

VARIABLE  
DISPLACEMENT  
AXIAL PISTON  
PUMPS

**DVP SERIES**

## GENERAL INFORMATIONS / INSTRUCTIONS

This variable displacement piston pump has **dual flows** 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 cm<sup>3</sup>/rev (0.48 in<sup>3</sup>/rev)

To 15 cm<sup>3</sup>/rev (0.91 in<sup>3</sup>/rev)

#### Gear units

From 4,95 cm<sup>3</sup>/rev (0.30 in<sup>3</sup>/rev)

To 21,14 cm<sup>3</sup>/rev (1.29 in<sup>3</sup>/rev)

### MAX SPEED

2600 min<sup>-1</sup>

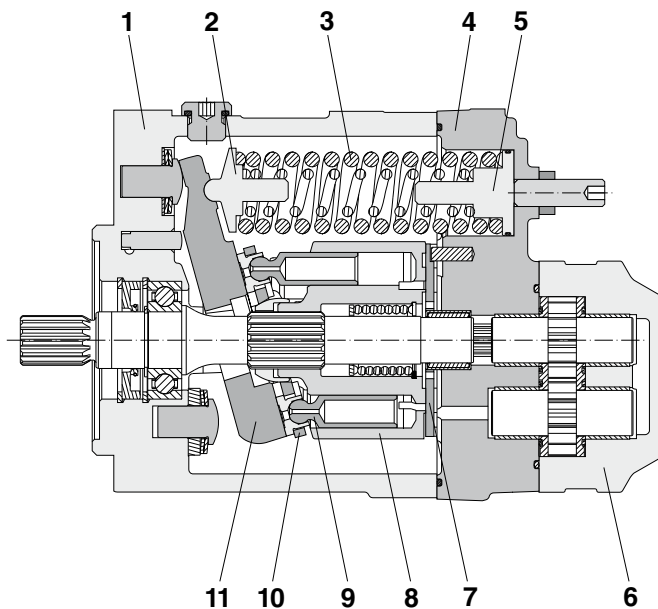
### APPLICATION

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

02/04.2013



**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 $\beta_{x_{(0)}} \geq 75$ according to ISO 16889	10 $\mu\text{m}$	10 $\mu\text{m}$	10 $\mu\text{m}$

Casappa recommends to use its own production filters:



02/04.2013

## 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	V = Viton
Operating temperature <span style="color: red;">○</span>	°C (°F)	min.	-25 (-13)	-15 (5) <span style="color: red;">○</span>
		max. cont.	80 (176)	110 (230)
		max. peak	100 (212)	125 (257)

### Piston units type

DVP

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

### KAPPA gear units

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

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

### POLARIS gear units

20-4

Displacement	$cm^3/rev$ ( $in^3/rev$ )	$V$	4,95	
			(0.30)	
Max. outlet pressure <span style="color: red;">○</span>	bar (psi)	cont.	250 (3625)	
		int.	280 (4060)	
		peak	300 (4350)	

● In working cycle: cont. = continuous - int. = intermittent

For different working conditions, please consult our sales department.

