

## 4.2 FIXED DISPLACEMENT – DOUBLE PUMP

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PVF101

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## ORDERING CODE

### 4.2.1 Fixed Displacement Vane Pump

PVF101 – 12 – 17 / 59 F R E A A 42 – XXXX

Fixed displacement vane pump

Seals

NBR  
F- FPM

Size

12 23 14 34  
13 33 24

Displacement

	Stage 2	Stage 1
	6	26
	8	33
	10	41
PVF101-12-	12 / 17	47
	19	53
	23	59
	25	65
	31	

	Stage 2	Stage 1
	41	52
	47	60
PVF101-23-	53 / 59	66
	76	94
	65	116

	Stage 2	Stage 1
	6	136
	8	153
PVF101-14-	10 / 12	184
	14	200
	17	237
	19	
	23	

	Stage 2	Stage 1
	52	136
	60	153
PVF101-34-	66 / 76	184
	94	200
	116	237

	Stage 2	Stage 1
	6	
	8	
	10	
	12	76
PVF101-13-	14 / 17	94
	19	116
	23	
	25	
	31	

	Stage 2	Stage 1
	76	76
PVF101-33-	94 / 116	94
		116

	Stage 2	Stage 1
	26	136
	33	153
PVF101-24-	41 / 47	184
		200
		237

Installation type

F Flange mounting

Shaft rotation

R Clockwise, viewed from shaft end

Discharge port position, stage 2

E Top left 45° (size 12, 23, 34)

A Top (size 13, 33, 14, 24)

Discharge port position, stage 1

A Top

Suction port position

A Top

Design number

42 Size 12, 13

41 Size 23

31 Size 24, 33, 34

32 Size 14

Design standard

European Standard

90 North American Standard

Modification number

XXXX Determined by manufacturer

## TECHNICAL INFORMATION

### 4.2.2 Specifications

Pump size												
			6	8	10	12	14	17	19	23	25	31
Geometric displacement		[cm³/rev]	6	8	10	12	14	17	19	23	25	31
Max. pressure with fluid type	HLP, HFD-U	[bar]	210 *1		210					210 *2	210	160
	HL	[bar]	160									
	HFC	[bar]	160									
	HFD-R	[bar]	160									
Drive speed	Min.	[rpm]	750 (at 100 cSt max.)									
	max.	[rpm]	1800 (1200 with HFD-R)									

\*<sup>1</sup> For pressures above 160 bar a minimum speed of 1450 rpm is required

\*<sup>2</sup> Max. pressure for PVF101-14 with 23 cm<sup>3</sup> displacement = 160 bar

Pump size			26	33	41	47	53	59	65
Geometric displacement	[cm <sup>3</sup> /rev]		26	33	41	47	53	59	65
Max. pressure with fluid type	HLP, HFD-U	[bar]	210						
	HL	[bar]	140						
	HFC	[bar]	160						
	HFD-R	[bar]	140						
Drive speed	Min.	[rpm]	600 (at 100 cSt max.)						
	max.	[rpm]	1800 (1200 with HFD-R)						

Pump size			5260667694116					136153184200237					
Geometric displacement		[cm³/rev]	52	60	66	76	94	116	136	153	184	200	237
Max. pressure with fluid type	HLP, HFD-U	[bar]	210					160	175				
	HL	[bar]	140										
	HFC	[bar]	160										
	HFD-R	[bar]	140										
Drive speed	Min.	[rpm]	600 (at 100 cSt max.)										
	max.	[rpm]	1800 (1200 with HFD-R)										

Pump size		PVF101-						
		12	13	23	33	14	24	34
Approx. weight	[kg]	25	45.6	51	84	75	78	98

#### 4.2.3 Hydraulic fluids

The pump series is designed for use with:

**Hydraulic oil based on mineral oil**  
(HL, HLP, ISO VG 32 or 46)

##### Synthetic fluids

(Phosphate ester, HFD-R)  
(Polyol ester, HFD-U)  
(Water glycolol, HFC)

#### 4.2.4 Viscosity range

**Normal** operating viscosity:  
20 - 400 cSt (mm<sup>2</sup>/s)

#### 4.2.5 Temperature range

**from 0 to +70 °C**  
with aqueous fluids:  
**5 to +50 °C**

#### 4.2.6 Seals

The pump series is equipped with NBR seals. When phosphate ester or polyolester fluids are used, FPM seals must be used.

#### 4.2.7 Filtration

For maximum pump and system component life time, the system should be protected from contamination by effective filtration. Cleanliness class:

**23 / 21 / 18 to ISO 4406:1999**

or

**Class 12 to NAS 1638**

or cleaner.

#### 4.2.8 Installation notes

##### A. Mounting with coupling

Use a flexible coupling whenever possible. There must not be any radial or axial forces on the pump shaft. The maximum misalignment is 0.1 mm and the angular deviation must be less than 0.2°.

##### B. Suction pressures

The suction pressures at the pump inlet port must be within the values specified in the following table. The internal diameter of the suction line must correspond to the internal diameter of the pump suction port.

If the pump is installed on the tank or above the oil level, the distance between the pump inlet and the oil level should not exceed 1 metre (0.8 metres when phosphate ester or aqueous fluids are used).

Pump type		Suction pressure		
		Minimum		Maximum
		Mineral oil	Phosphate ester, Aqueous fluid	
PVF101 series Double pumps	PVF101-12	-0.2 bar	-0.16 bar	+0.3 bar
	PVF101-13	-0.2 bar*		
	PVF101-23			
	PVF101-33			
	PVF101-14			
	PVF101-24			
	PVF101-34			

\* Min. suction pressure at speeds > 1700 rpm  
PVF101 with displacement 94 or 116 cm<sup>3</sup>/rev: 0 bar (1 bar abs.)  
PVF101 with displacement 76 cm<sup>3</sup>/rev: -0.07 bar  
PVF101 with displacement 237 cm<sup>3</sup>/rev: -0.13 bar

##### C. Commissioning notes

During initial commissioning or after a lengthy stoppage, the pump may develop suction problems. If this is the case, install an air bleed valve on the discharge side or the air can be released by slightly loosening the joint at the discharge port. As far as possible, the pump should be run in jog mode with unloaded circulation.

##### D. Other notes

If the pump is to be operated at speeds below 1200 rpm, install the pump with the inlet port at the top to ensure better suction.

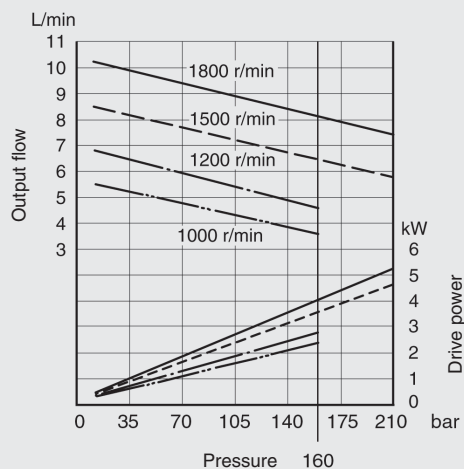
# PERFORMANCE DATA

## 4.2.9 PVF101-1x-

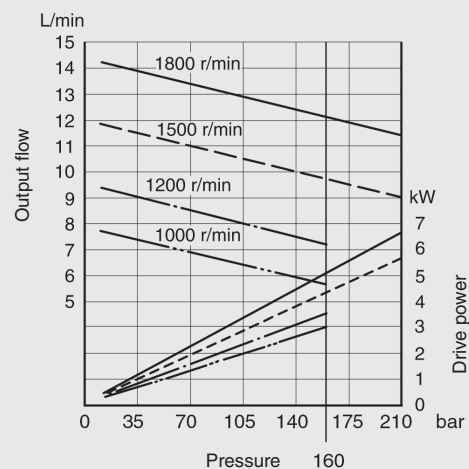
### Performance characteristic curves

at viscosity 20 mm<sup>2</sup>/s (ISO VG32 oil, 50 °C)

