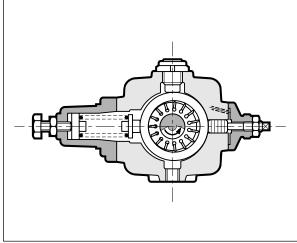
14 100/114 ED





PVD VARIABLE DISPLACEMENT VANE PUMPS WITH DIRECT PRESSURE ADJUSTER

OPERATING PRINCIPLE



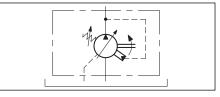
- The PVD pumps are variable displacement vane pumps with a mechanical type of pressure compensator.
- They allow instantaneous adjustment of the flow rate according to the circuit requirements. The consequence is that energy consumption is reduced and adequate in every phase of the cycle.
- The pump group is complete with hydrostatic axial compensation distribution plates that improve the volumetric efficiency and reduce wear of the components.
- The pressure compensator keeps the cam ring of the pumping group in the eccentric position with use of an adjustable load spring. When the delivery pressure equals the pressure corresponding to the spring setting, the cam ring is moved toward the center, adjusting the flow rate to the values required by the plant.
- In zero flow demand conditions, the pump delivers oil only to compensate any possible bleedings and pilotings, keeping the circuit pressure constant.
- The compensator response times are very low such as to allow elimination of the pressure relief valve.

PERFORMANCE RATINGS (measured with mineral oil with viscosity of 36 cSt at 50°C)

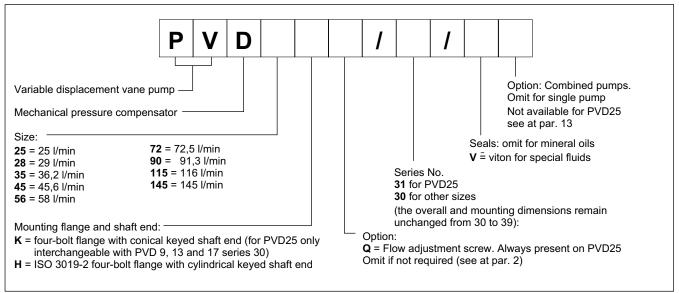
PVD sizes	25	28	35	45	56	72	90	115	145		
Geometric displacement (UNI ISO 3662)	16	20	25	31,5	40	50	63	80	100		
Actual displacement	cm³/rev	17,9	22,1	26,9	34,5	42,8	53,1	69	86,2	105,5	
Maximum flow at 1450 rpm and p = 80 bar I/min			29	36,2	45,6	58	72,5	91,3	116	145	
Max working pressure	120	120 100			100		80				
Pressure adjustment range bar		20 ÷ 120	30 ÷	100	30 ÷ 100			30 ÷ 80			
Maximum drain port pressure allowed bar		1									
Rotation speed range rpm		800 ÷ 1800									
Rotation direction	clockwise (seen from the outlet shaft side)										
Shaft loads	radial and axial loads are not allowed										
Max applicable torque on shaft: version H		110 197		400			740				
version K		70 -		-			-				
Mass kg		7,3 12			32			44			

Ambient temperature range	°C	-20 / +50		
Fluid temperature range	°C	-10 / +50		
Fluid viscosity range	see paragraph 3.2			
Recommended viscosity	cSt 22 ÷ 68			
Degree of fluid contamination		see paragraph 3.3		

HYDRAULIC SYMBOL



1 - IDENTIFICATION CODE



2 - VOLUME ADJUSTMENT SCREW - PVD*Q

The volume adjuster is fitted as standard on PVD25 pumps, while is optional on the other sizes .It consists of an adjustment screw and a small balanced piston that limit the maximum eccentricity of the pumping group cam ring, changing the displacement. The maximum flow is reduced by turning the adjustment screw clockwise.

Size	25	28	35	45	56	72	90	115	145	
Reduced displacement for screw turn	cm³	9,7	9,7	9,7	16,4	16,4	16,4	23,8	23,8	23,8
MIN displacement	cm³/rev	3,1	7,6	11,7	1,6	9,9	20,9	9,7	26,9	45,5

Tools required for adjustment:

PVD 25: adjustment screw hexagon socket key 5. Locking nut spanner 17.

PVD 28 to 145: square head screw, spanner 7, tooth retainer KM1 type, to loosen with hook wrench.

