

VARIABLE  
DISPLACEMENT  
AXIAL PISTON  
PUMPS

**MVP**

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## INDEX

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Section	Page
FEATURES .....	3
GENERAL INFORMATION / INSTRUCTIONS .....	4
MOUNTING POSITIONS .....	5
DISPLACEMENTS AND WORKING PRESSURES RANGE .....	6
TECHNICAL DATA .....	7
DISPLACEMENT SETTING CENTER OF GRAVITY .....	8
PORTS POSITION .....	12
OPERATING CURVES .....	13
SINGLE PUMPS AND COMMON INLET MULTIPLE PUMPS DIMENSIONS .....	20
DRIVE SHAFTS .....	32
MOUNTING FLANGES .....	36
PORTS SIZES .....	38
REGULATORS .....	40
MULTIPLE PUMPS WITH THROUGH DRIVE .....	59
HOW TO ORDER .....	70



**Modification from former edition.**

05/10.2014

## FEATURES

Variable displacement axial piston pumps swash plate design ideally suited for medium and high pressure open circuit applications. The compact design allows to be mounted directly on engine motors.

Replaces: 03/06.2011

### DISPLACEMENTS

From 14 cm<sup>3</sup>/rev (0.85 in<sup>3</sup>/rev)  
To 84,7 cm<sup>3</sup>/rev (5.17 in<sup>3</sup>/rev)

### PRESSURE

Max. continuous 280 bar (4060 psi)  
Max. intermittent 315 bar (4568 psi)  
Max. peak 350 bar (5075 psi)

### SPEED

Max. 3500 min<sup>-1</sup>

### APPLICATION

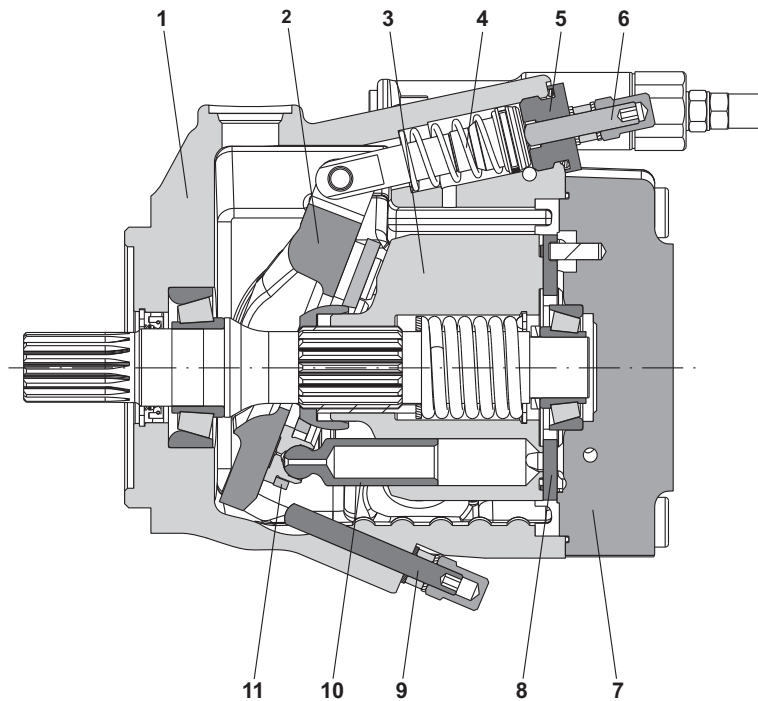
Medium, high pressure

### SECTOR

Mobile

### TYPICAL APPLICATIONS

- Skid Steer Loaders
- Wheel Loaders - Backhoe Loaders
- Mini and Midi-Excavators
- Telehandlers
- Forklifts
- Windmills - Green Energy
- Tractors & Attachements



1	Pump body
2	Swash plate
3	Cylinders block
4	Counterbalancing spring
5	Plug
6	Max. displacement limiter
7	Cover
8	Valve plate
9	Min. displacement limiter
10	Piston
11	Piston guide plate

05/10.2014

- Compact design
- Longer service life
- Low noise emission
- Max. and min. displacement limiter
- Drive shaft bearing suitable for radial and axial loads
- Hydraulic and Electro-hydraulic displacement controls

## GENERAL INFORMATION / INSTRUCTIONS

### DIRECTION OF ROTATION

Clockwise or anti-clockwise defined looking at the drive shaft.

### HYDRAULIC FLUID

Mineral oil based hydraulic fluid conforming to DIN 51524, fire resistant fluids and biodegradable fluids according to the technical data shown in the tables on pages 5 ÷ 7. The system should be designed to prevent aeration of the hydraulic fluid.

### FLUID VISCOSITY

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

Functional limit conditions are:

max.: 1500 cSt (6818 SSU) at start up at minimum temperature of -25 °C (-13 °F) with straight and short inlet line.

min.: 10 cSt (58 SSU) at maximum temperature of 110 °C (230 °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 bar (psi)	$\Delta p < 140$ (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:



### 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 shocks. For applications with axial and radial loads exceeding published standards, consult our sales department. 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 drain line is dimensioned in a way to guarantee a case pressure lower than 1,5 bar (22 psi) absolute. The drain line must be connected directly (no filter, no valves, no oil cooler) to the tank and must terminate below the oil level. 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.

### FOR VERY LOW TEMPERATURE

#### STARTING UP

We strongly recommend to warm up the oil before running the machine. If this is not possible, the warm up of the oil and of the pump should be carried out following these instructions:

- Start the pump in stand-by condition at minimum speed. Keep this working condition until the pump case reaches -20°C (-4°F)
- Increase slowly the displacement. Max pressure permitted: 50 bar (725 psi). The maximum permitted speed is strictly connected to the layout of the inlet circuit; check that there is no cavitation before increasing the speed.
- Keep this working condition until the oil temperature in the whole system is -10°C (14°F).
- Maximum pressure can be achieved from now on.
- Always check the outlet flow to prevent cavitation damage.

All the temperature are referred to oil with viscosity ISO VG 32 according to DIN 51 519.

#### SUGGESTIONS

To prevent cavitation at low temperature we suggest:

- To warm up the tank
- To pressurize the tank
- To oversize the inlet hose

Replaces: 03/06.2011

05/10.2014

## MOUNTING POSITIONS

Standard pump is supplied with D1 drain hole open and D2, D3, D4 plugged.

Before installation fill the pump with hydraulic oil for at least 3/4 of the volume keeping it in horizontal position.

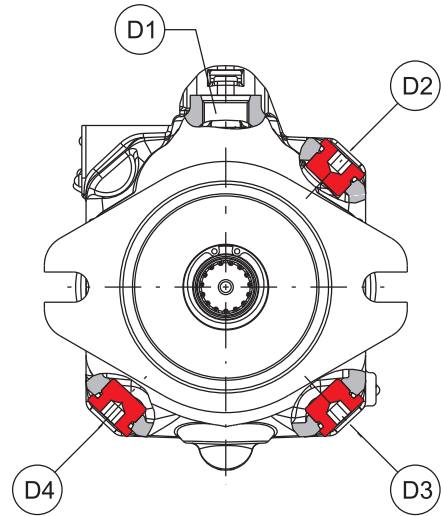
The pump can be mounted in a horizontal or vertical position. The highest of the case drain ports must be used to keep the required filling oil.

If D1 is not the highest drain port it must be closed by moving the plug from the hole chosen for the drain line.

The pump can be located above the oil level if the absolute pressure at the inlet port stays within the stated limits.

With exception of pump mounted below the oil level, we recommend to interpose a baffle plate between inlet and drain line.

To reduce further noise emission, we recommend to mount the pump below the oil level and avoid suction lines with sharp restrictions.

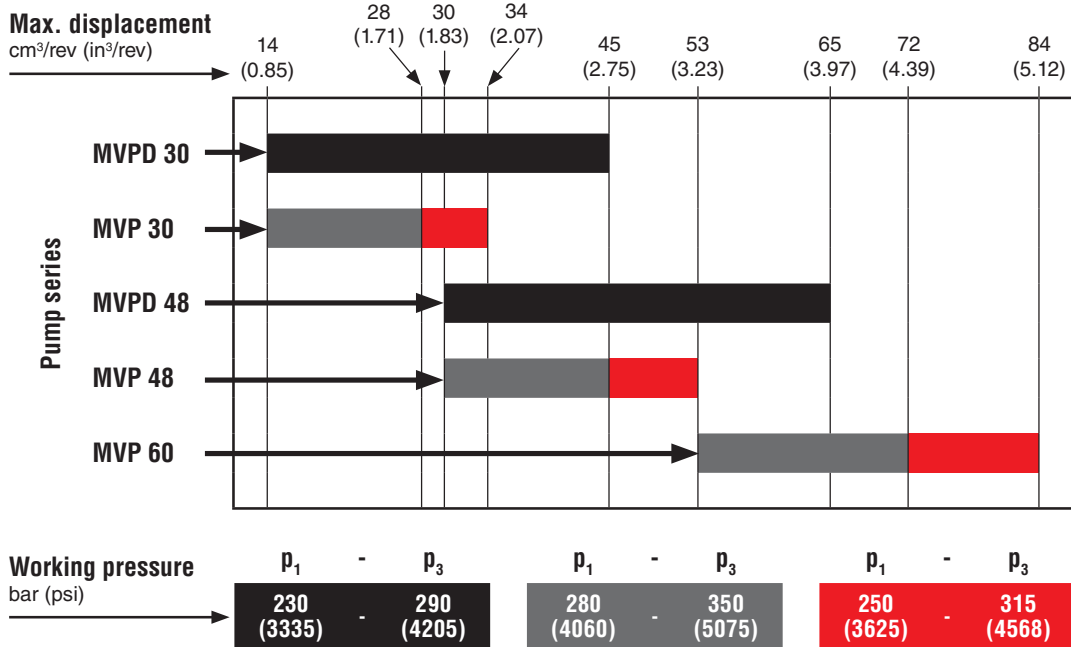


HORIZONTAL MOUNTING		VERTICAL MOUNTING	
	<p><b>Arrangement inside the tank.</b></p> <p>Minimum oil level equal or above the pump mounting face.</p> <p><math>A \geq 200 \text{ mm (7.874 in)}</math></p>		<p><b>Arrangement inside the tank.</b></p> <p>Minimum oil level equal or above the pump mounting face.</p> <p><math>A \geq 200 \text{ mm (7.874 in)}</math></p>
	<p><b>Arrangement inside the tank.</b></p> <p>Minimum oil level below the pump mounting face.</p> <p>Min. inlet pressure= 0,8 bar abs (24 in Hg)</p> <p><math>B \leq 800 \text{ mm (31.4961 in)}</math></p> <p><math>C = 200 \text{ mm (7.874 in)}</math></p>		<p><b>Arrangement inside the tank.</b></p> <p>Minimum oil level below the pump mounting face.</p> <p>Min. inlet pressure= 0,8 bar abs (24 in Hg)</p> <p><math>B \leq 800 \text{ mm (31.4961 in)}</math></p> <p><math>C = 200 \text{ mm (7.874 in)}</math></p>
	<p><b>Arrangement outside the tank above oil level.</b></p> <p>Min. inlet pressure= 0,8 bar abs (24 in Hg)</p> <p><math>B \leq 800 \text{ mm (31.4961 in)}</math></p> <p><math>C = 200 \text{ mm (7.874 in)}</math></p>		<p><b>Arrangement outside the tank above oil level.</b></p> <p>Min. inlet pressure= 0,8 bar abs (24 in Hg)</p> <p><math>B \leq 800 \text{ mm (31.4961 in)}</math></p> <p><math>C = 200 \text{ mm (7.874 in)}</math></p>
	<p><b>Arrangement outside the tank below oil level.</b></p> <p><math>C = 200 \text{ mm (7.874 in)}</math></p>		

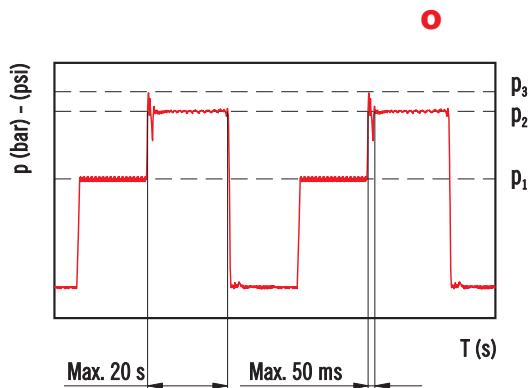
03/06.2011

IN= inlet line - D1= drain line - A= min. distance between the line - B+C= permissible suction height - C= line immersion depth

## DISPLACEMENTS AND WORKING PRESSURES RANGE



## PRESSURE DEFINITION



- $p_1$  Continuous pressure
- $p_2$  Intermittent pressure
- $p_3$  Peak pressure

To ensure proper operation, both  $p_2$  and  $p_3$  pressures must be kept within the limits stated on page 7 ÷ 9. If  $p_2$  is compliant, but  $p_3$  exceeds its limit, please decrease the relief setting  $p_2$  in order to keep the peak pressure  $p_3$  within the limit.

For high frequency applications please consult our technical sales department.

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## TECHNICAL DATA

### Technical data with mineral oil

**HL or HLP** mineral oil based hydraulic fluid to DIN 51524

Replaces: 03/06.2011

05/10.2014

Pump type MVP			<b>30-28</b>	<b>30-34</b>	<b>48-45</b>	<b>48-53</b>	<b>60-60</b>	<b>60-72</b>	<b>60-84</b>
Max. displacement (theor.) $V_{max}$	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)		28 (1.71)	34,8 (2.12)	45 (2.75)	53,7 (3.28)	60 (3.66)	72 (4.39)	84,7 (5.17)
Inlet pressure	bar abs. (in Hg)	min.				0,8 (24)			
		bar abs. (psi)				25 (363)			
Max. outlet pressure $p_{max}$	bar (psi)	continuous	280 (4060)	250 (3625)	280 (4060)	250 (3625)	280 (4060)	280 (4060)	250 (3625)
		intermittent	315 (4568)	280 (4060)	315 (4568)	280 (4060)	315 (4568)	315 (4568)	280 (4060)
		peak	350 (5075)	315 (4568)	350 (5075)	315 (4568)	350 (5075)	350 (5075)	315 (4568)
Max. drain line pressure	bar abs. (psi)					2 (29)			
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	3500	2900	3000	2500	3000	2700	2500
		@ $n_{max}$	98 (25.9)	101 (26.7)	135 (35.7)	134 (35.4)	180 (47.6)	194 (51.3)	212 (56.0)
Max. delivery (theor.)	l/min (US gpm)	@ 2000 min <sup>-1</sup>	56 (14.8)	70 (18.5)	90 (23.8)	107 (28.3)	120 (31.7)	144 (38.0)	169 (44.7)
		@ 1500 min <sup>-1</sup>	42 (11.1)	52 (13.7)	68 (18.0)	81 (21.4)	90 (23.8)	108 (28.5)	127 (33.6)
		@ $n_{max}$	45,7 (61.2)	42,1 (56.4)	63 (84.4)	55,9 (74.9)	84 (112.6)	90,7 (121.5)	88,2 (118.2)
Max. power (theor.) ( $\Delta p = p_{max}$ cont.)	kW (HP)	@ 2000 min <sup>-1</sup>	26,1 (35.0)	29 (38.9)	42 (56.3)	44,8 (60.0)	56 (75.0)	67,2 (90.0)	70,6 (94.6)
		@ 1500 min <sup>-1</sup>	19,6 (26.3)	21,8 (29.2)	31,5 (42.2)	33,6 (45.0)	42 (56.3)	50,4 (67.5)	52,9 (70.9)
		@ $p_{max}$ cont.	124,8 (1105)	138,5 (1226)	200,5 (1775)	213,7 (1891)	267,4 (2367)	320,9 (2840)	337 (2983)
Max. torque (theor.)	Nm (lbf in)	@ 100 bar (1450 psi)	44,6 (395)	55,4 (490)	71,6 (634)	85,5 (757)	95,5 (845)	114,6 (1014)	134,8 (1193)
		Moment of inertia	kgm <sup>2</sup> (ft <sup>2</sup> lbs)	0,002 (0.05)	0,002 (0.05)	0,003 (0.07)	0,003 (0.07)	0,008 (0.19)	0,008 (0.19)
Fill volume	l (US gallons)		0,85 (0.22)	0,85 (0.22)	1 (0.26)	1 (0.26)	1,3 (0.34)	1,3 (0.34)	1,3 (0.34)
Mass (approx.)	kg (lbs)		15 (33.1)	15 (33.1)	19 (41.9)	19 (41.9)	22 (48.5)	22 (48.5)	22 (48.5)
Seals			N= Buna			V= Viton			
Operating temperature	°C (°F)	min.				-25 (-13)	-15 (5)		
		max. cont.				80 (176)	110 (230)		
		max. peak				100 (212)	125 (257)		

(1) = with an inlet pressure of 1 bar abs (14.5 psi) and viscosity between 15 and 35 cSt (77 and 163 SSU).

Reducing the displacement or increasing the inlet pressure the max. speed changes. See table at page 10.

For different working conditions, please consult our technical sales department.

## TECHNICAL DATA

### Technical data restrictions with fire resistant fluid

- (1) = with an inlet pressure of 1 bar abs (14.5 psi) and viscosity between 15 and 35 cSt (77 and 163 SSU).

#### HFA - Oil emulsion in water (5 ÷ 15 % of oil)

Pump type MVP			30-28	30-34	48-45	48-53	60-60	60-72	60-84
Max. outlet pressure $p_{max}$	bar (psi)	continuous	140 (2030)						
		intermittent	150 (2175)						
		peak	160 (2320)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2200	1800	2000	1700	2000	1700	1500
Seals			N= Buna						
Operating temperature	°C (°F)	min.	2 (36)						
		max.	55 (131)						
Bearing life (ref. mineral oil)	%		20 %						

Replaces: 03/06.2011

#### HFB - Water emulsion in oil (40 % of water)

Pump type MVP			30-28	30-34	48-45	48-53	60-60	60-72	60-84
Max. outlet pressure $p_{max}$	bar (psi)	continuous	160 (2320)						
		intermittent	170 (2465)						
		peak	180 (2610)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2350	1900	2150	1800	2150	1800	1600
Seals			N= Buna						
Operating temperature	°C (°F)	min.	2 (36)						
		max.	60 (140)						
Bearing life (ref. mineral oil)	%		40 %						

#### HFC - Water-glycol (35 ÷ 55 % of water)

Pump type MVP			30-28	30-34	48-45	48-53	60-60	60-72	60-84
Max. outlet pressure $p_{max}$	bar (psi)	continuous	180 (2610)						
		intermittent	195 (2828)						
		peak	210 (3045)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2350	1900	2150	1800	2150	1800	1600
Seals			N= Buna						
Operating temperature	°C (°F)	min.	-10 (14)						
		max.	60 (140)						
Bearing life (ref. mineral oil)	%		40 %						

○ 05/10.2014



## TECHNICAL DATA

### Technical data restrictions with fire resistant fluid

○ (1) = with an inlet pressure of 1 bar abs (14.5 psi) and viscosity between 15 and 35 cSt (77 and 163 SSU).

#### HFD - Phosphate ester

Replaces: 03/06.2011

Pump type MVP			<b>30-28</b>	<b>30-34</b>	<b>48-45</b>	<b>48-53</b>	<b>60-60</b>	<b>60-72</b>	<b>60-84</b>
Max. outlet pressure $p_{max}$	bar (psi)	continuous	200 (2900)						
		intermittent	220 (3190)						
		peak	240 (3480)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2350	1900	2150	1800	2150	1800	1600
Seals			V= Viton						
Operating temperature	°C (°F)	min.	-10 (14)						
		max.	80 (176)						
Bearing life (ref. mineral oil)	%		90 %						

### Technical data restrictions with biodegradable fluids

#### HETG - Natural based fluid (the water content must never exceed 0,1 %)

Pump type MVP			<b>30-28</b>	<b>30-34</b>	<b>48-45</b>	<b>48-53</b>	<b>60-60</b>	<b>60-72</b>	<b>60-84</b>
Max. outlet pressure $p_{max}$	bar (psi)	continuous	180 (2610)						
		intermittent	195 (2828)						
		peak	210 (3045)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2350	1900	2150	1800	2150	1800	1600
Seals			N= Buna						
Operating temperature	°C (°F)	min.	-10 (14)						
		max.	60 (140)						
Bearing life (ref. mineral oil)	%		50 %						

#### HEPG - Polyglycol based synthetic fluid (the water content must never exceed 0,1 %)

○ 05/10.2014

Pump type MVP			<b>30-28</b>	<b>30-34</b>	<b>48-45</b>	<b>48-53</b>	<b>60-60</b>	<b>60-72</b>	<b>60-84</b>
Max. outlet pressure $p_{max}$	bar (psi)	continuous	180 (2610)						
		intermittent	195 (2828)						
		peak	210 (3045)						
Max. speed $n_{max}$	min <sup>-1</sup>	@ $V_{max}$ (1)	2350	1900	2150	1800	2150	1800	1600
Seals			V= Viton						
Operating temperature	°C (°F)	min.	-15 (5)						
		max.	90 (194)						
Bearing life (ref. mineral oil)	%		75 %						

#### HEES - Synthetic esters (the water content must never exceed 0,1 %)

Pump type MVP			<b>30-28</b>	<b>30-34</b>	<b>48-45</b>	<b>48-53</b>	<b>60-60</b>	<b>60-72</b>	<b>60-84</b>
Seals			V= Viton						
Operating temperature	°C (°F)	min.	-15 (5)						
		max.	80 (176)						
Bearing life (ref. mineral oil)	%		100 %						

## TECHNICAL DATA

### Design calculations for pump

<b>Q</b>	l/min (US gpm)	Flow
<b>M</b>	Nm (lbf in)	Torque
<b>P</b>	kW (HP)	Power
<b>V</b>	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)	Displacement
<b>n</b>	min <sup>-1</sup>	Speed
<b>Δp</b>	bar (psi)	Pressure
$\eta_v = \eta_v(V, \Delta p, n)$		Volumetric efficiency
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$		Hydro-mechanical efficiency
$\eta_t = \eta_v \cdot \eta_{hm}$		Overall efficiency

$$Q = Q_{theor.} \cdot \eta_v$$

$$Q_{theor.} = \frac{V \text{ (cm}^3\text{/rev)} \cdot n \text{ (min}^{-1}\text{)}}{1000} \quad [\text{l/min}]$$

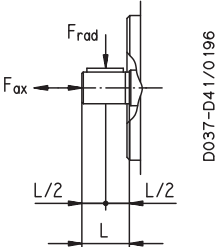
$$M = \frac{M_{theor.}}{\eta_{hm}} \quad [\text{Nm}]$$

$$M_{theor.} = \frac{\Delta p \text{ (bar)} \cdot V \text{ (cm}^3\text{/rev)}}{62,83}$$

$$P_{IN} = \frac{P_{OUT}}{\eta_t} \quad [\text{kW}]$$

$$P_{OUT} = \frac{\Delta p \text{ (bar)} \cdot Q \text{ (l/min)}}{600}$$

### Max. permissible load on drive shaft

Pump type		MVP 30•28	MVP 30•34	MVP 48•45	MVP 48•53	MVP 60•60	MVP 60•72	MVP 60•84	
$F_{ax}$ Axial force		N (lbf)	1000 (225)	1000 (225)	1500 (337)	1500 (337)	2000 (450)	2000 (450)	2000 (450)
$F_{rad}$ Radial force	@ L/2	N (lbf)	1500 (337)	1500 (337)	1500 (337)	1500 (337)	3000 (675)	3000 (675)	3000 (675)

### % Variation of the max. speed in relation of the inlet pressure and/or displacement reduction

Inlet pressure psi (bar abs)	Displacement %					% Variation of the max. speed
	65	70	80	90	100	
12 (0,8)	120	115	105	97	90	03/06.2011
13 (0,9)	120	120	110	103	95	
14.5 (1,0)	120	120	115	107	100	
17 (1,2)	120	120	120	113	106	
20 (1,4)	120	120	120	120	112	
23 (1,6)	120	120	120	120	117	
29 (2,0)	120	120	120	120	120	

#### Example 1

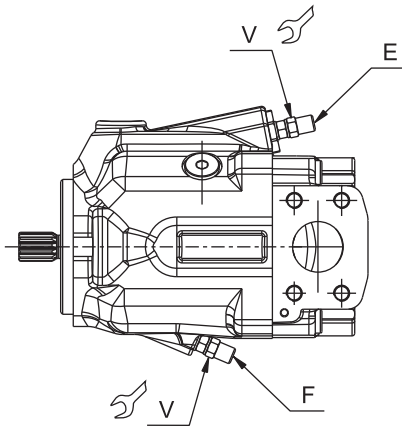
Displacement: 100 %  
Speed: 100 %  
Inlet pressure: 1,0 bar abs. (14.5 psi)

#### Example 2

Displacement: 80 %  
Inlet pressure: 1,0 bar abs. (14.5 psi)  
Speed: 115 %

## DISPLACEMENT SETTING

Replaces: 03/06.2011



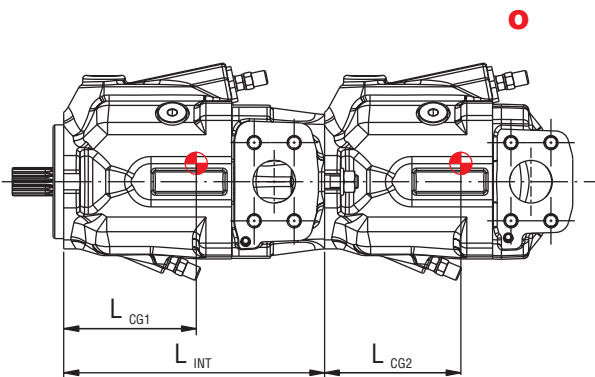
- E:** Max. displacement limiter
- F:** Min. displacement limiter
- G:** Min. and Max. displacement limiter (standard)
- V:** Tightening torque  $10^{\pm 1}$  Nm (80 ÷ 97 lbf in)

			MVP 30	MVP 48	MVP 60
Max. displacement setting range	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)	from	17,4 (1.06)	34,9 (2.13)	55 (3.36)
		to	34,8 (2.12)	53,7 (3.28)	84,7 (5.17)
Min. displacement setting range	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)	from	0	0	0
		to	17,4 (1.06)	10,7 (0.65)	38,1 (2.32)
One turn of screw changes pump displacement by approximately	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)	E	2,8 (0.17)	3,2 (0.20)	5,0 (0.31)
		F	2,3 (0.14)	3,0 (0.18)	4,2 (0.26)

For different setting ranges, please consult our technical sales department.

