

VARIABLE
DISPLACEMENT
AXIAL PISTON
PUMPS

DVP SERIES

GENERAL INFORMATIONS / INSTRUCTIONS

This variable displacement piston pump has **dual flow** and an additional piggybacked gear pump for auxiliary service, open center circuits. The pump has been designed specifically for **mini excavators** where compactness and ease of installation are critical. The automatic overall torque limiter allows you to optimize the performance of the machine while saving energy. An additional gear unit to supply joystick functions is also available.

DISPLACEMENTS

Piston units

From 7,8 cm³/rev (0.48 in³/rev)

To 15 cm³/rev (0.91 in³/rev)

Gear units

From 4,95 cm³/rev (0.30 in³/rev)

To 21,14 cm³/rev (1.29 in³/rev)

MAX SPEED

2600 min⁻¹

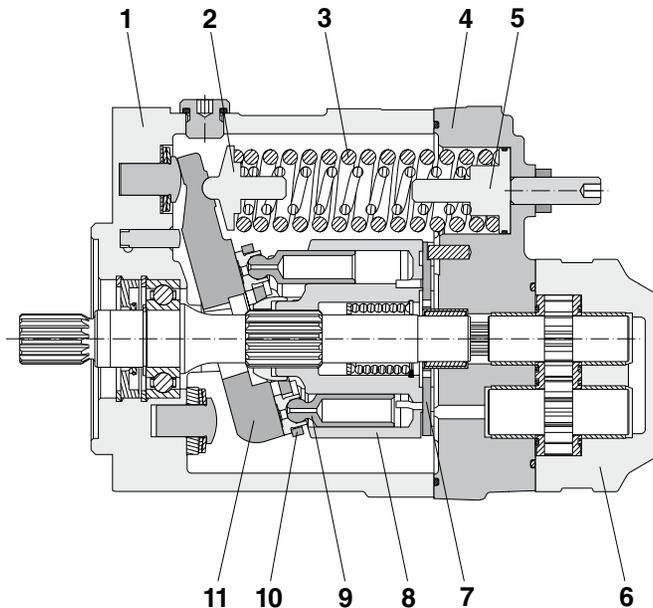
APPLICATION

Medium pressure

SECTOR

Mobile

- Compact design
- Low noise emission
- Energy savings
- Long service life



1	Pump body
2	Spring guide
3	Main pilot spring
4	Cover
5	Pilot piston
6	Pump body Kappa 20
7	Retaining plate
8	Cylinders block
9	Pistons
10	Pistons guide plate
11	Swash plate

03/07.2016



Modification from former edition.

GENERAL INFORMATIONS / INSTRUCTIONS

DIRECTION OF ROTATION

Clockwise defined looking at the drive shaft.

HYDRAULIC FLUID

Mineral oil based hydraulic fluid HL or HLP type conforming to DIN 51524. For the use of ecological fluids, HF fluid or HWBF fluid, please consult our sales department. The system should be designed to prevent aeration of the hydraulic fluid.

FLUID VISCOSITY

The fluid viscosity range for optimal use of DVP pump is between 15 and 35 cSt (77 and 163 SSU).

Functional limit conditions are:

max.: 1000 cSt (4546 SSU) at start up at -25 °C (-13 °F) with straight and short inlet line.

min.: 10 cSt (58 SSU) at maximum temperature of 100 °C (212 °F)

FILTRATION

To ensure the optimal performance and the maximum life to the pump, the hydraulic fluid must have and maintain a fluid contamination within the values shown in the table below.

Working pressure psi (bar)	$\Delta p < 140$ (2030)	$140 < \Delta p < 210$ (2030) (3045)	$\Delta p > 210$ (3045)
Contamination class NAS 1638	9	8	7
Contamination class ISO 4406:1999	20/18/15	19/17/14	18/16/13
Achieved with filter $\beta_{x(0.5)} \geq 75$ according to ISO 16889	10 μm	10 μm	10 μm

Casappa recommends to use its own production filters:



STORAGE

The storage must be in a dry environment.

Max storage time in ideal conditions is 24 months.

