

## 2.1 MEDIUM HEAVY DUTY SERIES CONTENTS

PPV100S

<b>Ordering Code</b>	2.1.1 Medium Heavy Duty Series
<b>Technical Information</b>	2.1.2 Specifications 2.1.3 Max. drive and through drive torque 2.1.4 Pump combinations for PPV100S 2.1.5 Specifications for special fluids 2.1.6 Seals 2.1.7 Filtration 2.1.8 Hydraulic fluids 2.1.9 Temperature range 2.1.10 Viscosity range 2.1.11 Adjustments 2.1.12 Installation notes
<b>Control Options</b>	2.1.13 Standard pressure control 2.1.14 Remote pressure control 2.1.15 Load sensing control 2.1.16 Availability of control type
<b>Performance Data</b>	2.1.17 PPV100-16 2.1.18 PPV100S37 2.1.19 PPV100S56 2.1.20 PPV100S71 2.1.21 PPV100S100 2.1.22 PPV100S145 2.1.23 PPV100S180
<b>Dimensions</b>	2.1.24 PPV100-16 2.1.25 PPV100S37 with 2-hole mounting flange 2.1.26 PPV100S37 with 4-hole mounting flange 2.1.27 PPV100S56 with 2-hole mounting flange 2.1.28 PPV100S56 with 4-hole mounting flange 2.1.29 PPV100S71 2.1.30 PPV100S100 2.1.31 PPV100S145 2.1.32 PPV100S180

# ORDERING CODE

## 2.1.1 Medium Heavy Duty Series

PPV100S 16 - F R 01 K K1 E1 C - 10 - XXXX

**Axial piston pump**  
**Medium Heavy Duty Series**  
**with lateral ports and**  
**prepared for through drive**

**Size**

16	16.3	cm <sup>3</sup> /rev
37	37.1	cm <sup>3</sup> /rev
56	56.3	cm <sup>3</sup> /rev
71	70.7	cm <sup>3</sup> /rev
100	100.5	cm <sup>3</sup> /rev
145	145.2	cm <sup>3</sup> /rev
180	180.7	cm <sup>3</sup> /rev

**Mounting type**

F Flange mounting

**Shaft rotation**

R Clockwise

**Control type**

01 Pressure compensator  
 07 Remote pressure compensator  
 14 Load sensing control

**Pressure setting range**

K 50 - 350 bar (standard, for control type 01 only)

**Shaft Extension**

K1 Parallel keyed shaft to ISO  
 K2 Parallel keyed shaft to SAE  
 SP Splined shaft to SAE

**Flange type**

E1 ISO 3019-2, metric thread  
 U1 SAE version, UN thread  
 U2 SAE version, BSPF-/ metric thread  
 J1 SAE version, RC-/ metric thread

**Mounting flange**

D 4-hole mounting flange (not for size 16)  
 C 2-hole mounting flange (only for sizes 16/37/56)

**Through drive versions**

- Single pump with steel case (standard)  
 A SAE A through drive (sizes 16-180)  
 AB SAE AB through drive (sizes 16-180)  
 B SAE B through drive (sizes 37-180)  
 BB SAE BB through drive (sizes 37-180 only)  
 C SAE C through drive (sizes 37-180 only)  
 CC SAE CC through drive (sizes 100-180 only)  
 D SAE D through drive (sizes 145-180 only)

**Design number**

10 Standard

**Design standard**

- Standard (FPM seal)  
 30 (see specifications for special fluids at point 2.1.5)  
 450 (see specifications for special fluids at point 2.1.5)

**Modification number**

XXXX Determined by manufacturer

# TECHNICAL INFORMATION

## 2.1.2 Specifications

Pump size			16	37	56	71	100	145	180	
Geometric displacement		[cm <sup>3</sup> /rev]	16.3	37.1	56.3	70.7	100.5	145.2	180.7	
Pressure	Rated	[bar]	315							
	Peak		350							
Drive speed	Min.	[rpm]	600							
	Max. (at -0.2 bar inlet pressure)		3600	2700	2500	2300	2100	1800	1800	
	Max. (at 0 bar inlet pressure)		3800	2700	2700	2400	2200	2000	1800	
Power (1500 rpm, 315 bar)		[kW]	14	32	48	60	86	126	156	
Pre-fill oil volume		[cm <sup>3</sup> ]	400	700	900	1300	1700	2400	3200	
Approx. weight (with pressure compensator 01)		[kg]	14.5	19.5	25.7	35	44.6	60	70.4	
Approx. weight (with remote pressure compensator 07)			16.2	21.2	27.4	37.2	46.9	62.2	72.6	
Approx. weight (with load sensing control 14)			17.5	22.5	28.7	38	47.6	63	73.4	
Moment of inertia		[kgm <sup>2</sup> ]	0.0009	0.0034	0.0069	0.0092	0.0163	0.0277	0.0362	

## 2.1.3 Max. drive and through drive torques

Pump size		16	37	
Mounting flange		2-hole	2-hole	4-hole
Maximum torque on primary shaft [Nm]	ISO shaft, keyed	94	295	451
	SAE shaft, keyed	135	295	528
	SAE splined shaft	136	364	784
Max. through drive torque [Nm]	ISO shaft, keyed	76	295	295
	SAE shaft, keyed	76	295	295
	SAE splined shaft	76	295	295

Pump size		56		71
Mounting flange		2-hole	4-hole	4-hole
Maximum torque on primary shaft [Nm]	ISO shaft, keyed	295	451	451
	SAE shaft, keyed	295	528	528
	SAE splined shaft	364	784	784
Max. through drive torque [Nm]	ISO shaft, keyed	295	295	297
	SAE shaft, keyed	295	295	297
	SAE splined shaft	295	295	297

Pump size		100	145	180
Mounting flange		4-hole	4-hole	4-hole
Maximum torque on primary shaft [Nm]	ISO shaft, keyed	789	1295	1295
	SAE shaft, keyed	852	1436	1436
	SAE splined shaft	1321	1965	1965
Max. through drive torque [Nm]	ISO shaft, keyed	609	609	609
	SAE shaft, keyed	609	609	609
	SAE splined shaft	609	609	609

## 2.1.4 Pump combinations PPV100S

Primary stage	PPV100S16	PPV100S37	PPV100S56	PPV100S71	PPV100S100	PPV100S145	PPV100S180
Secondary stage							
PPV100S16	•	•	•	•	•	•	•
PPV100S37		•	•	•	•	•	•
PPV100S56			•	•	•	•	•
PPV100S71				•	•	•	•
PPV100S100					•	•	•
PPV100S145						•	•
PPV100S180							•
PGE102	•	•	•	•	•	•	•
PGE103		•	•	•	•	•	•
PPV101-45		•	•	•	•	•	•
PPV101-80							
PPV101-112/140						•	•
PPV101-200							
PGI100-2		•	•	•			
PGI101		•	•	•			

\* For other pump combinations, please contact HYDAC DRIVE CENTER.

## 2.1.5 Specifications for special fluids

Fluid type	Pressure [bar]		Drive speed [rpm]		Temperature range [°C]	Viscosity range [cSt]	Design standard*2
	Rated	Intermittent	Rated	Maximum			
Water glycol Water > 35 % Polymer solution (HFC)	210	210	1200	1800*1	0 - 50	20 - 200	30
Phosphate ester synthetic (HFD-R)	210	210	1200	1800*1	0 - 60		–
Polyolester synthetic (HFD-U)	280	320	1200	1800	0 - 60		450

\*1 – If a drive speed of 1500 rpm or greater is used, an overhead reservoir is required.

\*2 – Use "Design Standard" field in Ordering Code 2.1.1.

## 2.1.6 Seals

The pump series is equipped with fluorocarbon (FPM) seals as standard.

If special hydraulic fluids are used, the seal material must be changed if required.

## 2.1.7 Filtration

For maximum service life of the pump and system components, the system should be protected from contamination by effective filtration.

Cleanliness class to NAS 1638  
Class 10 (21/19/16 ISO 4406:1999)  
or cleaner.

## 2.1.8 Hydraulic fluids

The pump series is designed for use with

<b>HL</b>	Hydraulic oil
<b>HFC</b>	Water glycol
<b>HLP</b>	Hydraulic oils of the R&O type
<b>HFD-U</b>	Polyolester
<b>HFD-R</b>	Phosphate ester

For use with other fluids, please contact HYDAC DRIVE CENTER.

## 2.1.9 Temperature range

-20 to + 95 °C oil temperature  
-20 to + 50 °C ambient temperature

### Note:

The highest fluid temperature will be at the drain port of the pump, up to 20 °C higher than in the reservoir.

## 2.1.10 Viscosity range

### Minimum viscosity:

10 cSt (mm<sup>2</sup>/s)\*  
Short-term ( t ≤ 1 min) for a max. temperature at drain port of 95 °C

### Normal operating viscosity:

10 - 200 cSt (mm<sup>2</sup>/s)\*

### Maximum viscosity:

1000 cSt (mm<sup>2</sup>/s)\*  
Short-term ( t ≤ 1 min) for cold starts  
(p ≤ 30 bar, n ≤ 1000 rpm,  
tmin - 10 °C)

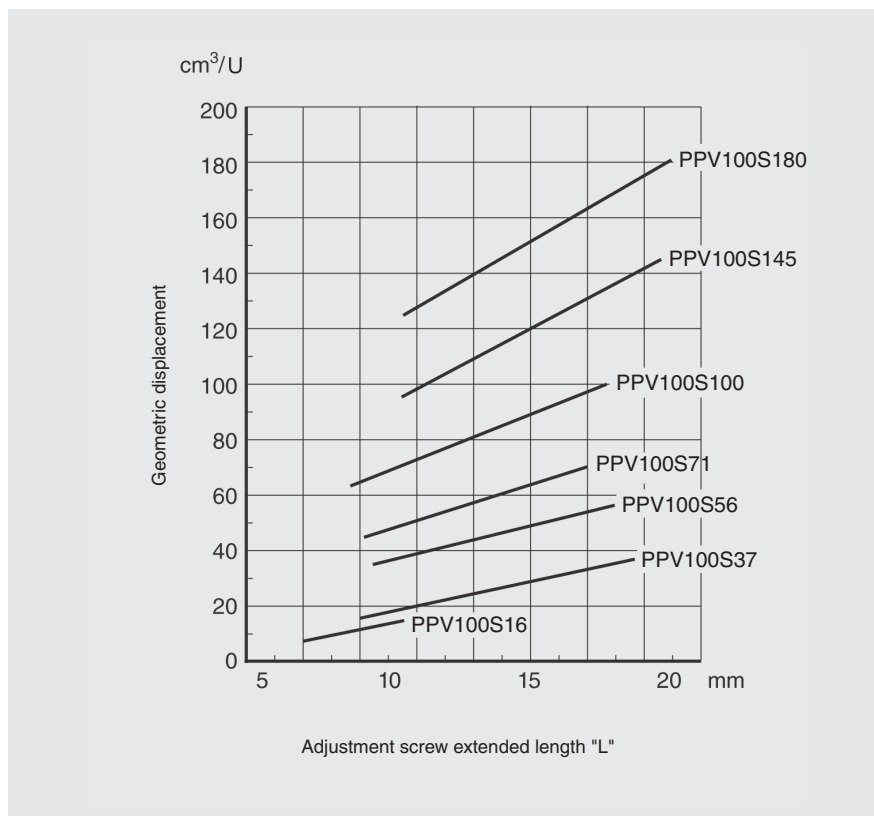
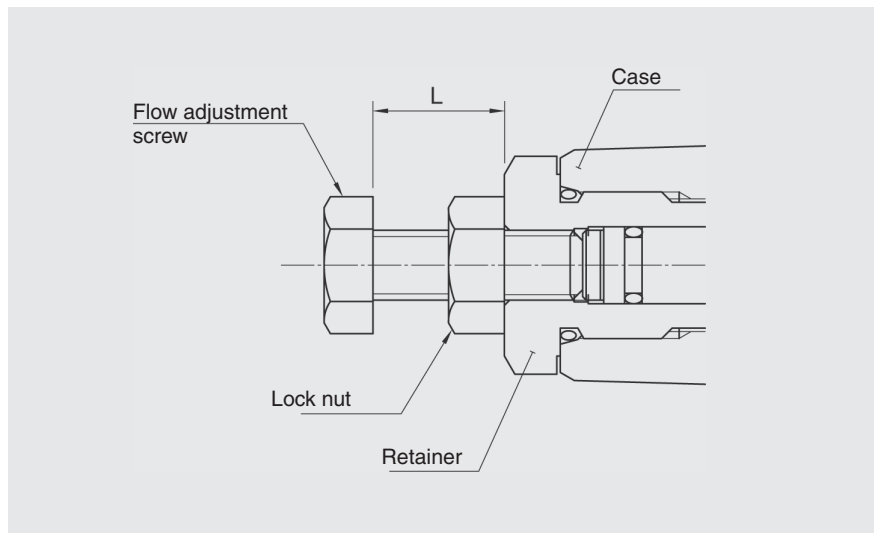
\*measured at drain port

For low temperature applications, please contact HYDAC DRIVE CENTER

### 2.1.11 Adjustments

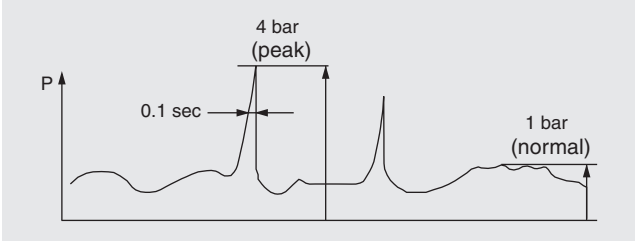
The pumps are supplied with a minimum discharge pressure and maximum flow rate setting. Pressure and flow rate can be adjusted using the adjustment screws to meet your system requirements.

Pump size	Volume		Pressure
	Volume adjustment screw rate	Min. adjustable displacement	Pressure adjustment screw rate
	[cm <sup>3</sup> per turn]	[cm <sup>3</sup> /rev]	[bar per turn]
PPV100S16	1.4	8	55
PPV100S37	3.3	16	
PPV100S56	4.2	35	
PPV100S71	4.9	45	63
PPV100S100	6.2	63	
PPV100S145	9.4	95	
PPV100S180	10.3	125	57



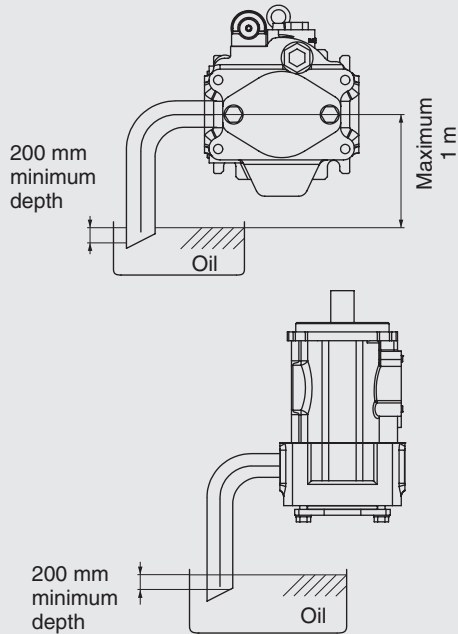
### 2.1.12 Installation notes

The pump should be installed horizontally with the case drain line initially rising above the level of the pump before continuing to the tank as shown in the diagram below. Do not connect the drain line to the suction line. The top drain port should always be used and the internal diameter of the drain line should be equal to or larger than the drain port to minimise pressure in the pump case. The pressure in the pump case should not exceed 1 bar as shown in the diagram below. Peak pressure should never exceed 4 bar.



### Installing the pump above the tank

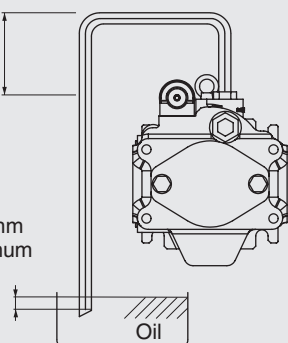
#### Suction line



#### Drain pipe

Must be higher than top of pump case

200 mm minimum depth



### Precautions:

- The distance between suction and drain pipes must be 200 mm minimum.
- Suction and drain pipes must be immersed at least 200 mm below the lowest oil level under operating conditions.
- The distance between the oil surface and the centre of the shaft must not exceed 1 m.
- The oil in the pump case must be refilled if the pump has not been operated for one month or longer.
- When installing a HYDAC pump always ensure that the fluid in the pump is prevented from draining away during stoppages.

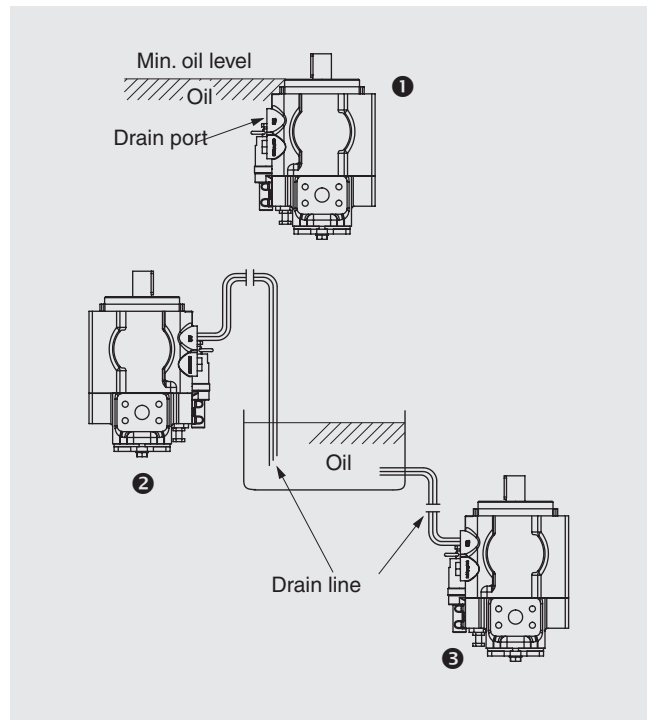
### Installing the pump vertically

For applications requiring vertical installation (shaft at the top) please connect lines as shown in the diagram below.

The oil level in the tank should be higher than the pump mounting flange (see diagram ①). If the oil level in the tank is lower than the pump mounting flange then the drain line should be installed as shown in diagram ②.

Once the pump is installed in the tank and immersed in the oil, the drain ports must be open to provide adequate lubrication to the internal components.

If the pump is installed outside the tank, there must be a separate drain line to the tank (diagram ③). If the drain line is higher than the oil level, fill the line with oil before commissioning.



# CONTROL OPTIONS

## 2.1.13 Standard pressure control

Description	Performance characteristics	Hydraulic circuit
<ul style="list-style-type: none"> <li>When the system pressure increases and comes close to the preset cut-off pressure, the pump flow decreases automatically and the set pressure is maintained.</li> </ul>		

## 2.1.14 Remote pressure control

Description	Performance characteristics	Hydraulic circuit
<ul style="list-style-type: none"> <li>The pump is used in combination with the pressure relief valve or multistage pressure relief valve. By controlling the pilot pressure, the full cut-off pressure can be controlled remotely to meet system requirements.</li> </ul>		

## 2.1.15 Load sensing control

Description	Performance characteristics	Hydraulic circuit
<ul style="list-style-type: none"> <li>This is an energy-saving type of control which maintains the pump flow and load pressure at the absolute minimum level necessary to operate the actuator.</li> <li>This type of control automatically regulates the displacement so that the differential pressure via the throttle valve remains constant. To do so, the load pressure must be introduced to the load sensing port "L" of the pump through an external line.</li> <li>Remote control of the pressure compensator is provided via the pilot port "PP".</li> <li>The standard differential pressure setting is <b>15 bar</b>. The differential pressure adjustment range is <b>10 to 30 bar</b>.</li> </ul>		

\*A throttle valve is not included with the pump.