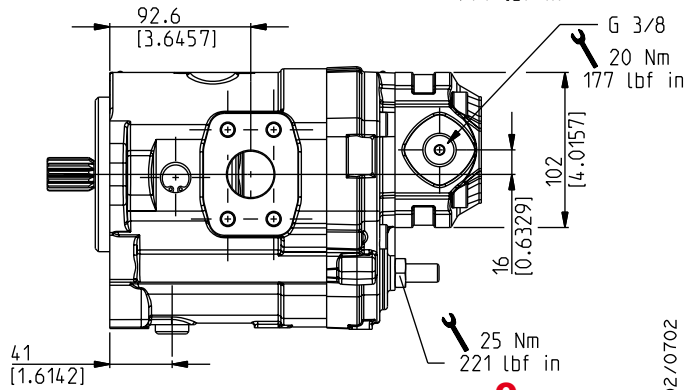
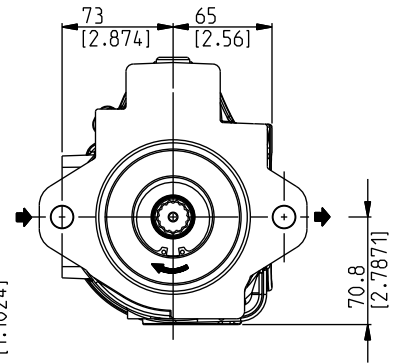
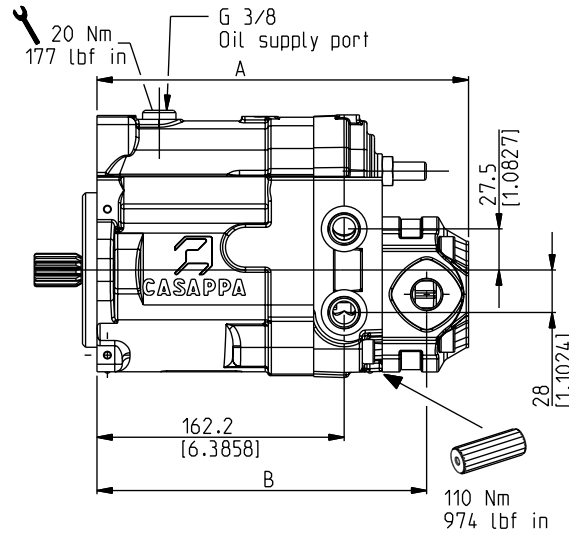
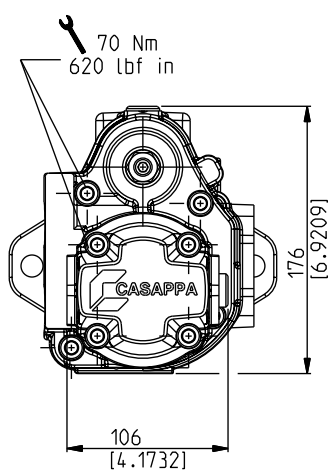
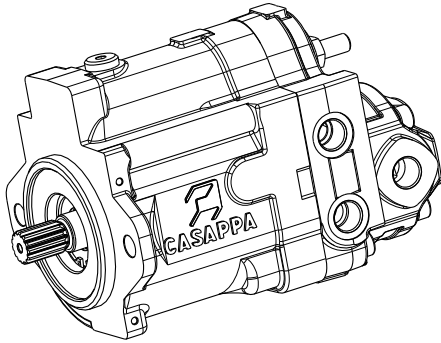
Replaces: 01/11.2007