## CENTER OF GRAVITY

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Center of gravity

$$M_{MF} = \frac{L_{CG1} \cdot m_1 + (L_{INT} + L_{CG2}) \cdot m_2}{102} \quad [\text{Nm}]$$

$M_{MF}$ : Load moment on mounting flange

$L_{CG}$ : Distance from center of gravity to mounting flange [mm]

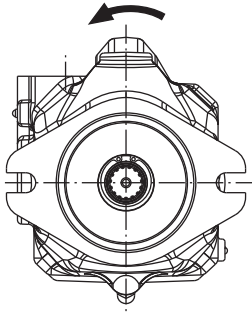
$m$ : Weight (kg)

		MVP 30	MVP 48	MVP 60
$L_{CG1}$	mm (in)	100 (3.9370)	116 (4.5669)	120 (4.7244)
$L_{CG2}$	mm (in)	90 (3.5433)	99 (3.8976)	107 (4.2126)
$L_{INT}$	mm (in)	208 (8.1890)	233 (9.1732)	253 (9.9606)

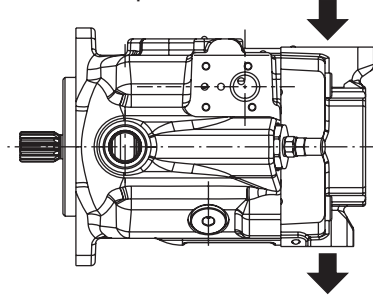
For single pumps refer to  $L_{CG2}$  values

## PORTS POSITION

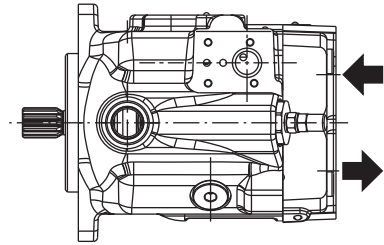
**Anti-clock rotation**



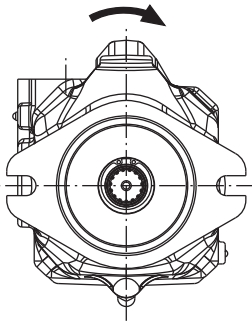
Side ports



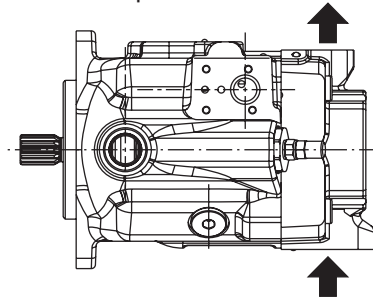
Rear ports



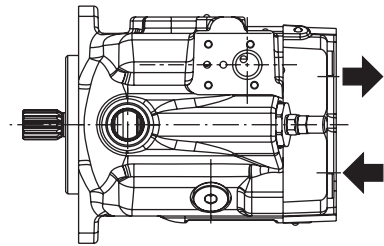
**Clockwise rotation**



Side ports



Rear ports



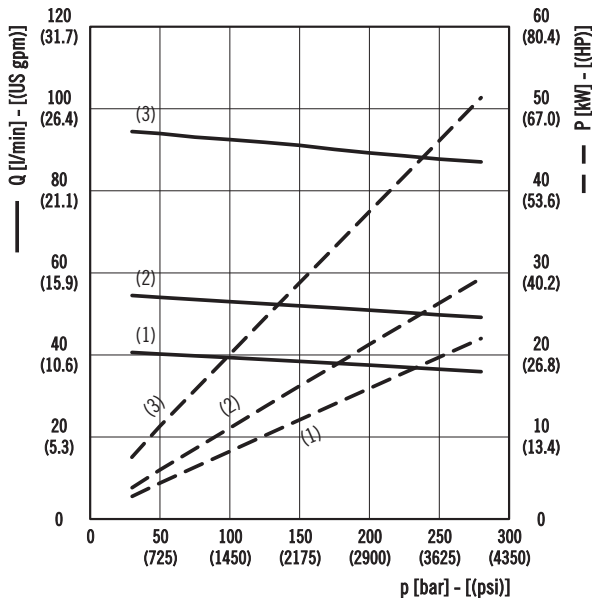
**MVP30•28**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 3500 min<sup>-1</sup>

**Delivery / power**

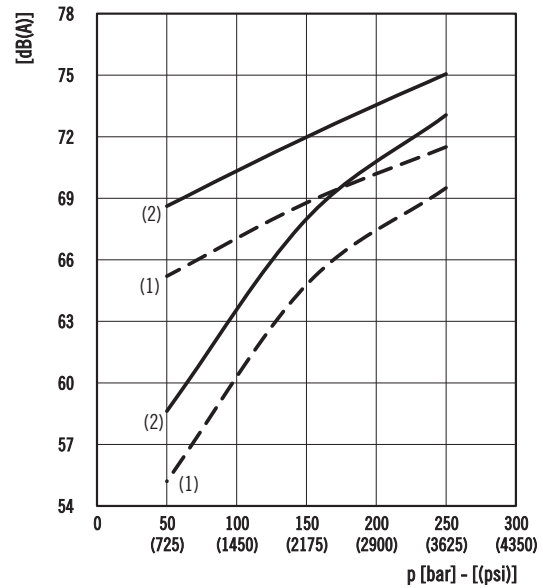
@ max. displacement



**Noise level**

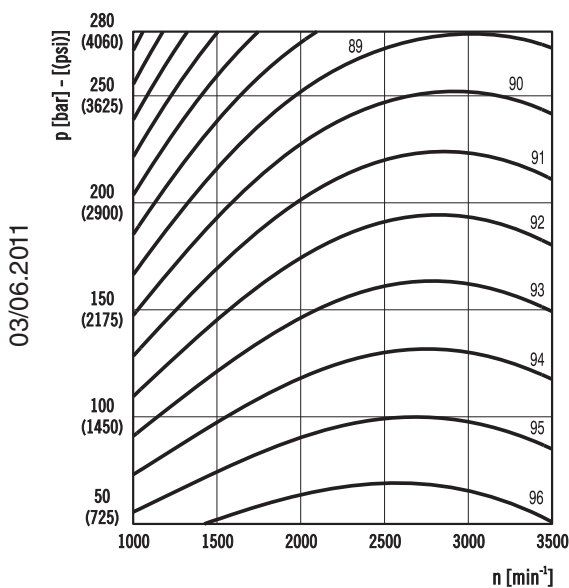
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



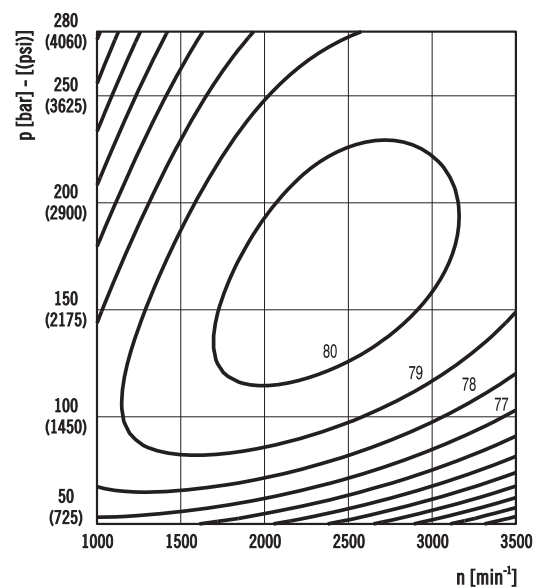
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

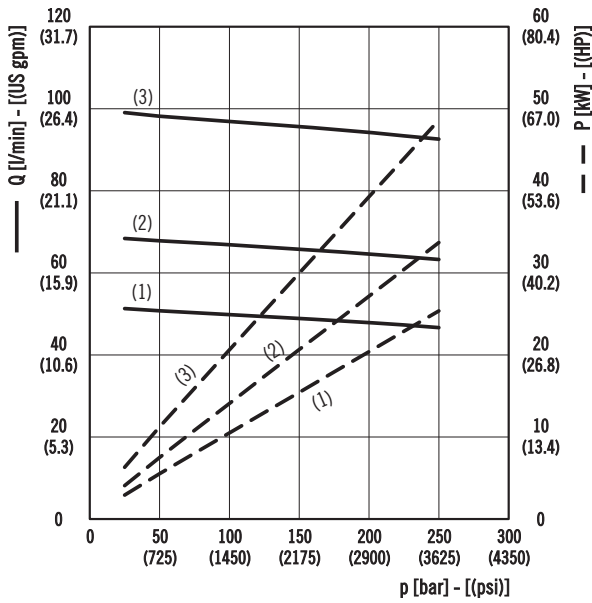
**MVP30•34**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 2900 min<sup>-1</sup>

**Delivery / power**

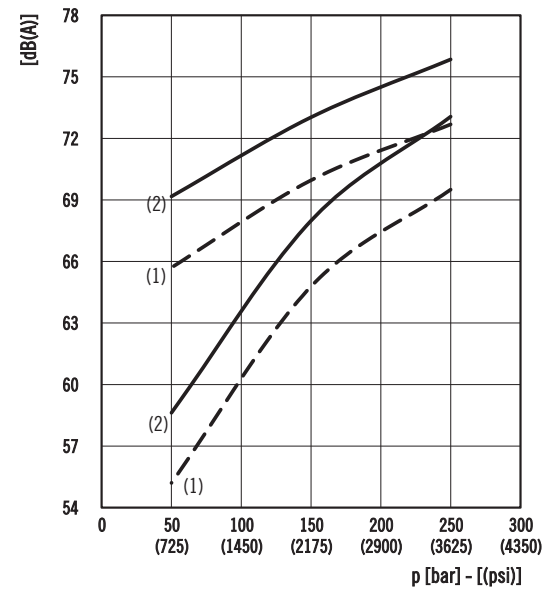
@ max. displacement



**Noise level**

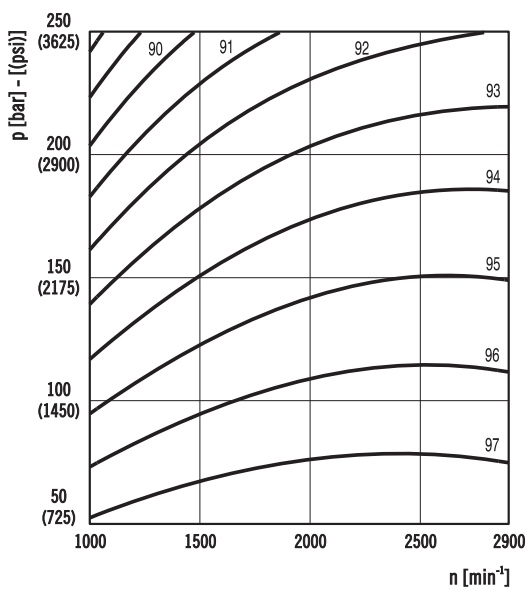
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



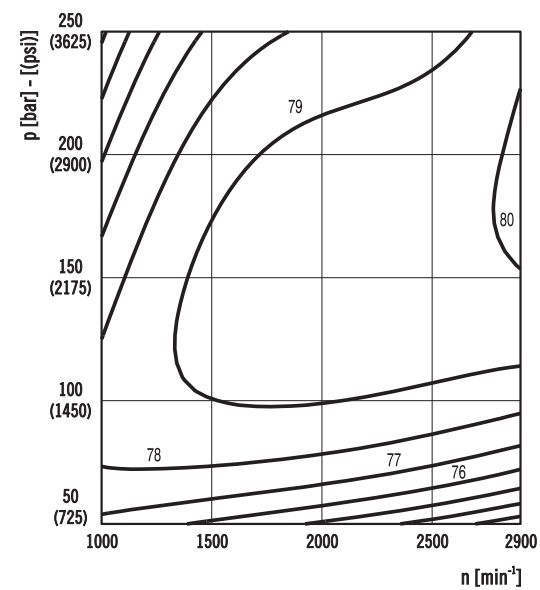
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



03/06.2011

Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

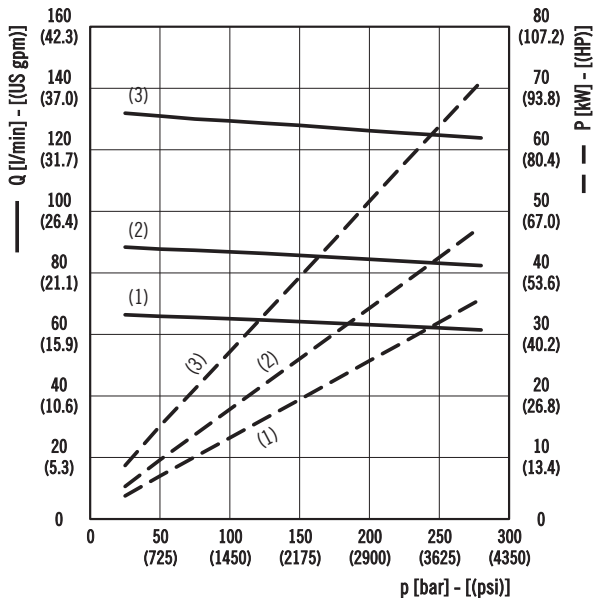
**MVP48•45**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 3000 min<sup>-1</sup>

**Delivery / power**

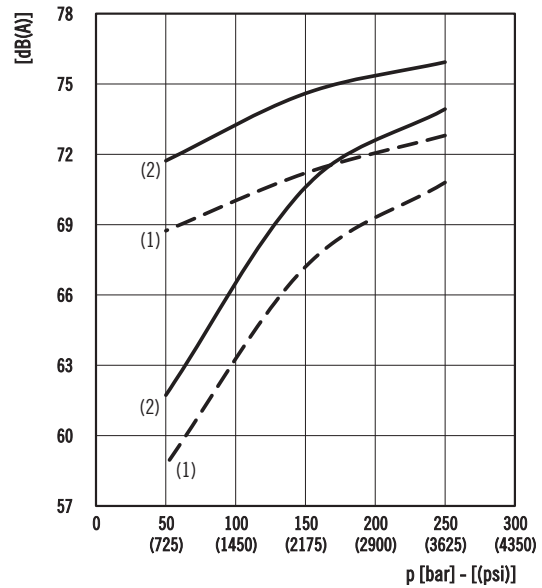
@ max. displacement



**Noise level**

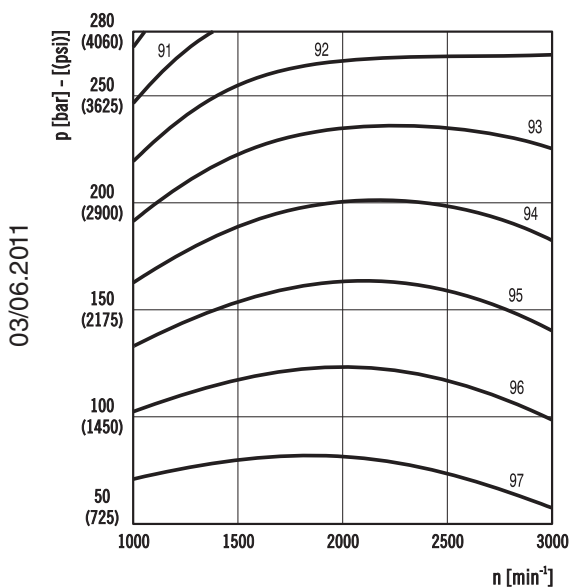
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



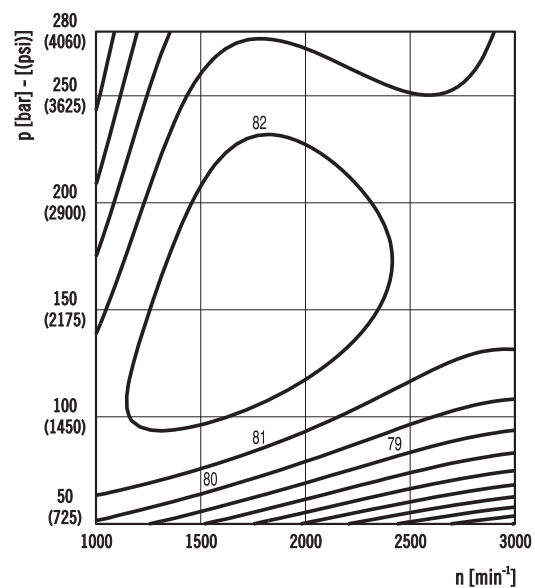
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

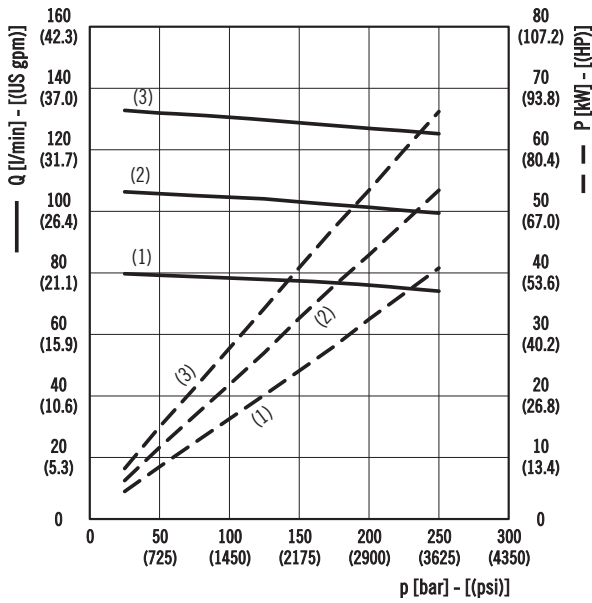
**MVP48•53**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 2500 min<sup>-1</sup>

**Delivery / power**

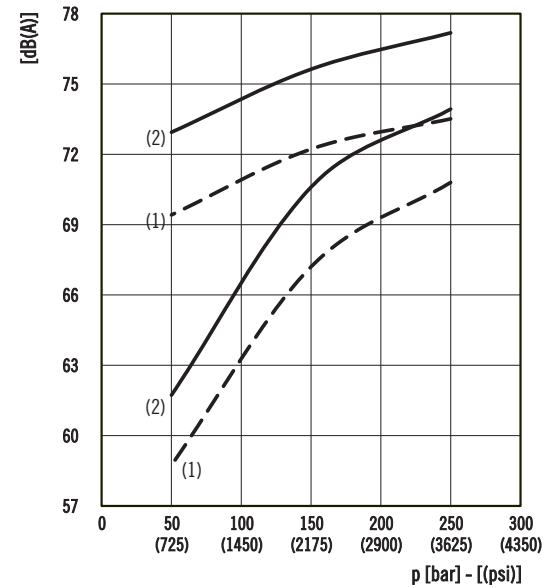
@ max. displacement



**Noise level**

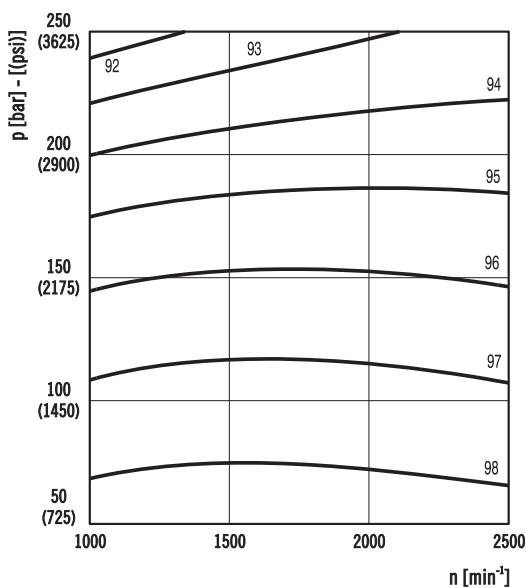
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



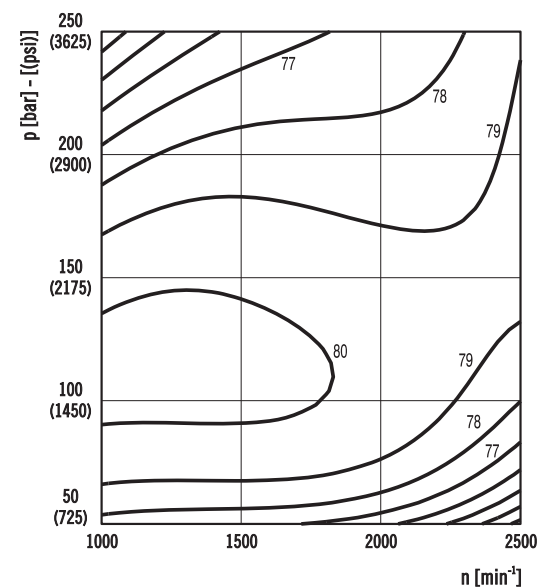
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



03/06.2011

Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.



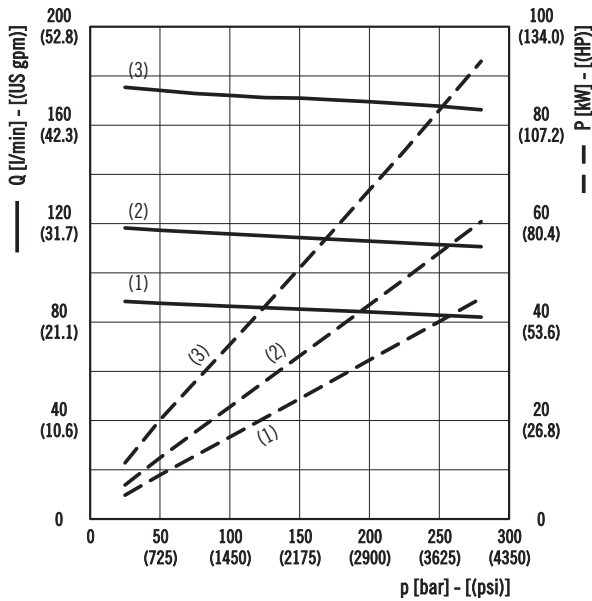
**MVP60•60**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 3000 min<sup>-1</sup>

**Delivery / power**

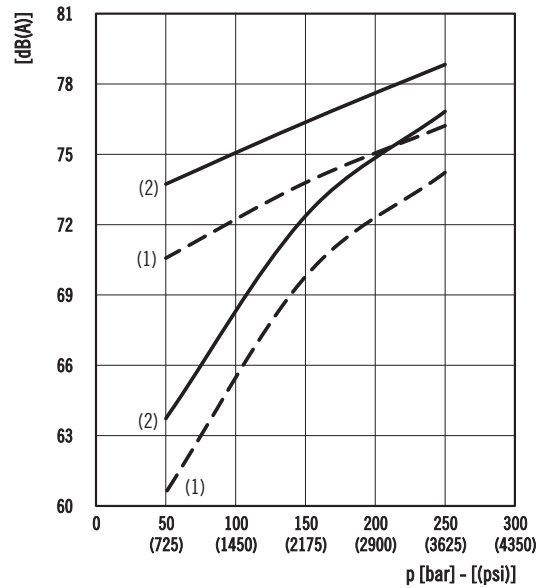
@ max. displacement



**Noise level**

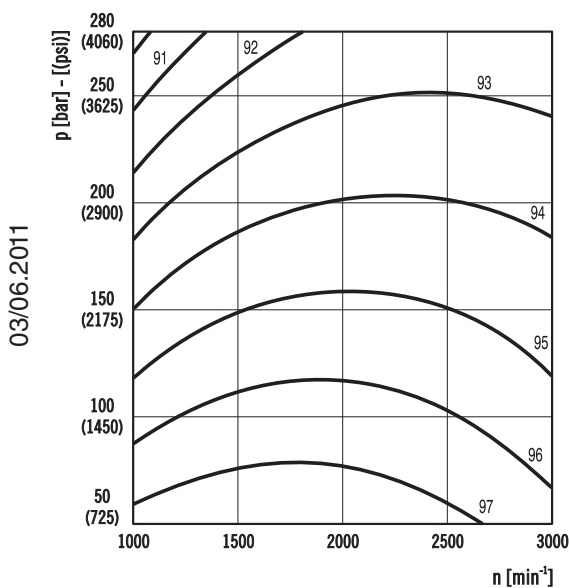
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement    - - - @ min. displacement



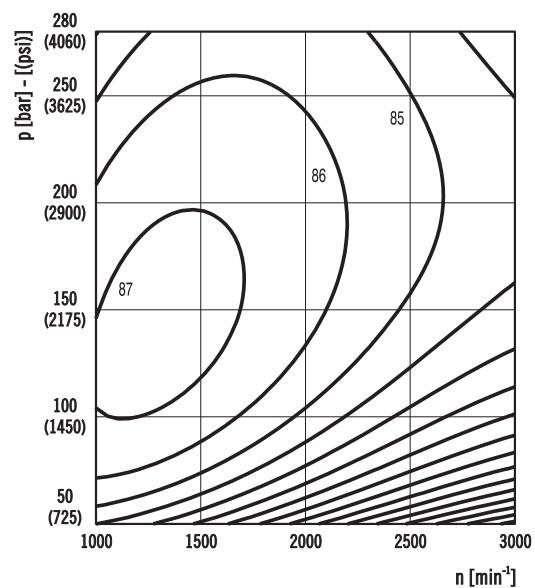
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

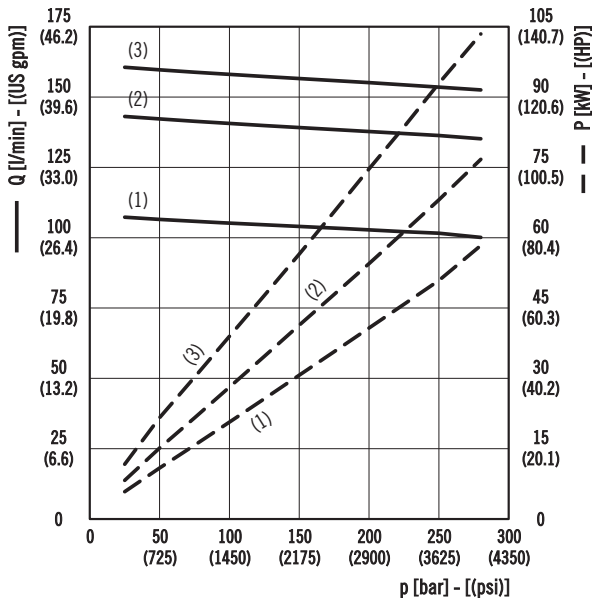
**MVP60•72**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min<sup>-1</sup>, (2) 2000 min<sup>-1</sup>, (3) 2700 min<sup>-1</sup>

**Delivery / power**

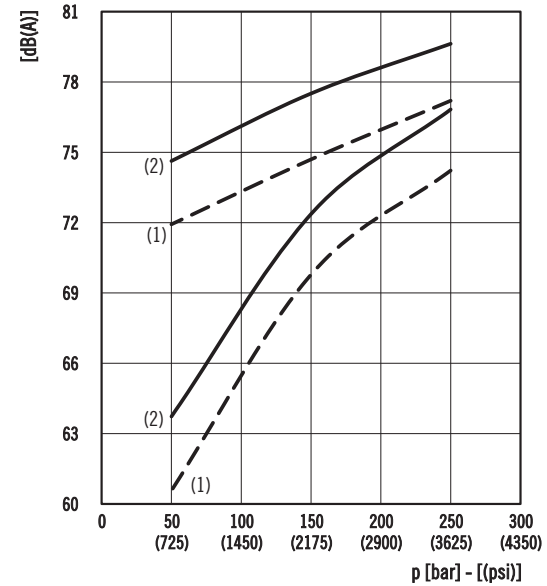
@ max. displacement



**Noise level**

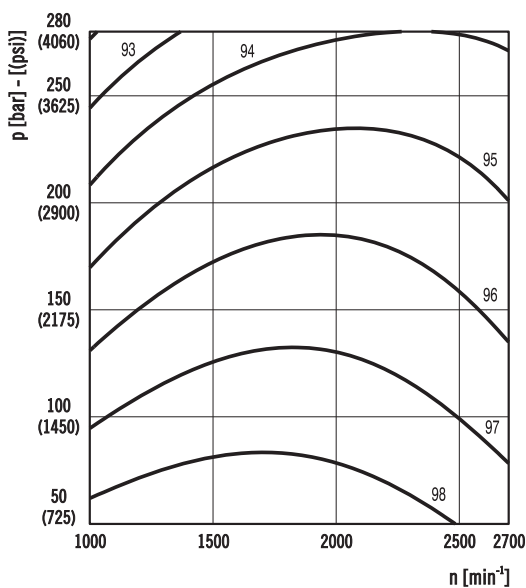
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



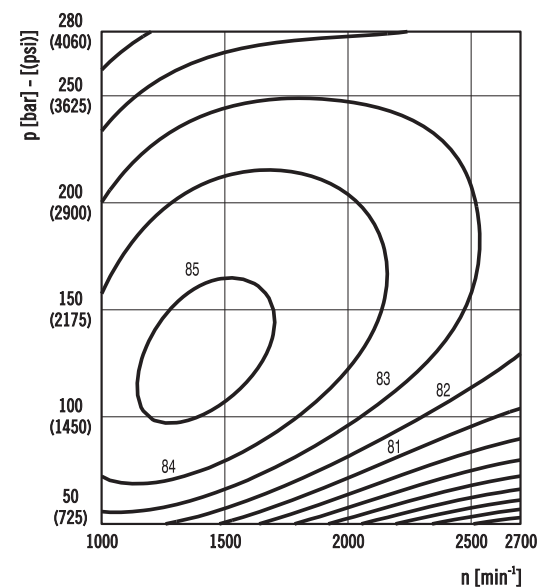
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



03/06.2011

Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

**MVP60•84**

**OPERATING CURVES**

Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed:

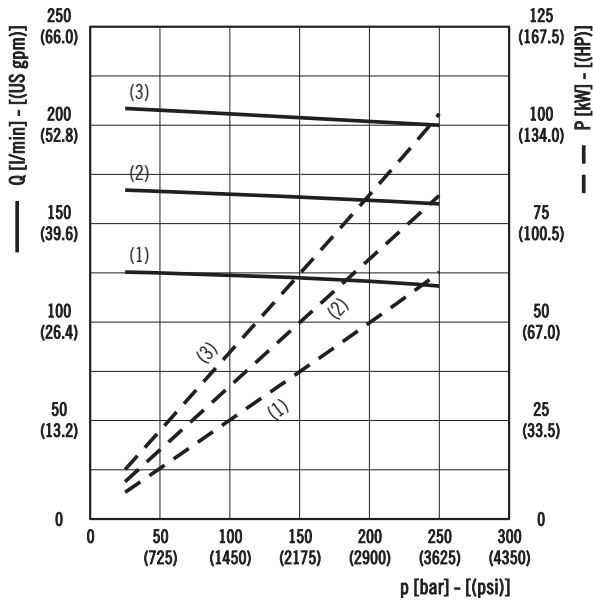
- (1) 1500 min<sup>-1</sup>
- (2) 2000 min<sup>-1</sup>
- (3) 2500 min<sup>-1</sup>



Replaces: 03/06.2011

**Delivery / power**

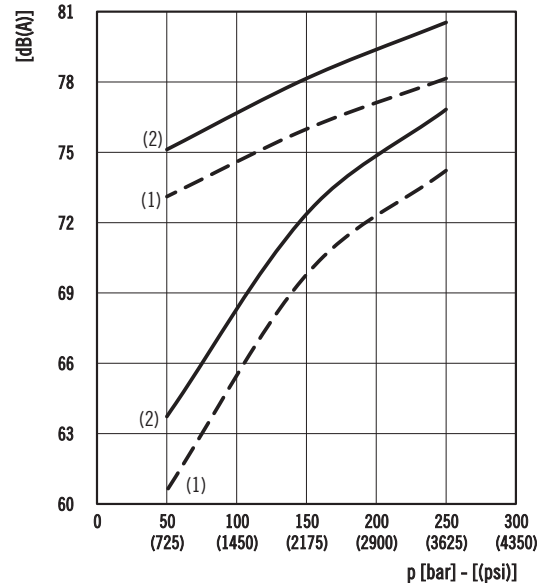
@ max. displacement



**Noise level**

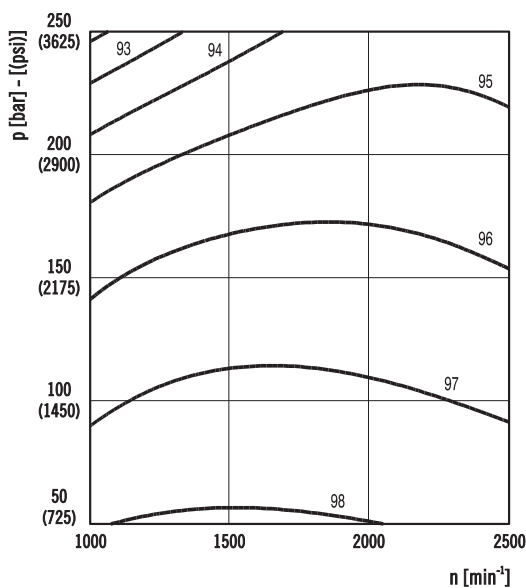
Distance from microphone to pump = 1 m (39.37 in)

