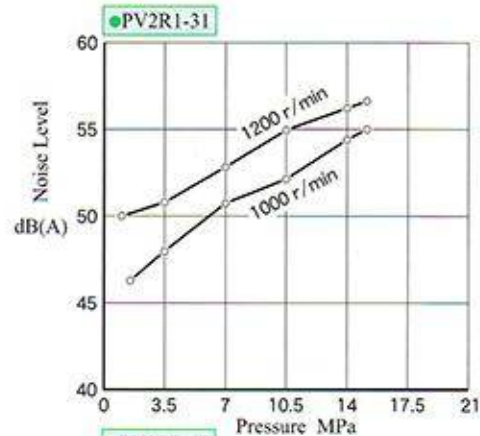
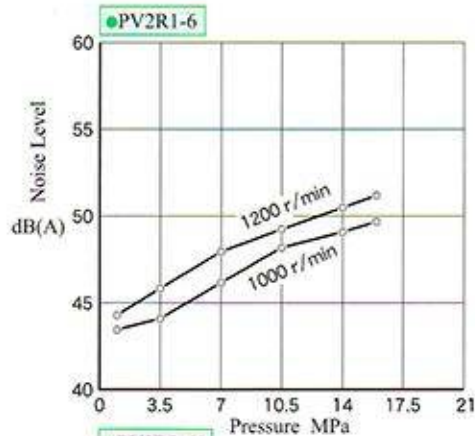
PV2R Series Single Vane Pumps Max. Pressure 21 MPa

Noise Level (Example) Measuring Conditions

Fluid viscosity: 20 cSt

Measurement position: One meter horizontally from pump head cover

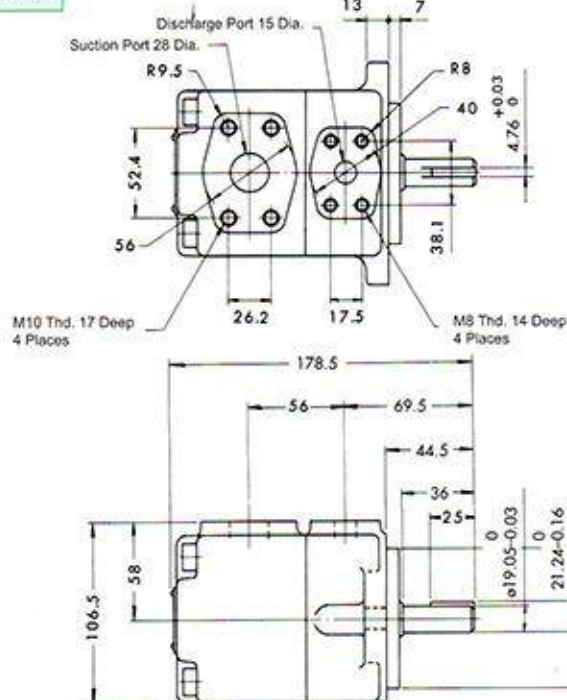
Background noise: 40 dB(A)



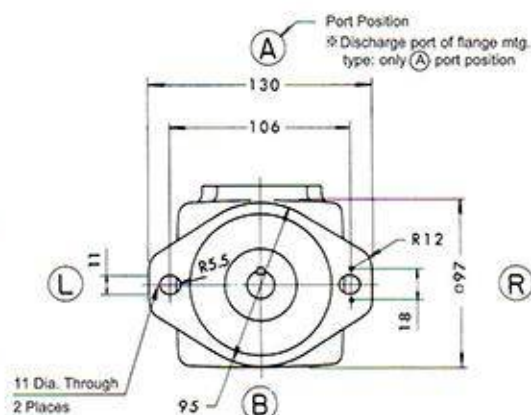
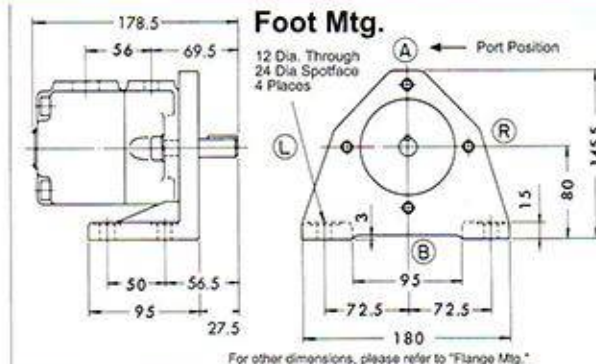
PV2R Series Single Vane Pumps Max. Pressure 21 MPa

PV2R1

Flange Mtg.

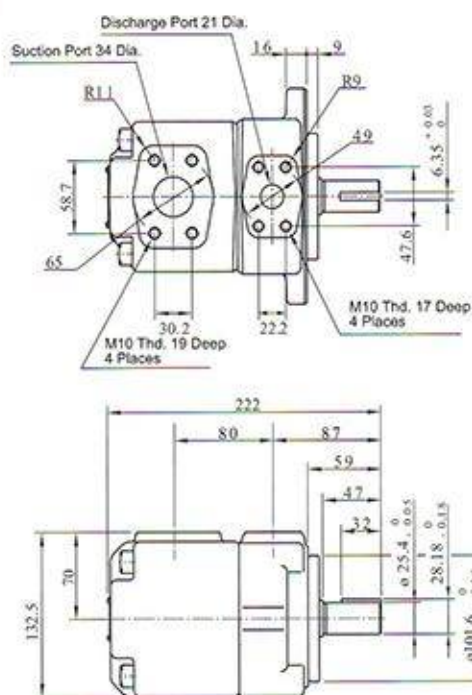


Foot Mtg.

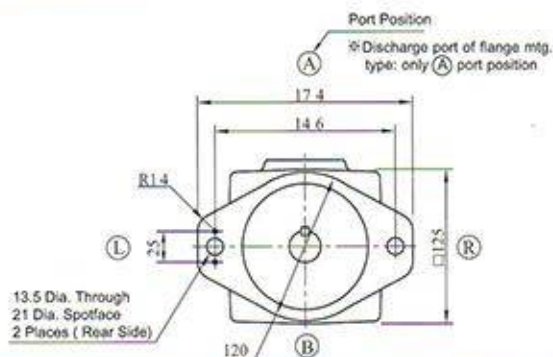
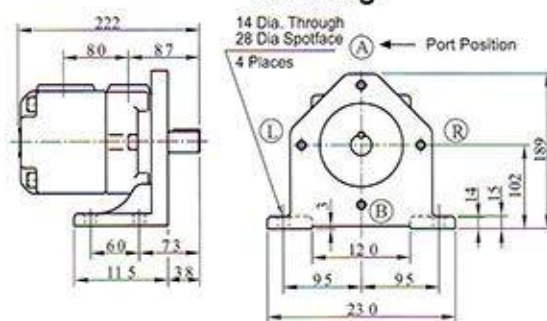


PV2R2

Flange Mtg.



Foot Mtg.

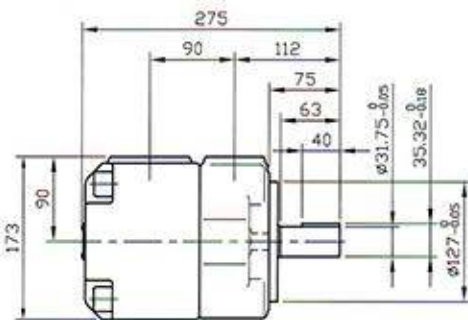
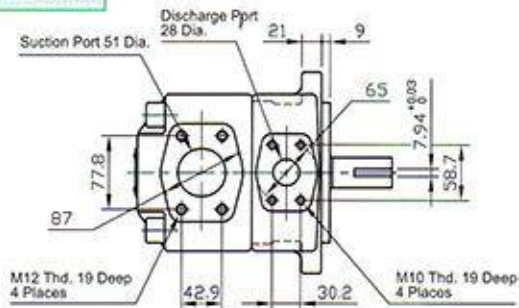


PV2R Series Single Vane Pumps

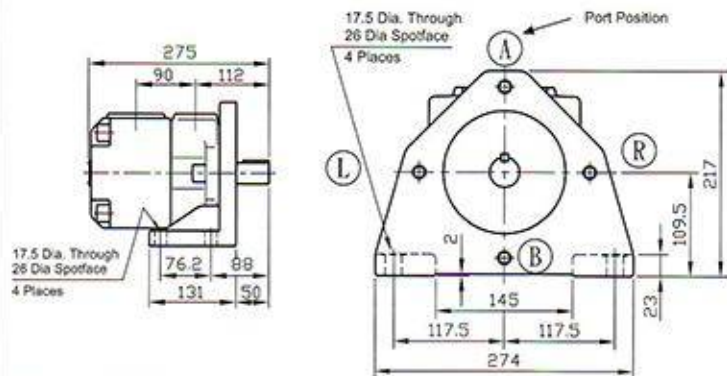
Max. Pressure 21 MPa

PV2R3

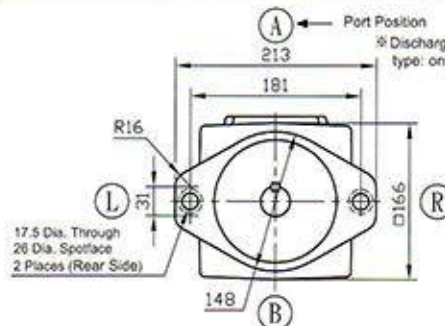
Flange Mtg.



Foot Mtg.

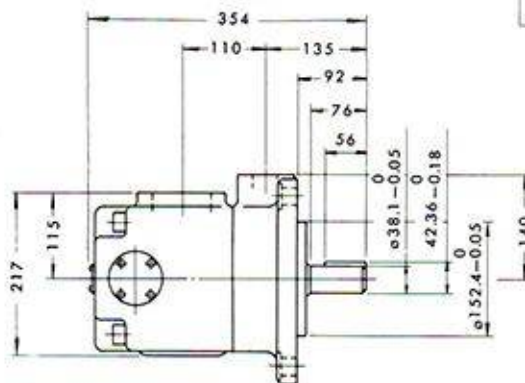
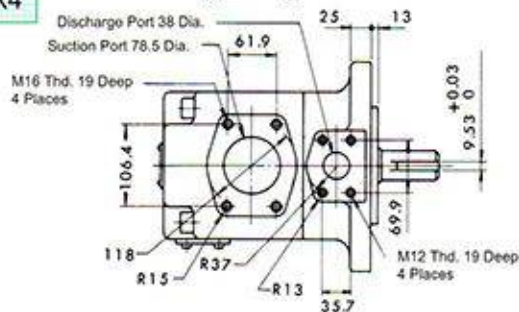


For other dimensions, please refer to "Flange Mtg."

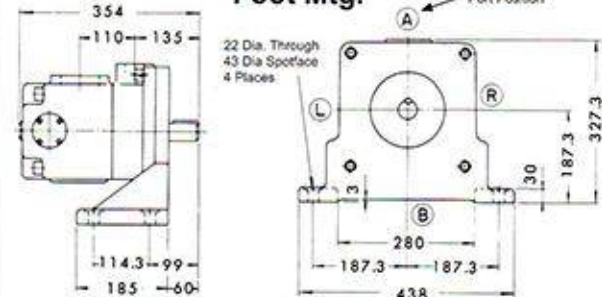


PV2R4

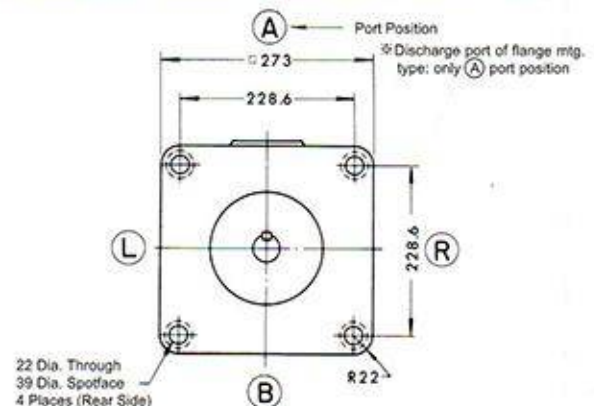
Flange Mtg.



Foot Mtg.

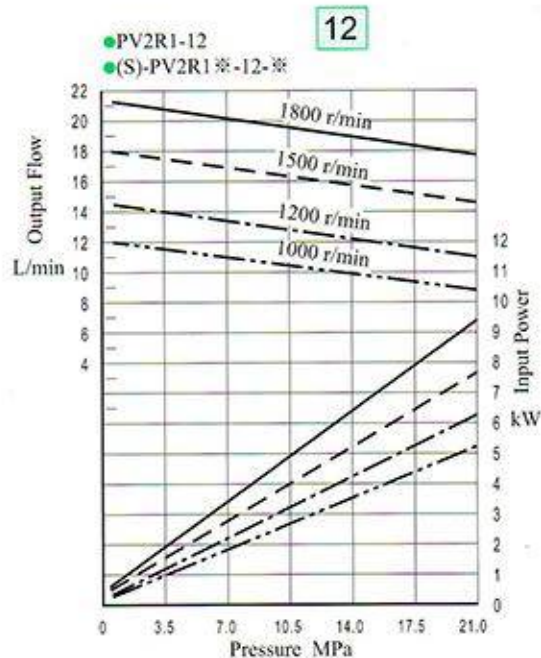
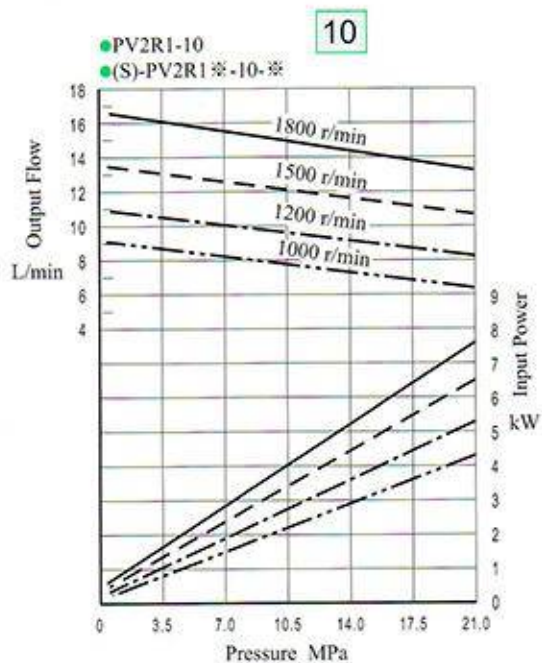
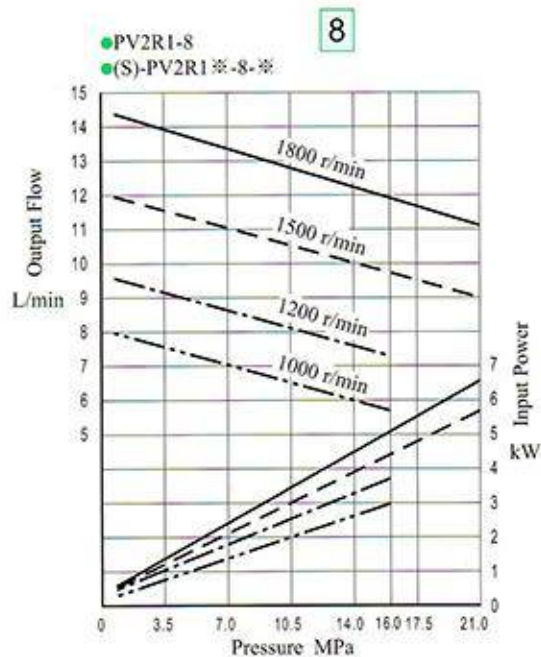
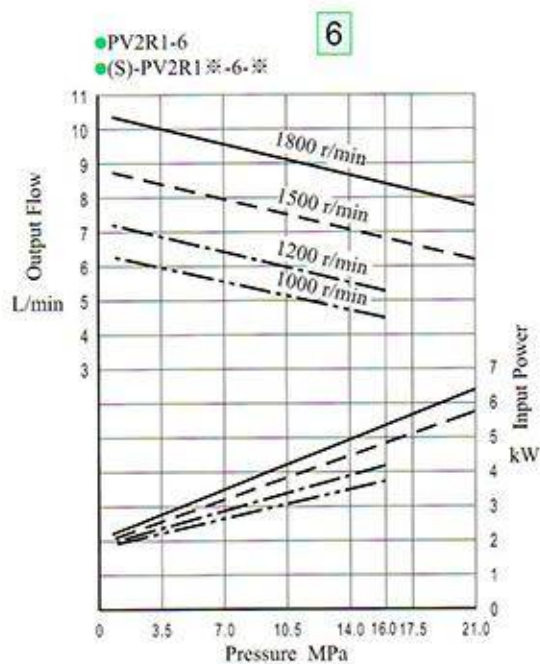


For other dimensions, please refer to "Flange Mtg."