○ 02/04.2013

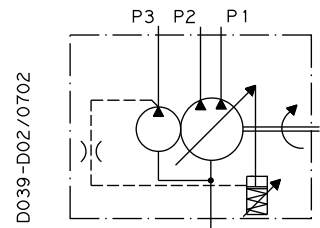
**DIMENSIONS**

**DVP**

Replaces: 01/11.2007



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02/04.2013

KAPPA gear units

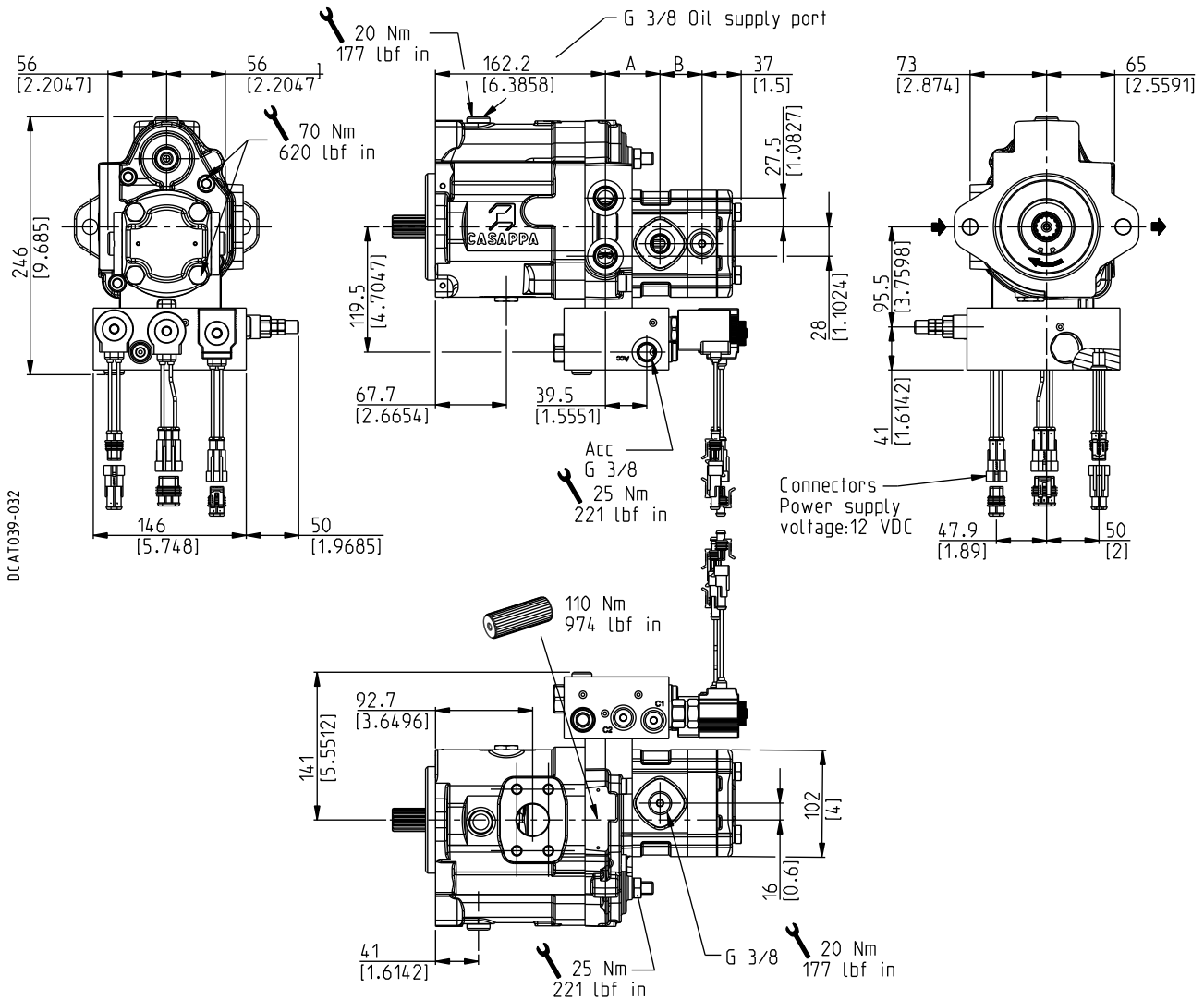
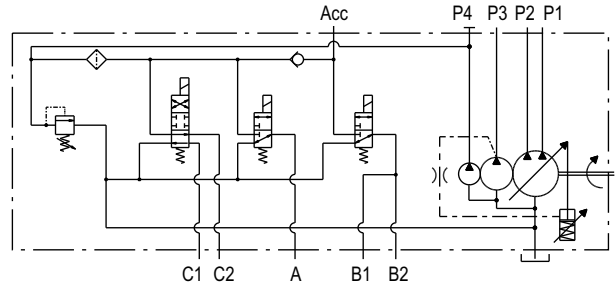
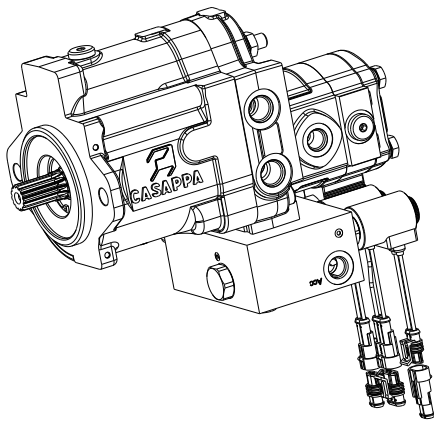
DVP piston units	20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions
<b>7,8 - 8 - 8,5</b>	240,2	242,7	245,2	248,7	252,7	258,2	264,7	mm
<b>9 - 10</b>	(9.4567)	(8.3740)	(9.6535)	(9.7913)	(9.9488)	(10.1654)	(10.4213)	(inch) <b>A</b>
<b>11 - 12,5</b>	212,7	215,2	217,7	221,2	219,7	225,2	231,7	mm
<b>14 -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