### Recommended valve for use with remote pressure control

Type:	Part no.:
DB3E-02X-350V	397405

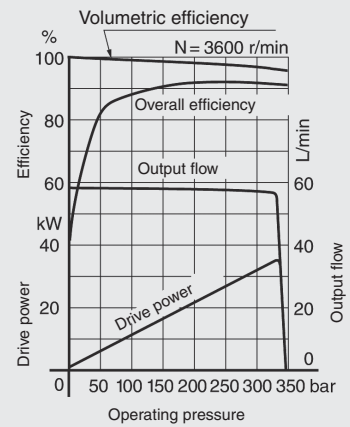
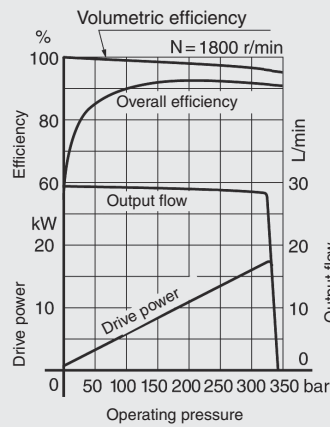
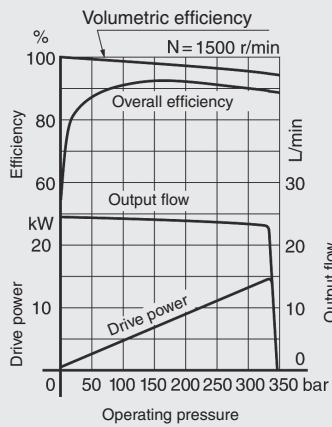
## 2.1.16 Availability of control type

Pump size	Geometric displacement cm <sup>3</sup> /rev	01 Pressure compensator type	07 Remote pressure compensator type	14 Load sensing type
PPV100S16	16.3	●	●	●
PPV100S37	37.1	●	●	●
PPV100S56	56.3	●	●	●
PPV100S71	70.7	●	●	●
PPV100S100	100.5	●	●	●
PPV100S145	145.2	●	●	●
PPV100S180	180.7	●	●	●

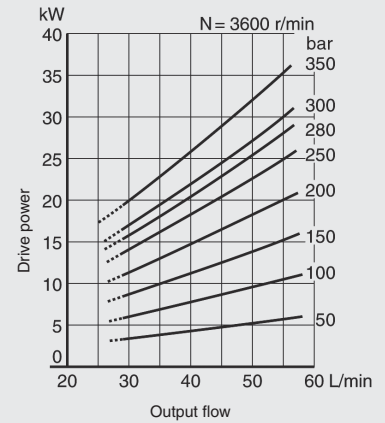
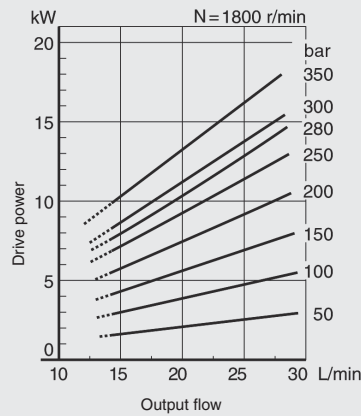
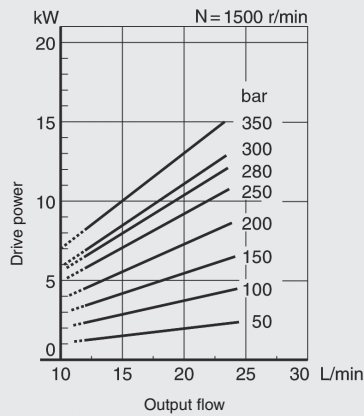
# PERFORMANCE DATA

## 2.1.17 PPV100S16

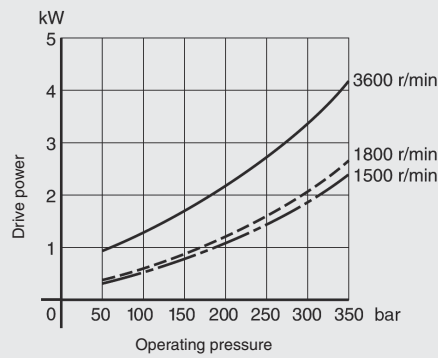
### ● Performance characteristic curve



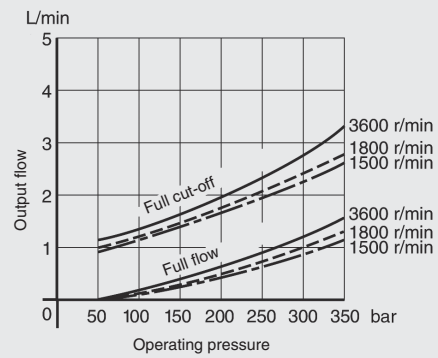
### ● Drive power



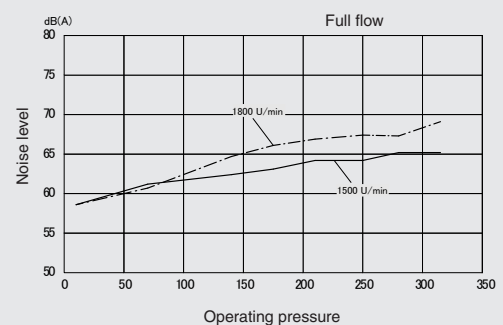
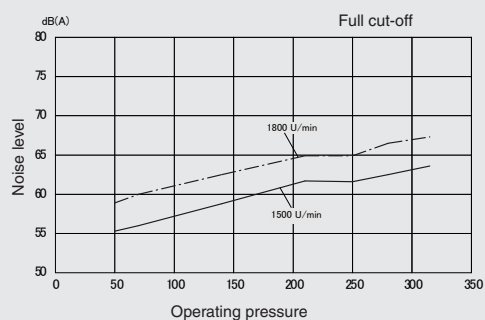
### ● Full cut-off power



### ● Drain

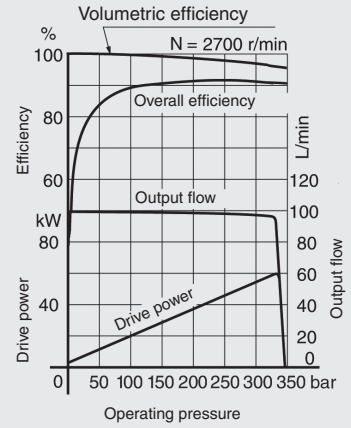
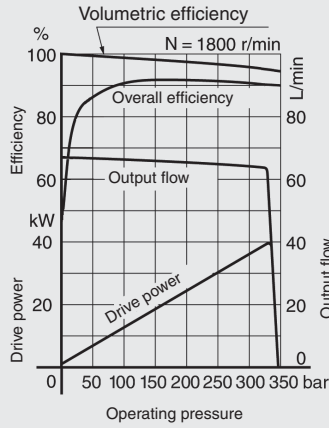
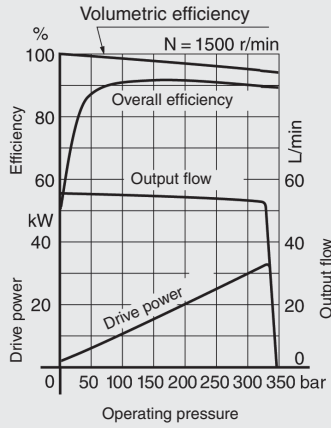


### ● Noise level

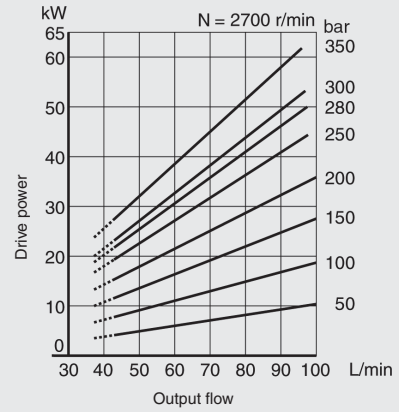
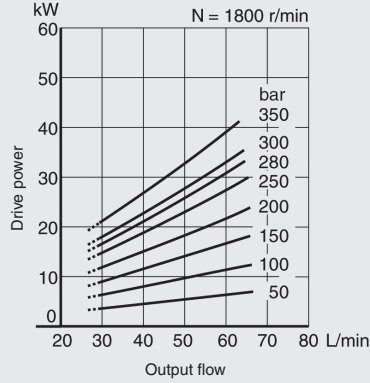
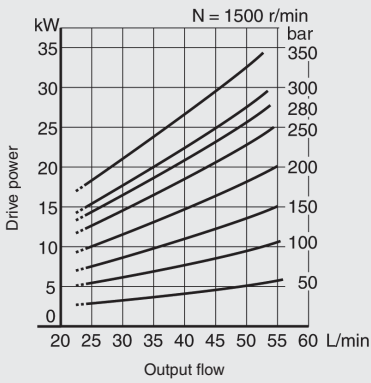


\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

● Performance characteristic curve

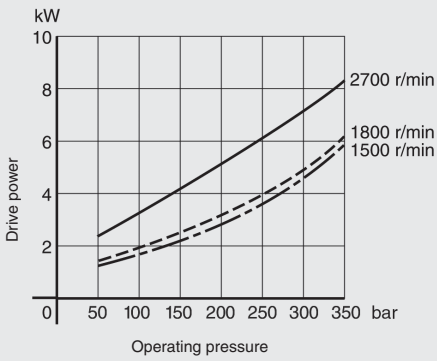


● Drive power

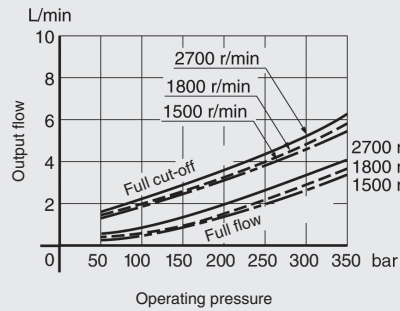


Note: The dotted lines in the graph are below the minimum adjustable flow

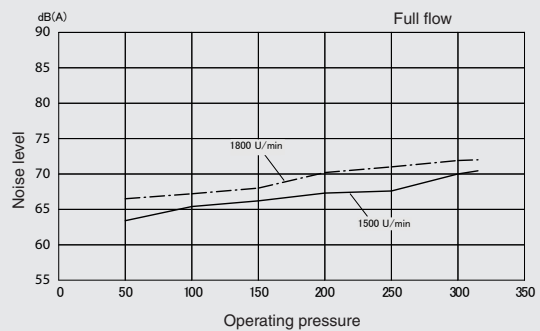
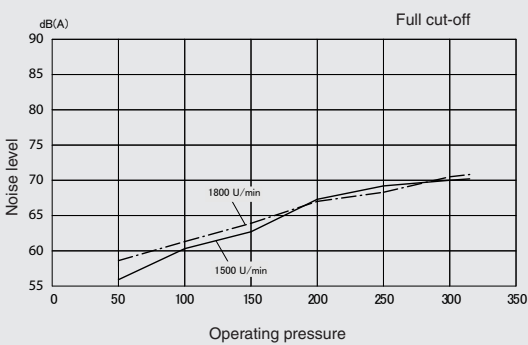
● Full cut-off power



● Drain

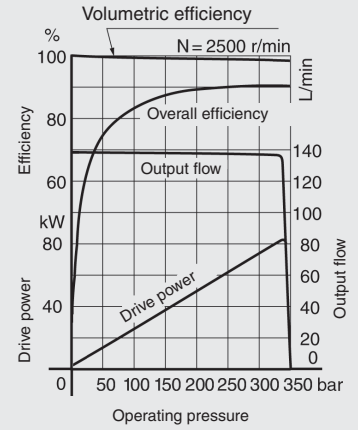
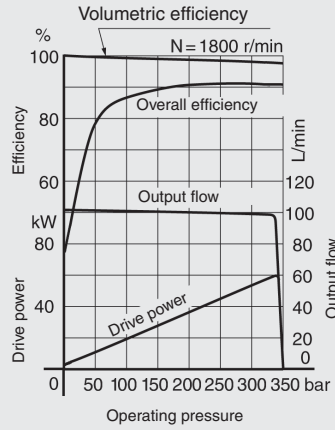
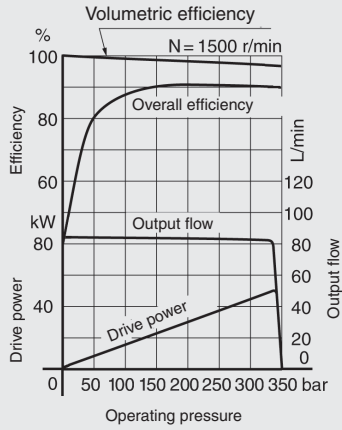


● Noise level

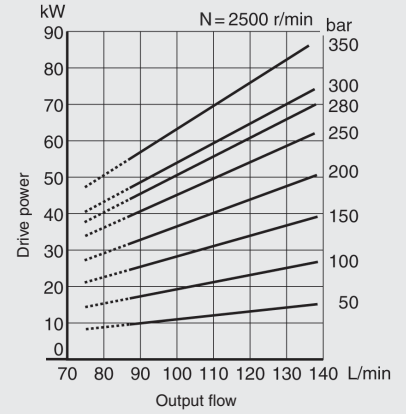
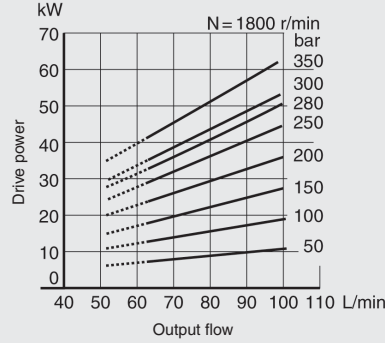
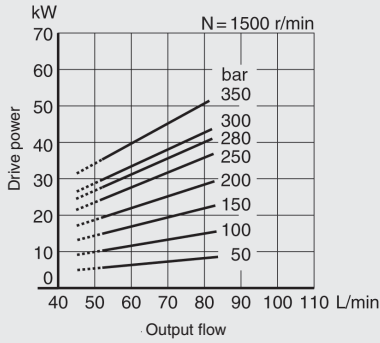


\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

● Performance characteristic curve

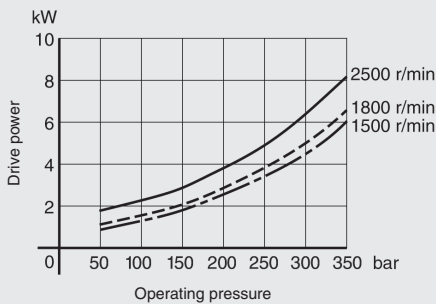


● Drive power

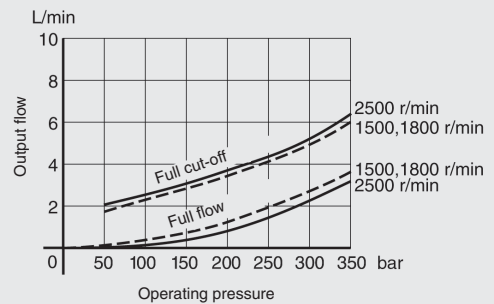


Note: The dotted lines in the graph are below the minimum adjustable flow

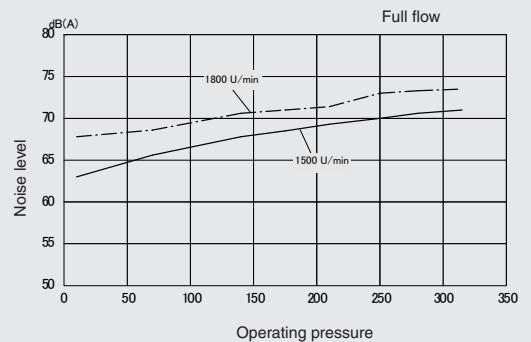
● Full cut-off power



● Drain

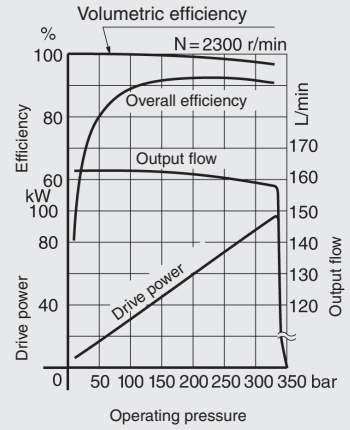
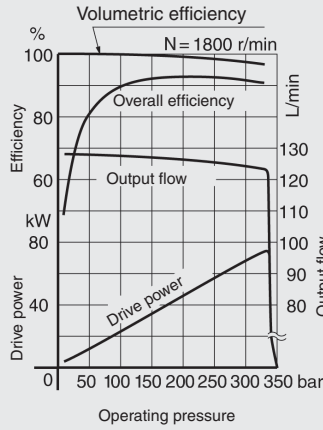
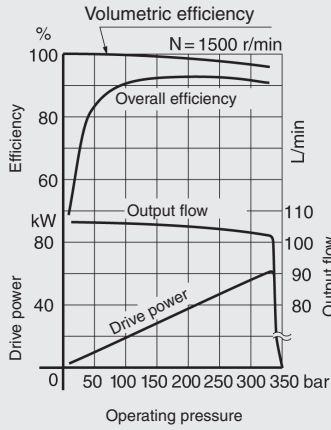


● Noise level

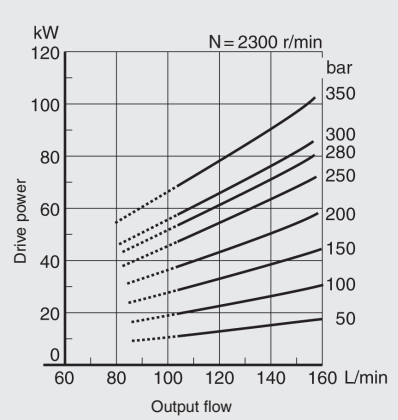
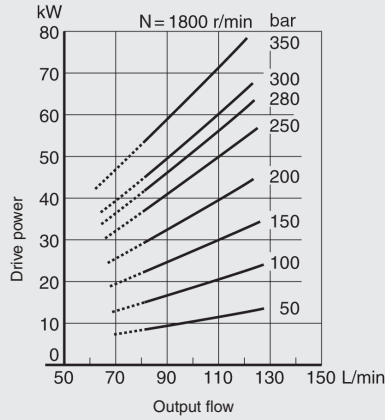
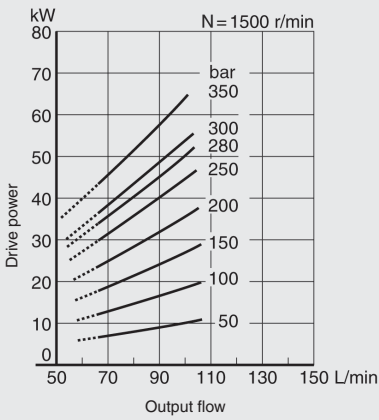


