

Fix Displacement Vane Pump Preferences for Open Loop Hydraulic Systems

4. VANE PUMPS, FIX DISPLACEMENT

4.1 FIX DISPLACEMENT



Series	Geometric Displacement [cm ³ /rev]	Operating Pressure Rated [bar]	Maximum Shaft Speed [min ⁻¹]
PVF100-1-6	5.8	210	1800
PVF100-1-8	8.0		1800
PVF100-1-10	9.4		1800
PVF100-1-12	12.2		1800
PVF100-1-14	13.7		1800
PVF100-1-17	16.6		1800
PVF100-1-19	18.6		1800
PVF100-1-23	22.7		1800
PVF100-1-25	25.3		1800
PVF100-1-31	31.0		160
PVF100-2-41	41.3	210	1800
PVF100-2-47	47.2		1800
PVF100-2-53	52.5		1800
PVF100-2-59	58.2		1800
PVF100-2-65	64.7		1800
PVF100-3-76	76.4		1800
PVF100-3-94	93.6		1800
PVF100-3-116	115.6	160	1800
PVF100-4-136	136.0	175	1800
PVF100-4-153	153.0		1800
PVF100-4-184	184.0		1800
PVF100-4-200	201.0		1800
PVF100-4-237	237.0		1800



4.1 FIX DISPLACEMENT CONTENT

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ORDERING CODE

4.1.1 Fix Displacement Vane Pumps

PVF100 - 1 - 6 F R A A 42 80 - XXXX

Fix Displacement Vane Pump

Special Seals

None NBR
F- FPM

Frame Size

1
2
3
4

Displacement

6
8
10
12
PVF100-1- 14
17
19
23
25
31
41
47
PVF100-2- 53
59
65
76
PVF100-3- 94
116
136
153
PVF100-4- 184
200
237

Type of Mounting

F Flange Mounting

Shaft Rotation

R Right Hand (clockwise)
viewed from the shaft

Discharge Port Position

A Upwards

Suction Port Position

A Upwards

Design Number

42 Frame Size 1
41 Frame Size 2
31 Frame Size 3
30 Frame Size 4

Design Standard

None Japanese Standard JIS, European Standard
90 North American Design Standard

Modification Number

XXXX Determined by Manufacturer

TECHNICAL INFORMATION

4.1.2 Specifications

Pump Size		PVF100-1										PVF100-2			
		6	8	10	12	14	17	19	23	25	31	41	47	53	
Geometric Displacement	[cm ³ /rev]	5.8	8.0	9.4	12.2	13.7	16.6	18.6	22.7	25.3	31.0	41.3	47.2	52.5	
Max. Pressure with Fluid Type	HLP	[bar]	210									160	210		
	HL	[bar]	160									140			
	HFC	[bar]	160												
	HFA	[bar]	70												
	HFD-R	[bar]	160									140			
Shaft Speed	Min.	[rpm]	750 (100 cSt max.)									600 (100 cSt max.)			
	Max.	[rpm]	1800 (1200 with HFD-R)												
Approx. Mass	[kg]	9.0									15.5				

Pump Size		PVF100-2		PVF100-3			PVF100-4					
		59	65	76	94	116	136	153	184	200	237	
Geometric Displacement	[cm ³ /rev]	58.2	64.7	76.4	93.6	115.6	136.0	153.0	184.0	201.0	237.0	
Max. Pressure with Fluid Type	HLP	[bar]	210			160	175					
	HL	[bar]	140									
	HFC	[bar]	160									
	HFA	[bar]	70									
	HFD-R	[bar]	140									
Shaft Speed	Min.	[rpm]	600 (100 cSt max.)			600						
	Max.	[rpm]	1800 (1200 with HFD-R)									
Approx. Mass	[kg]	15.5		30.9			68.5					

4.1.3 Hydraulic Fluids

The Pump series is prepared to be used with:

Petroleum Base Oil (Mineral Oil, HL, HLP, ISO VG 32 or 46)

Synthetic Fluids

(Phosphate Ester, HFD-R)

Fire Resistant Fluids (HFA, HFC)

4.1.4 Viscosity Range

Normal operating viscosity:
20 - 400 cSt (mm²/s)

4.1.5 Temperature Range

0 up to +70 °C

4.1.6 Seals

The pump series is equipped with **NBR** seals. Special seals (FPM) are required when phosphate ester type Fluids are used (Model Code: F).