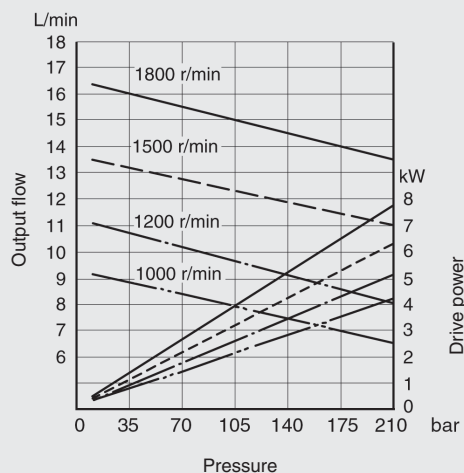
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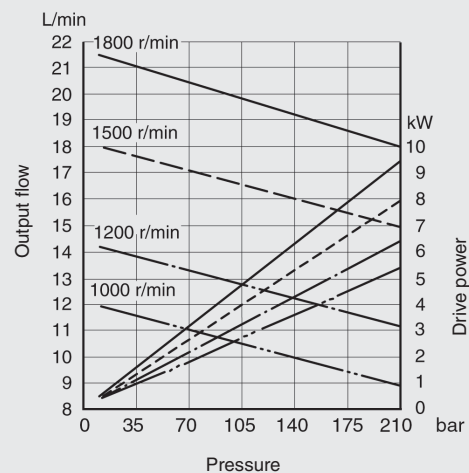
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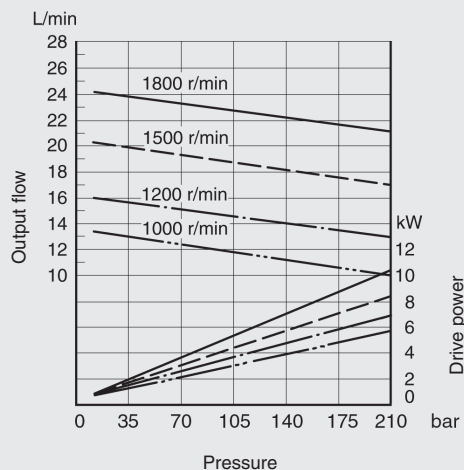
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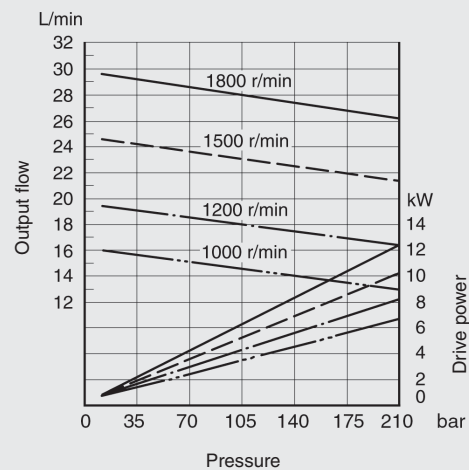
#### PVF101-1x-12/...



#### PVF101-1x-14/...

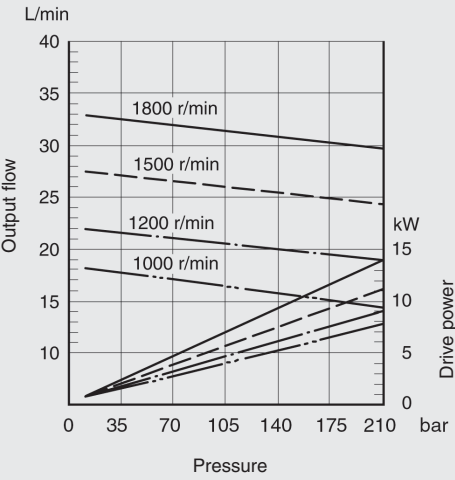


#### PVF101-1x-17/...

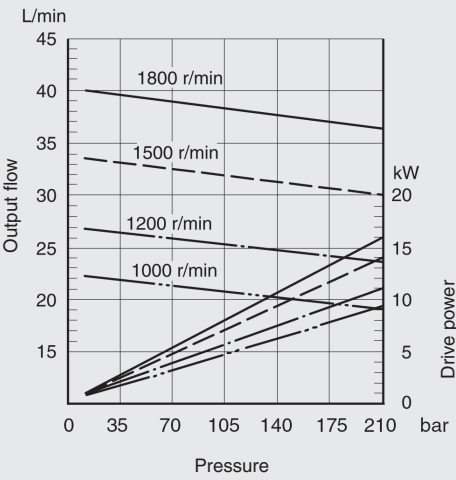


**Performance characteristic curves**  
 at viscosity 20 mm<sup>2</sup>/s (ISO VG32 oil, 50 °C)

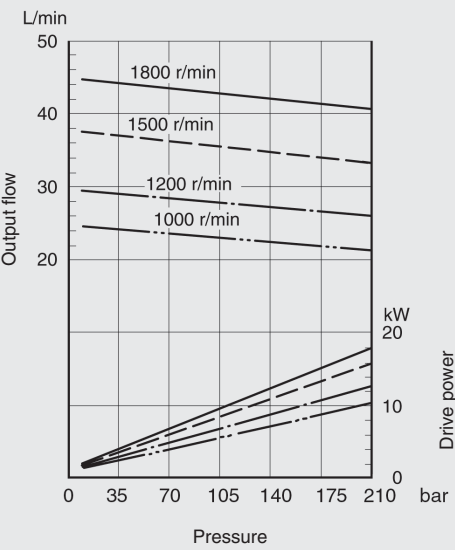
**PVF101-1x-19/...**



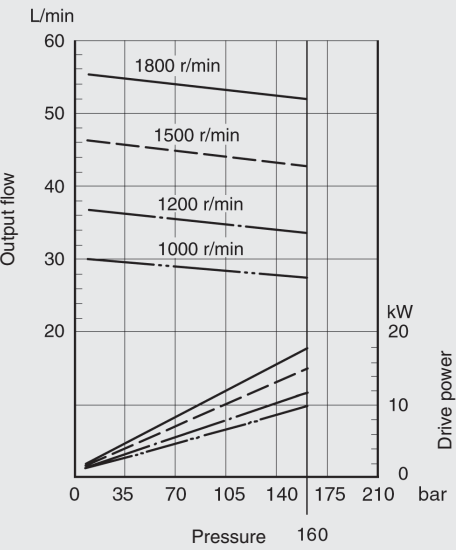
**PVF101-1x-23/...**



**PVF101-1x-25/...**



**PVF101-1x-31/...**

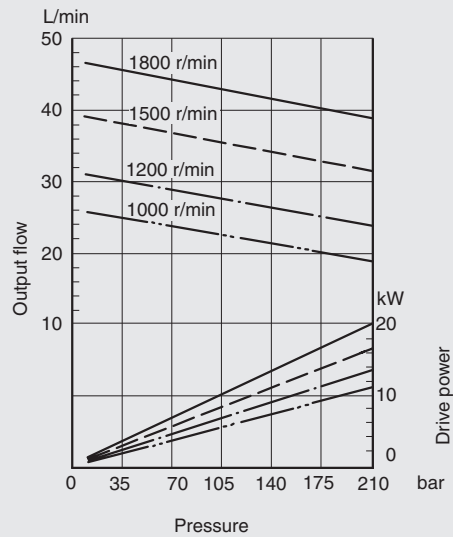


## 4.2.10 PVF101-2x- / PVF101-x2-

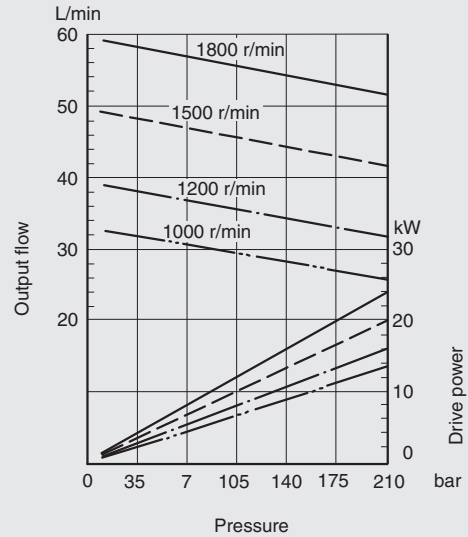
### Performance characteristic curves

at viscosity 20 mm<sup>2</sup>/s (ISO VG32 oil, 50 °C)

