

Variable displacement vane pump with hydraulic pressure compensator

PHP



Series Name	Displacement [cm ³ /r]	Flow rate at 1450rpm [l/min]	Max. Pressure [bar]
01 PHP 05-16	16	23	250
01 PHP 1-20	20	29	250
01 PHP 1-25	25	36	250
01 PHP 1-32	32	47	250
01 PHP 2-40	40	58	250
01 PHP 2-50	50	73	250
01 PHP 2-63	63	92	250
01 PHP 3-80	80	116	250
01 PHP 3-100	100	145	250
01 PHP 3-120	120	174	250

General description

PHP pumps are high pressure variable displacement vane pumps equipped with hydraulic pressure regulating device that allow you to instantly adjust the flow rate accordingly to circuit requirements. Variable displacement vane pumps are volumetric type so they deliver a maximum flow rate equivalent to its displacement for their speed of rotation. Operating pressure is due to pressure loads encountered by the fluid within the system. When the outlet pressure (on the system) equals the pump setting pressure, the flow rate is adjusted to the values required by the system. When this value is achieved, pump reduces its flow rate to zero, keeping the pressure almost constant. In zero flow conditions, pump delivers oil only to compensate any possible drain and piloting.

The series of PHP pumps, like all other Berarma variable displacement vane pumps, ensure:

- Silent running
- High efficiency
- Long working life
- Economy and simplification of hydraulic system
- Modular design
- Energy saving

The important performance increase guarantees:

- High operating pressure
- Excellent displacement dynamic control

The main innovation of the new series of 01 PHP pumps is the internal pump cartridge, designed to obtain perfect axial balancing, both in terms of hydrostatic compensation of the distribution plates and the fluid flow-rate from inlet to outlet.

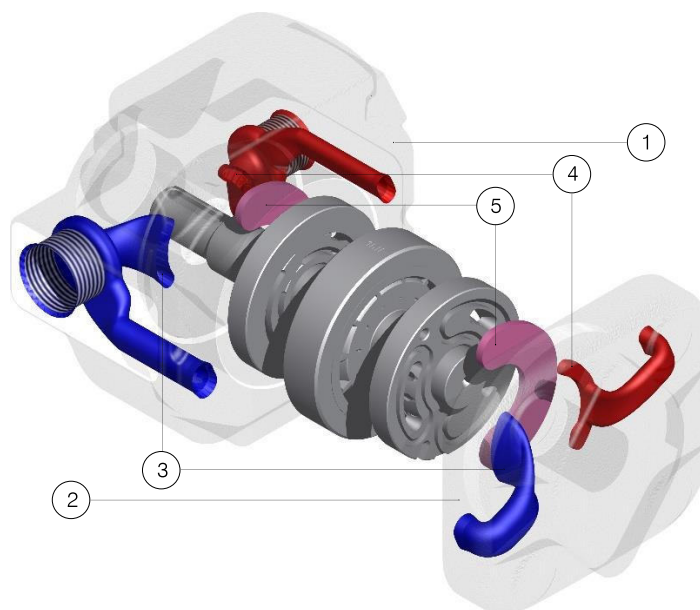
The series of PHP pumps is supplied with:

- ISO standard mounting flanges and shafts
- Gas BSP and/or SAE 3000 standard port connections
- Max. flow regulator unit to mechanically reduce pump max. displacement
- Different types of devices for hydraulic, electric and proportional control for flow rate and / or pressure
- Thru drive shaft (only with the option "A") to arrange combined pumps between Berarma pumps or the main other types of pump available on the fluid power market

Considering the features outlined above, the new series of PHP pumps is one of a kind, suitable for applications that require higher performances than the standard use of variable displacement vane pumps.

What makes the Berarma PHP series pumps a unique product of its kind?