4.1.7 Filtration

For maximum pump and system component life time, the system should be protected from contamination by effective filtration. Maintain the degree of contamination within

23 / 21 / 18 per ISO 4406:1999

or

Grade 12 per NAS 1638

4.1.8 Installation Notes

A. Alignment of shaft

Employ a flexible coupling whenever possible, and avoid any stress from bending or thrust. Maximum permissible misalignment is less than 0.1 mm TIR and maximum permissible misangular is less than 0.2°.

B. 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 from the oil (level less than 0.8 metre 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	
PVF100 Series Single Pumps	PVF100-1 PVF100-2	- 0.2 bar	- 0.16 bar	+0.3 bar
	PVF100-3 PVF100-4	- 0.2 bar *		

* minimum suction pressure at speeds above 1700 rpm:

PVF100-3-116: 0 bar (1 bar abs.)

PVF100-4-237: -0.13 bar

C. 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, 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.

D. 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.

PERFORMANCE DATA

4.1.9 Noise Level

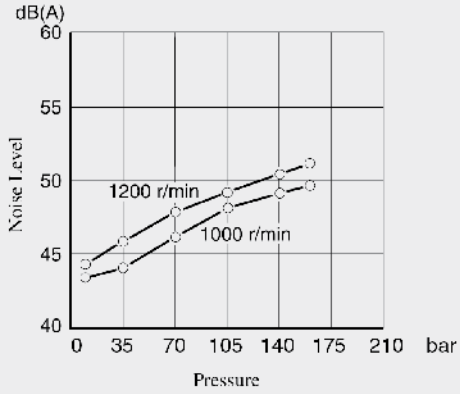
Measuring conditions

Fluid viscosity: 20 mm²/s

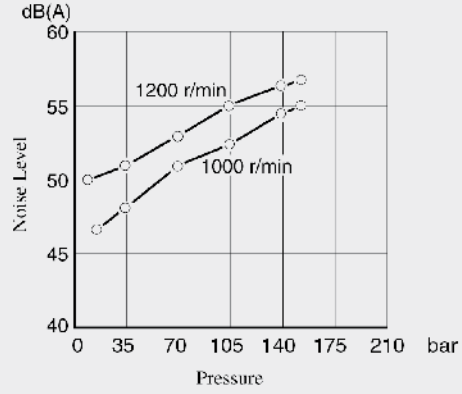
Measurement point: one metre horizontally away from pump head cover

Background noise: 40 dB (A)

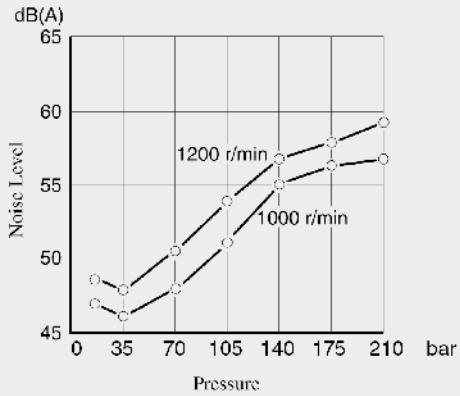
PVF100-1-6



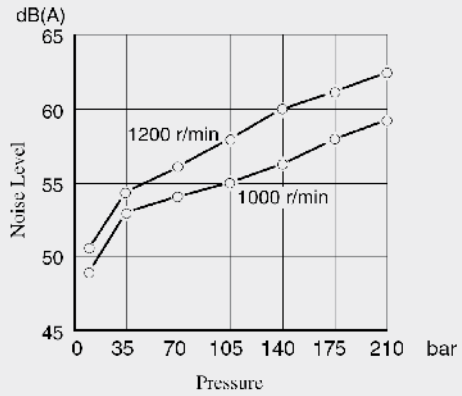
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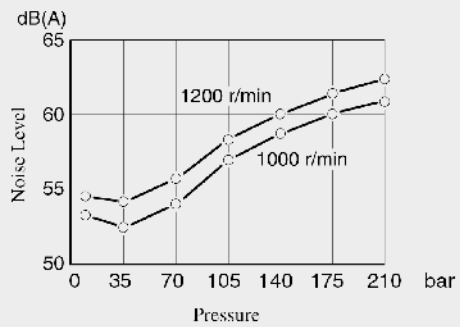
PVF100-2-41