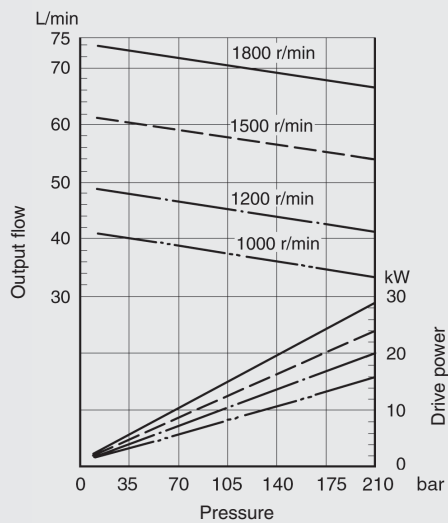
**PVF101-2x-26/...**  
**PVF101-x2-.../26...**



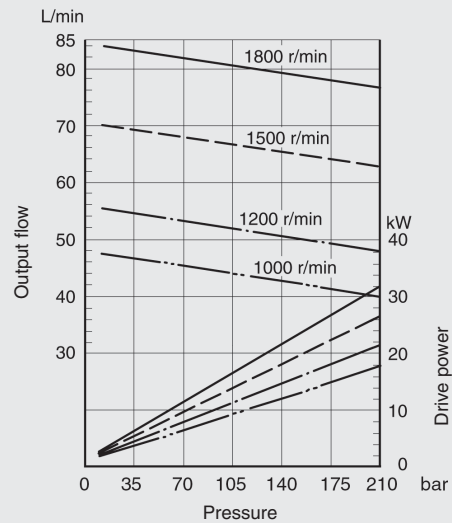
**PVF101-2x-33/...**  
**PVF101-x2-.../33...**



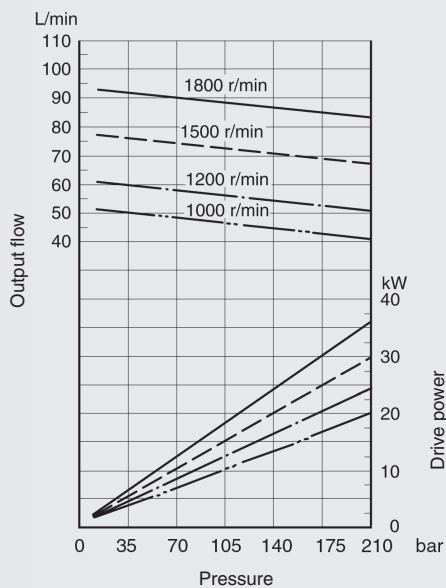
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**PVF101-x2-.../41...**



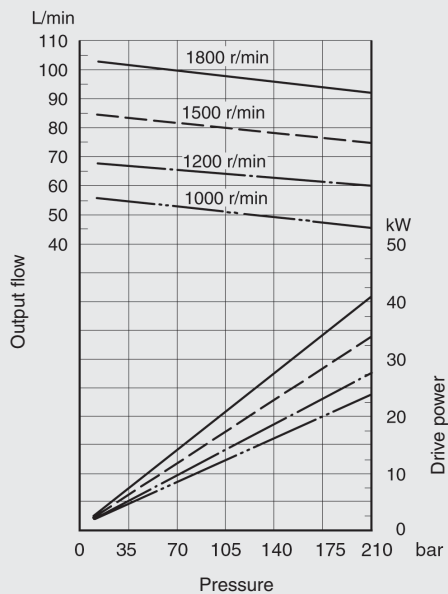
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**PVF101-x2-.../47...**



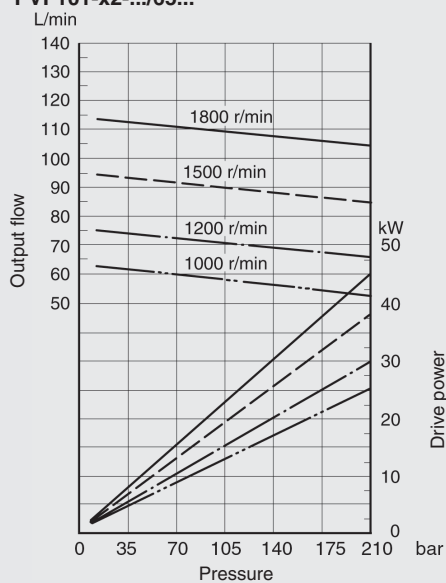
**PVF101-2x-53/...**  
**PVF101-x2-.../53...**



**PVF101-2x-59/...**  
**PVF101-x2-.../59...**



**PVF101-2x-65/...**  
**PVF101-x2-.../65...**



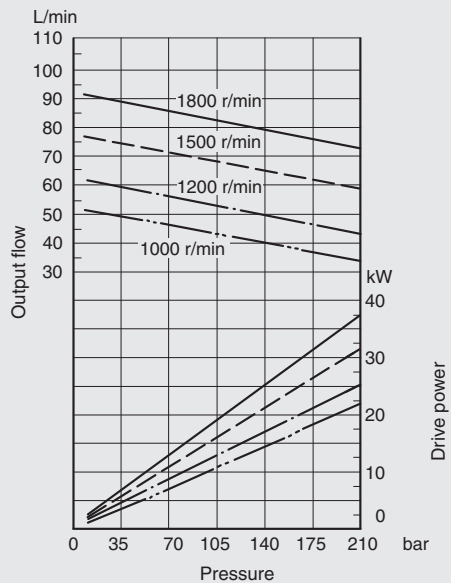


#### 4.2.11 PVF101-3x- / PVF101-x3-

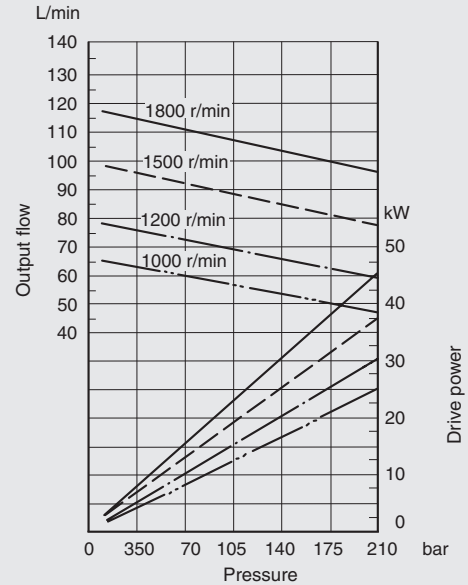
##### Performance characteristic curves

at viscosity 20 mm<sup>2</sup>/s (ISO VG32 oil, 50 °C)

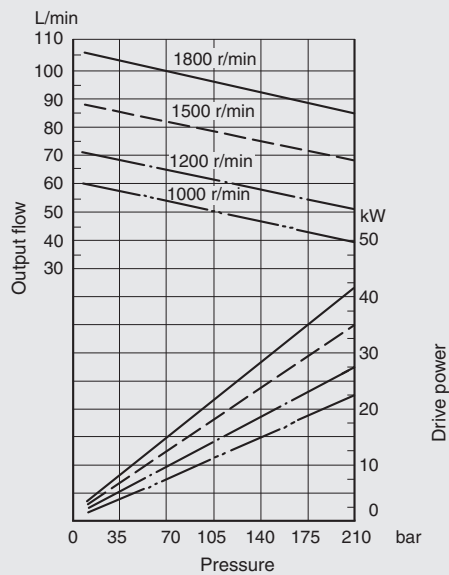
##### PVF101-3x-52/... PVF101-x3-.../52...