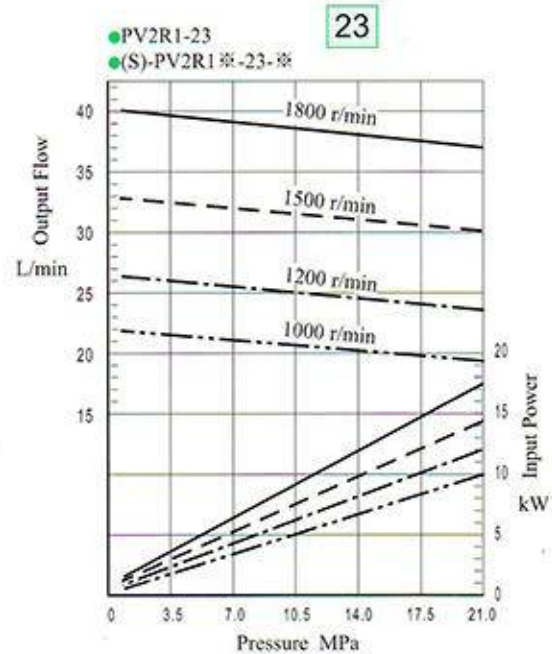
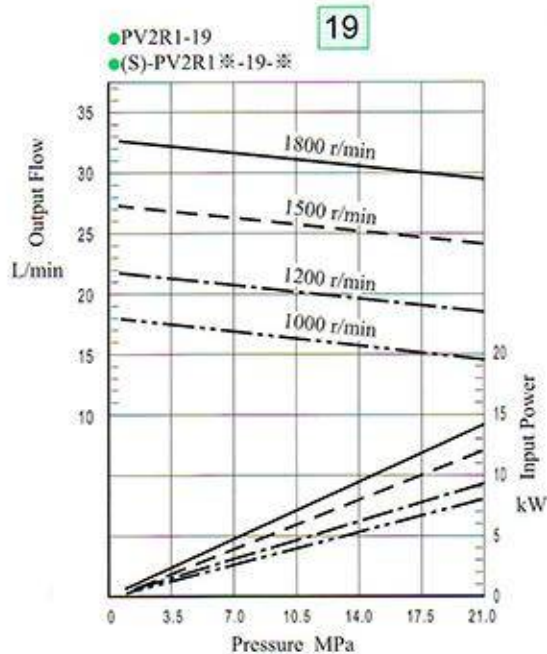
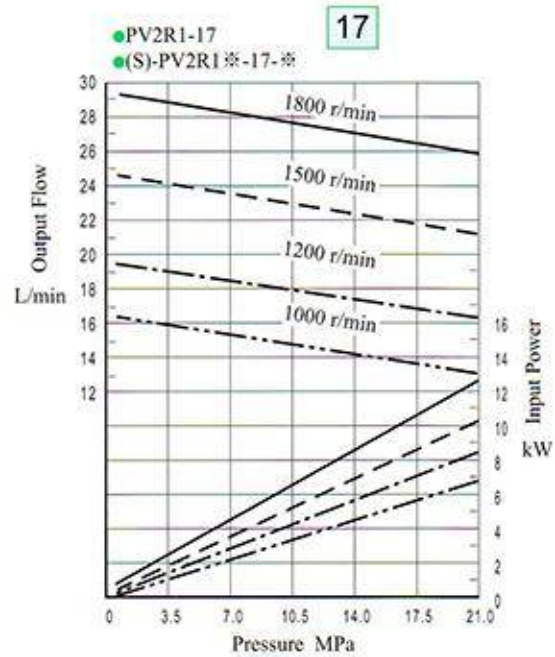
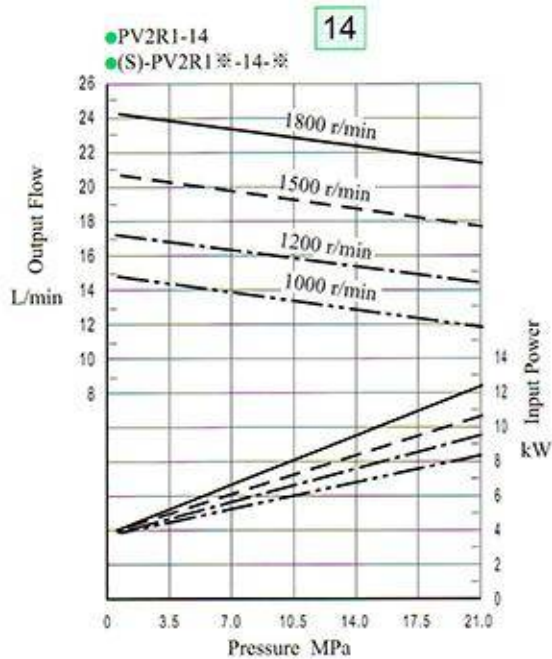
(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

Pressure-Output Flow-Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



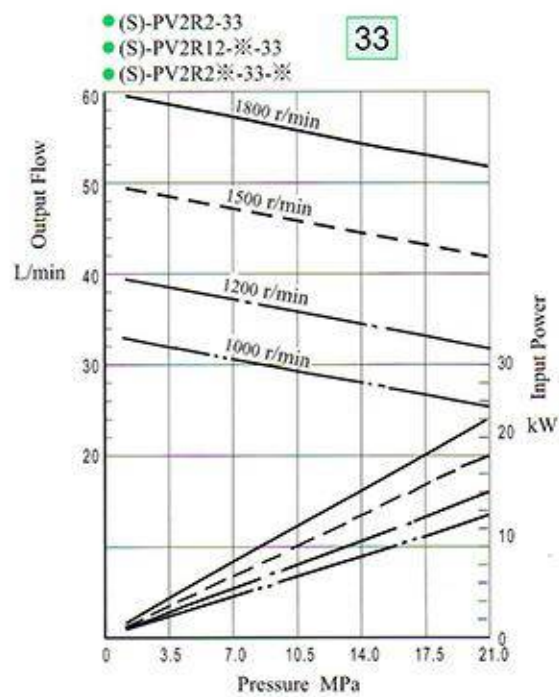
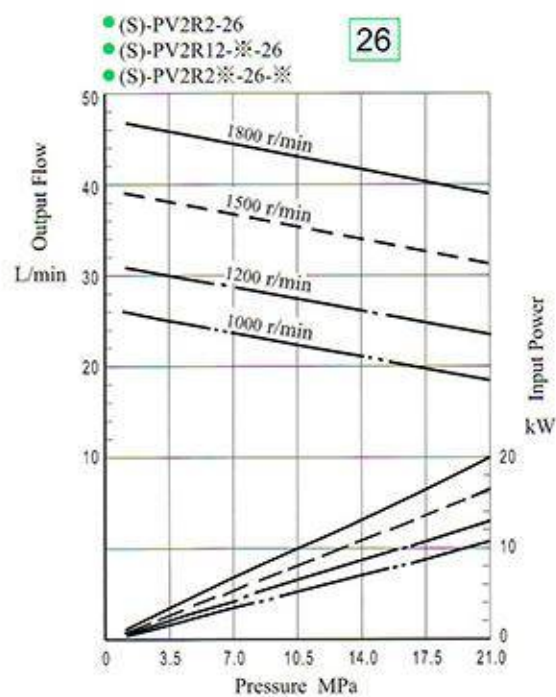
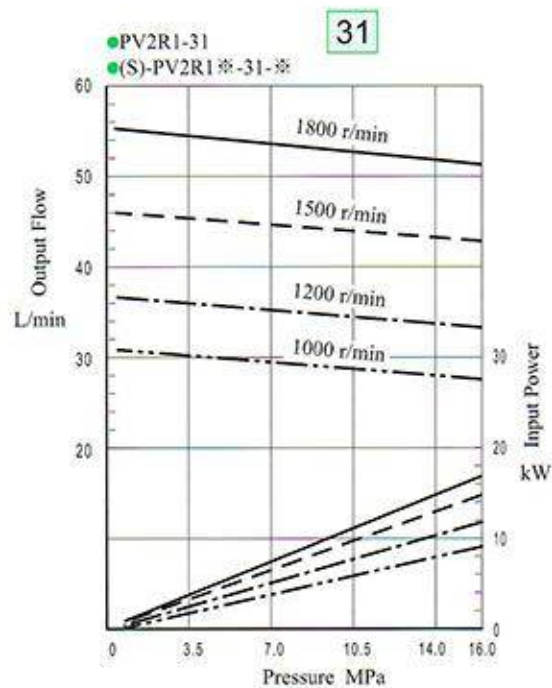
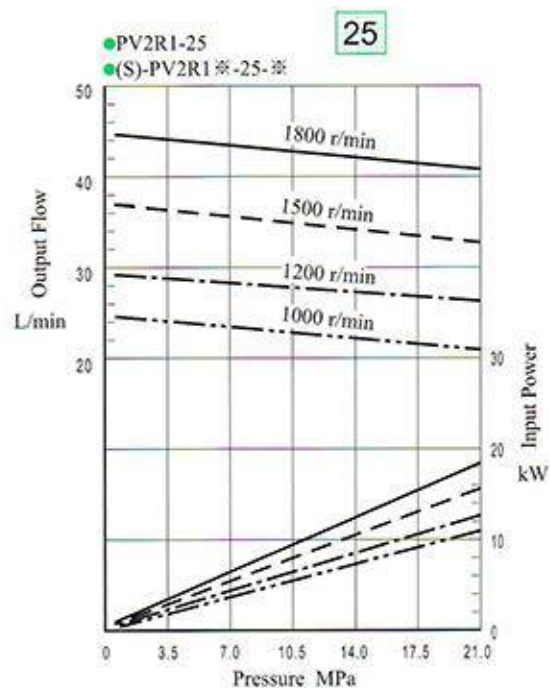
(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

Pressure—Output Flow · Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

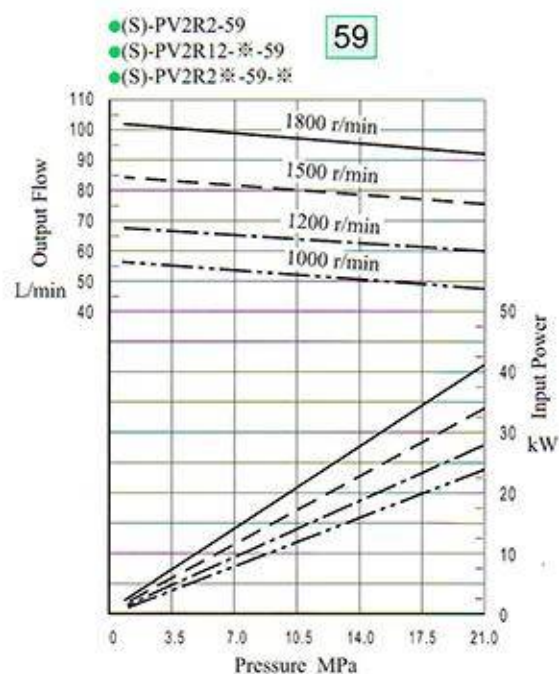
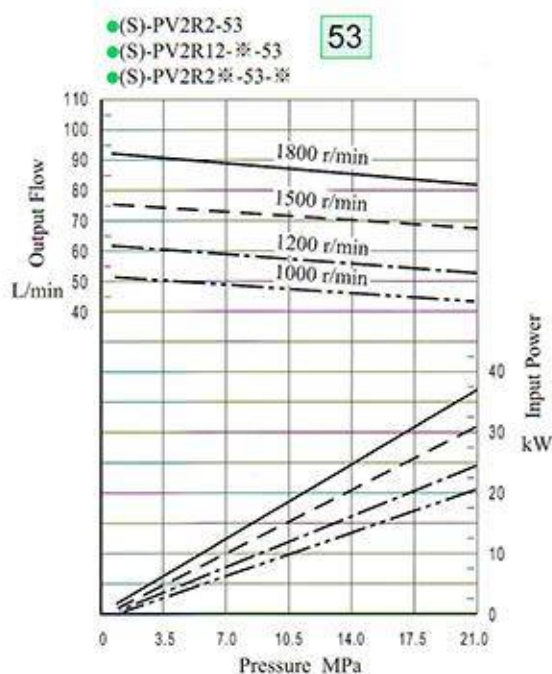
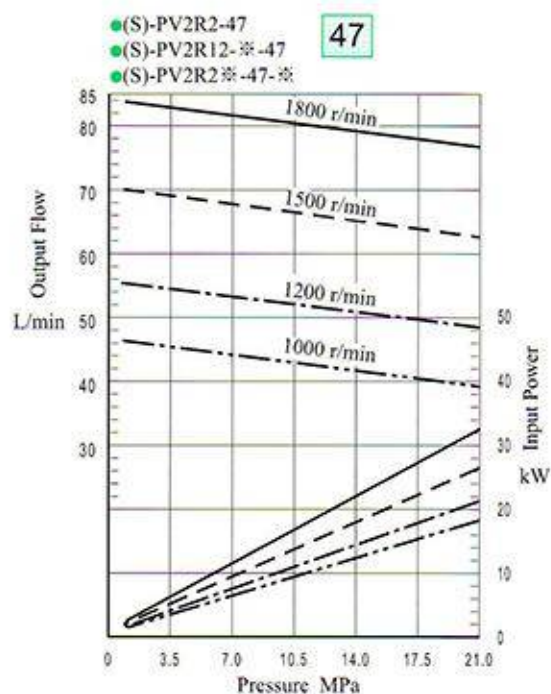
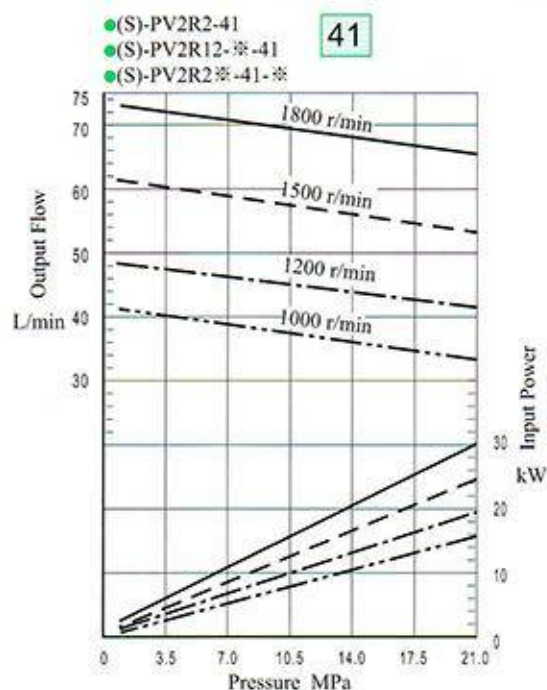
Pressure—Output Flow · Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

