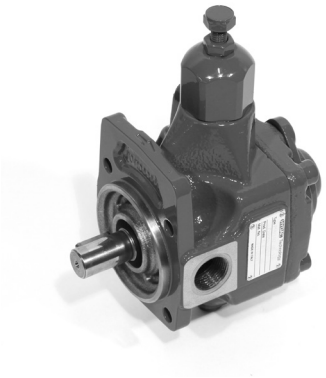


3.4 VARIABLE DISPLACEMENT MECHANICAL COMPENSATION

CONTENTS PVV102

ORDERING CODE

3.4.1 Variable Displacement, Mechanical Compensation

PVV102 – 05 – 16 F H R M - – - XXXX

Variable displacement vane pump with mechanical compensation

Size
05

Displacement
16

Flange and ports

F	ISO 3019/2 – BSP ISO 228/1 thread
FGR2	Size 2 gear pump - BSP ISO 228/1 thread

Pressure range

H	20-120 bar

Shaft rotation

R	Clockwise (viewed from shaft end)

Seals

M	NBR
E	FPM (FKM)

Options

–	Single pump (without through drive)
A	Through drive for double pump (only for F flange)

Modification number
XXXX Determined by manufacturer

3.4.2 Specifications

Pump size			16
Geometric displacement		[cm³/rev]	17.9
Rated		[bar]	120
Peak		[bar]	150
Drive speed	Min.	[rpm]	800
	Max.	[rpm]	1800
Approx. weight		[kg]	7.4
Max. axial shaft force		[N]	No radial or axial forces allowed.
Max. radial shaft force		[N]	

3.4.3 Hydraulic fluids

The pump series is designed for use with:

Hydraulic oil (normal mineral oil)
HLP to DIN ISO 51524/2 or
HM ISO 6743/4

Synthetic fluids
(Polyolester, HFD-U)

3.4.4 Viscosity range

Normal operating viscosity: 22 - 68 cSt (mm²/s)

Maximum viscosity at start-up: 400 cSt (mm²/s)

3.4.5 Temperature range

+15 to +60 °C

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

3.4.6 Seals

The pump series is equipped with NBR or FPM (FKM) seals.The actual seal material is specified in the model code.

3.4.7 Filtration

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

18/16/13 to ISO 4406/99

or

Class 7 to NAS 1638 or cleaner.

3.4.8 Max. drive and through drive torques

Nominal size		Size 05
Geometric displacement	[cm³/rev]	3.1 - 17.9
Max. torque on primary shaft	[Nm]	110
Max. through drive torque	[Nm]	55

Note:
Multiple pumps should be mounted in decreasing order of their torque. The sum of the individual torques of the pumps must not exceed the maximum torque permitted on the front pump.

3.4.9 Through drive models

Through drive pump	Drive pump **PVV102-05-**
PVV100-1-	●
PVV101-1-	●
PVV100-2-	
PVV101-2-	
PVV100-3-	
PVV101-3-	
PVV102-05-	●
PVV103-05-	●
PVV103-1-	
PGI102-2-	●
PGI102-3-	
PGE101-…-RBQ…	●
PGE102-…-RBR…	●
PGE103-…-RBS…	
SAE A	●
SAE B	

For other possible through drives, please contact HYDAC.

3.4.10 Installation notes

Step 1

PVV102 pumps size 05 can be installed in any position.

If the pump is installed above the oil level, particular attention must be paid to the suction pressure. The minimum cross-section of the suction line must be equal to or larger than the cross-section of the suction port of the pump.

The suction lines should be as short as possible, with a minimum number of bends and without reducing the cross-section.

When installing a HYDAC pump always ensure that the fluid in the pump is prevented from draining away during stoppages.

Step 2

All return and drain lines must be positioned so that the returning oil is not drawn out again immediately by the pump (see diagram).

The oil tank must be the correct size to dissipate the thermal power generated by the system components, and to achieve a low circulating speed. To ensure maximum pump working life, the suction oil temperature must never exceed 50 °C. In systems where the pump runs for a long time at a zero flow setting it is recommended that an oil cooler is installed. The pressure in the drain line must never exceed the value specified. The drain line must always feed directly into the tank, independently of all other lines and it must extend under the minimum oil level to avoid generating foam. In addition, the drain line must be free of restrictions and situated as far as possible away from the suction line

Step 3

The pump and motor must be connected using a gear coupling.

During assembly, the minimum distance between the two coupling halves must be strictly observed (see Detail A).