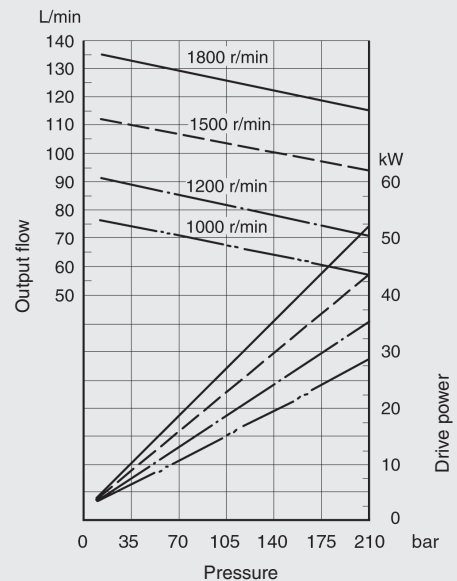
##### PVF101-3x-66/... PVF101-x3-.../66...



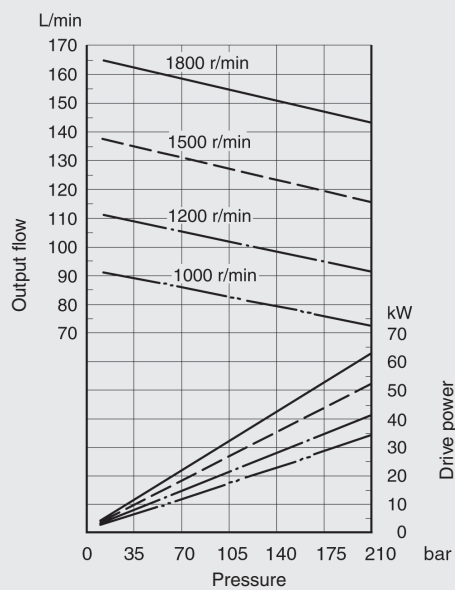
##### PVF101-3x-60/... PVF101-x3-.../60...



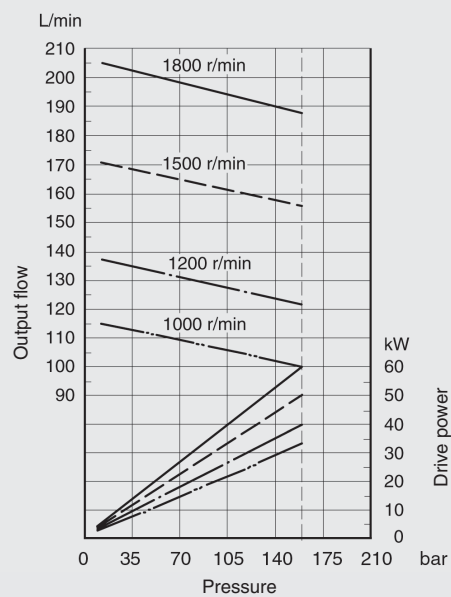
##### PVF101-3x-76/... PVF101-x3-.../76...



**PVF101-3x-94/...**  
**PVF101-x3-.../94...**



**PVF101-3x-116/...**  
**PVF101-x3-.../116...**

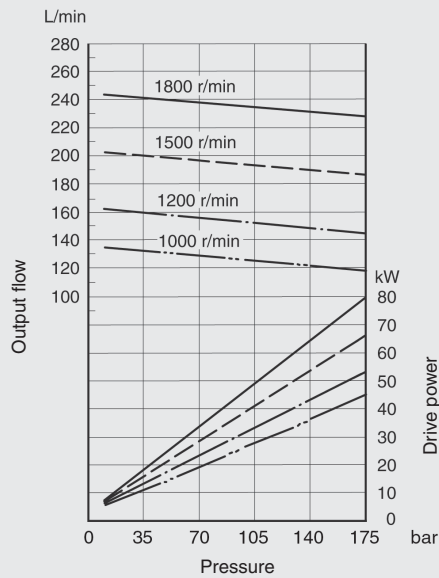


## 4.2.12 PVF101-x4-

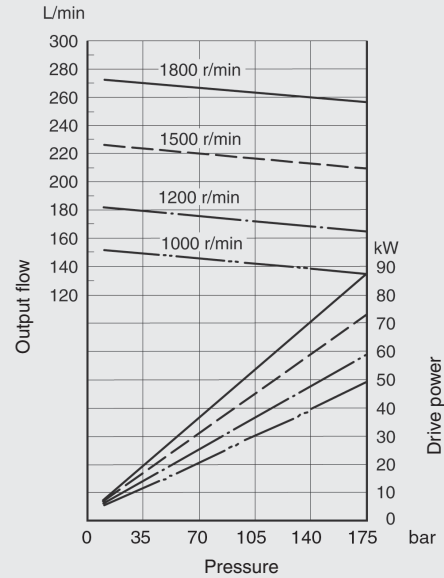
### Performance characteristic curves

at viscosity 20 mm<sup>2</sup>/s (ISO VG32 oil, 50 °C)

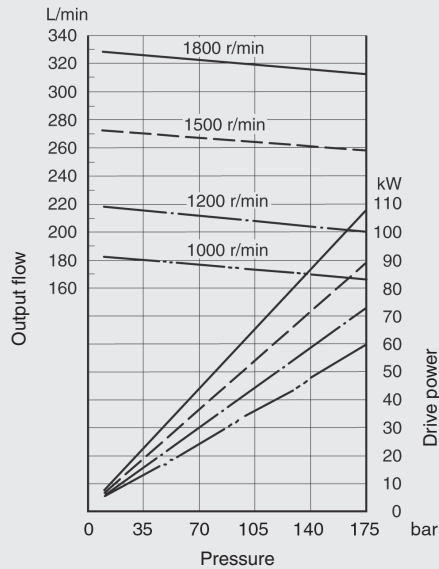
#### PVF101-x4-.../136...



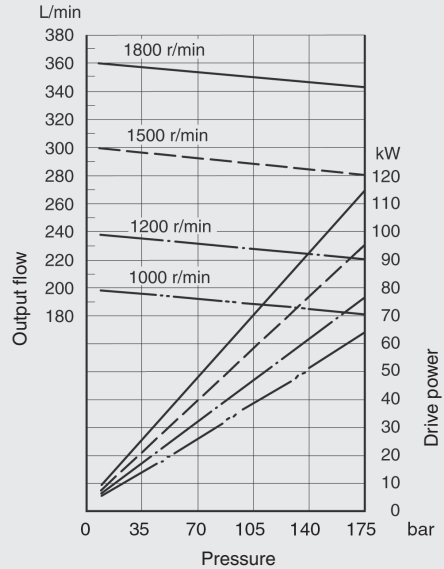
#### PVF101-x4-.../153...



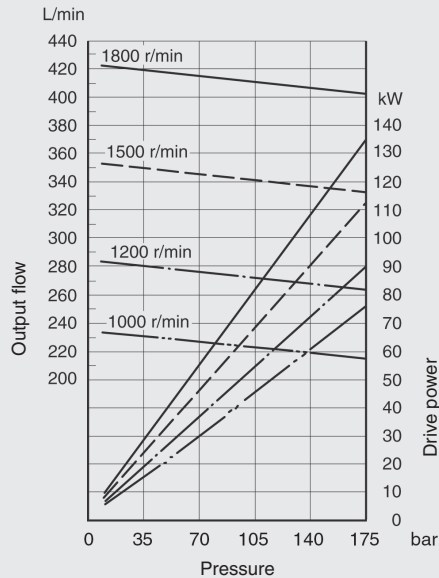
#### PVF101-x4-.../184...