The ideal storage temperature is between 5°C (41°F) and 20°C (68°F). No problem in case of temperature between -40°C (-40°F) and 50°C (122°F). Below -40°C (-40°F) please consult our technical sales department.

INSTALLATION

Check that the maximum coupling eccentricity stays within 0,25 mm (0.0098 in) to reduce shaft loads due to misalignment. It is advised to use a flexible coupling suitable to absorb eventual rotational shock. The direction of rotation of the pump must agree with the prime mover rotation. Before installation, the case of the pump must be filled with fluid.

LINES

The lines must have a major diameter which is at least as large as the diameter of pump ports, and must be perfectly sealed. To reduce loss of power, the lines should be as short as possible, reducing the sources of hydraulic resistance (elbow, throttling, gate valves, etc.) to a minimum. A length of flexible tubing is recommended to reduce the transmission of vibrations.

Before connecting the lines, remove any plug and make sure that the lines are perfectly clean. Check that the dimensions of the suction line guarantee a pressure equal or superior to 0,8 bar (24 in Hg). Inlet pressure less than 0,8 bar (24 in Hg) could cause an increase of noise emission, the decrease of the pump performances and a reduction of its life expectancy.

STARTING UP

Check that all connections are secure and that the entire system is completely clean. Add oil to the tank always using a filter. Bleed the air from the circuit to help the filling. Turn on the system for a few moments at minimum speed, then bleed the circuit again and check the level of oil in the tank. Gradually increase the pressure and speed of rotation up to the pre-set operating levels, which must stay within the stated limits as specified in the catalogue.

Replaces: 02/04.2013

03/07.2016

TECHNICAL DATA

Technical data with mineral oil

HL or HLP mineral oil based hydraulic fluid to DIN 51524

Inlet pressure	in Bar abs. (Hg)	min.	0,7 (21)
	bar abs. (psi)	max.	3 (44)
Max. speed n_{max}	min^{-1}	@ V_{max}	2600
Control type	Constant torque control		
Setting torque range	Nm (lbf in)	from 39 (345) to 120 (1062)	
Drain line	Internal		
Fill capacity	l (US gallon)	0,9 (0.2)	
Mass (without oil)	kg (lbs)	from 19,5 (43) to 20,5 (45.2)	
Seals	N = Buna		
Operating temperature ○	°C (°F)	min.	-25 (-13)
		max. cont.	80 (176)
		max. peak	100 (212)

Piston units type

DVP

Max. displacement (standard)	cm^3/rev (in^3/rev)	V_{max}	15 (0.91)	14 (0.85)	12,5 (0.76)	11 (0.67)	10 (0.61)	9 (0.55)	8,5 (0.52)	8 (0.49)	7,8 (0.48)
Min. displacement (standard)		V_{min}	4 (0.24) - 3,6 (0.22) - 3 (0.18) - 2,7 (0.16)								
Max. outlet pressure	bar (psi)	cont.	210 (3045)								
		int.	230 (3335)								
		peak	250 (3625)								
Max. delivery (theor.)	l/min (US gpm)	@ $V_{max} - n_{max}$	39 (10.3)	36,4 (9.6)	32,5 (8.6)	28,6 (7.6)	26 (6.9)	23,4 (6.2)	22,1 (5.84)	20,8 (5.50)	20,2 (5.34)

KAPPA gear units

20-4 20-6,3 20-8 20-11,2 20-14 20-16 20-20

Displacement	cm^3/rev (in^3/rev)	V	20-4	20-6,3	20-8	20-11,2	20-14	20-16	20-20
			4,95 (0.30)	6,61 (0.40)	8,26 (0.50)	11,23 (0.69)	14,53 (0.89)	16,85 (1.03)	21,14 (1.29)
Max. outlet pressure	bar (psi)	cont.	285 (4133)	285 (4133)	285 (4133)	275 (3988)	265 (3843)	260 (3770)	210 (3045)
		int.	300 (4350)	300 (4350)	300 (4350)	290 (4205)	290 (4205)	290 (4205)	290 (4205)
		peak	330 (4785)	330 (4785)	330 (4785)	320 (4640)	320 (4640)	320 (4640)	250 (3625)
Max. delivery (theor.)	l/min (US gpm)	@ $V - n_{max}$	12,8 (3.38)	17,1 (4.52)	21,4 (5.65)	29,2 (7.7)	37,7 (10.0)	43,8 (11.6)	54,9 (14.5)

POLARIS gear units

20-4

Displacement	cm^3/rev (in^3/rev)	V	20-4
			4,95 (0.30)
Max. outlet pressure ○	bar (psi)	cont.	250 (3625)
		int.	280 (4060)
		peak	300 (4350)

For different working conditions, please consult our sales department.