\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

● Performance characteristic curve

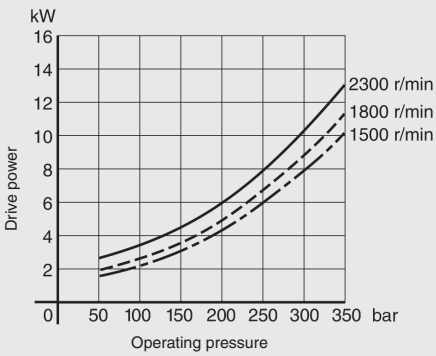


● Drive power

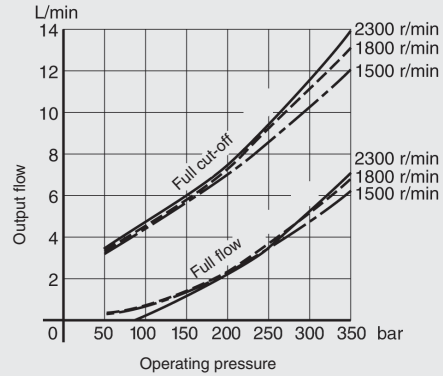


Note: The dotted lines in the graph are below the minimum adjustable flow

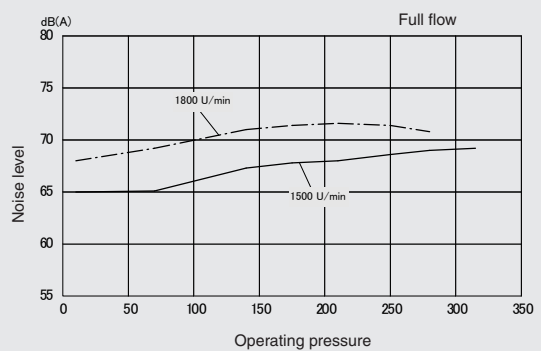
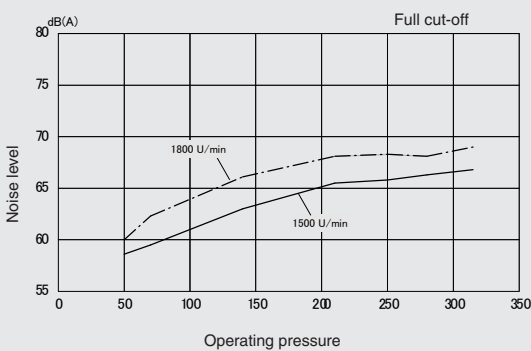
● Full cut-off power



● Drain

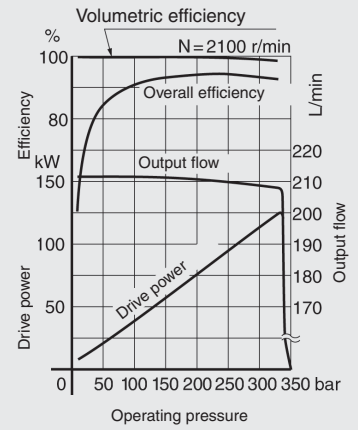
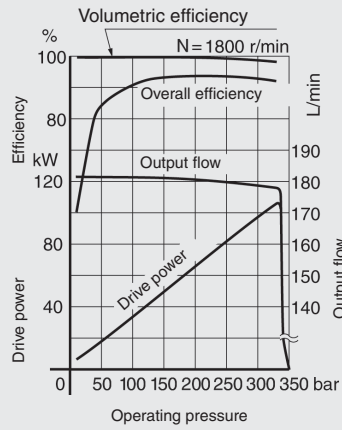
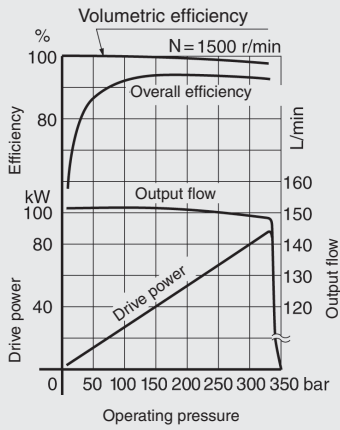


● Noise level

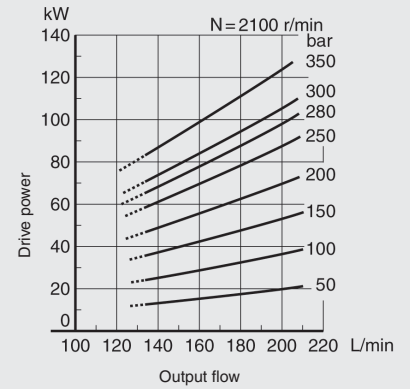
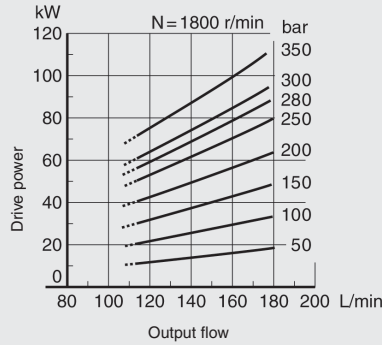
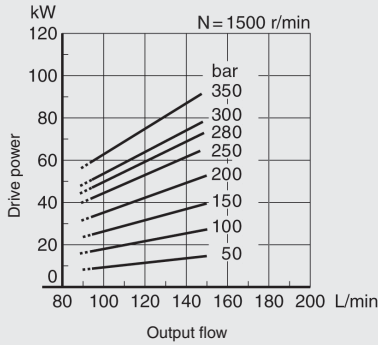


\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

● Performance characteristic curve

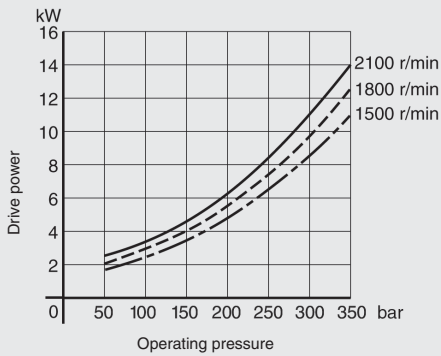


● Drive power

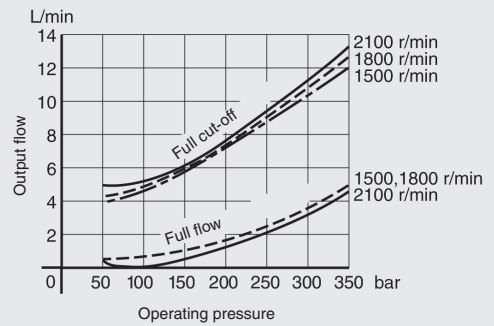


Note: The dotted lines in the graph are below the minimum adjustable flow

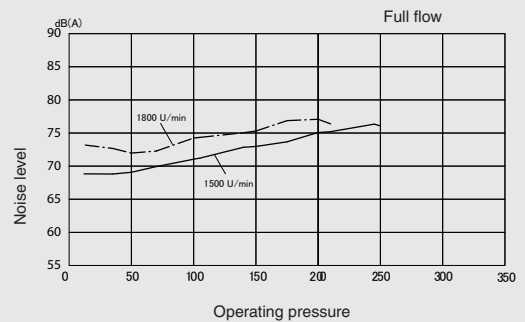
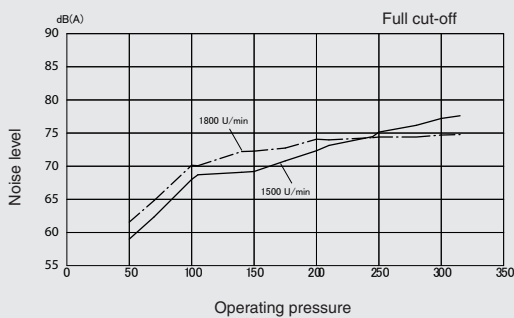
● Full cut-off power



● Drain



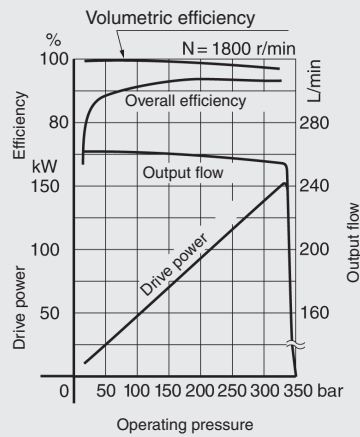
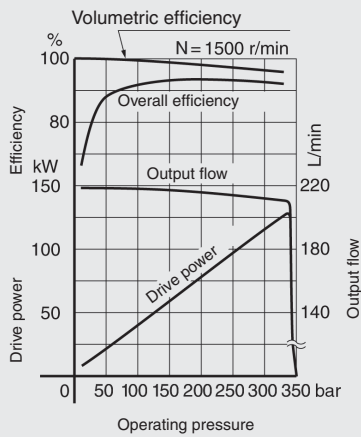
● Noise level



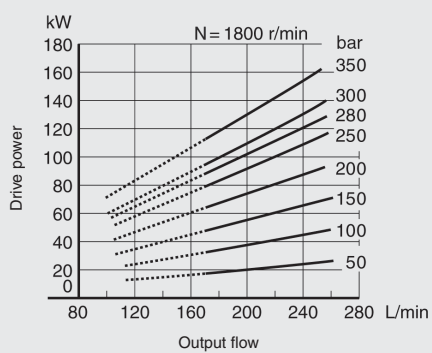
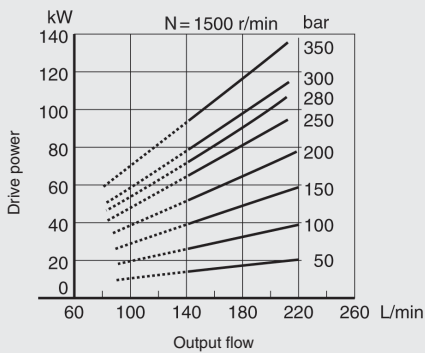
\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

## 2.1.22 PPV100S145

### ● Performance characteristic curve

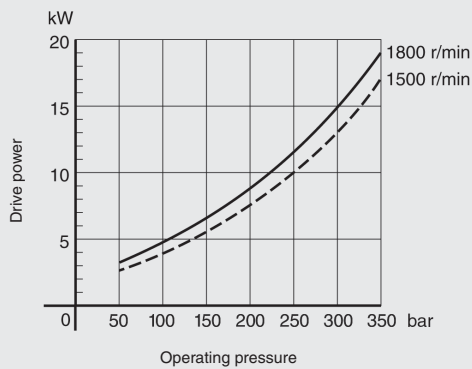


### ● Drive power

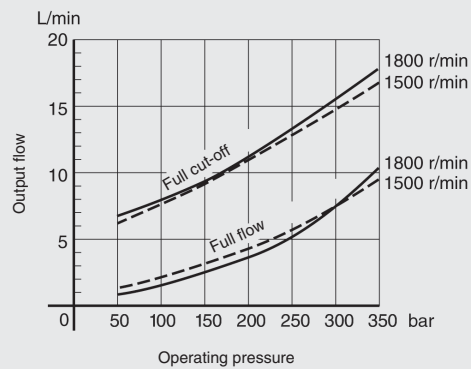


Note: The dotted lines in the graph are below the minimum adjustable flow

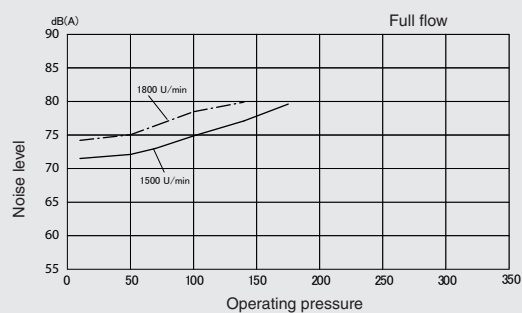
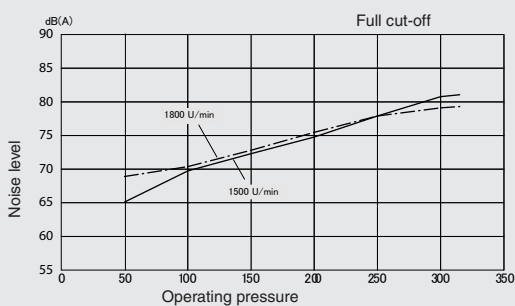
### ● Full cut-off power



### ● Drain



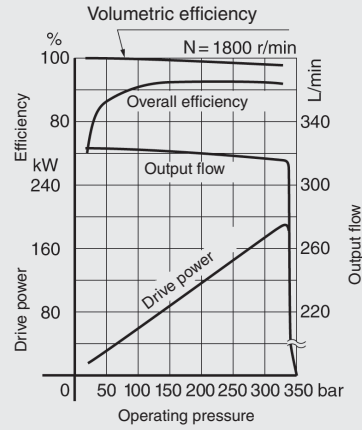
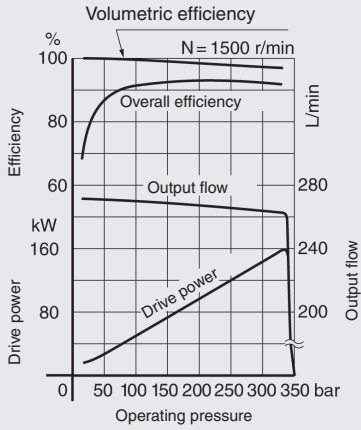
### ● Noise level



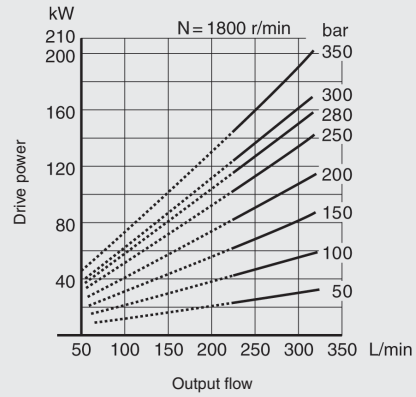
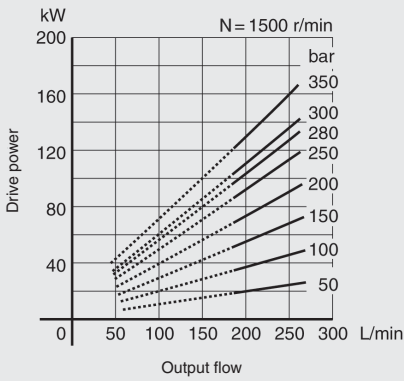
\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

2.1.23 PPV100S180

● Performance characteristic curve

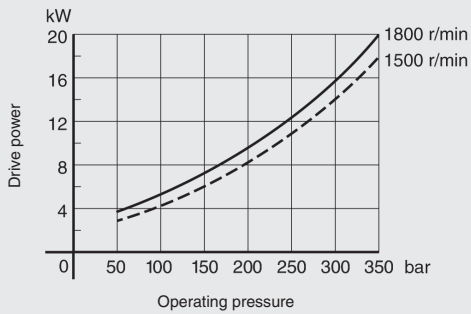


● Drive power

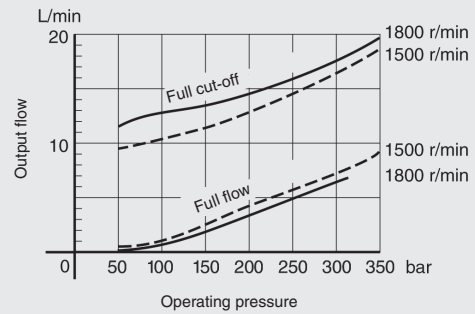


Note: The dotted lines in the graph are below the minimum adjustable flow

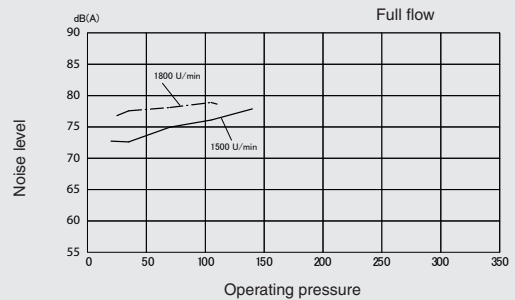
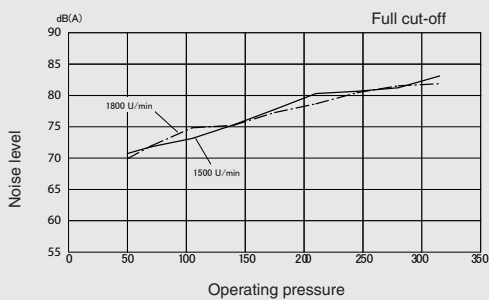
● Full cut-off power