#### PVF101-x4-.../200...



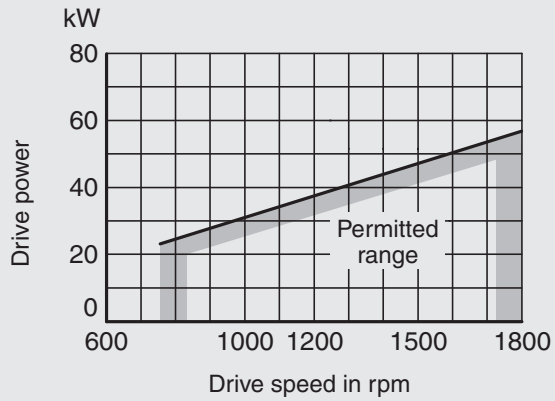
#### PVF101-x4-.../237...



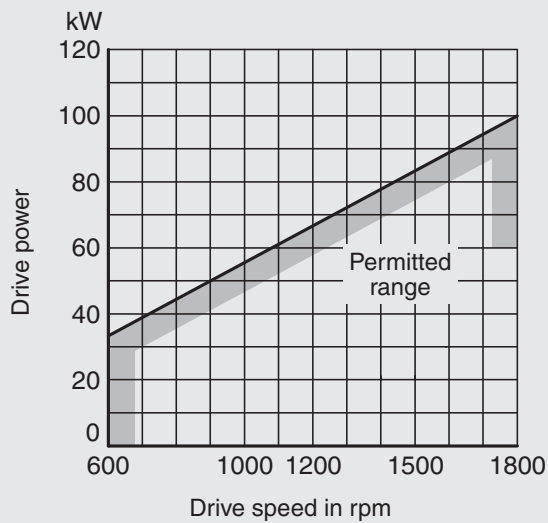
#### 4.2.13 Power limitations

The maximum drive power for sizes PVF101-12 and PVF101-33 is limited, depending on the motor speed.