3 - HYDRAULIC FLUID

3.1 - Fluid type

Use mineral oil based hydraulic fluids with anti-foam and antioxidant additives. For use of other types of fluid, keep in mind the limitations shown in the following table or consult our technical department for approval.

FLUID TYPE	NOTES
HFC	-The values shown in the performance ratings table must be reduced by at least 50%
(water glycol solutions	- The pump rotation speed must be limited to 1000 rpm.
with proportion of water ≤ 40%)	- Use NBR seals only
HFD	There are no particular limitations with this kinds of fluids. Operation with a fluid viscosity as close as possible to the optimum viscosity range specified in par. 3.2 is recommended.
(phosphate esters)	- Use FPM (Viton) seals only

3.2 - Fluid viscosity

The operating fluid viscosity must be within the following range:

minimum viscosity	16 cSt	referred to the maximum drainage fluid temperature of 50 °C
optimum viscosity	22 ÷ 68 cSt	referred to the fluid working temperature in the tank
maximum viscosity	400 cSt	limited to only the start-up phase of the pump

When selecting the fluid type, be sure that the true viscosity is within the range specified above at the operating temperature.

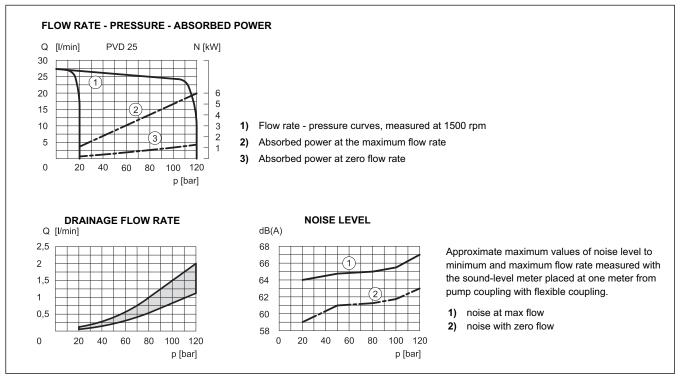
3.3 - Degree of fluid contamination

The maximum degree of fluid contamination must be according to ISO 4406:1999 class 20/18/15; therefore, use of a filter with $\beta_{20} \ge 75$ is recommended. A degree of maximum fluid contamination according to ISO 4406:1999 class 18/16/13 is recommended for optimum endurance

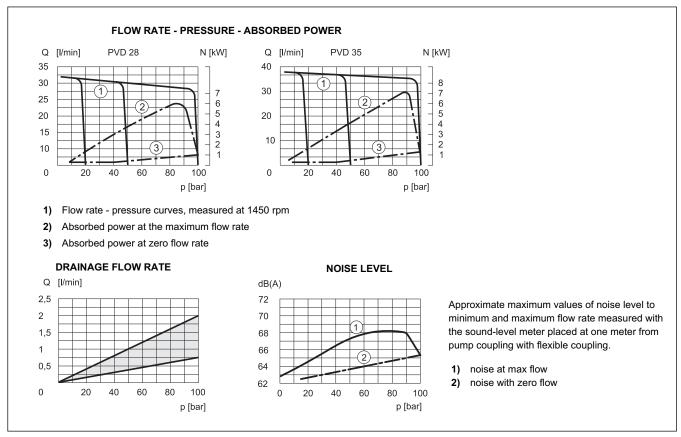
of the pump. Hence, use of a filter with $\beta_{10} \ge 100$ is recommended.

If there is a filter installed on the suction line, be sure that the pressure at the pump inlet is not lower than the values specified in paragraph 12. The suction filter must be equipped with a by-pass valve and, if possible, with a clogging indicator.