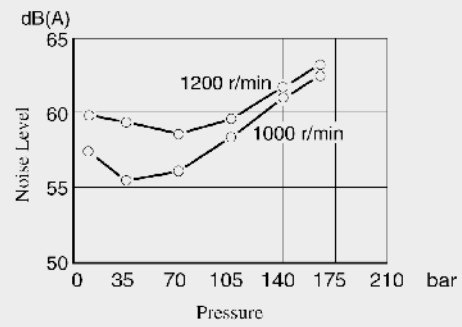
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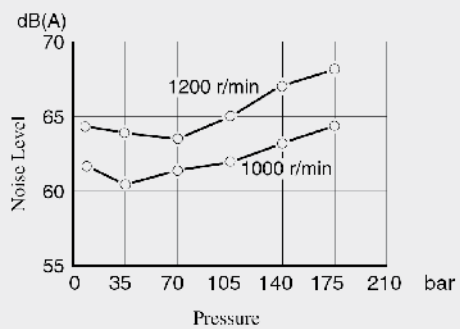
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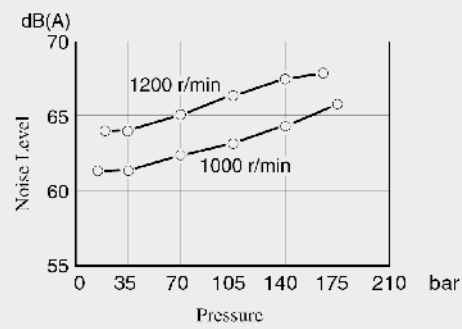
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PVF100-4-136



