

B

VANE PUMPS

Pump Type		Graphic Symbols	Output Flow at 1200 r/min at No-Load														Maximum Operating Pressure MPa (PSI)	Page
			U.S.GPM L/min															
Fixed Displacement	"PV2R" Series Single Pumps																21 (3050)	163
	"PV2R4A" Series Single Pumps																17.2 (2500)	177
	"PV2R" Series Double Pumps																21 (3050)	181
	"PV2R24A/34A" Series Double Pumps																21 (3050) 17.2(2500)	196

■ Hydraulic Fluids

1. Type of hydraulic fluids

Any type of hydraulic fluids listed in the Table 1 below can be used. However, the specifications of the pumps such as maximum pressure and maximum pump speed may be changed according to the type of hydraulic fluids to be used. For details, please refer to the specifications of the pump concerned.

● Hydraulic fluids

(Table 1)

Petroleum Base Oils		Use anti-wear type oils or R & O (Rust and Oxidation inhibitor) type oils (equivalent to ISO VG32 or 46).
Synthetic Fluids		Use phosphate ester type fluids. When phosphate ester type fluid is used, prefix "F-" to the model number because the special seals (fluororubber) are required to be used.
Water Containing Fluids	Water-Glycols	Standard pumps can be used without conditions. However, if any type other than those in Table 2 is used, the maximum operating pressure is limited.
	Water in Oil Emulsions	Standard pumps can be used without conditions.

● Anti-wear type water-glycols

(Table 2)

Fluid Manufacturer	Commercial Trade Name
Exxon Mobil	Mobil Nybac FR 200 D
JAPAN ENERGY CORP.	JOMO Hydria G
NIPPON OIL CORPORATION	HYRANDO FRX 46
Showa Shell Sekiyu K. K.	Shell HFC Fluid 46
MATSUMURA OIL RESEARCH CORP.	HYDOL HAW
COSMO OIL LUBRICANTS CO. , LTD.	COSMO FLUID HQ 46 COSMO FLUID GS 46

2. Fluid viscosity and temperature

Use the hydraulic fluids which satisfy the recommended viscosity and oil temperature given in the Table 3 below. However, please note that if any of the pumps listed in the table 4 is started at low speed, the maximum fluid viscosity is limited.

● Fluid viscosity and temperature

(Table 3)

Fluid	Temperature °C (°F)	Viscosity mm ² /s(SSU)
Petroleum Base Oils	0-70 (32-158)	20-400 (100-1800)
Phosphate Esters		
Water Glycols	0-50 (32-122)	
Water in Oil Emulsions	5-50 (41-122)	

● Maximum viscosity for low start-up speed

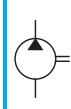
(Table 4)

Pump Type	Start-up Speed r/min	Max. Viscosity mm ² /s (SSU)
PV2R1 PV2R12 PV2R13 PV2R14	750	100 (455)
	950	200 (910)
	600	100 (455)
	950	200 (910)
PV2R2 PV2R23 PV2R24 PV2R24A		

3. Control of contamination

Contamination of hydraulic fluids results in pump failures and reduced pump lives. Carry out sufficient contamination control for hydraulic fluids and keep contamination level within NAS class 12.

Also, use a 100 μm (150-mesh) tank filter on the suction side, more than 50 mm (2 in.) away from the tank bottom.



Instructions

1. 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 (.004 inches) TIR and maximum permissible misangular is less than 0.2°.

2. Suction pressures

Set the suction pressure at pump inlet port at the value given in the table below. Furthermore, use the pipes in the suction side having the diameter as indicated on the installation drawings. In case where the pump is installed on the tank or at the position higher than the tank top cover, the height of the suction port of the pump should be less than 1 metre (3.3 ft.) from the oil level {less than 0.8 metre (2.6 ft.) in case of using phosphate ester fluids or water containing fluids}.

Pump Type		Suction Pressure		
		Minimum		Maximum
		Petroleum base oil	Phosphate ester type fluid Water containing fluid	
"PV2R" Series Single Pumps	PV2R1 PV2R2	-20 kPa (5.9 in. Hg Vacuum)	-16 kPa (4.7 in. Hg Vacuum)	+30 kPa (+4.3 PSIG)
	PV2R3 PV2R4 PV2R4A	-20 kPa [*] (5.9 in. Hg Vacuum) [*]		
"PV2R" Series Double Pumps	PV2R12	-20 kPa (5.9 in. Hg Vacuum)		
	PV2R13 PV2R23 PV2R33 PV2R14 PV2R24 PV2R34 PV2R24A PV2R34A	-20 kPa [*] (5.9 in. Hg Vacuum) [*]		

★ In relation to the rotating speed of the pump, the minimum suction pressure may be restricted for a certain nominal displacement. For details, please refer to the specifications of the pump concerned.

3. Precautions at starting

At an initial operation or at an operation after a long rest, the pump may have difficulty in sucking up fluid. In such cases, an air bleed valve should be installed beforehand on the discharge side (model No. ST1004-*-10*, see [page 820](#)), or discharge air by slightly slackening the connection on the discharge side. At starting, operate the pump intermittently as far as possible with no load.

For fluid viscosity at starting, see the item of "Hydraulic Fluids".

4. Other precautions

If a pump is used at speed below 1200 r/min, install the pump with the suction port upside so that the pump can suck up fluid easily at starting.

Interchangeability in Installation between Current and New Design

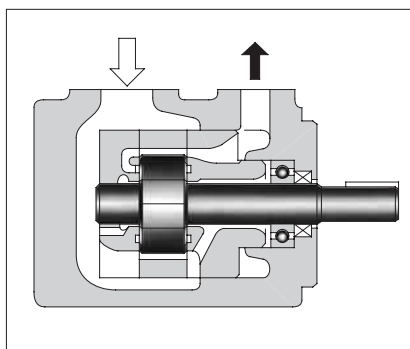
The models shown below have been changed in design.

Name	Model Numbers		Interchange-ability in Installation	Major Changes
	Current	New		
"PV2R1" Series Single Pumps	PV2R1-*-*-RAA- ^{40*} _{41*}	PV2R1-*-*-RAA-42*	Yes	● Lower noise level
"PV2R2" Series Single Pumps	PV2R2-*-*-RAA-40*	PV2R2-*-*-RAA-41*	Yes	● Lower noise level
"PV2R3" Series Single Pumps	PV2R3-*-*-RAA-30*	PV2R3-*-*-RAA-31*	Yes	● Lower noise level
"PV2R12" Series Double Pumps	PV2R12-*-*-REAA- ^{40*} _{41*}	PV2R12-*-*-REAA-42*	Yes	● Lower noise level
"PV2R13" Series Double Pumps	PV2R13-*-*-RAAA- ^{40*} _{41*}	PV2R13-*-*-RAAA-42*	Yes	● Lower noise level
"PV2R14" Series Double Pumps	PV2R14-*-*-RAAA- ^{30*} _{31*}	PV2R14-*-*-RAAA-32*	Yes	● Lower noise level
"PV2R23" Series Double Pumps	PV2R23-*-*-REAA-40*	PV2R23-*-*-REAA-41*	Yes	● Lower noise level
"PV2R33" Series Double Pumps	PV2R33-*-*-RAAA-30*	PV2R33-*-*-RAAA-31*	Yes	
"PV2R24" Series Double Pumps	PV2R24-*-*-RAAA-30*	PV2R24-*-*-RAAA-31*	Yes	
"PV2R34" Series Double Pumps	PV2R34-*-*-REAA-30*	PV2R34-*-*-REAA-31*	Yes	

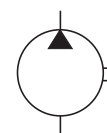
"PV2R" Series Single Vane Pumps

These pumps are of high pressure and high performance, which have been developed especially for low noise operation. To comply with a variety of applications including injection moulding machines, PV2R series single pumps provide the output flow of such a wide range as from 5.8 to 237 cm³/rev (.354 to 14.46 cu.in./rev).

The integral driving parts of the pumps are combined into a kit form and available for supply as a cartridge kit. Therefore, the replacement of the driving parts can be done easily.



Graphic Symbol



B

"PV2R" Series
Single Vane Pumps

Model Number Designation

F-	PV2R1	-6	-L	-R	A	A	-42	-*
Special Seals	Series Number	Nominal Displacement cm³/rev	Type of Mounting	Shaft Rotation	Discharge Port Position	Suction Port Position	Design Number	Design Standards
F: For phosphate ester type fluids (Omit if not required)	PV2R1	6, 8, 10, 12 14, 17, 19 23, 25, 31	L: Foot Mounting	(Viewed from Shaft End)			42	Refer to ★2
	PV2R2	41, 47, 53 59, 65					41	
	PV2R3	76, 94, 116	F: Flange Mounting	R: Clockwise ★1 (Normal)	A: Upwards (Normal)	A: Upwards (Normal)	31	
	PV2R4	136, 153, 184 200, 237					30	

★ 1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

★ 2. Design Standards: None.....Japanese Standard "JIS"
80.....European Design Standard
90.....N. American Design Standard

Pipe Flange Kits

Pipe flange kits are available. When ordering, specify the kit number from the table below.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers						
		Threaded Connection			Socket Welding ★ 1		Butt Welding	
		Japanese Standard "JIS"	European Design Standard	N. American Design Standard ★ 2	Japanese Standard "JIS" European Design Standard	N. American Design Standard ★ 2	Japanese Standard "JIS" European Design Standard	N. American Design Standard ★ 2
PV2R1	Suction	F5-08-A-10	F5-08-A-1080	—	F5-08-B-10	F5-08-B-1090	F5-08-C-10	F5-08-C-1090
	Discharge	F5-04-A-10	F5-04-A-1080	—	F5-04-B-10	F5-04-B-1090	F5-04-C-10	F5-04-C-1090
PV2R2	Suction	F5-10-A-10	F5-10-A-1080	—	F5-10-B-10	F5-10-B-1090	F5-10-C-10	F5-10-C-1090
	Discharge	F5-06-A-10	F5-06-A-1080	—	F5-06-B-10	F5-06-B-1090	F5-06-C-10	F5-06-C-1090
PV2R3	Suction	F5-16-A-10	F5-16-A-1080	—	F5-16-B-10	F5-16-B-1090	F5-16-C-10	F5-16-C-1090
	Discharge	F5-10-A-10	F5-10-A-1080	—	F5-10-B-10	F5-10-B-1090	F5-10-C-10	F5-10-C-1090
PV2R4	Suction	F5-24-A-10	—	—	F5-24-B-10	F5-24-B-1090	F5-24-C-10	F5-24-C-1090
	Discharge	F5-12-A-10	F5-12-A-1080	—	F5-12-B-10	F5-12-B-1090	F5-12-C-10	F5-12-C-1090

★ 1. In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of the flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.

★ 2. As dimensions of the pipe flange mounting surface are conformed to SAE 4 Bolt Split Flange (Standard Pressure Series), pipe flanges conforming to the SAE Standards can be used.

Notes: Special seals (Viton seals) are required when phosphate ester type fluids are used. (Prefix "F-" to the pipe flange kit number when ordering.)

● Details of the pipe flange kits are shown on page 824.

Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu.in./rev)	Max. Operating Pressure MPa (PSI)						Output Flow & Input Power	Shaft Speed Range r/min							
		Petroleum Base Oils		Water Containing Fluids			Synthetic Fluids		Max.	Min.						
		Anti-Wear Type	R & O Type	Anti-Wear ^{★1} Type Water Glycols	Water Glycols	Water in Oil Emulsions	Phosphate Esters									
PV2R1-6	5.8 (.354)	21 ^{★6}	16 (2320)	16 (2320)	7 (1020)	7 (1020)	16 (2320)	Refer to Pages 170 - 172	1800 (1200) ^{★4}	750 ^{★5}						
PV2R1-8	8.0 (.488)	(3050)														
PV2R1-10	9.4 (.574)															
PV2R1-12	12.2 (.744)															
PV2R1-14	13.7 (.836)															
PV2R1-17	16.6 (1.013)															
PV2R1-19	18.6 (1.135)															
PV2R1-23	22.7 (1.385)															
PV2R1-25	25.3 (1.544)															
PV2R1-31	31.0 (1.892)	16 (2320)														
PV2R2-41	41.3 (2.52)	21 (3050)	14 (2030)	16 (2320)	7 (1020)	7 (1020)	14 (2030)	Refer to Pages 172 & 173	1800 (1200) ^{★4}	600 ^{★5}						
PV2R2-47	47.2 (2.88)															
PV2R2-53	52.5 (3.20)															
PV2R2-59	58.2 (3.55)															
PV2R2-65	64.7 (3.95)															
PV2R3-76	76.4 (4.66)	21 (3050)	14 (2030)	16 (2320)	7 (1020)	7 (1020)	14 (2030)	Refer to Page 174	1800 (1200) ^{★4}	600						
PV2R3-94	93.6 (5.71)	16 (2320)							1800 ^{★2} (1200) ^{★4}							
PV2R3-116	115.6 (7.05)								1800 ^{★3} (1200) ^{★4}							
PV2R4-136	136 (8.30)	17.5 (2540)	14 (2030)	16 (2320)	7 (1020)	7 (1020)	14 (2030)	Refer to Pages 174 & 175	1800 (1200) ^{★4}	600						
PV2R4-153	153 (9.34)								1800 ^{★3} (1200) ^{★4}							
PV2R4-184	184 (11.23)															
PV2R4-200	201 (12.27)															
PV2R4-237	237 (14.46)															

★1. For the brands of anti-wear type water-glycols , see the item of "Hydraulic Fluids" on page 160.

★2. If PV2R3-116 is used at speed above 1700 r/min, the suction pressure is limited to 0 kPa (0 in. Hg.).

★3. If PV2R4-237 is used at speed above 1700 r/min, the suction pressure is limited to -13 kPa (3.94 in. Hg. vacuum).

★4. If phosphate ester or water containing fluids are used, the maximum speed is limited to 1200 r/min.

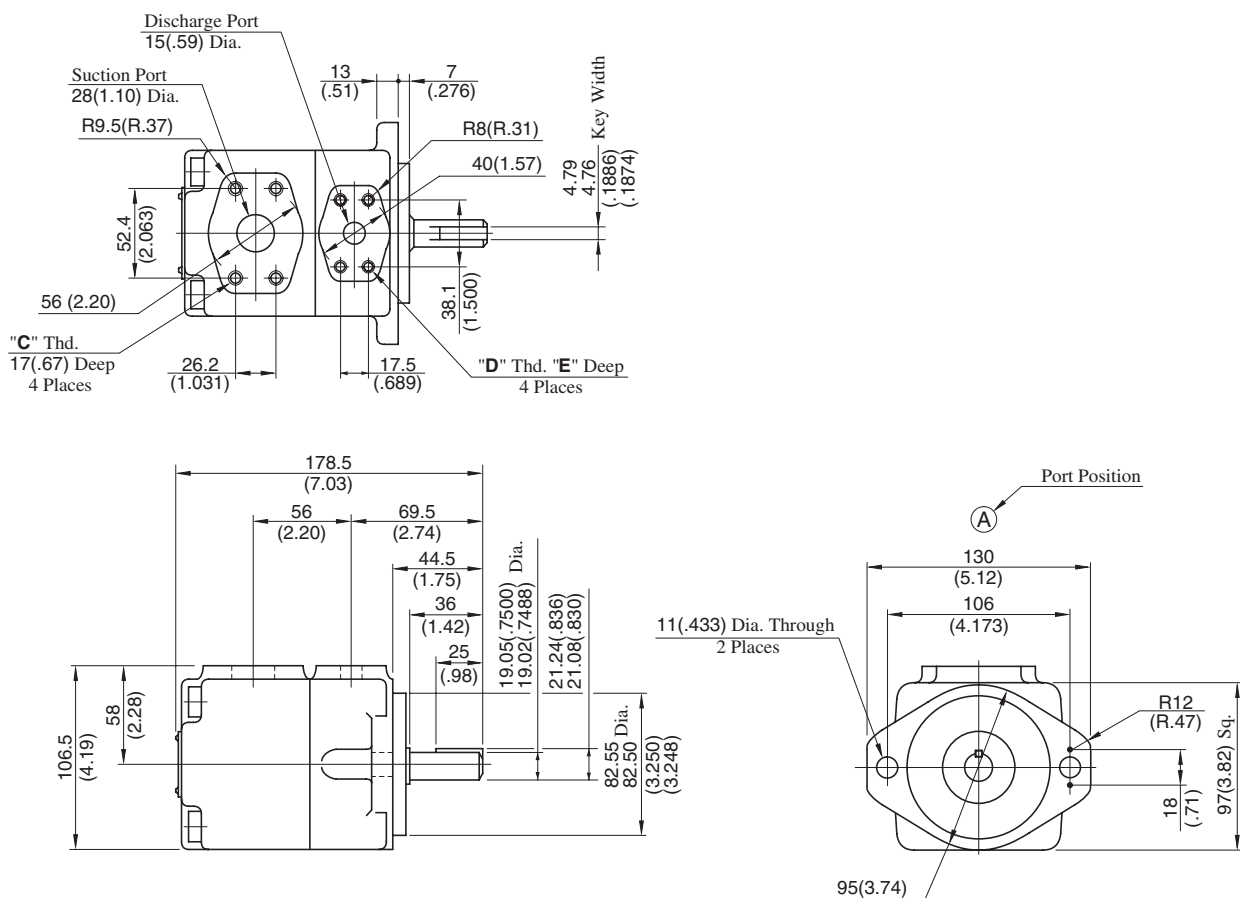
★5. For starting at low speed, the maximum viscosity is limited. For details, see the item of "Hydraulic Fluids" on page 160.

★6. For pressure above 16 MPa (2320 PSI), raise the speed over 1450 r/min.

Mass

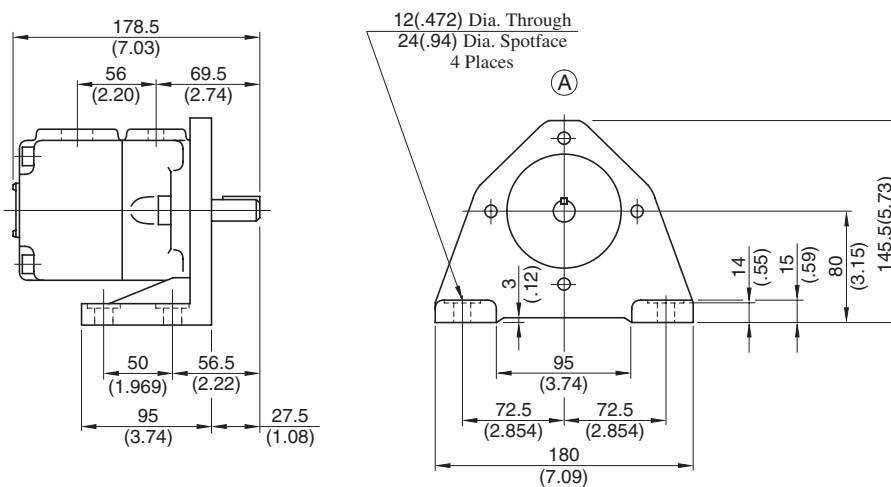
Model Numbers	Approx. Mass kg (lbs.)	
	Flange Mtg.	Foot Mtg.
PVR2R1	9.0 (19.8)	11.2 (24.7)
PVR2R2	15.5 (34.2)	19.8 (43.7)
PVR2R3	30.9 (68.1)	40.9 (90.2)
PVR2R4	68.5 (151)	93.5 (206)

Flange Mtg.: PV2R1-*-F-RAA-42/4290



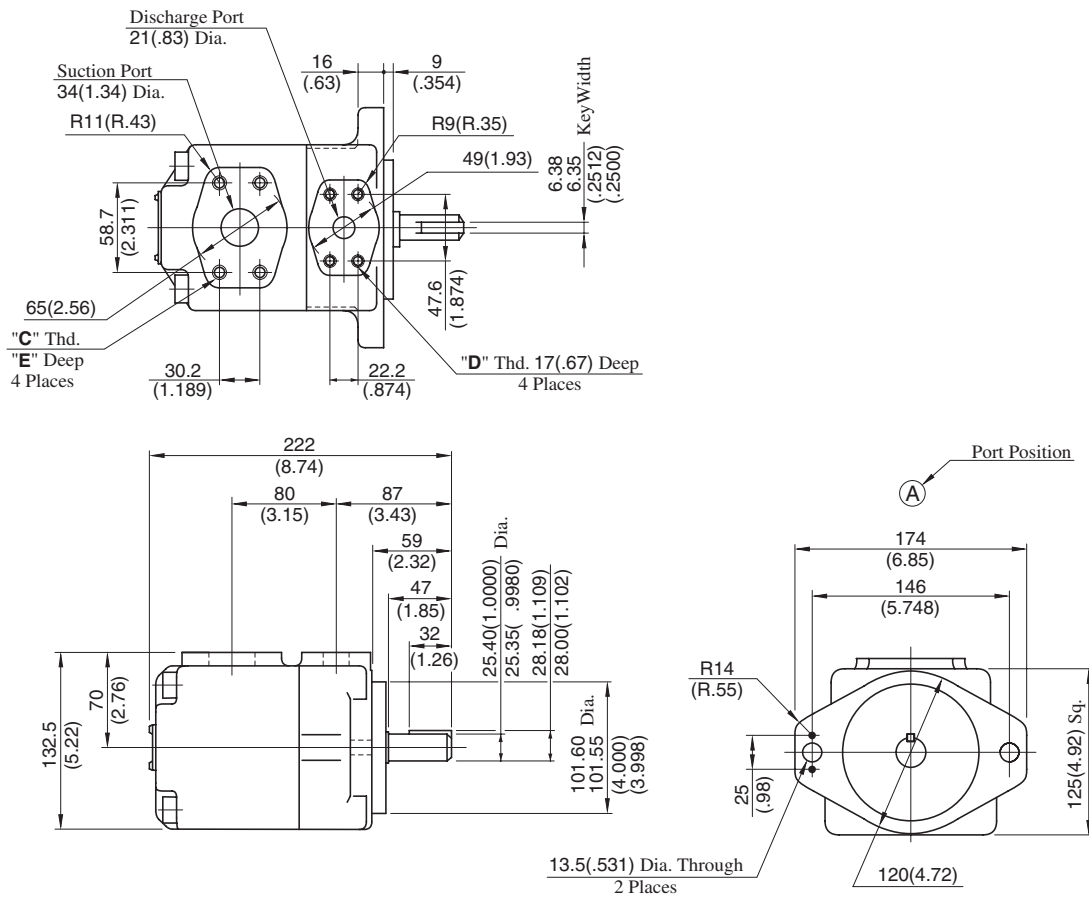
DIMENSIONS IN
MILLIMETRES (INCHES)