- 250 bar operating pressure
- Double inlet and outlet pipes in the internal cartridge of the pump
- Double hydrostatic compensation in axial direction on the distribution plates
- New functional concept of the pressure compensator device (reduction of pressure peak values and response time)
- Innovative shapes and design
- Wear reduction of the internal pump cartridge parts



Definition of pump components

- (1) Body
- (2) Cover
- (3) Double inlet pipe
- (4) Double outlet pipe
- (5) Double hydrostatic compensation

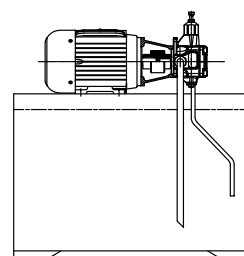
Technical data

Size	05	1	2	3
Geometric displacement according to ISO 3662 (cm ³ /r)	16	20 ÷ 25 ÷ 32	40 ÷ 50 ÷ 63	80 ÷ 100 ÷ 120
Actual displacement (cm ³ /r) Due to manufacturing tolerances, the value can vary by approx. ±3%	17	21 ÷ 26 ÷ 33	41 ÷ 50 ÷ 63	81 ÷ 100 ÷ 120
Maximum working pressure (bar) Pressure peak exceeding 30% (10% only for size 3) of the maximum operating pressure must be eliminated by adopting the appropriate measures	250			
Pressure setting range (bar)	H: 20 ÷ 250			H: 30 ÷ 250
Permitted maximum drain port pressure (bar)	1			
Inlet pressure (bar)	0.8 ÷ 1.5 absolute			
Speed range (rpm)	800 ÷ 1800	800 ÷ 1500 1800 allowed with pressure up to 160bar		
Rotation direction	R: right (clockwise) viewed from shaft end			
Load on drive shaft	NO RADIAL OR AXIAL LOADS ALLOWED			
Hydraulic fluid for other fluids please contact Berarma technical sales service	HM according to ISO 6743-4 HLP according to DIN 51524-2			
	HEES according to ISO 15380 FPM-Viton seals ÷ Pmax 160bar			
	HFD according to ISO 12922 FPM-Viton seals ÷ Pmax 160bar			
	HFC according to ISO 12922 water <40% ÷ NBR seals ÷ Pmax 100bar ÷ Vmax 1000rpm ÷ Temp. <40°C			
Viscosity range (cSt, mm ² /s)	22 ÷ 68 at operating temperature			
Starting viscosity under full flow conditions (cSt, mm ² /s)	400 max.			
Viscosity index according to ISO 2909	100 min.			
Inlet fluid temperature range (°C)	+ 15 / +60 ÷ pay attention to viscosity range			
Maximum acceptable fluid contamination level	20/18/15 according to ISO 4406 CLASS 9 according to NAS 1638			
Recommended fluid contamination level for a longer pump working life	18/16/13 according to ISO 4406 CLASS 7 according to NAS 1638			
Moment of inertia (kgm ²)	0.00019	0.0005	0.00909	0.015
	Weight single pump (kg)			
Standard control	16.4	19.1	44.8	55.2
PCS002 control	18.5	21.2	46.9	57.3
PCS003 control	18	20.8	46.4	56.9
PCS004 control	19	21.9	47.5	58
PCS005 control	17.9	20.6	46.3	56.7
PCS006 control	-	-	44.9	55.3
PCLS001 control	18.9	21.6	47.3	57.8
PCLS002 control	19.3	22.1	47.5	58.2
PCLS003 control	18.9	21.6	47.3	57.7
PCLS004 control	20	22.7	48.4	58.8
PCLS005 control	18.7	21.5	47.2	57.6

For further information and/or different operating conditions please contact Berarma technical sales service

Installation and start-up

For the installation and start-up of Berarma pumps please refer to related **Document USE AND MAINTENANCE MANUAL** available on our website.