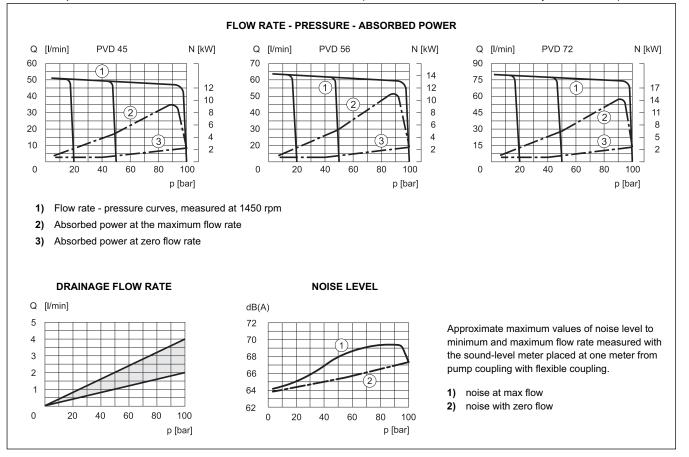
4 - PVD25 CHARACTERISTIC CURVES (obtained with viscosity of 36 cSt at 50°C)



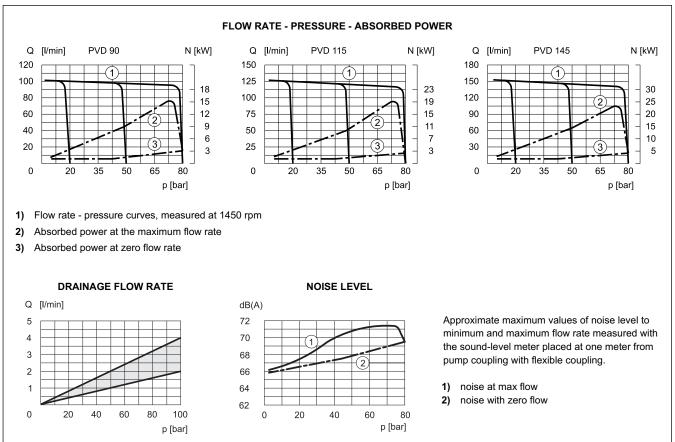
5 - PVD28, PVD35 CHARACTERISTIC CURVES (obtained with viscosity of 36 cSt at 50°C)



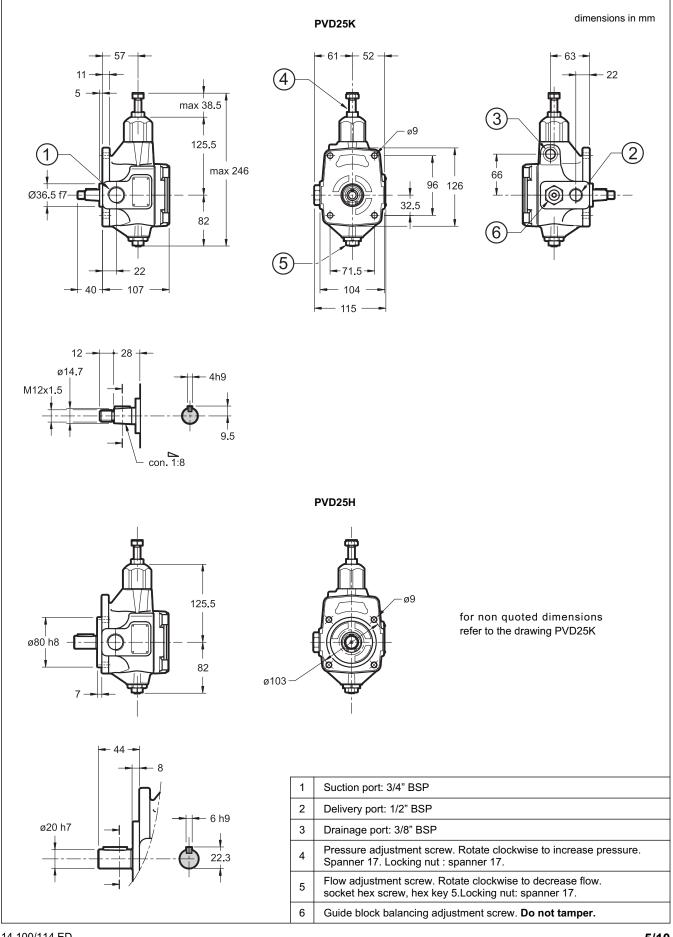
6 - PVD45, PVD56 and PVD72 CHARACTERISTIC CURVES (values obtained with mineral oil with viscosity of 36 cSt at 50°C)



7 - PVD90, PVD115 and PVD145 CHARACTERISTIC CURVES (values obtained with viscosity of 36 cSt at 50°C)