Foot Mtg.: PV2R1-*-L-RAA-42/4290



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

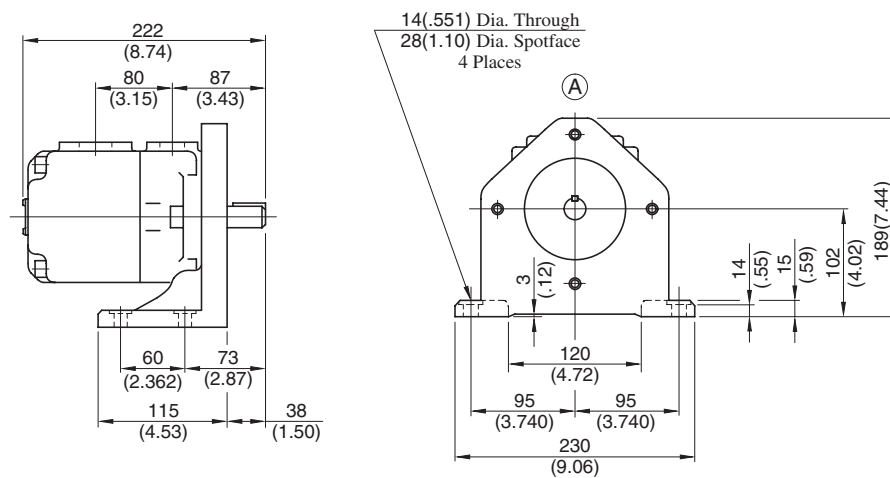
Flange Mtg.: PV2R2-*-F-RAA-41/4190



Model Numbers	"C" Thd.	"D" Thd.	E mm (Inches)
PV2R2-*-F-RAA-41	M10	M10	19 (.75)
PV2R2-*-F-RAA-4190	7/16-14 UNC	7/16-14 UNC	20 (.79)

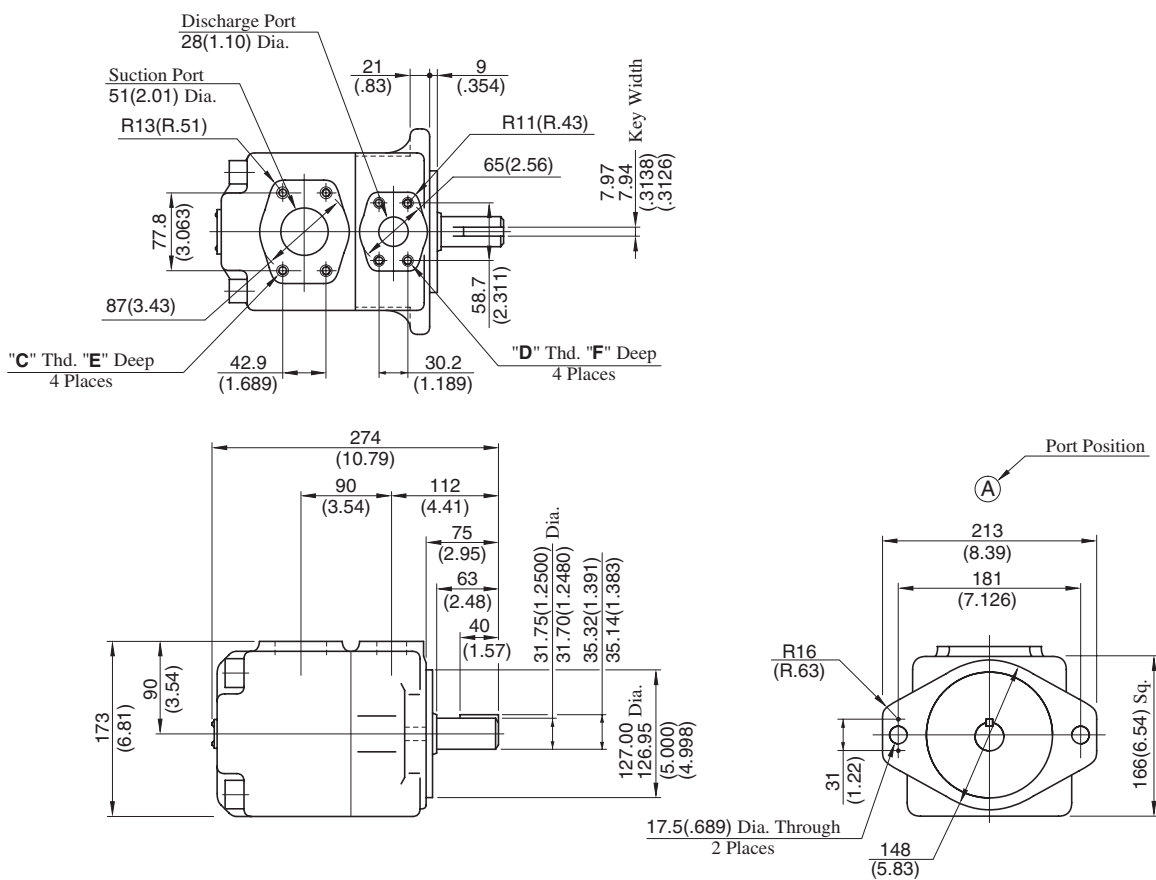
**DIMENSIONS IN
MILLIMETRES (INCHES)**

Foot Mtg.: PV2R2-*-L-RAA-41/4190



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

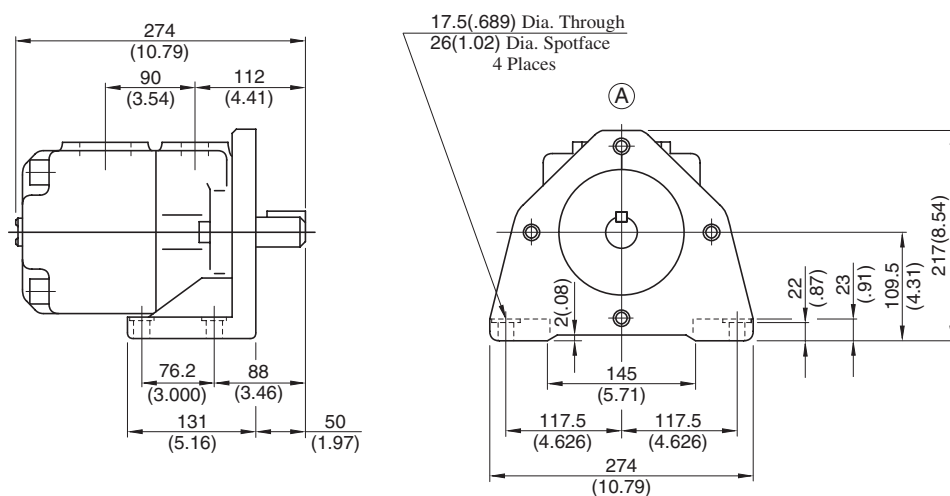
Flange Mtg.: PV2R3-*-F-RAA-31/3190



Model Numbers	"C" Thd.	"D" Thd.	Dimensions mm (Inches)	
			E	F
PV2R3-*-F-RAA-31	M12	M10	19 (.75)	19 (.75)
PV2R3-*-F-RAA-3190	1/2-13 UNC	7/16-14 UNC	21 (.83)	20 (.79)

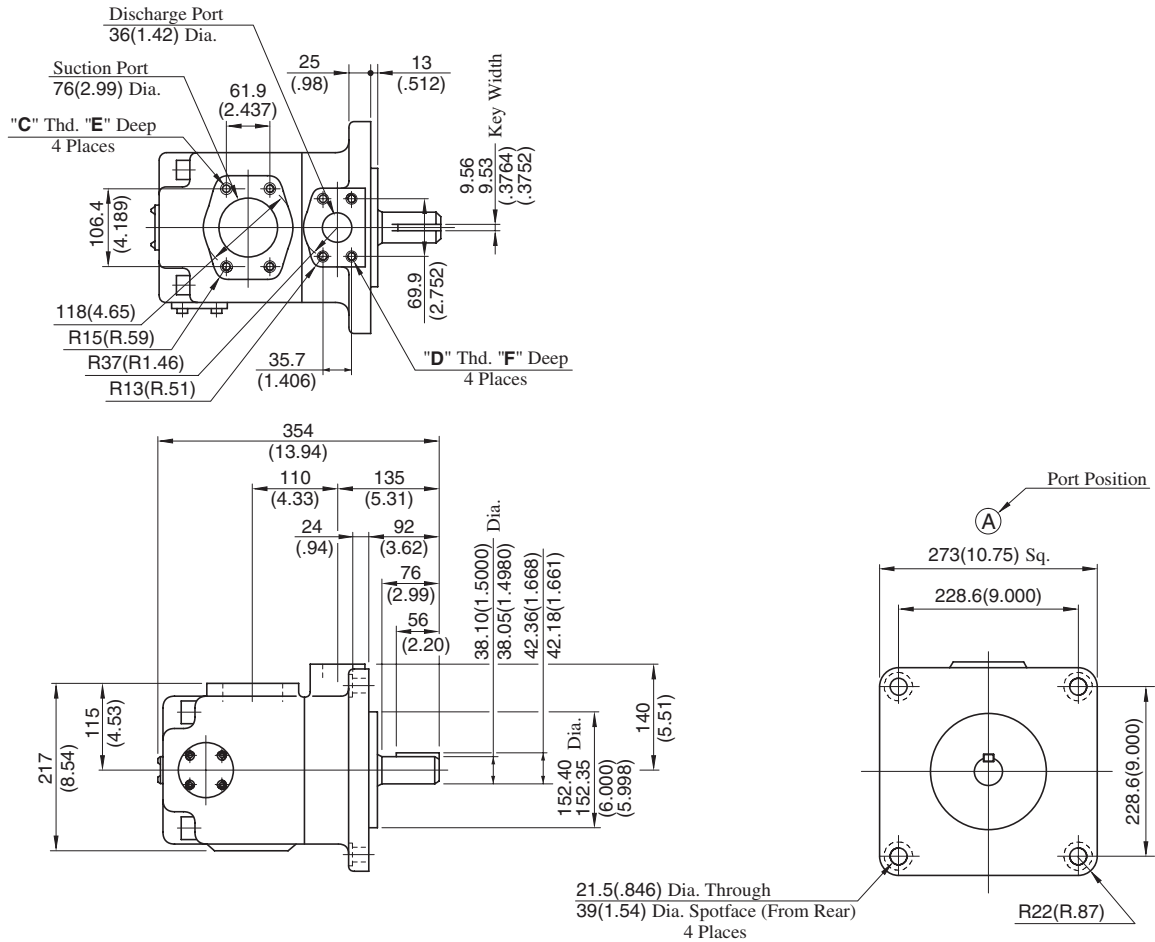
DIMENSIONS IN
MILLIMETRES (INCHES)