— @ max. displacement - - - @ min. displacement



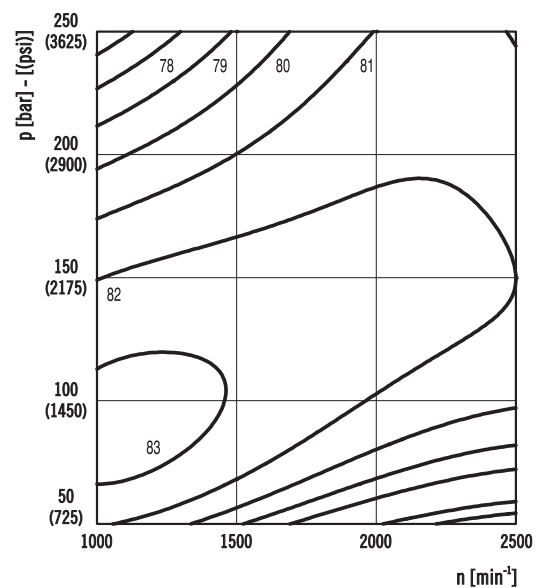
**Volumetric efficiency**

@ max. displacement



**Overall efficiency**

@ max. displacement



05/10.2014

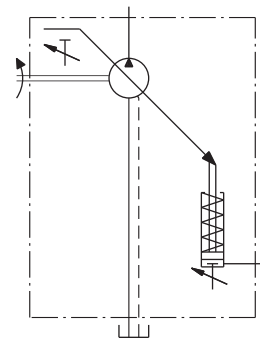
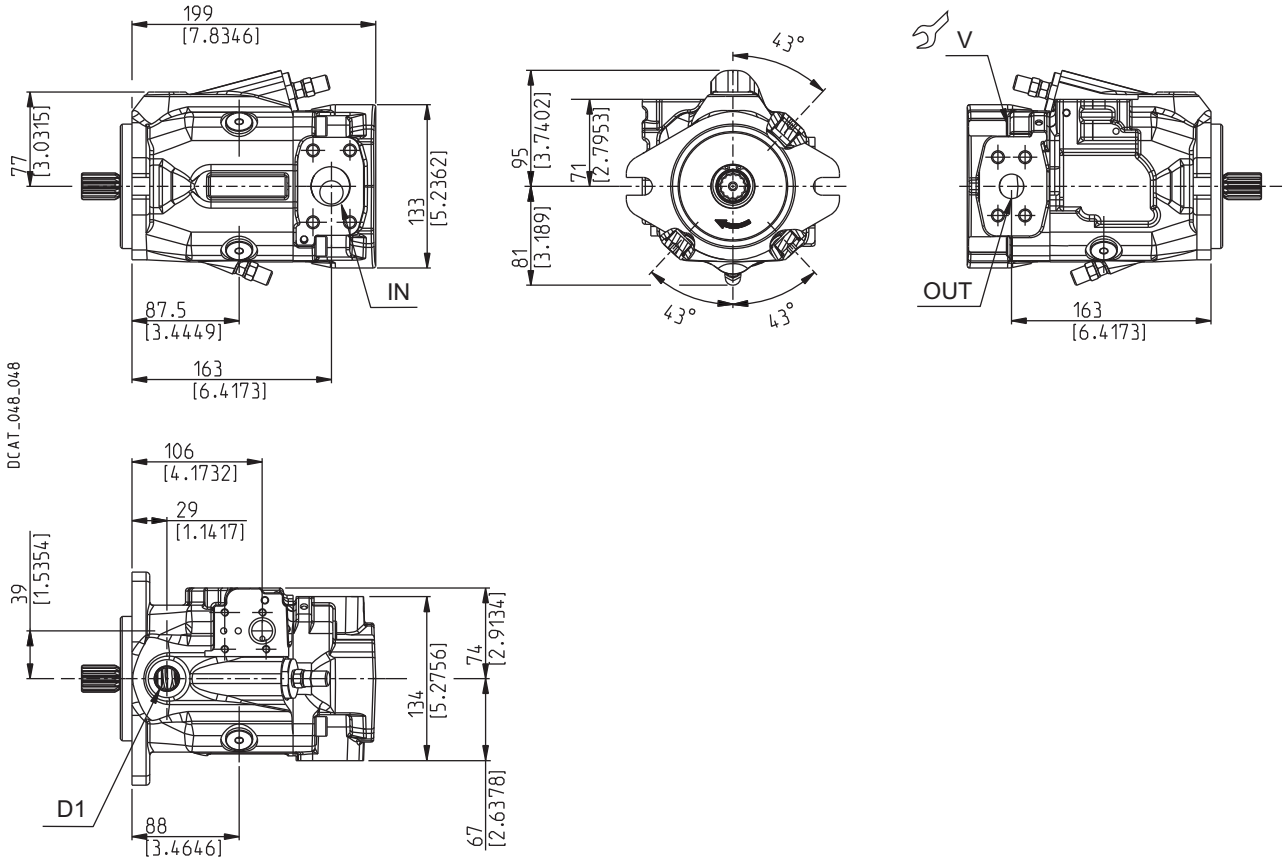
Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

**MVP30**

**SIDE PORTS - DIMENSIONS**

**L**

Drive shafts: page 32  
Mounting flanges: page 36



03/06.2011

Screws tightening torque Nm (lbf in)

V
70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
1" 1/4	3/4"	Drain port

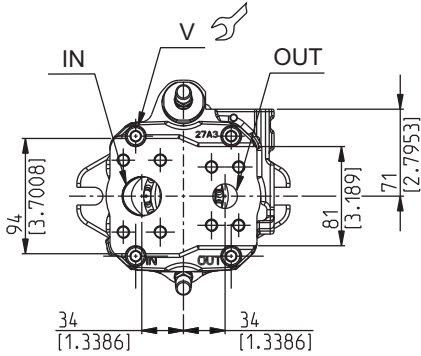
Dimensions at page 38 ÷ 39

**MVP30**

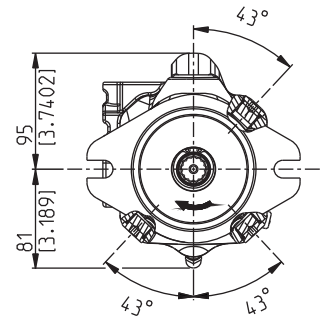
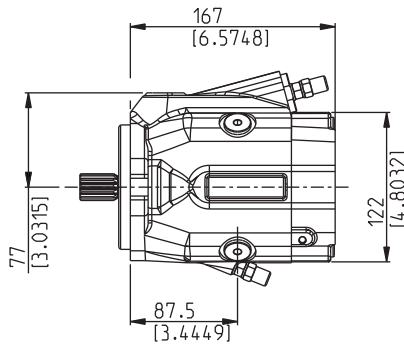
**REAR PORTS - DIMENSIONS**

**P**

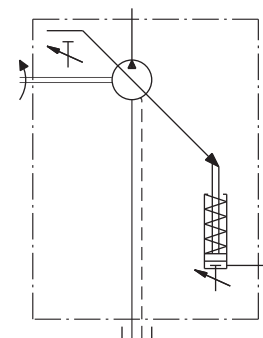
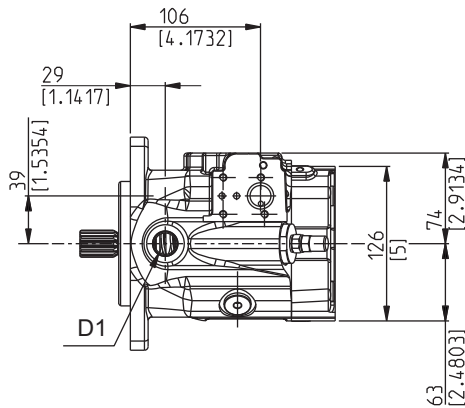
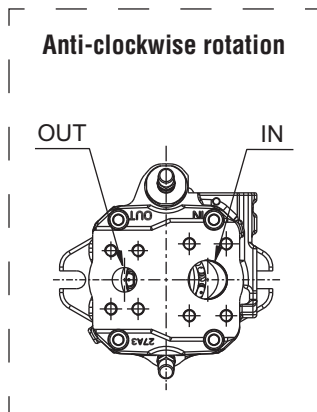
Drive shafts: page 32  
Mounting flanges: page 36



DCAT\_048\_047



Drive shafts: page 21  
Mounting flanges: page 21



03/06.2011

Screws tightening torque Nm (lbf in)

V
70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
1" 1/4	3/4"	Drain port

Dimensions at page 38 ÷ 39

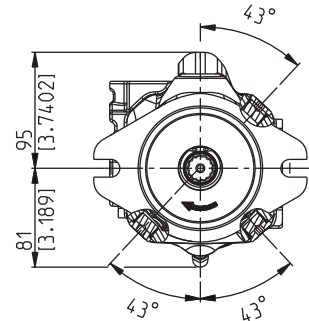
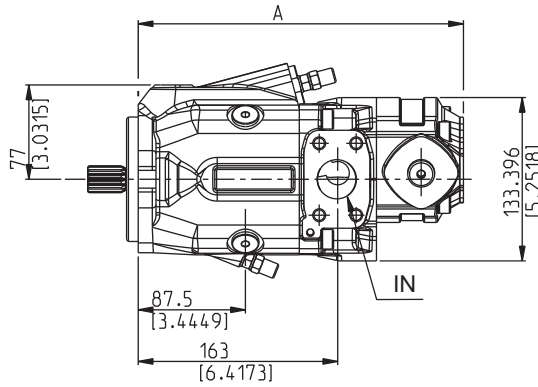
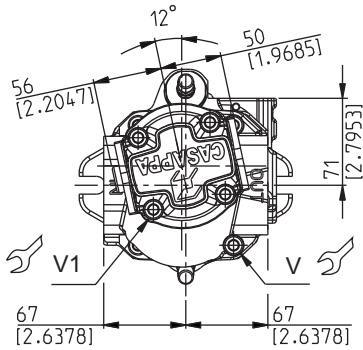
**MVP30/KP20**

**MULTIPLE PUMPS - DIMENSIONS**

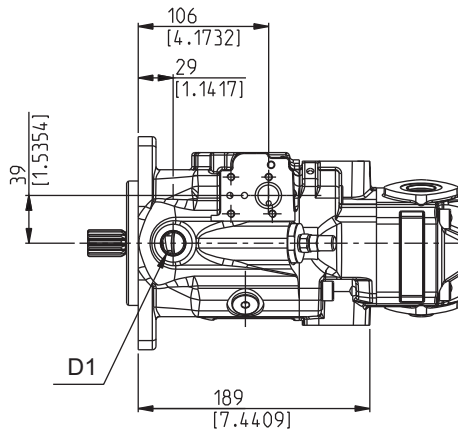
**L**

Common inlet intermediate flange:  
MVP code **P7**  
KP20 code **N5**

Drive shafts: page 32  
Mounting flanges: page 36



DCAT\_048\_048\_KP20



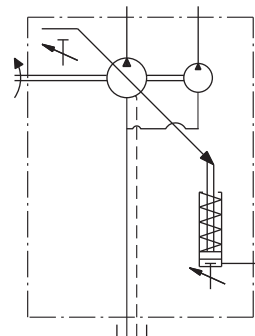
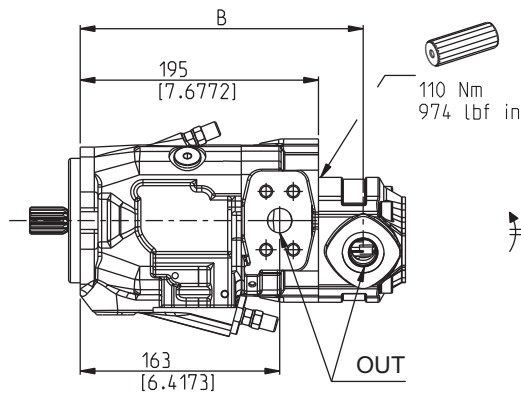
Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN		OUT		D1
MVP	MVP	KP20		Drain port
1" 1/4	3/4"	1/2"		

Dimensions at page 38 ÷ 39



03/06.2011

Gear pump KAPPA (for more information, please consult our technical sales department)

Pump type	20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions	
<b>MVP30</b>	246,5 (9.7047)	249 (9.8031)	251,5 (9.9016)	255 (10.0394)	259 (10.1969)	264,5 (10.4134)	271 (10.6693)	mm (in)	<b>A</b>
	219 (8.6220)	221,5 (8.7205)	224 (8.8189)	227,5 (8.9567)	226 (8.8976)	231,5 (9.1142)	238 (9.3701)	mm (in)	<b>B</b>

**MVP30/PHP20**

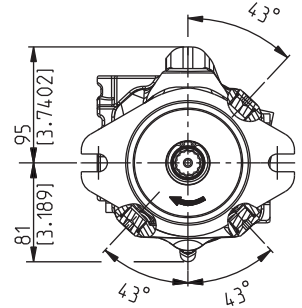
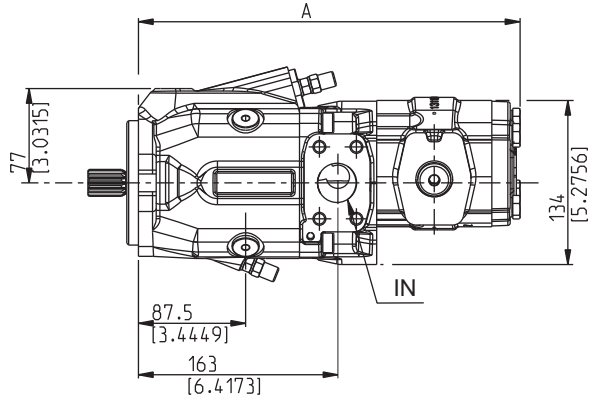
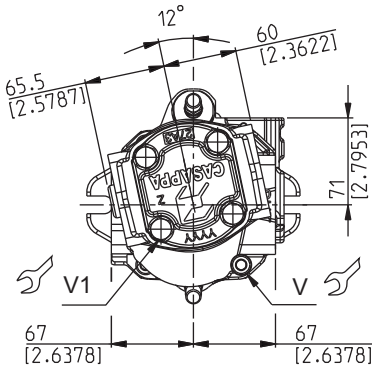
**MULTIPLE PUMPS - DIMENSIONS**

**L**

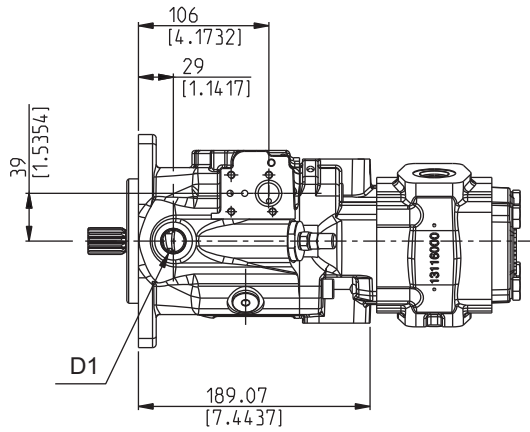
Common inlet intermediate flange:  
MVP code **I7**  
PHP20 code **S7**

Drive shafts: page 32  
Mounting flanges: page 36

Also available in  
combination with PLP20

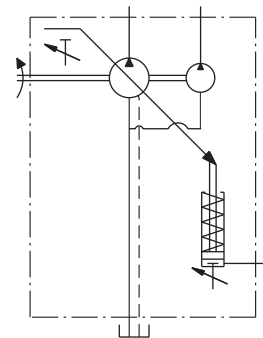
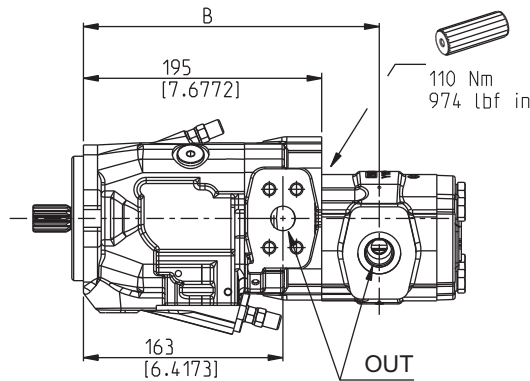


DCAT\_048\_048\_PHP



Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	70 ±7 (558 ÷ 682)



Ports (Nominal size)

IN	OUT	D1
MVP	MVP	PHP20
1" 1/4	3/4"	1/2"
		Drain port

03/06.2011

Dimensions at page 38 ÷ 39

Gear pump POLARIS PH (for more information, please consult our technical sales department)

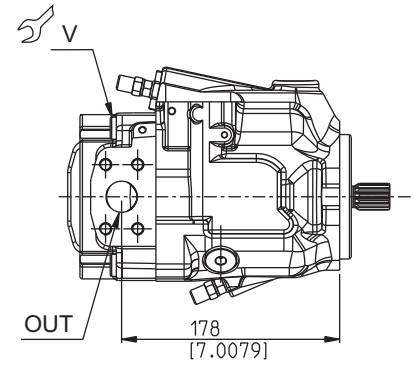
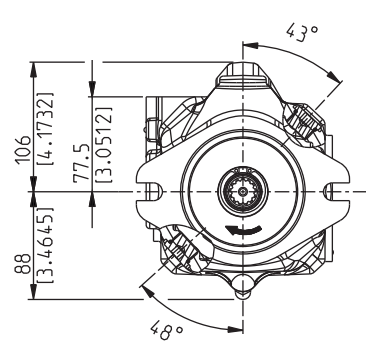
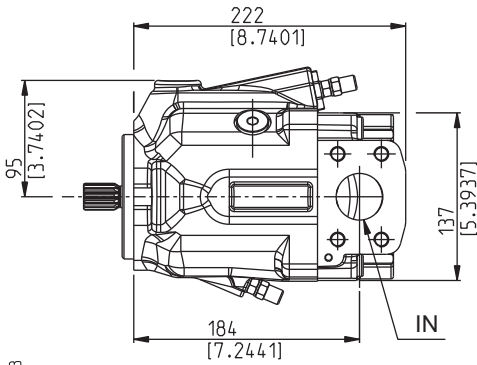
Pump type	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions
<b>MVP30</b>	291,5 (11.4764)	294,6 (11.5984)	297,9 (11.7283)	300,2 (11.8189)	302,6 (11.9134)	305,3 (12.0197)	312,6 (12.3071)	mm (in) <b>A</b>
	231,45 (9.1122)	233 (9.1732)	234,65 (9.2382)	235,8 (9.2835)	237 (9.3307)	238,35 (9.3839)	242 (9.5276)	mm (in) <b>B</b>

**MVP48**

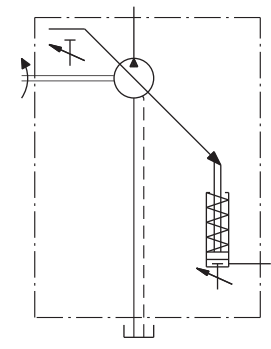
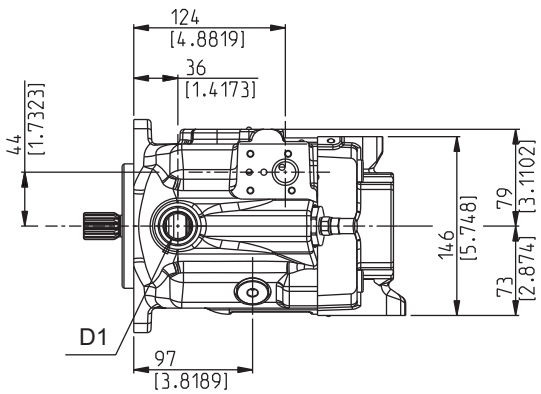
**SIDE PORTS - DIMENSIONS**

**L**

Drive shafts: page 33  
Mounting flanges: page 36



DCAT\_048\_053



Screws tightening torque Nm (lbf in)
<b>V</b>
100 ±10 (797 ÷ 974)

Ports (Nominal size)		
IN	OUT	D1
1" 1/2	1"	Drain port

Dimensions at page 38 ÷ 39

03/06.2011

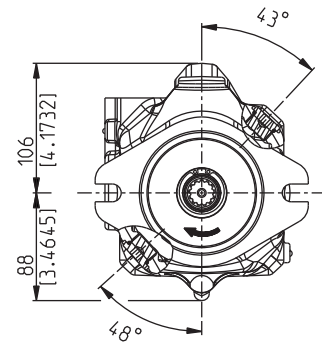
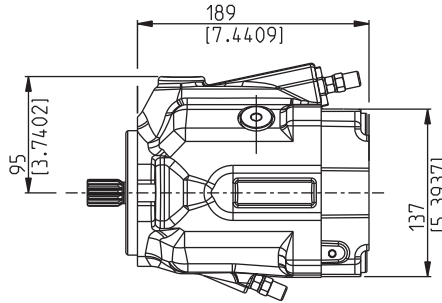
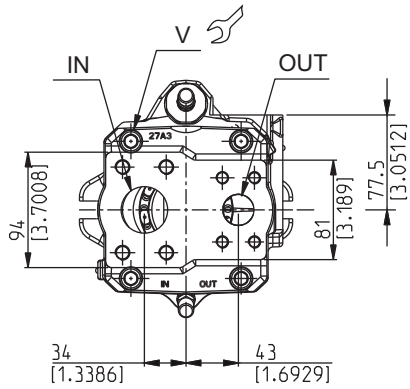


**MVP48**

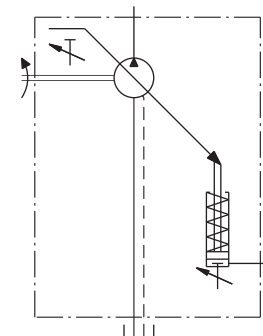
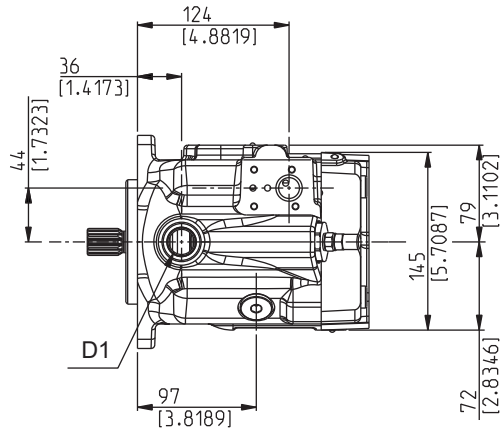
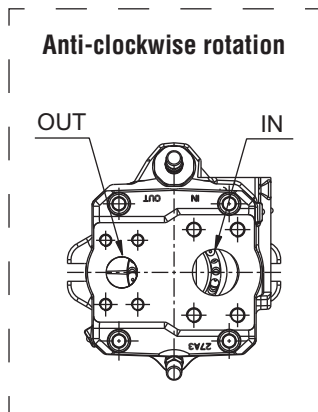
**REAR PORTS - DIMENSIONS**

**P**

Drive shafts: page 33  
Mounting flanges: page 36



DCAT\_048\_031



03/06.2011

Screws tightening torque Nm (lbf in)

V
100 ±10 (797 ÷ 974)

Ports (Nominal size)

IN	OUT	D1
1" 1/2	1"	Drain port

Dimensions at page 38 ÷ 39

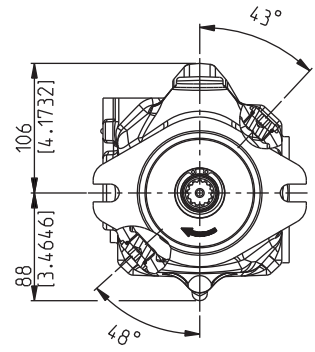
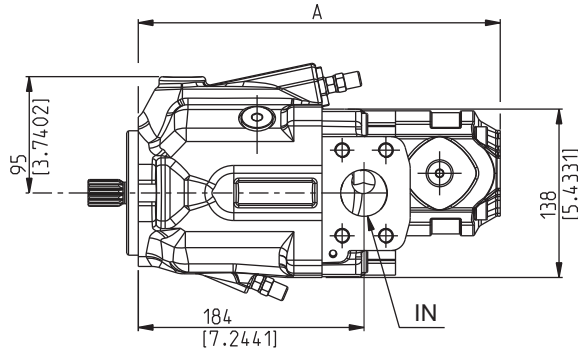
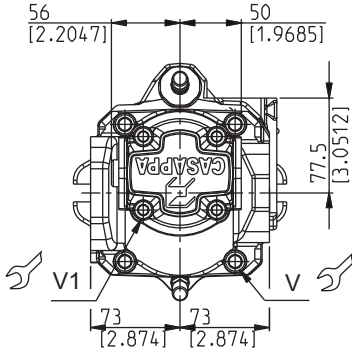
**MVP48/KP20**

**MULTIPLE PUMPS - DIMENSIONS**

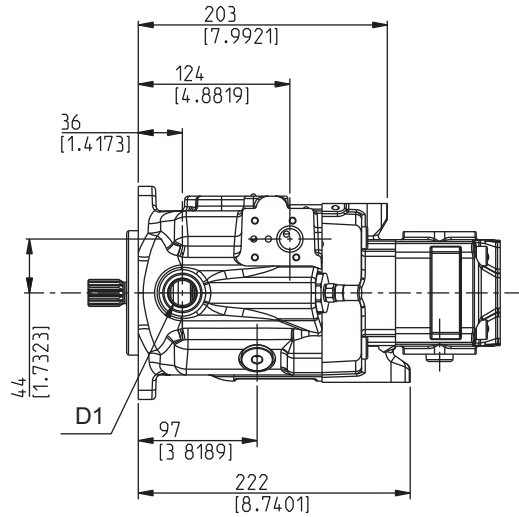
**L**

Common inlet intermediate flange:  
MVP code **P7**  
KP20 code **N5**

Drive shafts: page 33  
Mounting flanges: page 36



DCAT\_048\_031\_KP20



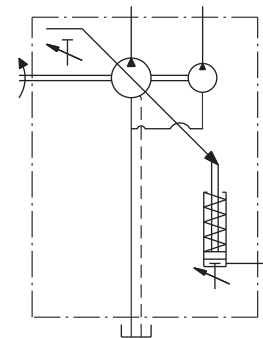
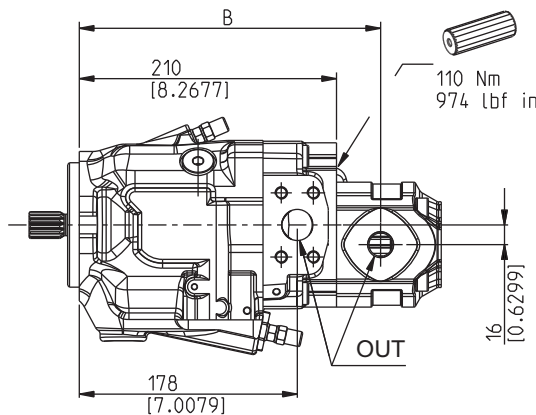
Screws tightening torque Nm (lbf in)

V	V1
100 ±10 (797 ÷ 974)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
MVP	MVP	KP20
1" 1/2	1"	1/2"
		Drain port

Dimensions at page 38 ÷ 39



03/06.2011

Gear pump KAPPA (for more information, please consult our technical sales department)

Pump type	20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions
<b>MVP48</b>	261,5 (10.2953)	264 (10.3937)	266,5 (10.4921)	270 (10.6299)	274 (10.7874)	279,5 (11.0039)	286 (11.2598)	mm (in) <b>A</b>
	234 (9.2126)	236,5 (9.3110)	239 (9.4094)	242,5 (9.5472)	241 (9.4882)	246,5 (9.7047)	253 (9.9606)	mm (in) <b>B</b>

**MVP48/PHP20**

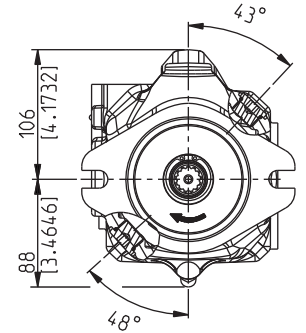
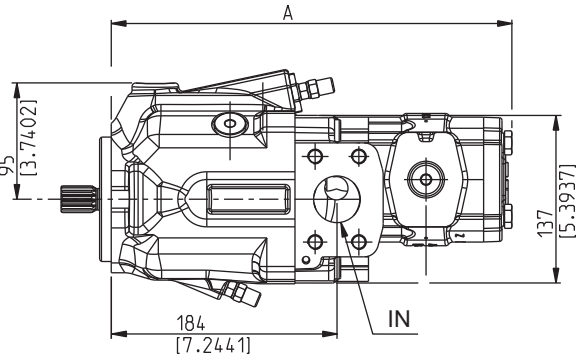
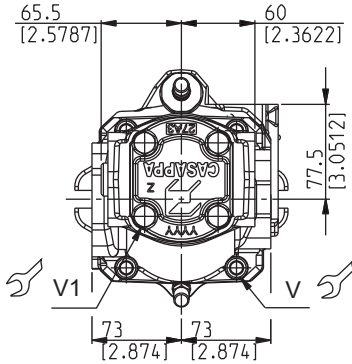
**MULTIPLE PUMPS - DIMENSIONS**

**L**

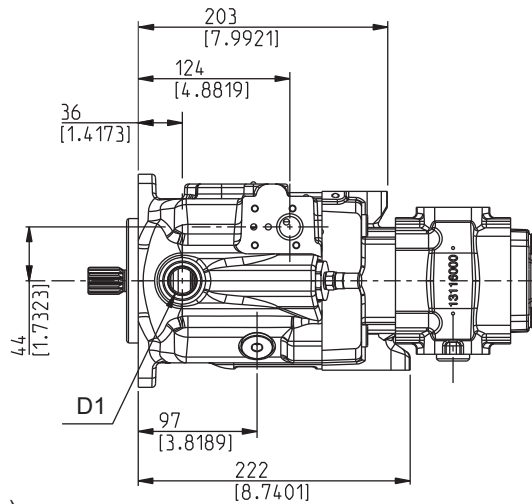
Common inlet intermediate flange:  
MVP code **I7**  
PHP20 code **S7**

Drive shafts: page 33  
Mounting flanges: page 36

Also available in  
combination with PLP20



DCAT\_048\_031\_PHP



Screws tightening torque Nm (lbf in)

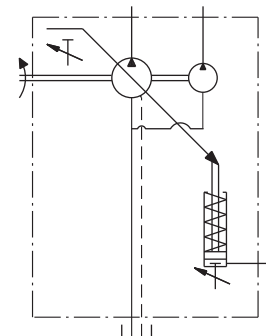
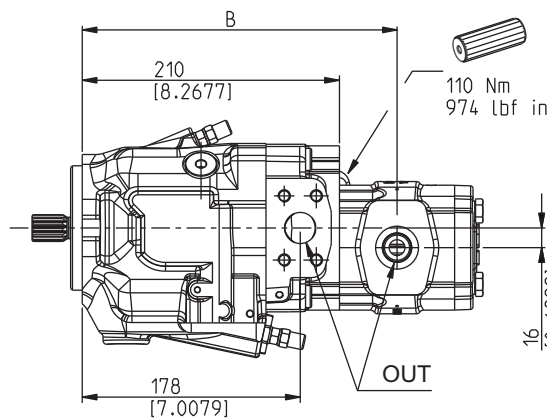
V	V1
100 ±10 (797 ÷ 974)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
MVP	MVP	PHP20
1" 1/2	1"	1/2"
		Drain port

