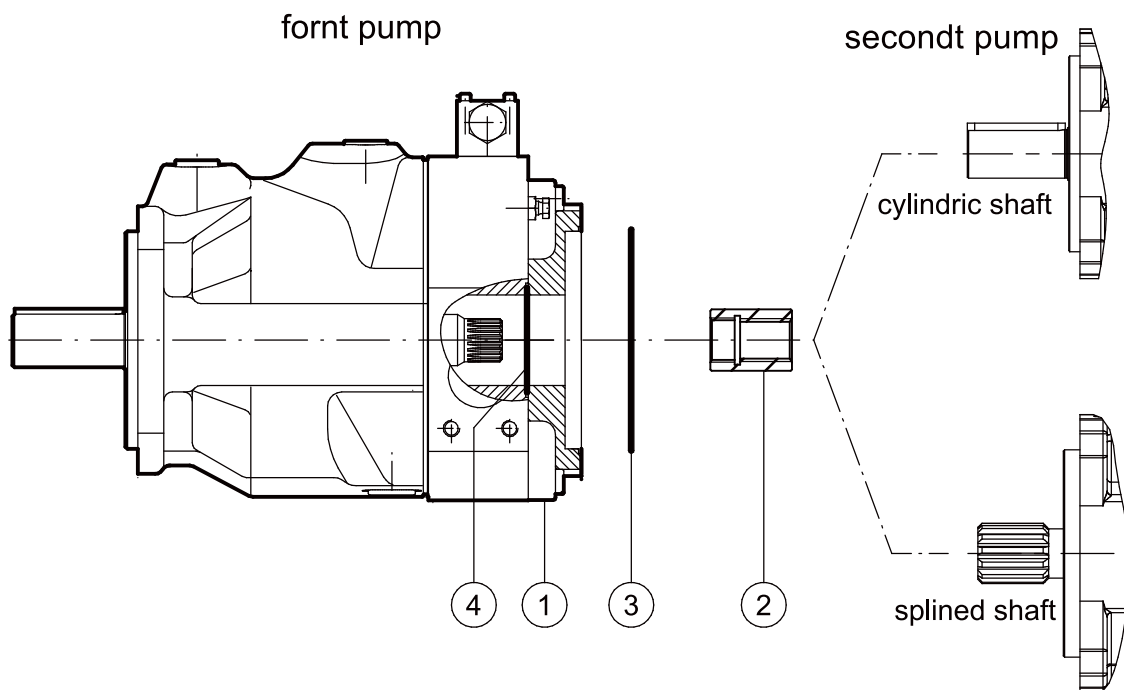


Pump combination

A

87

PV Axial piston pump



NO.	Name
1	adapter
2	coupling
3	front pump o-ring
4	second pump o-ring

Order code refers to next page



Pump combination

A

88

PV Axial piston pump

② Coupling Order no.

Second pump		Fornt pump Size				
Second pump shaft	Model	Body 1 (PV016~023, PV028)	Body 2 (PV032~046, 056,065)	Body 3 (PV063~092, 110,125)	Body 4 (PV140~180, 210)	Body 5 (PV270)
SAE splined shaft						
9T 16/32 DP		4A505032	4A505037	4A505051	4A505058	4A505069
11T 16/32 DP		--	--	--	--	--
13T 16/32 DP		4A505033	4A505034	4A505047	4A505059	4A505070
15T 16/32 DP	(PV016~023,PV028) (PV032~046,056,065)	--	4A505040	4A505120	4A505060	4A505071
14T 12/24 DP	(PV032~046,056,065)	--	4A505036	4A505052	4A505061	4A505072
17T 12/24 DP		--	--	--	--	--
13T 8/16 DP	(PV063~092, 110,125) (PV140~180,210)	--	--	--	4A505062	4A505073
15T 8/16 DP	(PV140~180,210) (PV270)	--	--	--	4A505063	4A505074
splined shaft DIN 5480						
15T W25x1.5x15	(PV016~023,PV028)	4A505031	4A505038	4A505049	4A505057	4A505068
20T W32x1.5x20	(PV032~046,056,065)	--	4A505039	4A505048	4A505056	4A505067
25T W40x1.5x25	(PV063~092, 110,125)	--	--	4A505050	4A505055	4A505066
24T W50x2.0x24	(PV140~180,210)	--	--	--	4A505054	4A505065
28T W60x2.0x28	(PV270)	--	--	--	--	4A505075
cylindric shaft						
Ø19.05*4.76		--	--	--	--	--
Ø22.22*4.76		--	4A505042	4A505043	4A505053	4A505064
Ø22.22*6.35		--	4A505042	4A505043	4A505053	4A505064
Ø25.4*6.35	(PV016~023,PV028)	--	4A505041	--	--	--
Ø31.75*7.94	(PV032~046,056,065)	--	--	--	--	--
Ø44.45*11.11	(PV063~092, 110,125) (PV140~180,210)	--	--	--	--	--
Ø50.8*12.7	(PV140~180,210) (PV270)	--	--	--	--	--
cylindric shaft						
Ø25*8	(PV016~023,028)	--	4A505035	--	--	--
Ø32*10	(PV032~046,056,065)	--	--	--	--	--
Ø40*12	(PV063~092,110,125)	--	--	--	--	--
Ø50*14	(PV140~180,210)	--	--	--	--	--
Ø65*18	(PV270)	--	--	--	--	--