● Drain



● Noise level

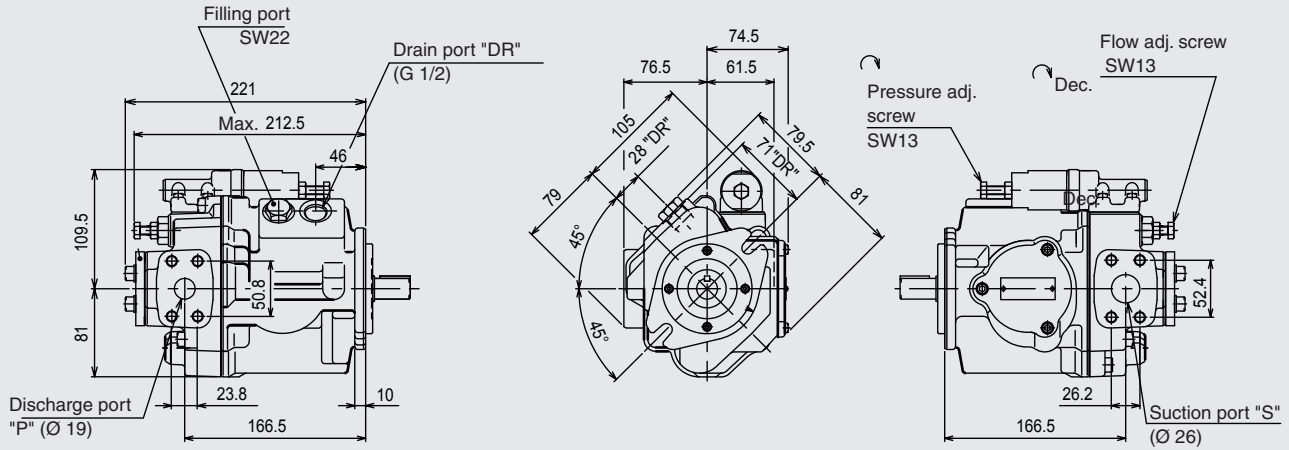


\* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling to DIN45635

# DIMENSIONS

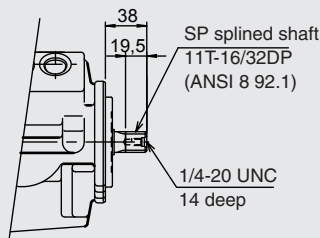
## 2.1.24 PPV100S16

### PPV100S16 with pressure control 01

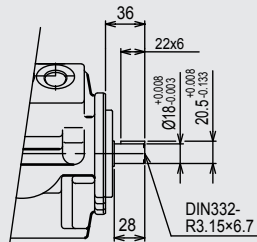


### Mounting flange and shaft options

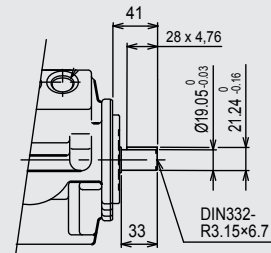
#### "SP" SAE AB Splined shaft



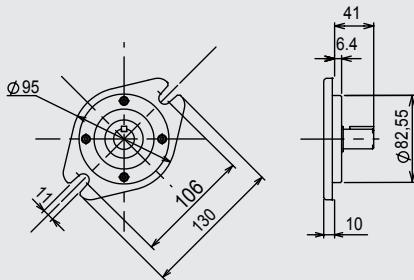
#### "K1" ISO Keyed shaft



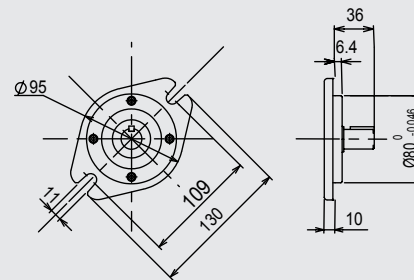
#### "K2" ISO Keyed shaft



#### "U1/U2/J1" SAE A Mounting flange

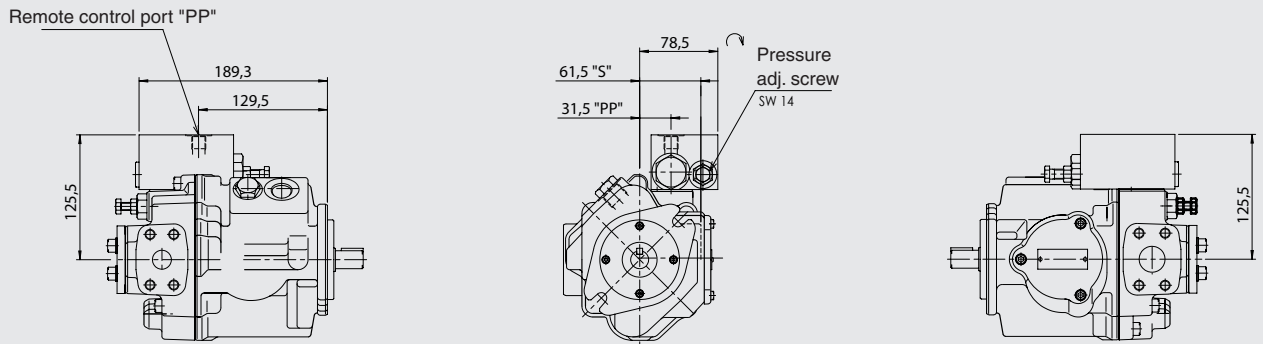


#### "E1" ISO Mounting flange

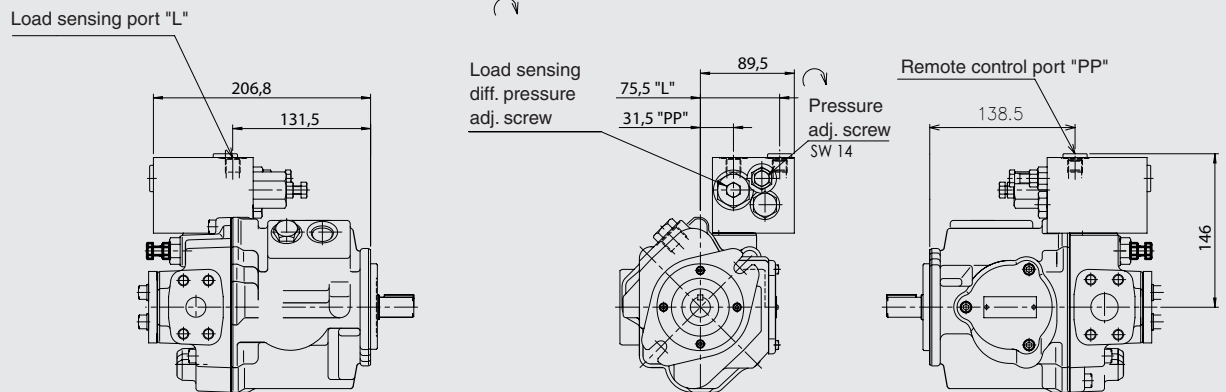


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S16-FR__E1C-10	M10; 19 deep	M10; 19 deep	M22x1.5; 13 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	3/4"	1"
PPV100S16-FR__U1C-10	3/8-16 UNC; 17 deep	3/8-16 UNC; 17 deep	7/8-14 UNF	1/2-20 UNF	1/2-20 UNF	3/4"	1"
PPV100S16-FR__U2C-10	M10; 19 deep	M10; 19 deep	G 1/2; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	3/4"	1"
PPV100S16-FR__J1C-10	M10; 19 deep	M10; 19 deep	Rc 1/2	Rc 1/4; 24 deep	Rc 1/4; 24 deep	3/4"	1"

**PPV100S16 with remote pressure control 07**



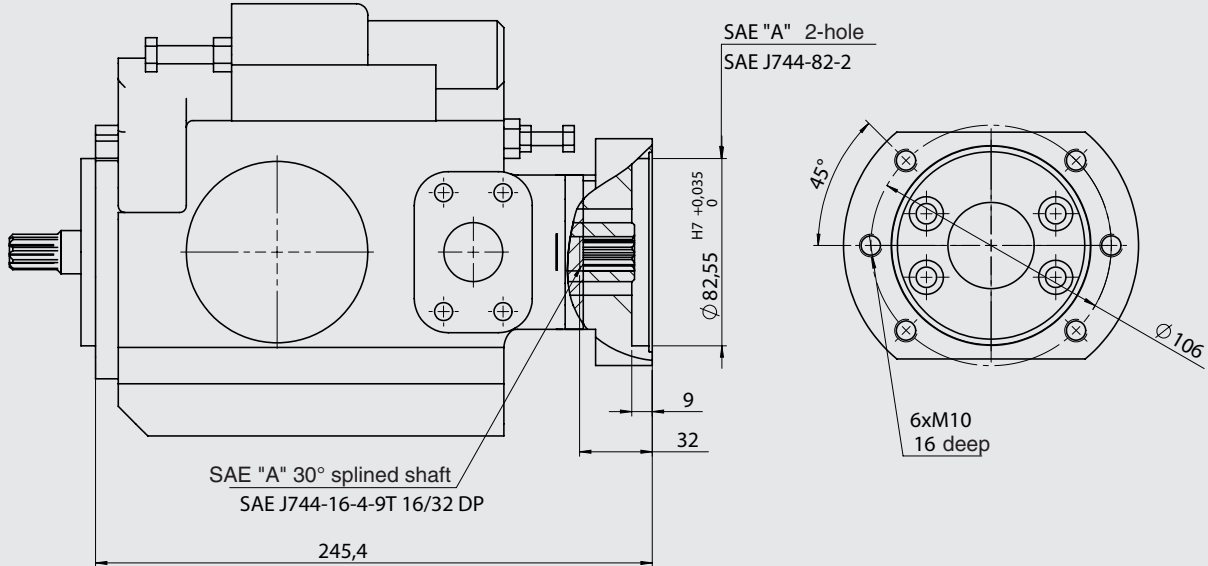
**PPV100S16 with load sensing control 14**



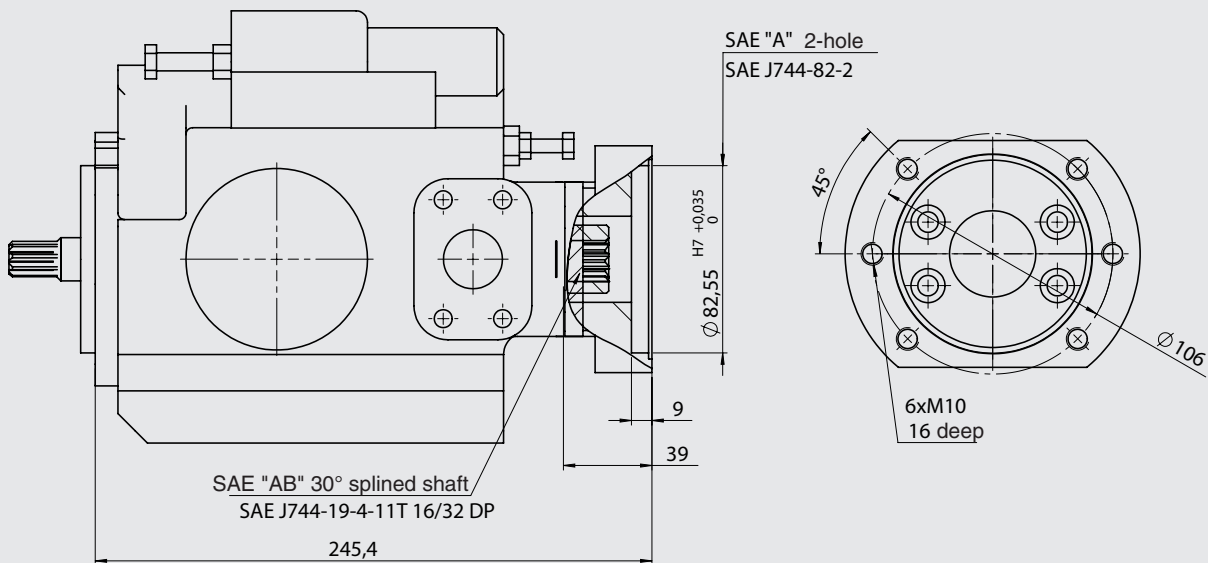
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port	Suction port	Drain port	Remote control port	Load sensing port	"P"	"S"
	"P"	"S"	"DR"	"PP"	"L"		
PPV100S16-FR__E1C-10	M10; 19 deep	M10; 19 deep	M22x1.5; 13 deep	M14x1.5 ; 13 deep	M14x1.5 ; 13 deep	3/4"	1"
PPV100S16-FR__U1C-10	3/8-16 UNC; 17 deep	3/8-16 UNC; 17 deep	7/8-14 UNF	1/2-20 UNF	1/2-20 UNF	3/4"	1"
PPV100S16-FR__U2C-10	M10; 19 deep	M10; 19 deep	G 1/2; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	3/4"	1"
PPV100S16-FR__J1C-10	M10; 19 deep	M10; 19 deep	Rc 1/2	Rc 1/4; 24 deep	Rc 1/4; 24 deep	3/4"	1"

PPV100S16 Through drive options

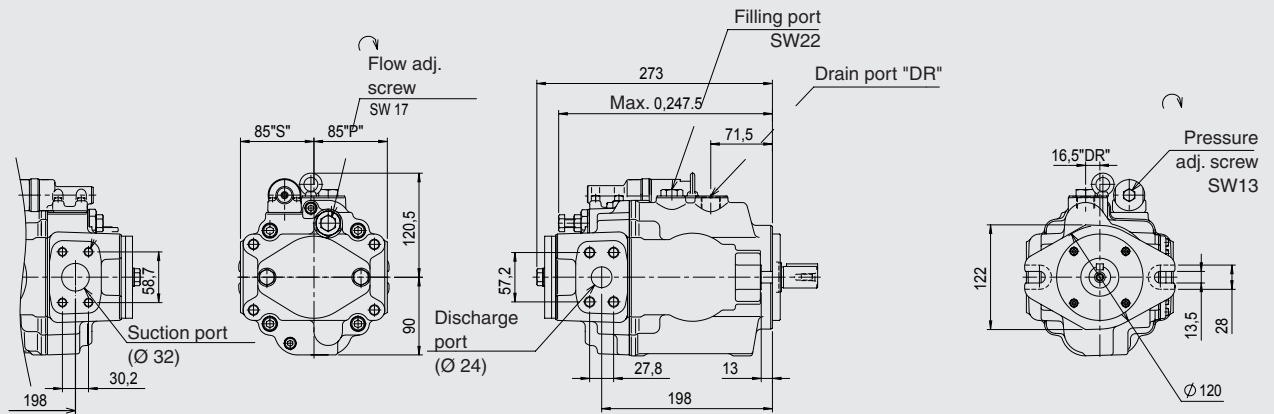
Through drive "SAE A"



Through drive "SAE AB"

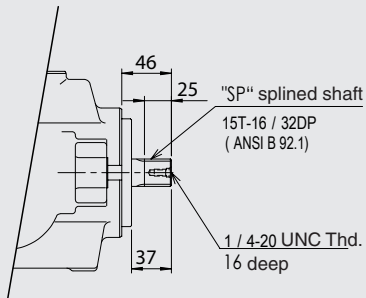


PPV100S37 with pressure control 01

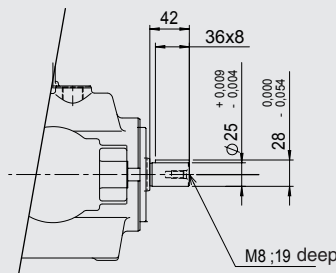


Mounting flange and shaft options

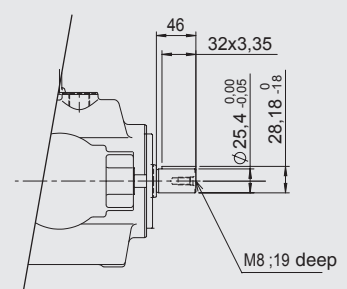
"SP" SAE BB Splined shaft



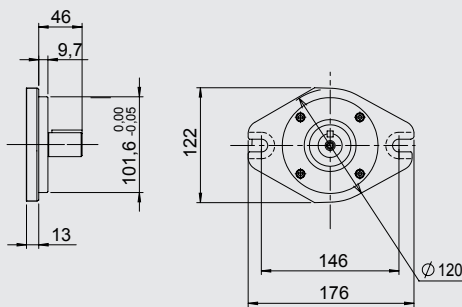
"K1" ISO Keyed shaft



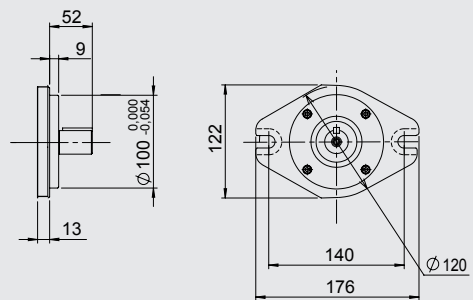
"K2" ISO Keyed shaft



"U1/U2/J1" SAE B Mounting flange



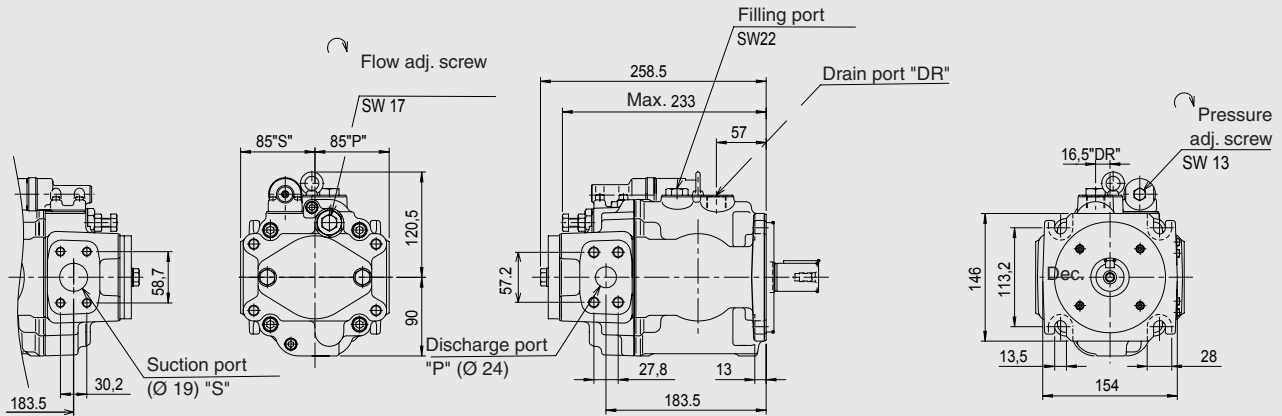
"E1" ISO Mounting flange



Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S37-FR__E1_-10	M12; 22 deep	M12; 22 deep	M22x1.5; 13 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1"	1 1/4"
PPV100S37-FR__U1C-10	7/16-14 UNC; 20 deep	7/16-14 UNC; 20 deep	7/8-14 UNF	1/2-20 UNF	1/2-20 UNF	1"	1 1/4"
PPV100S37-FR__U2C-10	M12; 22 deep	M10; 18 deep	G 1/2; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/4"
PPV100S37-FR__J1C-10	M12; 22 deep	M10; 18 deep	Rc 1/2	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/4"

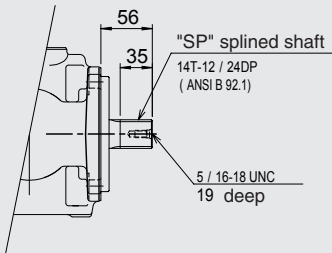
## 2.1.26 PPV100S37 with 4-hole mounting flange