PVF100-4-184

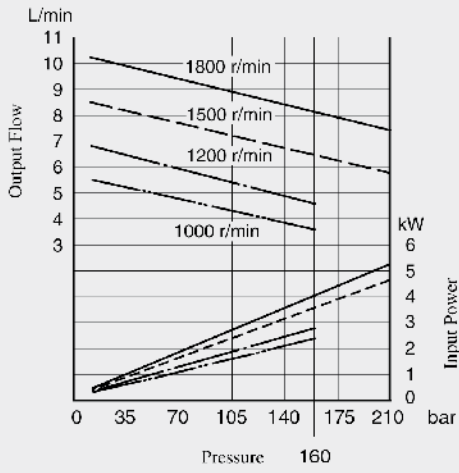


4.1.10 PVF100-1-

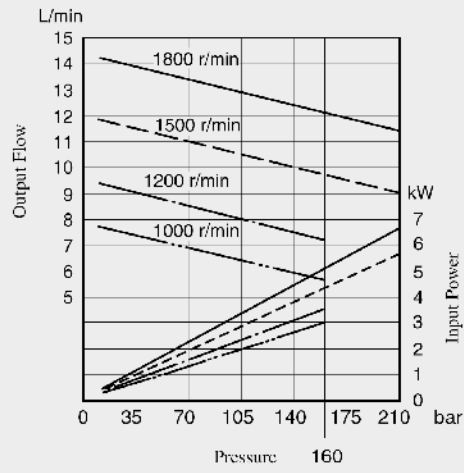
Typical Pump Characteristics

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

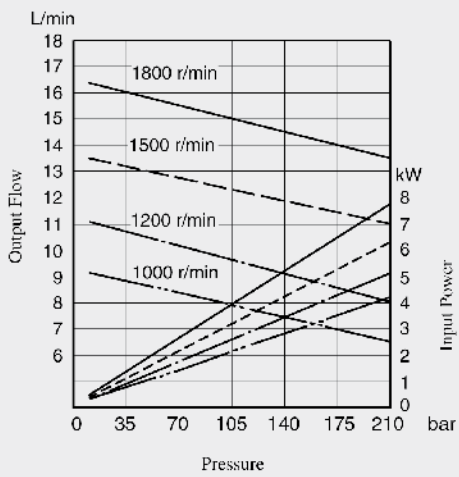
PVF100-1-6



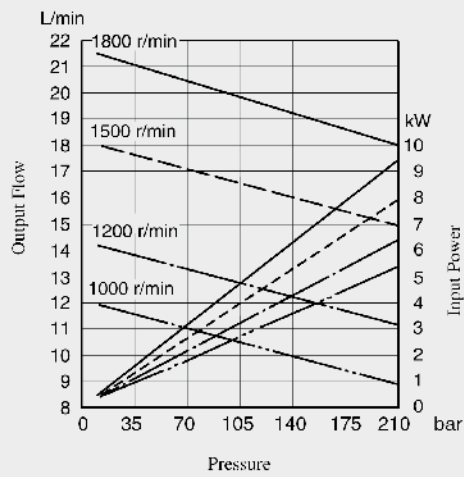
PVF100-1-8



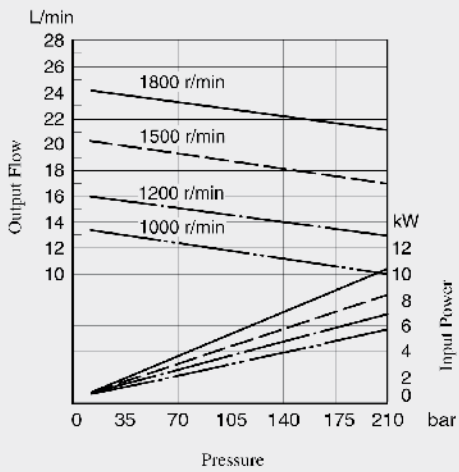
PVF100-1-10



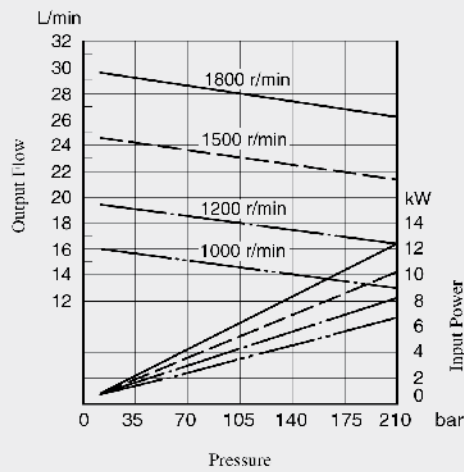
PVF100-1-12



PVF100-1-14



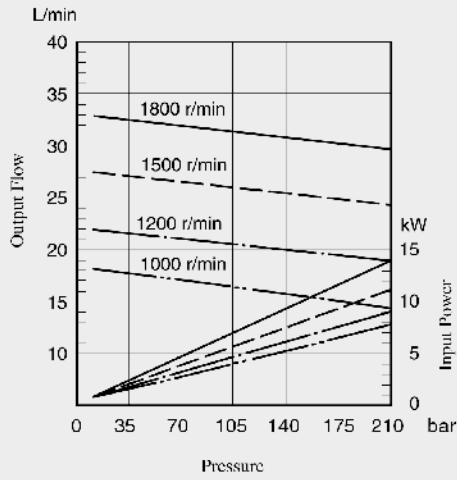
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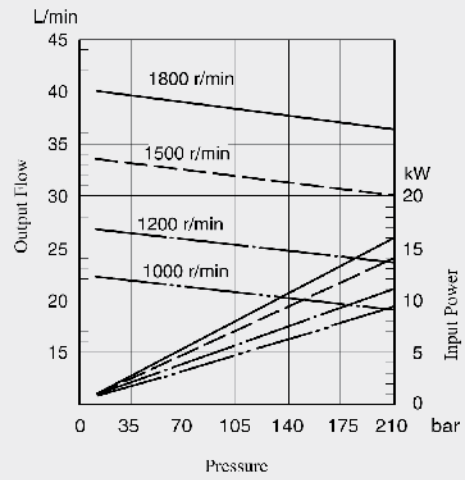
Typical Pump Characteristics