Replaces: 02/04.2013

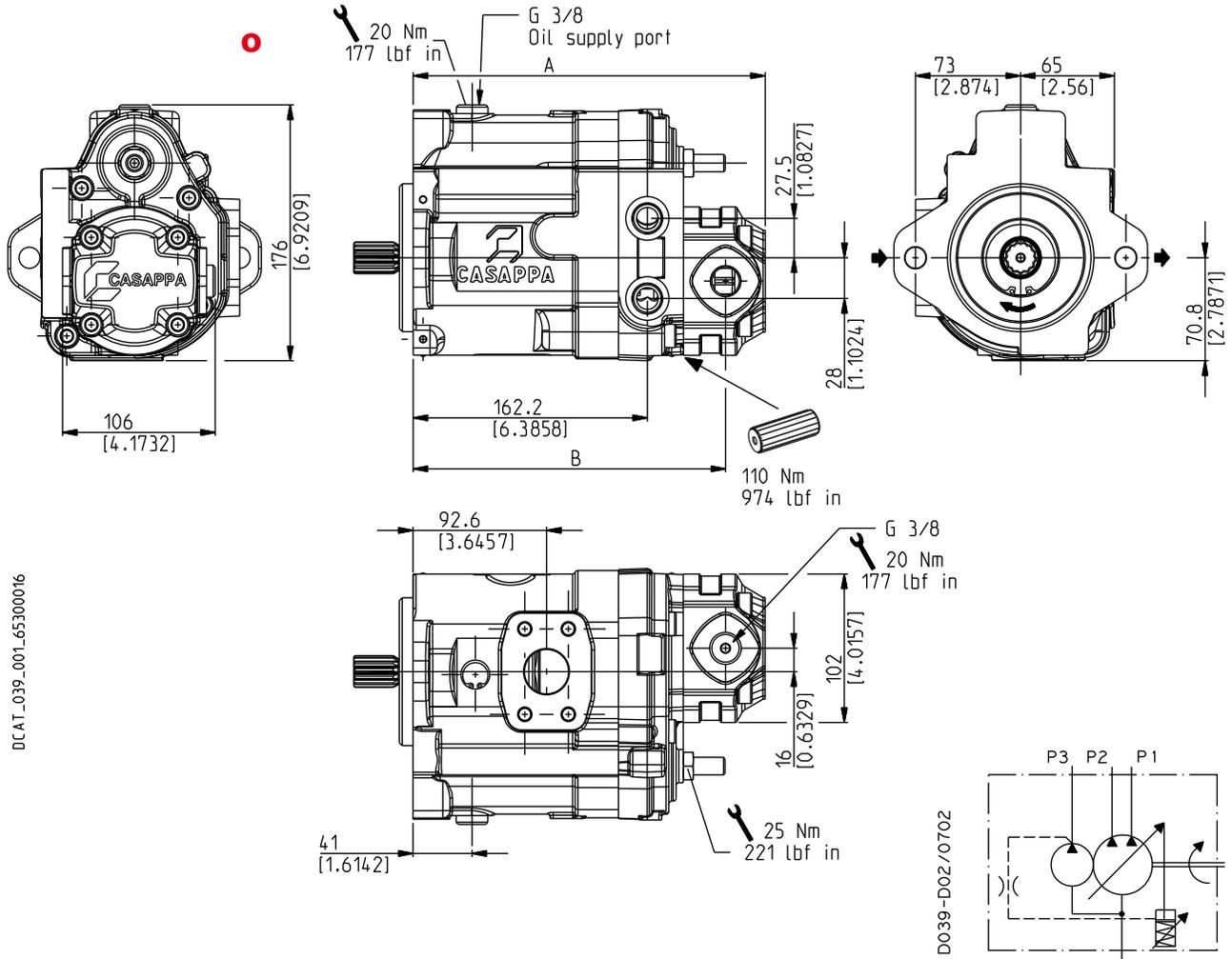
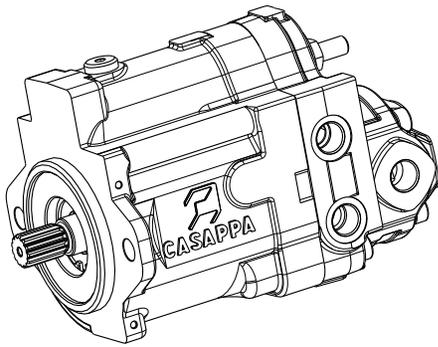
○ 03/07.2016