Pump combination

order no.

A

89

PV Axial piston pump

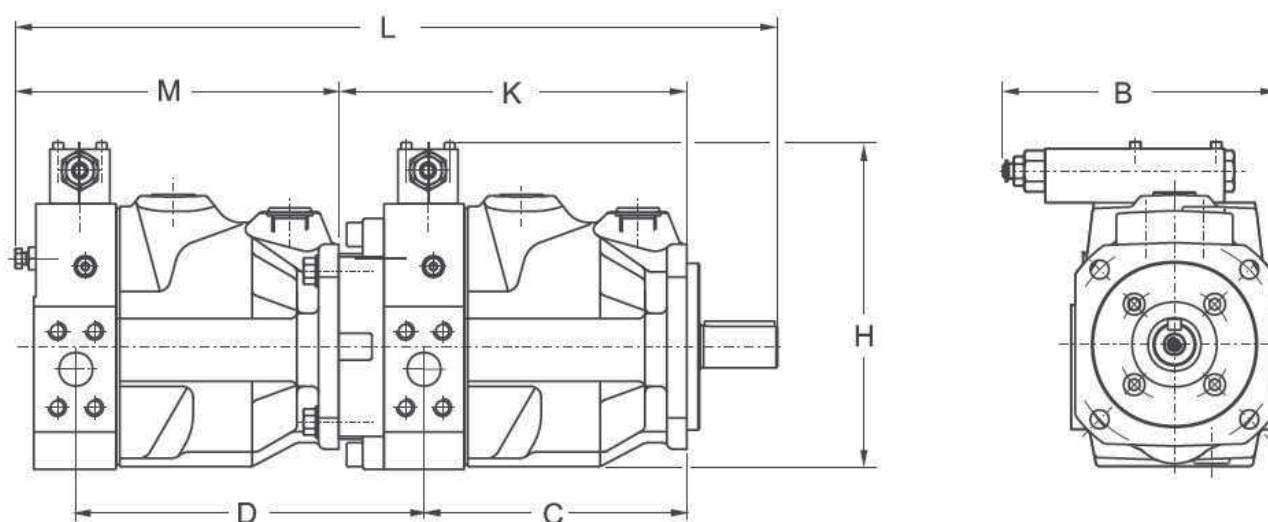
		①	③	④
Fornt pump	Thru drive code	Adapter	Fornt pump o-ring	Second pump o-ring
Body 1 (PV016~023,028)	I $\varnothing$ 63	4A504012	3AAA1BA134	3AAC1AA065
	J $\varnothing$ 80	4A504013	3AAA1BA134	3AAC1AA085
	K $\varnothing$ 100	4A504014	3AAA1BA134	3AAC1AA105
	C $\varnothing$ 50.8	4A504015	3AAA1BA134	3AAC1AA055
	D $\varnothing$ 82.55	4A504016	3AAA1BA134	3AAC1AA085
	E $\varnothing$ 101.6	4A504017	3AAA1BA134	3AAC1AA105
Body 2 (PV032~046,056,065)	I $\varnothing$ 63 (261L)	--	3AAA1BA146	--
	J $\varnothing$ 80 (261L)	--	3AAA1BA146	3AAD1AA080
	K $\varnothing$ 100 (261L)	4A504023	3AAA1BA146	3AAD1AA100
	L $\varnothing$ 125 (261L)	4A504024	3AAA1BA146	3AAD1AA125
	D $\varnothing$ 82.55 (261L)	4A504020	3AAA1BA146	3AAD1AA085
	E $\varnothing$ 101.6 (261L)	4A504021	3AAA1BA146	3AAD1AA100
	S $\varnothing$ 101.6 (276L)	4A504018	3AAA1BA146	3AAD1AA100
	F $\varnothing$ 127 (276L)	4A504019	3AAA1BA146	3AAD1AA130
Body 3 (PV063~092,110,125)	I $\varnothing$ 63	--	3AAA1BA146	--
	J $\varnothing$ 80	4A504030	3AAA1BA146	3AAD1AA080
	K $\varnothing$ 100	4A504031	3AAA1BA146	3AAD1AA100
	L $\varnothing$ 125	4A504032	3AAA1BA146	3AAD1AA125
	M $\varnothing$ 160	4A504033	3AAA1BA146	3AAF1AA316
	D $\varnothing$ 82.55	4A504025	3AAA1BA146	3AAD1AA085
	E $\varnothing$ 101.6	4A504026	3AAA1BA146	3AAD1AA100
	F $\varnothing$ 127	4A504027	3AAA1BA146	3AAD1AA130
	G $\varnothing$ 152.4	4A504028	3AAA1BA146	3AAA1AA163
Body 4 (PV140~180,210)	J $\varnothing$ 80	4A504039	3AAA1BA153	3AAD1AA080
	K $\varnothing$ 100	4A504040	3AAA1BA153	3AAD1AA100
	L $\varnothing$ 125	4A504041	3AAA1BA153	3AAD1AA125
	M $\varnothing$ 160	4A504042	3AAA1BA153	3AAF1AA316
	D $\varnothing$ 82.55	4A504035	3AAA1BA153	3AAD1AA085
	E $\varnothing$ 101.6	4A504036	3AAA1BA153	3AAD1AA100
	F $\varnothing$ 127	4A504037	3AAA1BA153	3AAD1AA130
	G $\varnothing$ 152.4	4A504038	3AAA1BA153	3AAA1AA163
Body 5 (PV270)	J $\varnothing$ 80	4A504049	3AAA1BA153	3AAD1AA080
	K $\varnothing$ 100	4A504050	3AAA1BA153	3AAD1AA100
	L $\varnothing$ 125	4A504051	3AAA1BA153	3AAD1AA125
	M $\varnothing$ 160	4A504052	3AAA1BA153	3AAF1AA316
	N $\varnothing$ 200	4A504053	3AAA1BA153	3AAF1AA320
	D $\varnothing$ 82.55	4A504044	3AAA1BA153	3AAD1AA085