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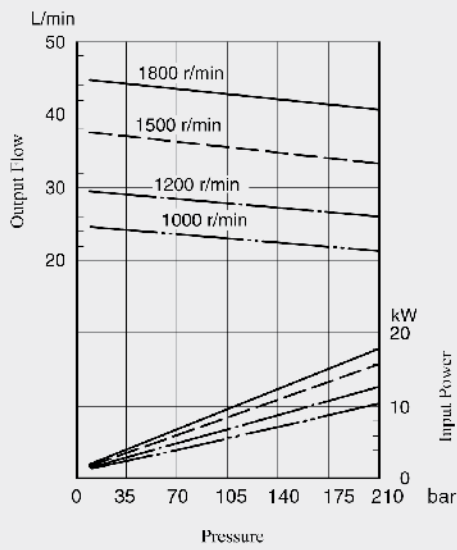
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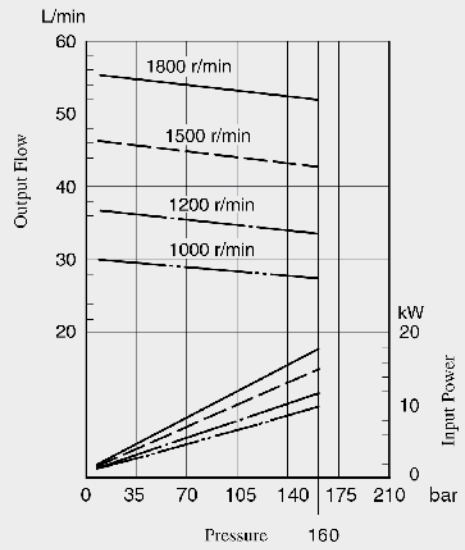
PVF100-1-23



PVF100-1-25



PVF100-1-31

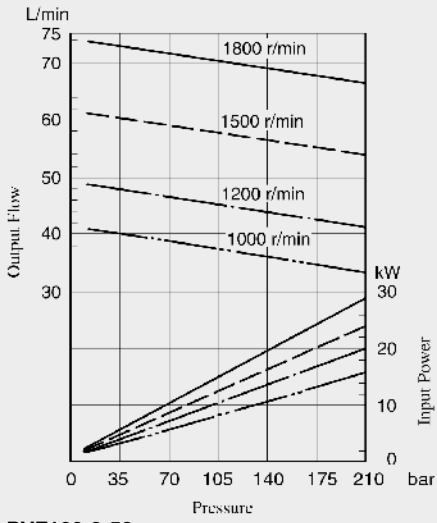


4.1.11 PVF100-2-

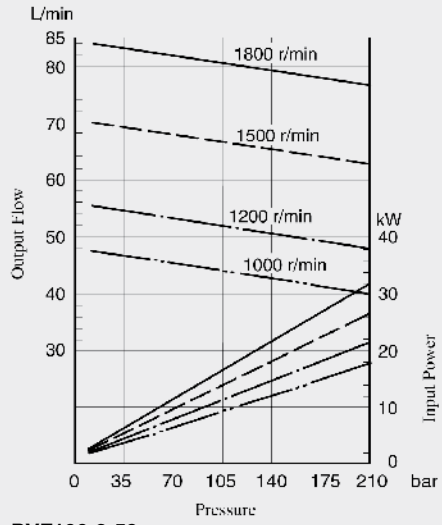
Typical Pump Characteristics

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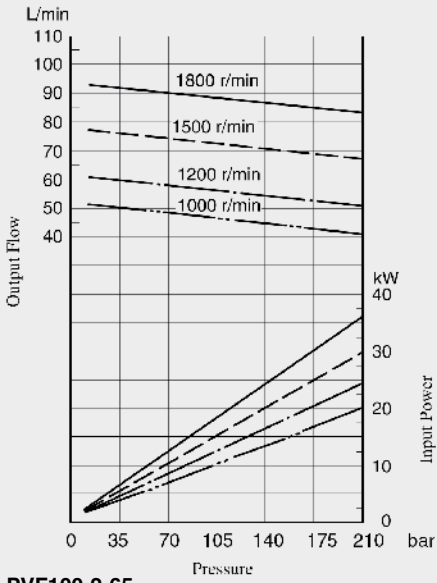
PVF100-2-41