To order please consult our sales department.

**DIMENSIONS (valve option)**

**DVP**

Replaces: 01/11.2007



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DVP piston units	KAPPA 20 gear units (●)	POLARIS 20 gear units (●)	Dimensions		
<b>7,8 - 8 - 8,5 - 9 - 10</b>			46,1 (1.8150)	mm (inch)	<b>A</b>
<b>11 - 12,5 - 14 - 15</b>	<b>20●8</b>	<b>20●4</b>	40,2 (1.5827)	mm (inch)	<b>B</b>

(●) To order and for different combinations please consult our sales department.

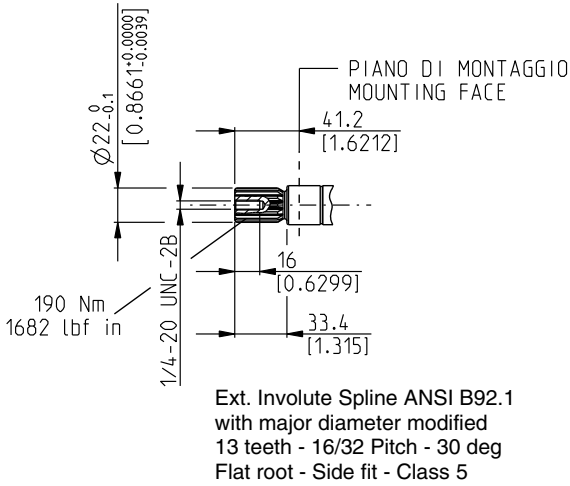
## SHAFTS / MOUNTING FLANGES

### SAE "B" SPLINE

**04**

Available with flange code **S5**

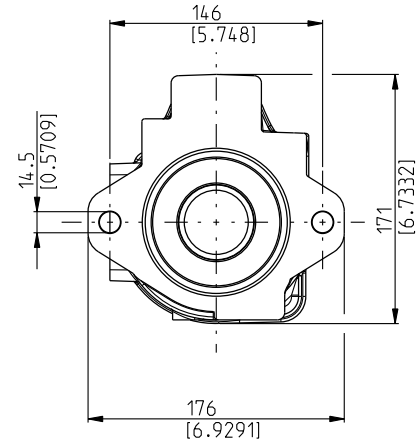
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### SAE "B" 2 HOLES