DIMENSIONS

DVP

Available also with built-in valves for different purposes.
For more information please consult our sales department.

Replaces: 02/04.2013



DCAT_039_001_65300016

D039-D02/0702

03/07.2016

KAPPA gear units

DVP piston units	20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions
7,8 - 8 - 8,5	240,2	242,7	245,2	248,7	252,7	258,2	264,7	mm A
9 - 10	(9.4567)	(8.3740)	(9.6535)	(9.7913)	(9.9488)	(10.1654)	(10.4213)	(inch)
11 - 12,5	212,7	215,2	217,7	221,2	219,7	225,2	231,7	mm B
14 - 15	(8.3740)	(8.4724)	(8.5709)	(8.7087)	(8.6496)	(8.8661)	(9.1220)	(inch)

To order please consult our sales department.

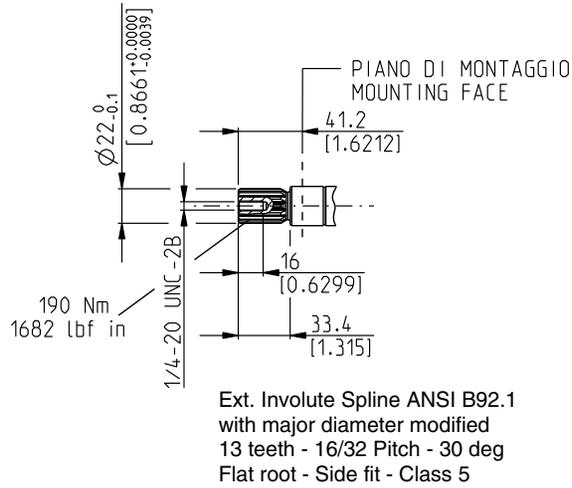
SHAFTS / MOUNTING FLANGES

SAE "B" SPLINE

04

Available with flange code **S5**

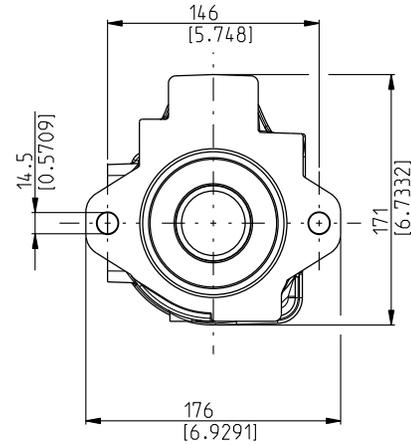
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SAE "B" 2 HOLES