### PPV100S37 with pressure control 01

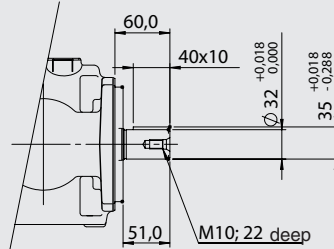


### Mounting flange and shaft options

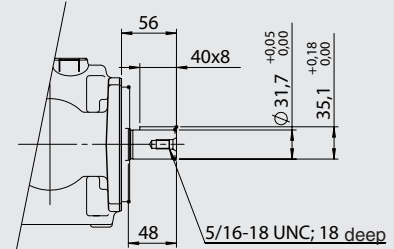
#### "SP" SAE C Splined shaft



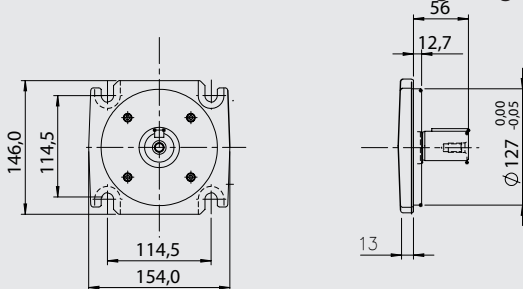
#### "K1" ISO Keyed shaft



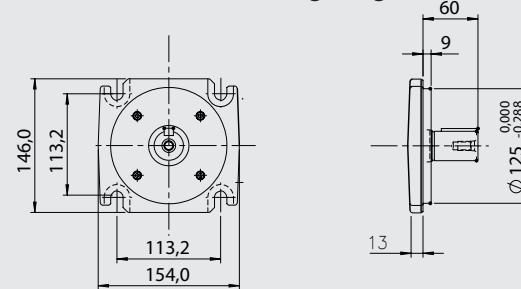
#### "K2" ISO Keyed shaft



#### "U1/U2/J1" SAE C Mounting flange

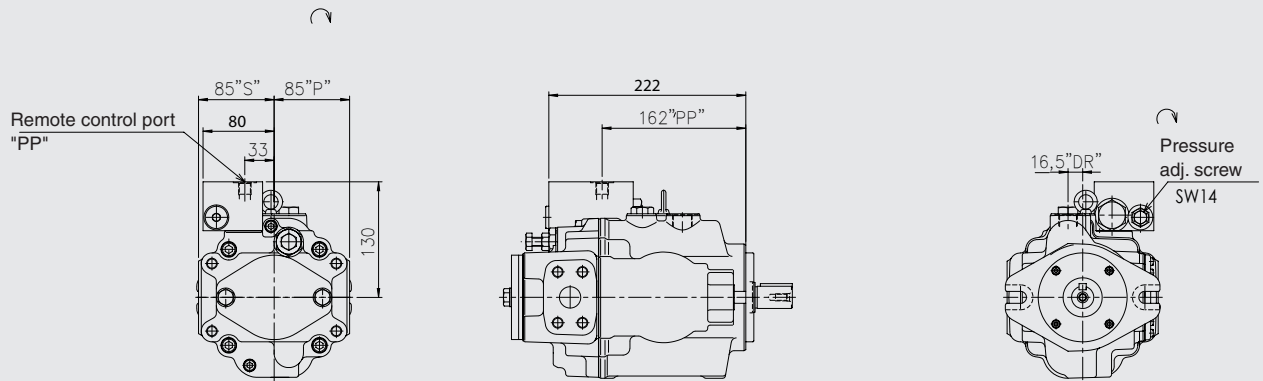


#### "E1" ISO Mounting flange

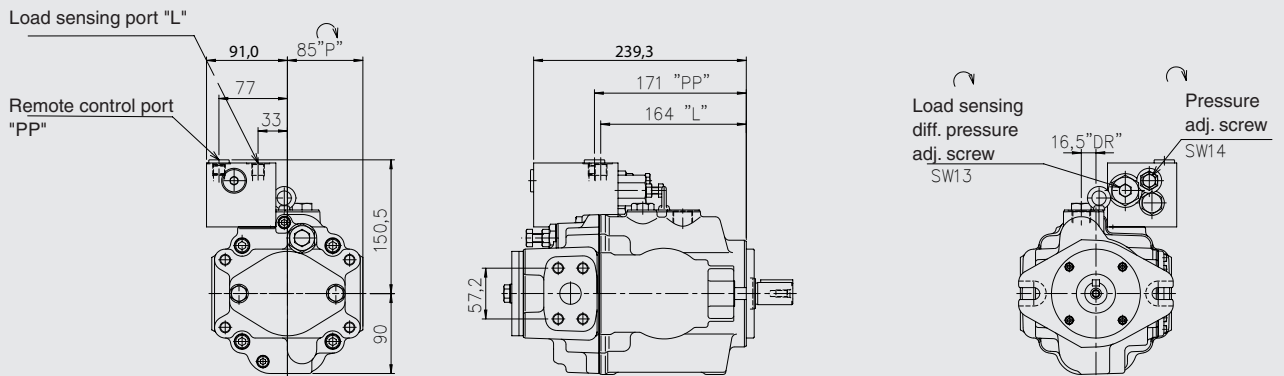


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S37-FR__E1_-10	M12; 22 deep	M10; 18 deep	M22x1.5; 13 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1"	1 1/4"
PPV100S37-FR__U1_-10	7/16-14 UNC; 20 deep	7/16-14 UNC; 20 deep	7/8-14 UNF	1/2-20 UNF	1/2-20 UNF	1"	1 1/4"
PPV100S37-FR__U2_-10	M12; 22 deep	M10; 18 deep	G 1/2; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/4"
PPV100S37-FR__J1_-10	M12; 22 deep	M10; 18 deep	Rc 1/2	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/4"

**PPV100S37 with remote pressure control 07**



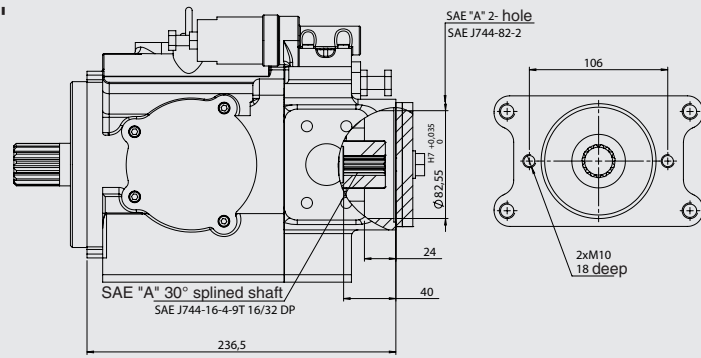
**PPV100S37 with load sensing control 14**



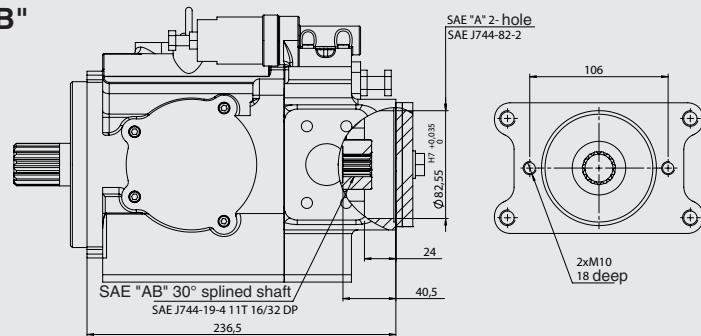
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port	Suction port	Drain port	Remote control port	Load sensing port	"P"	"S"
	"P"	"S"	"DR"	"PP"	"L"	"P"	"S"
PPV100S37-FR__E1_-10	M12; 22 deep	M10; 18 deep	M22x1.5; 13 deep	M14x1.5; 13 deep	M14x1.5 ; 13 deep	1"	1 1/4"
PPV100S37-FR__U1_-10	7/16-14 UNC; 20 deep	7/16-14 UNC; 20 deep	7/8-14 UNF	1/2-20 UNF	1/2-20 UNF	1"	1 1/4"
PPV100S37-FR__U2_-10	M12; 22 deep	M10; 18 deep	G 1/2; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/4"
PPV100S37-FR__J1_-10	M12; 22 deep	M10; 18 deep	Rc 1/2	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/4"

PPV100S37 Through drive options

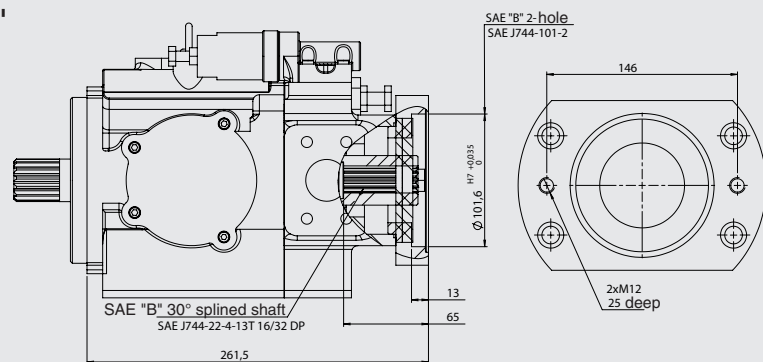
Through drive "SAE A"



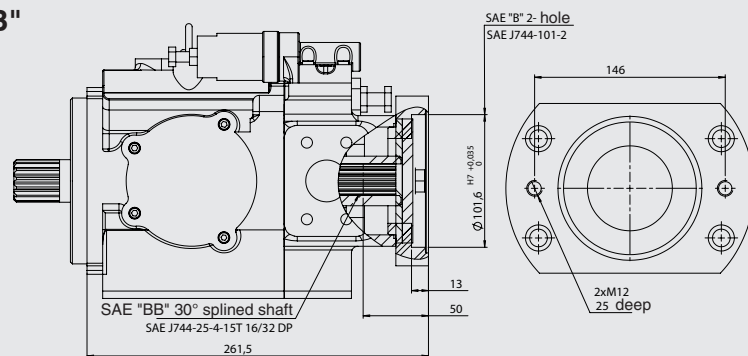
Through drive "SAE AB"



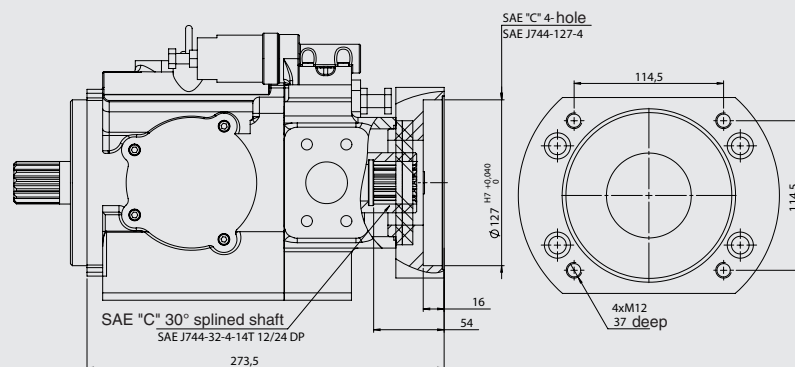
Through drive "SAE B"



Through drive "SAE BB"

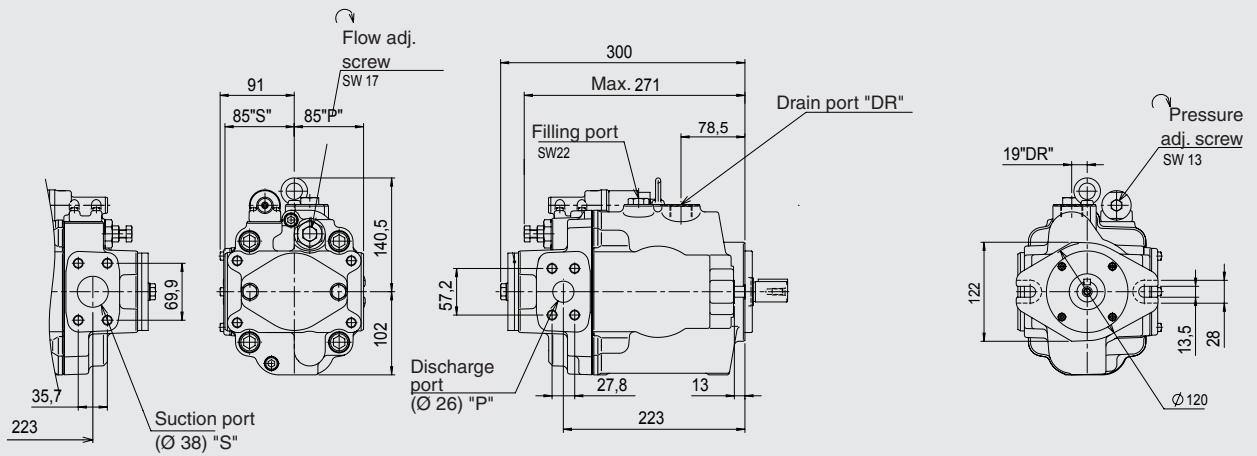


Through drive "SAE C"



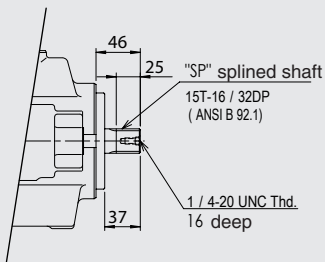
## 2.1.27 PPV100S56 with 2-hole mounting flange

### PPV100S56 with pressure control 01

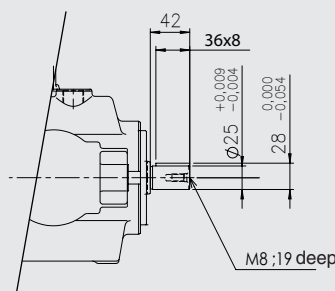


### Mounting flange and shaft options

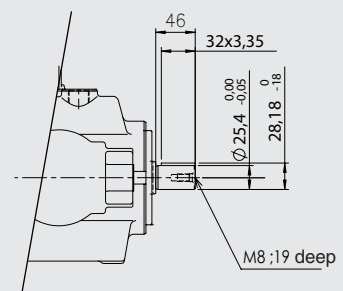
#### "SP" SAE BB Splined shaft



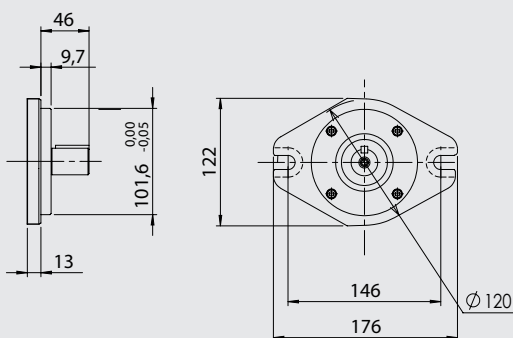
#### "K1" ISO Keyed shaft



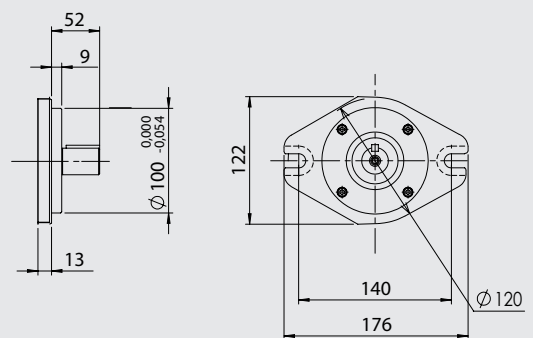
#### "K2" ISO Keyed shaft



#### "U1/U2/J1" SAE B Mounting flange



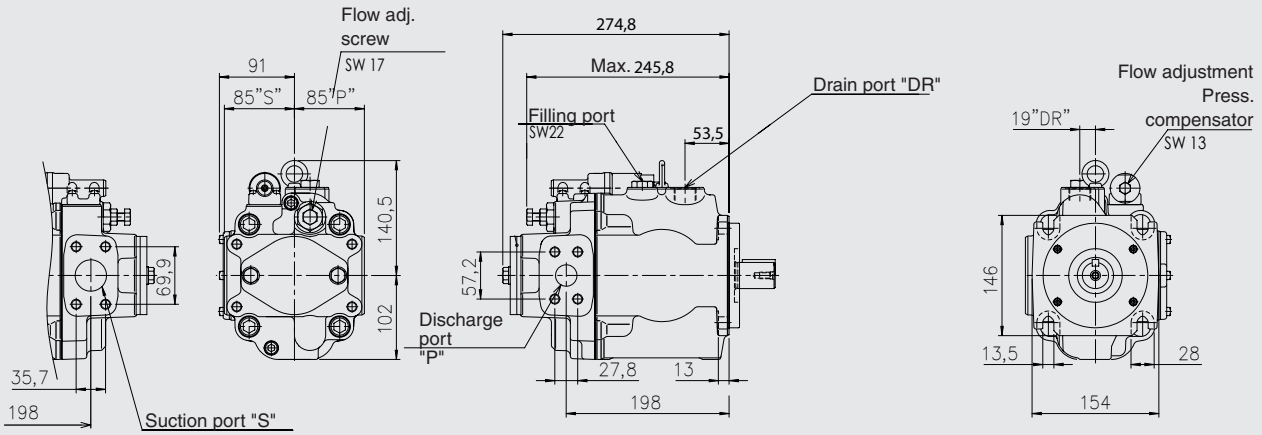
#### "E1" ISO Mounting flange



Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S56-FR__E1_-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1"	1 1/2"
PPV100S56-FR__U1_-10	7/16-14 UNC; 20 deep	1/2-13 UNC	7/8-14 UN	1 1/16-12 UNF	1/2-20 UNF	1"	1 1/2"
PPV100S56-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/2"
PPV100S56-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/2"

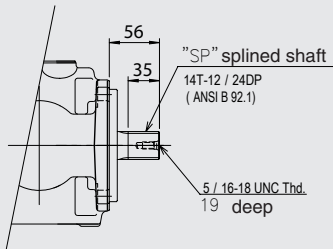
## 2.1.28 PPV100S56 with 4-hole mounting flange

### PPV100S56 with pressure control 01

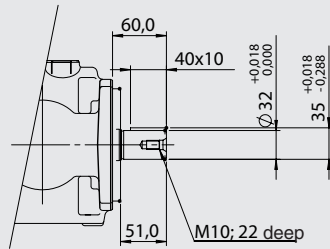


### Mounting flange and shaft options

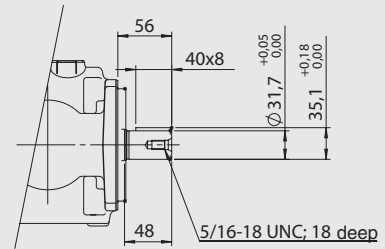
#### "SP" SAE C Splined shaft



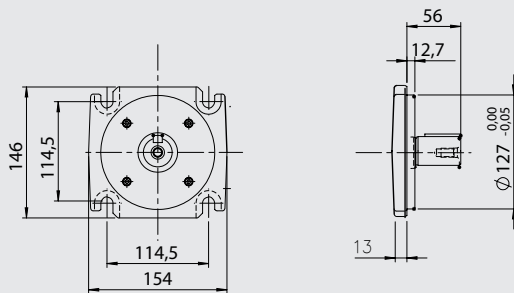
#### "K1" ISO Keyed shaft



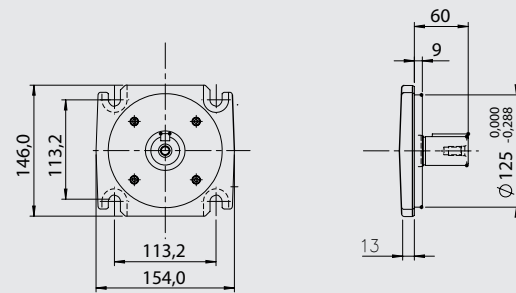
#### "K2" ISO Keyed shaft



#### "U1/U2/J1" SAE C Mounting flange

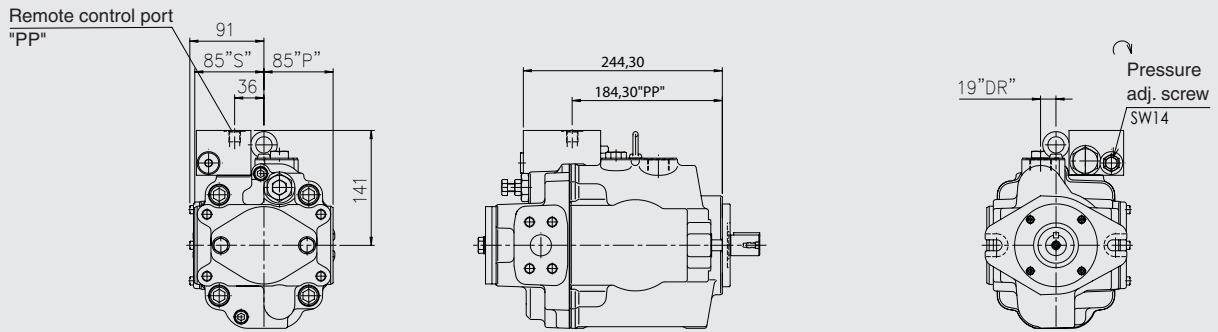


#### "E1" ISO Mounting flange

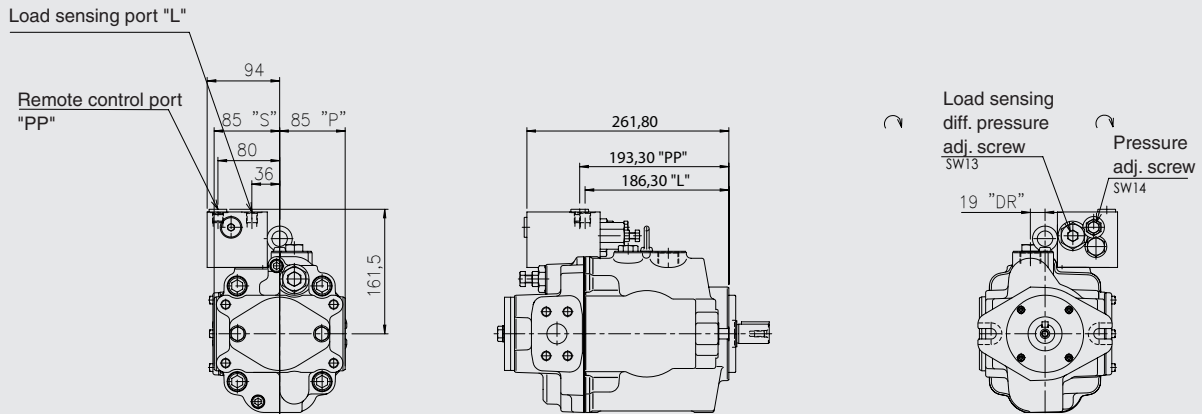


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S56-FR__E1_-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1"	1 1/2"
PPV100S56-FR__U1_-10	7/16-14 UNC; 20 deep	1/2-13 UNC	7/8-14 UN	1 1/16-12 UNF	1/2-20 UNF	1"	1 1/2"
PPV100S56-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/2"
PPV100S56-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/2"