**S5**

SAE J744

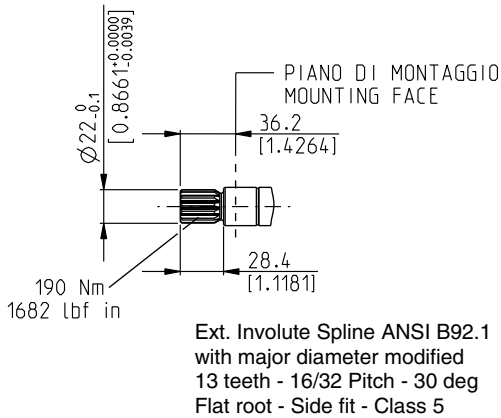


### SPLINE

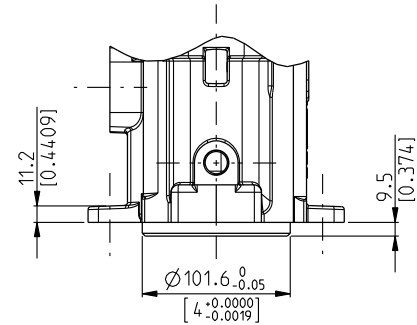
**F8**

Available with flange code **S5**

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DCAT\_039\_003\_48417003



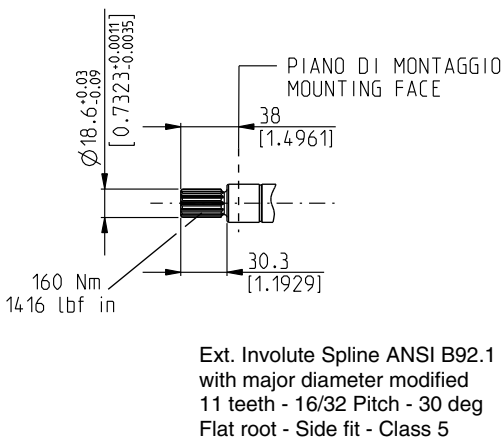
### SPLINE

**C1**


Available with flange code **S5**


01/11.2007

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## PORTS SIZE


 Tightening torque for low pressure side port.

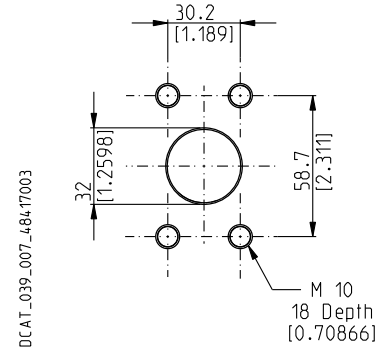
 Tightening torque for high pressure side port (values obtained at 350 bar)

### 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)
<b>MD</b>	1" 1/4	DVP	20 <sup>+1</sup> (177 ÷ 186)

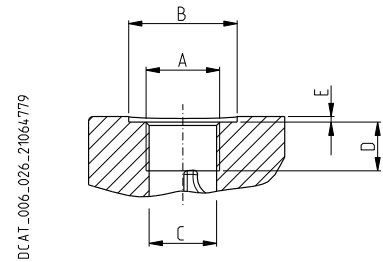



Replaces: 01/11.2007

### 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)
<b>GC</b>	3/8"	PL20	G 3/8	30 (1.1811)	15 (0.5906)	14 (0.5512)	0,5 (0.0197)	25 <sup>+1</sup> (221 ÷ 230)
			DVP	30 (1.1811)	19 (0.7480)	17 (0.6693)	2 (0.0787)	50 <sup>+2,5</sup> (443 ÷ 465)
<b>GD</b>	1/2"	KP20	G 1/2	—	—	20 (0.7874)	—	50 <sup>+2,5</sup> (443 ÷ 465)


DVP outlet port

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## PORTS SIZE

 Tightening torque for low pressure side port.


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

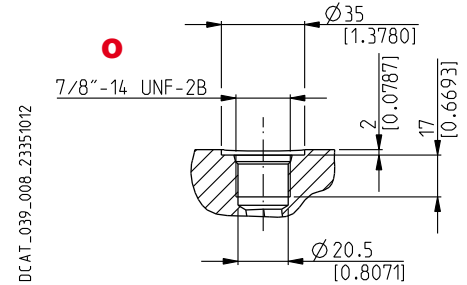
Replaces: 01/11.2007

### SAE STRAIGHT THREAD PORTS J514

**ODT**

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

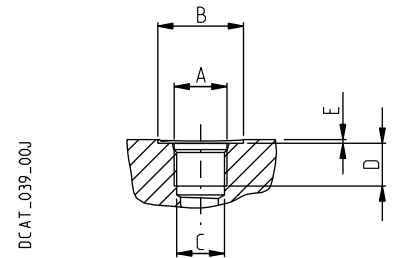
CODE	Nominal size	Pump type	 Nm (lbf in)
<b>OC</b>	5/8"	DVP KP20	70 <sup>+5</sup> (620 ÷ 664)