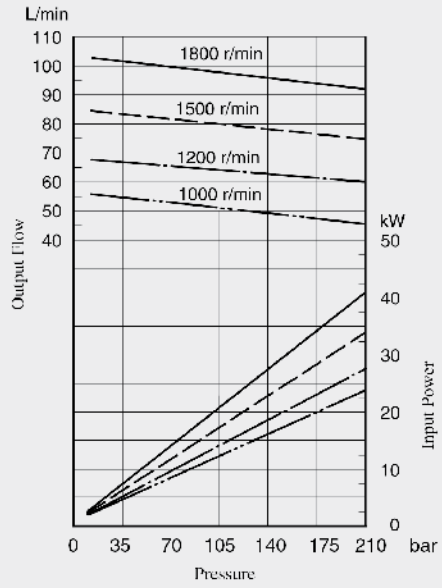
PVF100-2-47



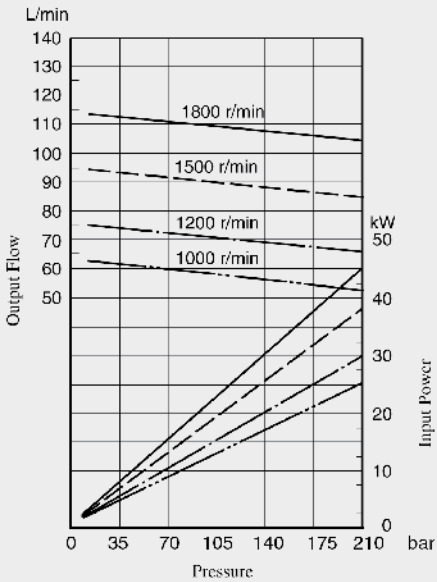
PVF100-2-53



PVF100-2-59



PVF100-2-65

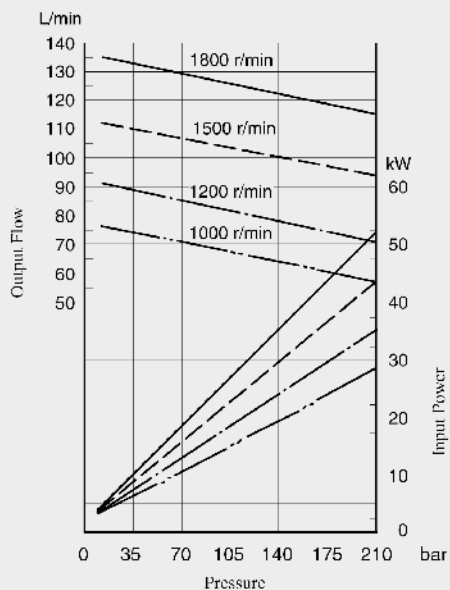


4.1.12 PVF100-3-

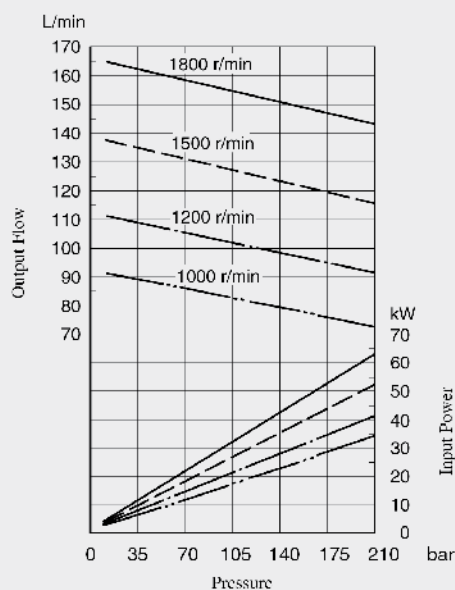
Typical Pump Characteristics

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

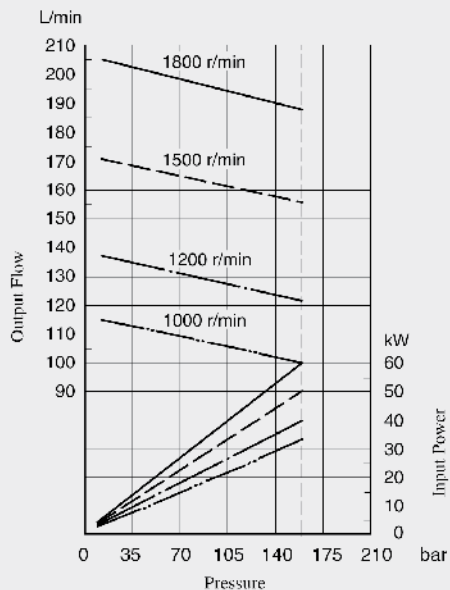
PVF100-3-76