Ordering code

Series Name	Size Displacement	Flange	Pressure setting	Rotation	Seals	Options	Pressure controls
01 PHP	2 – 50	F	H	R	M	A	PCS003

Code	Size	Displacement cm ³ /r
05 – 16	05	16
1 – 20	1	20
1 – 25	1	25
1 – 32	1	32
2 – 40	2	40
2 – 50	2	50
2 – 63	2	63
3 – 80	3	80
3 – 100	3	100
3 – 120	3	120

Code	Flange	Ports
F	ISO 3019-2 4 holes	Gas BSP / SAE 3000
FGR2 <small>only for size 05</small>	Rectangular gear pump 2	Gas BSP

Code	Pressure setting (bar)
H	20 ÷ 250 for size 05,1 and 2 30 ÷ 250 for size 3

Code	Rotation direction
R	Right (cw) view from shaft end

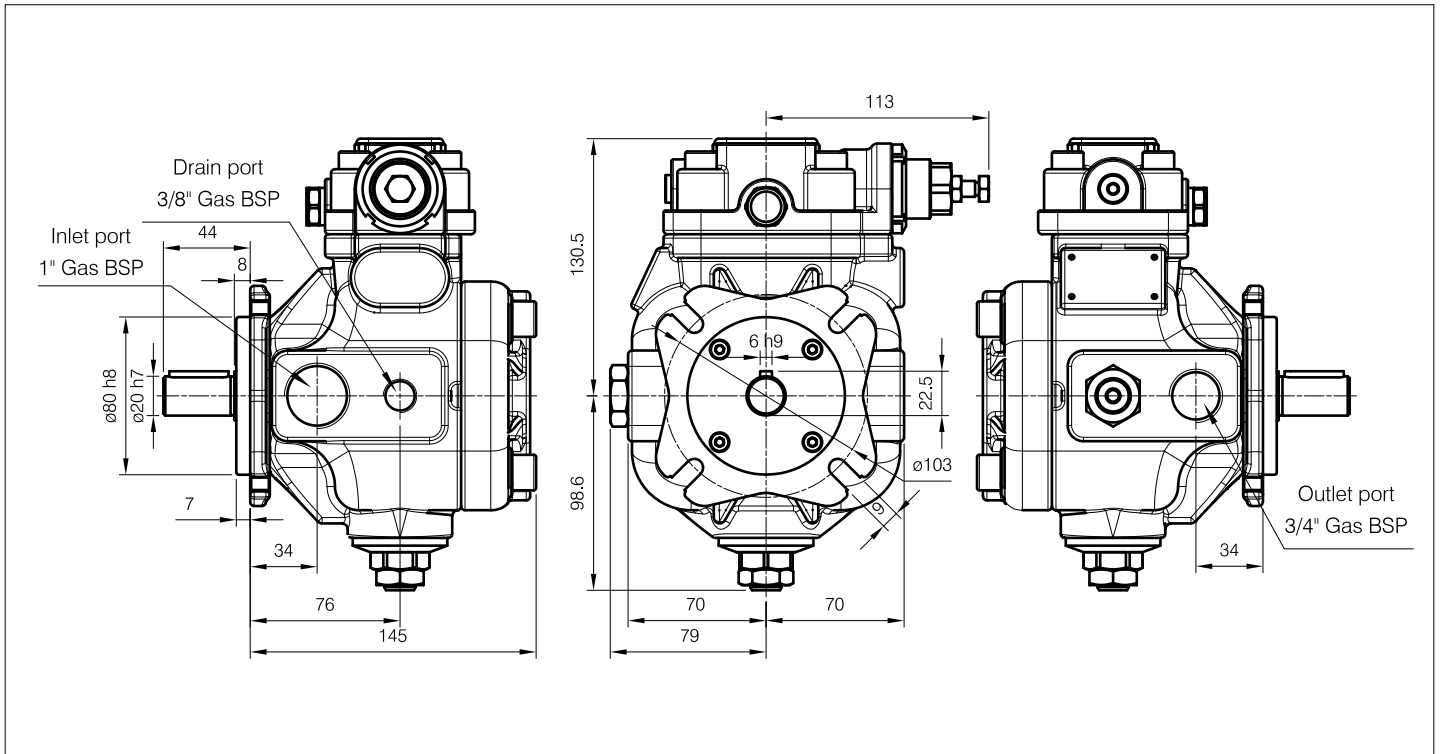
Code	Seals
M	NBR
E	FPM – Viton

Code	Option
/	Omit for no option
A	Thru drive shaft for combined pumps (only for flange F)