03/06.2011

Dimensions at page 38 ÷ 39



Gear pump POLARIS PH (for more information, please consult our technical sales department)

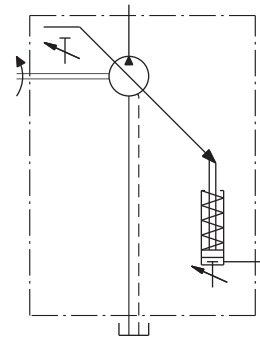
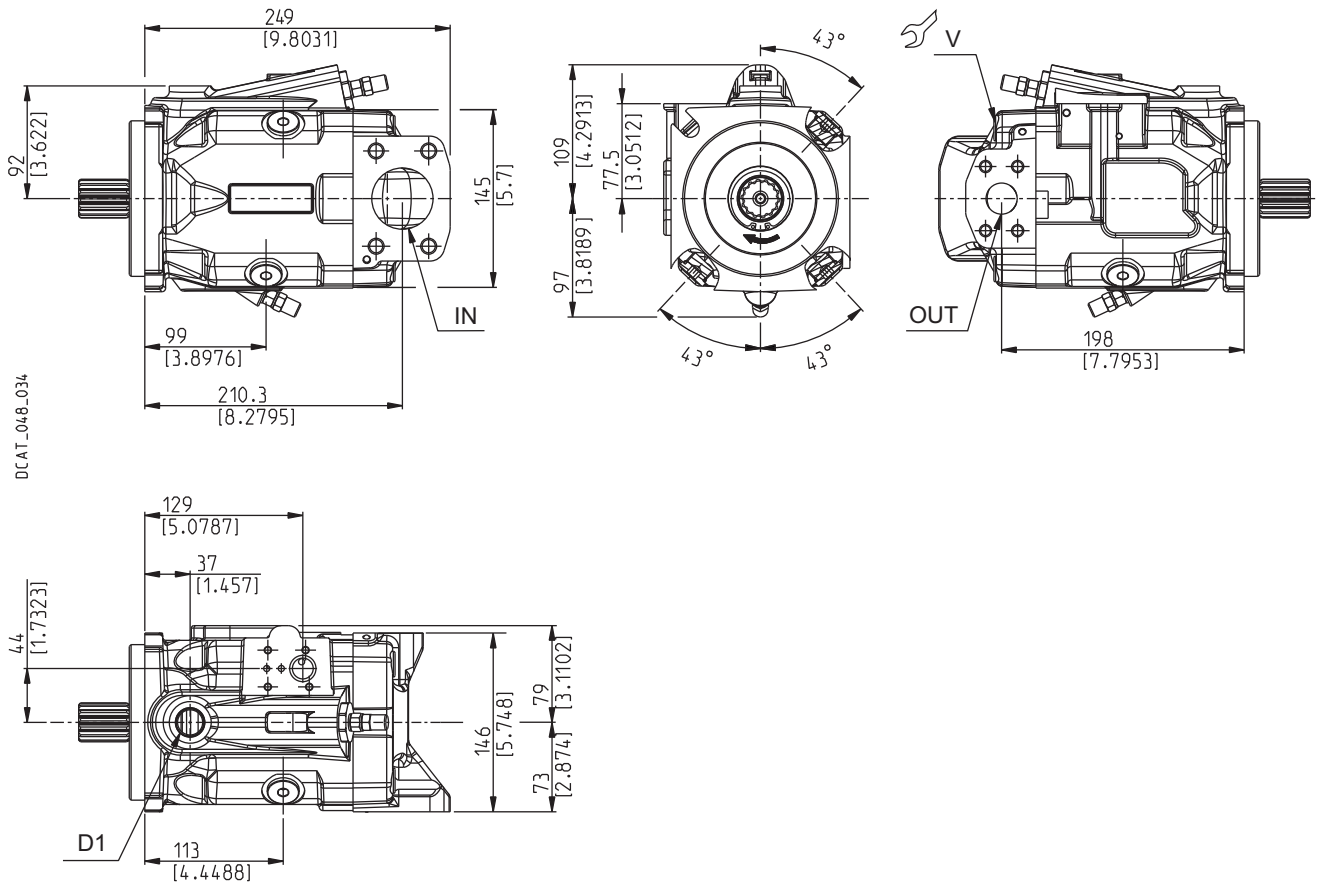
Pump type	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions
<b>MVP48</b>	306,5 (12.0669)	309,6 (12.1890)	312,9 (12.3189)	315,2 (12.4094)	317,6 (12.5039)	320,3 (12.6102)	327,6 (12.8976)	mm (in) <b>A</b>
	246,45 (9.7028)	248 (9.7638)	249,65 (9.8287)	250,8 (9.8740)	252 (9.9213)	253,35 (9.9744)	257 (10.1181)	mm (in) <b>B</b>

**MVP60**

**SIDE PORTS - DIMENSIONS**

**L**

Drive shafts: page 34 ÷ 35  
Mounting flanges: page 36 ÷ 37



Screws tightening torque Nm (lbf in)

V
130 ±13 (1036 ÷ 1266)

Ports (Nominal size)

IN	OUT	D1
2"	1"	Drain port

Dimensions at page 38 ÷ 39

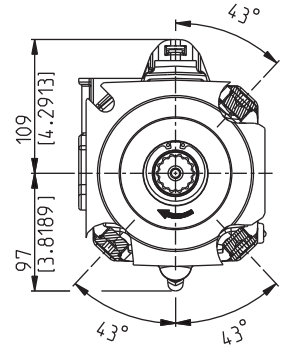
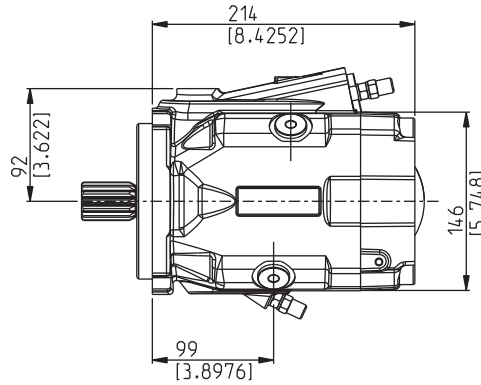
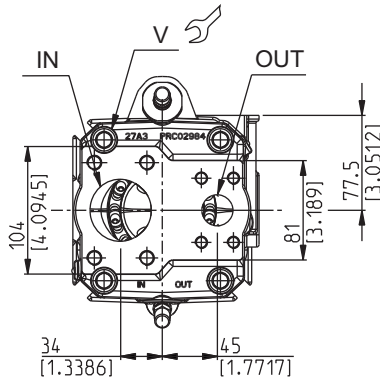
03/06.2011

**MVP60**

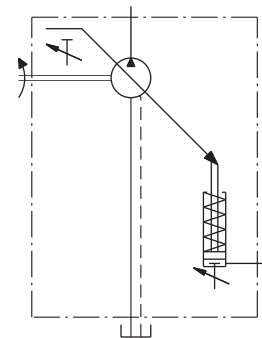
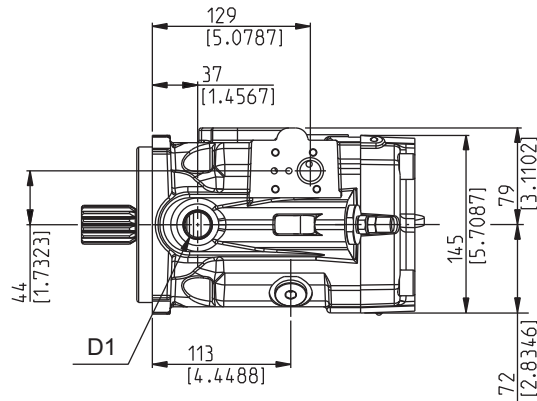
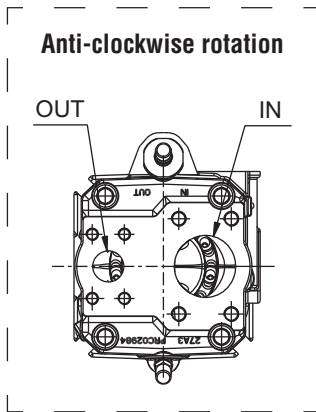
**REAR PORTS - DIMENSIONS**

**P**

Drive shafts: page 34 ÷ 35  
Mounting flanges: page 36 ÷ 37



DCAT\_048\_005



03/06.2011

Screws tightening torque Nm (lbf in)

**V**

130 ±13  
(1036 ÷ 1266)

Ports (Nominal size)

**IN**

**OUT**

**D1**

2"

1"

Drain port

Dimensions at page 38 ÷ 39

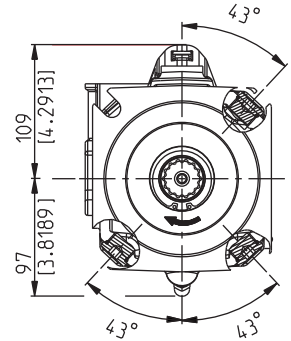
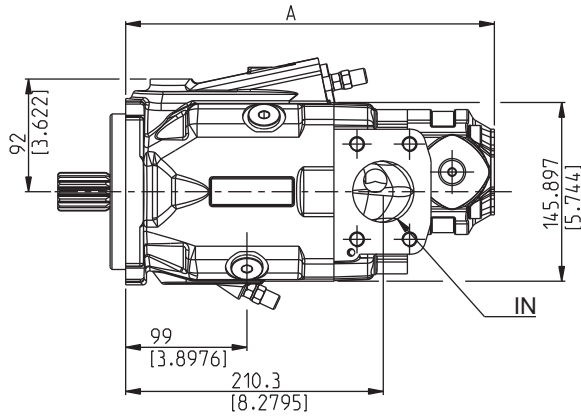
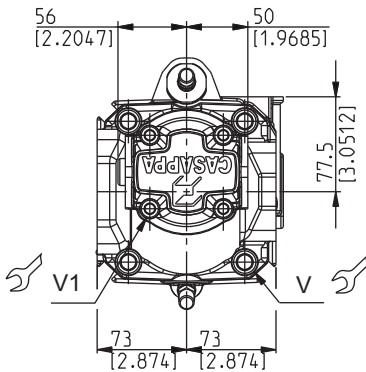
**MVP60/KP20**

**MULTIPLE PUMPS - DIMENSIONS**

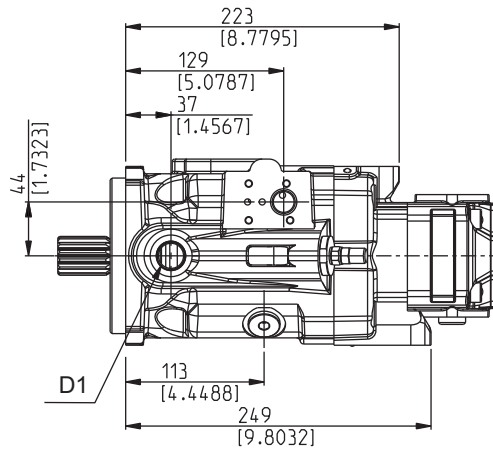
**L**

Common inlet intermediate flange:  
MVP code **P7**  
KP20 code **N5**

Drive shafts: page 34 ÷ 35  
Mounting flanges: page 36 ÷ 37



DCAT\_048\_029\_KP20

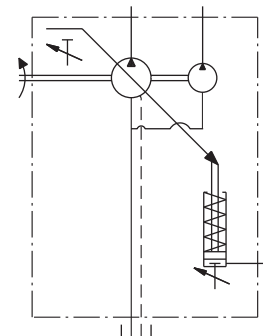
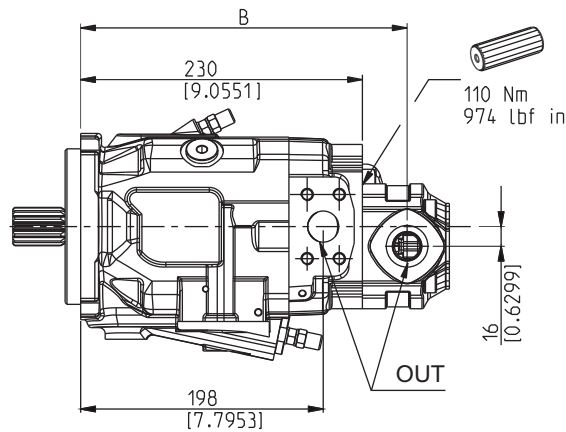


Screws tightening torque Nm (lbf in)

V	V1
130 ±13 (1036 ÷ 1266)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN		OUT		D1
MVP	MVP	KP20		Drain port
2"	1"	1/2"		



Dimensions at page 38 ÷ 39

Gear pump KAPPA (for more information, please consult our technical sales department)

Pump type	20•4	20•6,3	20•8	20•11,2	20•14	20•16	20•20	Dimensions	
<b>MVP60</b>	281,5 (11.0827)	284 (11.1811)	286,5 (11.2795)	290 (11.4173)	294 (11.5748)	299,5 (11.7913)	306 (12.0472)	mm (in)	<b>A</b>
	254 (10.000)	256,5 (10.0894)	259 (10.1969)	262,5 (10.3346)	261 (10.2756)	266,5 (10.4921)	273 (10.7480)	mm (in)	<b>B</b>

03/06.2011

**MVP60/PHP20**

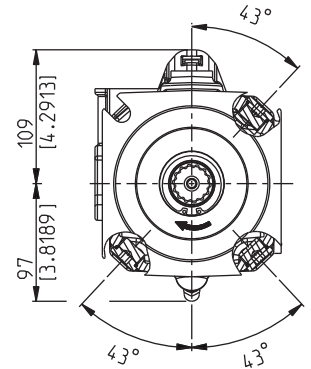
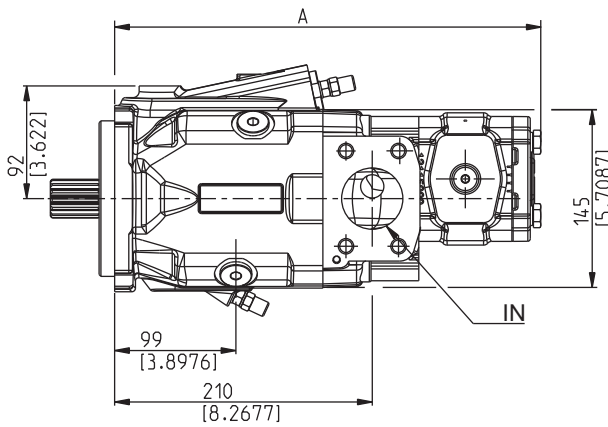
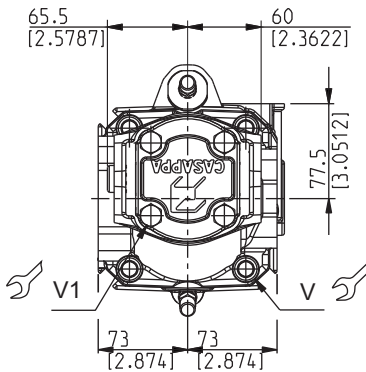
**MULTIPLE PUMPS - DIMENSIONS**

**L**

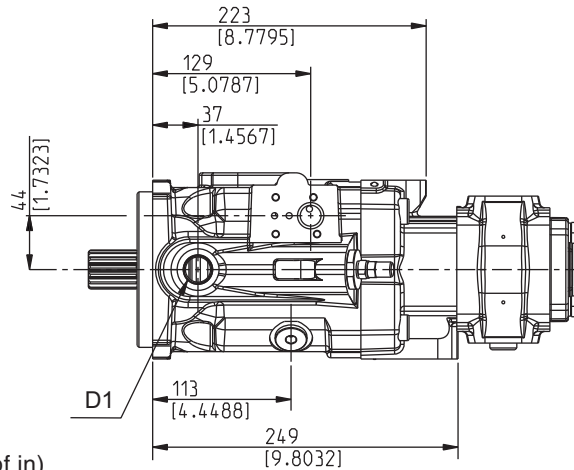
Common inlet intermediate flange:  
MVP code **I7**  
PHP20 code **S7**

Drive shafts: page 34 ÷ 35  
Mounting flanges: page 36 ÷ 37

Also available in  
combination with PLP20



DCAT\_048\_035\_PHP

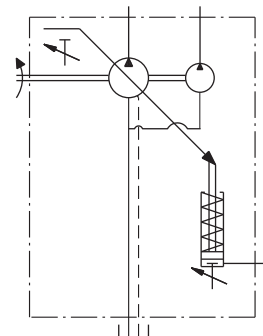
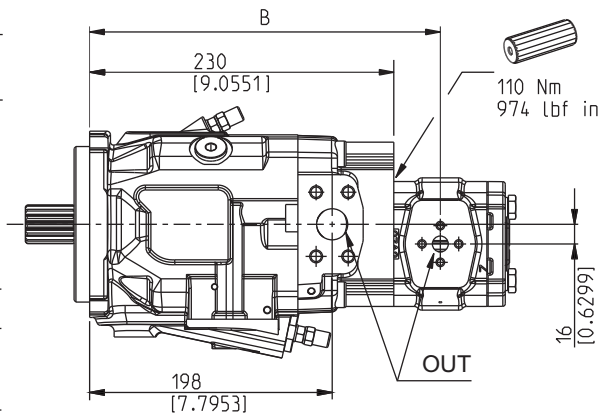


Screws tightening torque Nm (lbf in)

V	V1
130 ±13 (1036 ÷ 1266)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
MVP 2"	MVP 1"    PHP20 1/2"	Drain port



03/06.2011

Dimensions at page 38 ÷ 39

Gear pump POLARIS PH (for more information, please consult our technical sales department)

Pump type	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions
<b>MVP60</b>	326,5 (12.8543)	329,6 (12.9764)	332,9 (13.1063)	335,2 (13.1969)	337,6 (13.2913)	340,3 (13.3976)	347,6 (13.6850)	mm (in) <b>A</b>
	266,45 (10.4902)	268 (10.5512)	269,65 (10.6161)	270,8 (10.6614)	272 (10.7087)	273,35 (10.7618)	277 (10.9055)	mm (in) <b>B</b>

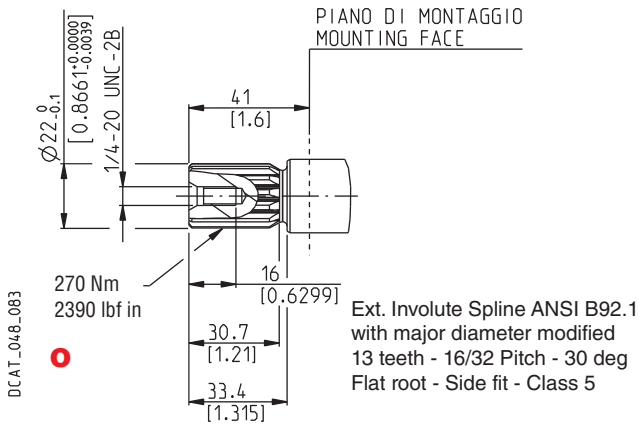
**MVP30**

**DRIVE SHAFTS**

**SAE "B" SPLINE**

**04**

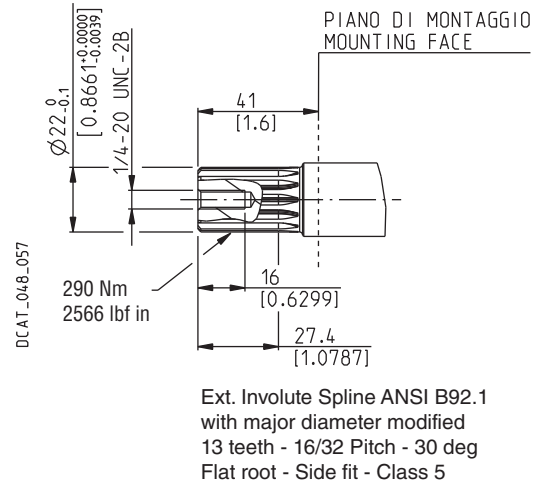
Mounting face refers to flange code **S5**



**SAE "B" SPLINE**

**4R**

Mounting face refers to flange code **S5**

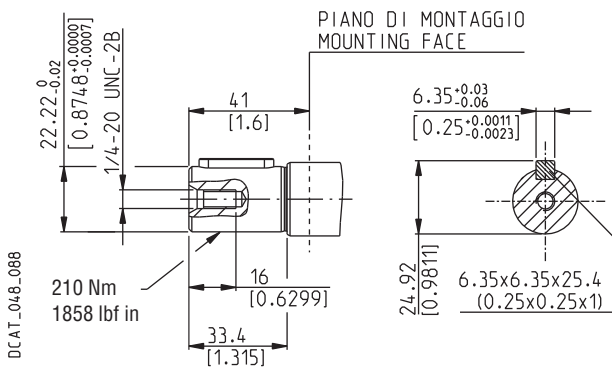


Replaces: 03/06.2011

**SAE "B" STRAIGHT**

**32**

Mounting face refers to flange code **S5**



05/10.2014

For different drive shafts, please consult our technical department.



**MVP48**

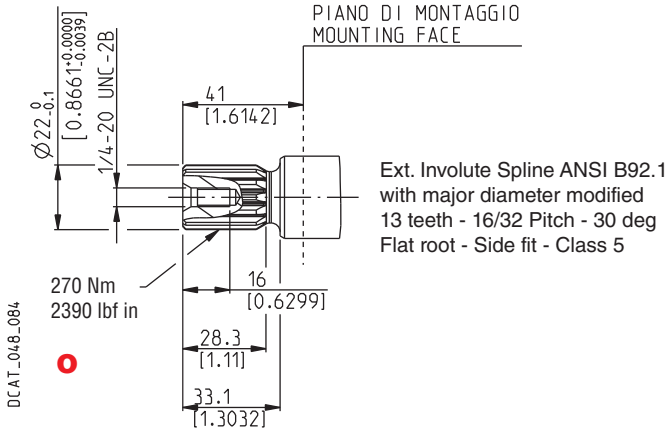
**DRIVE SHAFTS**

**SAE "B" SPLINE**

**04**

Mounting face refers to flange code **S5**

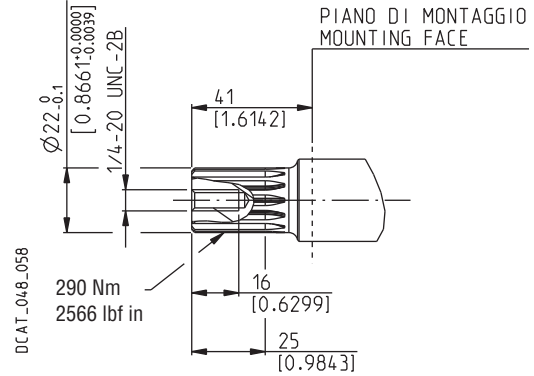
Replaces: 03/06.2011



**SAE "B" SPLINE**

**4R**

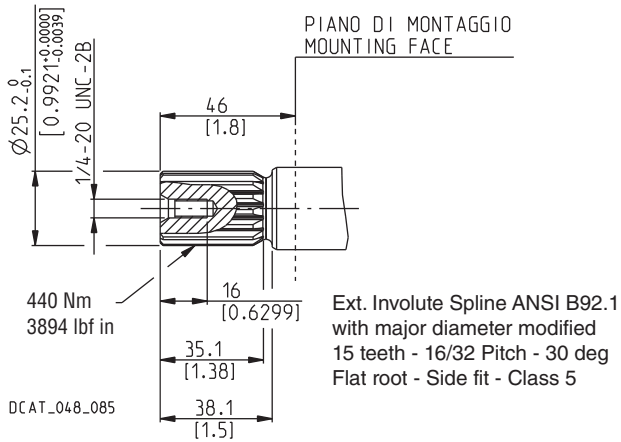
Mounting face refers to flange code **S5**



**SAE "BB" SPLINE**

**05**

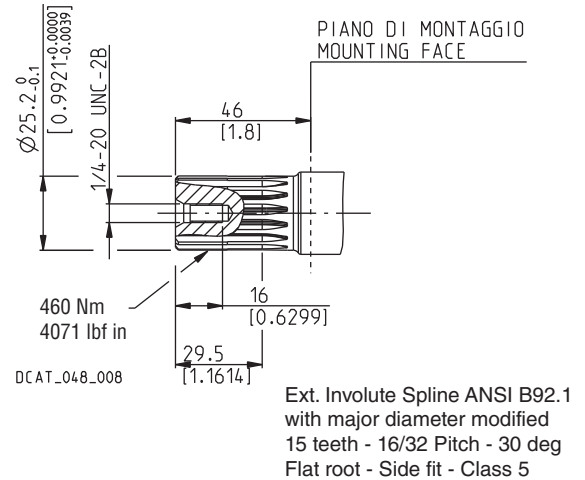
Mounting face refers to flange code **S5**



**SAE "BB" SPLINE**

**5R**

Mounting face refers to flange code **S5**

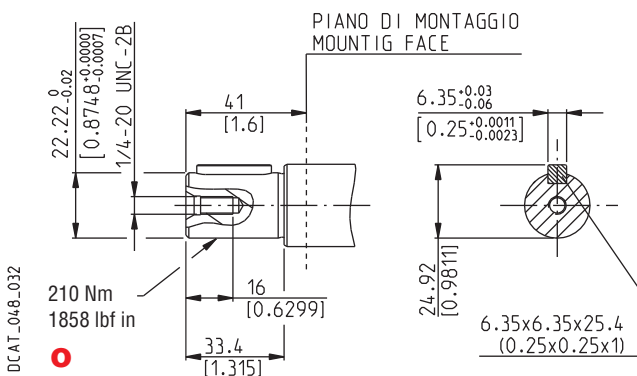


**SAE "B" STRAIGHT**

**32**

Mounting face refers to flange code **S5**

05/10.2014



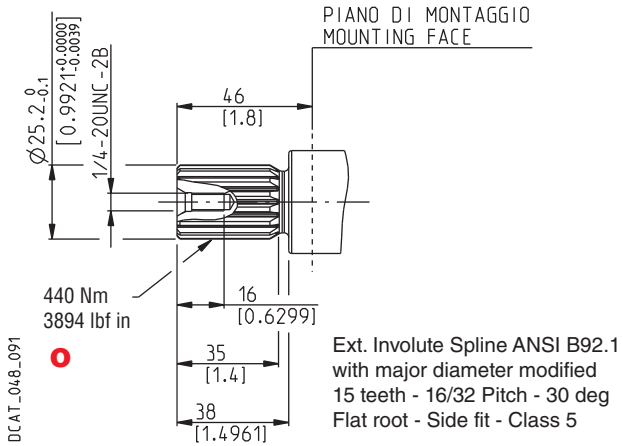
**MVP60**

**DRIVE SHAFTS**

**SAE "BB" SPLINE**

**05**

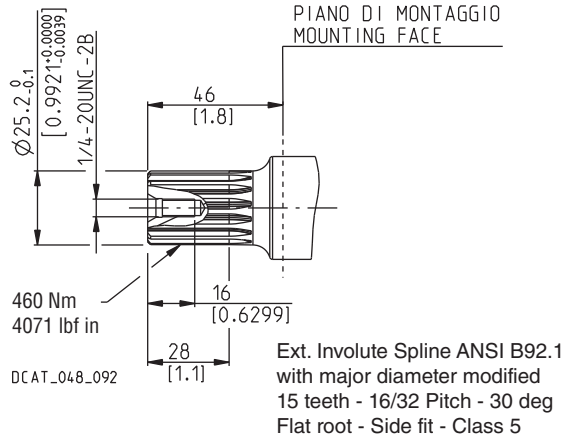
Mounting face refers to flange code **S5**



**SAE "BB" SPLINE**

**5R**

Mounting face refers to flange code **S5**

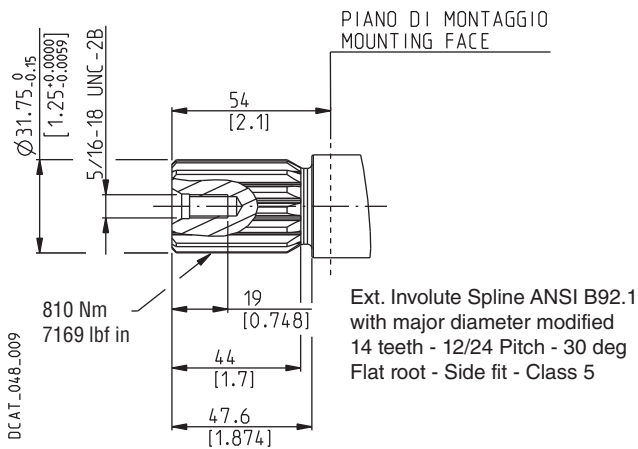


Replaces: 03/06.2011

**SAE "C" SPLINE**

**06**

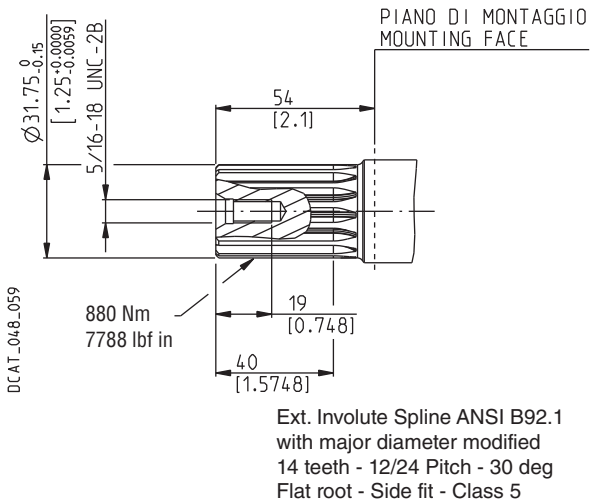
Mounting face refers to flange code **S7** and **S8**



**SAE "C" SPLINE**

**6R**

Mounting face refers to flange code **S7** and **S8**



05/10.2014

For different drive shafts, please consult our technical department.