PVF100-3-94



PVF100-3-116

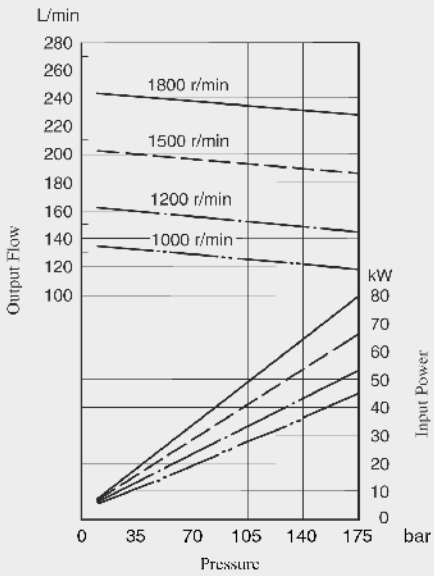


4.1.13 PVF100-4-

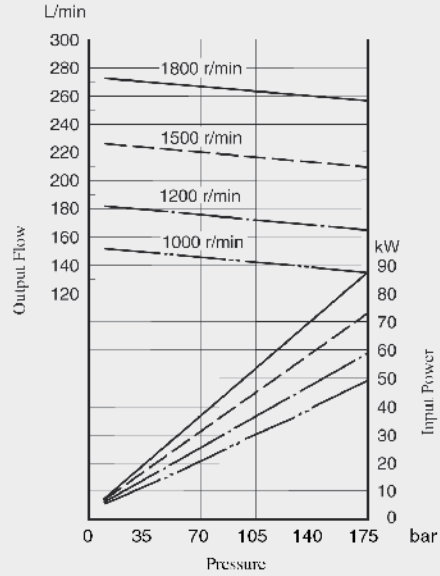
Typical Pump Characteristics

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

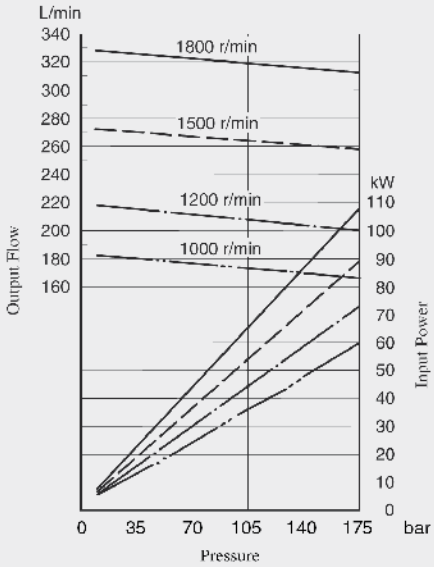
PVF100-4-136



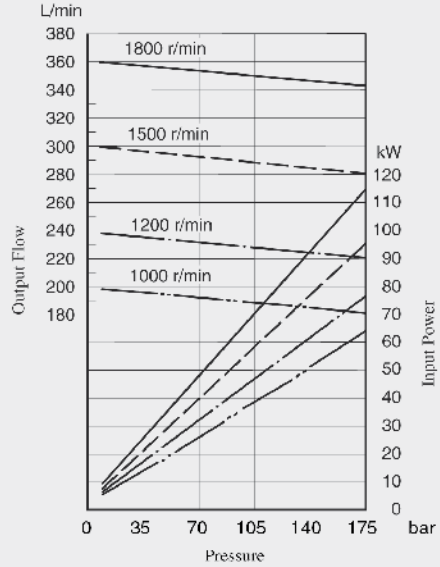
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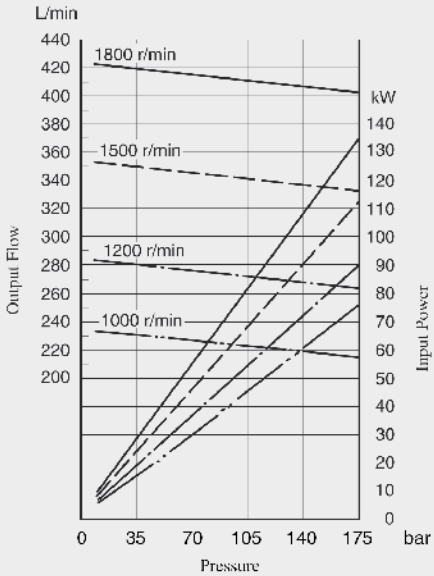