PVF101-12 – Max. drive power

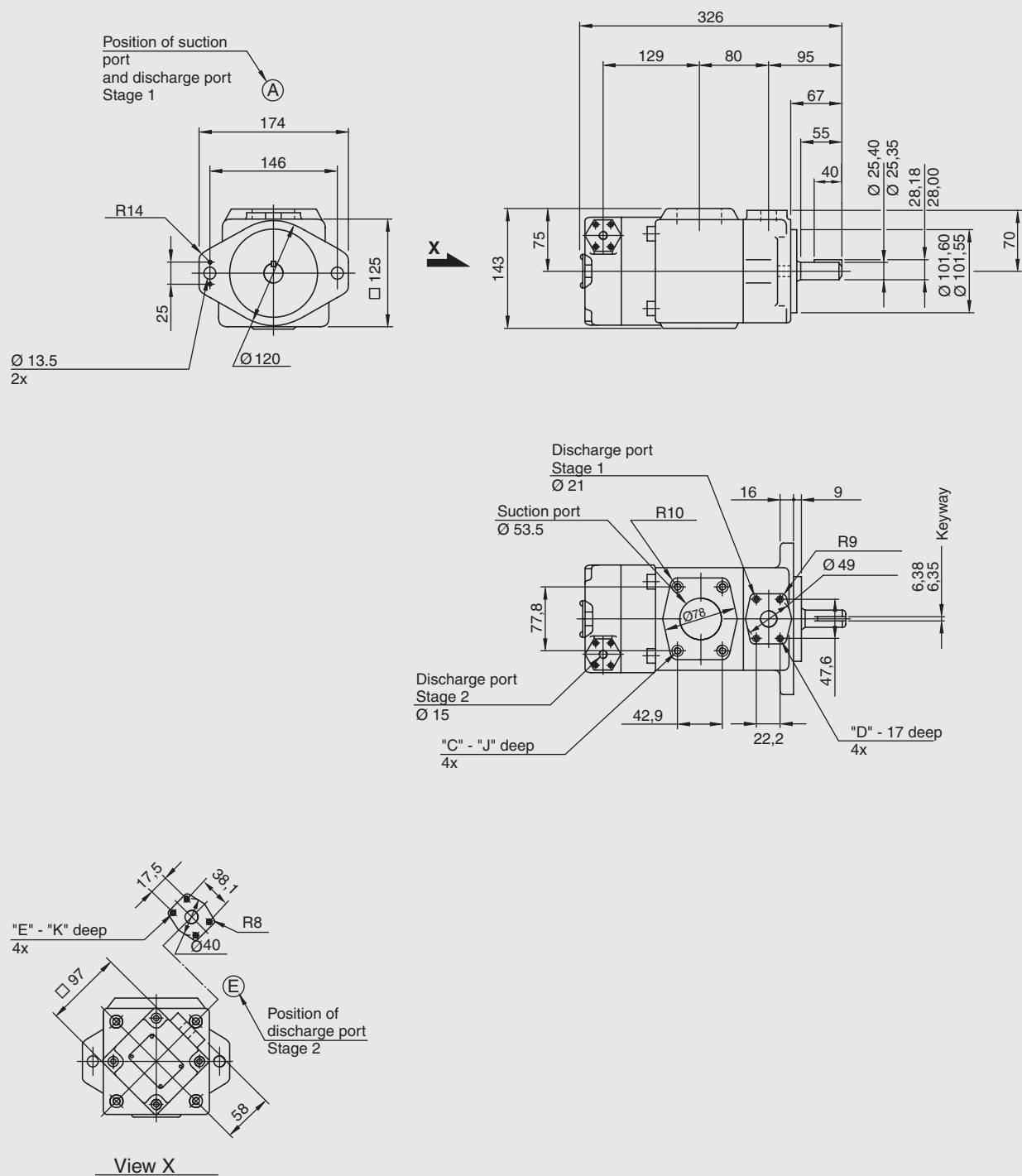


PVF101-33 – Max. drive power



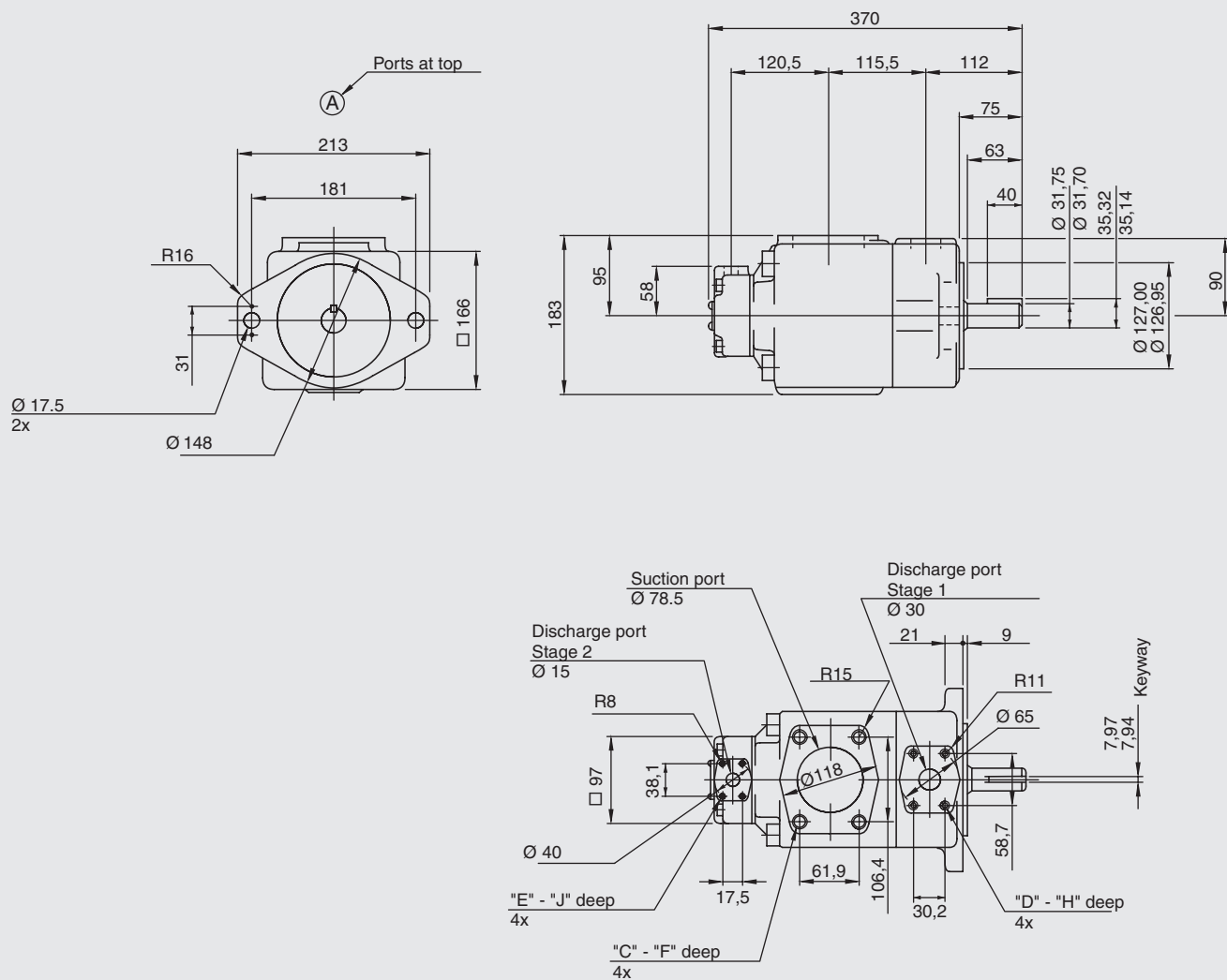
## DIMENSIONS

### 4.2.14 PVF101-12-



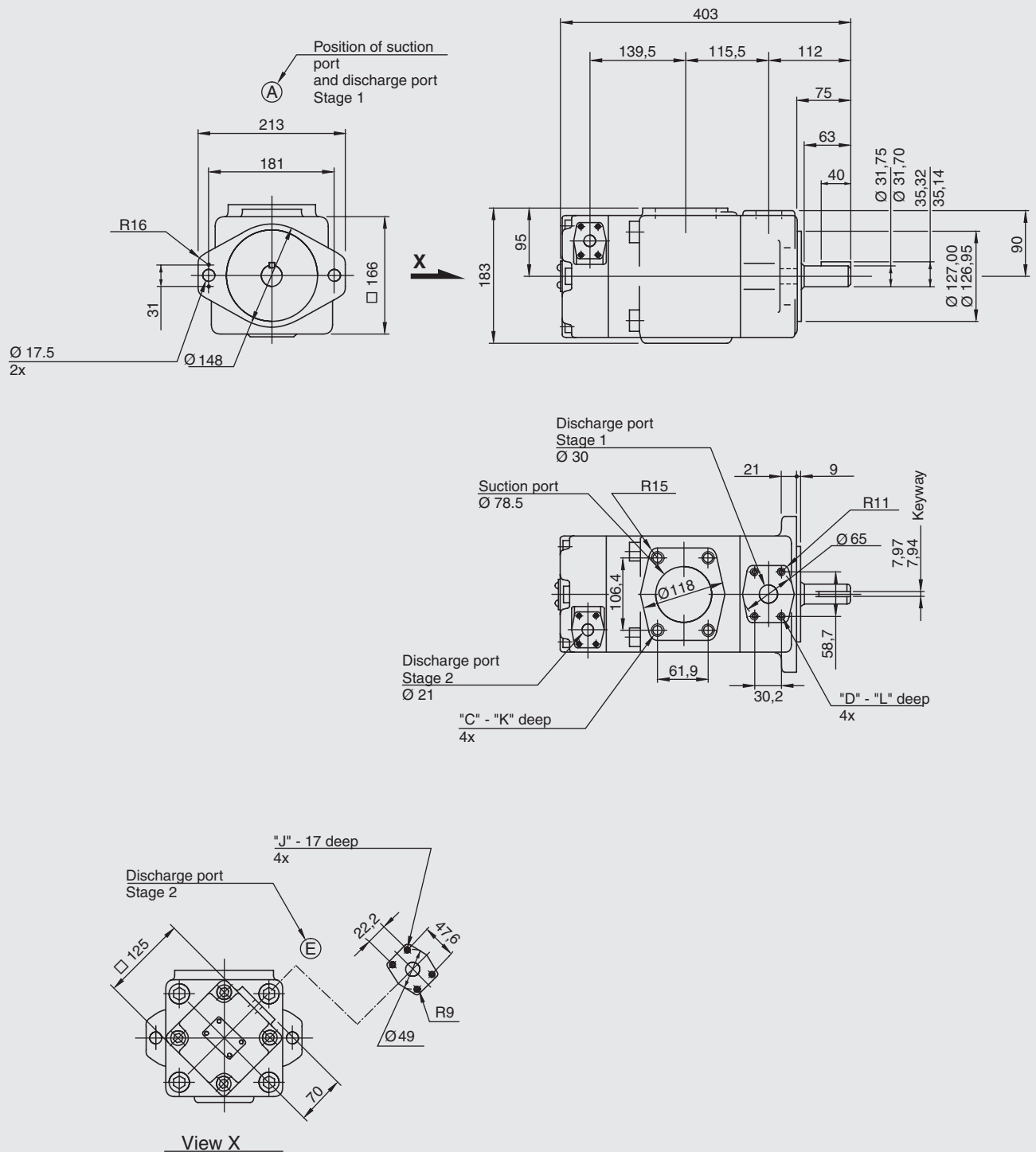
Design Standard	"C" Thread	"D" Thread	"E" Thread	J mm	K mm
PVF101-12-...42 European Standard	M12	M10	M8	19	14
PVF101-12-...4290 US Standard	1/2-13 UNC	3/8-16 UNC	5/16-18 UNC	21	16