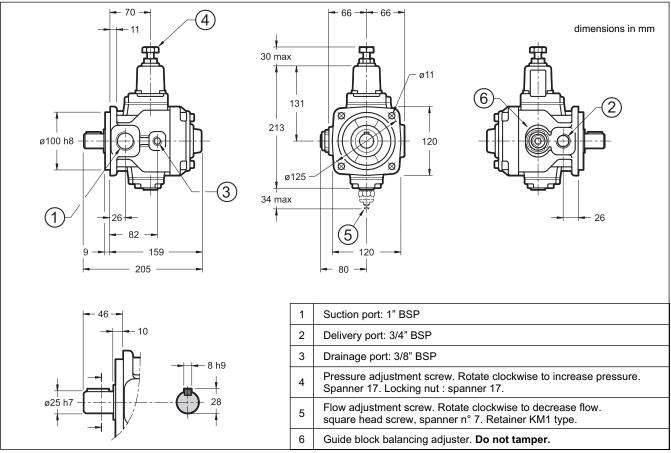


8 - PVD25 OVERALL AND MOUNTING DIMENSIONS

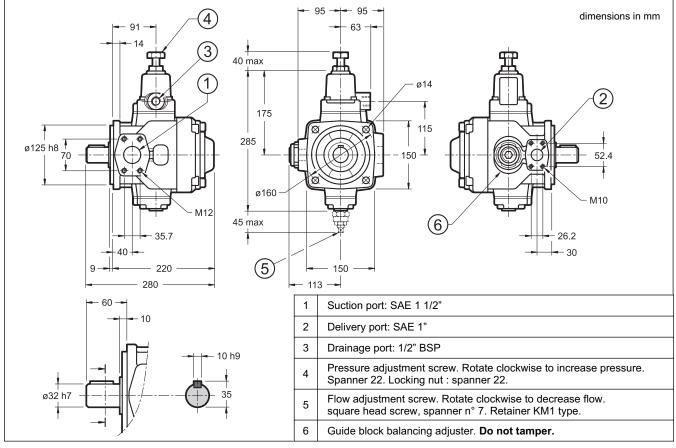


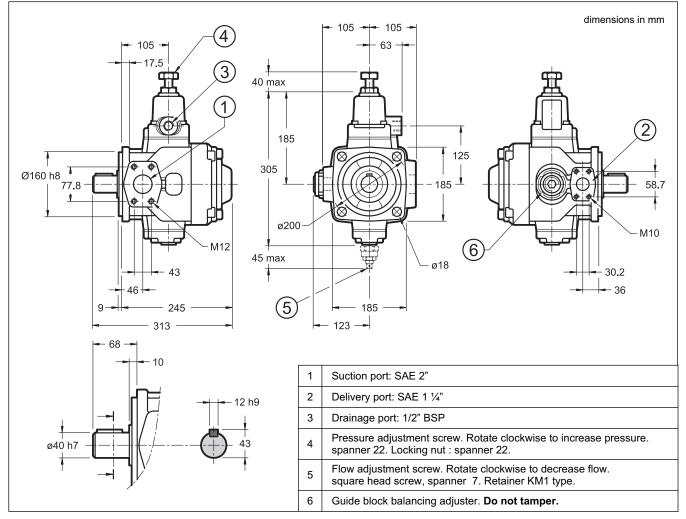
PVD

9 - PVD28, PVD35 OVERALL AND MOUNTING DIMENSIONS



10 - PVD45, PVD56 AND PVD72 OVERALL AND MOUNTING DIMENSIONS





11 - PVD90, PVD115 AND PVD145 OVERALL AND MOUNTING DIMENSIONS

12 - INSTALLATION

- The instruction manual for the installation and commissioning of the pumps is always included in the packaging with the pump. Observe restrictions in this document and follow the instructions.
- The PVD pumps up to size 35 can be installed with the axis oriented in any position. For other sizes the pump must be installed with the axis in horizontal position and with the pressure compensator upward.
- The motor-pump connection must be carried out directly with a flexible coupling. Couplings that generate axial or radial loads on the pump shaft are not allowed.
- The suction line must be short, with end pipe cut at 45 ° and suitably sized: the minimum cross-section of the tube should reflect that of the thread on the inlet port of the pump to facilitate the oil flow. Bends and restrictions or an excessive line length can impair correct operation of the pump.