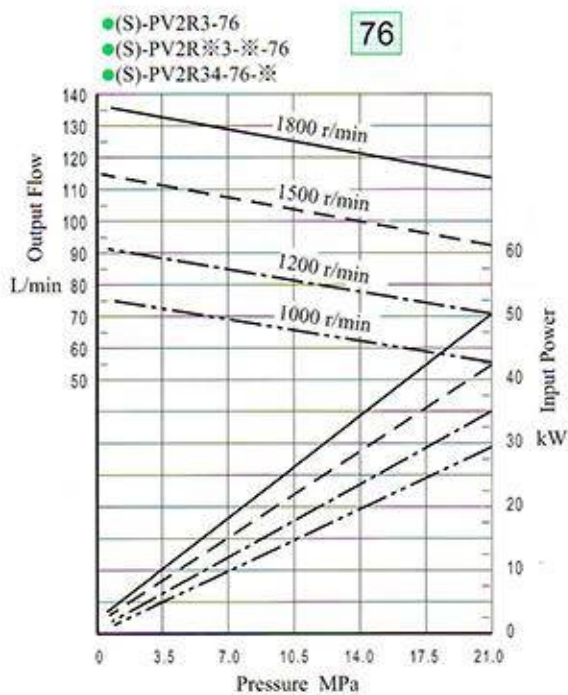
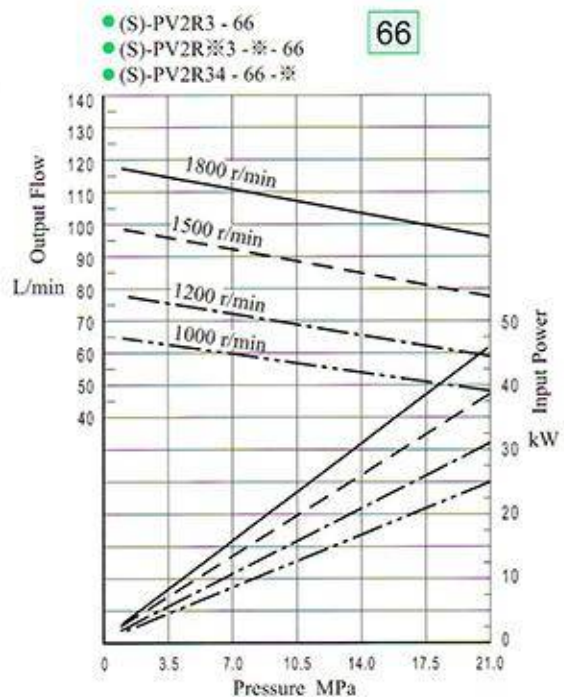
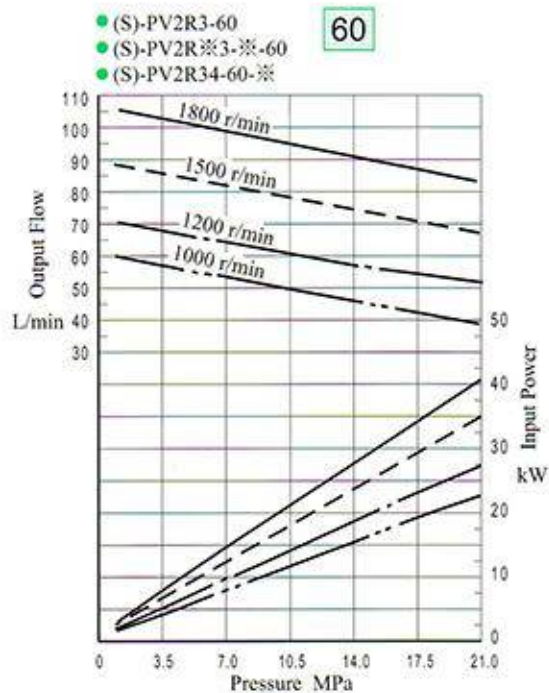
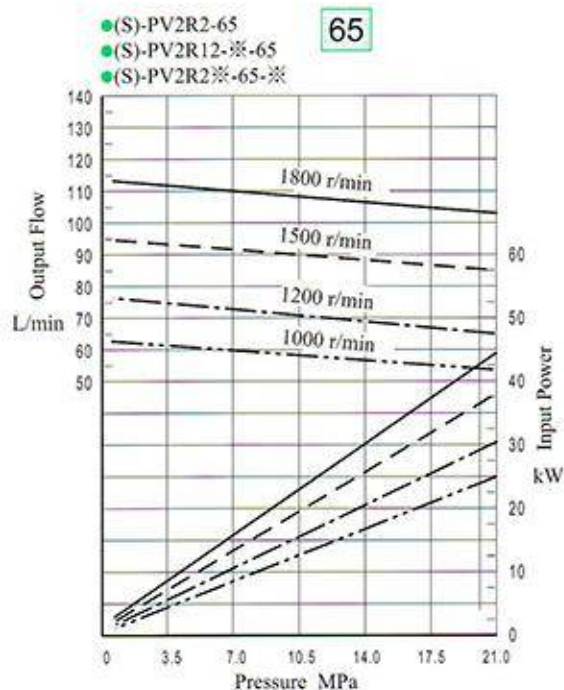
Pressure—Output Flow • Input Power Characteristics

Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



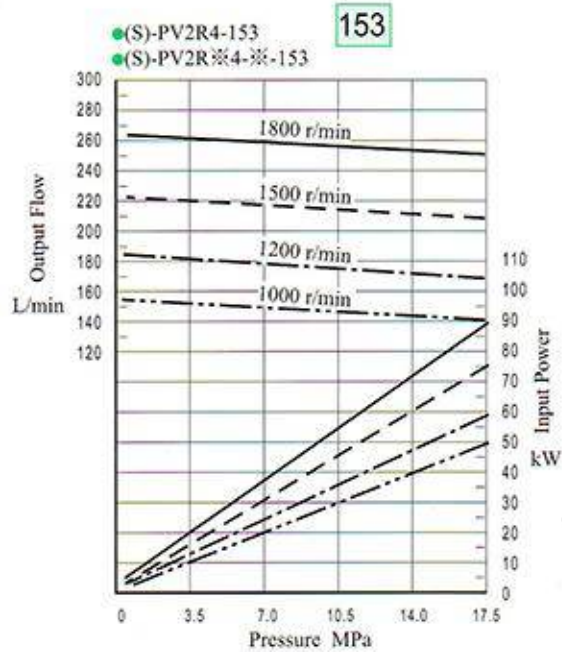
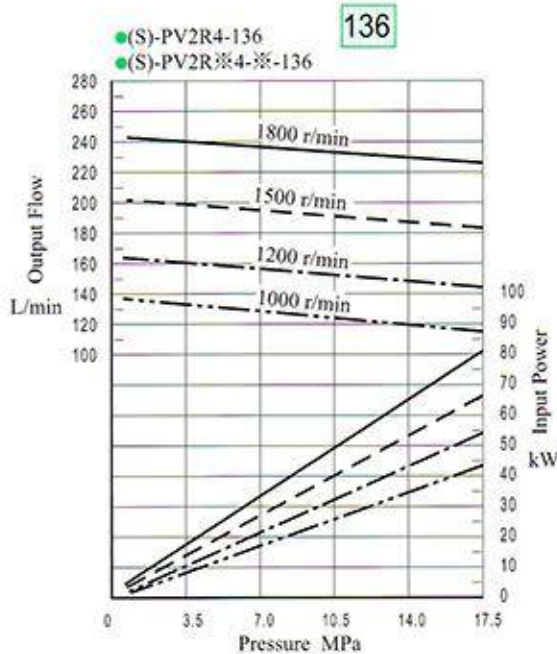
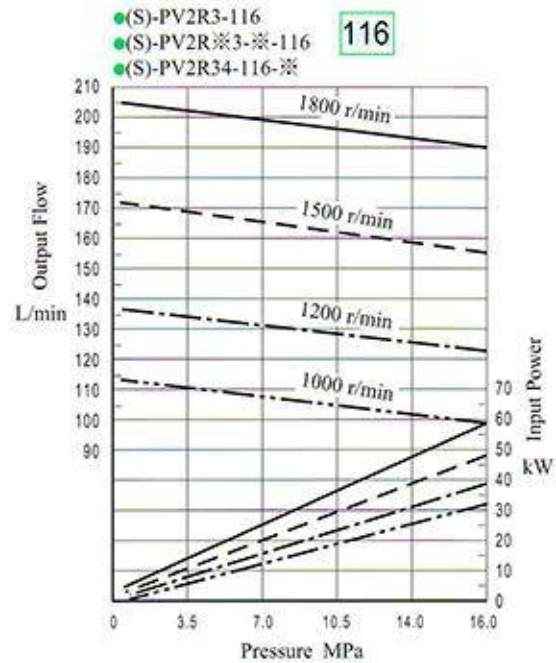
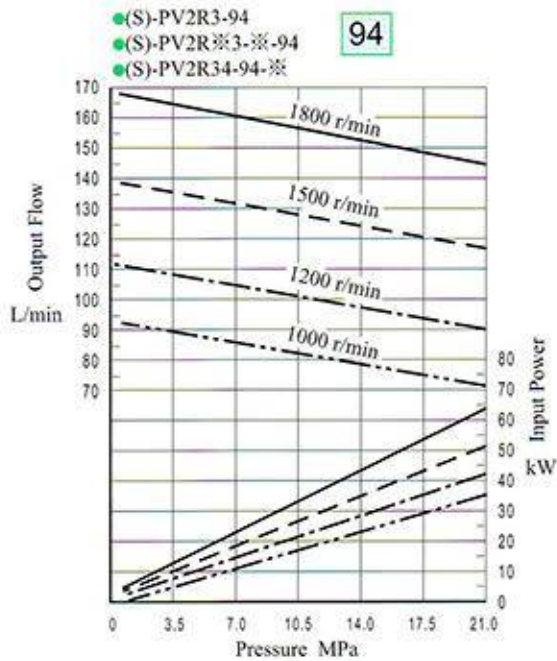
(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

Pressure—Output Flow · Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



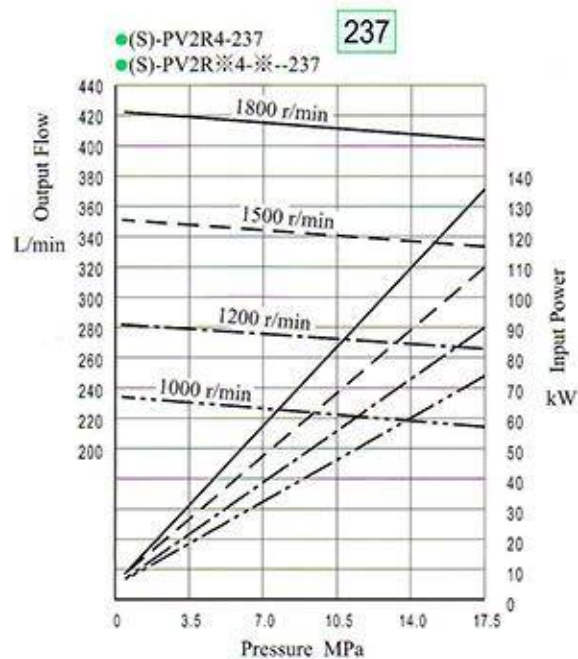
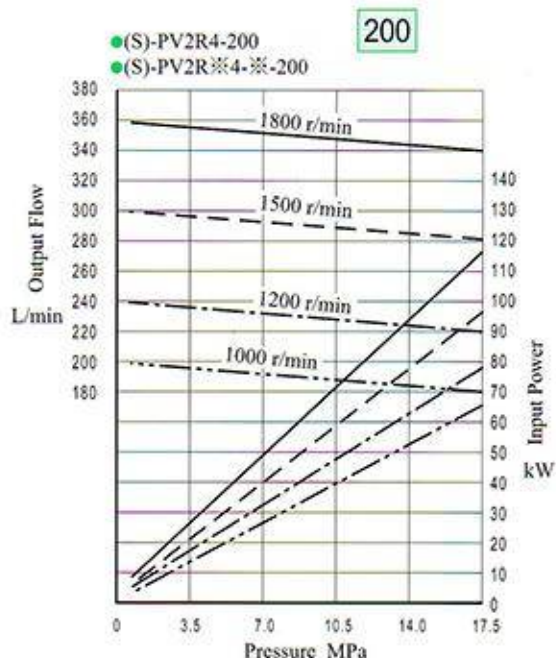
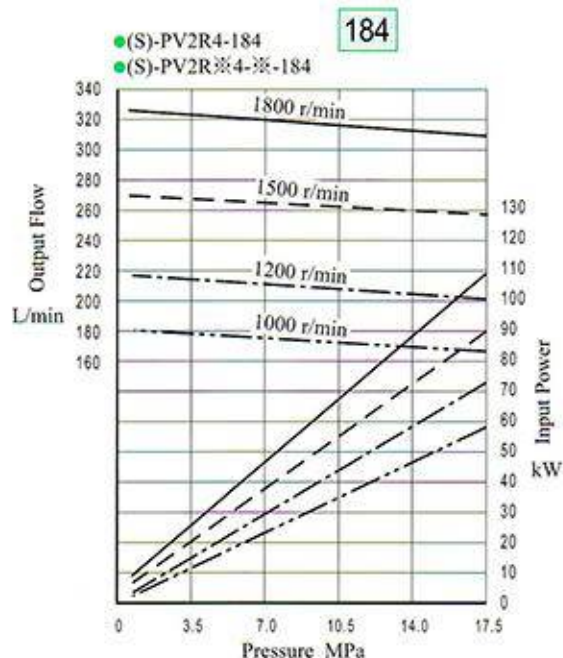
(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

Pressure—Output Flow · Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



(S)-PV2R Series Single Vane Pumps Max. Pressure 21 MPa

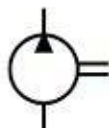
Pressure—Output Flow · Input Power Characteristics
Fluid Viscosity 20 mm²/s (ISO VG32 Oils, 50°C)



S-PV2R Series Single Vane Pumps Max. Pressure 21 MPa



Graphic Symbol



- The pumps with high pressure and high quality, have been developed especially for low noise operation
- The pumps can be used on various applications including injection moulding machines and machine tools...etc, with output range: 26.6~237cm³/rev.
- The pump cartridge kit is assembled by screws, so it is easy to assemble and maintain.
- Because of small pressure pulsation, the noise level of the machines can be reduced considerably.

Specifications

Model No.	Geometric Displacement cm ³ /rev	Max. Pressure MPa (kgf/cm ²)	Shaft Speed Range r/min	Mass kg	
				Flange Mtg	Foot Mtg
S-PV2R2-26 - ※ - ※ ※ ※ - 45	26.6	21 (210)	★1 600~1800	31.0	39.0
S-PV2R2-33 - ※ - ※ ※ ※ - 45	33.3				
S-PV2R2-41 - ※ - ※ ※ ※ - 45	41.3				
S-PV2R2-47 - ※ - ※ ※ ※ - 45	47.2				
S-PV2R2-53 - ※ - ※ ※ ※ - 45	52.5				
S-PV2R2-59 - ※ - ※ ※ ※ - 45	58.2				
S-PV2R2-65 - ※ - ※ ※ ※ - 45	64.7				
S-PV2R2-75 - ※ - ※ ※ ※ - 45	75	16 (160)			
S-PV2R3-60 - ※ - ※ ※ ※ - 35	59.6	21 (210)	600~1800	55.5	63.5
S-PV2R3-66 - ※ - ※ ※ ※ - 35	66.3				
S-PV2R3-76 - ※ - ※ ※ ※ - 35	76.4				
S-PV2R3-85 - ※ - ※ ※ ※ - 35	85				
S-PV2R3-94 - ※ - ※ ※ ※ - 35	93.6				
S-PV2R3-108 - ※ - ※ ※ ※ - 35	108	17.5 (175)			
S-PV2R3-116 - ※ - ※ ※ ※ - 35 ★2	115.6	16 (160)			
S-PV2R3-125 - ※ - ※ ※ ※ - 35	125	14 (140)			
S-PV2R4-136 - ※ - ※ ※ ※ - 35	136	17.5 (175)	600~1800	70	95
S-PV2R4-153 - ※ - ※ ※ ※ - 35	153				
S-PV2R4-184 - ※ - ※ ※ ※ - 35	184				
S-PV2R4-200 - ※ - ※ ※ ※ - 35	201				
S-PV2R4-237 - ※ - ※ ※ ※ - 35 ★2	237				

★1. For starting at low speed of shaft rotation, the maximum viscosity is limited. Please refer to page 8 for details (Table 2).

★2. When operating with a shaft speed exceeding 1700rpm, the minimum suction pressure is restricted. Please refer to page 8 (Table 1).

● For pressure - output flow & input power characteristics, please refer to page 28~34.

● Anti-wear type petroleum hydraulic fluids are recommended to use with these pumps. (please refer to page 7)

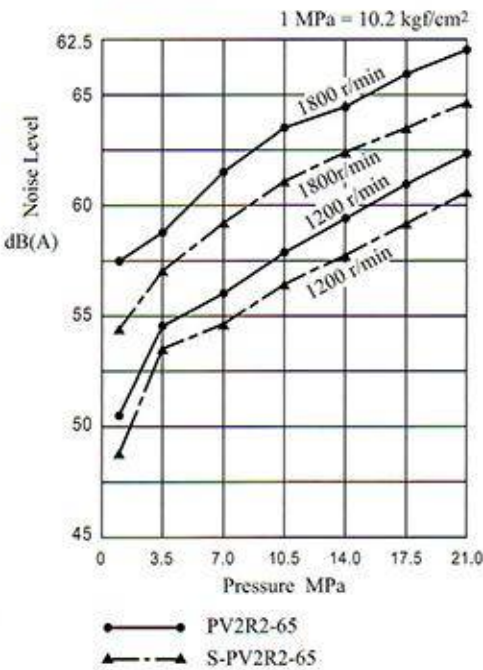
● Noise Level Comparison of S-PV2R2-65 and PV2R2-65, please refer to page 36 (Diagram 1).