Foot Mtg.: PV2R3-*-L-RAA-31/3190



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

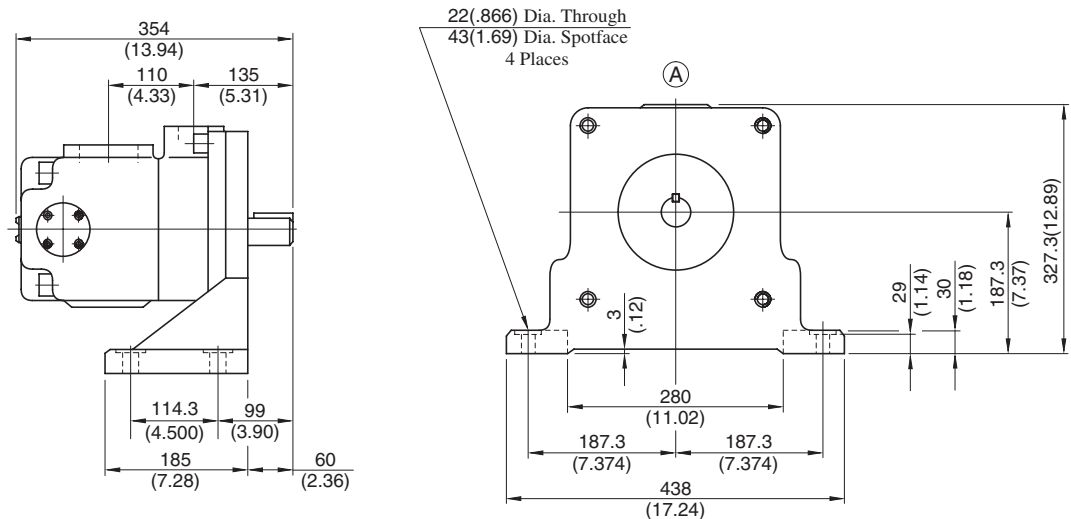
Flange Mtg.: PV2R4-*-F-RAA-30/3090



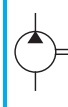
Model Numbers	"C" Thd.	"D" Thd.	Dimensions mm (Inches)	
			E	F
PV2R4-*-F-RAA-30	M16	M12	19 (.75)	19 (.75)
PV2R4-*-F-RAA-3090	5/8-11 UNC	1/2-13 UNC	21 (.83)	21 (.83)

**DIMENSIONS IN
MILLIMETRES (INCHES)**

Foot Mtg.: PV2R4-*-L-RAA-30/3090



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



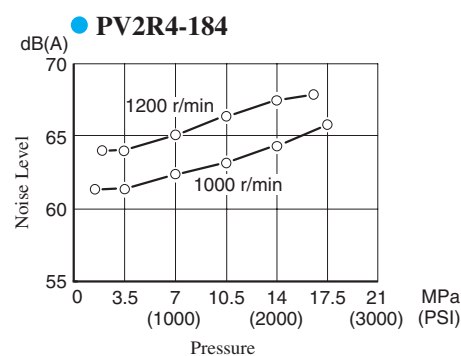
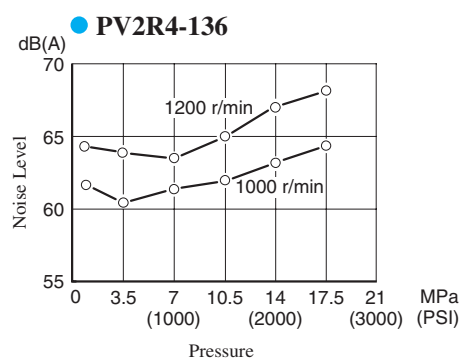
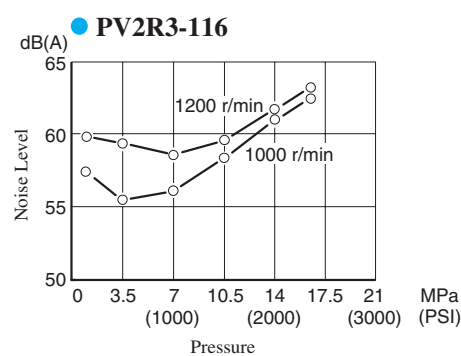
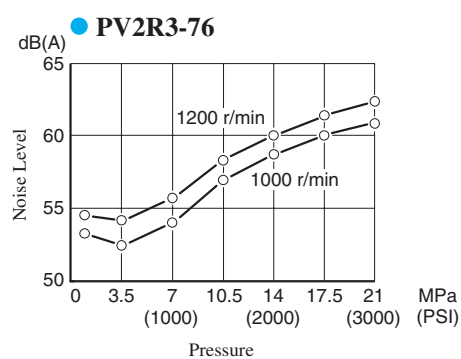
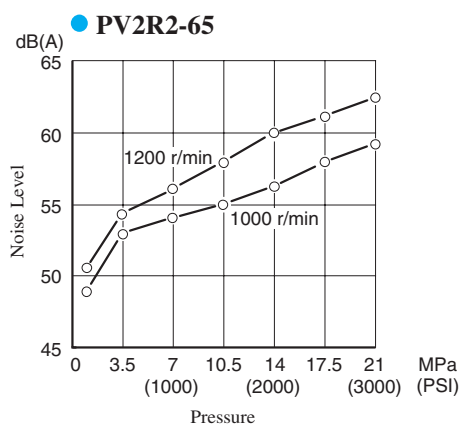
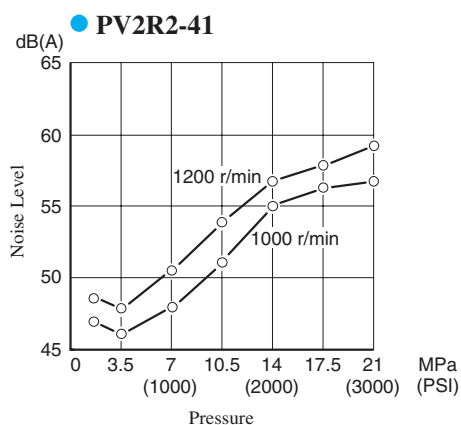
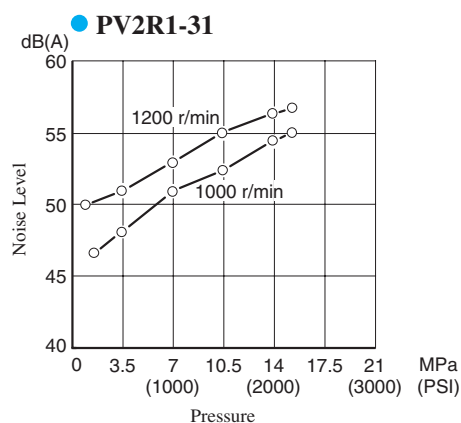
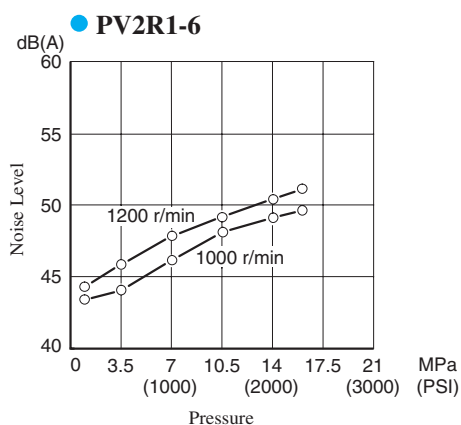
Noise Level

Measuring conditions

Fluid viscosity : 20 mm²/s (100 SSU)

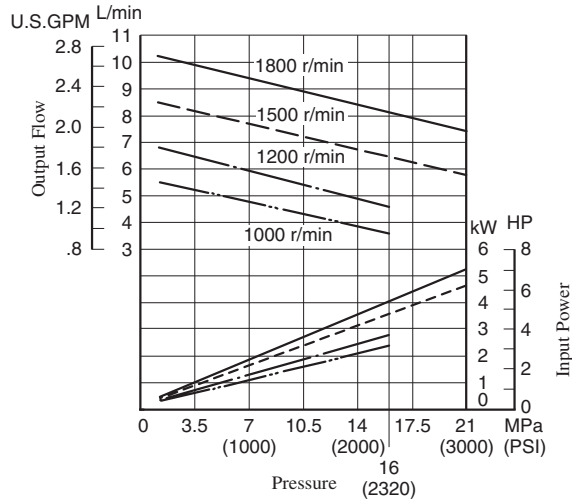
Measurement point : One metre (3.3 ft.) horizontally away from pump head cover

Back ground noise : 40 dB (A)