## 4.2.15 PVF101-13-



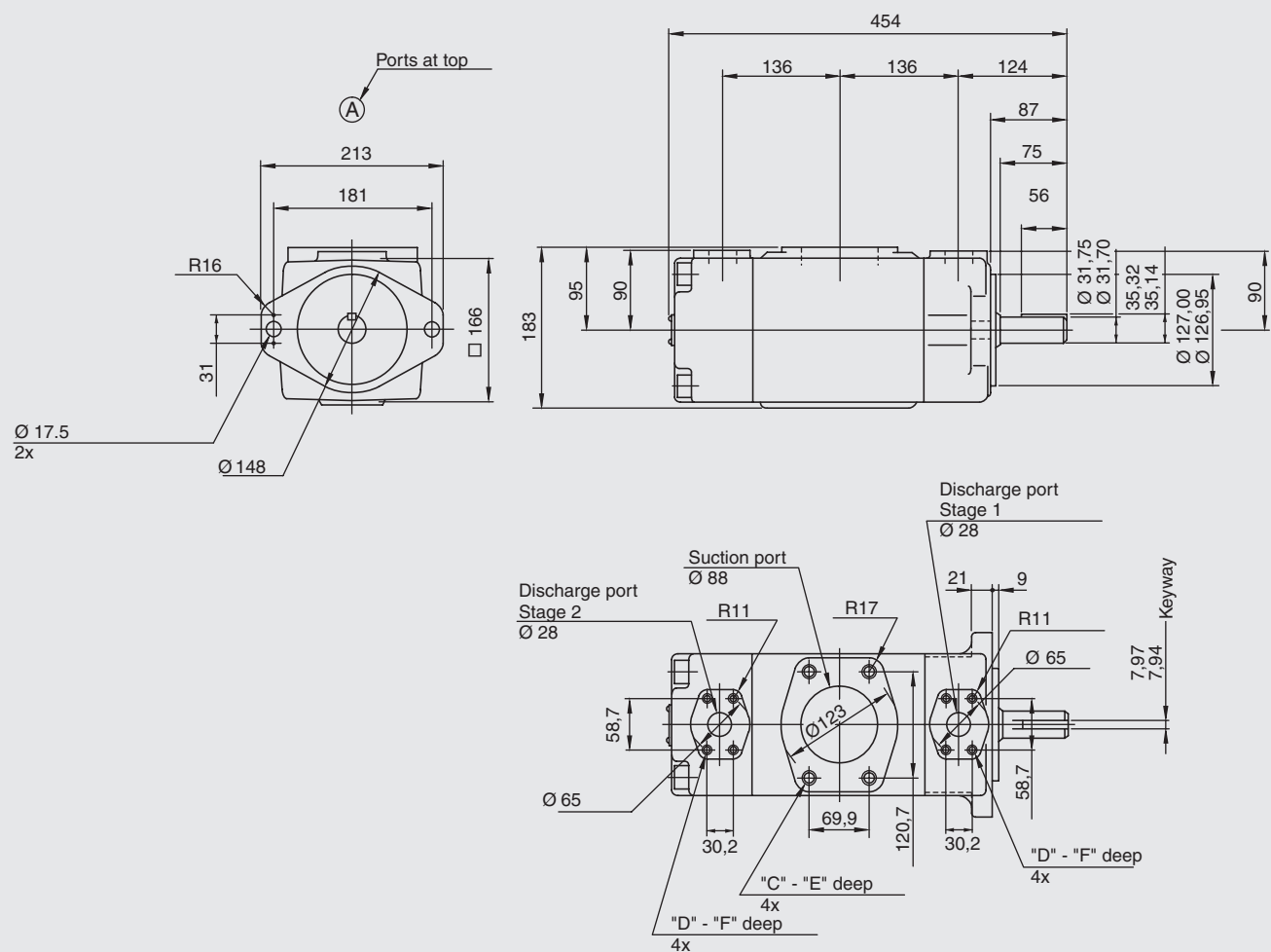
Design Standard	"C" Thread	"D" Thread	"E" Thread	F mm	H mm	J mm
PVF101-13-...42 European Standard	M16	M10	M8	19	19	14
PVF101-13-...4290 US Standard	5/8-11 UNC	7/16-14 UNC	5/16-18 UNC	21	20	16

#### 4.2.16 PVF101-23-



Design Standard	"C" Thread	"D" Thread	"J" Thread	K mm	L mm
PVF101-23-...41 European Standard	M16	M10	M10	19	19
PVF101-23-...4190 US Standard	5/8-11 UNC	7/16-14 UNC	3/8-16 UNC	21	20

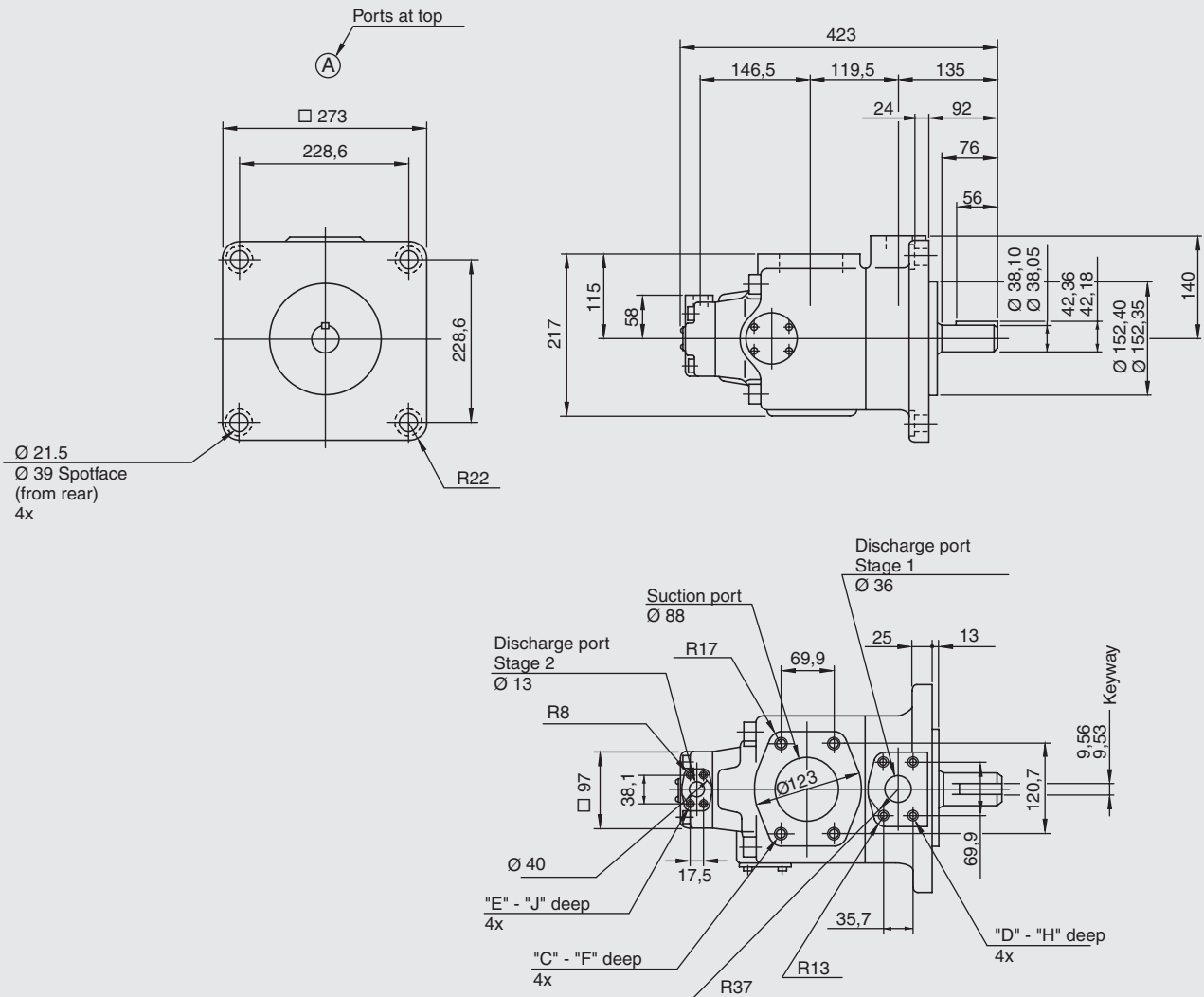
#### 4.2.17 PVF101-33-



Design Standard	"C" Thread	"D" Thread	E mm	F mm
PVF101-33-...31 European Standard	M16	M10	19	19
PVF101-33-...3190 US Standard	5/8-11 UNC	7/16-14 UNC	21	20