S5

SAE J744

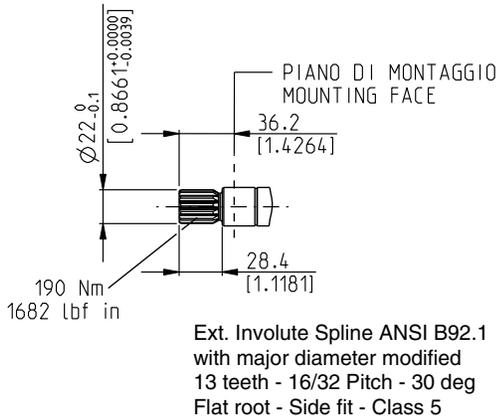


SPLINE

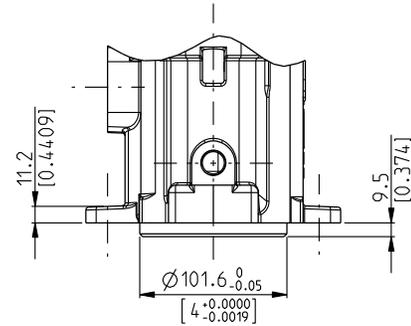
F8

Available with flange code **S5**

DCAT_039_005_47552000



DCAT_039_003_48417003

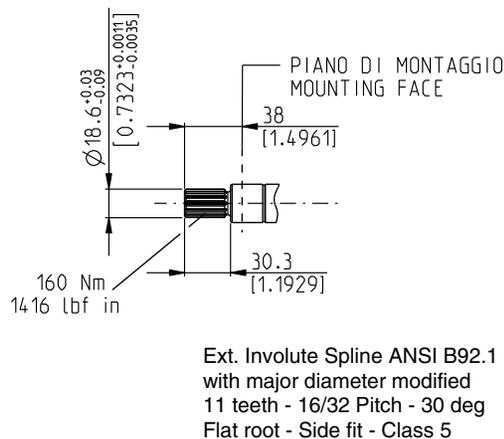


SPLINE

C1

Available with flange code **S5**

DCAT_039_006_47552030



01/11.2007

PORTS SIZE

 Tightening torque for low pressure side port.

 Tightening torque for high pressure side port (values obtained at 350 bar)

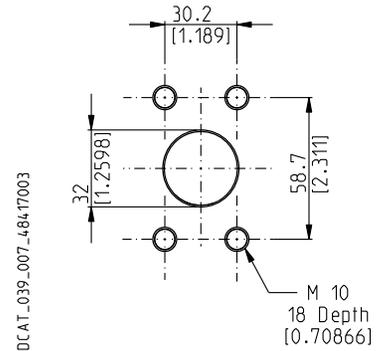
Replaces: 01/11.2007

INLET PORT

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI SSM

Metric thread ISO 60° conforms to ISO/R 262

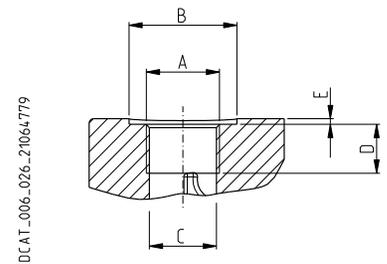
CODE	Nominal size	Pump type	 Nm (lbf in)
MD	1" 1/4	DVP	20 ⁺¹ (177 ÷ 186)



OUTLET PORTS

GAS STRAIGHT THREAD PORTS BSPP

British standard pipe parallel (55°) conforms to UNI - ISO 228



CODE	Nominal size	Pump type	A	Ø B	Ø C	D	E	 Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)
GC	3/8"	PL20	G 3/8	30 (1.1811)	15 (0.5906)	14 (0.5512)	0,5 (0.0197)	25 ⁺¹ (221 ÷ 230)
GD	1/2"	DVP	G 1/2	30 (1.1811)	19 (0.7480)	17 (0.6693)	2 (0.0787)	50 ^{+2.5} (443 ÷ 465)
		KP20		—	—	20 (0.7874)	—	50 ^{+2.5} (443 ÷ 465)

02/04.2013

DVP outlet port

PORTS SIZE

 Tightening torque for low pressure side port.