Model Number Designation

S-PV2R2-41-F-R A A-※	
Series Number (Super low noise type)	Design Number
Nominal displacement cm ³ /rev	Suction Port Position (Viewed from shaft end) A : Upwards(Normal) B : Downwards R : Right L : Left
Type of Mounting L : Foot mounting F : Flange Mounting	Discharge Port Position (view from shaft end) A : Upwards(Normal) B : Downwards R : Right L : Left Flange mounting is available for A only
Shaft Rotation(Viewed from shaft end) R : Clockwise(Normal) L : Anti-clockwise	

S-PV2R Series Single Vane Pumps
Max. Pressure 21 MPa

■ Noise level comparison of S-PV2R2-65 and PV2R2-65
 Fluid Viscosity 32cSt
 Measurement point: 1M horizontally away from pump head cover



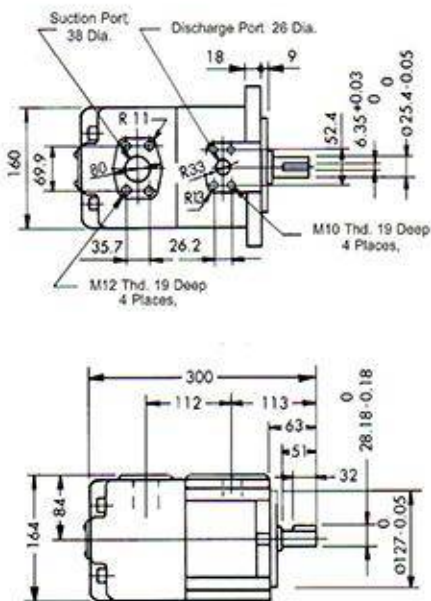
Pipe Flange

Pump Model Number	Name of Ports	Pipe Flange Kit Model No.
S-PV2R2	Suction	F5-12-A-10T
	Discharge	F5-08-A-10T
S-PV2R3	Suction	F5-16-A-10T
	Discharge	F5-10-A-10T
S-PV2R4	Suction	F5-24-B-10T
	Discharge	F5-12-B-10T

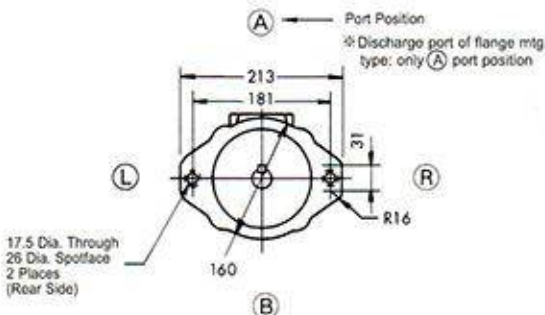
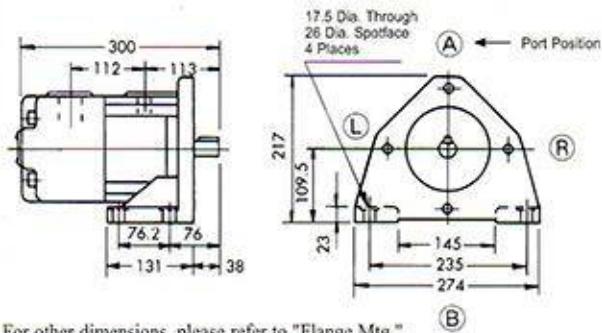
- In Pipe Flange Kit Model No. A: Threaded Connection / B: For Pipe Socket Welding.
- Details of the pipe flange kit are described please refer to page 50.
- When ordering, please specify pipe flange kit model.

S-PV2R2

Flange Mtg.



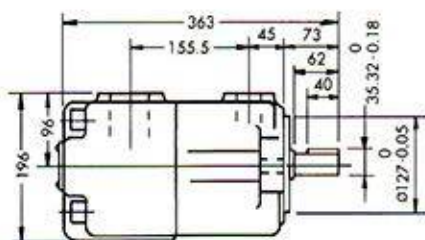
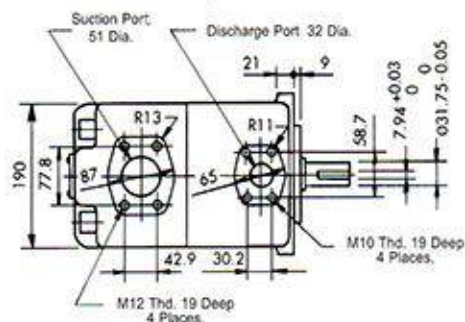
Foot Mtg.



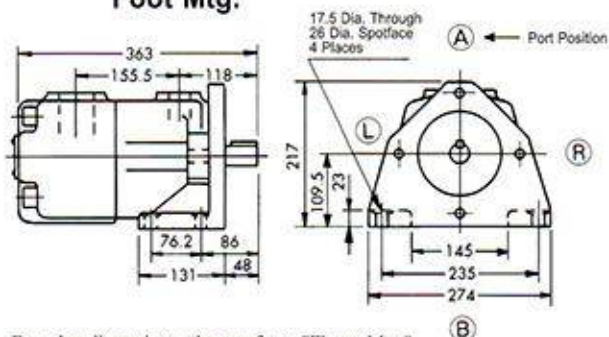
S-PV2R Series Single Vane Pumps

S-PV2R3

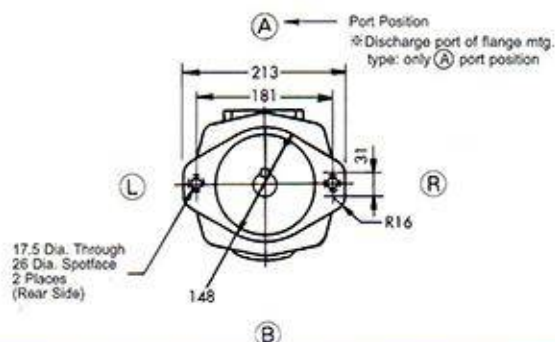
Flange Mtg.



Foot Mtg.

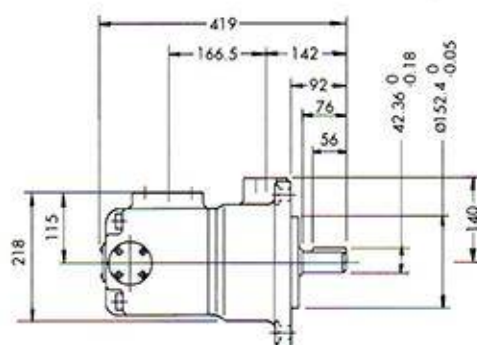
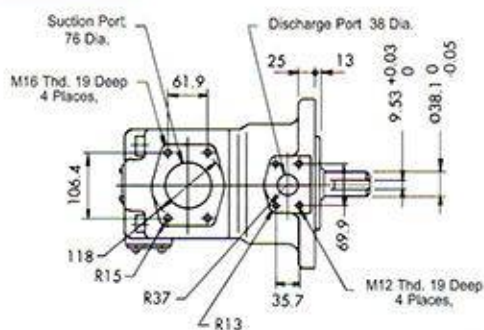


For other dimensions, please refer to "Flange Mtg."

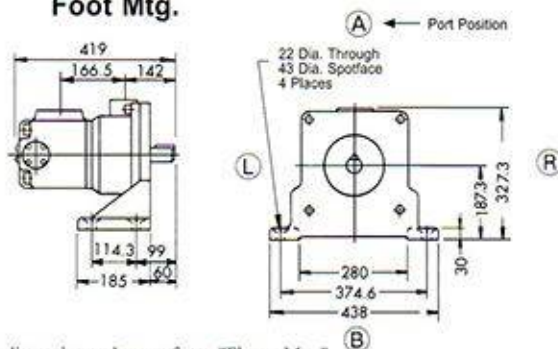


S-PV2R4

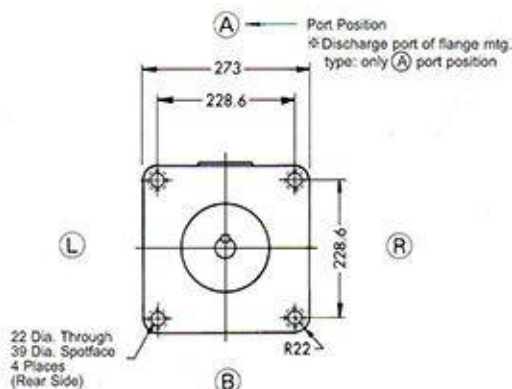
Flange Mtg.



Foot Mtg.



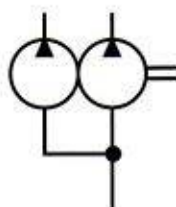
For other dimensions, please refer to "Flange Mtg."



S-PV2R Series Double Vane Pumps Max. Pressure 21 MPa



Graphic Symbol



- These double pumps consist of two PV2R series single pumps combined in tandem within a single housing and driven by a common shaft.
- Fluid delivered from the two separate ports can be either supplied to separate or common circuits.

Model Number Designation

S-PV2R12	-6	-65	-L	-R	E	A	A	-42
Series Number	Small Volume Pump Nominal Displacement cm ³ /rev	Large Volume Pump Nominal Displacement cm ³ /rev	Mounting	Direction of Rotation (viewed from shaft end)	Small Volume Pump Discharge port position (viewed from shaft end)	Large Volume Pump Discharge port position (viewed from shaft end)	Suction Port Position (viewed from shaft end)	Design Number
PV2R12		26 33 41 47			E: Left up (Normal) F: Right up G: Right down H: Left down			★4
S-PV2R12		53 59 65 75						45
PV2R13	6 8 10 12 14 17	60 66 76 85 94 108			A: Upwards (Normal) B: Downwards			★4
S-PV2R13	19 23 25 31	116 125						45
★1 PV2R14		136 153 184 200 237			R: Right L: Left	A: Upwards (Normal) B: Downwards	A: Upwards (Normal) B: Downwards	★4
S-PV2R14			L: Foot Mounting	R: Clockwise (Normal)				35
PV2R22		26 33 41 47 53 59 65 75 (Close to shaft end)			E: Left up (Normal) F: Right up G: Right down H: Left down	R: Right L: Left	R: Right L: Left	40
PV2R23	26 33 41 47 53 59	60 66 76 85 94 108 116 125						41
S-PV2R23	65 75		F: Flange Mounting	L: Anti-clockwise				45
★1 PV2R24		136 153 184 200 237			A: Upwards (Normal) B: Downwards R: Right L: Left			31
S-PV2R24								35
★1 PV2R34	60 66 76 85 94 108				E: Left up (Normal) F: Right up G: Right down H: Left down			31
S-PV2R34	116 125							35
★1 PV2R33		60 66 76 85 94 108 116 125			A: Upwards (Normal) B: Right down R: Right L: Left			31
S-PV2R33								35

- ★1: Delivery is longer, if you have any requirement, please contact our sales engineers.
 2: About the limit of the maximum operation pressure for each nominal displacement, please refer to the next page (P39)
 3: Pressure-Output Flow, Input Power Characteristics, please refer to page 28~34.

Pipe Flange Kits

Pump Model No.	Pipe Flange Kit Model No.		
	Suction	Large Pump Discharge	Small Pump Discharge
PV2R12	F5-16 -A- 10T	F5-06 -A- 10T	F5-04 -A- 10T
S-PV2R12	F5-20 -A- 10T	F5-08 -A- 10T	F5-06 -A- 10T
PV2R13	F5-24 -B- 10T	F5-10 -A- 10T	F5-04 -A- 10T
S-PV2R13	F5-24 -B- 10T	F5-10 -A- 10T	F5-06 -A- 10T
PV2R14	F5-28 -B- 10T	F5-12 -A- 10T	F5-04 -A- 10T
S-PV2R14	F5-28 -B- 10T	F5-12 -B- 10T	F5-06 -B- 10T
PV2R22	F5-20 -A- 10T	F5-06 -A- 10T	F5-06 -A- 10T
PV2R23	F5-24 -B- 10T	F5-10 -A- 10T	F5-06 -A- 10T
S-PV2R23	F5-24 -B- 10T	F5-10 -A- 10T	F5-08 -A- 10T
PV2R24	F5-28 -B- 10T	F5-12 -A- 10T	F5-06 -A- 10T
S-PV2R24	F5-28 -B- 10T	F5-12 -B- 10T	F5-08 -B- 10T
PV2R33	F5-28 -B- 10T	F5-10 -A- 10T	F5-10 -A- 10T
S-PV2R33	F5-28 -B- 10T	F5-10 -A- 10T	F5-10 -A- 10T
PV2R34	F5-32 -B- 10T	F5-12 -B- 10T	F5-10 -B- 10T
S-PV2R34	F5-32 -B- 10T	F5-12 -B- 10T	F5-10 -B- 10T

- In Pipe Flange Kit Model No. A: Threaded Connection / B: For Pipe Socket Welding.
 ● Details of the pipe flange kit are described please refer to page 50.
 ● When ordering, please specify pipe flange kit model.

Series Number	Small Volume Pump Nominal Displacement cm ³ /rev	Large Volume Pump Nominal Displacement cm ³ /rev	Design Number
PV2R12	6, 8, 10, 12, 14	26, 33, 41, 47, 53, 59, 65	43
	17, 19, 23, 25, 31		4326
	6, 8, 10, 12, 14	75	4323
	17, 19, 23, 25, 31		43123
PV2R13	6, 8, 10, 12, 14	60, 66, 76, 94, 116	43
	17, 19, 23, 25, 31		4326
	6, 8, 10, 12, 14	85, 108, 125	4323
	17, 19, 23, 25, 31		43123
PV2R14	6, 8, 10, 12, 14	136, 153, 184, 200, 237	33
	17, 19, 23, 25, 31		3326

(S)-PV2R Series Double Vane Pumps Max. Pressure 21 MPa

Specifications

Maximum Operation Pressure

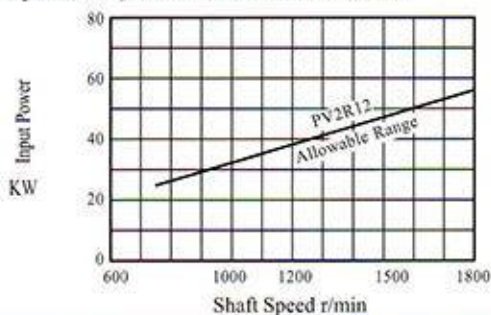
Nominal Displacement	Geometric Displacement cm ³ /rev	Maximum Operation Pressure MPa (kgf/cm ²)
6	5.8	★1 21 (210)
8	8.0	
10	9.4	
12	12.2	
14	13.7	
17	16.6	
19	18.6	
23	22.7	
25	25.3	★2 16 (160)
31	31.0	
26	26.6	
33	33.3	
41	41.3	
47	47.2	
53	52.5	
59	58.2	
65	64.7	★2 16 (160)
75	75	
60	59.6	
66	66.3	
76	76.4	
85	85	
94	93.6	
108	108	★2 17.5 (175)
116	115.6	★2 16 (160)
125	125	★2 14 (140)
136	136	★2 17.5 (175)
153	153	
184	184	
200	201	
237	237	

★1. When small volume pump pressure above 16 MPa (160 kgf/cm²), shaft rotation speed must raise more than 1450 rpm.

★2. When you choose Nominal Displacement, the Maximum operation pressure is limited at 14/16/17.5 MPa.

Limit of the Input Power

(S)-PV2R12 series, the sum of the input power to small volume pump and large volume pump is limited against the speed of shaft rotation as follows:



Shaft Speed Range

Model Numbers	Shaft Speed Range r/min	
	★3 Maximum	★4 Minimum
(S)-PV2R12	1800	750
(S)-PV2R13	1800	750
(S)-PV2R14	1800	750
(S)-PV2R23	1800	600
(S)-PV2R24	1800	600
(S)-PV2R34	1800	600

★3. The minimum suction pressure is limited in accordance with the speed. Please refer to page 8 (Table 1) for details.

★4. The Limit of Maximum Viscosity when starting at low speed of shaft rotation. Please refer to page 8 (Table 2) for details.