Dimensions

A

Double pump dimensions

PV Axial piston pump



Main pump	Second pump	Interface main pump	L	B	C	D	H	K	M
PV016,020,023,028	PV016,020,023,028	100 B4 HW	489	196	170.5	225	220	225	212
PV032,040,046, 056,065	PV016,020,023,028 PV032,040,046,056,065	125 B4 HW	541	208	197	235.5	245	261	212
			574	208	197	261	245	261	245
PV063,080,092 110,125	PV016,020,023,028 PV032,040,046,056,065 PV063,080,092,110,125	160 B4 HW	630	232	252	244.5	299	326	212
			663	232	252	271	299	326	245
			724	232	252	326	299	326	306
PV140,180,210	PV016,020,023,028 PV032,040,046,056,065 PV063,080,092,110,125 PV140,180,210	160 B4 HW	719	230	305	208.5	349	415	212
			752	230	305	307	349	415	245
			813	230	305	362	349	415	306
			878	230	305	415	349	415	385
PV270	PV016,020,023,028 PV032,040,046,056,065 PV063,080,092,110,125 PV140,180,210 PV270	200 B4 HW	860	255	403	299	406	531.5	212
			893	255	403	325.5	406	531.5	245
			954	255	403	380.5	406	531.5	306
			1033	255	403	433.5	406	531.5	385
			1134	255	403	531.5	406	531.5	510

PV Axial Piston Pump

A

91

PV Axial piston pump

Thru drive, shaft load limitations

The max. Transferable torque in Nm for the different shafts options are:

Shaft code	PV016-023 PV028	PV032-046 PV056&065	PV063-125	PV032-046 PV210	PV270
N	300	550	1320	2000	2000
D	300	610	1218	2680	2680
F	-	-	-	1320	-
G	-	-	-	1640	-
M	300	570	1150	1900	2850
K	405	675	1400	2650	3980

Important notice

The max. allowable torque of the individual shaft must not be exceeded.