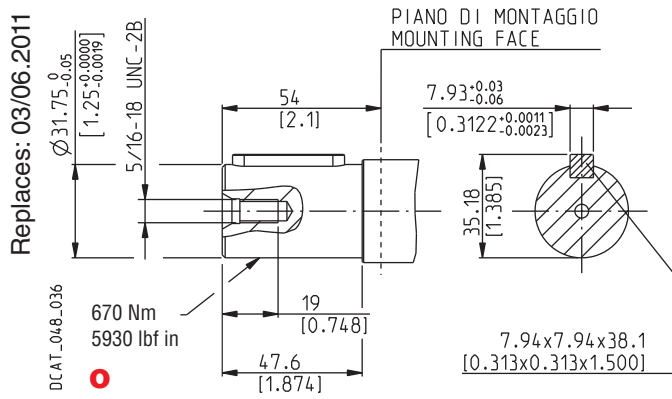
**MVP60**

**DRIVE SHAFTS**

**SAE "C" STRAIGHT**

**34**

Mounting face refers to flange code **S8**



05/10.2014

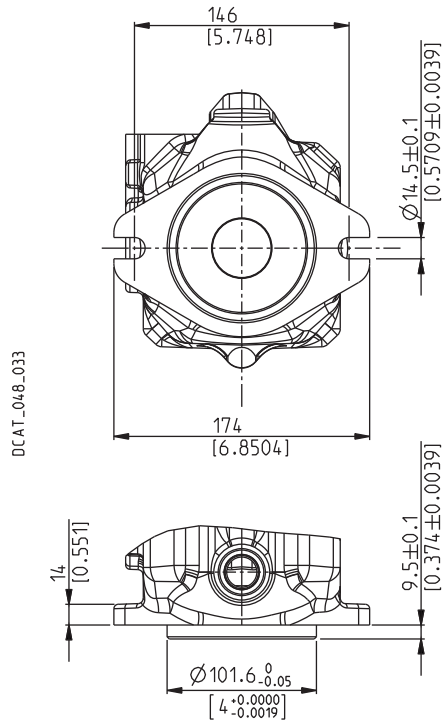
For different drive shafts, please consult our technical department.

## MOUNTING FLANGES AND TABLE OF COMPATIBILITY

**SAE "B" 2 HOLES**

**S5**

Conforms to SAE J744



Replaces: 03/06.2011

**DRIVE SHAFTS**  
See page 32 ÷ 35

Pump type	04	4R	32	05	5R	06	6R	34
<b>MVP 30</b>	<b>X</b>	<b>X</b>	<b>X</b>					
<b>MVP 48</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>			
<b>MVP 60</b>				<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

X Available combination

05/10.2014

## MOUNTING FLANGES AND TABLE OF COMPATIBILITY

### SAE "C" 2 HOLES

**S7**

Conforms to SAE J744

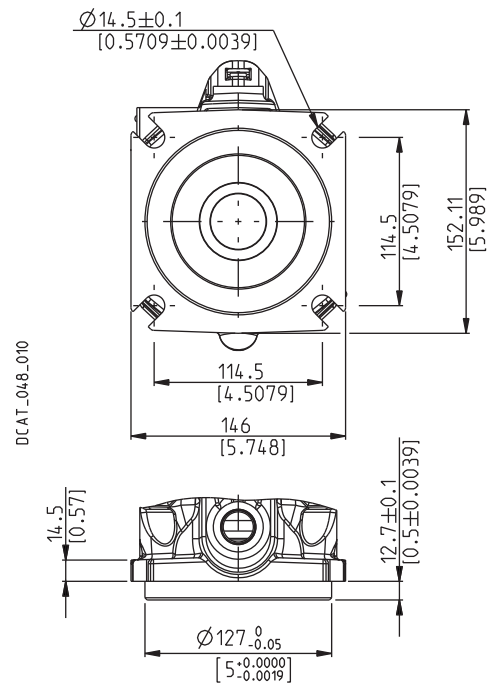
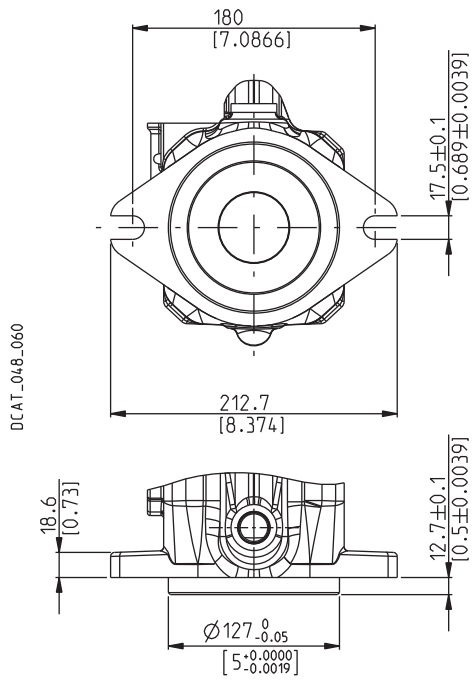
○

### SAE "C" 4 HOLES

**S8**

Conforms to SAE J744

Replaces: 03/06.2011



#### ○ DRIVE SHAFTS

See page 34 ÷ 35

Pump type	05	5R	06	6R	34
<b>MVP 60</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

X Available combination

#### ○ DRIVE SHAFTS

See page 34 ÷ 35

Pump type	05	5R	06	6R	34
<b>MVP 60</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

X Available combination

○ 05/10.2014

## PORTS SIZES

Ports type	INLET / OUTLET PORTS						DRAIN PORTS		LOAD SENSING PORTS		KP20 / PHP20 GEAR PUMPS	
	Split SSM		Split SSS		SAE ODT		Gas BSPP	SAE ODT (●)	Gas BSPP	SAE ODT (●)	Gas BSPP	SAE ODT
	IN	OUT	IN	OUT	IN	OUT	D1	D1	X	X	OUT	OUT
MVP 30	MD	MB	SD	SB	—	—	—	OB	GA	03	GD	OC
MVP 48	ME	MC	SE	SC	OH	OF	GD	OC	GA	03	GD	OC
MVP 60	MF	MC	SF	SC	MF	OF	GD	OC	GA	03	GD	OC

(●) Available only with inlet and outlet ports type Split SSS and SAE ODT.



Tightening torque for low pressure side port

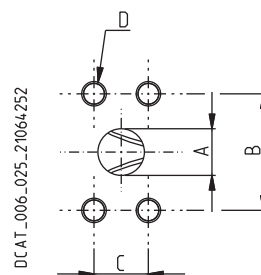


Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]

### SAE FLANGED PORTS J518 - Standard pressure series 3000 psi - Code 61 **SSM**

Metric thread ISO 60° conforms to ISO/R 262

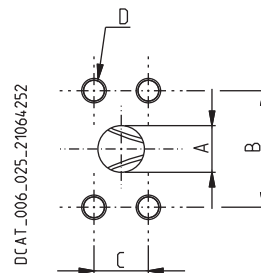
CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
<b>MB</b>	3/4"	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	M 10 17 (0.6693)	—	45 <sup>+2,5</sup> (398 ÷ 420)
<b>MC</b>	1"	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	M 10 17 (0.6693)	—	30 <sup>+2,5</sup> (266 ÷ 288)
<b>MD</b>	1" 1/4	32 (1.2598)	58,7 (2.3110)	30,2 (1.1890)	M 10 17 (0.6693)	20 <sup>+1</sup> (177 ÷ 186)	—
<b>ME</b>	1" 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	M 12 20 (0.7874)	30 <sup>+2,5</sup> (266 ÷ 288)	—
<b>MF</b>	2"	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	M 12 20 (0.7874)	30 <sup>+2,5</sup> (266 ÷ 288)	—



### SAE FLANGED PORTS J518 - Standard pressure series 3000 psi - Code 61 **SSS**


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


CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
<b>SB</b>	3/4"	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	3/8 - 16 UNC-2B 17 (0.6693)	—	30 <sup>+2,5</sup> (266 ÷ 288)
<b>SC</b>	1"	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	3/8 - 16 UNC-2B 17 (0.6693)	—	35 <sup>+2,5</sup> (310 ÷ 332)
<b>SD</b>	1" 1/4	32 (1.2598)	58,7 (2.3110)	30,2 (1.1890)	7/16 - 14 UNC-2B 17 (0.6693)	25 <sup>+1</sup> (221 ÷ 230)	—
<b>SE</b>	1" 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	1/2 - 13 UNC-2B 20 (0.7874)	30 <sup>+2,5</sup> (266 ÷ 288)	—
<b>SF</b>	2"	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	1/2 - 13 UNC-2B 20 (0.7874)	30 <sup>+2,5</sup> (266 ÷ 288)	—



03/06.2011

## PORTS SIZES

 Tightening torque for low pressure side port

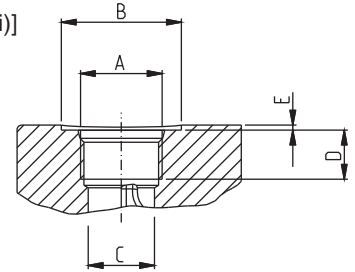
 Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]



### SAE STRAIGHT THREAD PORTS J514

**ODT**

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

DCAT\_006\_027\_21060524



CODE	Nominal size	A	Ø B	Ø C	D	E		
							Nm (lbf in)	Nm (lbf in)
<b>03 (X)</b>	1/4"	7/16" - 20 UNF - 2B	—	9,5 (0.3740)	—	—	—	12 <sup>+1</sup> (106 ÷ 115)
<b>0B (●)</b>	1/2"	3/4" - 16 UNF - 2B	33 (1.2992)	17, (1.3780)	—	1 (0.0394)	20 <sup>+1</sup> (177 ÷ 186)	—
<b>0C (●)</b>	5/8"	7/8" - 14 UNF - 2B	35 (1.3780)	20,5 (0.8071)	—	2 (0.0787)	30 <sup>+2.5</sup> (266 ÷ 288)	—
<b>0C (◆)</b>			34 (1.3386)	20,5 (0.8071)	17 (0.6693)	0,5 (0.0197)	—	70 <sup>+5</sup> (620 ÷ 664)
<b>0F</b>	1"	1 5/16" - 12 UNF - 2B	—	30,5 (1.2008)	20 (0.7874)	—	—	170 <sup>+10</sup> (1505 ÷ 1593)
<b>0H</b>	1" 1/2	1 7/8" - 12 UNF - 2B	—	45 (1.7717)	20 (0.7874)	—	100 <sup>+5</sup> (885 ÷ 929)	—

(X) = Load sensing port

(●) = Drain port

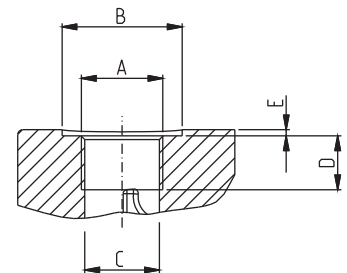
(◆) = KP20 / PHP20 outlet port



### GAS STRAIGHT THREAD PORTS

**BSPP**

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

DCAT\_006\_026\_21064779



CODE	Nominal size	A	Ø B	Ø C	D	E		
							Nm (lbf in)	Nm (lbf in)
<b>GA (X)</b>	1/8"	G 1/8	—	8,75 (0.3444)	12 (0.4724)	—	—	5 <sup>+0.25</sup> (44 ÷ 46)
<b>GD (●)</b>	1/2"	G 1/2	30 (1.1811)	19 (0.7480)	17 (0.6693)	2 (0.0787)	20 <sup>+1</sup> (177 ÷ 186)	—
<b>GD (◆)</b>			—	19 (0.7480)	17 (0.6693)	—	—	50 <sup>+2.5</sup> (443 ÷ 465)

(X) = Load sensing port

(●) = Drain port

(◆) = KP20 / PHP20 outlet port

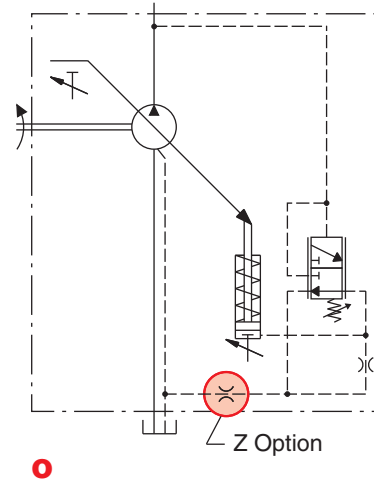
03/06.2011

# PRESSURE COMPENSATOR

**RPO**

Regulates the pump displacement automatically to maintain the pressure below the fixed pre-adjusted limit.

Compensator type	Pump type	Pressure setting range	Standard setting
		bar (psi)	bar (psi)
<b>RPO</b>	<b>MVP 30-28</b>	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	<b>MVP 30-34</b>	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	<b>MVP 48-45</b>	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	<b>MVP 48-53</b>	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	<b>MVP 60-60</b>	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	<b>MVP 60-72</b>	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	<b>MVP 60-84</b>	80 ÷ 250 (1160 ÷ 3625)	250 (3625)



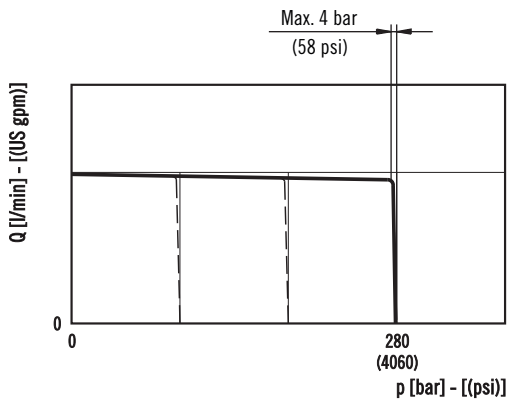
Replaces: 03/06.2011

## Z OPTION

Damping restrictor for critical applications. In case of system instability or pressure oscillations, the additional damping restrictor slows down the pump control system, damping the regulation transients. The pump recovery time increases. The use of the damping restrictor must be evaluated and approved by Casappa technical sales department for the specific application.

## OPERATING CURVES

Curves have been obtained at the speed of 1500 min<sup>-1</sup> and oil temperature 50 °C (122 °F).

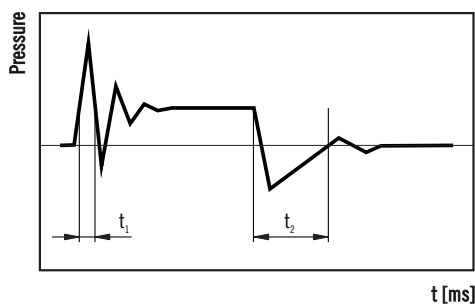


## REMOTE CONTROL

For remote pressure compensator LS3 see page 50.

## RESPONSE AND RECOVERY TIME

According to SAE J745 (using outlet pressure).



Pump type	t <sub>1</sub> Response time [ms] (off stroke)	t <sub>2</sub> Recovery time [ms] (on stroke)
<b>MVP 30</b>	46	150
<b>MVP 48</b>	48	150
<b>MVP 60</b>	50	150

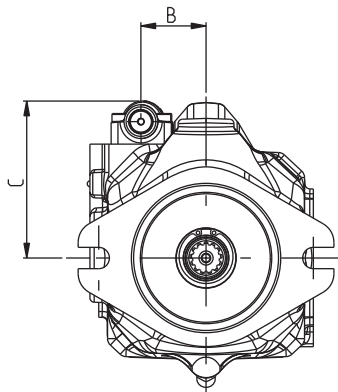
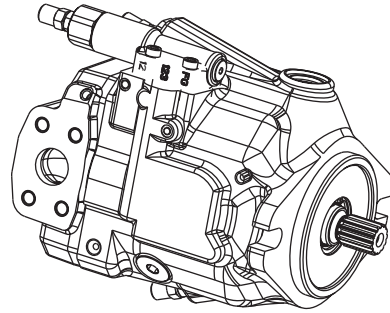
05/10.2014



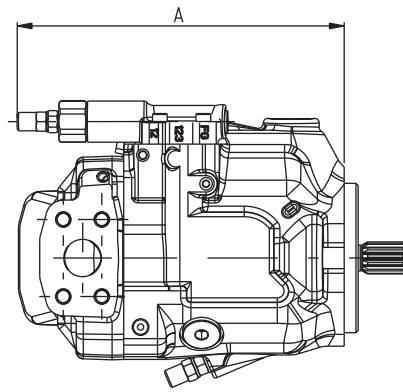
**PRESSURE COMPENSATOR**

**RPO**

Replaces: 03/06.2011



DCAT\_048\_041



05/10.2014



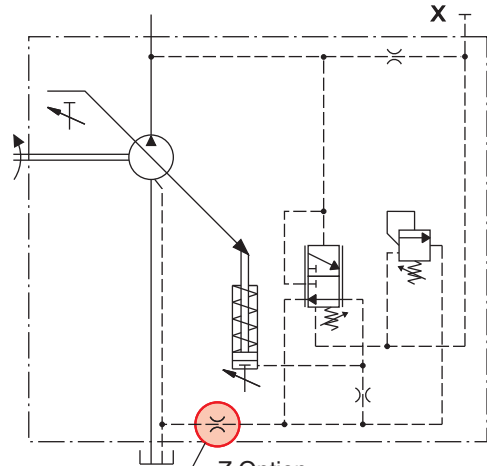
Pump type	<b>A</b>	<b>B</b>	<b>C</b>
	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	203 (7.9921)	39 (1.5354)	101 (3.9764)
<b>MVP 48</b>	222 (8.7402)	44 (1.7323)	107 (4.2126)
<b>MVP 60</b>	227 (8.9370)	44 (1.7323)	107 (4.2126)

**PRESSURE COMPENSATOR**

**RP1**

Regulates the pump displacement automatically to maintain the pressure below the fixed pre-adjusted limit.  
Designed to work at high frequency  $\geq 1$  cycle/min and/or at pressure  $> 280$  bar (4060 psi).

**RP1**

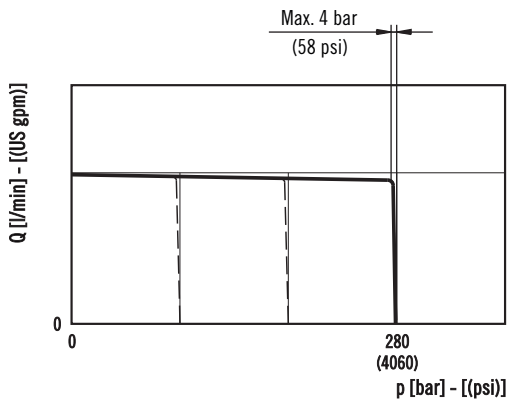


**Z Option**  
(See page 40 for more information)

Replaces: 04/01.2012

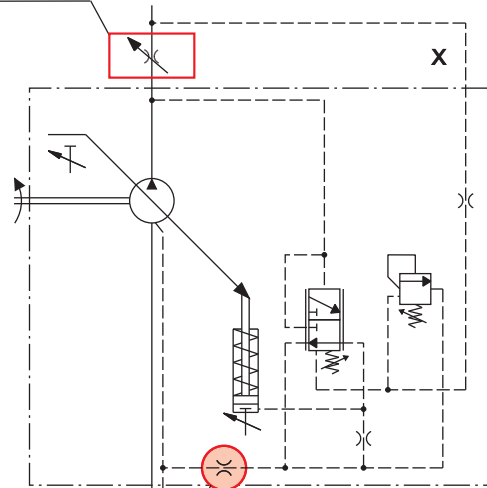
**OPERATING CURVES**

Curves have been obtained at the speed of  $1500 \text{ min}^{-1}$  and oil temperature  $50 \text{ }^\circ\text{C}$  ( $122 \text{ }^\circ\text{F}$ ).



**RP1 - LS2 (with flow control)**

Not included in supply



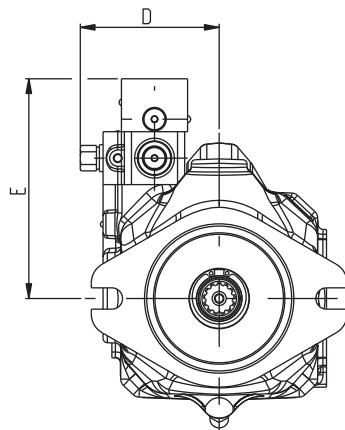
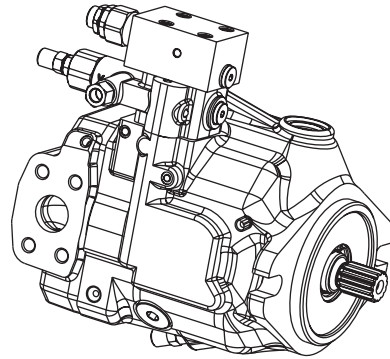
**Z Option**  
(See page 40 for more information)

05/10.2014

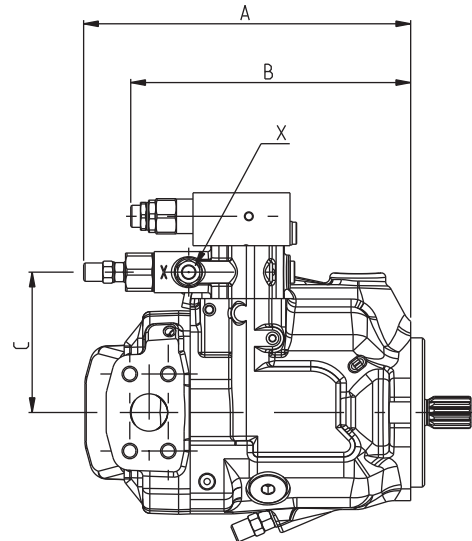
**PRESSURE COMPENSATOR**

**RP1**

Replaces: 03/06.2011



DCAT\_048\_045



RP1 - LS2 configuration shown.

05/10.2014



Pump type	A	B	C	D	E
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	203 (7.9921)	171 (6.7323)	86 (3.3858)	89,5 (3.5236)	137 (5.3937)
<b>MVP 48</b>	222,5 (8.7598)	190 (7.4803)	92,5 (3.6417)	94,5 (3.7205)	143,5 (5.6496)
<b>MVP 60</b>	227,5 (8.9567)	195,6 (7.7008)	92,5 (3.6417)	94,5 (3.7205)	143,5 (5.6496)

X: Load-sensing port. Dimensions at page 38 ÷ 39

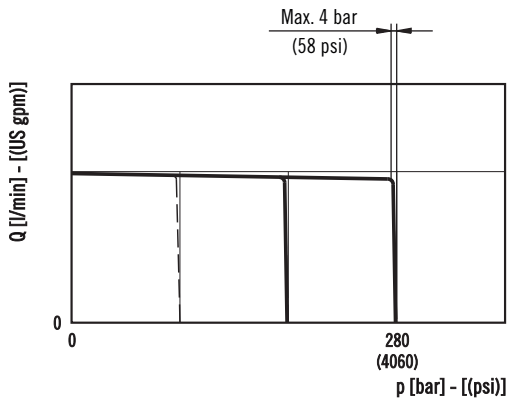
# DUAL SETTING PRESSURE COMPENSATOR

**RP2**

Regulates the pump displacement automatically to maintain the pressure below two fixed pre-adjusted limits. The electrically piloted valve allows to switch between the two different limits.

## OPERATING CURVES

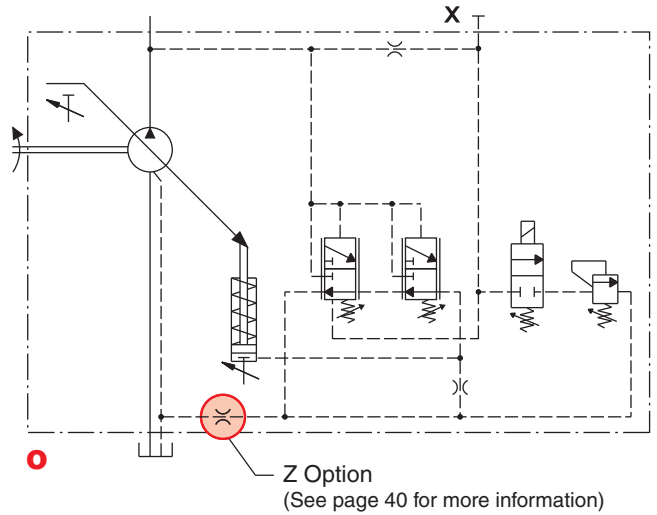
Curves have been obtained at the speed of 1500 min<sup>-1</sup> and oil temperature 50 °C (122 °F).



## VALVE FEATURES

Valve code	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
3	Normally closed	24 VAC
6	Normally open	12 VDC
7	Normally open	24 VDC
8	Normally open	24 VAC

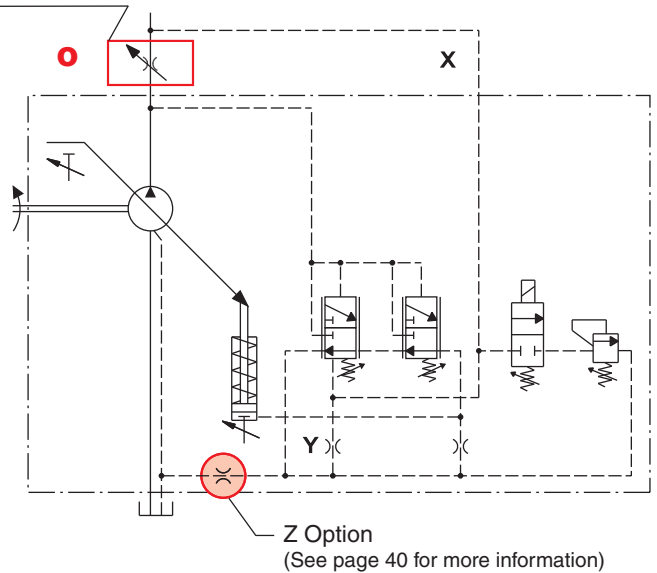
## RP2



Replaces: 04/01.2012

## RP2 - LS2 (with flow control)

Not included in supply

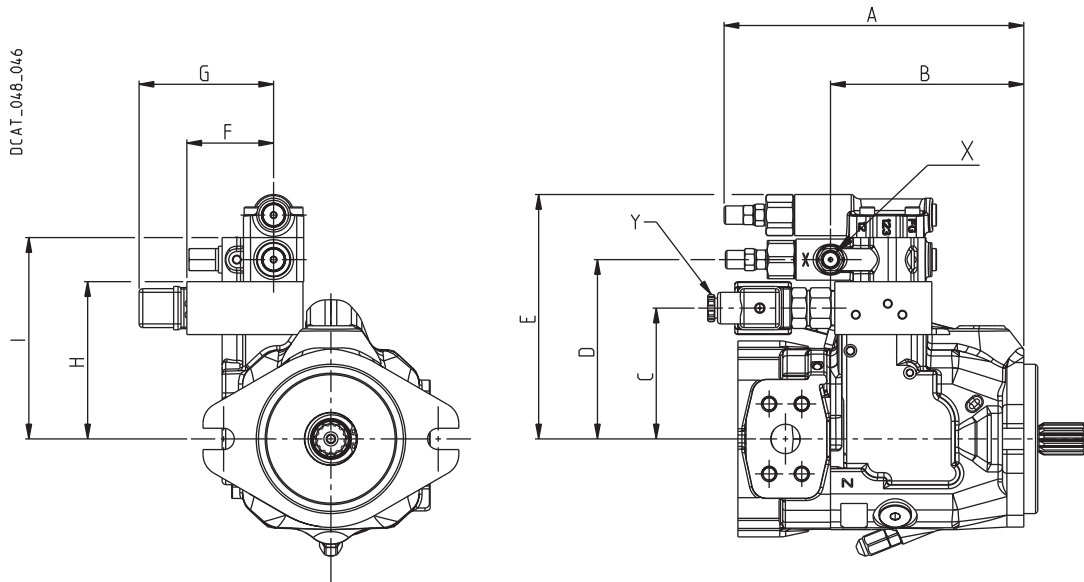
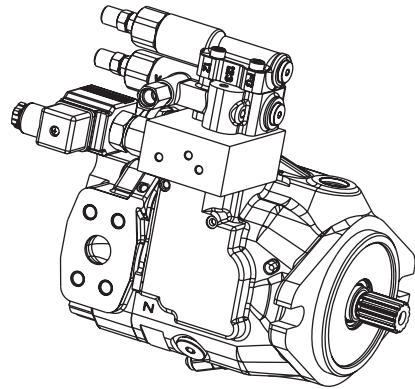


05/10.2014

**DUAL SETTING PRESSURE COMPENSATOR**

**RP2**

Replaces: 03/06.2011



RP2 - LS2 configuration shown.

05/10.2014



Pump type	A	B	C	D	E	F	G	H	I
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	204 (8.0315)	131 (5.1575)	89 (3.5039)	122 (4.8031)	166 (6.5354)	98 (3.8583)	132 (5.1969)	107 (4.2126)	137 (5.3937)
<b>MVP 48</b>	223 (8.7795)	151 (5.9449)	95 (3.7402)	128,5 (5.0591)	172,8 (6.8031)	103 (4.0551)	137 (5.3937)	113 (4.4488)	143,5 (5.6496)
<b>MVP 60</b>	228,6 (9.0000)	156 (6.1417)	95 (3.7402)	128,5 (5.0591)	172,8 (6.8031)	103 (4.0551)	137 (5.3937)	113 (4.4488)	143,5 (5.6496)

X: Load-sensing port. Dimensions at page 38 ÷ 39

Y: Connector. Standard type DIN 43 650 / ISO 4400. For other connectors please consult our technical sales department.

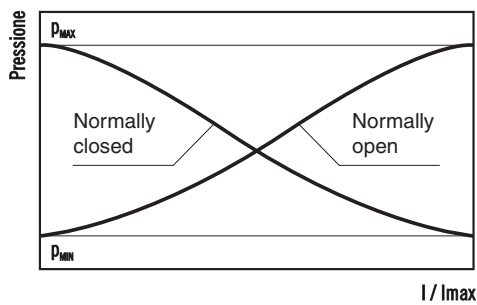
# ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR

**PEC**

Regulates the pump displacement automatically to maintain the pressure below the variable limit set through a command current signal.

## OPERATING CURVES

Curves have been obtained at the speed of 1500 min<sup>-1</sup> and oil temperature 50 °C (122 °F).