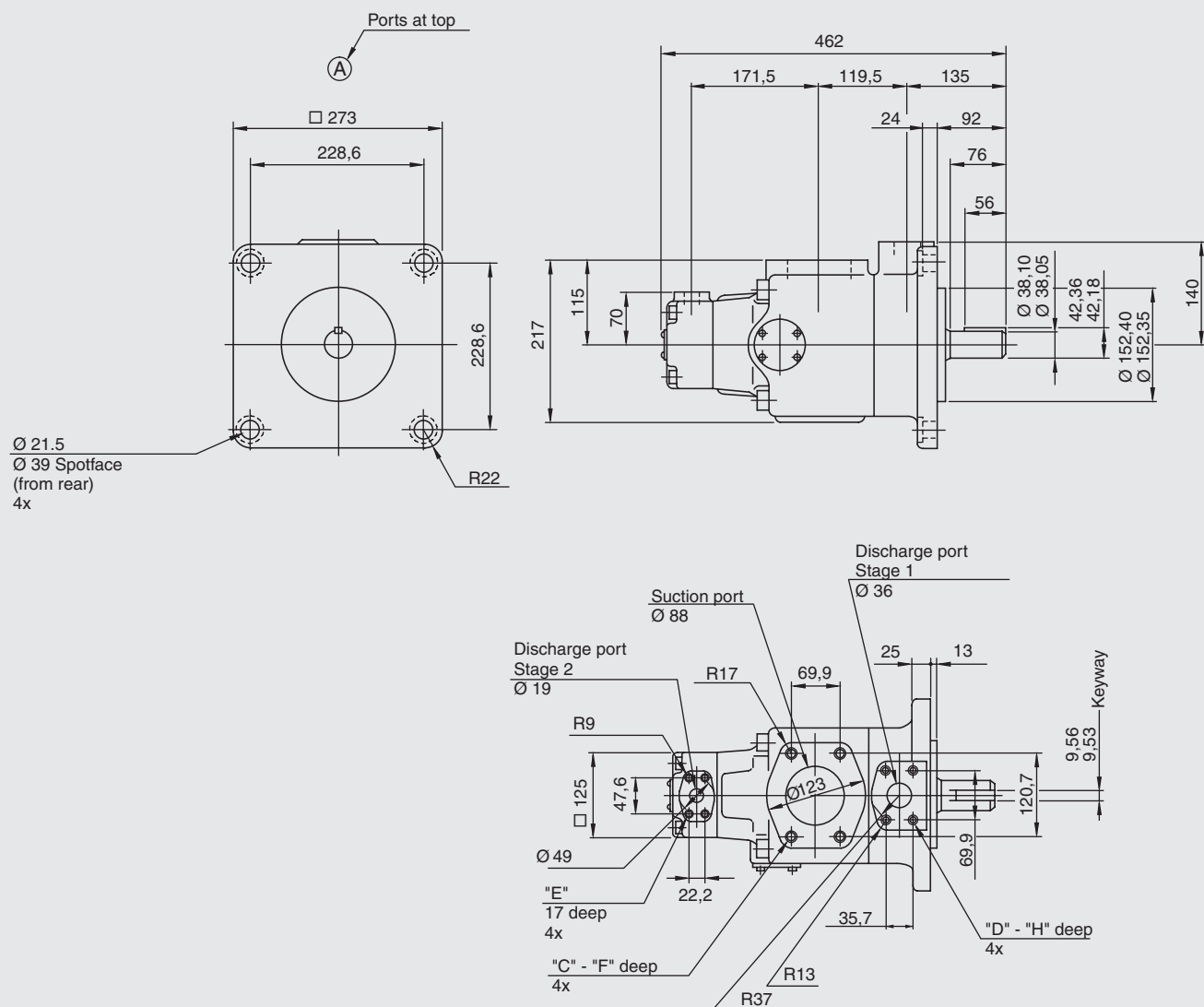


#### 4.2.18 PVF101-14-



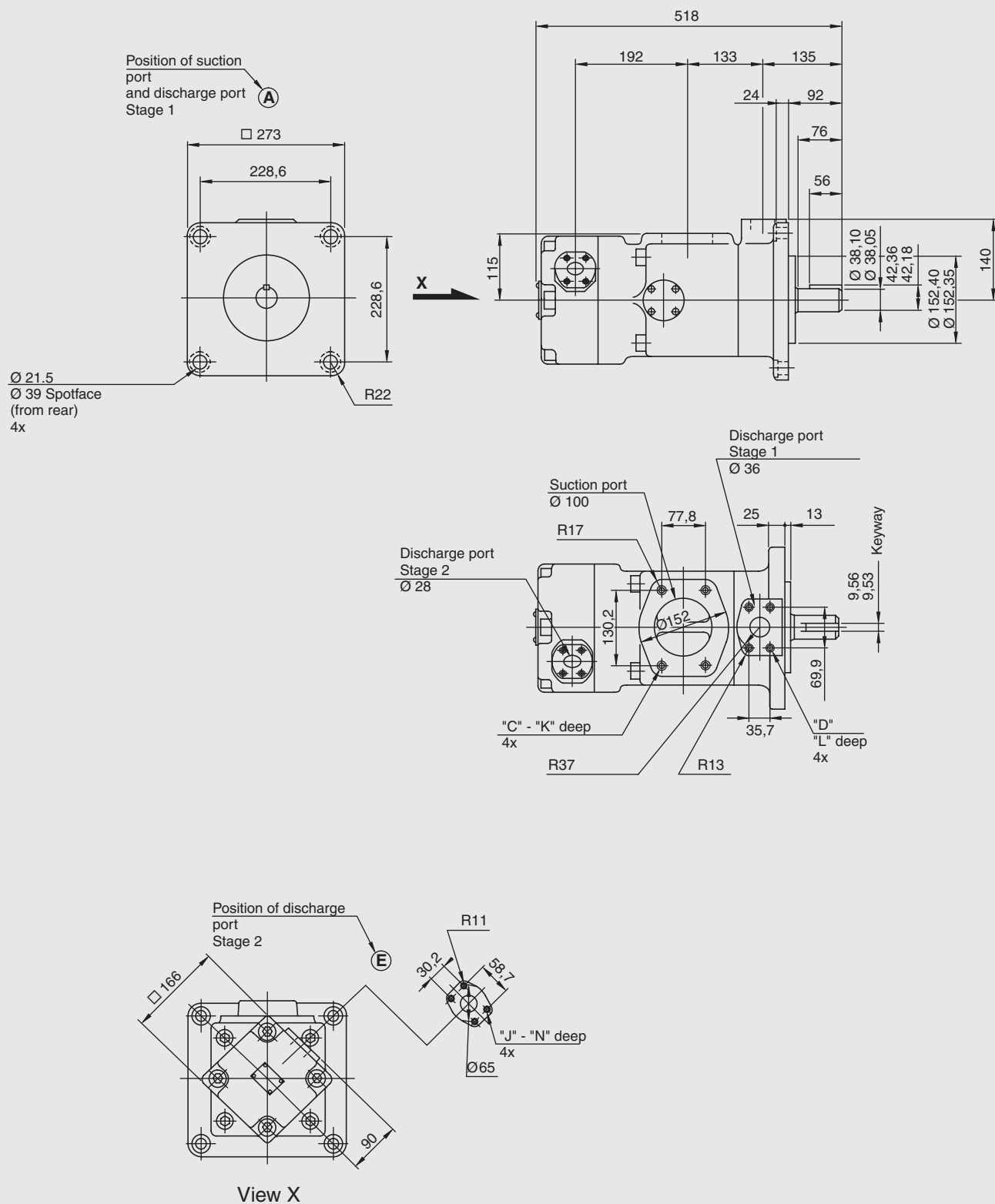
Design Standard	"C" Thread	"D" Thread	"E" Thread	F mm	H mm	J mm
PVF101-14-...32 European Standard	M16	M12	M8	19	19	14
PVF101-14-...3290 US Standard	5/8-11 UNC	1/2-13 UNC	5/16-18 UNC	21	21	16

## 4.2.19 PVF101-24-



Design Standard	"C" Thread	"D" Thread	"E" Thread	F mm	H mm
PVF101-24-...31 European Standard	M16	M12	M10	19	19
PVF101-24-...3190 US Standard	5/8-11 UNC	1/2-13 UNC	3/8-16 UNC	21	21

#### 4.2.20 PVF101-34-



Design Standard	"C" Thread	"D" Thread	"J" Thread	K mm	L mm	N mm
PVF101-34-...31 European Standard	M16	M12	M8	19	19	19
PVF101-34-...3190 US Standard	5/8-11 UNC	1/2-13 UNC	7/16-14 UNC	21	21	20