For 2-pump combinations, there is no problem because PV series offers 100%thru torque.

For 3-pump combinations (or more), the limit torque will be reached or exceeded.

Therefore, it is necessary to calculate the torque factor and compare with the allowed torque limit factor in the table.

Requirement: calculated torque factor
< torque factor

To make the necessary calculations easier and more user friendly it is not required to calculate actual torque requirements in Nm and compare them with the shaft limitations. The table on the right shows limit factors that include material specification, safety factors and conversion factors.

The total torque factor is represented by the sum of the individual torque factors of all pumps in the complete pump combination.

The torque factor of each individual pump is calculated by multiplying the max. operating pressure p of the pump(in bar) with the max.displacement V_g of the pump(in cm^3/rev).

pump	shaft	torque limit factor
PV016-PV023 PV028	N	17700
	D	17700
	M	17700
	K	20130
PV032-046 PV056&065	N	32680
	D	36380
	M	33810
	K	40250
PV063-PV092 PV110&125	N	77280
	D	72450
	M	67620
	K	83720
PV140-PV180 PV210	N	118400
	D	158760
	F	78750
	G	97650
	M	113400
	K	157500
PV270	N	119000
	D	159700
	M	170100
	K	236250

Total torque factor of the combination=
sum of individual torque factors of all pumps

Torque factor of any pump= $p \times V_g$ (pressure in bar x displacement in cm^3/rev)