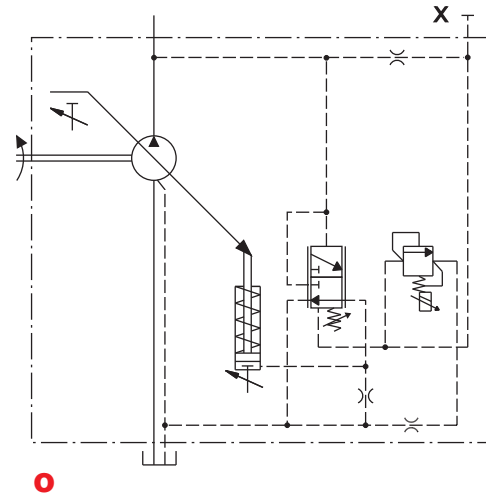


## VALVE FEATURES

Valve code	Arrangement	Volt
1	Normally closed	12 VDC
2	Normally closed	24 VDC
6	Normally open	12 VDC
7	Normally open	24 VDC

Volt	12 V (+/- 10%)	24 V (+/- 10%)
Limit current	1,7 A	0,85 A
Dither frequency	150 Hz	150 Hz
Operating temperature	-40 °C ÷ 100 °C (-40 °F ÷ 212 °F)	
Connector type	DIN 43 650 / ISO 4400 DEUTSCH DT04-2P	

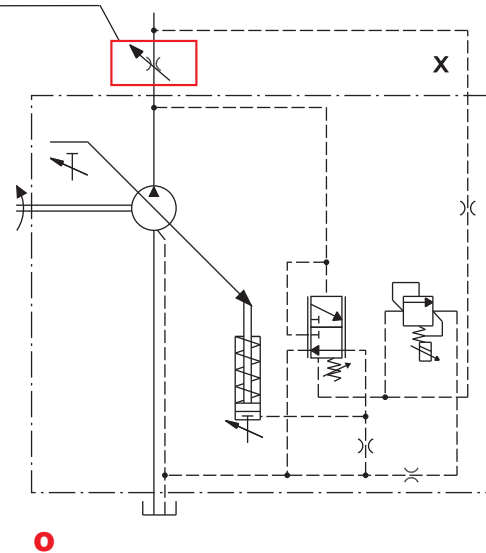
## PEC



Replaces: 03/06.2011

## PEC - LS2 (with flow control)

Not included in supply

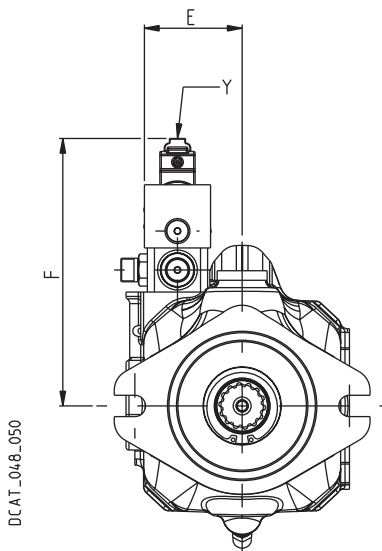
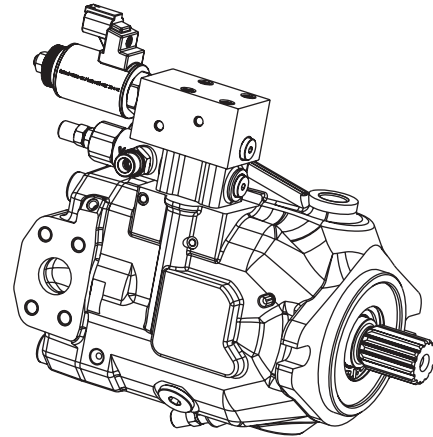


05/10.2014

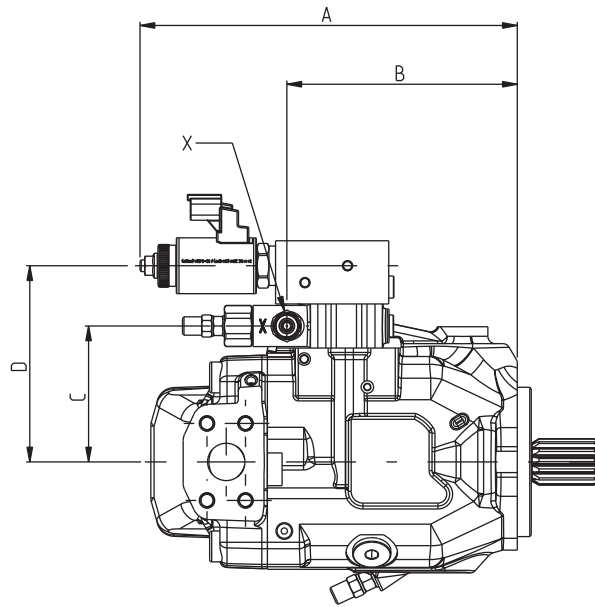
**ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR**

**PEC**

Replaces: 03/06.2011



DCAT\_048\_050



05/10.2014



Pump type	A	B	C	D	E	F
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	232 (9.1339)	132 (5.1969)	86 (3.3858)	127 (5.0000)	61 (2.4016)	144 (5.6693)
<b>MVP 48</b>	251 (9.8819)	151 (5.9449)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)
<b>MVP 60</b>	257 (10.1181)	157 (6.1811)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)

X: Load-sensing port. Dimensions at page 38 ÷ 39  
Y: Connector type DIN 43 650 / ISO 4400 or DEUTSCH DT04-2P

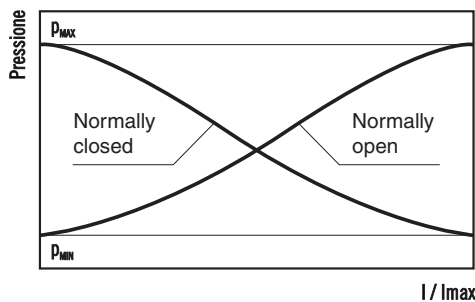
# ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PLUS ANGULAR SENSOR **PECA**

Regulates the pump displacement automatically to maintain the pressure below the variable limit set through a command current signal. The swivel angular sensor converts the actual position of the swashplate into a voltage output signal that can be used for different purposes. This signal and the proportional relief valve allow to realise the following different control logics by means of an external control unit:

- Variable maximum pressure limiter
- Electronic flow compensator with variable setting (variable Load-Sensing)
- Electronic torque limiter with variable torque setting
- Power limiter
- Flow control
- Working e-modes

## OPERATING CURVES

Curves have been obtained at the speed of 1500 min<sup>-1</sup> and oil temperature 50 °C (122 °F).

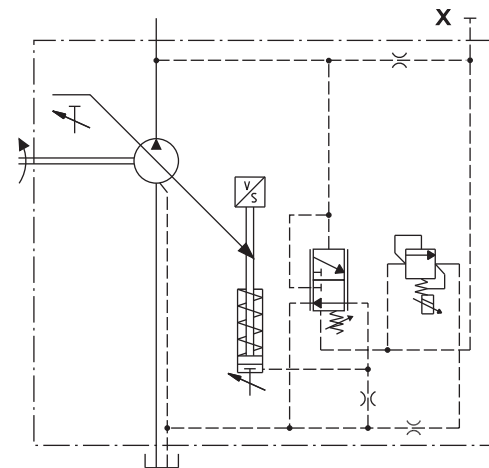


## VALVE FEATURES

Valve code	Arrangement	Volt
<b>1</b>	Normally closed	12 VDC
<b>2</b>	Normally closed	24 VDC
<b>6</b>	Normally open	12 VDC
<b>7</b>	Normally open	24 VDC

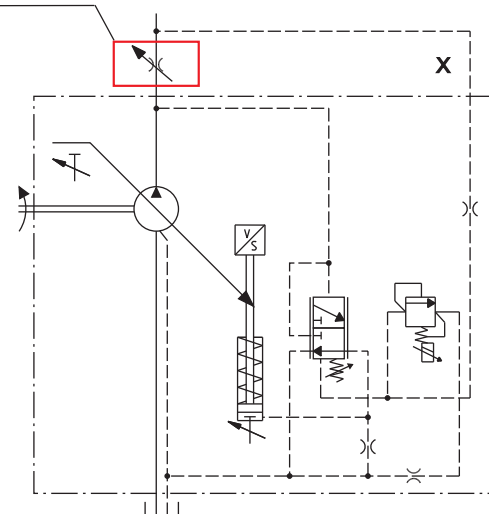
Volt	12 V (+/- 10%)	24 V (+/- 10%)
Limit current	1,7 A	0,85 A
Dither frequency	150 Hz	150 Hz
Operating temperature	-40 °C ÷ 100 °C (-40 °F ÷ 212 °F)	
Connector type	DIN 43 650 / ISO 4400 DEUTSCH DT04-2P	
Angular sensor connector type	DEUTSCH DTM04-4P	

## PECA

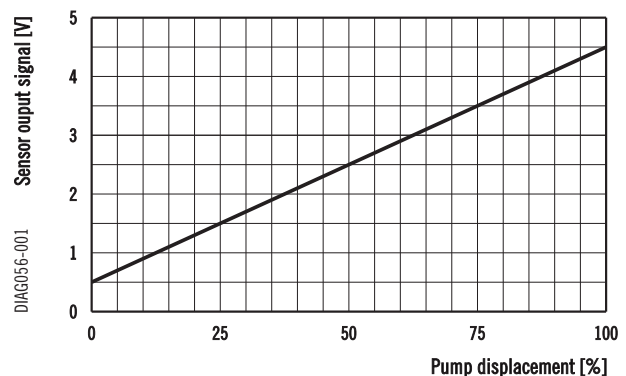


## PEC - LS2 (with flow control)

Not included in supply



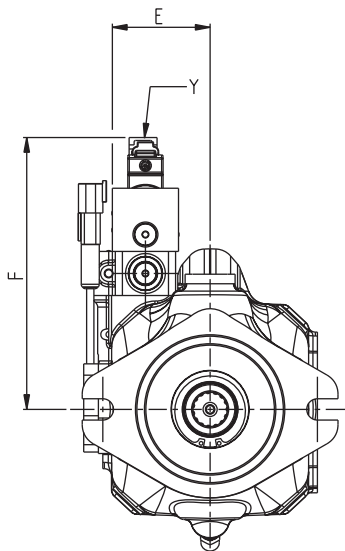
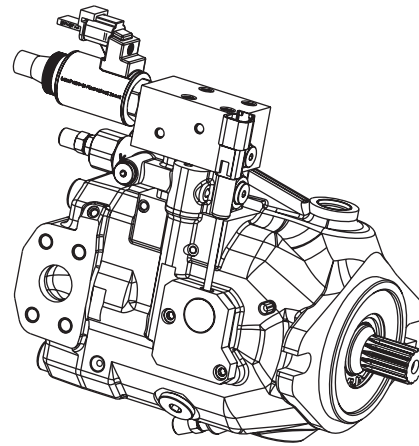
## ANGULAR SENSOR



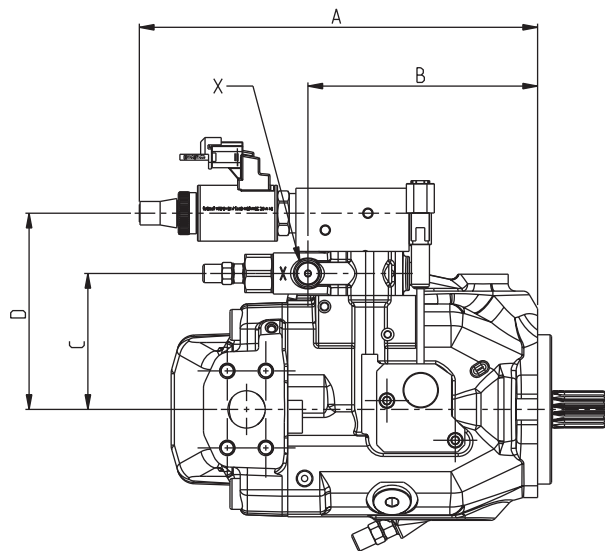
05/10.2014



**ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PLUS ANGULAR SENSOR PECA**



DCAT\_048\_077



05/10.2014

Pump type	A	B	C	D	E	F
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	232 (9.1339)	132 (5.1969)	86 (3.3858)	127 (5.0000)	61 (2.4016)	144 (5.6693)
<b>MVP 48</b>	251 (9.8819)	151 (5.9449)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)
<b>MVP 60</b>	257 (10.1181)	157 (6.1181)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)

X: Load-sensing port. Dimensions at page 38 ÷ 39  
Y: Connector type DIN 43 650 / ISO 4400 or DEUTSCH DT04-2P

# FLOW COMPENSATOR (Load-sensing)

**LS**

Regulates the pump displacement to maintain a constant (load independent) pressure drop across a flow metering device. In the standard version the flow compensator is combined with pressure compensator.

Flow compensator type	Pressure compensator	Differential pressure setting range	Standard setting
		bar (psi)	bar (psi)
<b>LS0</b> (■)	<b>RPO</b>	12 ÷ 40 (174 ÷ 580)	14 (203)
<b>LS2</b> (◆)	<b>RPO</b>		
<b>LS3</b> (●)	<b>RPO</b>		

- (■): Suggested when the directional control valve does not have the bleed function
- (◆): Y is plugged. Suggested when the directional control valve has the bleed function
- (●): For remote pressure control.

Pilot flow ≈ 1,3 ÷ 1,5 l/min (0.34 ÷ 0.40 US gpm)

In standard setting conditions 14 bar (203 psi) the stand-by pressure is 15<sup>±2</sup> bar (218<sup>±29</sup> psi).

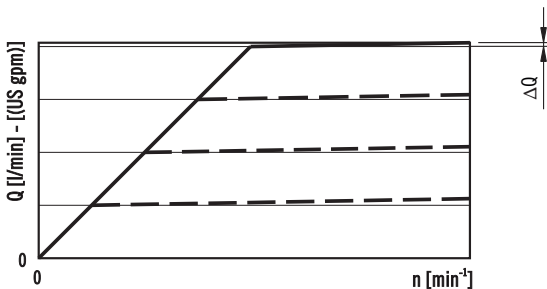
**NOTES**

Available without pressure compensator RP.  
For more information, please consult our technical sales department.

**OPERATING CURVES**

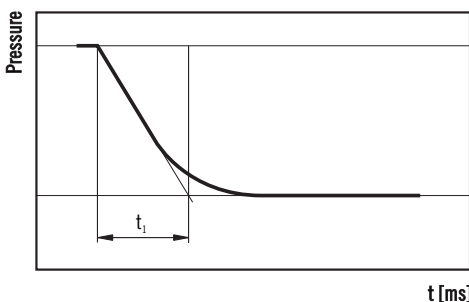
Curves have been obtained at the speed of 1500 min<sup>-1</sup> and oil temperature 50 °C (122 °F).

Curve at variable speed

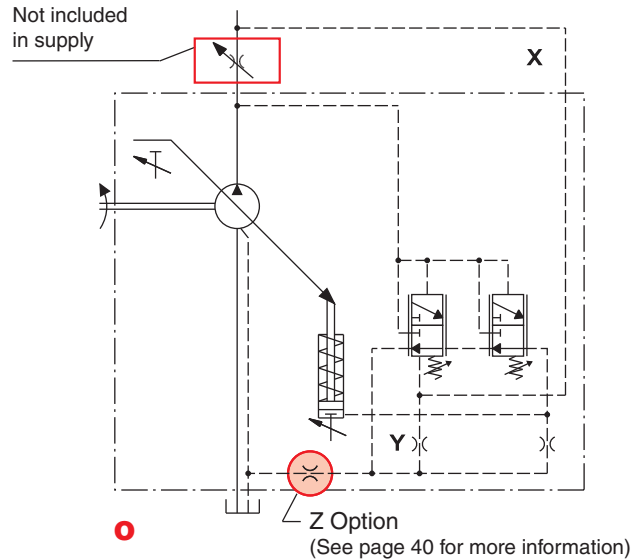


**RESPONSE TIME**

According to SAE J745 (using outlet pressure).

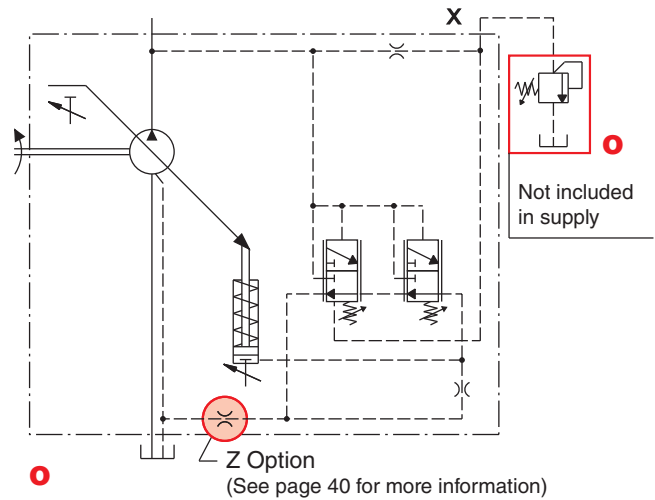


**LS0 - LS2**



Replaces: 04/01.2012

**LS3 - Remote pressure compensator**



**ΔQ max**

Pump type	l/min (US gpm)
<b>MVP 30</b>	0,9 (0.24)
<b>MVP 48</b>	1,7 (0.45)
<b>MVP 60</b>	2,5 (0.66)

**t<sub>i</sub>**

Pump type	Response time [ms] (off stroke)
<b>MVP 30</b>	120
<b>MVP 48</b>	120
<b>MVP 60</b>	120

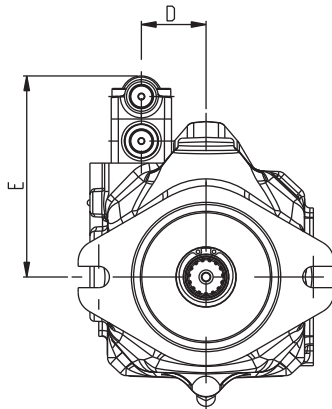
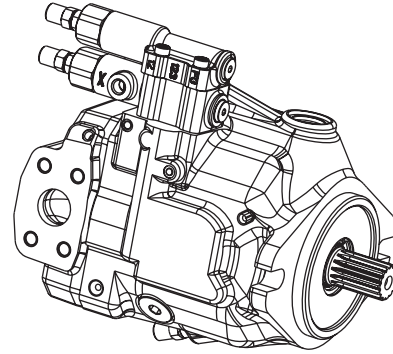
According to SAE J745 (using outlet pressure)

05/10.2014

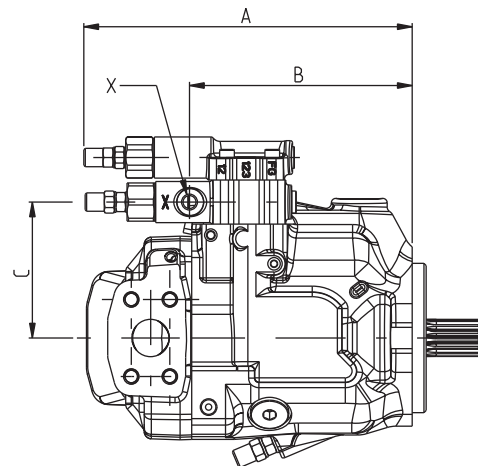
**FLOW COMPENSATOR (Load-sensing)**

**LS**

Replaces: 03/06.2011



DCAT\_048\_042



05/10.2014



Pump type	A	B	C	D	E
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	204 (8.0315)	131,5 (5.1772)	89 (3.5039)	59,5 (2.3425)	136 (5.3543)
<b>MVP 48</b>	223 (8.7795)	151 (5.9449)	95,5 (3.7598)	64,5 (2.5394)	143 (5.6299)
<b>MVP 60</b>	229 (9.0157)	156 (6.1417)	95,5 (3.7598)	64,5 (2.5394)	143 (5.6299)

X: Load-sensing port. Dimensions at page 38 ÷ 39

# TORQUE LIMITER

**RN**

Regulates the pump displacement according to the system pressure, to maintain the pre-adjusted torque value and protect the prime mover from overload. To have the best torque limiter regulation, the pre-adjusted absorbed torque has to be higher than the value shown in the following table.

Pump type	Min. torque	Min. power (●)
	Nm (lbf in)	kW (HP)
<b>MVP 30</b>	45 (398)	7.1 (9,5)
<b>MVP 48</b>	61 (540)	9.6 (12,9)
<b>MVP 60</b>	97 (859)	15.2 (20,4)

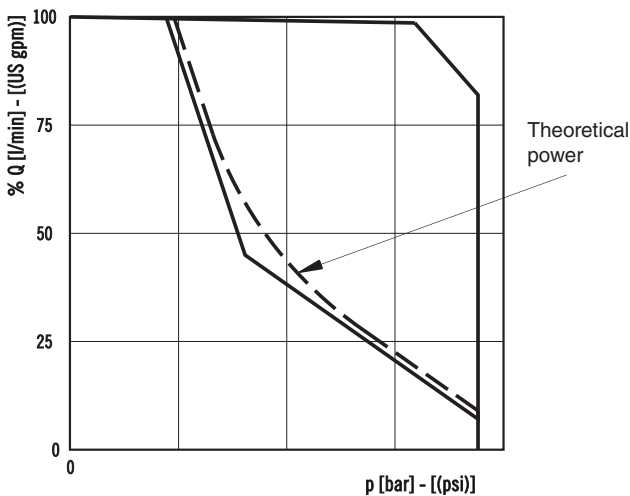
(●) @ 1500 min<sup>-1</sup>

For lower torque setting values, the regulator limits the maximum working pressure to a value lower than the standard setting for the pressure regulator 280 bar (4060 psi).  
When ordering the torque limiter please specify the requested value of torque [eg. 70 Nm (620 lbf in)] or the requested power and speed [eg. 10 kW (13.4 HP) at 1500 min<sup>-1</sup>].

**NOTES**

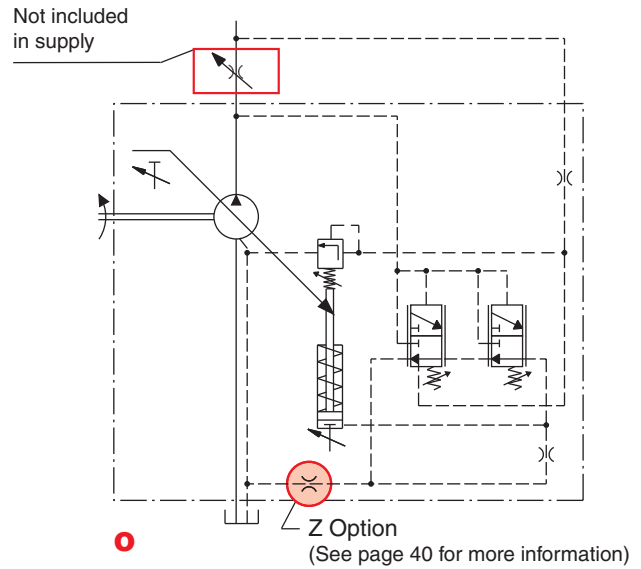
Available without pressure compensator RP.  
For more information, please consult our technical sales department.

**OPERATING CURVES**



**RN0 - Standard**

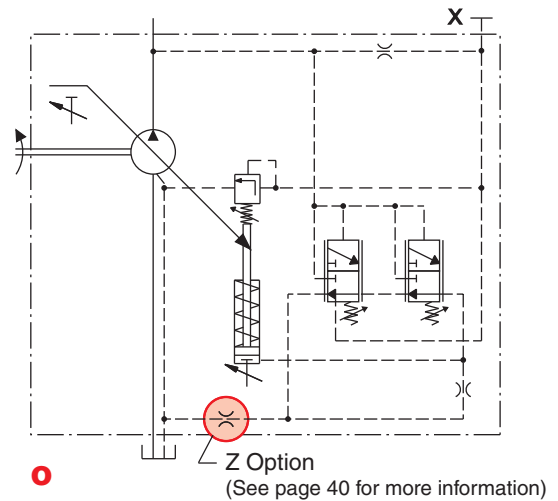
Torque limitation for closed center valve.



Replaces: 04/01.2012

**RN1 - Internal pilot**

Torque limitation for open center valve.

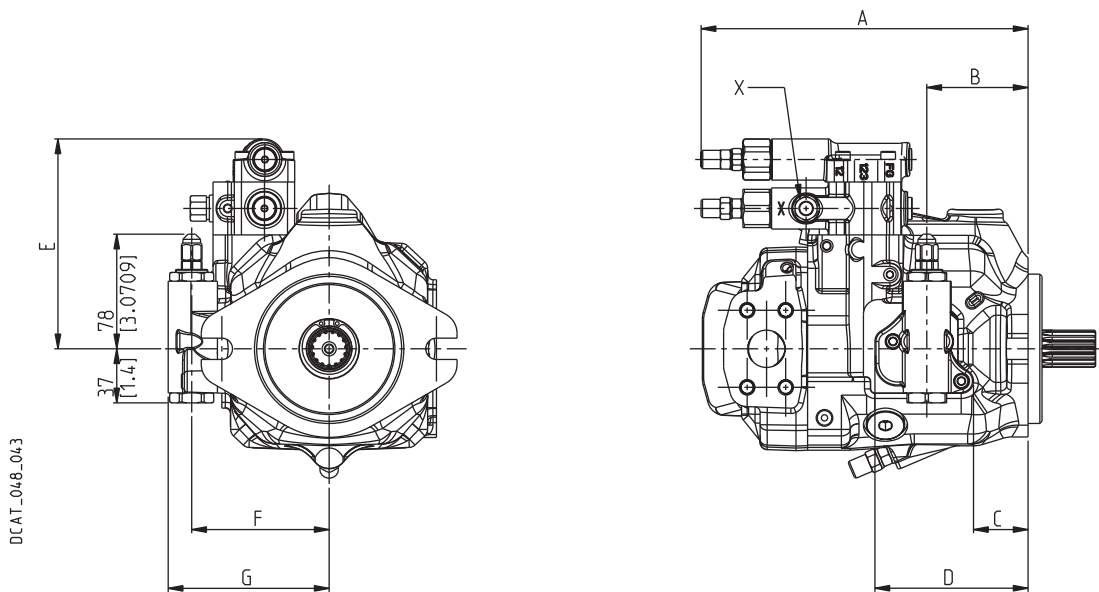
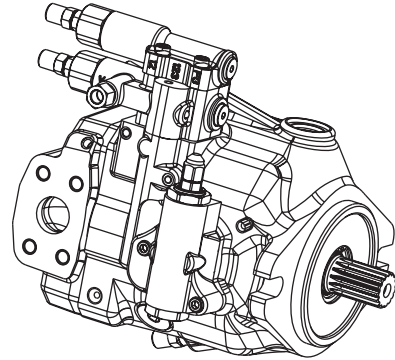


05/10.2014

**TORQUE LIMITER**

**RN**

Replaces: 03/06.2011



05/10.2014



Pump type	A	B	C	D	E	F	G
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	204 (8.0315)	77 (3.0315)	45 (1.7717)	111 (4.3701)	136 (5.3543)	89,5 (3.5236)	105,5 (4.1535)
<b>MVP 48</b>	223 (8.7795)	69 (2.7165)	37 (1.4567)	103 (4.0551)	143 (5.6299)	93,5 (3.6811)	109,5 (4.3110)
<b>MVP 60</b>	229 (9.0157)	80 (3.1496)	48 (1.8898)	114 (4.4882)	143 (5.6299)	93,5 (3.6811)	109,5 (4.3110)

X: Load-sensing port. Dimensions at page 38 ÷ 39

## DUAL SETTING TORQUE LIMITER

**RN2**

Regulates the pump displacement automatically to maintain the torque below two fixed pre-adjusted limits. The electrically piloted valve allows to switch between the two different limits.

### RN2-LS0 / RN2-LS2

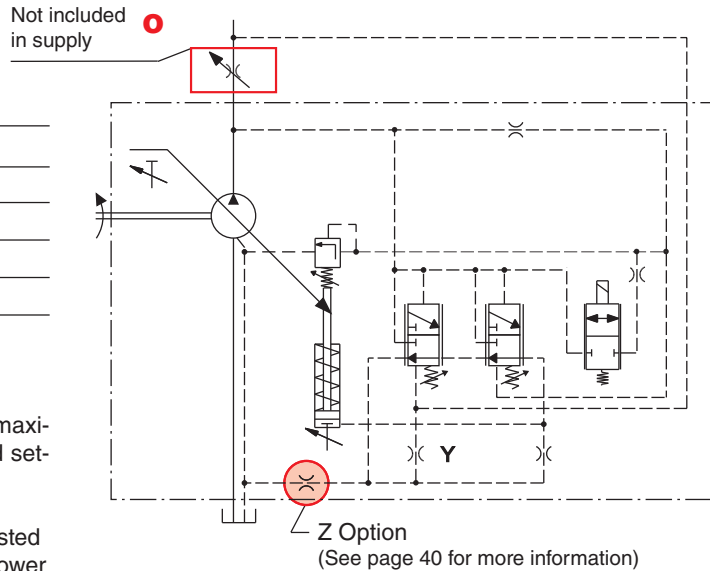
For LS2 configuration Y is plugged.

Pump type	Min. torque	Min. power (●)
	Nm (lbf in)	kW (HP)
<b>MVP 30</b>	45 (398)	7.1 (9,5)
<b>MVP 48</b>	61 (540)	9.6 (12,9)
<b>MVP 60</b>	97 (859)	15.2 (20,4)

(●) @ 1500 min<sup>-1</sup>

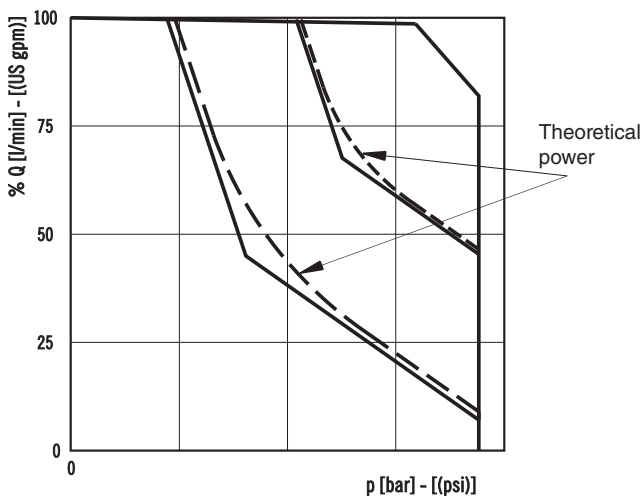
For lower torque setting values, the regulator limits the maximum working pressure to a value lower than the standard setting for the pressure regulator 280 bar (4060 psi).