Other types of motor-pump couplings are not permitted.

There must be no **radial or axial forces** on the pump shaft.

Step 4

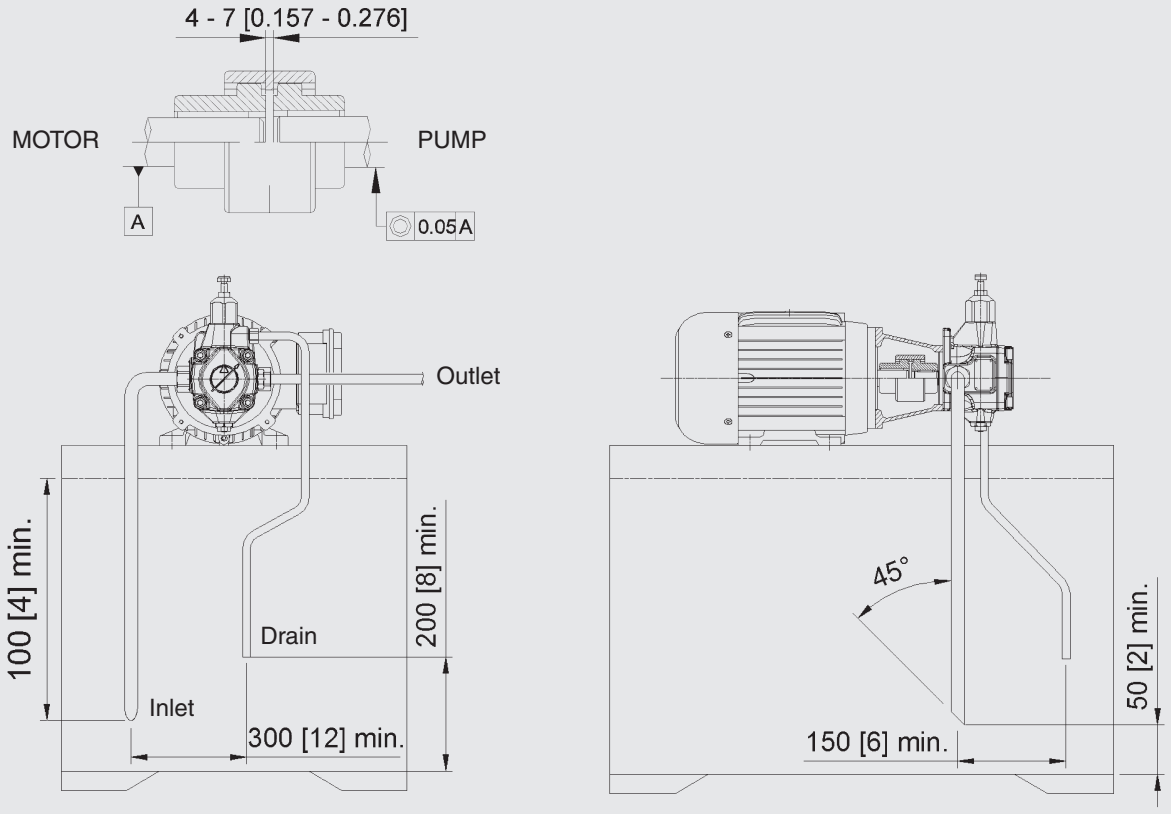
During commissioning, the pump must firstly be run at maximum capacity (P connected to T), with the oil flowing directly into the tank, in order to vent the pump.

Venting the pump can take several minutes.

Pump filling (oil emerging from the discharge port) should only take a few seconds. If not, the pump must be switched off and the procedure repeated.

Provided that the system and pump are completely full of oil, the pump can be started up during subsequent operation against a maximum pressure of 30 bar.

During both initial commissioning and subsequent start-up operations, the difference between the oil temperature and the ambient temperature (pump case) must not exceed 20 °C.



Note:
For further information, see brochure section "Installation Instructions for Variable Displacement Vane Pumps".