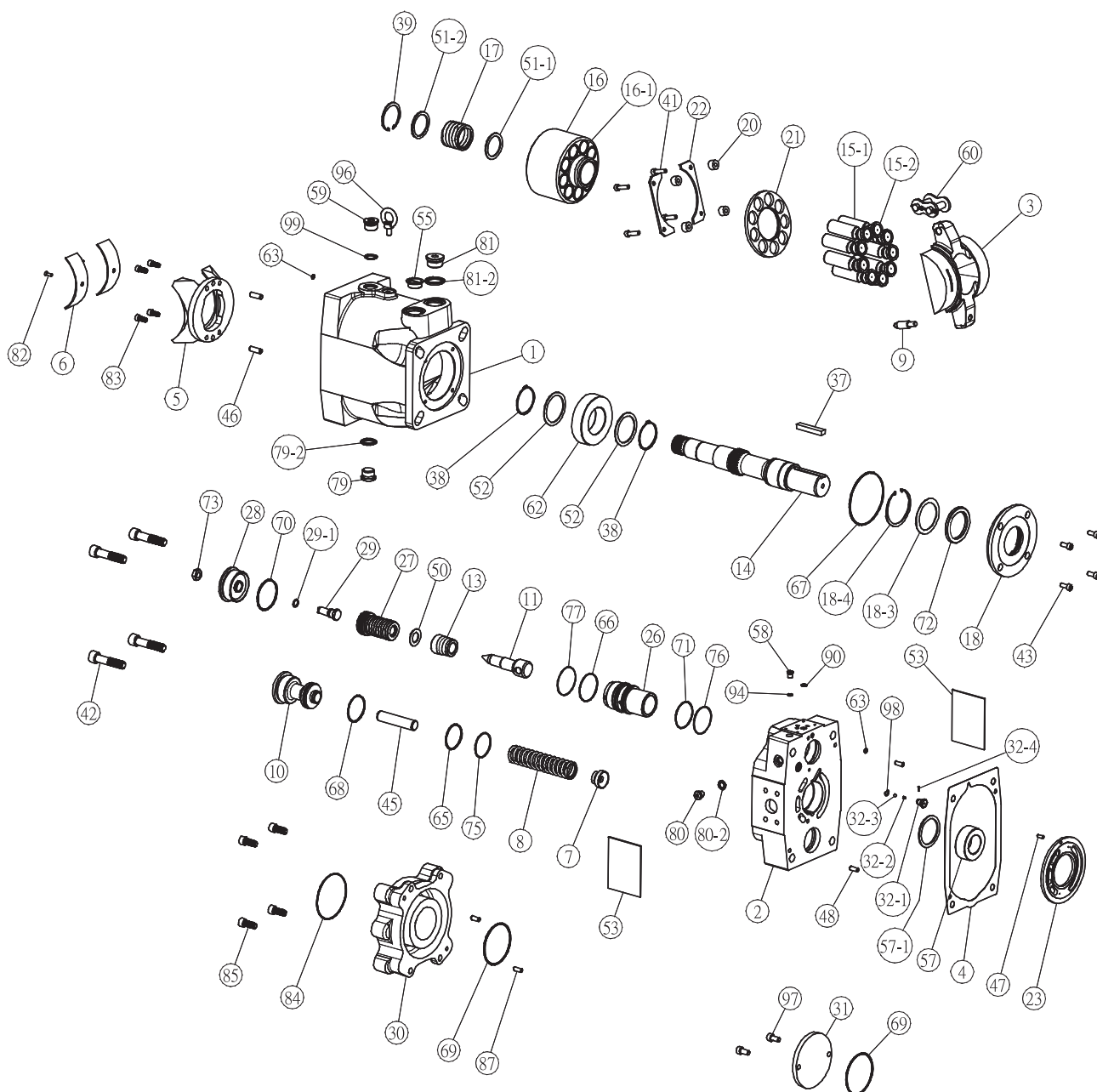
PV Axial piston pump exploded view

A

(E.g.Body 4)

92

PV Axial piston pump



Remark: Body1 without (16-1)
 Body1~3 without (18-3)
 Body1~3,5 without (57-1)

※YEOSHE product specifications are subject to change without prior notice.

PV Axi piston pump exploded view

A

93

PV Axial piston pump

NO	Item	NO	Item
1	Pump body	51-1	Washer-cylinder block
2	Pump cover	51-2	Washer-cylinder block
3	Swash plate	52	Washer-shaft
4	Body seal	53	Seal
5	Trunnion carrier	55	Plug
6	Trunnion bearing	57	Needle bearing
7	Guide-servo spring	57-1	Washer
8	Servo spring	58	Plug-comp.interface
9	Locator-servo spring	59	Plug-feedback
10	Plug-servo spring	60	Chain link
11	Connector-swash plate	62	Roller bearing
13	Contour sleeve	63	O-ring
14	Shaft	65	O-ring
15-1	Piston assembly	66	O-ring
15-2	Piston shose	67	O-ring
16	Cylinder block	68	O-ring
16-1	Cylinder block washer	69	O-ring
17	Spring-cylinder block	70	O-ring
18	Pilot cover	71	O-ring
18-3	Pilot cover washer	72	Shaft-seal
18-4	Snap ring	73	Lock nut with seal
20	Distance washer	75	B/U ring
21	Slipper retainer	76	B/U ring
22	Retainer segment	77	B/U ring
23	Valve plate	79	Plug
26	Servo piston sleeve	79-2	Washer
27	Servo piston	80	Plug
28	Servo piston cover	80-2	Washer
29	Spindle	81	Plug
29-1	O-ring	81-2	Washer
30	Adaptor	82	Screw
31	Cover plate	83	Screw
32-1	Air bleed valve	84	O-ring
32-2	Spring	85	Adaptor-screw
32-3	Ball	87	Adaptor-pin
32-4	Pin	90	O-ring
37	Key	94	O-ring
38	Snap ring-shaft	96	Lift eye
39	Snap ring-cyl.block	97	Screw
41	Retainer screw	98	O-ring
42	Screw	99	O-ring
43	Head cap screw		
45	Guide pin-servo		
46	Loc.pin-cradle		
47	Loc.pin-valve plate		
50	Washer-servo piston		



General installation information

A

94

PV Axial piston pump

A. Fluid recommendations

Premium quality hydraulic mineral oil fluids are recommended, like H-LP oils to DIN 51524, part2.

The viscosity range should be 25 to 50 mm²/s (cSt) at 50° C. Operating temperatures –10 to +70°C.