PVF100-4-184



PVF100-4-200

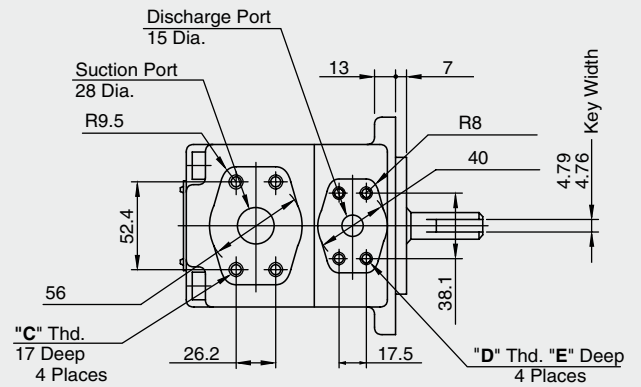
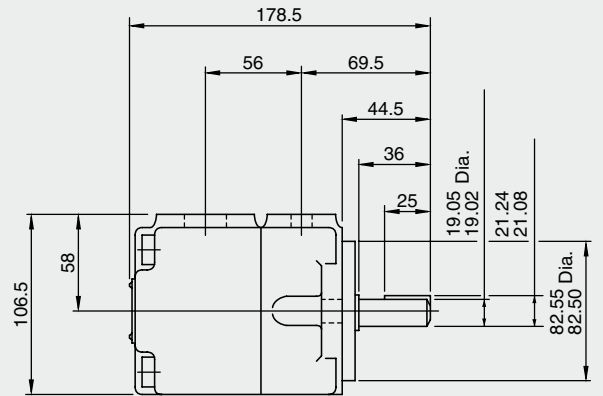
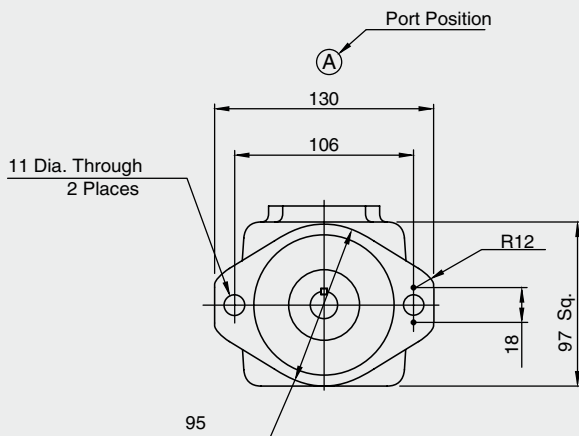


PVF100-4-237



DIMENSIONS

4.1.14 PVF100-1-



Model Numbers	"C" Thd.	"D" Thd.	E mm
PVF100-1...42 Japanese / European Standard	M10	M8	14
PVF100-1...4290 North America Standard	3/8-16 UNC	5/16-18 UNC	16