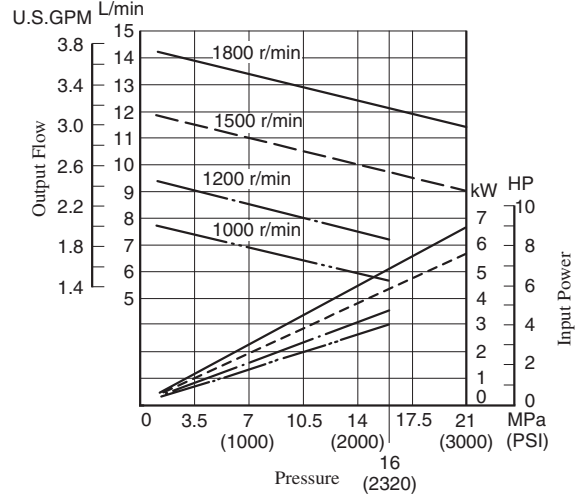


Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

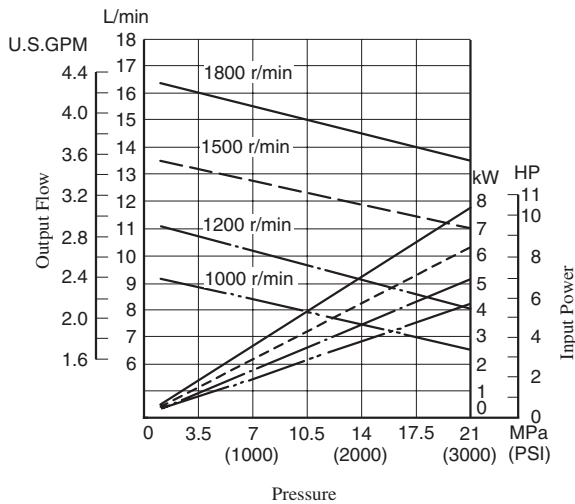
● PV2R1-6



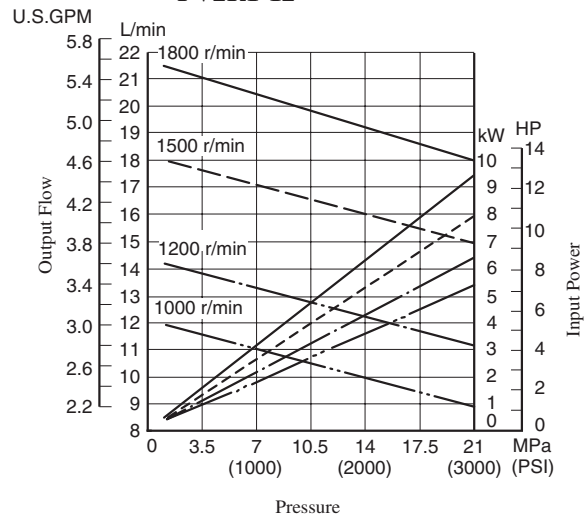
● PV2R1-8



● PV2R1-10

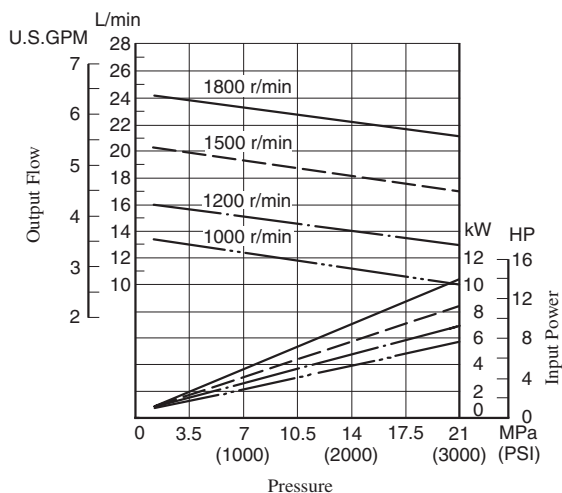


● PV2R1-12

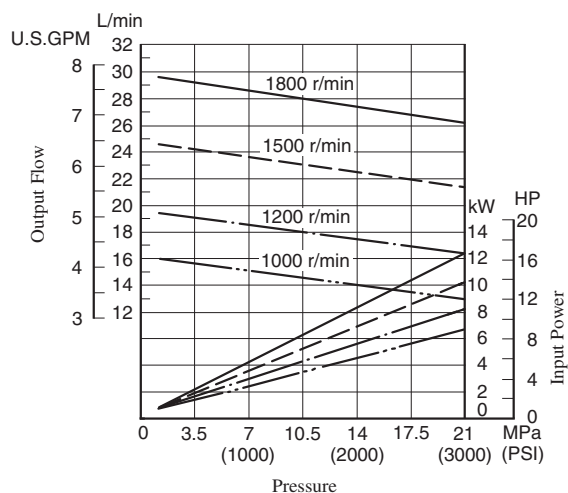


Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

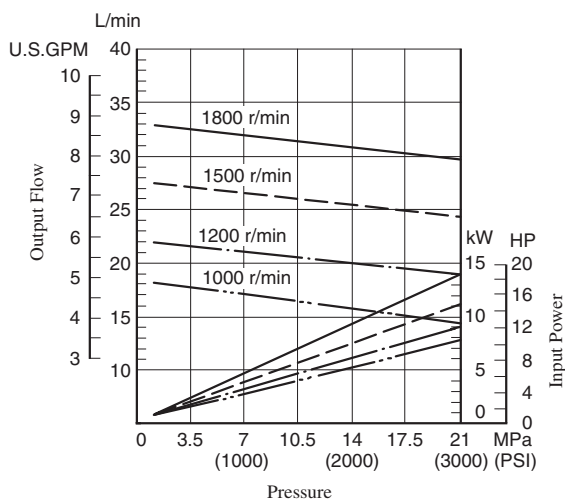
● PV2R1-14



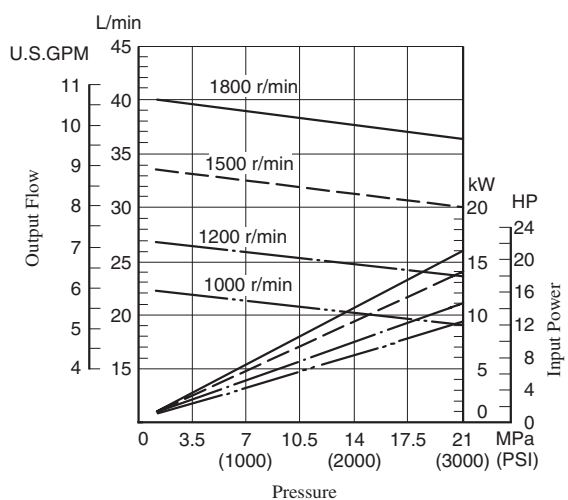
● PV2R1-17



● PV2R1-19



● PV2R1-23



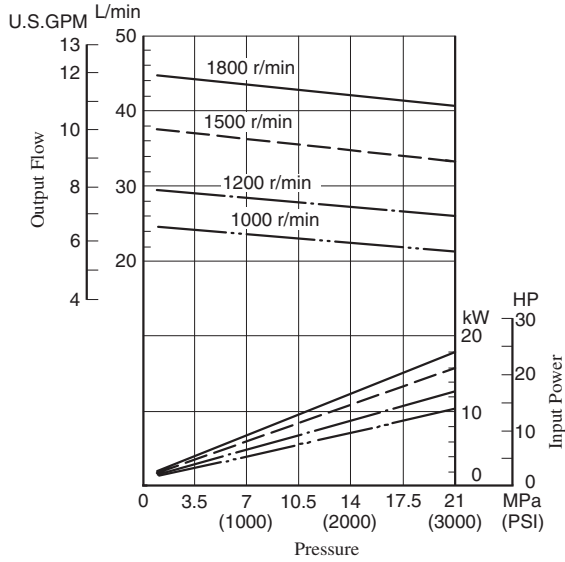
B



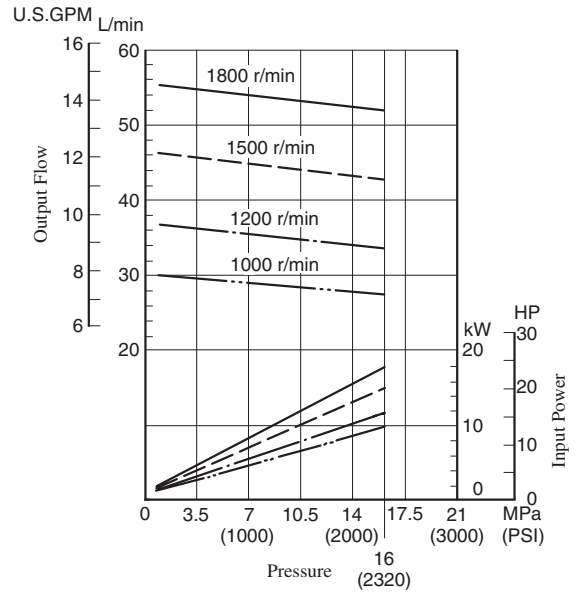
"PV2R" Series
Single Vane Pumps

Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

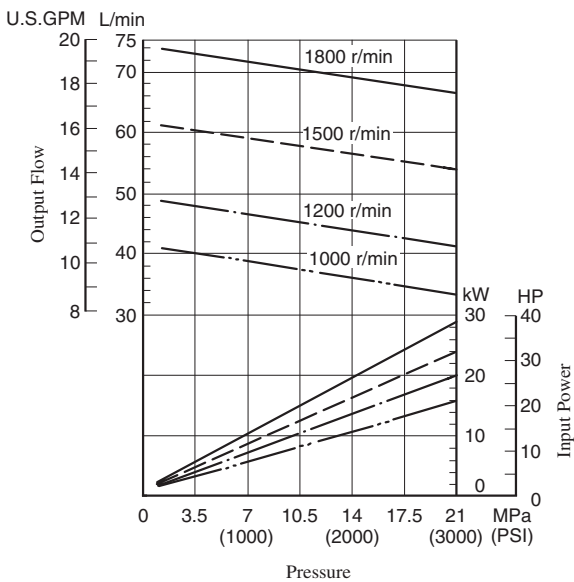
● PV2R1-25



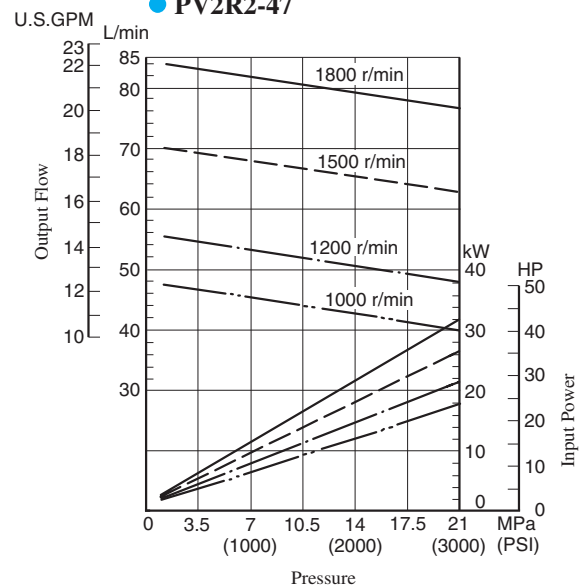
● PV2R1-31



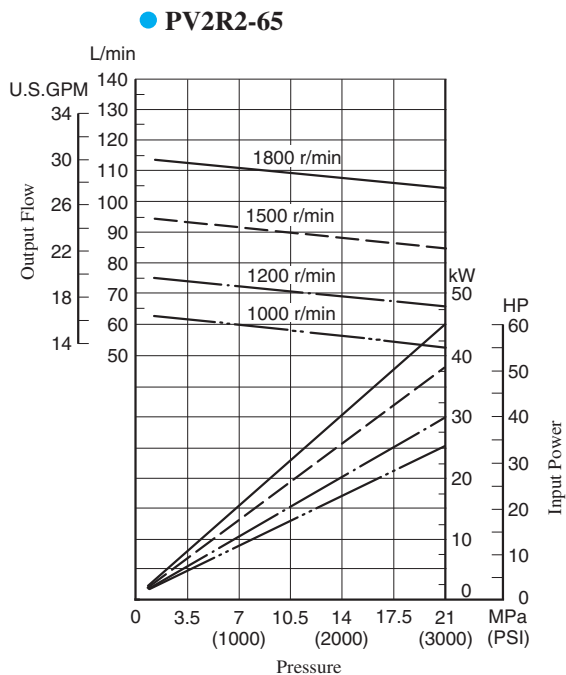
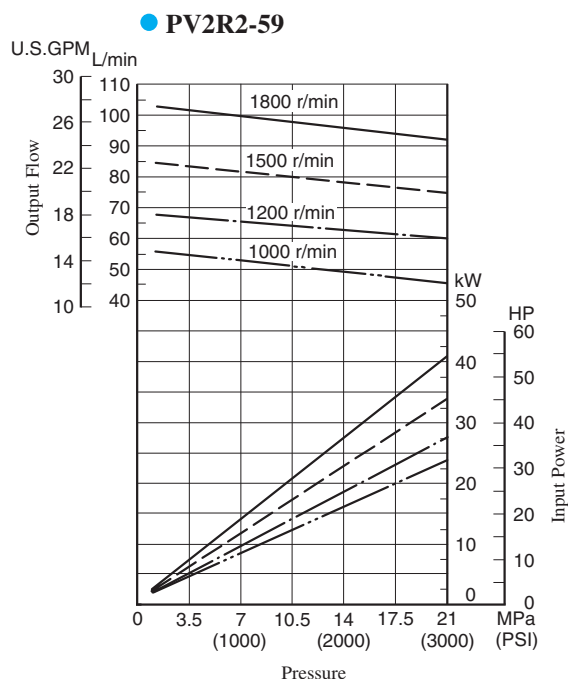
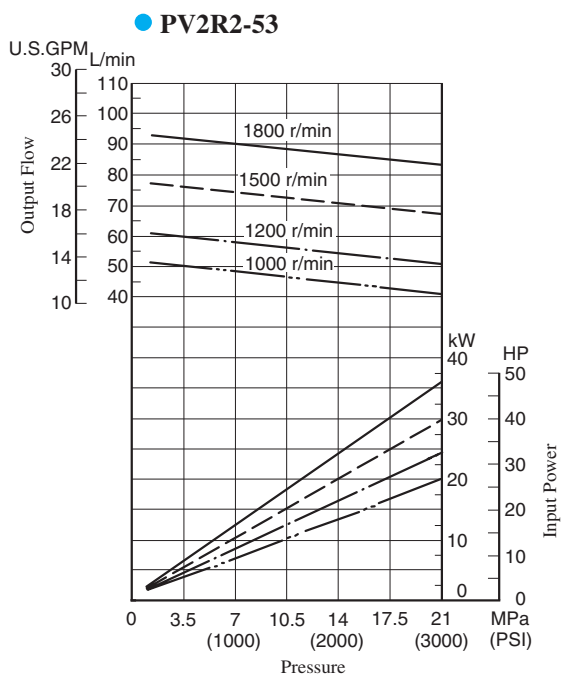
● PV2R2-41