For other fluids such as phosphoric acid esters or for other operating conditions, please consult with YEOSHE for assistance.

B. Seals

NBR (Nitrile) seals are used for operation with hydraulic fluids based on mineral oil.

For synthetic fluid, as perhaps phosphoric acid esters, Fluorocarbon seals are required.

Please consult with YEOSHE for assistance.

C. Filtration

For maximum pump and system component functionability and life, the system should be protected from contamination by effective filtration.

Fluid cleanliness should be in accordance with ISO classification ISO 4406.

The quality of filter elements should be in accordance with ISO standards.

(1) Minimum requirement for filtration rate $\times$ (mm):

General hydraulic systems for satisfactory operation:

Class 19/15, to ISO 4406 X=25 μ m ($\beta_{25} \geq 75$) to ISO 4572

(2) Hydraulic systems with maximum component life and functionability:

Class 16/13, to ISO 4406 X=10 μ m ($\beta_{10} \geq 75$) to ISO 4572

It is recommended to use return line or pressure filters.

YEOSHE Filter Division offers a wide range of these filters for all common applications and mounting styles.

The use of suction filters should be avoided, especially with fast response pumps.

Bypass filtration is a good choice for best filter efficiency.

D. Installation and mounting

Horizontal mounting:

Outlet port-side or top. Inlet port-side or bottom, drain port always uppermost.

Vertical mounting: Shaft pointing upwards.

Install pump and suction line in such way that the maximum inlet vacuum never exceeds 0.8 bar absolute.

The inlet line should be as short and as straight as possible.

A short suction line cut to 45° is recommended when the pump is mounted inside the reservoir, to improve the inlet conditions. All connections should be leak-free, otherwise the air in the suction line will cause cavitations, noise, and damage to the pump.

E. Shaft rotation and alignment

Pump and motor shafts must be aligned within 0.25mm T.I.R. maximum. A floating coupling must be used.

Bellhousings and couplings can be ordered at manufacturers listed in this catalog.

Please follow the coupling manufacturer's installation instructions.

Please consult with YEOSHE for assistance on radial load type drives.

F. Start up

Prior to start up, the pump case must be filled with hydraulic fluid (use case drain port).

Initial start up should be at zero pressure with an open circuit to enable the pump to prime.

Pressure should only be increased once the pump has been fully primed.

Attention: Check motor rotation direction.

G. Operating noise of pumps

The normal operating noise of a pump and constantly-operation noise of the entire hydraulic system is largely determined by where and how the pump is mounted and how it is connected to the down stream hydraulic system. Besides, size, style, and installation of hydraulic tube are the major influence on the overall noise emitted by a hydraulic system.

General installation information

H. Noise reduction measures

Flexible elements help to prevent pump body vibration from being transmitted to other construction elements, where amplification may occur. Such elements can be:

Bell housing with elastic dampening flange with vulcanized labyrinth

- (1) Floating and flexible coupling
- (2) Damping rails
- (3) Or silent blocks for mounting the electric motor or the foot mounting flange
- (4) Flexible tube connections (compensators) or hoses on inlet, outlet, and drain port of the pump.
- (5) Exclusive use of gas tight tube fittings for inlet connections to avoid ingress of air causing cavitations and excessive noise.

I. Drain line

The drain line must lead directly to the reservoir without restriction. The drain line must not be connected to any other return line.

The end of the drain line must be below the lowest fluid level in the reservoir and as far away as possible from the pump inlet line. This ensures that the pump is not empty itself when it's not in operation and the hot aireated oil will not be recirculated.

For the same reason, when the pump is mounted inside the reservoir, the drain line should be arranged in such a way that a siphon is created. This ensures that the pump is always filled with fluid.

The drain pressure must not exceed 1 bar.

Drain line length should not exceed 2 meters.

Minimum diameter should be selected according to the port size and a straight low pressure fitting with maximized bore should be used.

	PV016/PV020/PV023 PV028	PV032/PV040/PV046 PV056/PV065	PV063~092 PV110/PV125	PV140~180 PV210	PV270
Size of pipe joints	3/8"	1/2"	3/4"	1"	1-1/4"
I.D. of pipes	Ø12 more	Ø15 more	Ø19 more	Ø25 more	Ø32 more
Length of drain	Under 1m	Under 1m	Under 1m	Under 1m	Under 1m