**PPV100S56 with remote pressure control 07**



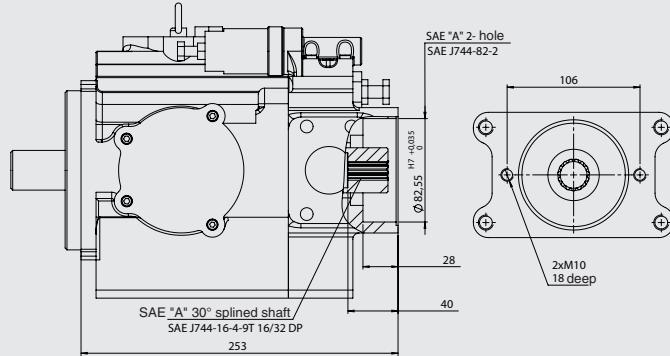
**PPV100S56 with load sensing control 14**



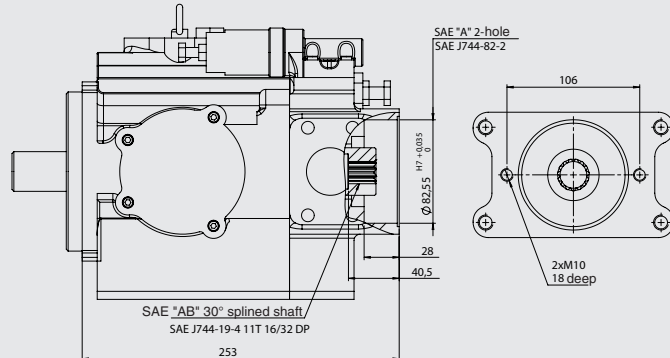
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S56-FR__E1_-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1"	1 1/2"
PPV100S56-FR__U1_-10	7/16-14 UNC; 20 deep	1/2-13 UNC	7/8-14 UN	1 1/16-12 UNF	1/2-20 UNF	1"	1 1/2"
PPV100S56-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1"	1 1/2"
PPV100S56-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1"	1 1/2"

PPV100S56 Through drive options

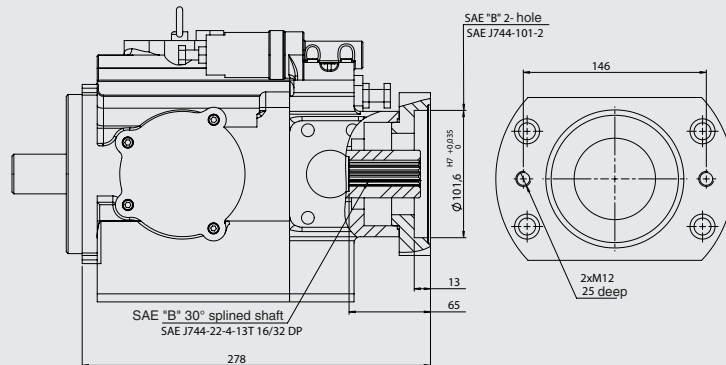
Through drive "SAE A"



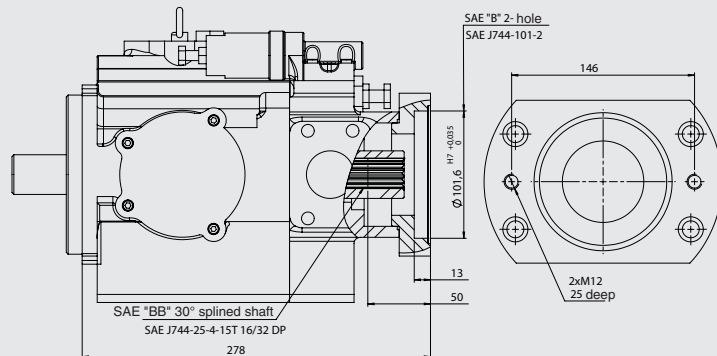
Through drive "SAE AB"



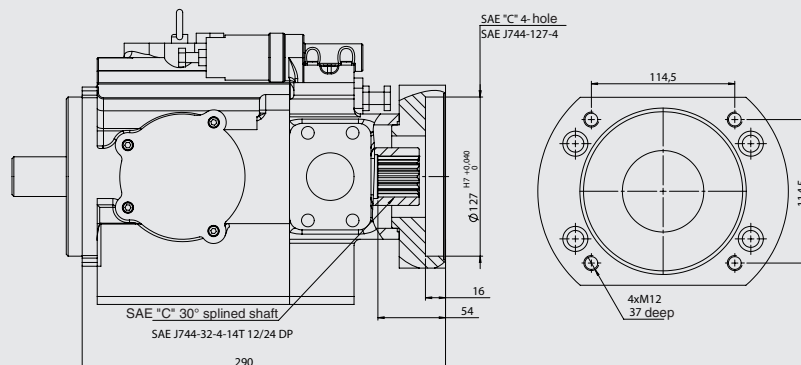
Through drive "SAE B"



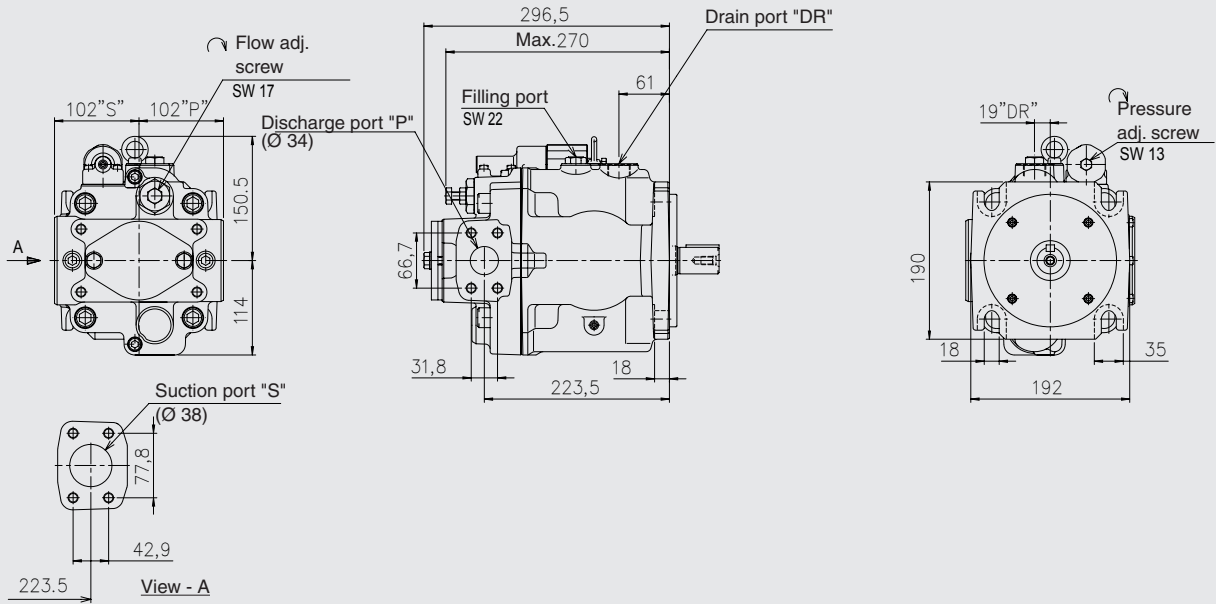
Through drive "SAE BB"



Through drive "SAE C"

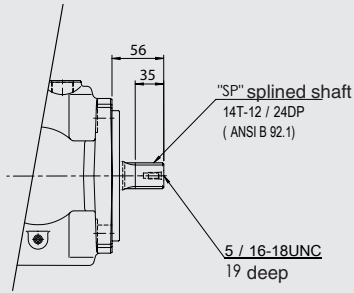


PPV100S71 with pressure control 01

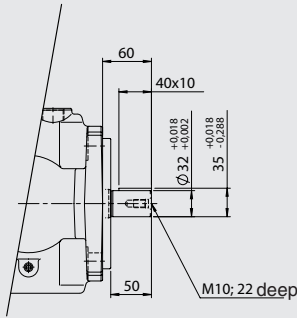


Mounting flange and shaft options

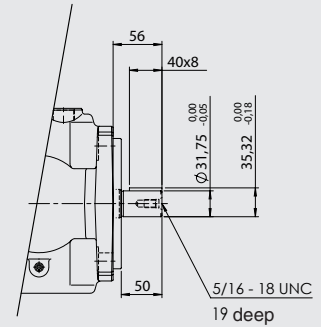
"SP" SAE C Splined shaft



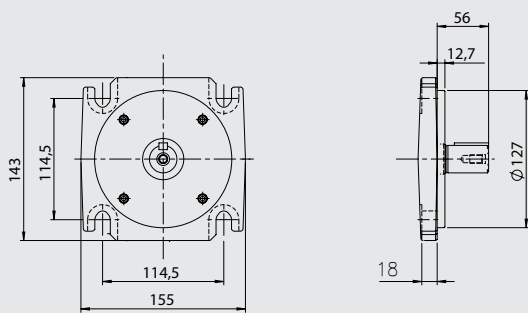
"K1" ISO Keyed shaft



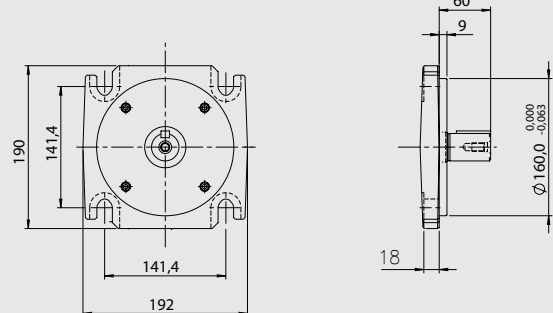
"K2" ISO Keyed shaft



"U1/U2/J1" SAE C Mounting flange

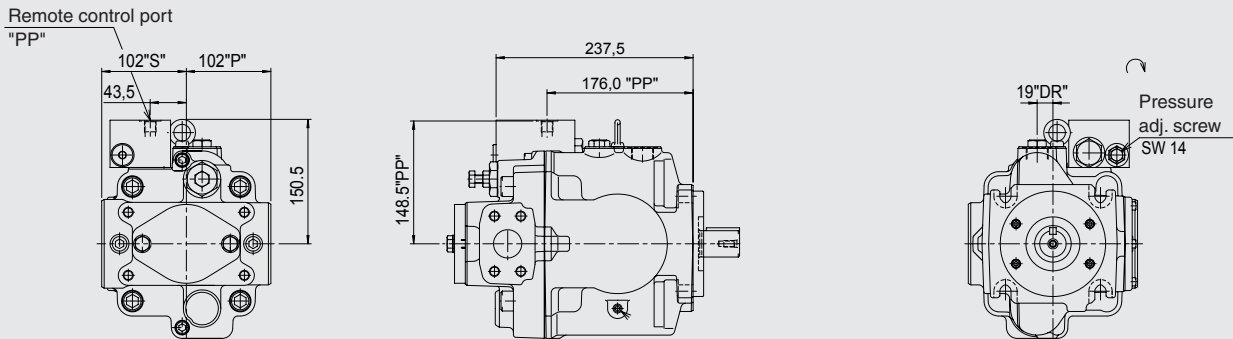


"E1" ISO Mounting flange

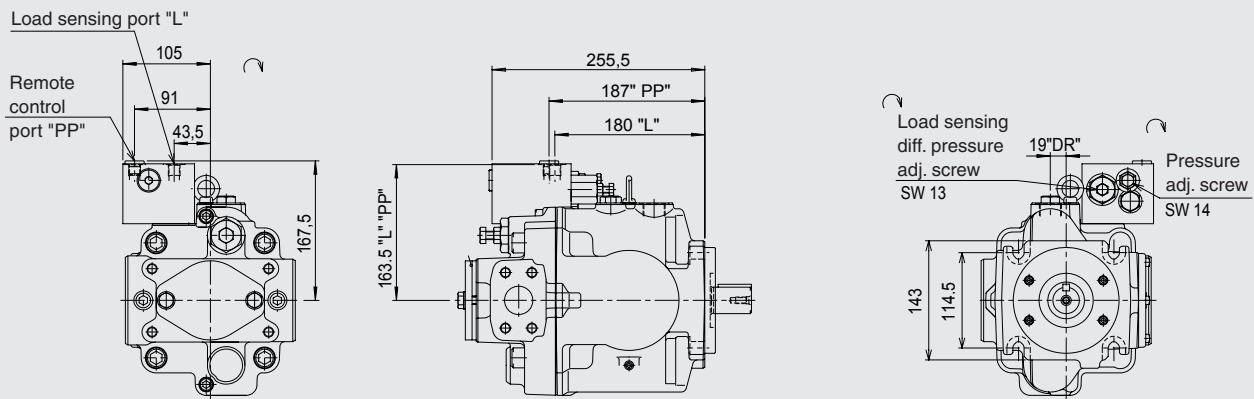


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S71-FR__E1_-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2"
PPV100S71-FR__U1_-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2"
PPV100S71-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2"
PPV100S71-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2"

### PPV100S71 with remote pressure control 07



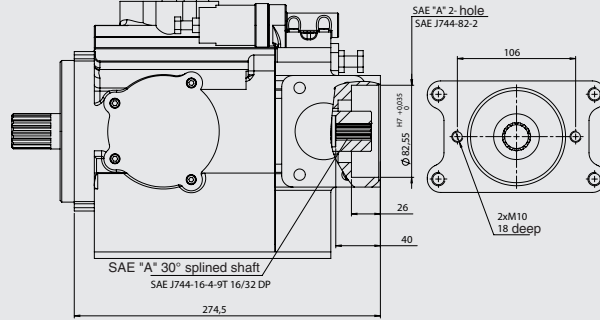
### PPV100S71 with load sensing control 14



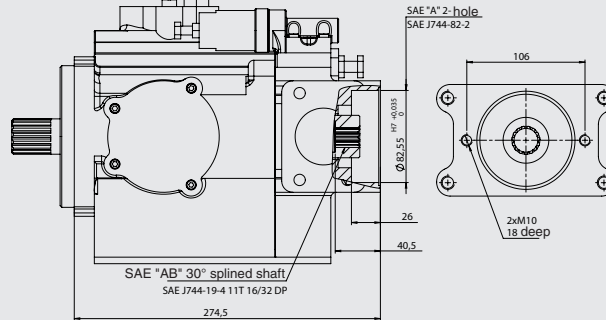
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S71-FR__E1_-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2"
PPV100S71-FR__U1_-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2"
PPV100S71-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2"
PPV100S71-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2"

PPV100S71 Through drive options

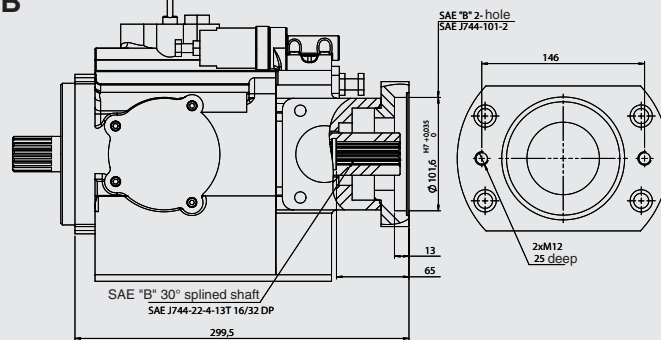
Through drive "SAE A"



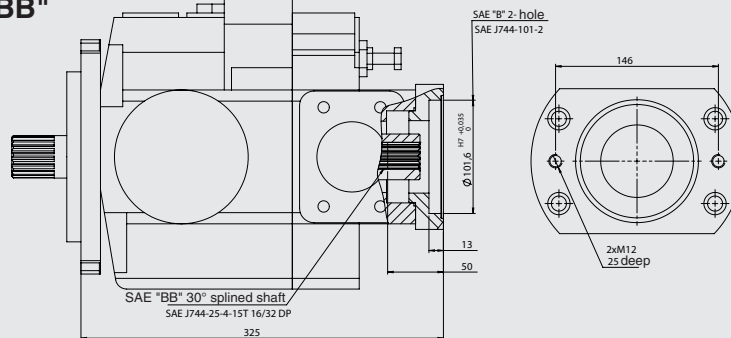
Through drive "SAE AB"



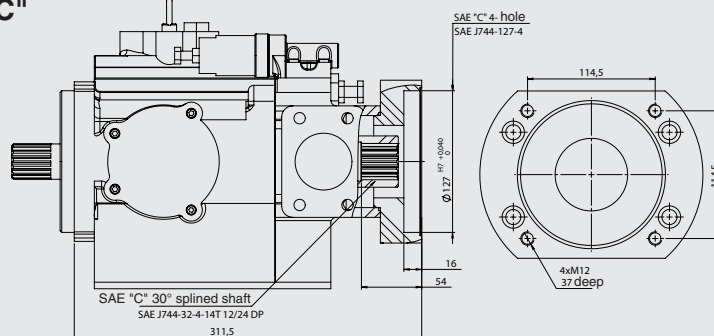
Through drive "SAE B"



Through drive "SAE BB"