### JIS B2351 STRAIGHT THREAD PORTS

**JIS**

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



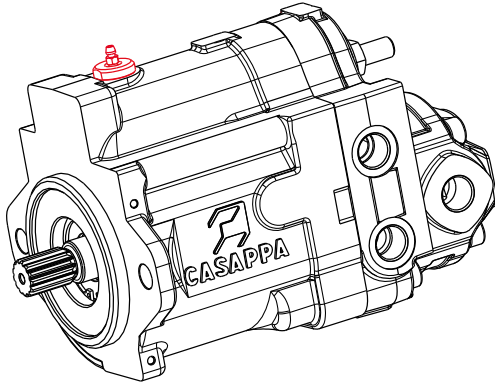
CODE	Nominal size	Pump type	A	Ø B	Ø C	D	E	 Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	
<b>JC</b>	3/8"	PL20	PF 3/8	28	15	18	0,5	25 <sup>+1</sup>
		KP20	(G 3/8)	(1.1024)	(0.5906)	(0.7087)	(0.0197)	(221 ÷ 230)
<b>JD</b>	1/2"	DVP					2	50 <sup>+2,5</sup>
		PL20	PF 1/2	34	19	18	0,5	(443 ÷ 465)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

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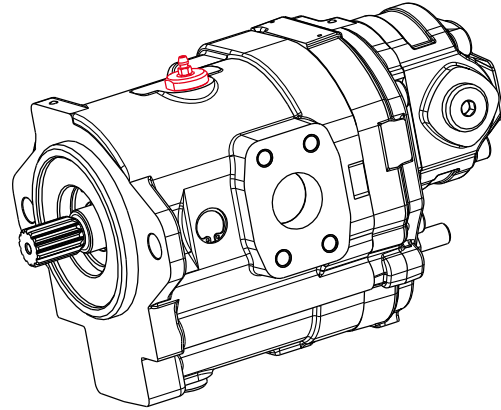
## BREATHER PLUG AND MOUNTING POSITIONS (ONLY ON REQUEST)

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

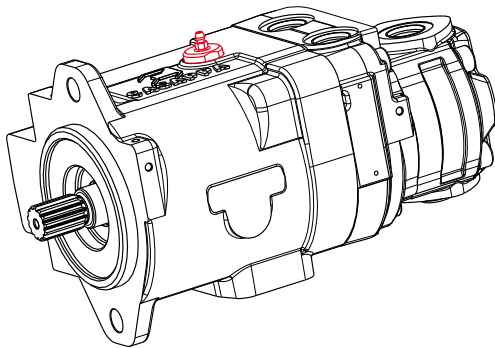
**STANDARD POSITION**



**REAR POSITION**



**SIDE POSITION**

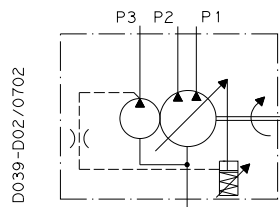
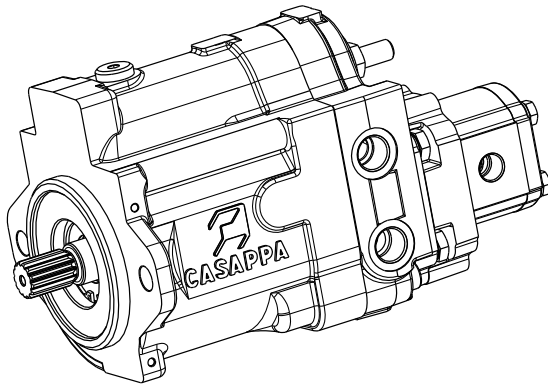