3.4.11 Adjustments

Pump size	Available displace-ment [cm³]	Volume adjustment screw rate [cm³]	Minimum adjustable displace-ment [cm³]
PVV102-05-16	17.9	9.7	3.1

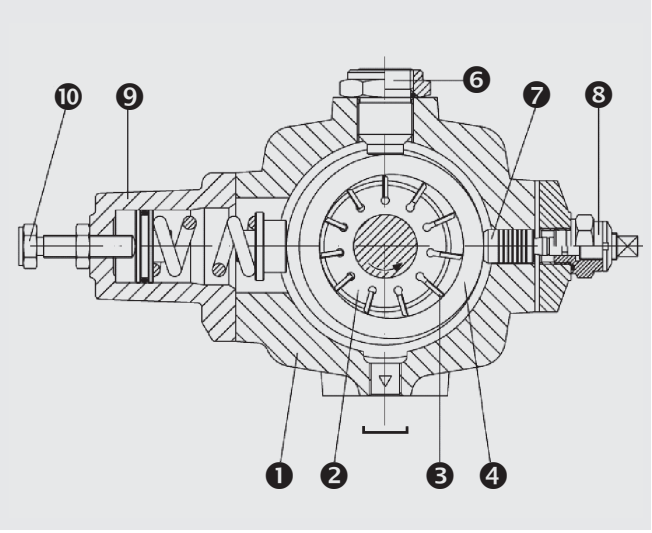
CONTROL OPTIONS

3.4.12 Standard pressure control

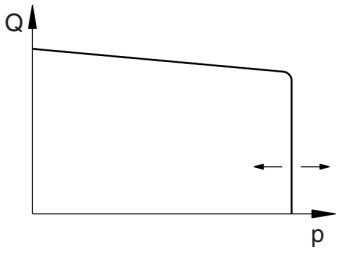
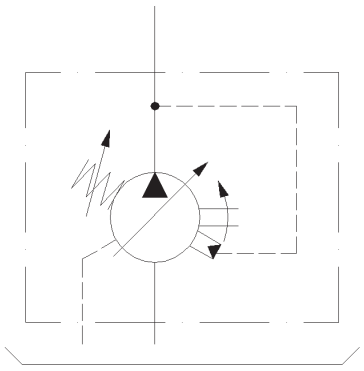
The PVV102 variable displacement vane pumps are available in nominal size 05.

The low pressure pumps, type PVV102 (120 bar), are equipped with a mechanical pressure regulating device.

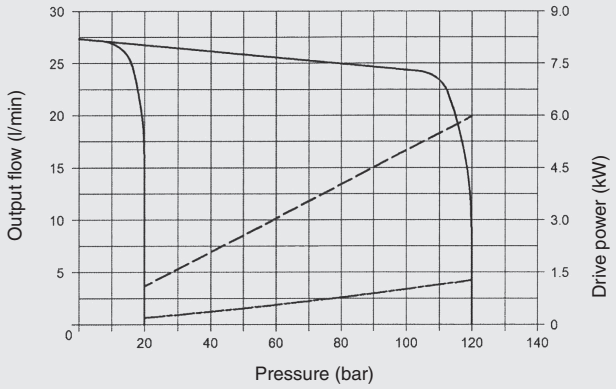
Pump components include:
a body ❶,
a drive rotor ❷,
which houses the vanes ❸
that convey the fluid into
the inlet and outlet chambers;
a stator ❹ (mobile circular ring) for varying the eccentricity
and therefore displacement;
side distribution plates
with axial hydrostatic compensation,
which delimit the inlet and outlet chambers;
a guide block balancing adjustment screw ❻
(this must not be altered by the user);
a displacment adjustment piston❼,
a maximum volume adjustment screw ❽
a pressure regulating device ❾;
a pressure regulator adjustment ❿.



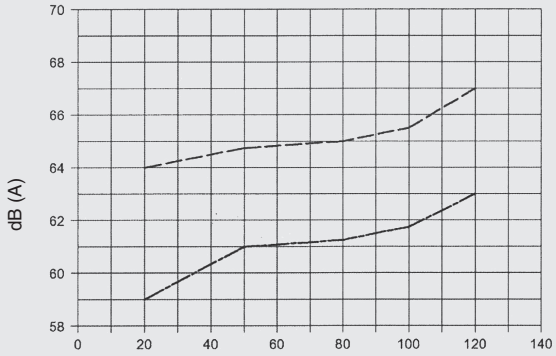
Diagrams and characteristic curves for pressure control:

Description	Performance characteristics	Hydraulic circuit
Standard pump with standard pressure control		