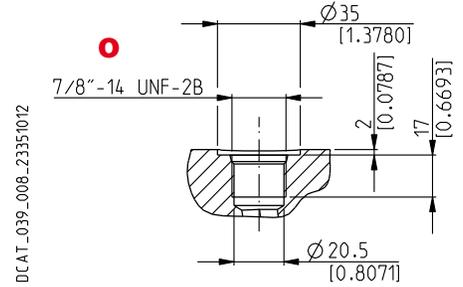
 Tightening torque for high pressure side port (values obtained at 350 bar)

SAE STRAIGHT THREAD PORTS J514

ODT

American straight thread UNC-UNF 60° conforms to ANSI B 1.1

CODE	Nominal size	Pump type	 Nm (lbf in)
OC	5/8"	DVP KP20	70 ⁺⁵ (620 ÷ 664)



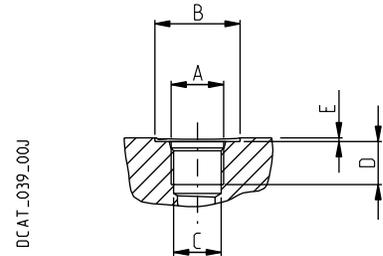
Replaces: 01/11.2007

JIS B2351 STRAIGHT THREAD PORTS

JIS

British standard pipe parallel (55°) conforms to UNI - ISO 228

CODE	Nominal size	Pump type	A	Ø B	Ø C	D	E	 Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	
JC	3/8"	PL20	PF 3/8	28	15	18	0,5	25 ⁺¹
		KP20	(G 3/8)	(1.1024)	(0.5906)	(0.7087)	(0.0197)	(221 ÷ 230)
JD	1/2"	DVP					2 (0.0787)	50 ^{+2,5} (443 ÷ 465)
		PL20	PF 1/2	34	19	18	0,5	50 ^{+2,5}
		KP20	(G 1/2)	(1.3386)	(0.7480)	(0.7087)	1 (0.0394)	(443 ÷ 465)

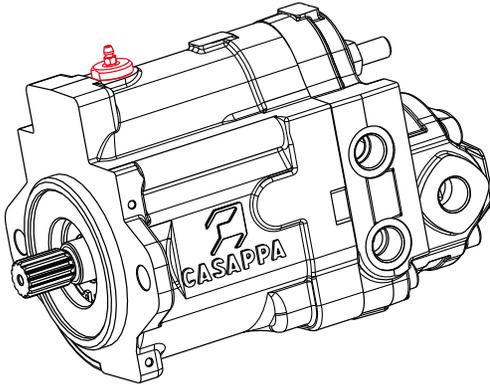


02/04.2013

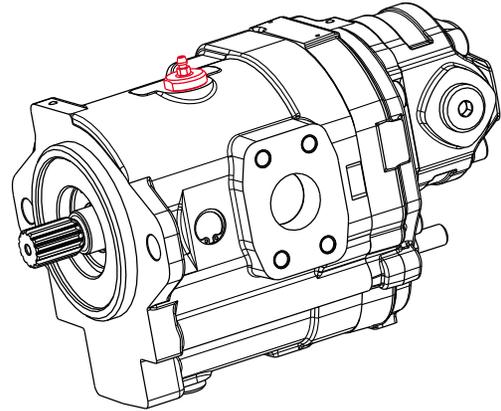
BREATHING PLUG AND MOUNTING POSITIONS (ONLY ON REQUEST)

Breather plug is available only on request.
For more information please consult our sales department.

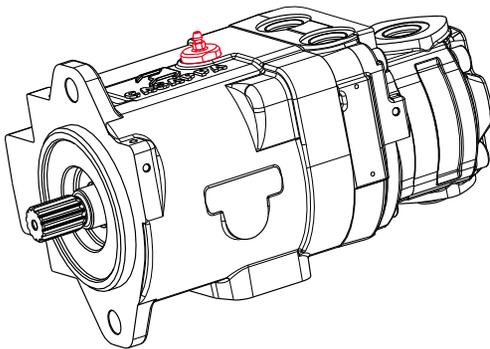
STANDARD POSITION



REAR POSITION



SIDE POSITION

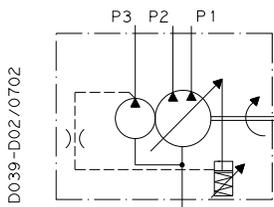
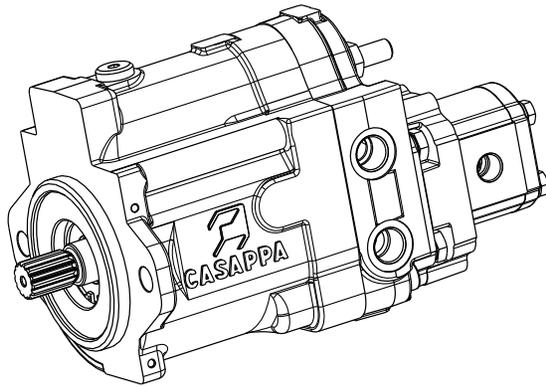