When ordering the torque limiter please specify the requested value of torque [eg. 70 Nm (620 lbf in)] or the requested power and speed [eg. 10 kW (13.4 HP) at 1500 min<sup>-1</sup>].



Replaces: 04/01.2012

### OPERATING CURVES



### VALVE FEATURES

Valve code	Arrangement	Volt
<b>1</b>	Normally closed	12 VDC
<b>2</b>	Normally closed	24 VDC
<b>6</b>	Normally open	12 VDC
<b>7</b>	Normally open	24 VDC

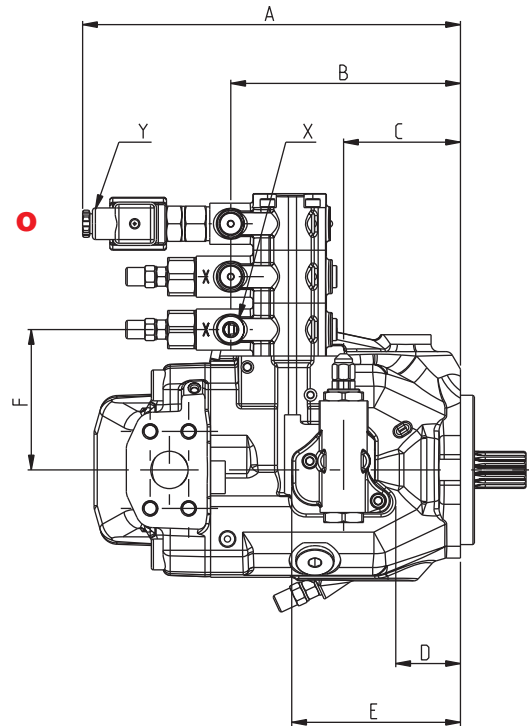
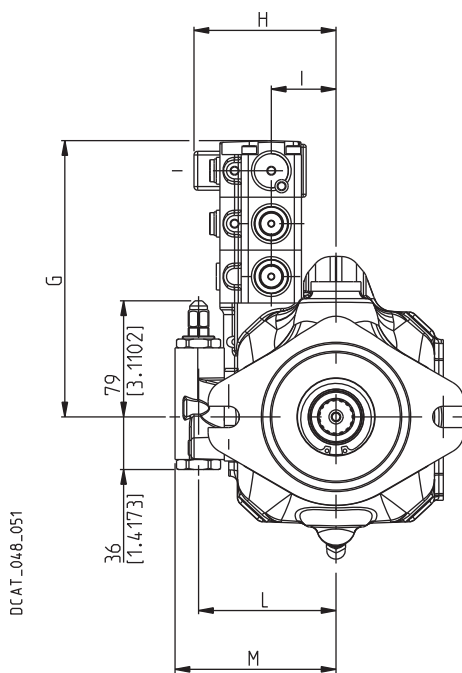
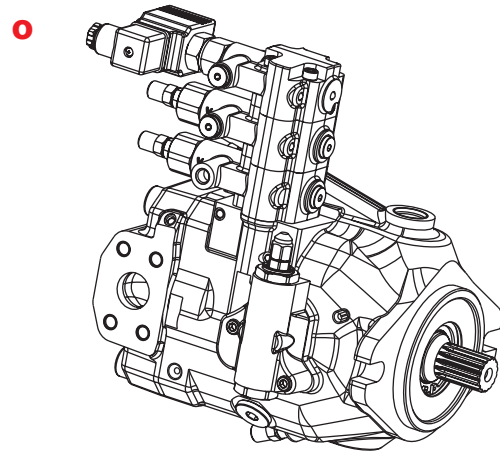
Connector type	DIN 43 650 / ISO 4400 DEUTSCH DT04-2P
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**O** 05/10.2014

**DUAL SETTING TORQUE LIMITER**

**RN2**

Replaces: 03/06.2011



05/10.2014

Pump type	A	B	C	D	E	F	G	H	I	L	M
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	232 (9.1339)	131,5 (5.1772)	77 (3.0315)	45 (1.7717)	111 (4.3701)	89 (3.5039)	181,5 (7.1457)	92 (3.6220)	39 (1.5354)	89,5 (3.5236)	105,5 (4.1535)
<b>MVP 48</b>	252 (9.9213)	151 (5.9449)	69 (2.7165)	37 (1.4567)	103 (4.0551)	95,5 (3.7598)	188 (7.4016)	97 (3.8189)	44 (1.7323)	93,5 (3.6811)	109,5 (4.3110)
<b>MVP 60</b>	257 (10.1181)	156 (6.1417)	80 (3.1496)	48 (1.8898)	114 (4.4882)	95,5 (3.7598)	188 (7.4016)	97 (3.8189)	44 (1.7323)	93,5 (3.6811)	109,5 (4.3110)

X: Load-sensing port. Dimensions at page 38 ÷ 39

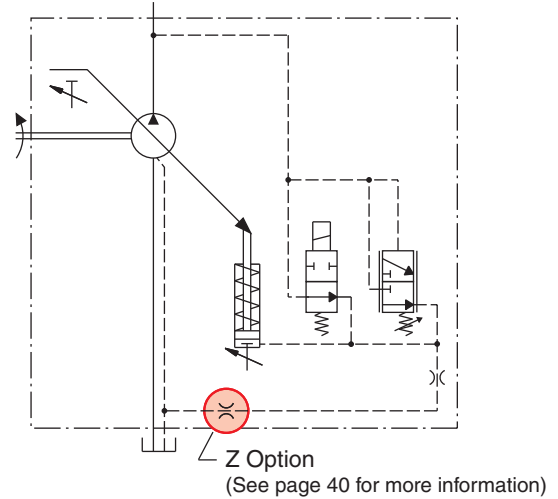
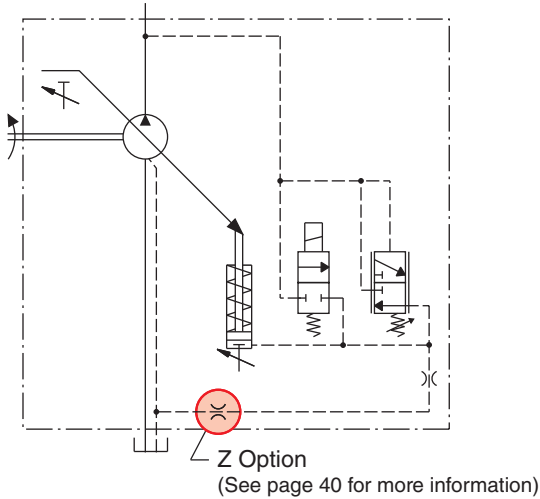
Y: Connector. Standard type DIN 43 650 / ISO 4400. For other connectors please consult our technical sales department.

## UNLOADING VALVE

**U..**

**NC** (normally closed)

**NA** (normally open)



Replaces: 03/06.2011

With the valve NC type (normally closed), energizing the solenoid valve the displacement is reset and the pump is unloaded.

With the valve NA type (normally open), energizing the solenoid valve the pump works at the maximum displacement.

**NOTES** ●

Available without pressure compensator RP.  
For more information, please consult our technical sales department.

**VALVE FEATURES**

Valve code	Arrangement	Volt
<b>U1</b>	Normally closed	12 VDC
<b>U2</b>	Normally closed	24 VDC
<b>U3</b>	Normally closed	24 VAC
<b>U4</b>	Normally closed	110 VAC
<b>U5</b>	Normally closed	220 VAC
<b>U6</b>	Normally open	12 VDC
<b>U7</b>	Normally open	24 VDC
<b>U8</b>	Normally open	24 VAC
<b>U9</b>	Normally open	110 VAC
<b>U10</b>	Normally open	220 VAC

Connector type	DIN 43 650 / ISO 4400
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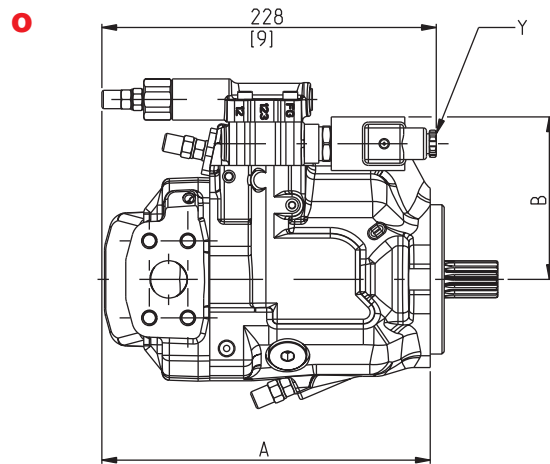
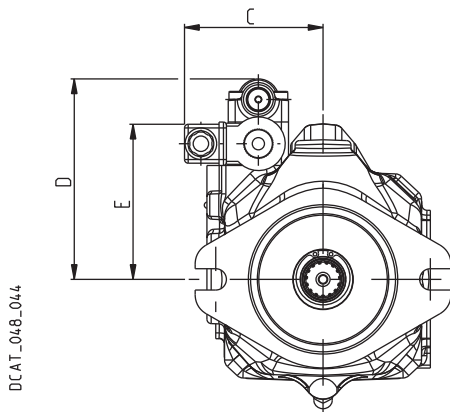
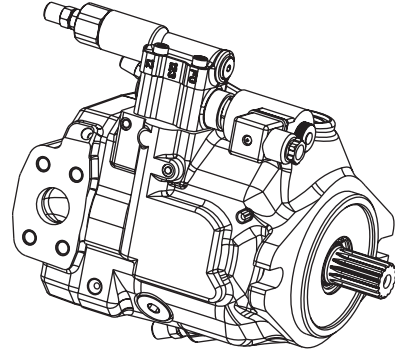
● 05/10.2014



**UNLOADING VALVE**

**U..**

Replaces: 03/06.2011



05/10.2014

Pump type	A	B	C	D	E
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
<b>MVP 30</b>	204 (8.0315)	104 (4.0945)	89 (3.5039)	130 (5.1181)	99 (3.8976)
<b>MVP 48</b>	223 (8.7795)	110,5 (4.3504)	94 (3.7008)	137 (5.3937)	105,5 (4.1535)
<b>MVP 60</b>	229 (9.0157)	110,5 (4.3504)	94 (3.7008)	137 (5.3937)	105,5 (4.1535)

Y: Connector. Standard type DIN 43 650 / ISO 4400. For other connectors please consult our technical sales department.

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**NOTES**

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03/06.2011

## MULTIPLE PUMPS

### THROUGH DRIVE

MVP through drive axial piston pumps offer the flexibility to obtain different groups able to supply several hydraulic systems. The operating characteristics of each assembled pumps are the same as the corresponding single pumps according to the following conditions:

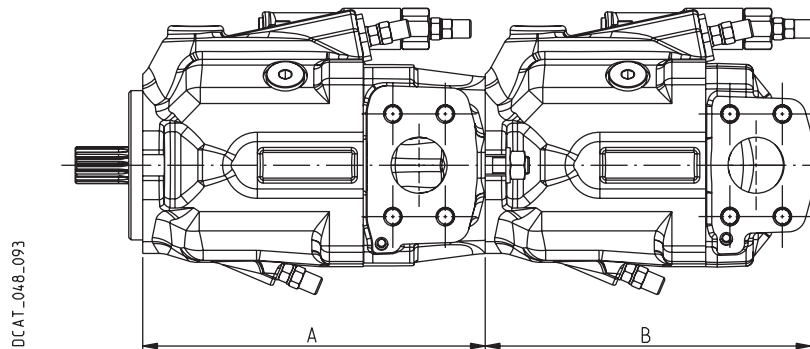
- 1) Do not exceed the maximum transmissible torque.
- 2) The maximum rotational speed is that of the lowest rated speed of the single unit incorporated.

Replaces: 03/06.2011

<b>M</b>	Nm (lbf in)	Torque
<b>V</b>	cm <sup>3</sup> /rev (in <sup>3</sup> /rev)	Displacement
<b>Δp</b>	bar (psi)	Pressure
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$		Hydro-mechanical efficiency

$$M = \frac{\Delta p \text{ (bar)} \cdot V \text{ (cm}^3\text{/rev)}}{62,83 \cdot \eta_{hm}} \quad [\text{Nm}]$$

Notes: The torque absorbed from the shaft of the first pump results from the sum of the torques due to all the single stages. The achieved value must not exceed the maximum torque limit given for the shaft of the first pump.



**A:** Front section (through drive)

**B:** MVP Rear pump (the same of single pump with side or rear ports)

○ Gear rear pump are also available, please see the respective technical catalogues.

○ 05/10.2014

<b>A</b>		
Pump type	Flanged for	Code
<b>MVP 30</b>	SAE A	AS1
	SAE B	AS5
<b>MVP 48</b>	SAE B	AS5
<b>MVP 60</b>	SAE B	AS5

**MVP30**

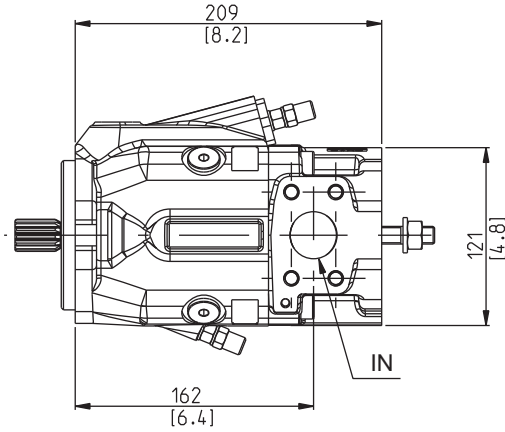
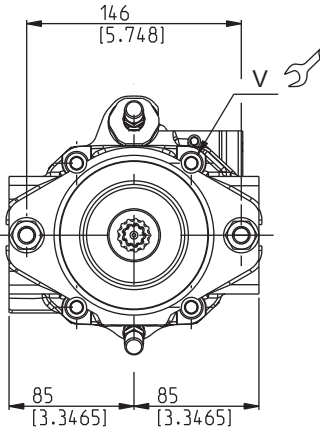
**FRONT SECTION - DIMENSIONS**

**AS1**

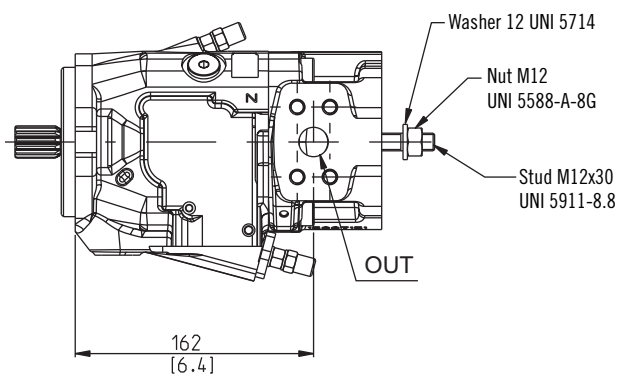
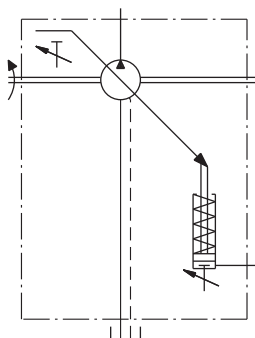
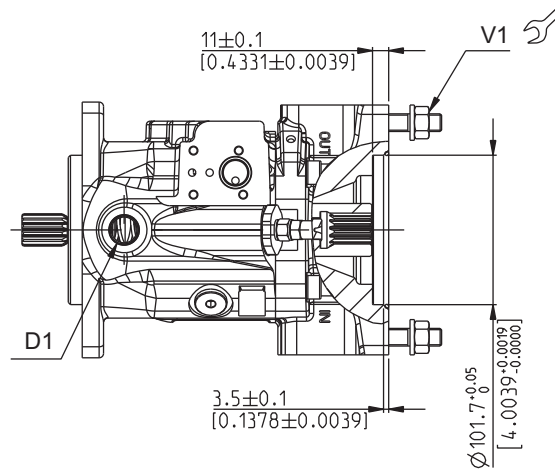
Through drive SAE A

Drive shafts: page 32  
Mounting flanges: page 36

The drawing shows a front section with clockwise rotation



DCAT\_048\_062



Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	70 ±7 (558 ÷ 682)

Ports (Nominal size)

IN	OUT	D1
1" 1/2	1"	Drain port

Dimensions at page 38 ÷ 39

05/10.2014

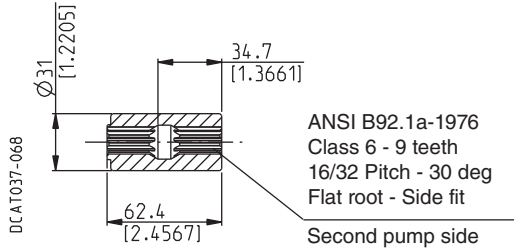
**MVP30**

**COUPLINGS - DIMENSIONS**

**SAE "A" SPLINE**

**03**

Available with flange code **AS1**

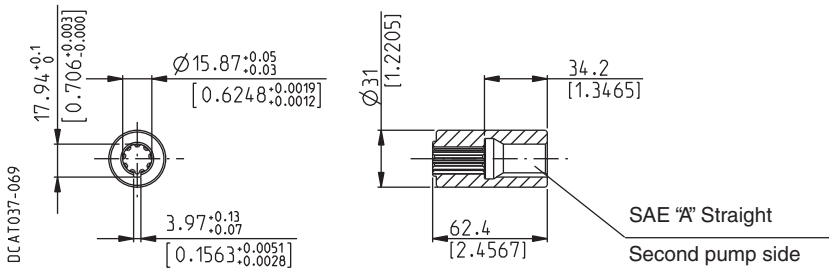


**MAX 100 Nm (885 lbf in)**

**SAE "A" STRAIGHT**

**31**

Available with flange code **AS1**



**MAX 70 Nm (620 lbf in)**

05/10.2014

**MVP30**

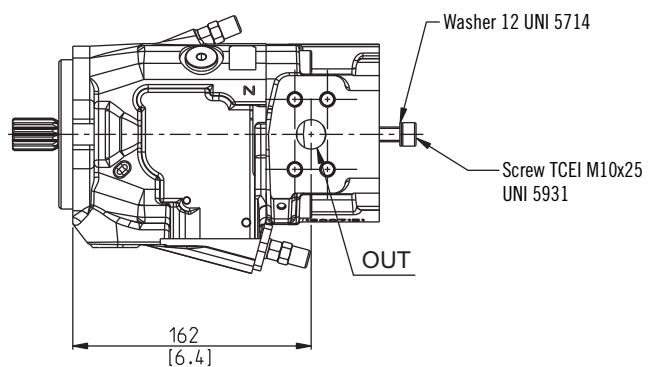
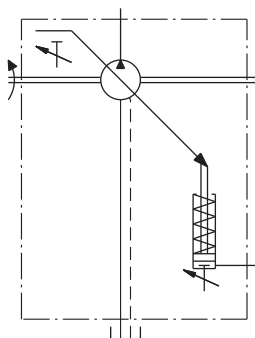
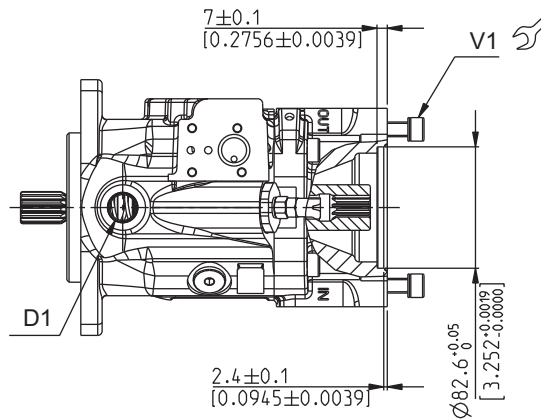
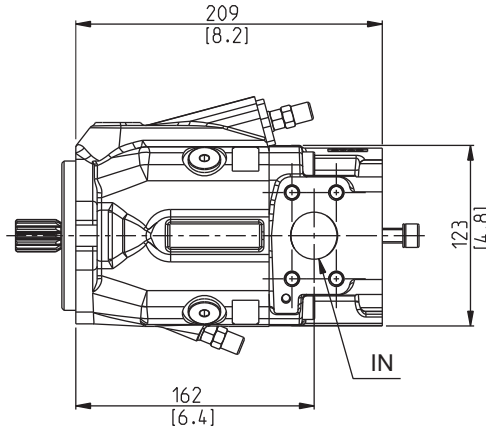
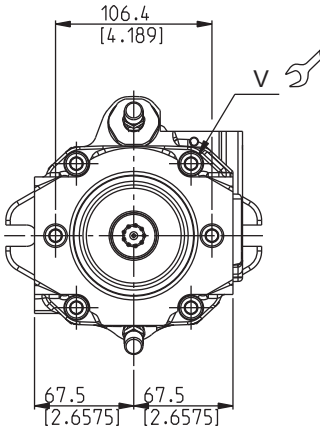
**FRONT SECTION - DIMENSIONS**

**AS5**

Through drive SAE B

Drive shafts: page 32  
Mounting flanges: page 36

The drawing shows a front section with clockwise rotation



Screws tightening torque Nm (lbf in)

V	V1
70 ±7 (558 ÷ 682)	100 ±10 (797 ÷ 974)

Ports (Nominal size)

IN	OUT	D1
1" 1/2	1"	Drain port

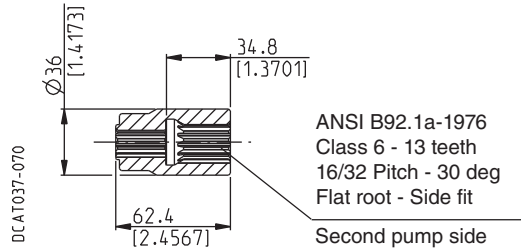
Dimensions at page 38 ÷ 39

05/10.2014

**SAE "B" SPLINE**

**04**

Available with flange code **AS5**

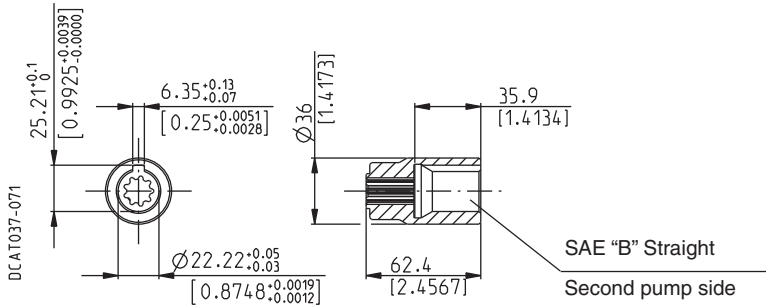


**MAX 100 Nm (885 lbf in)**

**SAE "B" STRAIGHT**

**32**

Available with flange code **AS5**



**MAX 100 Nm (885 lbf in)**

05/10.2014

**MVP48**

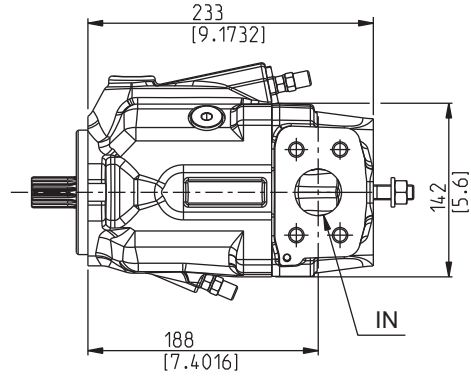
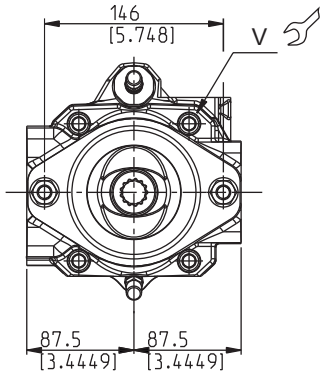
**FRONT SECTION - DIMENSIONS**

**AS5**

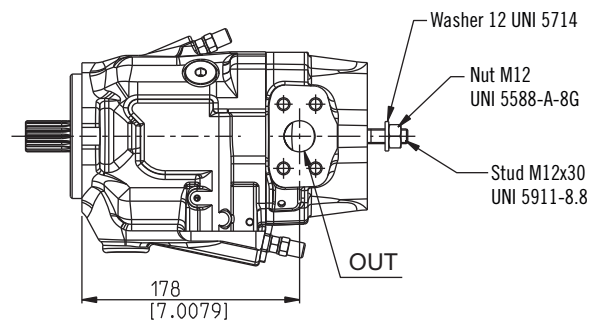
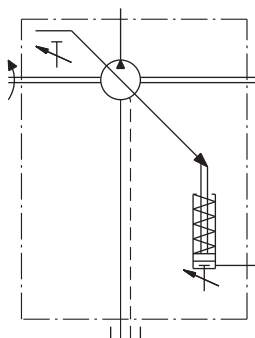
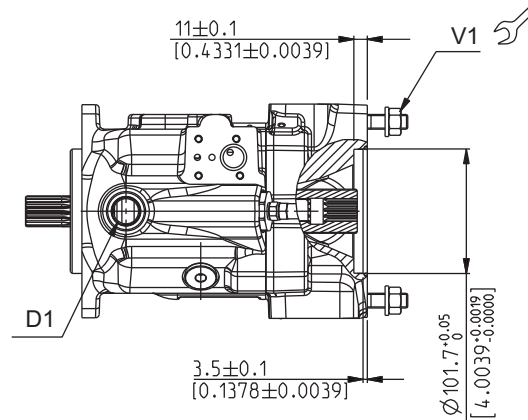
Through drive SAE B

Drive shafts: page 33  
Mounting flanges: page 36

The drawing shows a front section with clockwise rotation



DCAT\_048\_036



Replaces: 03/06.2011

05/10.2014

Screws tightening torque Nm (lbf in)

V	V1
100 ±10 (797 ÷ 974)	100 ±10 (797 ÷ 974)

Ports (Nominal size)

IN	OUT	D1
1" 1/2	1"	Drain port

Dimensions at page 38 ÷ 39



**MVP48**

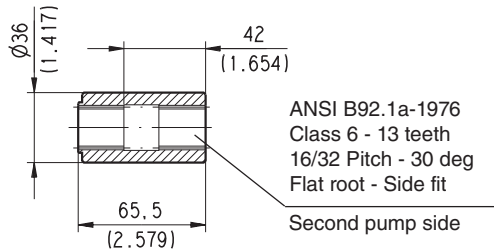
**COUPLINGS - DIMENSIONS**

**SAE "B" SPLINE**

**04**

Available with flange code **AS5**

Replaces: 03/06.2011  
D037-D61/0.196



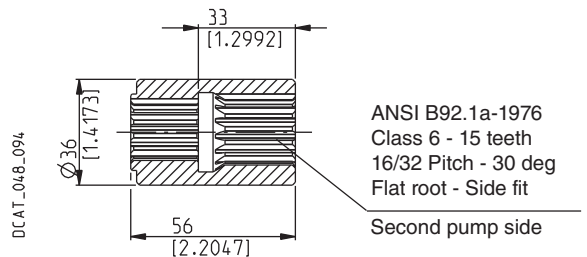
**MAX 200 Nm (1770 lbf in)**

○

**SAE "BB" SPLINE**

**05**

Available with flange code **AS5**



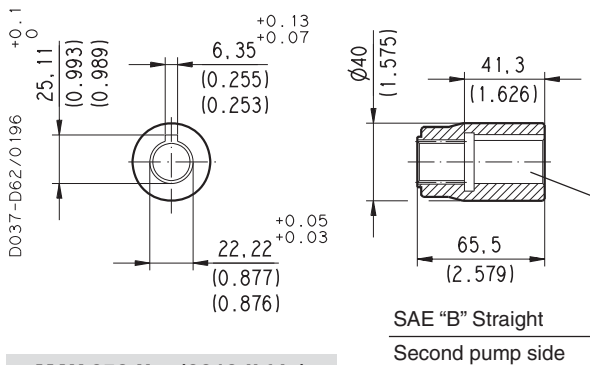
**MAX 250 Nm (2213 lbf in)**

○

**SAE "B" STRAIGHT**

**32**

Available with flange code **AS5**



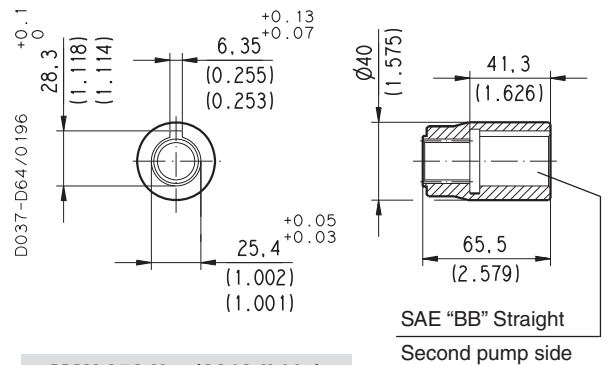
**MAX 250 Nm (2213 lbf in)**

○

**SAE "BB" STRAIGHT**

**33**

Available with flange code **AS5**



**MAX 250 Nm (2213 lbf in)**

○ 05/10.2014

**MVP60**

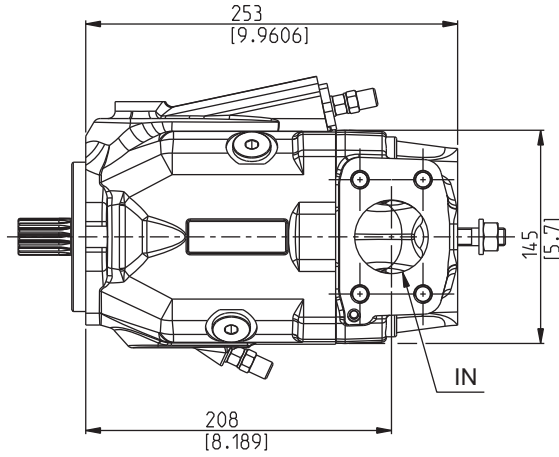
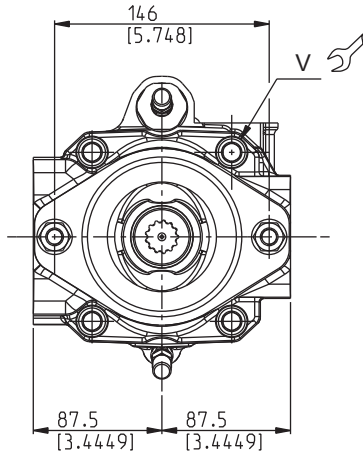
**FRONT SECTION - DIMENSIONS**