Volumetric efficiency - zero flow setting curve

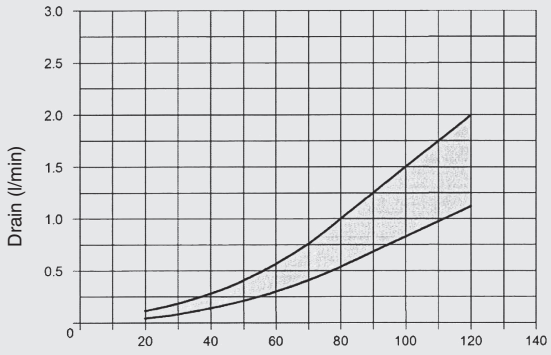


Maximum noise level



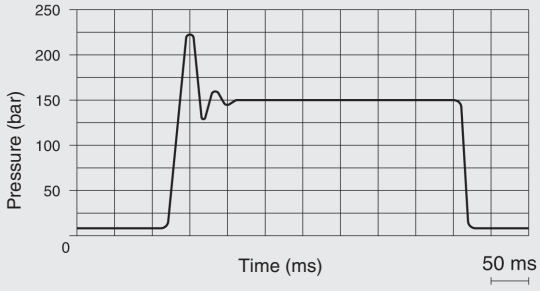
* measured with noise level meter 1 metre away from pump in an anechoic room using a flexible coupling

Drainage flow



Values determined with pump on zero flow setting

Control times and dynamic performance



Drive power at maximum displacement

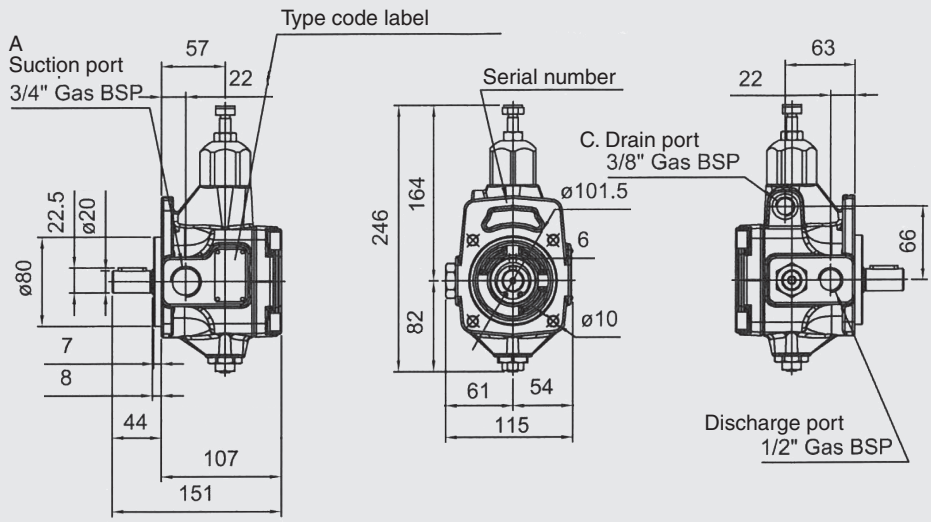
Drive power at zero flow setting

Pressure peaks are due to the test system.

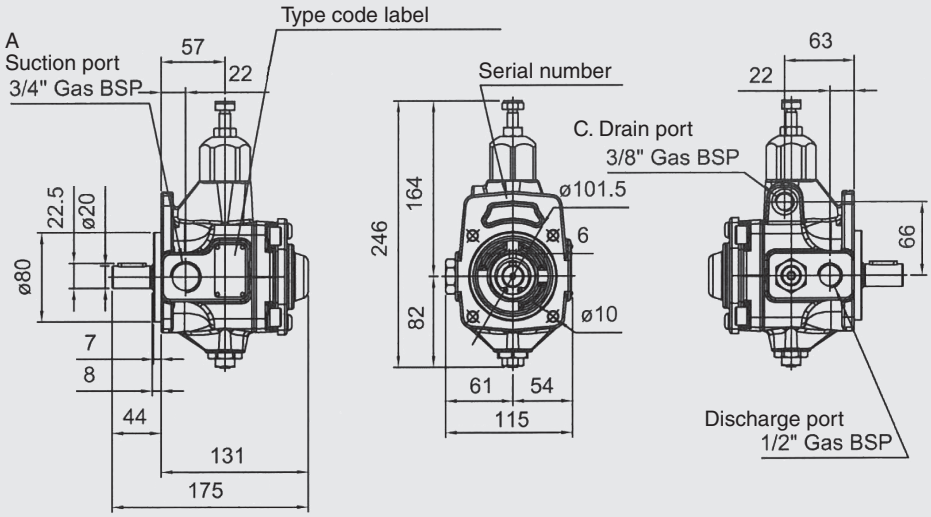
Pressure peaks exceeding 30 % of the maximum operating pressure must be avoided.