## AVAILABILITY OF COMBINATION

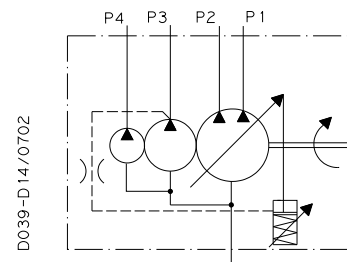
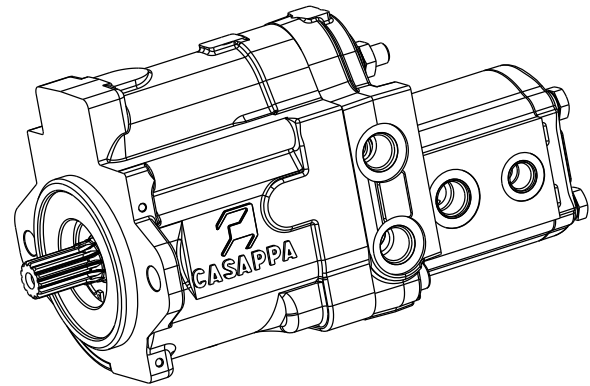
The pump is standard with common inlet.  
For more information please consult our sales department.

Replaces: 01/11.2007

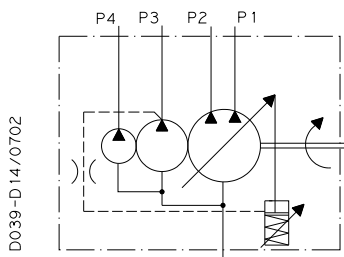
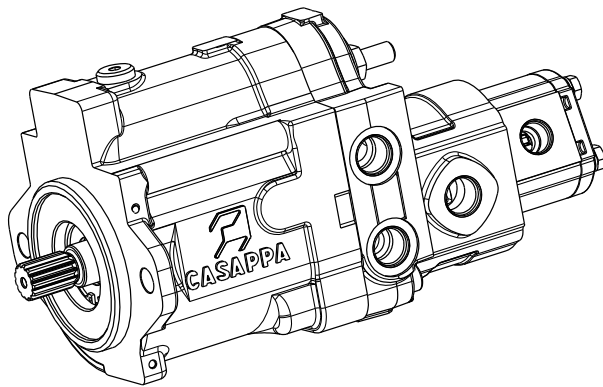
**DVP + PLP10**



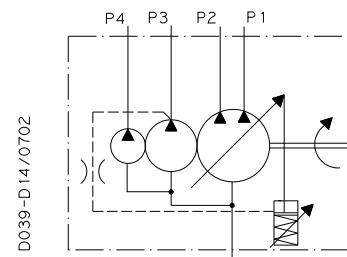
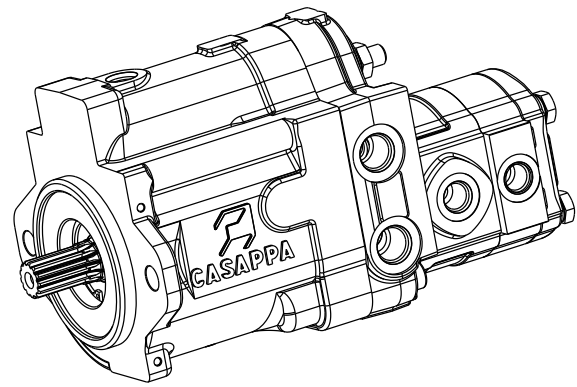
**DVP + PLP20**



**DVP + KP20 + PLP10**



**DVP + KP20 + PLP20**



02/04.2013

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

DVP 02 T A

Edition: 02/04.2013

Replaces: DVP 01 T A



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