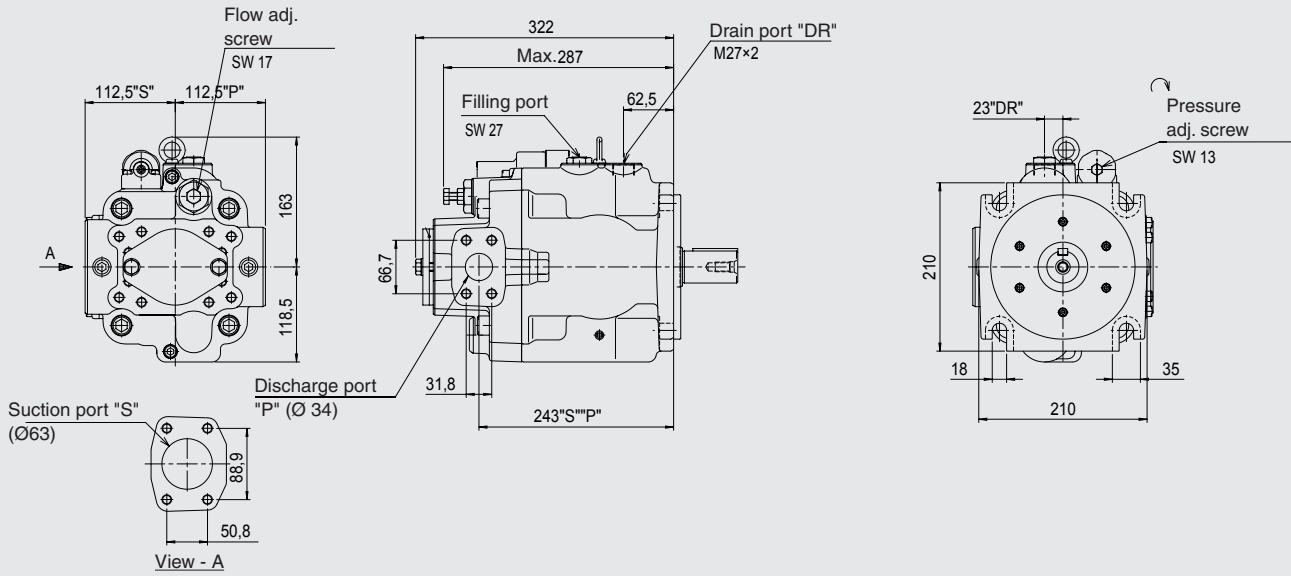


Through drive "SAE C"



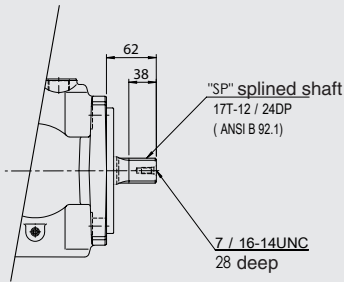
## 2.1.30 PPV100S100

### PPV100S100 with pressure control 01

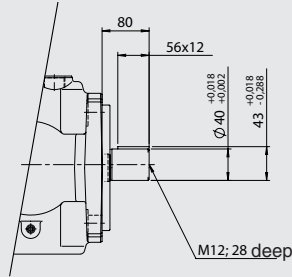


### Mounting flange and shaft options

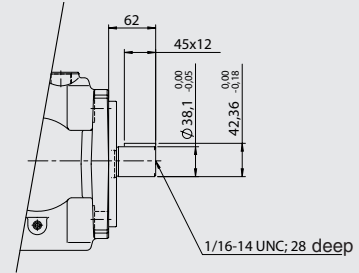
#### "SP" SAE CC Splined shaft



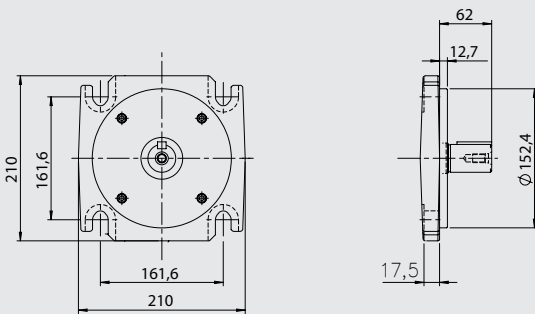
#### "K1" ISO Keyed shaft



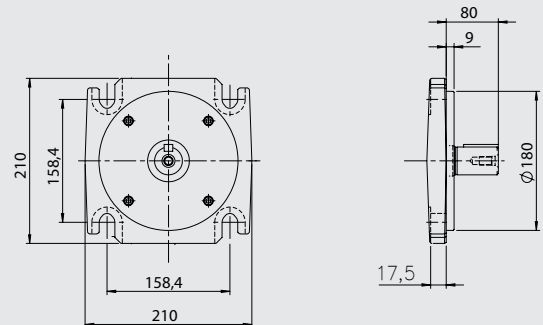
#### "K2" ISO Keyed shaft



#### "U1/U2/J1" SAE D Mounting flange

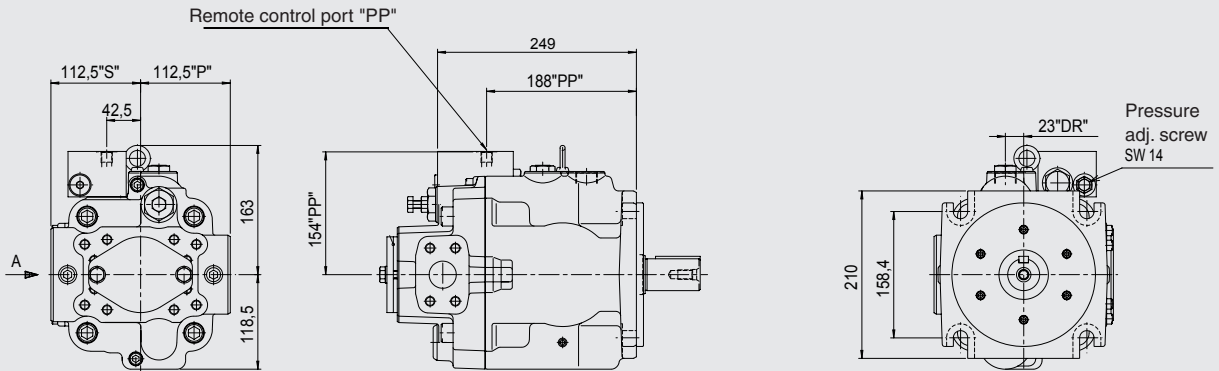


#### "E1" ISO Mounting flange

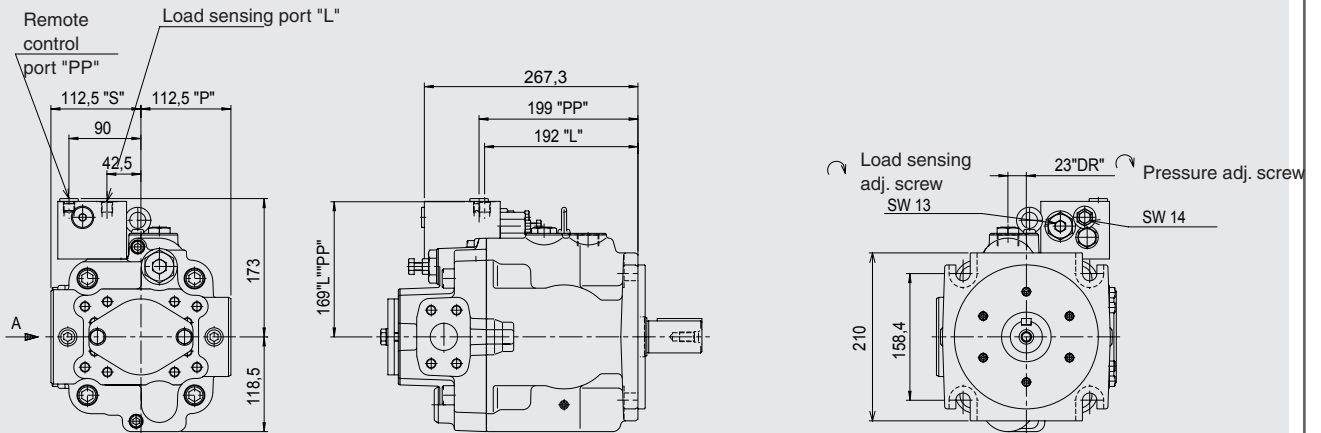


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S100-FR__E1D-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2 1/2"
PPV100S100-FR__U1D-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2 1/2"
PPV100S100-FR__U2D-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2 1/2"
PPV100S100-FR__J1D-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2 1/2"

**PPV100S100 with remote pressure control 07**



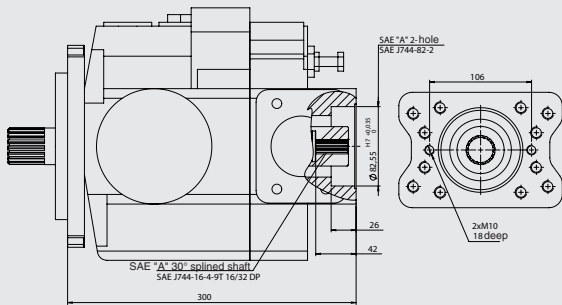
**PPV100S100 with load sensing control 14**



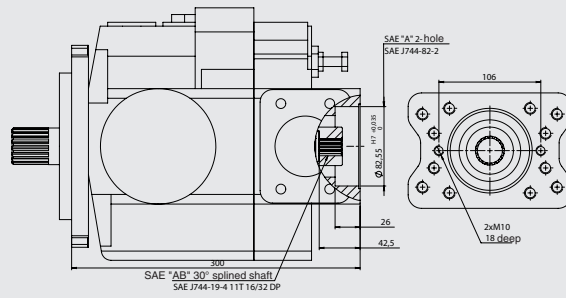
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S100-FR__E1D-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2 1/2"
PPV100S100-FR__U1_-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2 1/2"
PPV100S100-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2 1/2"
PPV100S100-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2 1/2"

PPV100S100 Through drive options

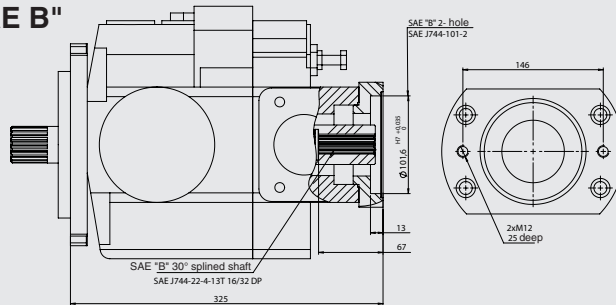
Through drive "SAE A"



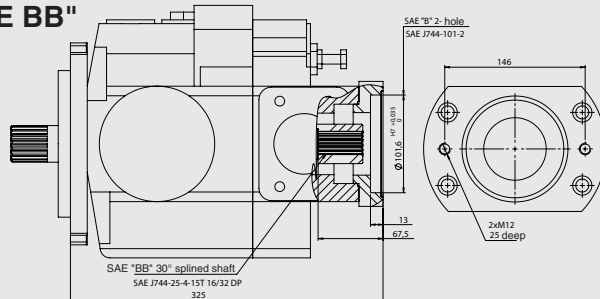
Through drive "SAE AB"



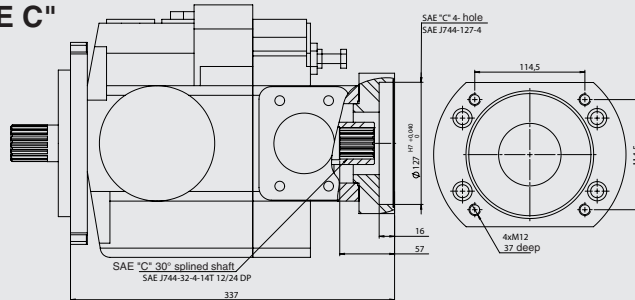
Through drive "SAE B"



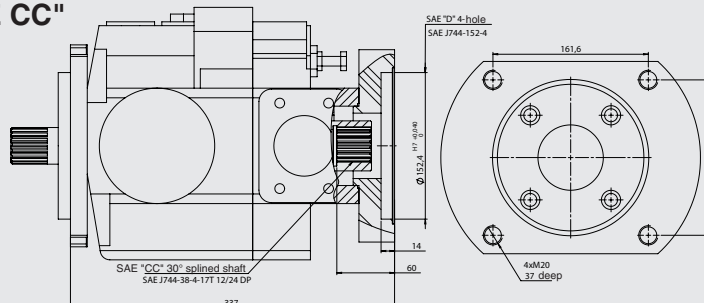
Through drive "SAE BB"



Through drive "SAE C"

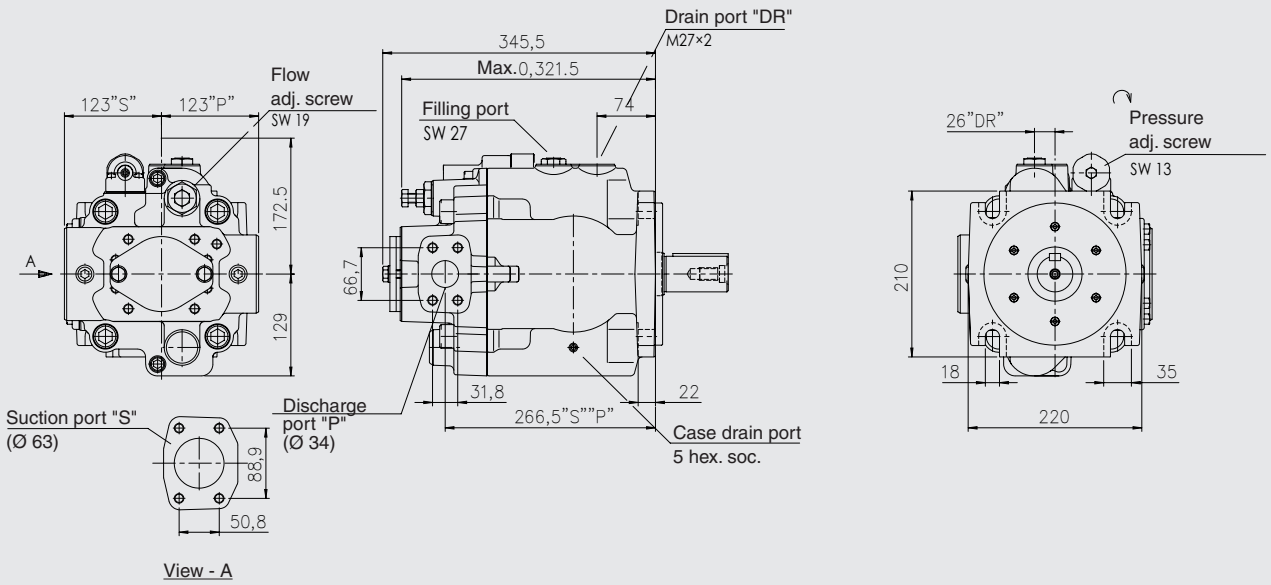


Through drive "SAE D"  
Splined shaft "SAE CC"



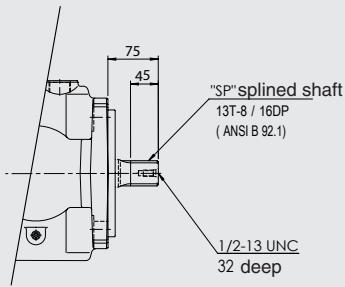
2.1.31 PPV100S145

PPV100S145 with pressure control 01

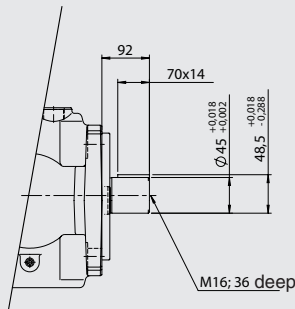


Mounting flange and shaft options

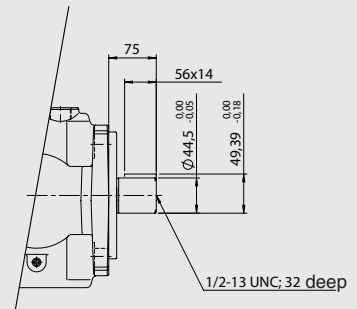
"SP" SAE D Splined shaft



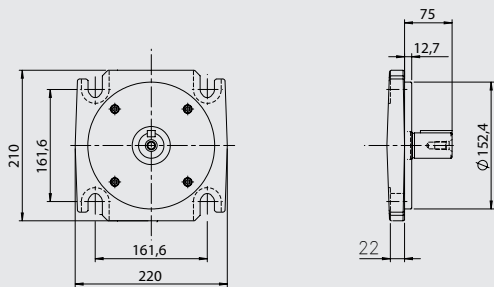
"K1" ISO Keyed shaft



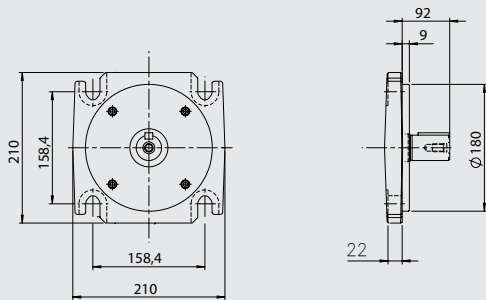
"K2" ISO Keyed shaft



"U1/U2/J1" SAE D Mounting flange

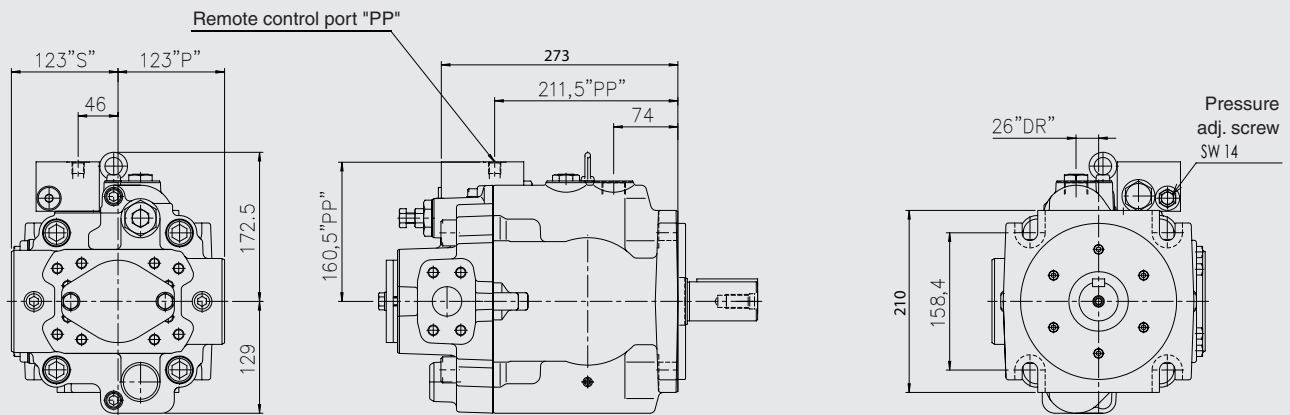


"E1" ISO Mounting flange

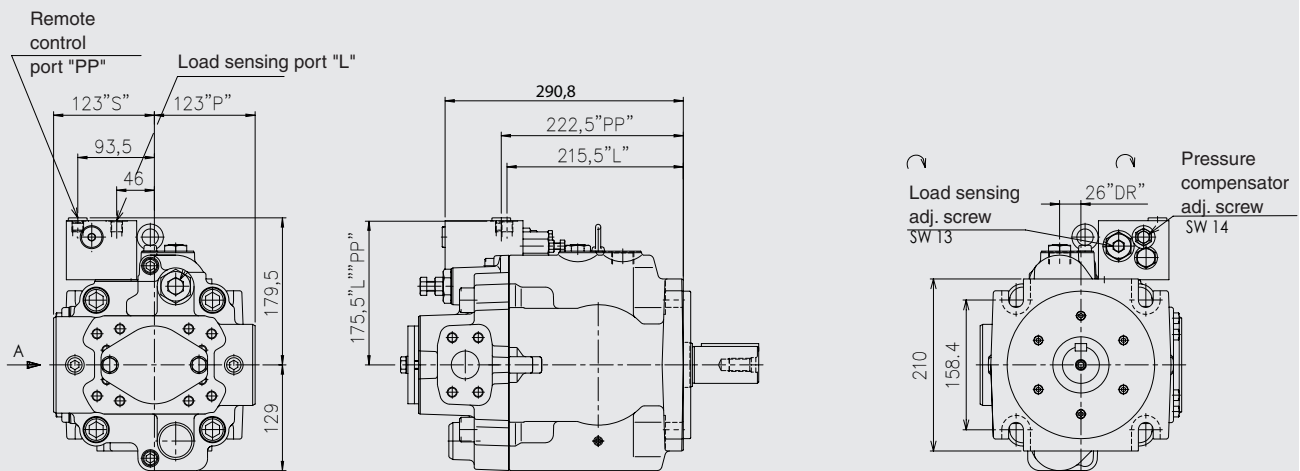


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S145-FR__E1D-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2 1/2"
PPV100S145-FR__U1_-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2 1/2"
PPV100S145-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2 1/2"
PPV100S145-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2 1/2"