01/11.2007

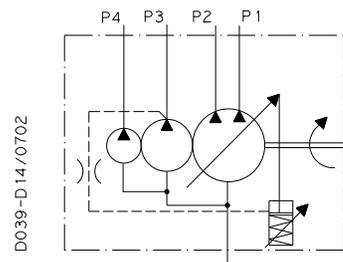
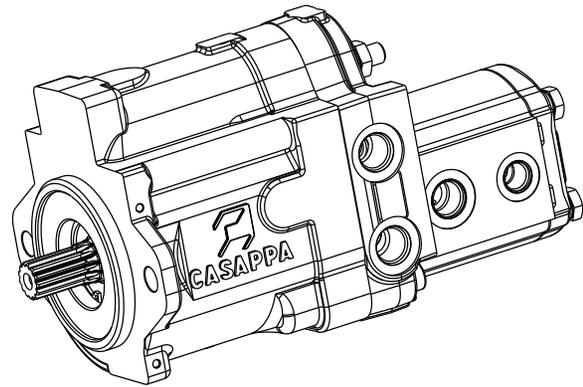
OTHER COMBINATIONS

The pump is standard with common inlet.
For more information please consult our sales department.

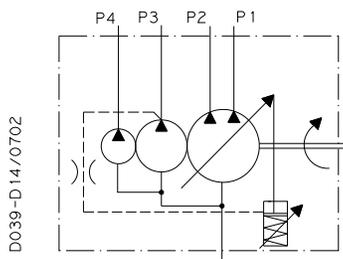
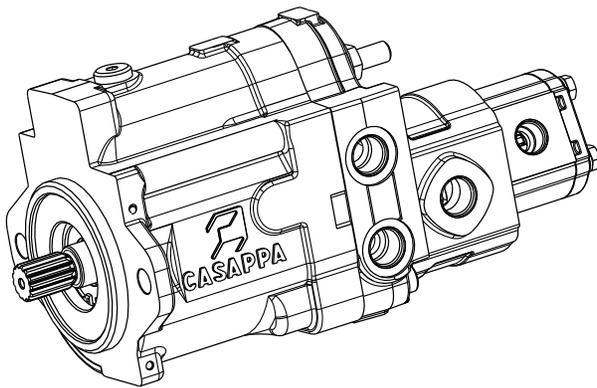
DVP + PLP10



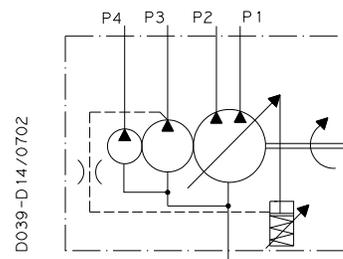
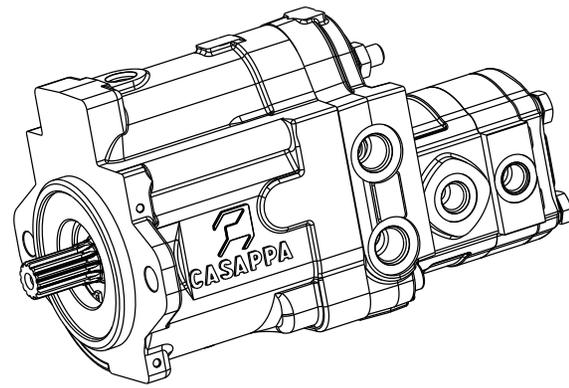
DVP + PLP20 TWIN



DVP + KP20 + PLP10



DVP + KP20 + PLP20



Replaces: 01/11.2007

02/04.2013

Our policy is one of continuous improvement in product. Specification of items may, therefore, be changed without notice.

DVP 03 T A

Edition: 03/07.2016

Replaces: DVP 02 T A



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