Mass

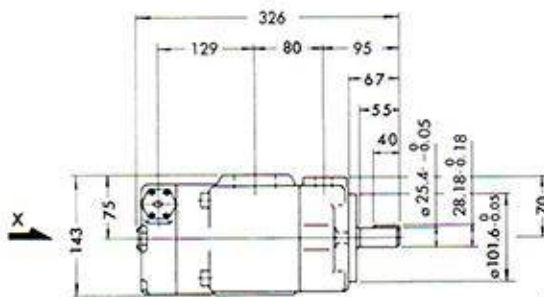
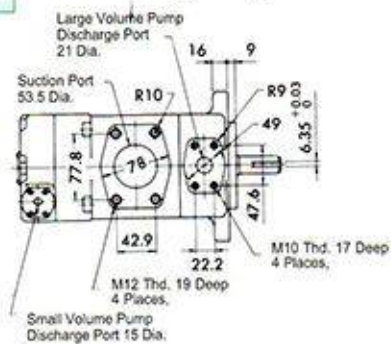
Pump Model No.	Mass kg	
	Flange Mtg.	Foot Mtg.
PV2R12	25	29.3
S-PV2R12	41	51
PV2R13	45.6	55.6
S-PV2R13	64	74
PV2R14	75	100
S-PV2R14	94	119
PV2R22	57	61
PV2R23	51	61
S-PV2R23	74	84
PV2R24	78	103
S-PV2R24	112	137
PV2R33	84	94
S-PV2R33	92	102
PV2R34	98	123
S-PV2R34	126	151

HYDRAULIC PUMPS

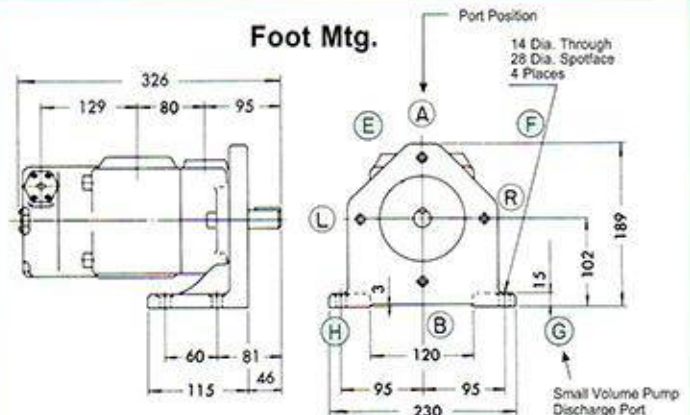
(S)-PV2R Series Double Vane Pumps **Max. Pressure 21 MPa**

PV2R12

Flange Mtg.

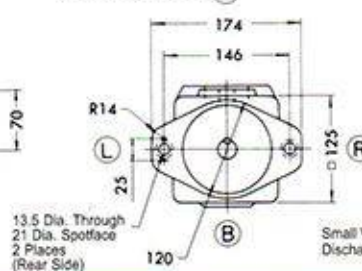


Foot Mtg.



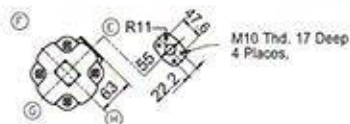
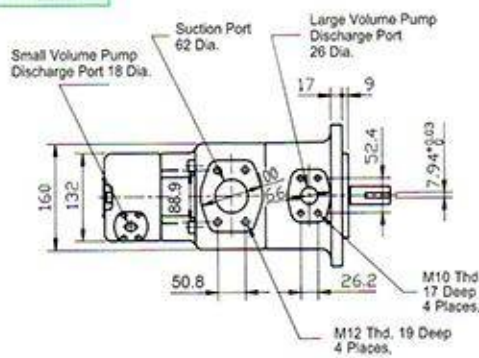
For other dimensions, please refer to "Flange Mtg."

Suction Port & Large Volume Pump Discharge Port Position

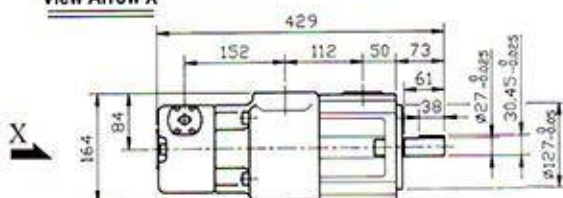


S-PV2R12

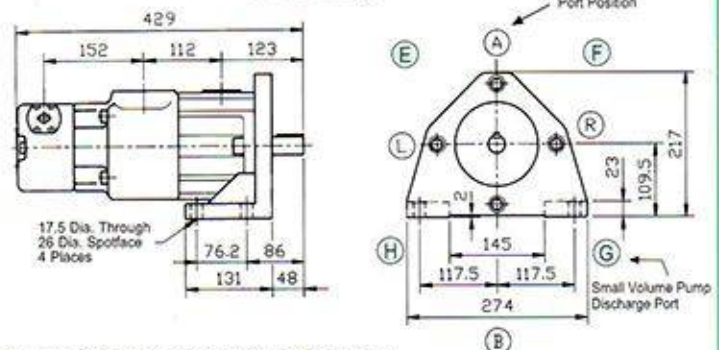
Flange Mtg.



View Arrow X



Foot Mtg.

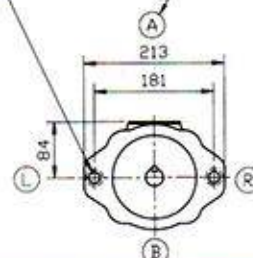


For other dimensions, please refer to "Flange Mtg."

17.5 Dia. Through
26 Dia. Spotface
2 Places

Port Position

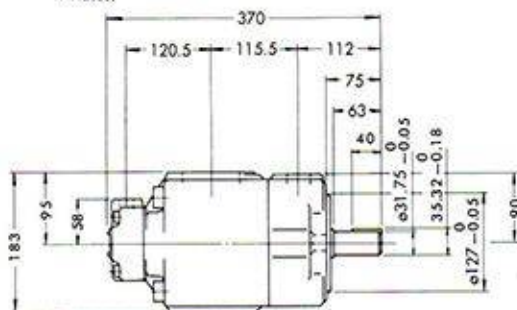
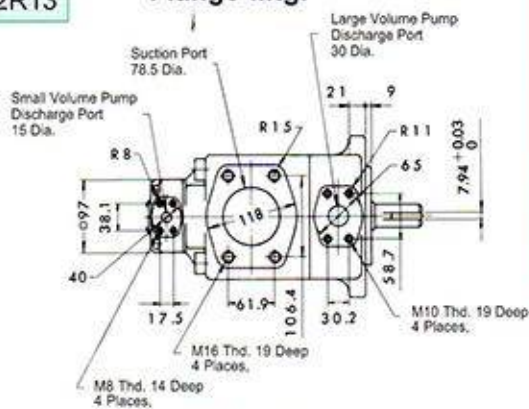
*Discharge port of flange mtg.
type for the large volume: only (A) port position



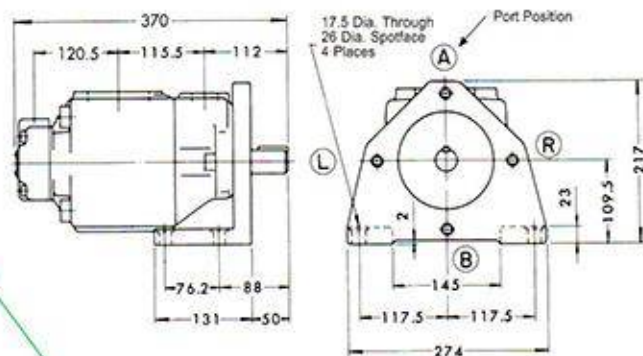
(S)-PV2R Series Double Vane Pumps **Max. Pressure 21 MPa**

PV2R13

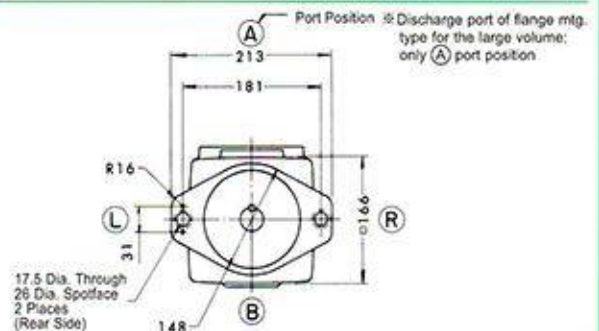
Flange Mtg.



Foot Mtg.

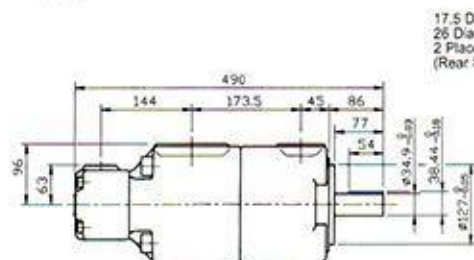
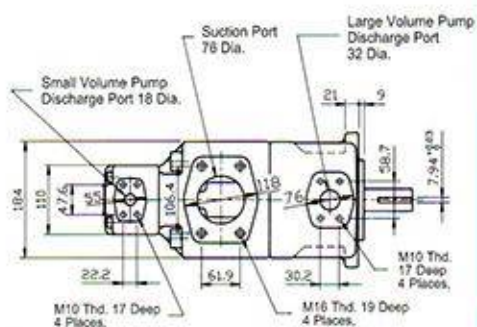


For other dimensions, please refer to "Flange Mtg."

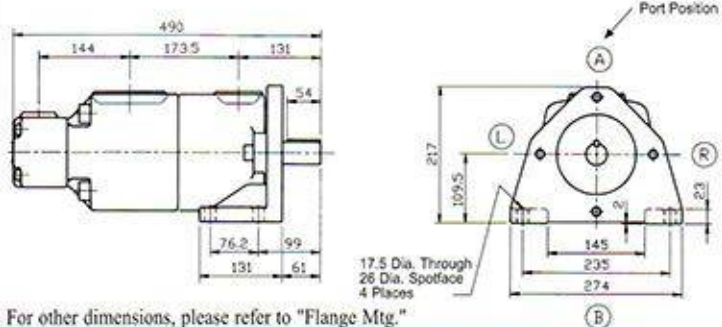


S-PV2R13

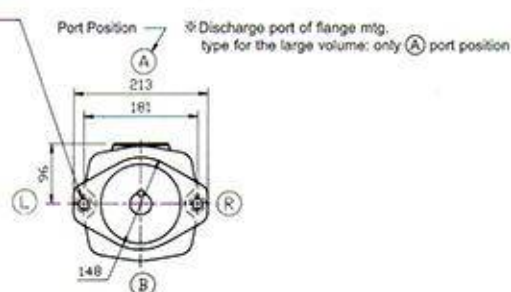
Flange Mtg.



Foot Mtg.



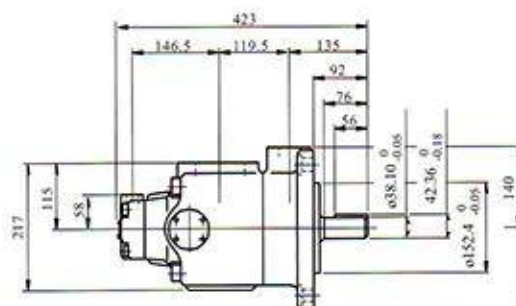
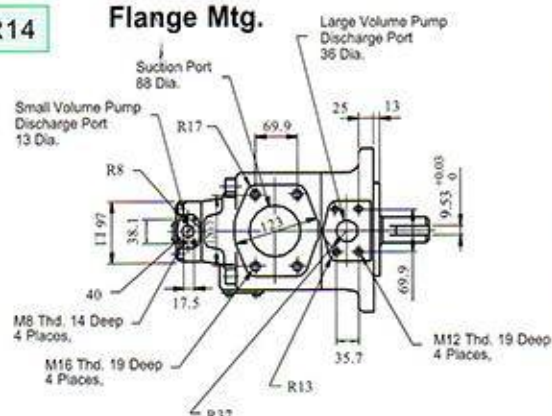
For other dimensions, please refer to "Flange Mtg."



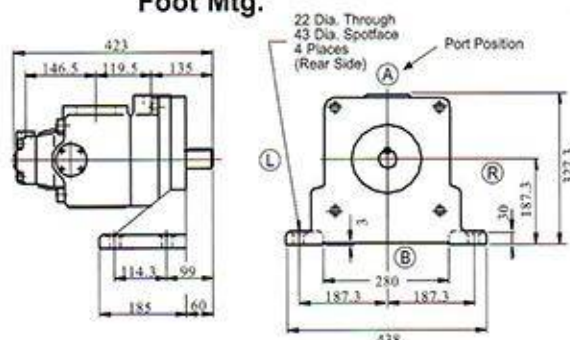
(S)-PV2R Series Double Vane Pumps Max. Pressure 21 MPa

PV2R14

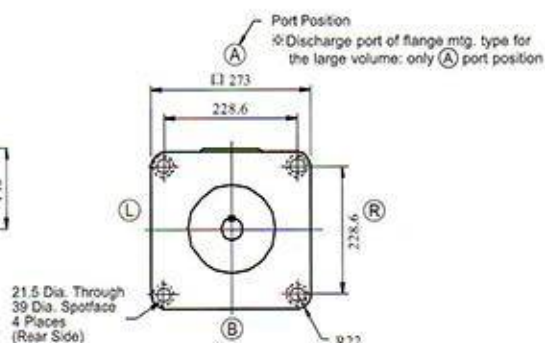
Flange Mtg.



Foot Mtg.

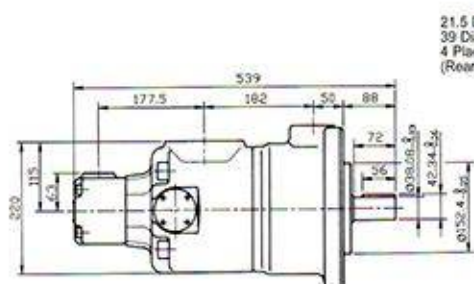
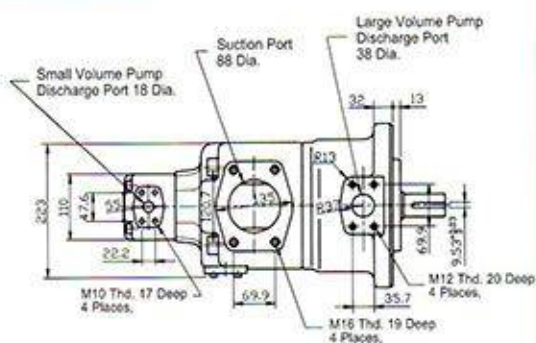


For other dimensions, please refer to "Flange Mtg."

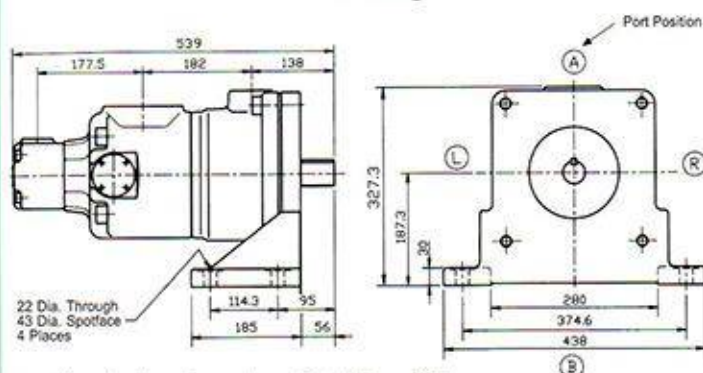


S-PV2R14

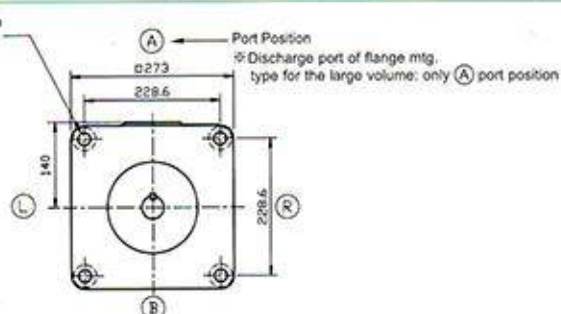
Flange Mtg.



Foot Mtg.



For other dimensions, please refer to "Flange Mtg."

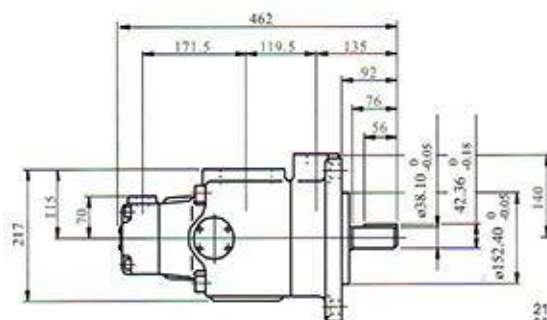
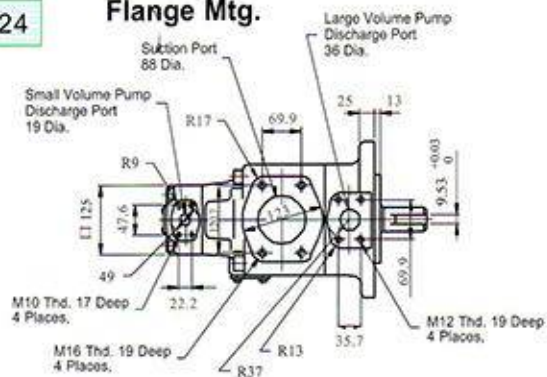


HYDRAULIC PUMPS

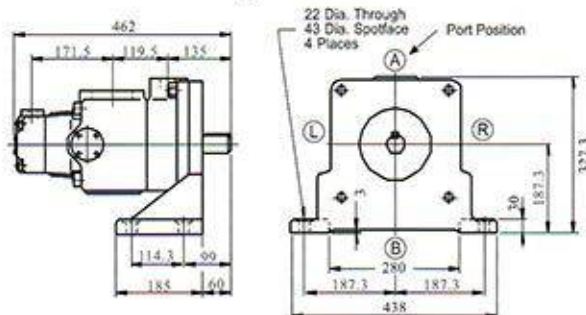
(S)-PV2R Series Double Vane Pumps Max. Pressure 21 MPa

PV2R24

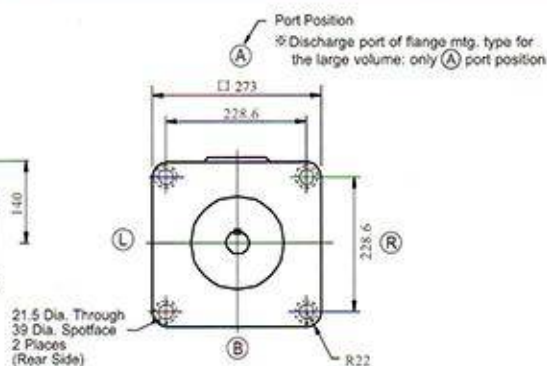
Flange Mtg.