● PV2R2-47



Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

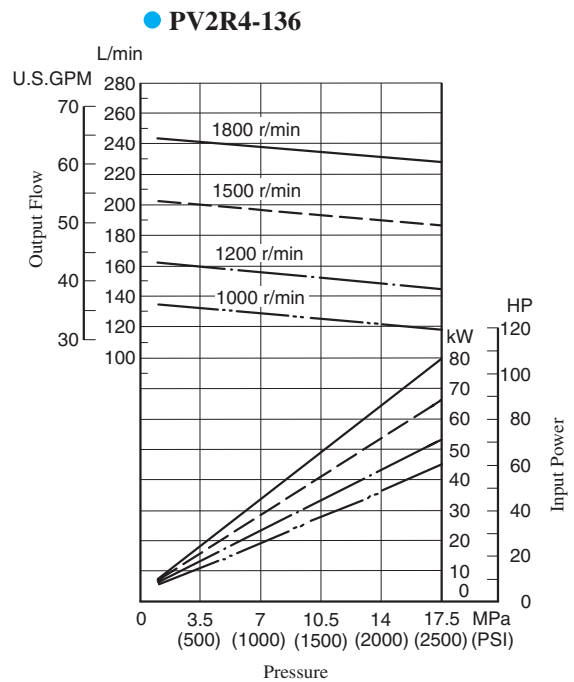
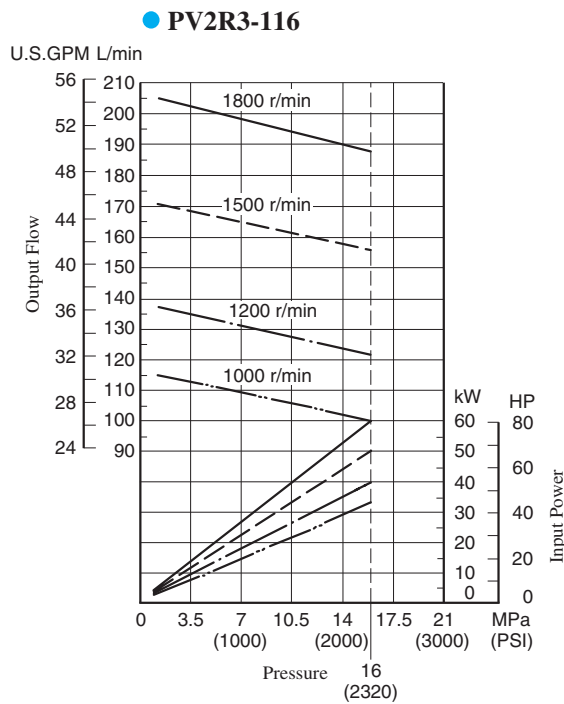
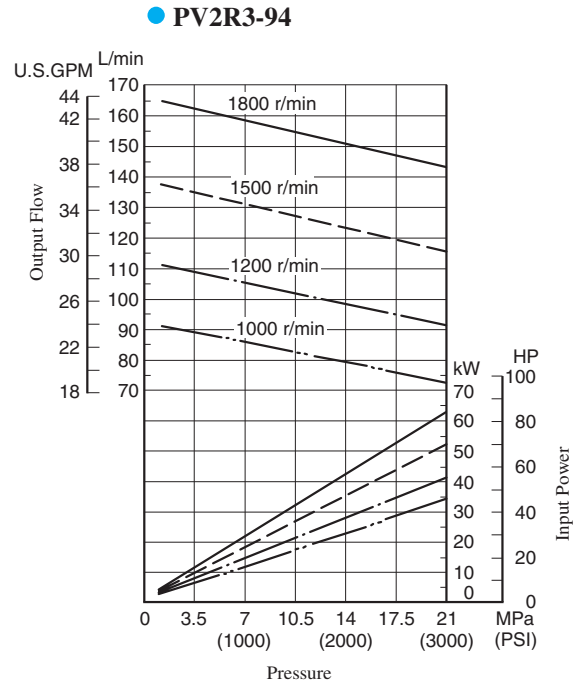
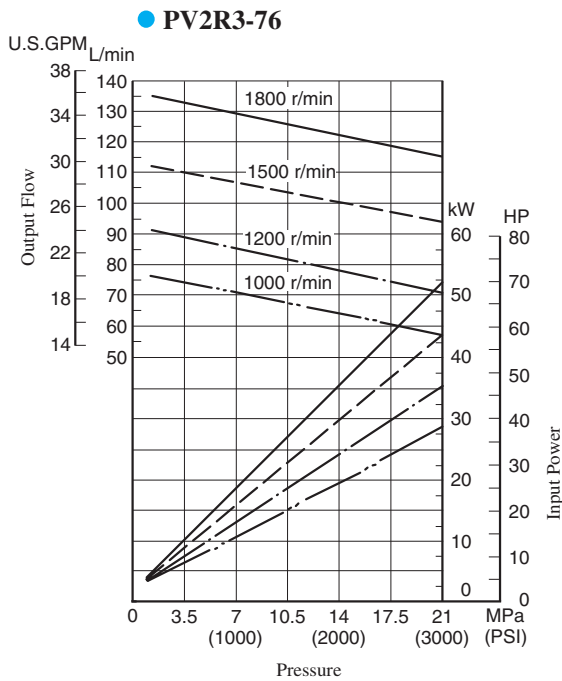


B



"PV2R" Series
Single Vane Pumps

Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]



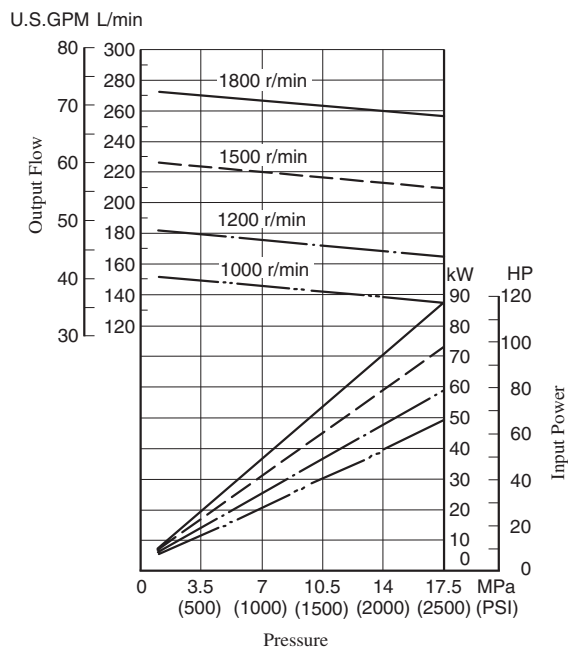
Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