3.4.14 PVV102-05-6

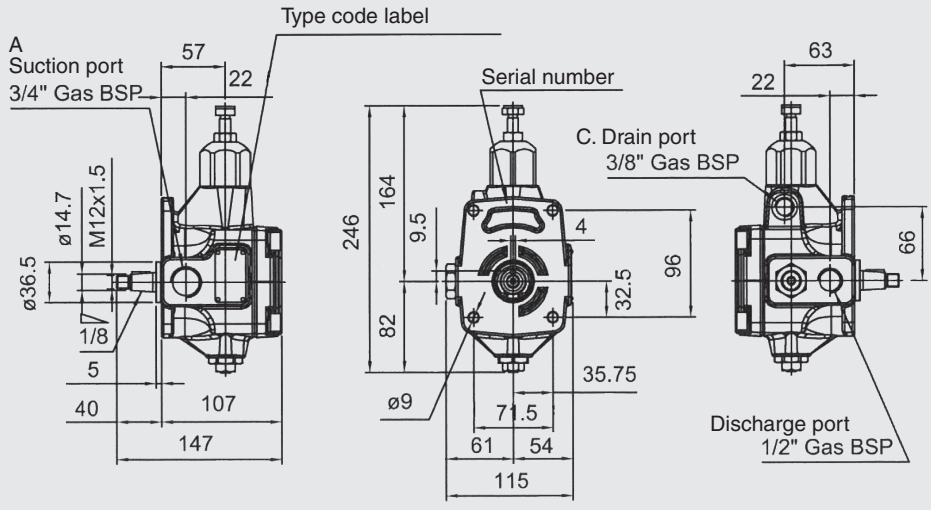
PVV102-05-16



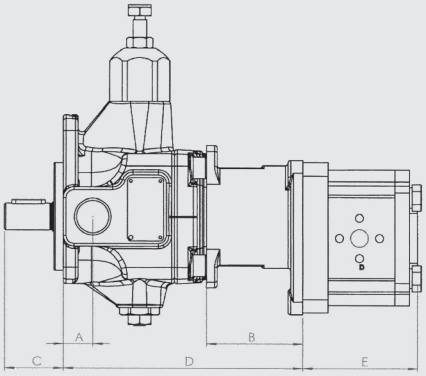
PVV102-05-16 (F - A)



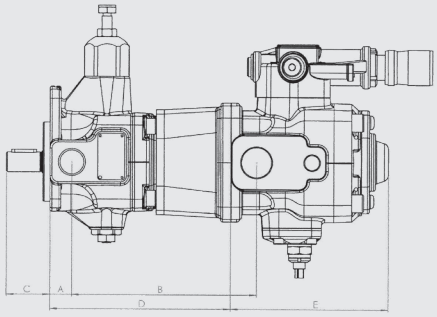
PVV102-05-16 (FGR2)



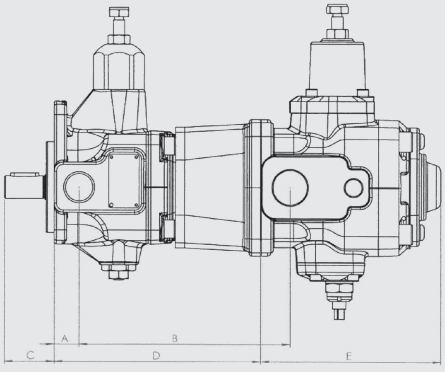
Multiple pumps
Front pump PVV102-05- ... F



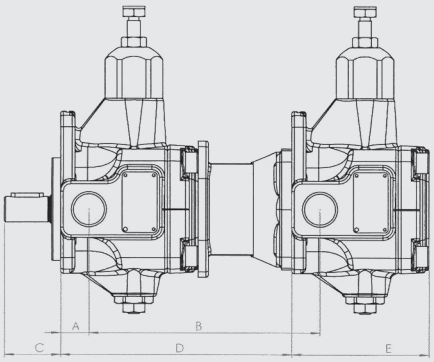
End pump	A	B	C	D	E
Gear pump Size 1	22	72	44	176	dependent on size selected
Gear pump Size 2	22	72	44	176	dependent on size selected



End pump	A	B	C	D	E
PVV100-1- ... F/ PVV101-1- ... F	22	186	44	182	159



End pump	A	B	C	D	E
PVV100-1- ... F/ PVV101-1- ... F	22	186	44	182	159



End pump	A	B	C	D	E
PVV102-05- ... F	22	180	44	180	107