Foot Mtg.

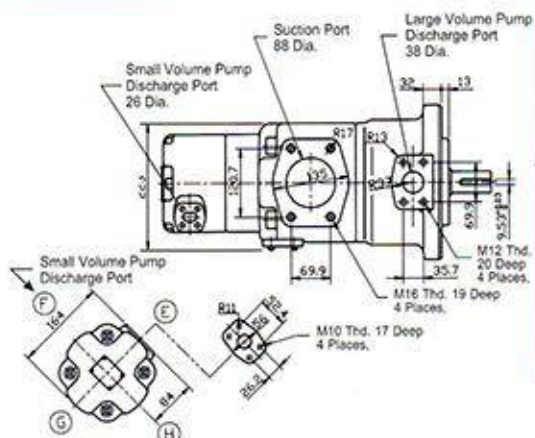


For other dimensions, please refer to "Flange Mtg."

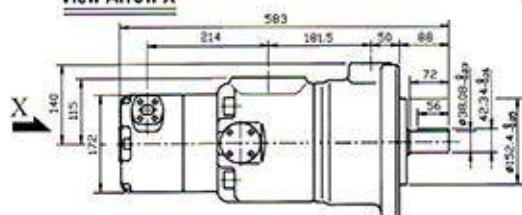


S-PV2R24

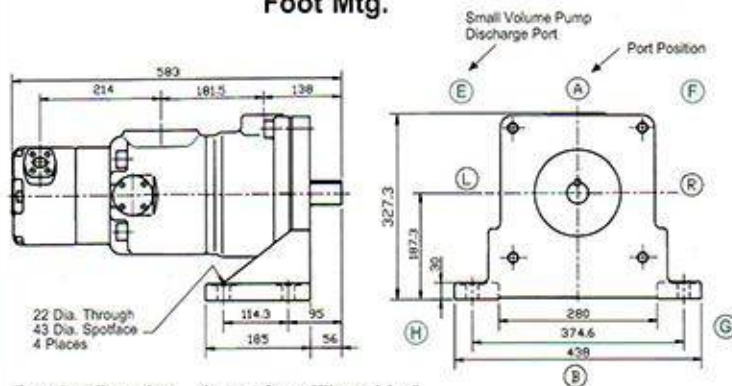
Flange Mtg.



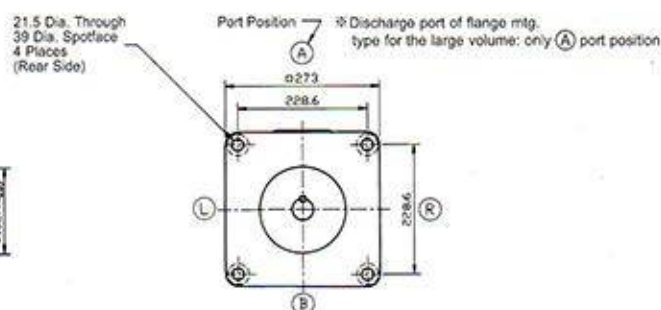
View Arrow X



Foot Mtg.



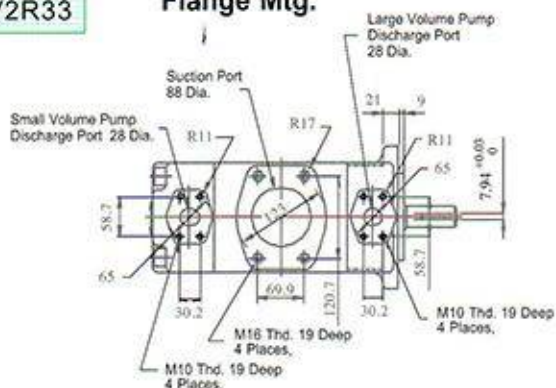
For other dimensions, please refer to "Flange Mtg."



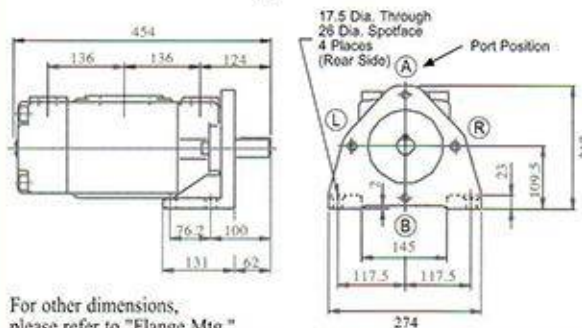
(S)-PV2R Series Double Vane Pumps **Max. Pressure 21 MPa**

PV2R33

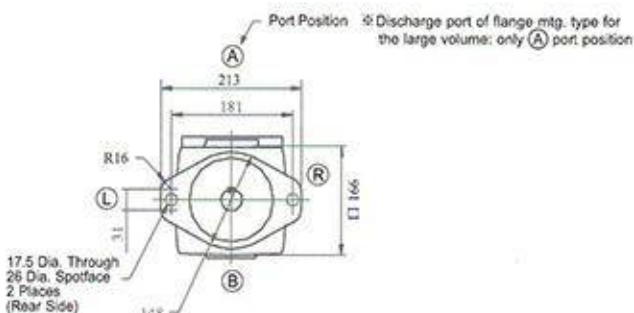
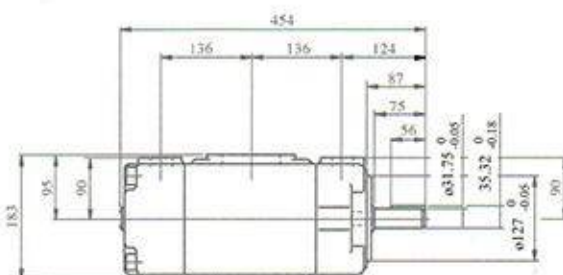
Flange Mtg.



Foot Mtg.



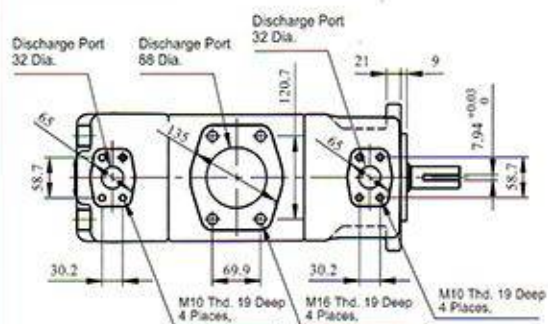
For other dimensions,
please refer to "Flange Mtg."



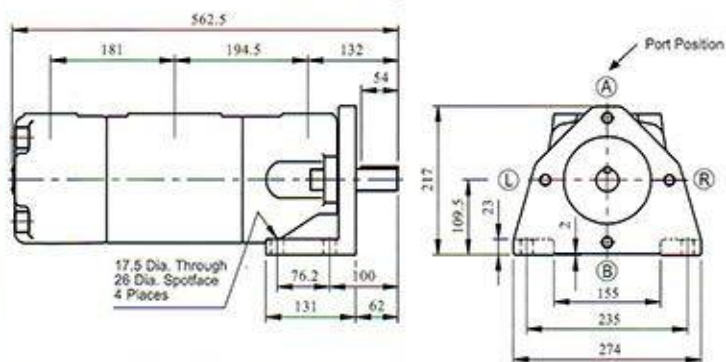
④ Discharge port of flange mtg. type for the large volume; only (A) port position

S-PV2R33

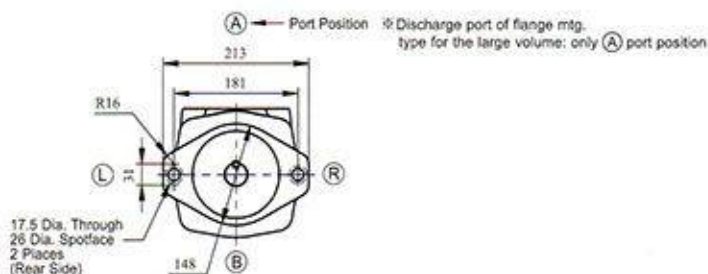
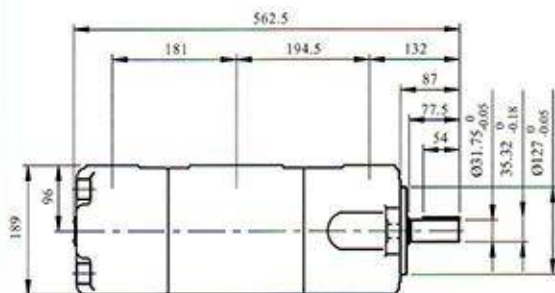
Flange Mtg.



Foot Mtg.



For other dimensions, please refer to "Flange Mtg."

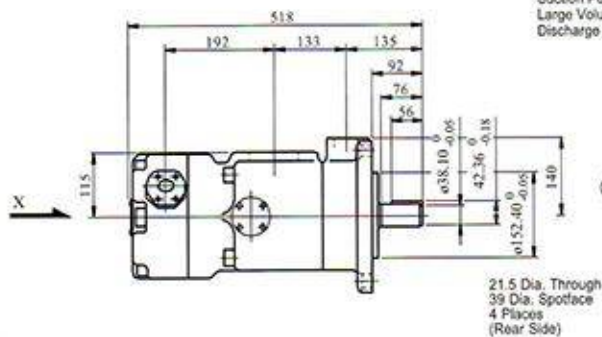
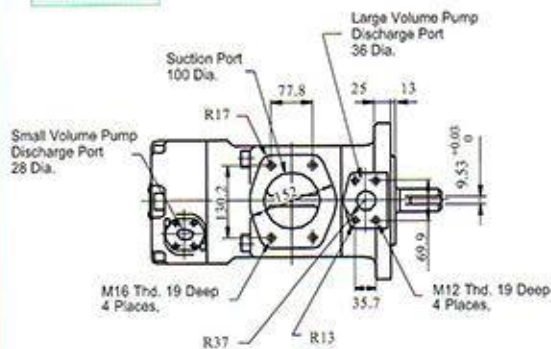


Discharge port of flange mtg.
type for the large volume; only (A) port position

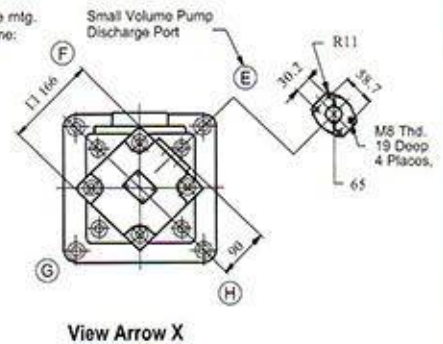
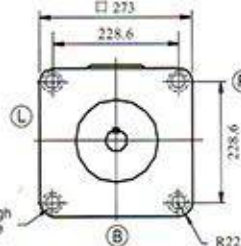
(S)-PV2R Series Double Vane Pumps **Max. Pressure 21 MPa**

PV2R34

Flange Mtg.

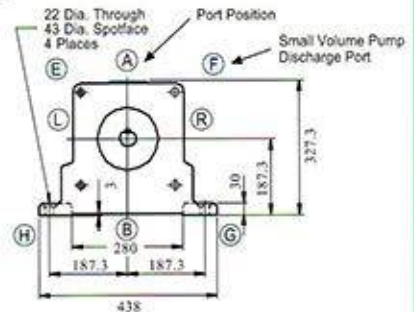
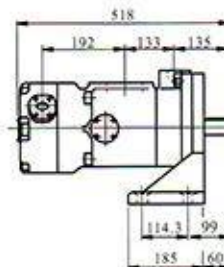


Section Port & Large Volume Pump Discharge Port Position



View Arrow X

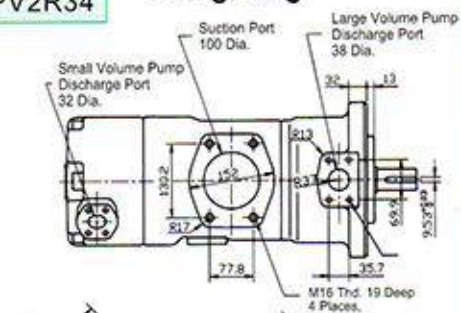
Foot Mtg.



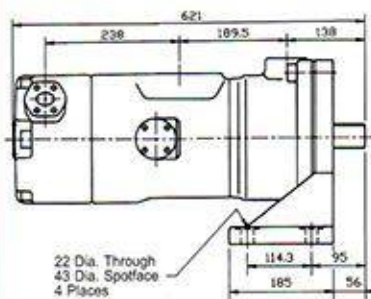
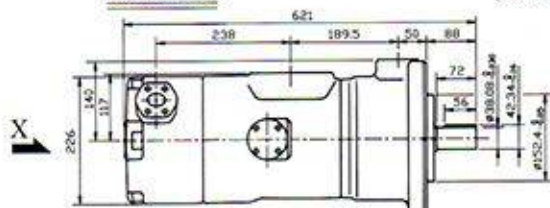
For other dimensions, please refer to "Flange Mtg."

S-PV2R34

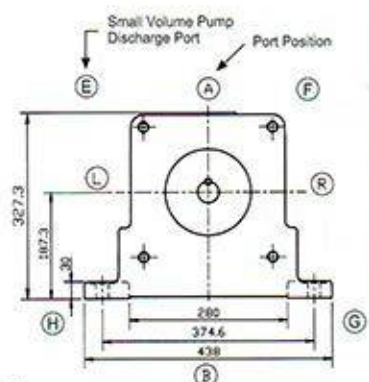
Flange Mtg.



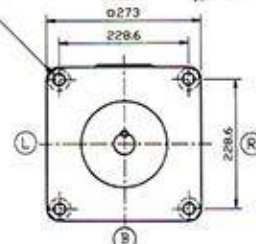
View Arrow X



For other dimensions, please refer to "Flange Mtg."



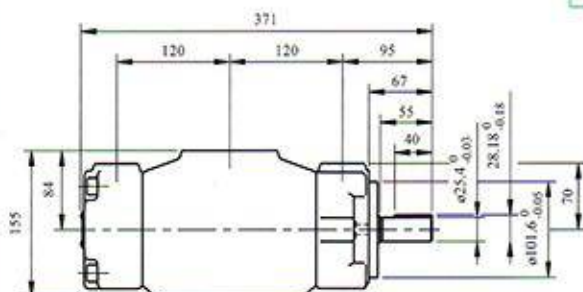
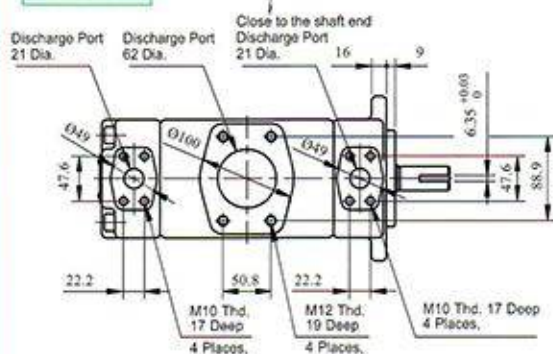
- Port Position
 - ✧ Discharge port of flange mtg.
type for the large volume: only (A) port position



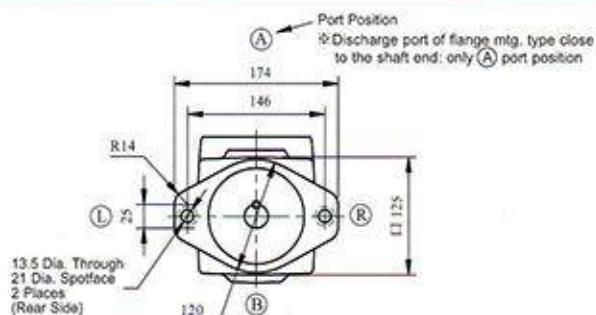
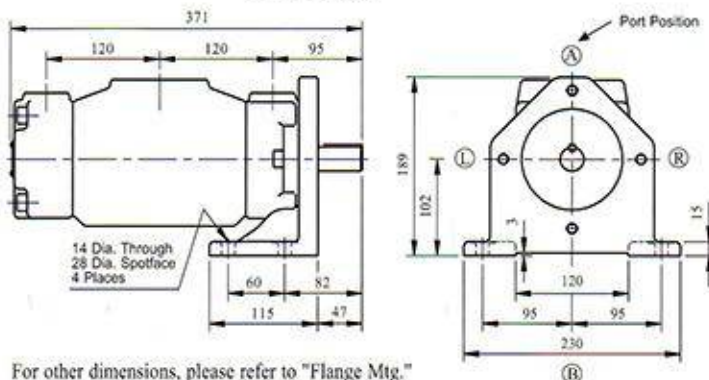
(S)-PV2R Series Double Vane Pumps Max. Pressure 21 MPa

PV2R22

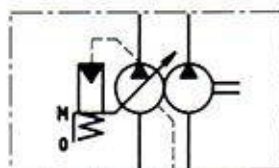
Flange Mtg.