B

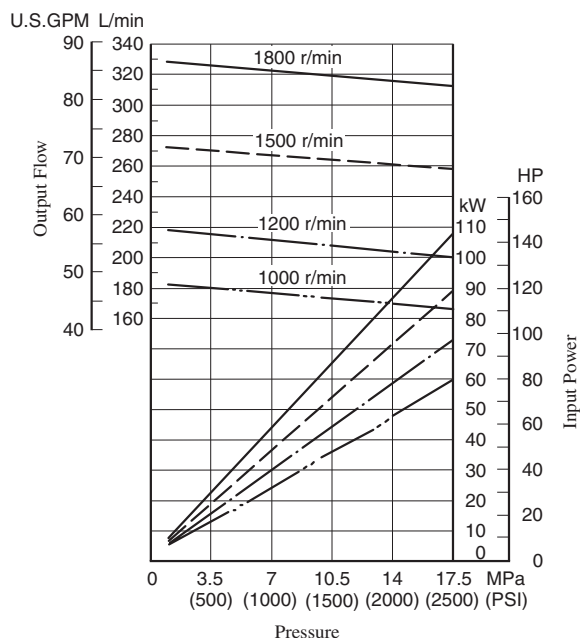


"PV2R" Series
Single Vane Pumps

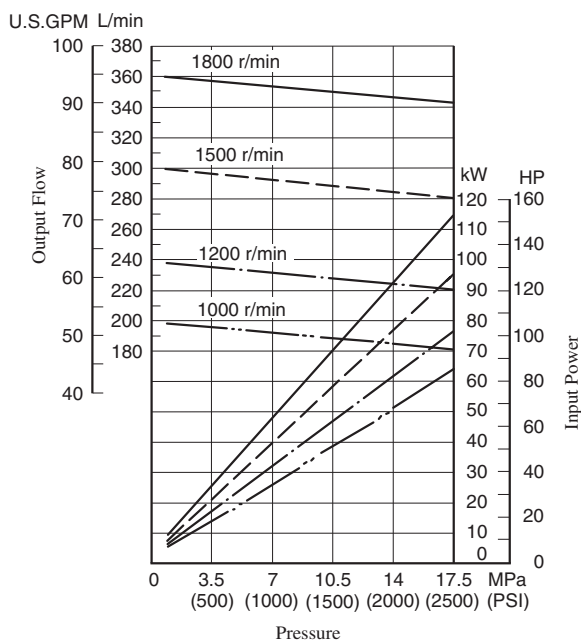
● PV2R4-153



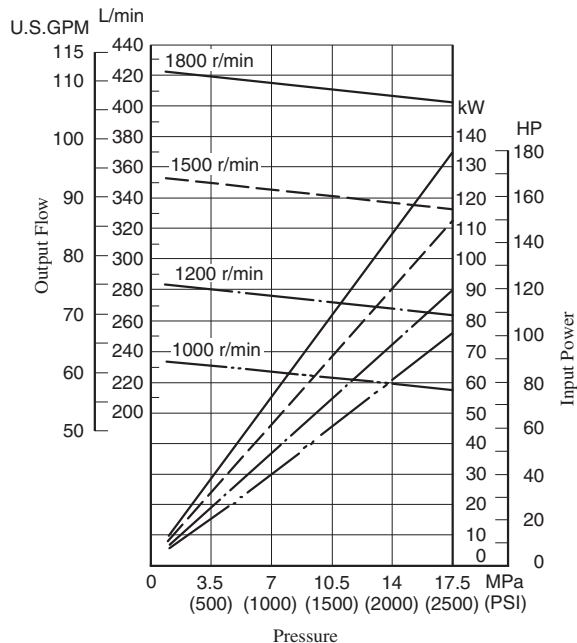
● PV2R4-184



● PV2R4-200

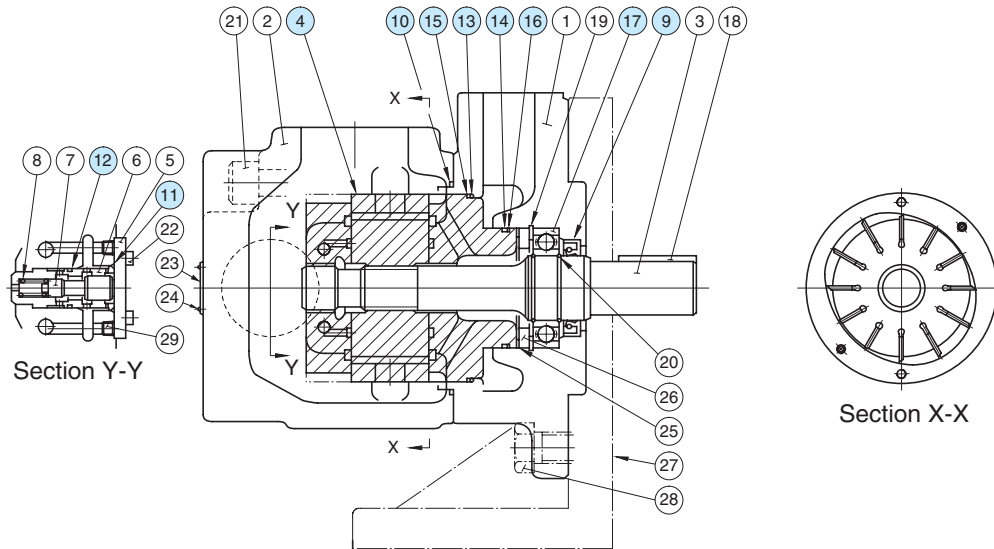


● PV2R4-237



Spare Parts List

PV2R1-**-*-RAA-42/4290
 PV2R2-**-*-RAA-41/4190
 PV2R3-**-*-RAA-31/3190
 PV2R4-**-*-RAA-30/3090



Cartridge Kits

Model Numbers	④ Cartridge Kit Numbers	Model Numbers	④ Cartridge Kit Numbers
PV2R1-6-**-RAA-42*	CPV2R1-6-R-42	PV2R2-41-**-RAA-41*	CPV2R2-41-R-41
PV2R1-8-**-RAA-42*	CPV2R1-8-R-42	PV2R2-47-**-RAA-41*	CPV2R2-47-R-41
PV2R1-10-**-RAA-42*	CPV2R1-10-R-42	PV2R2-53-**-RAA-41*	CPV2R2-53-R-41
PV2R1-12-**-RAA-42*	CPV2R1-12-R-42	PV2R2-59-**-RAA-41*	CPV2R2-59-R-41
PV2R1-14-**-RAA-42*	CPV2R1-14-R-42	PV2R2-65-**-RAA-41*	CPV2R2-65-R-41
PV2R1-17-**-RAA-42*	CPV2R1-17-R-42	PV2R3-76-**-RAA-31*	CPV2R3-76-R-31
PV2R1-19-**-RAA-42*	CPV2R1-19-R-42	PV2R3-94-**-RAA-31*	CPV2R3-94-R-31
PV2R1-23-**-RAA-42*	CPV2R1-23-R-42	PV2R3-116-**-RAA-31*	CPV2R3-116-R-31
PV2R1-25-**-RAA-42*	CPV2R1-25-R-42	PV2R4-136-**-RAA-30*	CPV2R4-136-R-30
PV2R1-31-**-RAA-42*	CPV2R1-31-R-42	PV2R4-153-**-RAA-30*	CPV2R4-153-R-30
		PV2R4-184-**-RAA-30*	CPV2R4-184-R-30
		PV2R4-200-**-RAA-30*	CPV2R4-200-R-30
		PV2R4-237-**-RAA-30*	CPV2R4-237-R-30

Seals & Bearings

Item	Name of Parts	Part Numbers				Qty.
		PV2R1	PV2R2	PV2R3	PV2R4	
9★	Oil Seal	ISD 26 42 8	ISD 30 42 8	ISD 35 55 11	ISD 45 68 12	1
10★	O-Ring	SO-NB-G80	SO-NB-G105	SO-NB-G135	SO-NB-G145	1
11★	O-Ring	—	—	—	SO-NB-P28	1
12★	O-Ring	—	—	—	SO-NB-P22A	1
13★	O-Ring	SO-NB-G60	SO-NB-G85	SO-NB-G115	SO-NA-G130	1
14★	O-Ring	SO-NB-G30	SO-NB-P46	SO-NB-A231	SO-NA-G80	1
15★	Back Up Ring	—	—	—	SO-BE-G130	1
16★	Back Up Ring	—	—	—	SO-BB-G80	1
17	Bearing	6004	6205	6207	6209	1

Note: 1) Item Nos. ⑬ and ⑭ (o-rings) and ⑮ and ⑯ (back up rings) are included in cartridge kit.

2) For pumps for phosphate ester type hydraulic fluids different part Nos. are used. Please contact us.

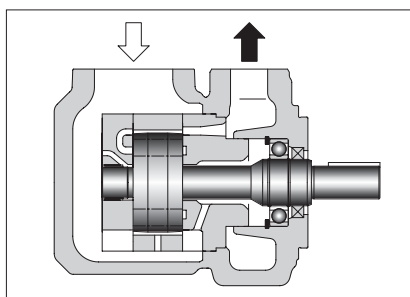
★ When ordering seals, please specify the kit number from the table right.

List of Seal Kits

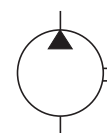
Pump Model Numbers	Seal Kit Numbers
PV2R1-**-*-RAA-42/4290	KS-PV2R1-40
PV2R2-**-*-RAA-41/4190	KS-PV2R2-40
PV2R3-**-*-RAA-31/3190	KS-PV2R3-30
PV2R4-**-*-RAA-30/3090	KS-PV2R4-30

"PV2R4A" Series Single Vane Pumps

These high pressure, high performance pumps have been developed to meet space-saving requirements. These pumps are a very compact version of the PV2R4, a vane pump series that has proven to exhibit outstanding low noise characteristics.



Graphic Symbol



B

"PV2R4A" Series
Single Vane Pumps

Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu.in./rev)	Max. Operating Pressure MPa (PSI)						Output Flow & Input Power	Shaft Speed Range r/min	
		Petroleum Base Oils		Water Containing Fluids			Synthetic Fluids		Max.	Min.
		Anti-Wear Type	R & O Type	Anti-Wear Type Water-Glycols ^{★1}	Water Glycols	Water in Oil Emulsions	Phosphate Esters			
PV2R4A-138	138.5 (8.45)	17.2 (2500)	14 (2030)	16 (2320)	7 (1020)	7 (1020)	14 (2030)	Refer to Pages 179 & 180	1800 (1200) ^{★3}	600
PV2R4A-162	162.6 (9.92)								1800 ^{★2} (1200) ^{★3}	
PV2R4A-193	194.4 (11.86)								1800 ^{★2} (1200) ^{★3}	

★1. For the brands of anti-wear type water-glycols, see the item of "Hydraulic Fluids" on page 160.

★2. If PV2R4A-193 is used at speed above 1700 r/min, the suction pressure is limited to 0 kPa (0 in. Hg.).

★3. If phosphate ester or water containing fluids are used, the maximum speed is limited to 1200 r/min.

Model Number Designation

F-	PV2R4A	-138	-L	-R	A	A	-10	-*
Special Seals	Series Number	Nominal Displacement cm ³ /rev	Type of Mounting	Shaft Rotation	Discharge Port Position	Suction Port Position	Design Number	Design Standards
F: For phosphate ester type fluids (Omit if not required)	PV2R4A	138, 162, 193	L: Foot Mounting F: Flange Mounting	R: Clockwise ^{★1} (Normal)	A: Upwards (Normal)	A: Upwards (Normal)	10	Refer to ★2

★1. Available to supply pump with anti-clockwise rotation.
Consult Yuken for details.

★2. Design Standards: None.....Japanese Standard "JIS"
80.....European Design Standard
90.....N. American Design Standard

Pipe Flange Kits

Pipe flange kits are available. When ordering, specify the kit number from the table below.

Pump Model Numbers	Name of Port	Pipe Flange Kit Numbers						
		Threaded Connection			Socket Welding ^{★1}		Butt Welding	
		Japanese Standard "JIS"	European Design Standard	N. American Design Standard ^{★2}	Japanese Standard "JIS" European Design Standard	N. American Design Standard ^{★2}	Japanese Standard "JIS" European Design Standard	N. American Design Standard ^{★2}
PV2R4A	Suction	F5-24-A-10	—	—	F5-24-B-10	F5-24-B-1090	F5-24-C-10	F5-24-C-1090
	Discharge	F5-12-A-10	F5-12-A-1080	—	F5-12-B-10	F5-12-B-1090	F5-12-C-10	F5-12-C-1090

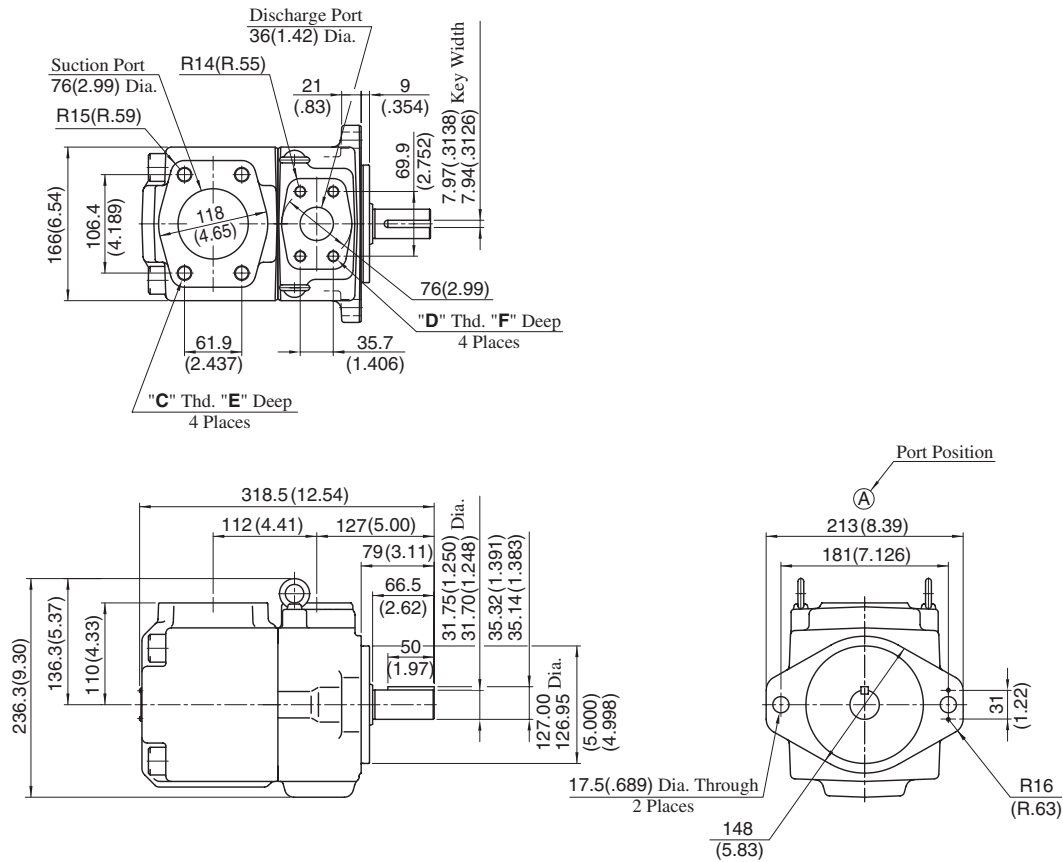
★1. In case of using socket welding flanges, there is a case where the operating pressure should be set lower than the normal because of strength of the flanges. Therefore, please pay cautious attention to the operating pressure when the socket welding flanges are used.