**PPV100S145 with remote pressure control 07**



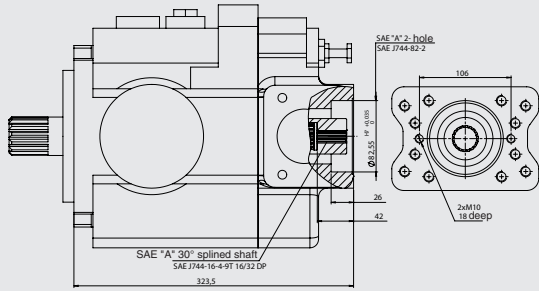
**PPV100S145 with load sensing control 14**



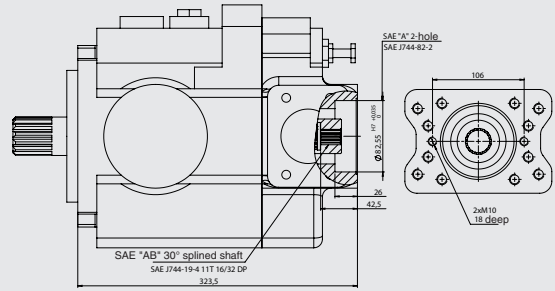
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S145-FR__E1D-10	M12; 22 deep	M12; 22 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/4"	2 1/2"
PPV100S145-FR__U1_-10	1/2-13 UNC; 21 deep	1/2-13 UNC; 21 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/4"	2 1/2"
PPV100S145-FR__U2_-10	M12; 22 deep	M12; 22 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/4"	2 1/2"
PPV100S145-FR__J1_-10	M12; 22 deep	M12; 22 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/4"	2 1/2"

PPV100S145 Through drive options

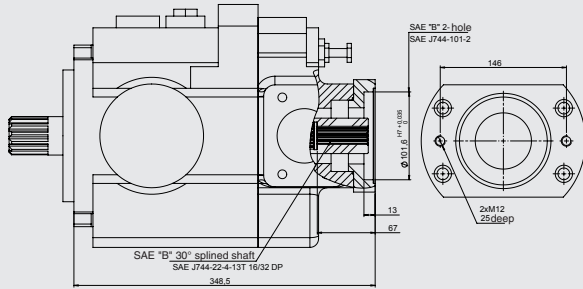
Through drive "SAE A"



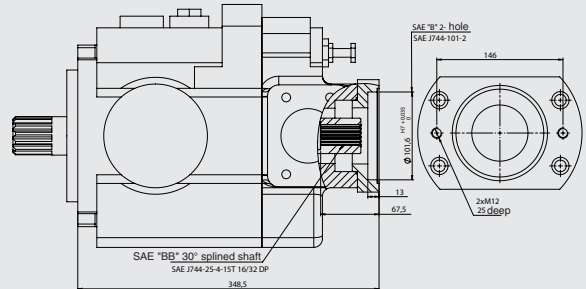
Through drive "SAE AB"



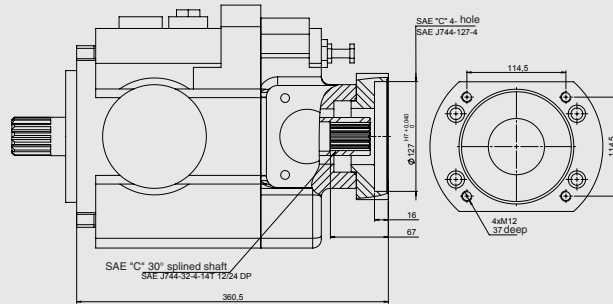
Through drive "SAE B"



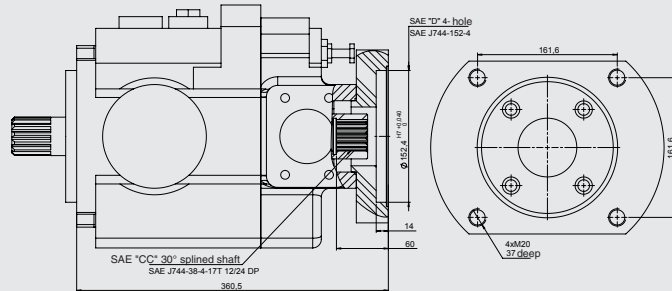
Through drive "SAE BB"



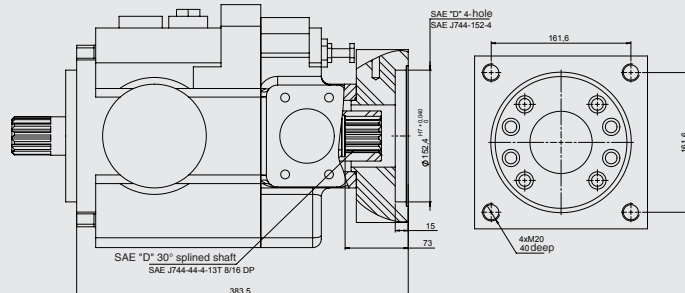
Through drive "SAE C"



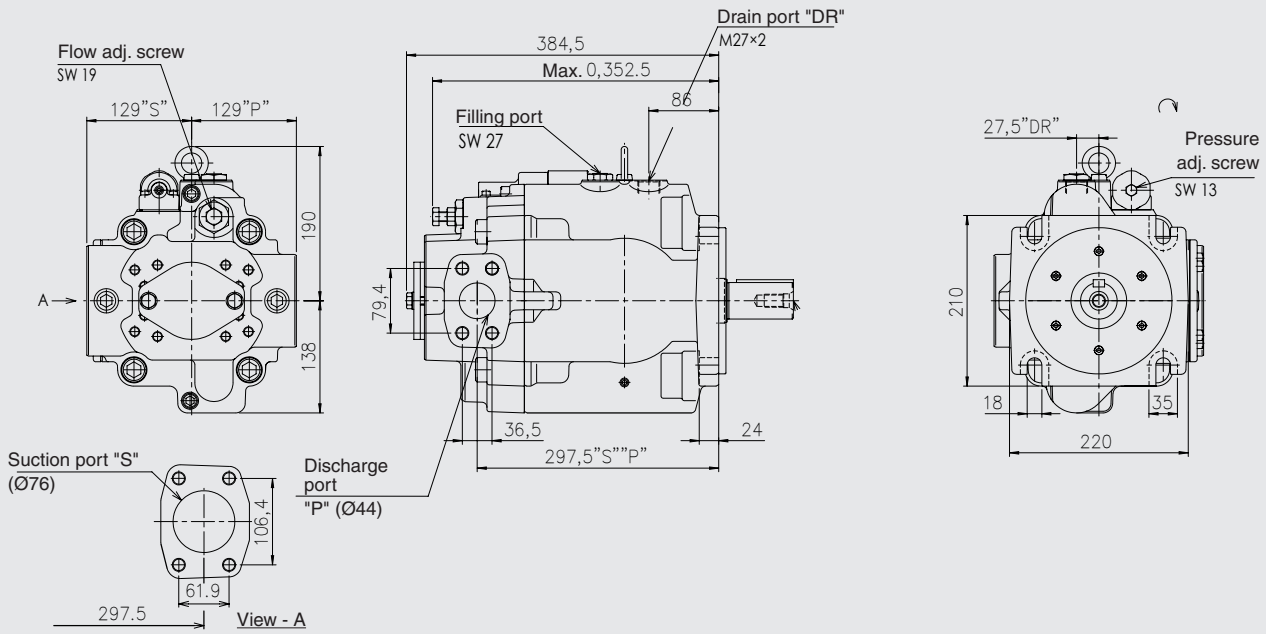
Through drive "SAE D"  
Splined shaft "SAE CC"



Through drive "SAE D"

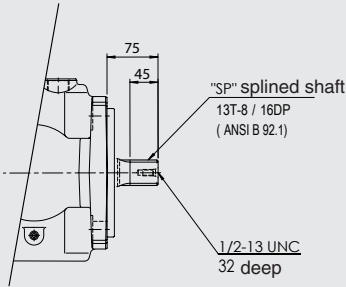


PPV100S180 with pressure control 01

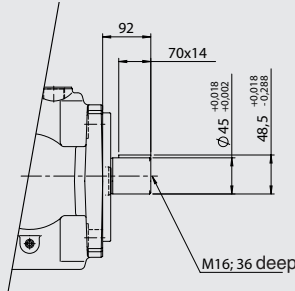


Mounting flange and shaft options

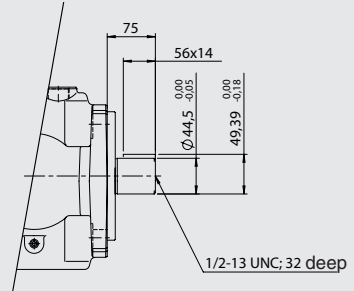
"SP" SAE D Splined shaft



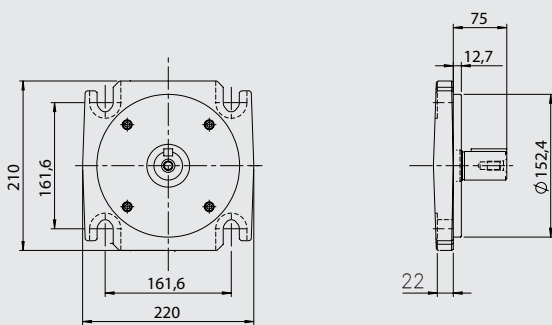
"K1" ISO Keyed shaft



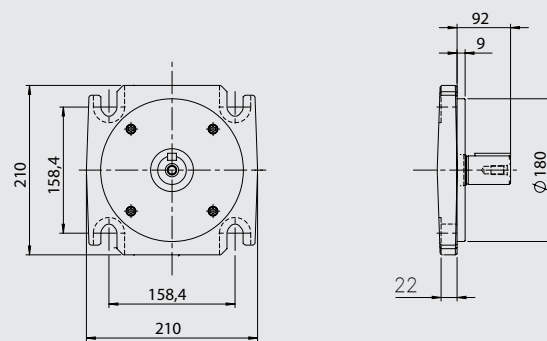
"K2" ISO Keyed shaft



"U1/U2/J1" SAE D Mounting flange

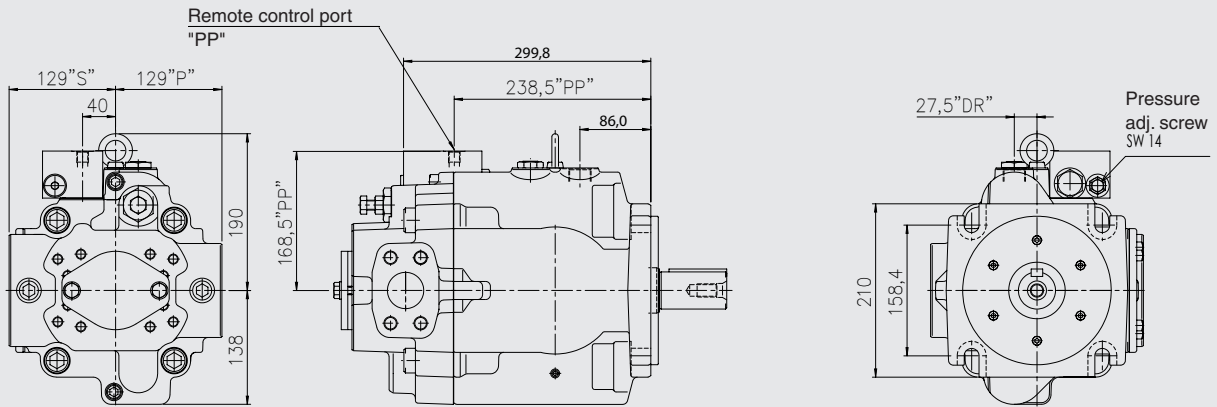


"E1" ISO Mounting flange

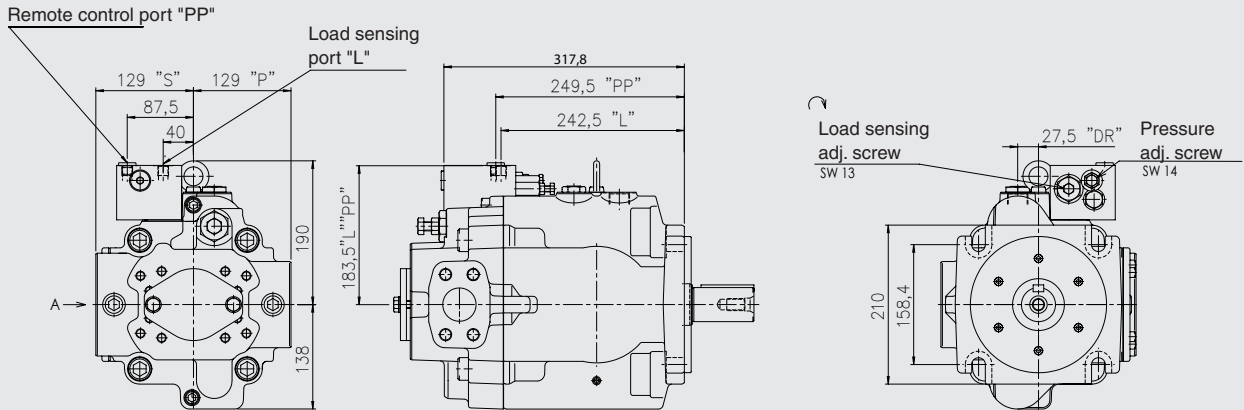


Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S180-FR__E1D-10	M16; 29 deep	M16; 29 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/2"	3"
PPV100S180-FR__U1_-10	5/8-11 UNC; 29 deep	5/8-11 UNC; 29 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/2"	3"
PPV100S180-FR__U2_-10	M16; 29 deep	M16; 29 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/2"	3"
PPV100S180-FR__J1_-10	M16; 29 deep	M16; 29 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/2"	3"

**PPV100S180 with remote pressure control 07**



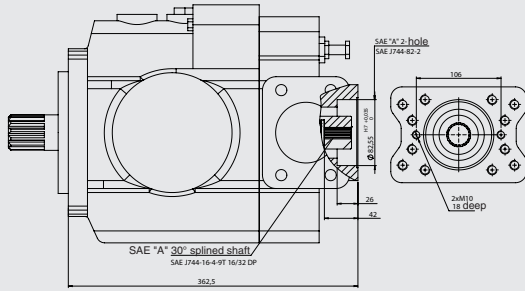
**PPV100S180 with load sensing control 14**



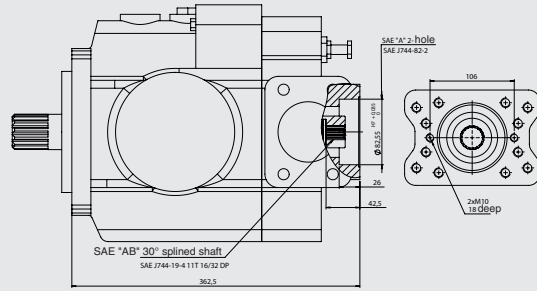
Pump type	Thread size					Dimensions to SAE J 518 (full flange)	
	Discharge port "P"	Suction port "S"	Drain port "DR"	Remote control port "PP"	Load sensing port "L"	"P"	"S"
PPV100S180-FR__E1_-10	M16; 29 deep	M16; 29 deep	M27x2; 15 deep	M14x1.5; 13 deep	M14x1.5; 13 deep	1 1/2"	3"
PPV100S180-FR__U1_-10	5/8-11 UNC; 29 deep	5/8-11 UNC; 29 deep	1 1/16-12 UN	1/2-20 UNF	1/2-20 UNF	1 1/2"	3"
PPV100S180-FR__U2_-10	M16; 29 deep	M16; 29 deep	G 3/4; 17 deep	G 1/4; 24 deep	G 1/4; 24 deep	1 1/2"	3"
PPV100S180-FR__J1_-10	M16; 29 deep	M16; 29 deep	Rc 3/4	Rc 1/4; 24 deep	Rc 1/4; 24 deep	1 1/2"	3"

PPV100S180 Through drive options

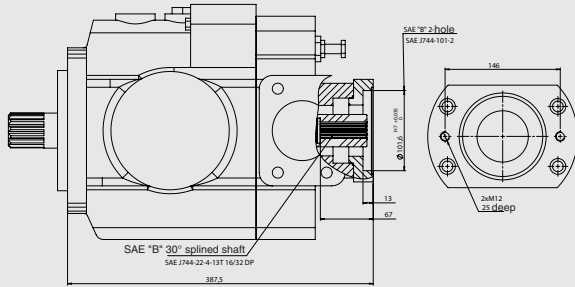
Through drive "SAE A"



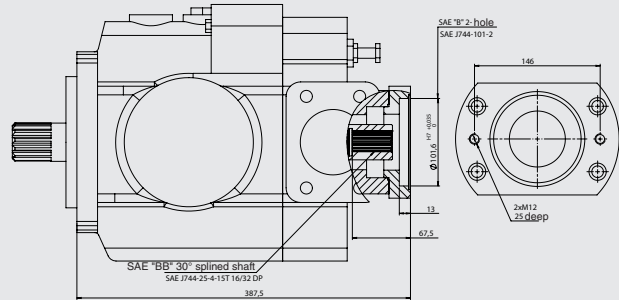
Through drive "SAE AB"



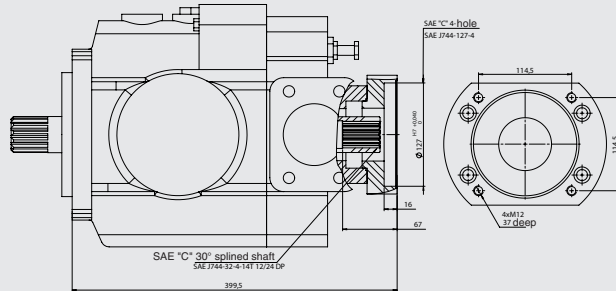
Through drive "SAE B"



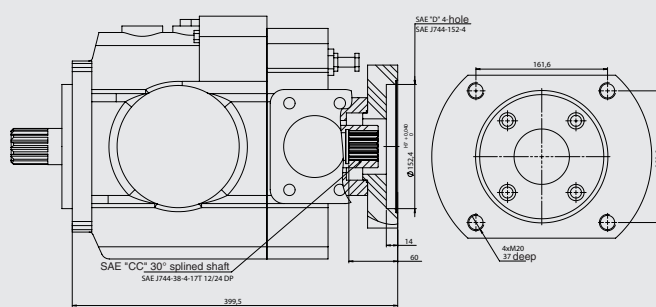
Through drive "SAE BB"



Through drive "SAE C"



Through drive "SAE D"  
Splined shaft "SAE CC"



Through drive "SAE D"