Foot Mtg.

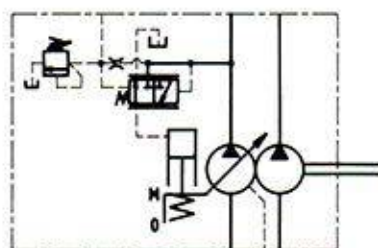
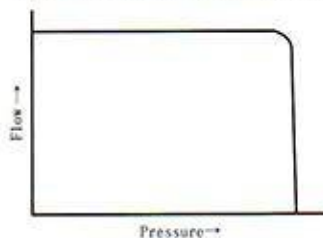


A¹⁶₂₂SR Series Piston & Vane Pumps

Max. Pressure 21 MPa


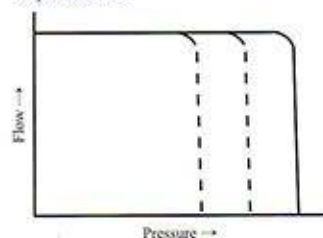
01 : Pressure Compensator Control Valve

- ★ 1. Pressure Compensator Control Type:
When the system pressure increases and comes close to the preset cut-off pressure, the pump flow decreases automatically while maintaining the set pressure as it is. According to your requirements, flow and cut-off pressure can be adjusted manually.



07 : Pilot Pressure Control type Valve

- ★ 2. Pilot Pressure Control Type:
The pump is used in combination with the pilot relief valve or multistage pressure control valve. By controlling the pilot remote-controlled according to your requirements.



- This double pump combines characteristics of piston pump's high cut-off pressure and vane pump's large volume low noise; with high and low pressure circuit design, the motor power can be used most effectively.
- Piston pumps also have options of AR16/AR22 piston pumps (the maximum operating pressure 16 MPa). Please refer to page 16-19.

Specifications

Model No.	Geometric Displace. cm ³ /rev				Max. Pressure MPa (kgf/cm ²)		Minimum Adj. Flow L/min Piston Pump	Shaft Speed Range r/min	Mass kg	
	Piston Pump	Vane Pump			Piston Pump	Vane Pump			Flange Mtg.	Foot Mtg.
*1 A16SR3-※-※-35	15.8	60	66	76	21.4	21.0	4	*2 600~1800	72	80
*1 A22SR3-※-※-35	22.2	85	94	108	16.3	(17.5/16/14)	6		72	80
A16SR4-※-※-35	15.8	136	153	184	21.4	17.5	4		86.5	111.5
A22SR4-※-※-35	22.2	200	*2	237	16.3		6		86.5	111.5

- *1. When starting at low speed of shaft rotation the maximum viscosity is limited. Please refer to page 8 (Table 2).
*2. When operating with a shaft speed exceeding 1700rpm, the minimum suction pressure is restricted. Please refer to page 8 (Table 1)
- For pressure - output flow & input power characteristics, please refer to page 32~34.
 - Anti-wear type petroleum hydraulic fluids are recommended to use with these pumps. (please refer to page 7)
 - Care in application of Piston Pump
1. Must be careful about the contamination control of the hydraulic fluid. Please keep the contamination rate under NAS10. Suction port must be installed with at least 100 μ m filter, return circuit must be installed with spin-on return filter less than 25 μ m.
 2. Install the pump so that the "Filling Port" is at the top.
 3. Suction port pressure is between -125mmHg ~ +0.05MPa (0.5kgf/cm²), piping diameter of suction ports is the same as the piping diameter of flanges.
 4. To prevent extra noise when piping for suction port or discharge port, please use soft rubber pipes.
 5. Make sure to keep the pressure inside the pump under 0.1MPa (1kgf/cm²), compact pressure under 0.5MPa (5kgf/cm²), please use piping connection size of 3/8 (caliber is bigger than ϕ 8.5), piping caliber is bigger than ϕ 10, piping length should be less than 1m, pipe's end should be immersed in the fluid.
 6. Before you operate at the first time, please put 600cc clean operating oil into the pump through the suction port.
 7. When the pump is ready to dispatch, please set the pump at maximum flow and minimum pressure.
 8. Whenever setting the pressure, make sure the full cut-off pressure never exceeds the permissible maximum intermittent pressure.

Model Number Designation

A16SR3-FR01CS-76-A-A-※		Design Number
Piston Pump	A16, A22	Vane Pump Suction Port Position (view from shaft end)
Vane Pump	SR3:S-PV2R3 SR4:S-PV2R4	A : upwards (normal) B : downwards R : right L : left
Mounting	L : Foot Mtg. F : Flange Mtg.	Vane Pump Discharge Port Position (view from shaft end)
Direction of Rotation (View from Shaft End)	R : Clockwise (Normal)	A : upwards (normal) B : downwards R : right L : left
Piston Pump Control Type	★ 1 : 01 : Pressure Compensator Control Type ★ 2 : 07 : Pilot Pressure Control Type	Vane Pump Nominal Displacement (cm ³ /rev)
		A※SR3: 60, 66, 76, 94, 108, 116, 125 A※SR4: 136, 153, 184, 200, 237
		Piston Pump Port Position
		S : Side Port
		Piston Pump Press. Adj. Range
		B : 1.2~7 MPa (12.2~71.4kgf/cm ²) C : 1.2~16 MPa (12.2~163kgf/cm ²) H : 1.2~21 MPa (12.2~214kgf/cm ²) (Applicable only for A16)

Pipe Flange Kits

Pump Model No.	Piston Pump Pipe Flange Kit Model No.			
	Piston Pump		Vane Pump	
	Suction	Discharge	Suction	Discharge
A16SR3 A22SR3	F5-06-A-10T	F5-06-A-10T	F5-16-A-10T	F5-10-A-10T
A16SR4 A22SR4	F5-06-A-10T	F5-06-A-10T	F5-24-B-10T	F5-12-B-10T

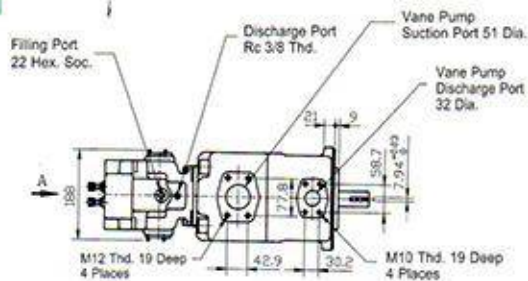
- In Pipe Flange Kit Model No. A: Threaded Connection / B: For Pipe Socket Welding.
- Details of the pipe flange kit please refer to page 50.
- When ordering, please specify pipe flange kit model.

A₂₂¹⁶SR Series Piston & Vane Pumps

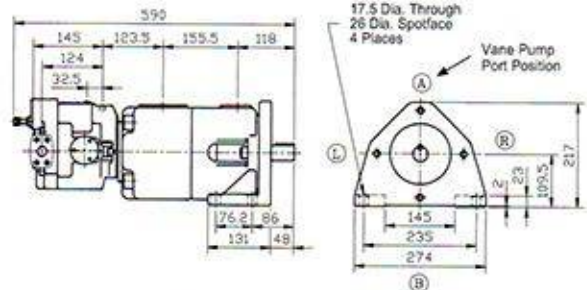
Max. Pressure 21 MPa

$$A_{22}^{16} \text{SR3}$$

Flange Mtg.(Side Port)

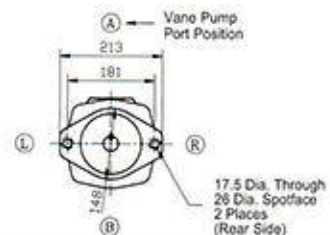
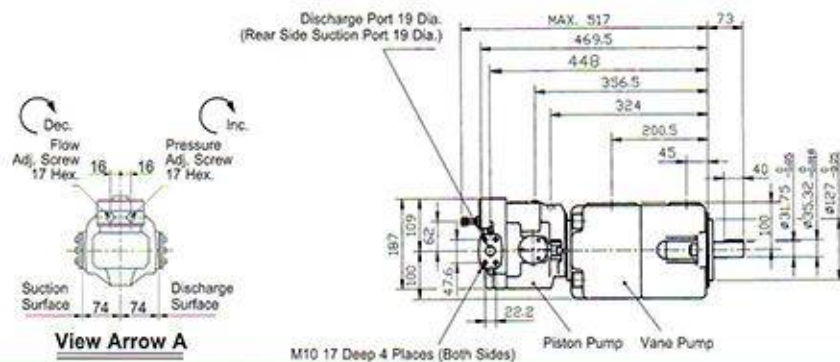


Foot Mtg.(Side Port)

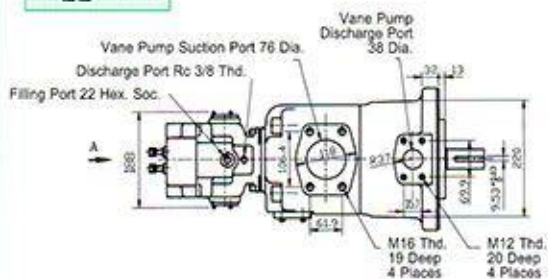


For other dimensions, please refer to Flange Mtg.

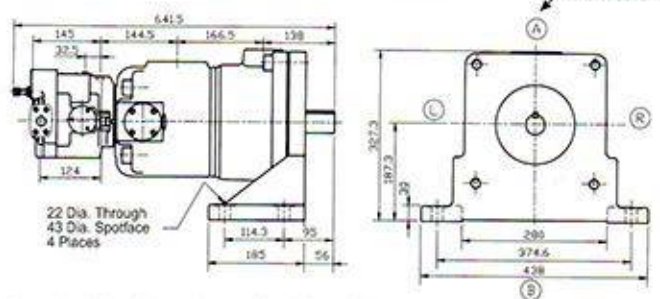
Flange Mtg.(Side Port)


$${}_{22}^{16}\text{A} \text{ SR4}$$

Flange Mtg.(Side Port)

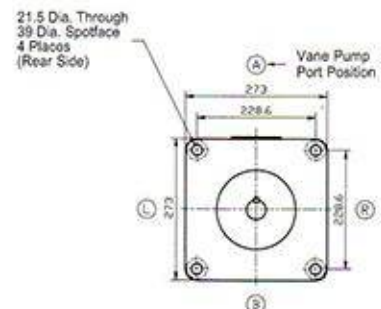
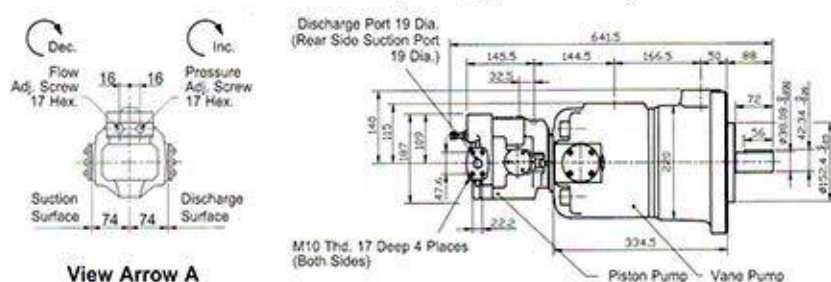


Foot Mtg.(Side Port)



For other dimensions, please refer to Flange Mtg.

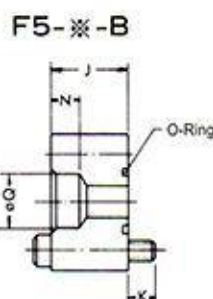
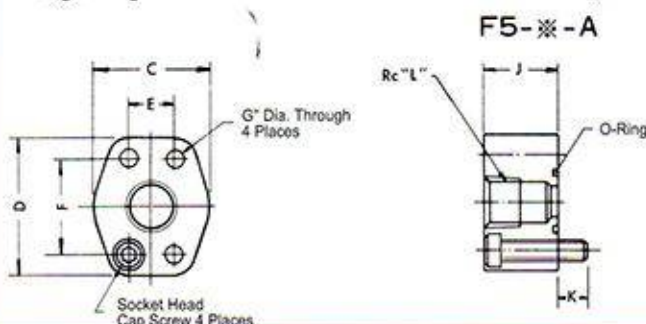
Flange Mtg.(Side Port)



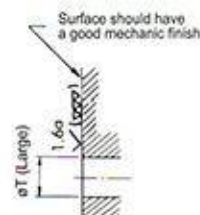
F5 Series Pipe Flange Kits

Max. Pressure 21 MPa

Flange Mtg. Dimensions: SAE 4 Bolt Solid Flanges



Customer's Mounting Surface

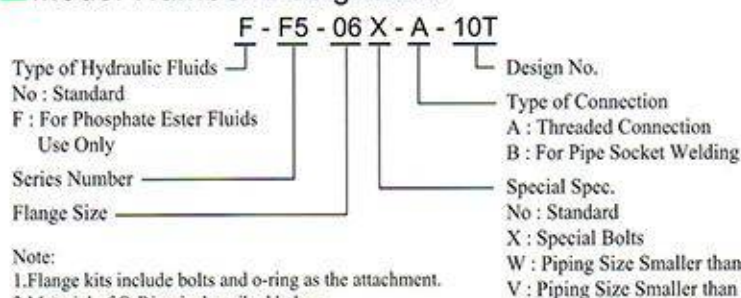


Specifications

 1 MPa = 10.2 kgf/cm²

Model No.	Piping Size	Dimension mm											O-Ring	Socket Head Cap Screw	Max. Pressure MPa	Mass kg
		C	D	E	F	G	J	K	L	N	Q	T				
F5-04W-A	3/8	40	56	17.5	38.1	8.8	26	12	3/8	-	-	16	P22	M 8 x 30	21	0.5
F5-04W-B								9	-	9	17.8			M 8 x 35		
F5-04 -A	1/2							12	1/2	-	-			M8 x 30		
F5-04 -B								9	-	11	22.2			M8 x 35		
F5-06X-A	3/4	54	71	22.2	47.6	8.8	28.5	12	3/4	-	-	20	G30	M 8 x 30	21	0.7
F5-06X-B								-	12	27.7	M 8 x 40					
F5-06 -A						11	17	3/4	-	-	M10 x 35					
F5-06 -B								-	12	27.7	M10 x 45					
F5-08W-A	3/4	56	76	26.2	52.4	11	28.5	17	3/4	-	-	26	G35	M10 x 35	21	0.9
F5-08W-B									-	12	27.7			M10 x 45		
F5-08 -A	1							17	1	-	-			M10 x 35		
F5-08 -B									-	14	34.5			M10 x 45		
F5-10 -A	1-1/4	72	84	30.2	58.7	11	28.5	17	1-1/4	-	-	32	G40	M10 x 35	21	1.2
F5-10 -B									-	16	43.2			M10 x 45		
F5-12 -A	1-1/2	74	96	35.7	69.9	13.5	30	17	1-1/2	-	-	38	G50	M12 x 35	21	1.5
F5-12 -B									15	-	18			49.1		
F5-16W-A	1-1/2	96	107	42.9	77.8	13.5	29.5	15.5	1-1/2	-	-	48	G65	M12 x 30	21	1.8
F5-16W-B									-	18	49.1			M12 x 45		
F5-16 -A	2							15	2	-	-	51		M12 x 30	17.5	1.7
F5-16 -B									-	20	61.1			M12 x 45		
F5-20W-B	2	100	117	50.8	88.9	13.5	38	17	-	20	61.1	51	G70	M12 x 55	17.5	2
F5-20 -B									2-1/2	-	20			77.1		
F5-24 -B	3	116	135	61.9	106.4	17.5	38	17	-	20	90.0	76	G85	M16 x 55	3.5	2.7
F5-28 -B	3-1/2	134	153	69.9	120.7	17.5	38	17	-	28	102.8	88	G100	M16 x 55	3.5	3.4
F5-32 -B	4	150	162	77.8	130.2	17.5	43	17	-	28	115.5	101	G115	M16 x 60	3.5	3.7

Model Number Designation



- Note:
- Flange kits include bolts and o-ring as the attachment.
 - Material of O-Ring is described below.
F5-※-※-10T NBR(Buna N) HS 90
F-F5-※-※-10T FPM(Viton) HS 90
 - The strength of bolt is 12.9T

Tightening Torque for Bolts

Bolt Size	Tightening Torque N · m	
	Recommendation	Tolerance
M8	34.3	±10%
M10	67.2	
M12	115.7	
M16	281.5	

Tightening Torque above is applicable to pressure line only.