★2. As dimensions of the pipe flange mounting surface are conformed to SAE 4 Bolt Split Flange (Standard Pressure Series), pipe flanges conforming to the SAE Standards can be used.

Notes: Special seals (Viton seals) are required when phosphate ester type fluids are used. (Prefix "F-" to the pipe flange kit number when ordering.)

● Details of the pipe flange kits are shown on page 824.

Flange Mtg.: PV2R4A-*-F-RAA-10/1090

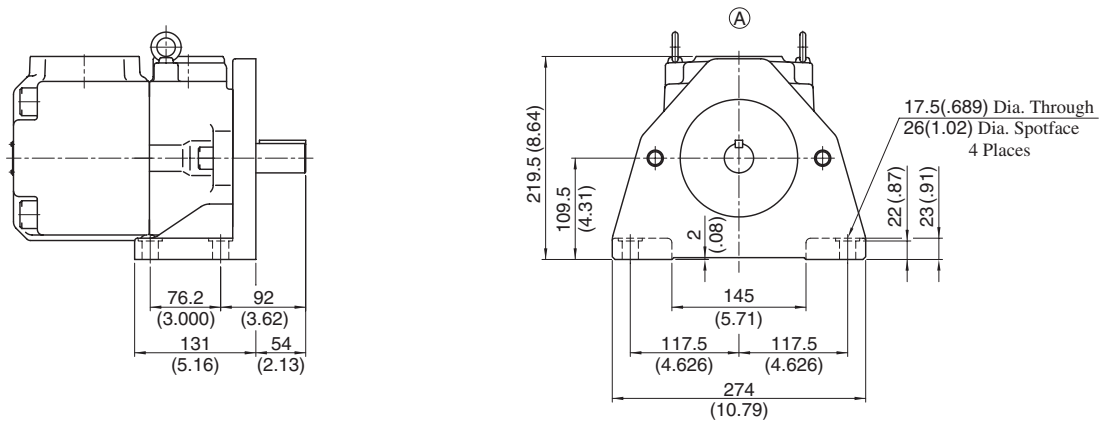


Approx. Mass.....40 kg (88.2 lbs.)

Model Numbers	"C" Thd.	"D" Thd.	Dimensions mm (Inches)	
			E	F
PV2R4A-*-F-RAA-10	M16	M12	29 (1.14)	22 (.87)
PV2R4A-*-F-RAA-1090	5/8-11 UNC	1/2-13 UNC	21 (.83)	21 (.83)

**DIMENSIONS IN
MILLIMETRES (INCHES)**

Foot Mtg.: PV2R4A-*-L-RAA-10/1090



Approx. Mass.....50 kg (110 lbs.)

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

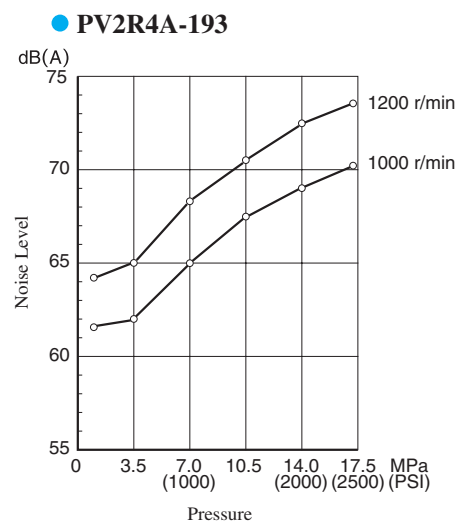
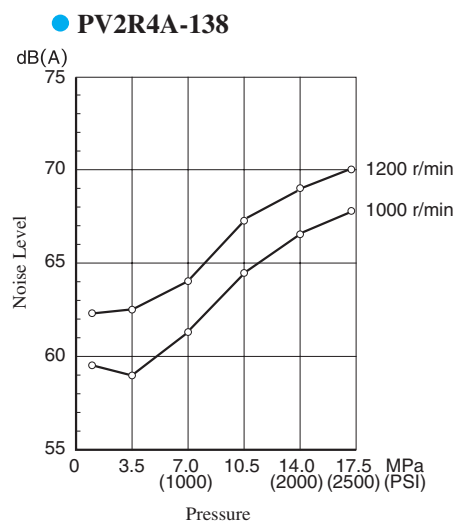
Noise Level

Measuring conditions

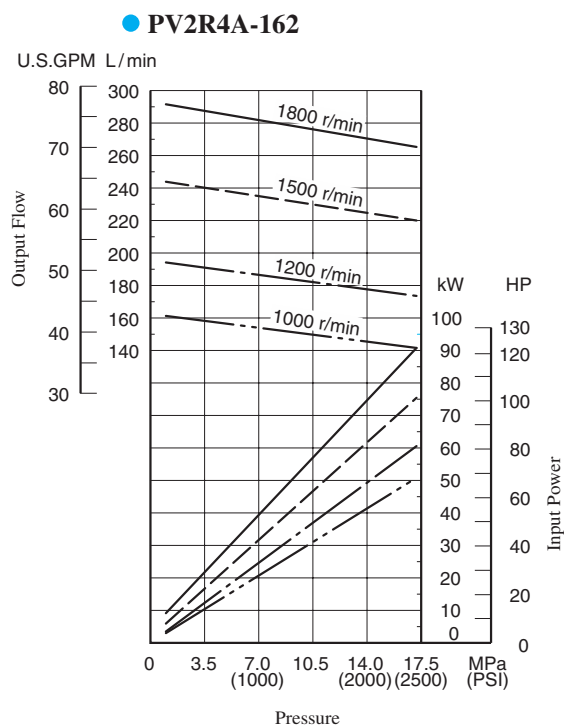
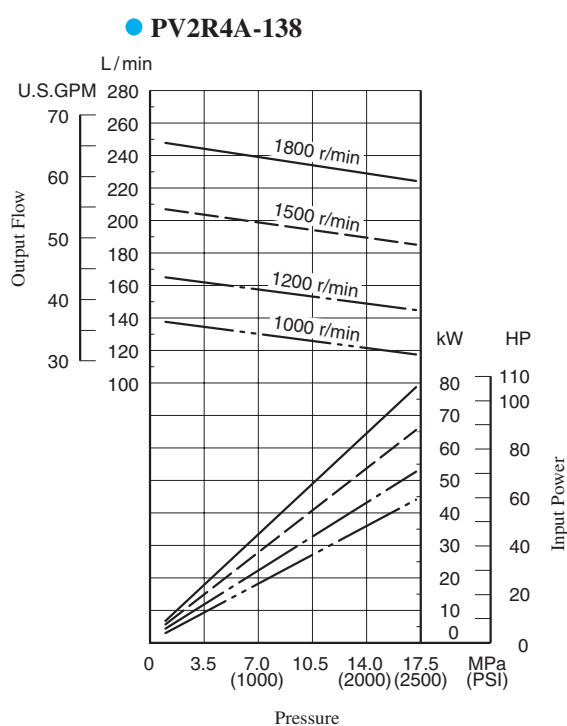
Fluid viscosity : 20 mm²/s (100 SSU)

Measurement point : One metre (3.3 ft.) horizontally away from pump head cover

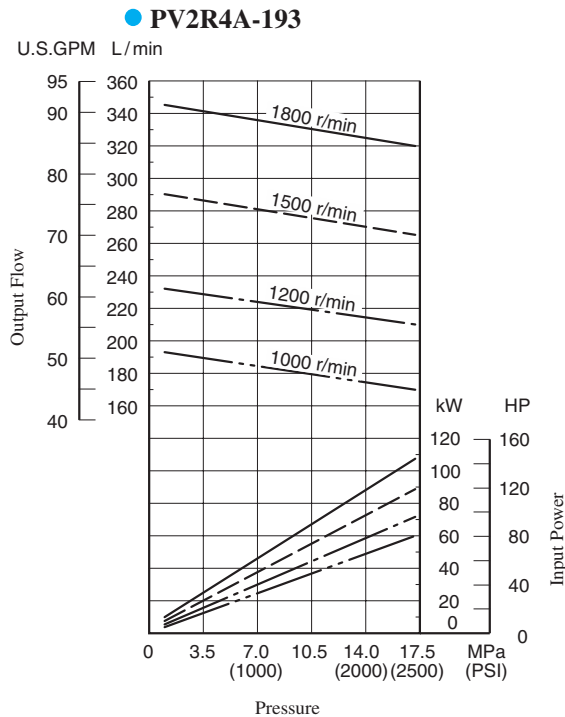
Back ground noise : 40 dB (A)



Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]

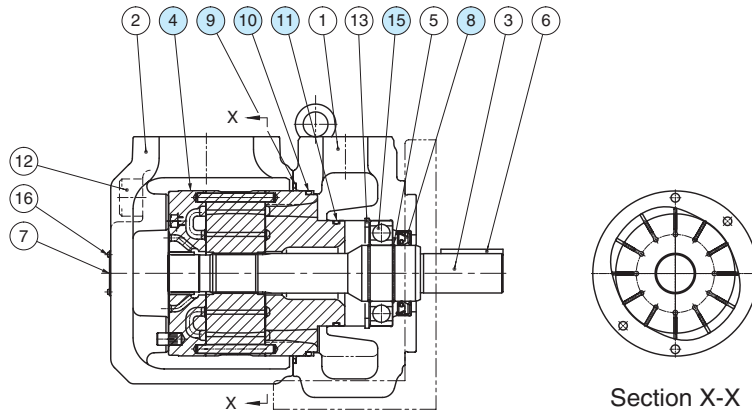


Typical Pump Characteristics at Viscosity 20 mm²/s (100 SSU) [ISO VG32 Oils, 50°C (122°F)]



■ Spare Parts List

PV2R4A-*-*-RAA-10/1090



● Cartridge Kits

Model Numbers	④ Cartridge Kit Numbers
PV2R4A-138-*-RAA-10*	CPV2R4A-138-R-10
PV2R4A-162-*-RAA-10*	CPV2R4A-162-R-10
PV2R4A-193-*-RAA-10*	CPV2R4A-193-R-10

● Seals & Bearings

Item	Name of Parts	Part Numbers	Qty.
8 ★	Oil Seal	ISD 45 68 12	1
9 ★	O-Ring	SO-NB-G140	1
10 ★	O-Ring	SO-NB-A250	1
11 ★	O-Ring	SO-NB-G80	1
15	Bearing	6209	1

Note: 1) Item Nos. ⑩ and ⑪ (o-rings) are included in cartridge kit.

2) For pumps for phosphate ester type hydraulic fluids different part Nos. are used. Please contact us.

★ When ordering seals, please specify the kit number from the table below.

● List of Seal Kits

Pump Model Numbers	Seal Kit Numbers
PV2R4A-*-*-RAA-10/1090	KS-PV2R4A-10