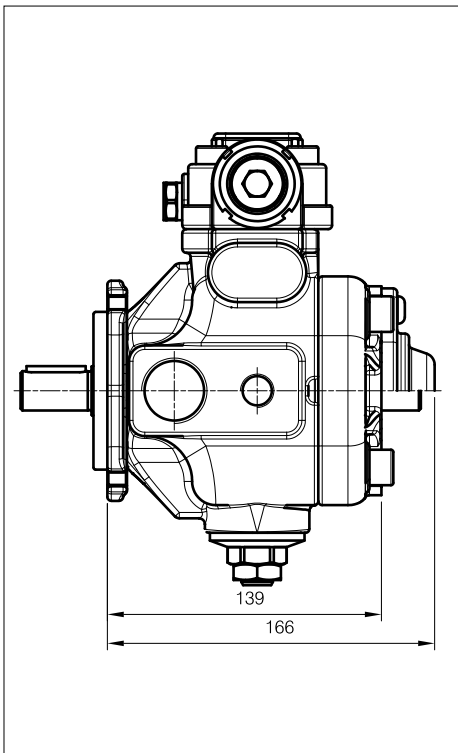
Code	Pressure control
/	Single stage of pressure
PCS002	Single stage of pressure with remote control
PCS003	Two stages of pressure, one with fixed setting at the minimum pressure
PCS004	Two stages of pressure, both adjustable
PCS005	Proportional pressure control
PCS006 <small>only for size 2-3</small>	Single stage of pressure with minimum displacement limiter control
PCLS001	Load Sensing control with single stage of pressure
PCLS002	Load Sensing control with single stage of pressure with remote control
PCLS003	Load Sensing control with two stages of pressure, one with fixed setting at the minimum pressure
PCLS004	Load Sensing control with two stages of pressure, both adjustable
PCLS005	Load Sensing with proportional pressure control

Overall dimensions

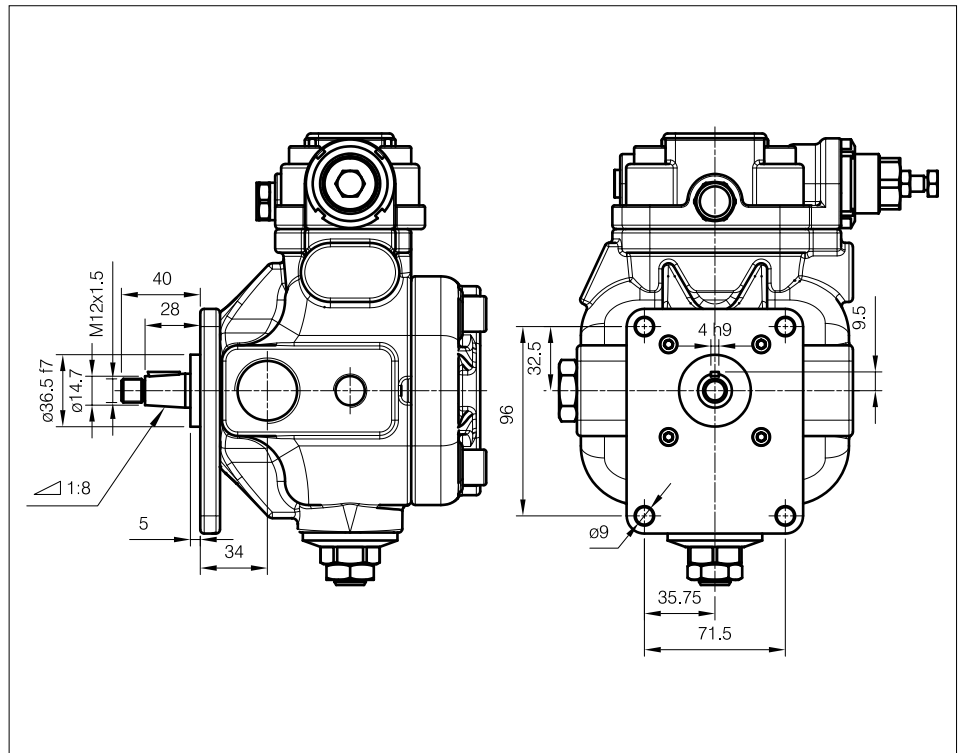
01 PHP 05-16 – Flange “F”