SVPF Series Variable Vane Pump

Max. Pressure 7 MPa

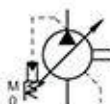


This pump is quiet, small, high efficiency, longevity, and quick response, the pressure and flow of this pump are adjustable and it is suitable for small and light equipment such as machine tools and shoes machine.

Model Number Designation

SVPF	-12	-70	-B	-20
Series number	Geometric Displacement, L/min (1800 rpm)	Max. Operating Pressure MPa (kgf/cm ²)	Shaft size (mm)	Design number
SVPF	12	20 : 2.0 (20 kgf/cm ²)	B : shaft size ø15.875 (suggestion)	20
	20	35 : 3.5 (35 kgf/cm ²)	None : shaft size ø12.7	
	30	55 : 5.5 (55 kgf/cm ²)	None :ø19.05 mm	
	40	70 : 7.0 (70 kgf/cm ²)		

Graphic Symbol



Piping for Drain

The piping of the drain port should not be set over 0.05 MPa of the body. The length of Piping should not be over 1 m and please do not mix the return piping with other solenoid valves. The end of the piping should be put into the fluid. Recommend the size of the drain piping is as follows:

The fitting of the piping: 1/4 (internal diameter $\phi 6.6$ plus)

The internal diameter of the piping: $\phi 7$ plus

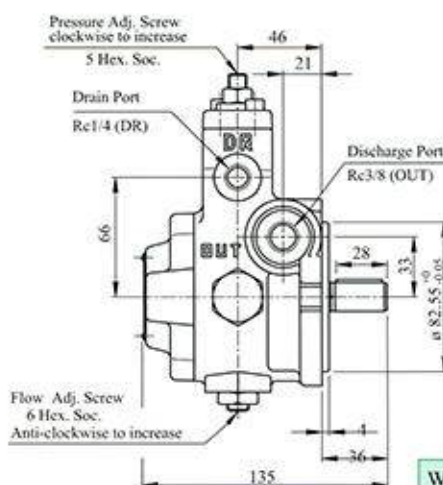
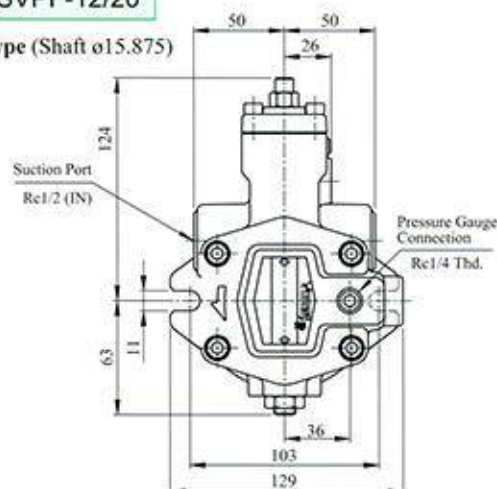
Setting of the pressure and displacement

The flow of the this pump is set at the Max. and the pressure of this pump is set at the lowest while the pump dispatched. Please reset the pressure and flow according to real working condition after receiving the pump.

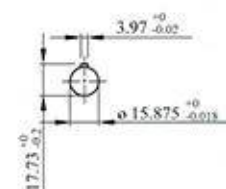
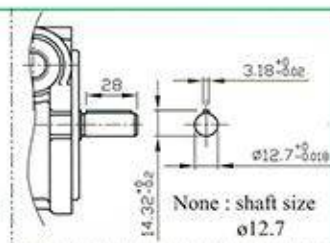
Please refer to page 52 for other characteristics.

SVPF-12/20

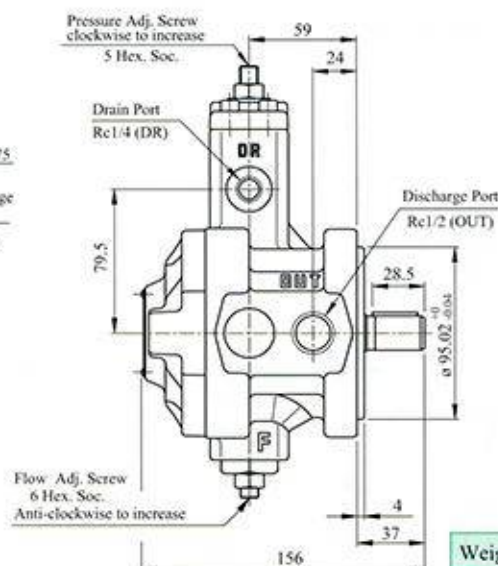
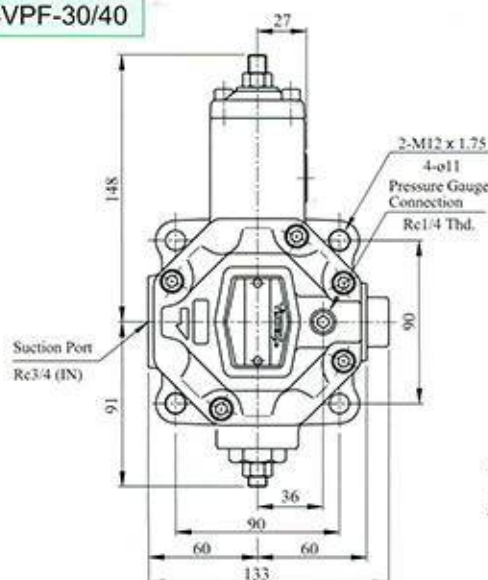
B Type (Shaft $\phi 15.875$)



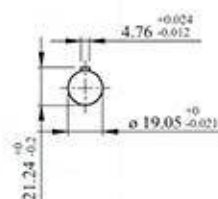
Weight 5.5 kg



SVPF-30/40



Weight 8 kg



SVPDF Series Double Variable Vane Pump Max. Pressure 7 MPa



Graphic Symbol



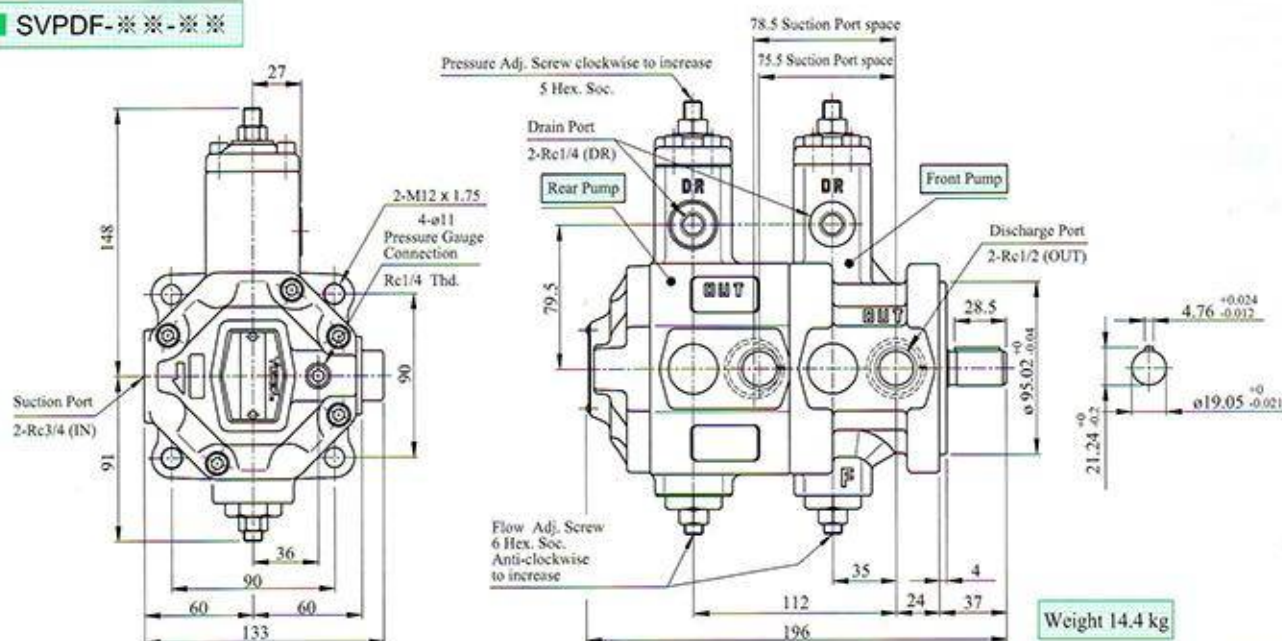
This pump is quiet, small, high efficiency, longevity, and quick response. The double variable vane pump can save the installing space, the suction port and discharge port is separate.

Model Number Designation

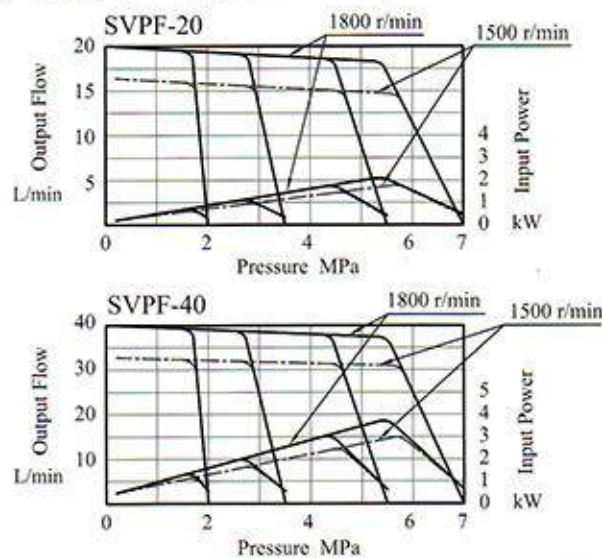
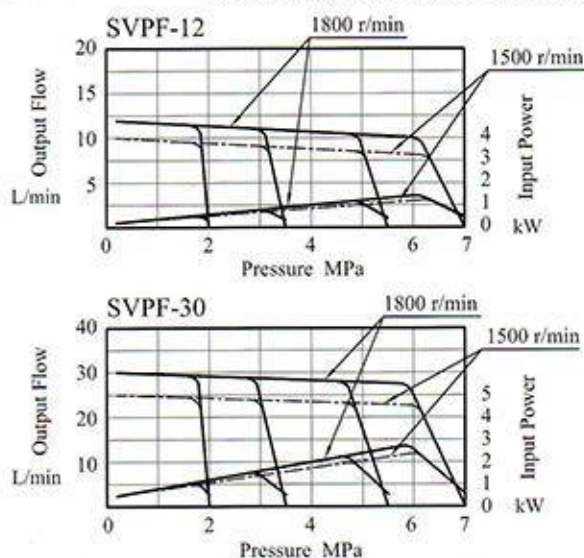
SVPDF	-30	70	-30	70	-20
Series Number	Front Pump Geometric Displacement L/min (1800 rpm)	Front Pump Max. Operating Pressure MPa (kgf/cm ²)	Rear Pump Geometric Displacement L/min (1800 rpm)	Rear Pump Max. Operating Pressure MPa (kgf/cm ²)	Design Number
SVPDF	30	20 : 2.0 (20 kgf/cm ²)	30	20 : 20 (20 kgf/cm ²)	20
		35 : 3.5 (35 kgf/cm ²)		35 : 35 (35 kgf/cm ²)	
		55 : 5.5 (55 kgf/cm ²)		55 : 55 (55 kgf/cm ²)	
		70 : 7.0 (70 kgf/cm ²)		70 : 70 (70 kgf/cm ²)	

Please refer to page 51 for the piping of the drain port, the setting of the pressure and displacement

SVPDF-※※※※



Characteristics : The following characteristics are based on fluid viscosity 46 mm²/s (ISO VG-46 40°C)



Relief Valves

Max. Pressure 25 MPa



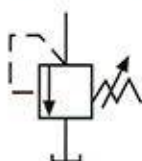
Remote Control Relief Valve



Direct Type Relief Valve

Graphic Symbol

Remote Control / Direct Type

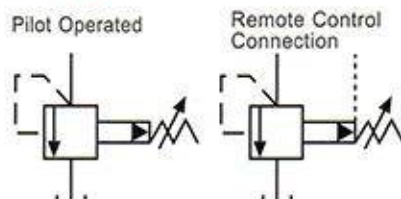


General Type Pilot Operated Relief Valve



Low Noise Type Pilot Operated Relief Valve

Graphic Symbol



- Remote Control Relief Valves are used for hydraulic pressure control valve(Relief Valve, Pressure Reducing Valve) by remote control.
- Relief Valve is used to protect hydraulic system from excessive pressure and can also be used to maintain a constant pressure in the hydraulic system.

Specifications

Valve Type	Valve Size	Model No.	Pressure Adjustment Range MPa (kgf/cm ²)	Max. Flow L/min	Mass kg
Remote Control Relief Valve	1/8	DT-01-22 DG-01-22	Max. 25 (250)	2	1.6 1.4
Direct Type Relief Valve	1/4	DT-02-※-22 DG-02-※-22	Please refer to Model Number Designation	16	1.5
Pilot Operated Relief Valve	General Type	3/8 BT-03-※-32 BG-03-※-32	0.5~25 (5~250)	100	5.0 4.7
		3/4 BT-06-※-32 BG-06-※-32		200	5.0 5.6
		1-1/4 BT-10-※-32 BG-10-※-32		400	8.5 8.7
	Low Noise Type	3/8 S-BG-03-※-L-R-40	0.4~25 (4~250)	100	4.1
		3/4 S-BG-06-※-L-R-40		200	5.0

*Low-pressure control type, please contact sales people for details.

Model Number Designation

D T-02-B-22

Design No.
Pressure Adjustment Range MPa (kgf/cm²)
(Applicable only for DT-02 & DG-02)
B : 0.5~7 (5~70)
C : 3.5~14 (35~140)
H : 7.0~21 (70~210)
Valve Size
Type of Connection
T : Threaded Connection
G : Sub-plate Mounting
Series No.

S-B G-06-V-L-※

Low Noise Type
(Omit if not required)
Series Number
Type of Connection
T : Threaded Connection
(only for general type)
G : Sub-plate Mounting
Valve Size
Design No.
Direction of Pressure adjustment handle
(only for S-BG)
(Viewed from pressure gauge connection side)
L : Left (Standard) ◦ R : Right
High Venting Pressure Feature*(Optional)
(Omit if not required)
*Use high venting pressure type to reduce the response time from unload to load.

- The Min. Flow: The setting pressure will be unstable when using small flow; therefore, the flow should be bigger than the min. flow as the below table.

Model No.	BG/BT Series	S-BG Series
03	8 L/min	5 L/min
06		
10	15 L/min	-

Sub-plate

Valve Model No.	Sub-plate Model No.	Piping Size Rc	Mass kg
DG-01,DG-02	DGM-02-20	1/4	0.7
(S)-BG-03	BGM-03-20	3/8	2.4
	BGM-03X-20	1/2	3.1
(S)-BG-06	BGM-06-20	3/4	4.7
	BGM-06X-20	1	5.7
BG-10	BGM-10-20	1-1/4	8.4
	BGM-10X-20	1-1/2	10.3

- Sub-plates are available. When ordering.
- Please refer to page 54, 56 for the dimensions.

Mounting Bolts (Attachment)

Model No.	Socket Head Cap Screw	Qty	Tightening Torque N·m
DG-01	M5 x 45 Lg	4	8~9
DG-02	M5 x 45 Lg	4	
BG-03	M12 x 70 Lg	2	104~127
	M12 x 95 Lg	2	
BG-06	M16 x 60 Lg	2	253~310
	M16 x 80 Lg	2	
BG-10	M20 x 70 Lg	2	493~603
	M20 x 90 Lg	2	
S-BG-03	M12 x 40 Lg	4	104~127
S-BG-06	M16 x 50 Lg	4	253~310

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