**AS5**

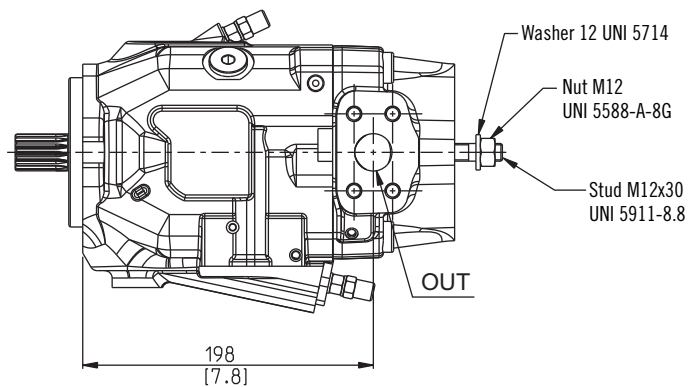
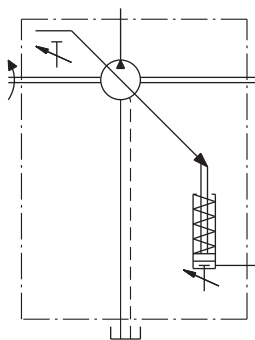
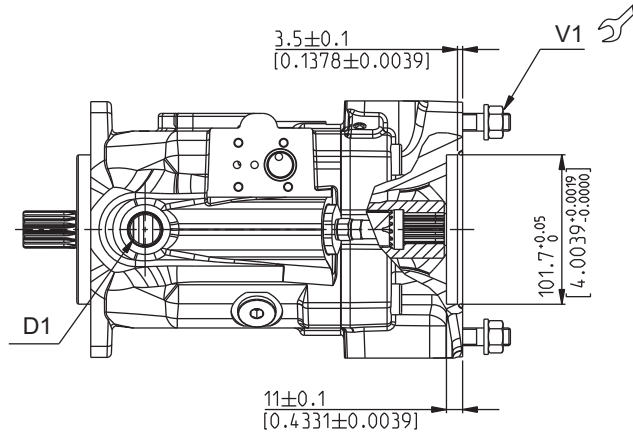
Through drive SAE B

Drive shafts: page 34 ÷ 35  
Mounting flanges: page 36 ÷ 37

The drawing shows a front section with clockwise rotation



DCAT\_048\_040



Screws tightening torque Nm (lbf in)

V	V1
130 ±13 (1036 ÷ 1266)	100 ±10 (797 ÷ 974)

Ports (Nominal size)

IN	OUT	D1
2	1"	Drain port

Dimensions at page 38 ÷ 39

Replaces: 03/06.2011

05/10.2014

**MVP60**

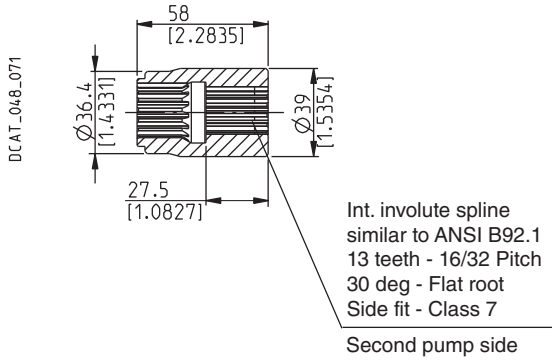
**COUPLINGS - DIMENSIONS**

**SAE "B" SPLINE**

**04**

Available with flange code **AS5**

Replaces: 03/06.2011



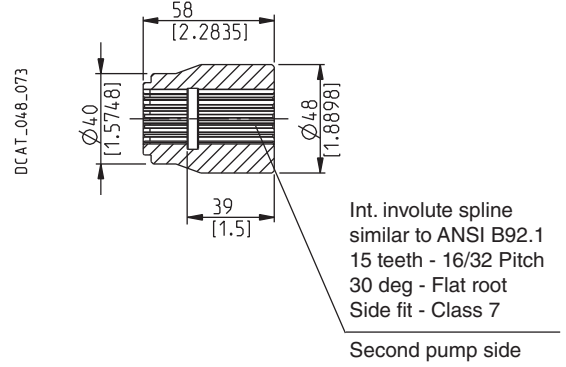
**MAX 200 Nm (1770 lbf in)**



**SAE "BB" SPLINE**

**05**

Available with flange code **AS5**



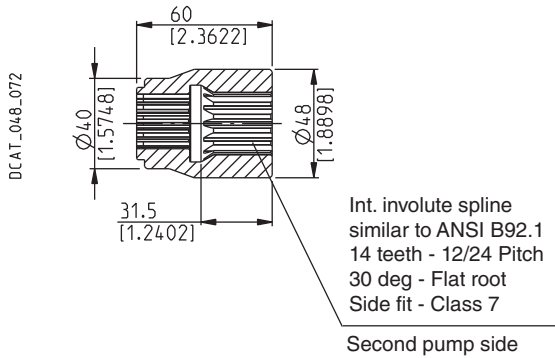
**MAX 250 Nm (2213 lbf in)**



**SAE "C" SPLINE**

**06**

Available with flange code **AS5**



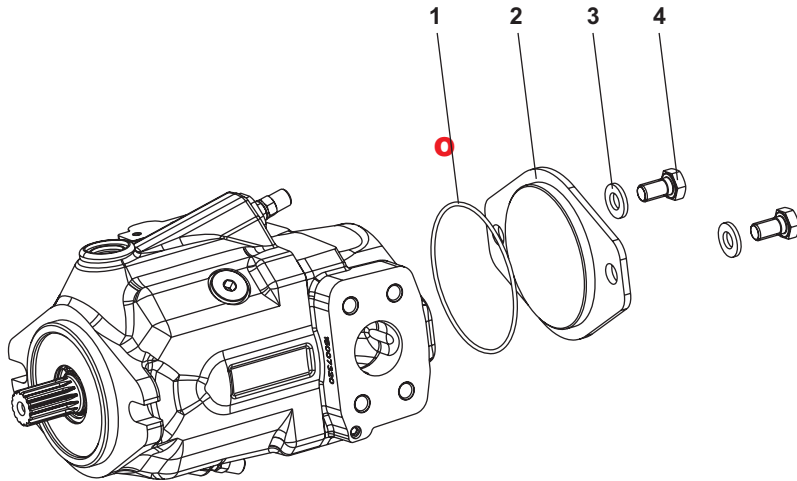
**MAX 430 Nm (3806 lbf in)**

05/10.2014



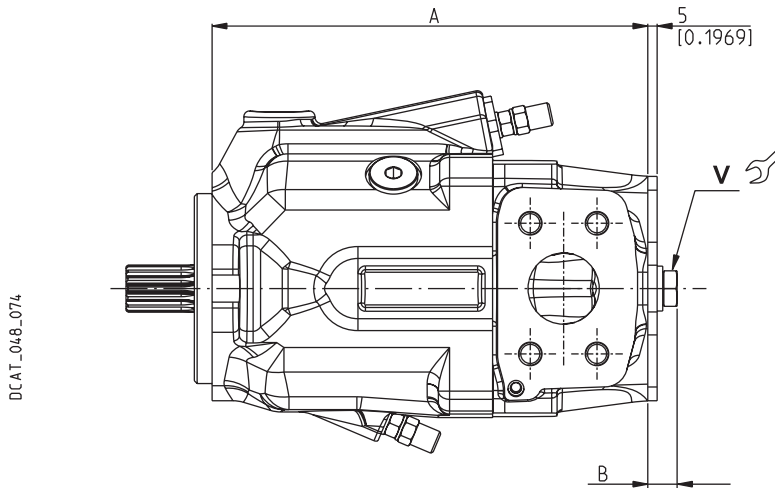
## FRONT SECTION KIT COVER

Kit cover is available to obtain single pumps starting from the front sections of multiple pumps.  
Before closing the intermediate flange check that the coupling has been removed.

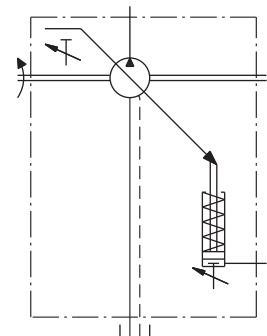


### Kit part brake down

- 1 - Seal
- 2 - Flange
- 3 - Washers
- 4 - Screws



DCAT\_048\_074



Pump type	Flanged for	Code	Front section		Kit cover
			A mm (in)	B mm (in)	Code
<b>MVP 30</b>	SAE A	AS1	209 (8.2283)	14 (0.5512)	<b>62100006</b>
<b>MVP 30</b>			209 (8.2283)		
<b>MVP 48</b>	SAE B	AS5	233 (9.1732)	16 (0.6299)	<b>62100007</b>
<b>MVP 60</b>			253 (9.9606)		

Screws tightening torque Nm (lbf in)

V
20 ±1 (159 ÷ 195)

Replaces: 03/06.2011

05/10.2014

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## NOTES

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05/10.2014


## HOW TO ORDER SINGLE PUMPS

1	2	3	4	5	6	7	8 ...
<b>MVP30-28</b>	<b>S</b>	-	<b>04</b>	<b>S5</b>	-	<b>L</b>	<b>MD/MB</b> - <b>N</b> - ...

1	Pump type (max. displacement)	Code
	28 cm <sup>3</sup> /rev (1.74 in <sup>3</sup> /rev)	<b>MVP 30-28</b>
	34,8 cm <sup>3</sup> /rev (2.12 in <sup>3</sup> /rev)	<b>MVP 30-34</b>
	45 cm <sup>3</sup> /rev (2.75 in <sup>3</sup> /rev)	<b>MVP 48-45</b>
	53,7 cm <sup>3</sup> /rev (3.28 in <sup>3</sup> /rev)	<b>MVP 48-53</b>
	60 cm <sup>3</sup> /rev (3.66 in <sup>3</sup> /rev)	<b>MVP 60-60</b>
	72 cm <sup>3</sup> /rev (4.39 in <sup>3</sup> /rev)	<b>MVP 60-72</b>
	84,7 cm <sup>3</sup> /rev (5.17 in <sup>3</sup> /rev)	<b>MVP 60-84</b>

2	Rotation	Code
	Anti-clockwise	<b>S</b>
	Clockwise	<b>D</b>

3	Drive shaft (a)	Code
	SAE "B" spline (13 teeth)	<b>04</b>
	SAE "B" spline (13 teeth)	<b>4R</b> 
	SAE "B" straight	<b>32</b>
	SAE "BB" spline (15 teeth)	<b>05</b>
	SAE "BB" spline (15 teeth)	<b>5R</b> 
	SAE "C" spline (14 teeth)	<b>06</b>
	SAE "C" spline (14 teeth)	<b>6R</b> 
	SAE "C" straight	<b>34</b>

4	Mounting flange (a)	Code
	SAE "B" 2 holes	<b>S5</b>
	SAE "C" 2 holes	<b>S7</b> 
	SAE "C" 4 holes	<b>S8</b>

5	Ports position	Code
	Side	<b>L</b>
	Rear	<b>P</b>


Code	Inlet/outlet ports		6
	Nominal size		
	Inlet IN	Outlet OUT	Pump type
	SAE 3000	SAE 3000	
<b>SAE FLANGED PORTS METRIC THREAD (SSM)</b>			
<b>MD/MB</b>	1" 1/4	3/4"	MVP 30
<b>ME/MC</b>	1" 1/2	1"	MVP 48
<b>MF/MC</b>	2"	1"	MVP 60
<b>SAE FLANGED PORTS UNC THREAD (SSS)</b>			
<b>SD/SB</b>	1" 1/4	3/4"	MVP 30
<b>SE/SC</b>	1" 1/2	1"	MVP 48
<b>SF/SC</b>	2"	1"	MVP 60
<b>SAE STRAIGHT THREAD PORTS (ODT)</b>			
	—	—	MVP 30
<b>OH/OF</b>	1" 1/2	1"	MVP 48
<b>MF/OF</b>	2"	1"	MVP 60

Code	Seals	7
<b>N</b>	Buna (standard)	
<b>V</b>	Viton	

Code	Regulators	8
...	See how to order on page 71 ÷ 73	

(a) Drive shafts availability at pages 32 ÷ 35 and mounting flanges availability at pages 36 ÷ 37

Replaces: 03/06.2011

 05/10.2014

## HOW TO ORDER REGULATORS

### PRESSURE COMPENSATORS - FLOW COMPENSATORS (Load-sensing)

Replaces: 03/06.2011

	8	9	10	<b>O</b> 11	12	13
Pressure compensator	<b>RP0</b> -			<b>Z</b> -		<b>G</b>
Pressure compensator	<b>RP1</b> -			<b>Z</b> -		<b>G</b>
Pressure compensator with flow control	<b>RP1</b> -		<b>LS2</b> -	<b>Z</b> -		<b>G</b>
Dual setting pressure compensator	<b>RP2</b> -	<b>1</b> -		<b>Z</b> -	<b>S</b> -	<b>G</b>
Dual setting pressure compensator with flow control	<b>RP2</b> -	<b>1</b> -	<b>LS2</b> -	<b>Z</b> -	<b>S</b> -	<b>G</b>
Flow compensator	<b>LS0</b> -			<b>Z</b> -		<b>G</b>
Flow compensator for remote control	<b>LS2</b> -			<b>Z</b> -		<b>G</b>
Pressure compensator for remote control	<b>LS3</b> -			<b>Z</b> -		<b>G</b>

8	Regulators type	Code
	Pressure compensator	<b>RP0</b>
	Pressure compensator	<b>RP1</b>
	Dual setting pressure compensator	<b>RP2</b>
	Flow compensator	<b>LS0</b>
	Flow compensator for remote control	<b>LS2</b>
	Pressure compensator for remote control	<b>LS3</b>

Code	Flow control option (b)	10
<b>LS2</b>	Flow compensator	

Code	Restrictor option	11
	Without restrictor (standard - no code)	
<b>Z</b>	Damping restrictor (only for critical applications)	

9	Valve type (a)	Code
	Normally closed 12 VDC	<b>1</b>
	Normally closed 24 VDC	<b>2</b>
	Normally closed 24 VAC	<b>3</b>
	Normally open 12 VDC	<b>6</b>
	Normally open 24 VDC	<b>7</b>
	Normally open 24 VAC	<b>8</b>

Code	Connector type (a)	12
<b>S</b>	DIN 43 650 / ISO 4400 (standard)	
<b>D</b>	Deutsch DT04-2P	

Code	Displacement limiter	13
<b>G</b>	Min. and Max. displacement limiter	

**O** 05/10.2014

### ORDER EXAMPLE

MVP60 pump with dual setting pressure compensator:

**MVP60.60S-05S5-LMF/MC-N-RP2-1-S-G**

(a) Only for RP2

(b) Only for RP1 and RP2

## HOW TO ORDER REGULATORS

### ELECTRO-PROPORTIONAL PRESSURE COMPENSATORS - UNLOADING VALVES

Electro-proportional pressure compensator	8	9	10	11	12	13	14	15	16	
	PEC	1	A	-		...	/	...	S	G
Electro-proportional pressure compensator with flow control	PEC	1	A	LS2	-	...	/	...	S	G
Electro-proportional pressure compensator plus angular sensor	PECA	1	A	-		...	...	S	G	
Electro-proportional pressure compensator plus angular sensor with flow control	PECA	1	A	LS2	-	...	...	S	G	
Unloading valve	U..	-			Z	-			G	

Replaces: 03/06.2011

8	Regulators type	Code
	Electro-proportional pressure compensator	PEC
	Electro-proportional pressure compensator and swashplate angular sensor	PECA
	Unloading valve - Normally closed 12 VDC	U1
	Unloading valve - Normally closed 24 VDC	U2
	Unloading valve - Normally closed 24 VAC	U3
	Unloading valve - Normally closed 110 VAC	U4
	Unloading valve - Normally closed 220 VAC	U5
	Unloading valve - Normally open 12 VDC	U6
	Unloading valve - Normally open 24 VDC	U7
	Unloading valve - Normally open 24 VAC	U8
	Unloading valve - Normally open 110 VAC	U9
	Unloading valve - Normally open 220 VAC	U10

9	Valve type (a)	Code
	Normally closed 12 VDC	1
	Normally closed 24 VDC	2
	Normally open 12 VDC	6
	Normally open 24 VDC	7

10	Position (a)	Code
	Position 0°	A
	Position 90°	B

Code	Flow control option (b)	11
LS2	Flow compensator for remote control	

Code	Restrictor option (c)	12
	Without restrictor (standard - no code)	
Z	Damping restrictor (only for critical applications)	

Code	Min. pressure setting (a)	13
...	Please specify the requested value in bar	

Code	Max. pressure setting (a)	14
...	Please specify the requested value in bar	

Code	Connector type	15
S	DIN 43 650 / ISO 4400 (standard)	
D	Deutsch DT04-2P (a)	

Code	Displacement limiter	16
G	Min. and Max. displacement limiter	

05/10.2014

### ORDER EXAMPLE

MVP60 pump with electro-proportional pressure compensator with flow control:

**MVP60.60S-05S5-LMF/MC-N-PEC-1-A-LS2-100/300-S-G**

- (a) Only for PEC and PECA
- (b) Only for PEC and PECA with flow control
- (c) Only for U.. unloading valve



## HOW TO ORDER REGULATORS

### TORQUE LIMITERS

Replaces: 03/06.2011

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	8	9	10	11	12	13	14	15	16
Torque limiter - standard	<b>RN0</b>	-			<b>Z</b>	- <b>G</b>	- ... /		...
Torque limiter - internal pilot	<b>RN1</b>	-			<b>Z</b>	- <b>G</b>	- ... /		...
Dual setting torque limiter with flow control	<b>RN2</b>	- <b>1</b>	- <b>S</b>	- <b>LS0</b>	- <b>Z</b>	- <b>G</b>	- ... /	...	...
Dual setting torque limiter with remote flow control	<b>RN2</b>	- <b>1</b>	- <b>S</b>	- <b>LS2</b>	- <b>Z</b>	- <b>G</b>	- ... /	...	...

8	Regulators type	Code
	Torque limiter - standard	<b>RN0</b>
	Torque limiter - internal pilot	<b>RN1</b>
	Dual setting torque limiter with flow control	<b>RN2</b>

9	Valve type (a)	Code
	Normally closed 12 VDC	<b>1</b>
	Normally closed 24 VDC	<b>2</b>
	Normally open 12 VDC	<b>6</b>
	Normally open 24 VDC	<b>7</b>

10	Connector type (a)	Code
	DIN 43 650 / ISO 4400 (standard)	<b>S</b>
	Deutsch DT04-2P	<b>D</b>

Code	Flow control option (a)	11
<b>LS0</b>	Flow compensator	
<b>LS2</b>	Flow compensator for remote control	

Code	Restrictor option	12
	Without restrictor (standard - no code)	
<b>Z</b>	Damping restrictor (only for critical applications)	

Code	Displacement limiter	13
<b>G</b>	Min. and Max. displacement limiter	

Code	Torque limiter setting (b)	14
...	Please specify the requested torque value in Nm	

Code	Second torque limiter setting (a) - (b)	15
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (c)	16
...	Please specify the requested speed value	

o 05/10.2014

- (a) Only for RN2
- (b) Refer to page 52 and 54 for more information
- (c) Do not exceed the maximum speed shown on page 7 ÷ 9

### ORDER EXAMPLE

MVP60 pump with dual setting torque limiter with flow control:

**MVP60.60S-05S5-LMF/MC-N-RN2-1-S-LS0-Z-G-150/200/2100**

## HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

### Common inlet



1	2	3	4	5	6	7	8 ...	9	10	7	11	12	13	14				
MVP30-28	S	-	04	S5	-	L	MD/MB	-	N	-	...	-	G	-	P7	-	A	(# / # / #) /
Front section																		
Rear section																		
KP20-6,3 S - - L **/GD - N5 - N - P																		

1	Pump type (max. displacement)	Code
	Front section - The same of single pumps	MVP ...
	Rear section - KAPPA 20 gear pumps (a)	KP 20 ...
	Rear section - POLARIS PH gear pumps (b)	PHP 20 ...

2	Rotation	Code
	Anti-clockwise	S
	Clockwise	D

3	Drive shaft (c)	Code
	SAE "B" spline (13 teeth)	04
	SAE "B" spline (13 teeth)	4R
	SAE "B" straight	32
	SAE "BB" spline (15 teeth)	05
	SAE "BB" spline (15 teeth)	5R
	SAE "C" spline (14 teeth)	06
	SAE "C" spline (14 teeth)	6R
	SAE "C" straight	34

4	Mounting flange (c)	Code
	SAE "B" 2 holes	S5
	SAE "C" 2 holes	S7
	SAE "C" 4 holes	S8

5	Ports position	Code
	Side	L

6	Inlet/outlet ports (a) - (b)	Code
	Nominal size	
	Pump type	Inlet IN      Outlet OUT
		SAE 3000      SAE 6000
	SAE FLANGED PORTS METRIC THREAD (SSM)	
	MVP 30	1" 1/4      3/4"      MD/MB
	MVP 48	1" 1/2      1"      ME/MC
	MVP 60	2"      1" 1/4      MF/MC

Code	Inlet/outlet ports		6
	Nominal size		
	Inlet IN	Outlet OUT	Pump type
	SAE 3000	SAE 3000	
	SAE FLANGED PORTS UNC THREAD (SSS)		
SD/SB	1" 1/4	3/4"	MVP 30
SE/SC	1" 1/2	1"	MVP 48
SF/SC	2"	1"	MVP 60
	SAE STRAIGHT THREAD PORTS (ODT)		
	—	—	MVP 30
OH/OF	1" 1/2	1"	MVP 48
MF/OF	2"	1"	MVP 60

Code	Seals		7
N	Buna (standard)		
V	Viton		

Code	Regulators	8
...	See how to order on page 71 ÷ 73	

Code	Displacement limiter	9
G	Min. and Max. displacement limiter	

Code	Intermediate flange	10	
	FRONT SECTION		
P7	Flanged for KP20		
I7	Flanged for PHP20		
	REAR SECTION		
N5	Kappa 20 (common inlet)		
S7	Polaris PHP 20 (common inlet)		

Code	Sections	11
A	Front	
P	Rear	

Replaces: 03/06.2011

05/10.2014

## HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

Replaces: 03/06.2011

Code	<b>Torque limiter setting (#)</b>	12
...	Please specify the requested torque value in Nm	
Code	<b>Second torque limiter setting (#)</b>	13
...	Please specify the requested torque value in Nm	
Code	<b>Torque limiter setting speed (#)</b>	14
...	Please specify the requested speed value	



- Omit code only if ordering assembled multiple pumps
- (#) Only for torque limiter. Refer to page 73 for more information. Write these codes at the end only if ordering assembled multiple pumps
- (a) KAPPA 20 gear pumps: displacements on page 22, 26 and 30. For more information, please see the respective technical catalogue
- (b) POLARIS PH gear pumps: displacements on page 23, 27 and 31. For more information, please see the respective technical catalogue
- (c) Drive shafts availability at pages 32 ÷ 35 and mounting flanges availability at pages 36 ÷ 37

## ORDER EXAMPLE

Common inlet double pump MVP 60 with RN1 torque limiter-internal pilot + PHP20 gear pump.

### INDIVIDUAL SECTIONS

Front section

**MVP 60.60S-06S8-L MF/MC-N-RN1-G-I7-A (100/2500)**

Rear section

**PHP 20.23S-L \*\*/GD-S7-N-P**

### ASSEMBLED DOUBLE PUMP

**MVP 60.60S-06S8-L MF/MC-N-RN1-G/PHP 20.23-L \*\*/GD (100/2500)**

05/10.2014

## HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/PISTON PUMP

### Through drive



1	2	3	4	5	6	7	8 ...	9	10	11	12	13	14
<b>MVP 60-60</b>	<b>S</b>	<b>- 05</b>	<b>S5</b>	<b>- L</b>	<b>MF/MC</b>	<b>- N</b>	<b>- ...</b>	<b>- G</b>	<b>- AS5</b>	<b>- 04</b>	<b>- (# / # / #)</b>	<b>/</b>	
Front section (through drive)													

<b>MVP 30-28</b>	<b>S</b>	<b>- 04</b>	<b>S5</b>	<b>- L</b>	<b>MD/MB</b>	<b>- N</b>	<b>- ...</b>	<b>- G</b>	<b>-</b>	<b>-</b>	<b>- ...</b>	<b>/ ...</b>	<b>/ ...</b>
Rear section (single pump)													

<b>1</b>	<b>Pump type (max. displacement)</b>	Code
	Front section MVP (the same of single pumps) (a)	<b>MVP ...</b>
	Rear section MVP (the same of single pumps) (a)	<b>MVP ...</b>

<b>2</b>	<b>Rotation</b>	Code
	Anti-clockwise	<b>S</b>
	Clockwise	<b>D</b>

<b>3</b>	<b>Drive shaft (b)</b>	Code
	SAE "B" spline (13 teeth)	<b>04</b>
	SAE "B" spline (13 teeth)	<b>4R</b>
	SAE "B" straight	<b>32</b>
	SAE "BB" spline (15 teeth)	<b>05</b>
	SAE "BB" spline (15 teeth)	<b>5R</b>
	SAE "C" spline (14 teeth)	<b>06</b>
	SAE "C" spline (14 teeth)	<b>6R</b>
	SAE "C" straight	<b>34</b>

<b>4</b>	<b>Mounting flange (b)</b>	Code
	SAE "B" 2 holes	<b>S5</b>
	SAE "C" 2 holes	<b>S7</b>
	SAE "C" 4 holes	<b>S8</b>

<b>5</b>	<b>Ports position</b>	Code
	Side	<b>L</b>

<b>6</b>	<b>Inlet/outlet ports</b>	Code
		Nominal size
	Pump type	Inlet IN      Outlet OUT
		SAE 3000      SAE 6000
<b>SAE FLANGED PORTS METRIC THREAD (SSM)</b>		
	MVP 30	1" 1/4      3/4" <b>MD/MB</b>
	MVP 48	1" 1/2      1" <b>ME/MC</b>
	MVP 60	2"      1" 1/4 <b>MF/MC</b>
<b>SAE FLANGED PORTS UNC THREAD (SSS)</b>		
	MVP 30	1" 1/4      3/4" <b>SD/SB</b>
	MVP 48	1" 1/2      1" <b>SE/SC</b>
	MVP 60	2"      1" <b>SF/SC</b>

Code	<b>Inlet/outlet ports</b>	6
	Nominal size	
	Inlet IN      Outlet OUT	Pump type
	SAE 3000      SAE 3000	
<b>SAE STRAIGHT THREAD PORTS (ODT)</b>		
	—      —	MVP 30
	<b>OH/OF</b> 1" 1/2      1"	MVP 48
	<b>MF/OF</b> 2"      1"	MVP 60

Code	<b>Seals</b>	7
	<b>N</b> Buna (standard)	
	<b>V</b> Viton	

Code	<b>Regulators</b>	8
	<b>...</b> See how to order on page 71 ÷ 73	

Code	<b>Displacement limiter</b>	9
	<b>G</b> Min. and Max. displacement limiter	

Code	<b>Intermediate flange (c)</b>	10
	<b>AS1</b> SAE "A" 2 holes	
	<b>AS5</b> SAE "B" 2 holes	

Code	<b>Coupling (d)</b>	11
	<b>03</b> SAE "A" spline (9 teeth)	
	<b>31</b> SAE "A" straight	
	<b>04</b> SAE "B" spline (13 teeth)	
	<b>32</b> SAE "B" straight	
	<b>05</b> SAE "BB" spline (15 teeth)	
	<b>33</b> SAE "BB" straight	
	<b>06</b> SAE "C" spline (14 teeth)	

Code	<b>Torque limiter setting (#)</b>	12
	<b>...</b> Please specify the requested torque value in Nm	

Replaces: 03/06.2011

05/10.2014

## HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/PISTON PUMP

Replaces: 03/06.2011

Code	<b>Second torque limiter setting (#)</b>	13
...	Please specify the requested torque value in Nm	
Code	<b>Torque limiter setting speed (#)</b>	14
...	Please specify the requested speed value	



- (a) Displacements on page 70
- (b) Drive shafts availability at pages 32 ÷ 35 and mounting flanges availability at pages 36 ÷ 37
- (c) Intermediate flanges on page 59
- (d) Couplings availability:  
MVP30 on page 61 and 63  
MVP48 on page 65  
MVP60 on page 67

- Omit code only if ordering assembled multiple pumps
- (#) Only for torque limiter. Refer to page 73 for more information.

## ORDER EXAMPLE

Through drive double pump MVP 60 with RN2 (dual setting torque limiter with remote flow control) + MVP 30 with LS0 flow compensator.

### INDIVIDUAL SECTIONS

Front section

**MVP 60.60S-06S8-L MF/MC-N-RN2-1-S-LS2-G-AS5/04 (70/85/2600)**

Rear section

**MVP 30.34S-04S5-L MD/MB-N-LS0-Z-G**

### ASSEMBLED DOUBLE PUMP

**MVP 60.60S-06S8-L MF/MC-N-RN2-1-S-LS2-G (70/85/2600)/ MVP 30.34S-04S5-L MD/MB-N-LS0-Z-G**

Through drive double pump MVP 48 with RN0 (standard torque limiter) + KP 30 gear pump.

05/10.2014

### INDIVIDUAL SECTIONS

Front section

**MVP 48.45S-04S5-LME/MC-N-RN0-G-AS5/04 (80/2300)**

Rear section

**KP30.51S0-04S5-LED/EB-N-P**

### ASSEMBLED DOUBLE PUMP

**POMPA MVP 48.45S-04S5-LME/MC-N-RN0-G/KP30.51-04S5-LED/EB (80/2300)**

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## NOTES

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05/10.2014

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

MVP 05 T A

Edition: 05/10.2014

Replaces: MVP 04 T A



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