Suction pressure should be between 0.8 and 1.5 bar absolute

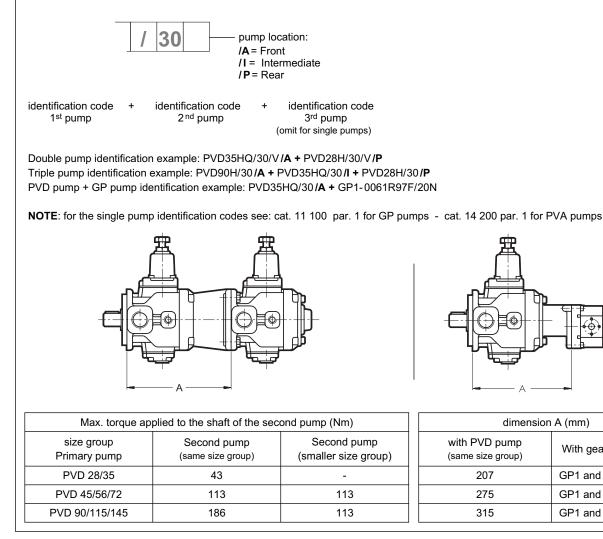
- The drainage pipe must be connected directly to the tank by a line separate from other discharges, located as far as possible from the suction line and lengthened to below the minimum oil level in order to avoid foaming.
- The tank must be suitably sized in order to allow the cooling of the fluid. It should be good that the fluid in the tank do not exceed 50°C. If necessary, consider the installation of a heat exchanger on the drain line.
- The pump start up must be done in full displacement ($P \rightarrow T$) with flow to the tank, to purge the air.
- It's essential that the difference between the fluid temperature and the ambient (pump body) temperature doesn't exceed 20°C
- The pumps are usually placed directly upon the oil tank. Flooded suction port installation of the pumps is recommended in the case of circuits with high flow rates and pressures.

13 - MULTIPLE PUMPS

The PVD pumps from size 28 and up are designed to be connected one to the other in decreasing order of displacement. They can be combined also with PVA type pumps (see catalogue 14 200) and with GP1 and GP2 size gear pumps (see catalogue 11 100). The torque on the shaft must be further reduced after the second pump. Consult our technical department for this type of applications .

IDENTIFICATION CODE FOR MULTIPLE PUMPS

Fill the ordering code, following the coupling sequence of the pumps. Insert the suffix that shows the pump position at the end of each PVD pump identification code.



With gear pump type:

196

262

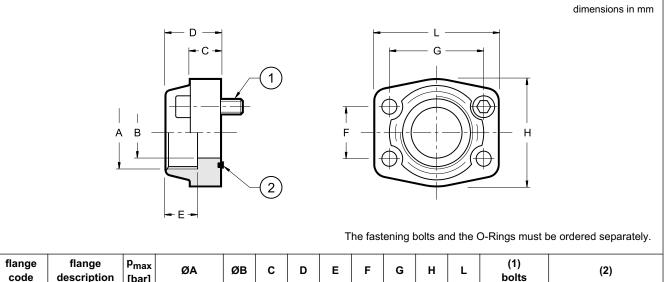
287

GP1 and GP2

GP1 and GP2

GP1 and GP2

14 - CONNECTION FLANGES



code	description	[bar]	ØA	ØВ	С	D	E	F	G	н	L	bolts	(2)
0610713	SAE - 1"	345	1" BSP	25	18	38	22	26.2	52.4	22	70	N. 4	OR 4131 (32.93x3.53)
0610720	SAE - 1 1/4"	276	1 1/4" BSP	32	21	41	22	30.2	58.7	68	79	SHC M10x35	OR 4150 (37.69x3.53)
0610714	SAE - 1 1/2"	207	1 1/2" BSP	38	25	44	24	35.7	70	78	93	N. 4	OR 4187 (47.22x3.53)
0610721	SAE - 2"	207	2" BSP	51	25	45	30	43	77.8	90	102	SHC M12x45	OR 4225 (56.74x3.53)



DUPLOMATIC OLEODINAMICA S.p.A. 20015 PARABIAGO (MI) • Via M. Re Depaolini 24 Tel. +39 0331.895.111 Fax +39 0331.895.339

www.duplomatic.com • e-mail: sales.exp@duplomatic.com