01 PHP 05-16 – Flange “F” + Option “A”



01 PHP 05-16 – Flange “FGR2”



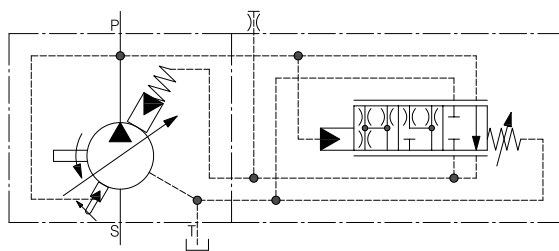
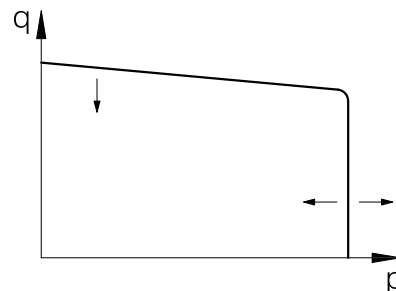
For information, please refer to related **Catalog COUPLINGS and ACCESSORIES**

Standard control

Single stage of pressure

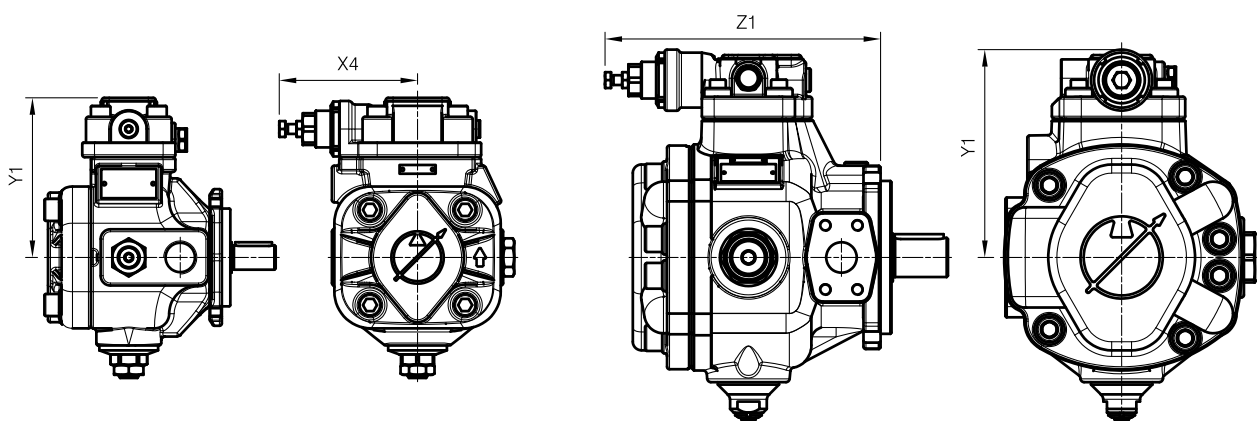
This standard control enables the pump displacement to be adjusted (until zero flow setting condition) according to the flow rate required by the hydraulic system, keeping the working pressure constant and equal to the value set on the compensator device.

The pressure value setting of the compensator device is adjusted by means of the pressure setting screw and locked using the locknut.



01 PHP 05

01 PHP 1-2-3



Size	X4	Y1	Z1
01 PHP 05	113	130.5	-
01 PHP 1	-	136.5	204
01 PHP 2	-	170	225
01 PHP 3	-	179	248

For further information see related documentation on Berarma website or contact Berarma technical sales service