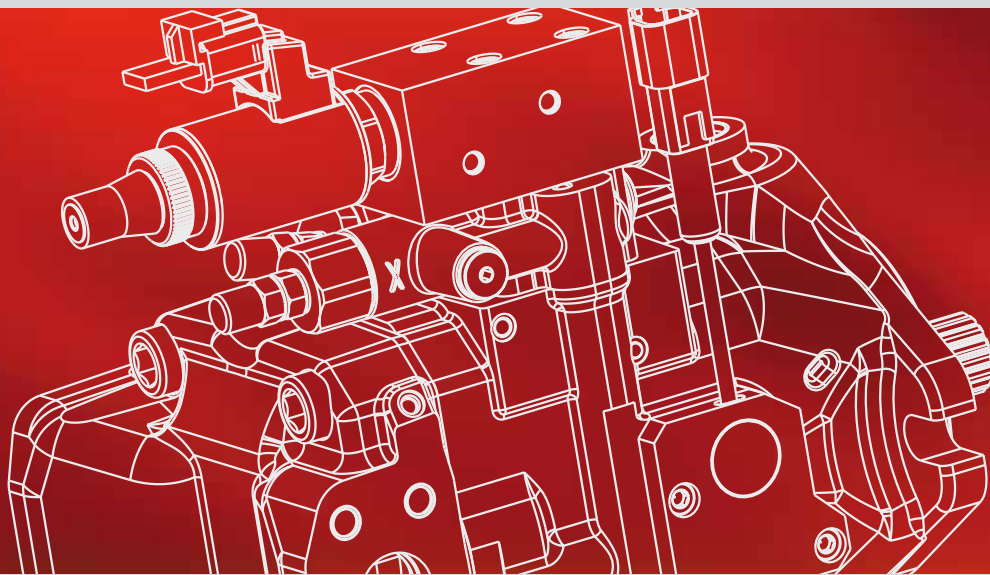




VARIABLE
DISPLACEMENT
AXIAL PISTON
PUMPS

MVP

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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 cm³/rev (0.85 in³/rev)
To 84,7 cm³/rev (5.17 in³/rev)

PRESSURE

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

SPEED

Max. 3500 min⁻¹

APPLICATION

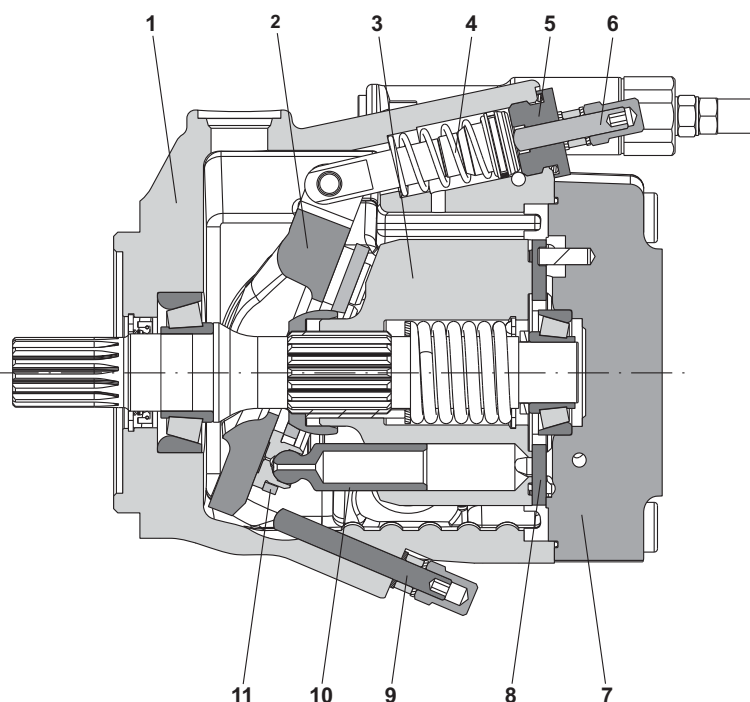
Medium, high pressure

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 μ m	10 μ m	10 μ 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.

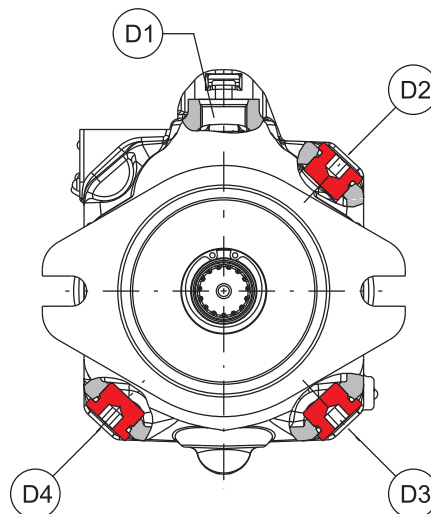
The pump can be mounted in a horizontal or vertical position. The highest of the case drain ports must be used to keep the required filling oil.

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.

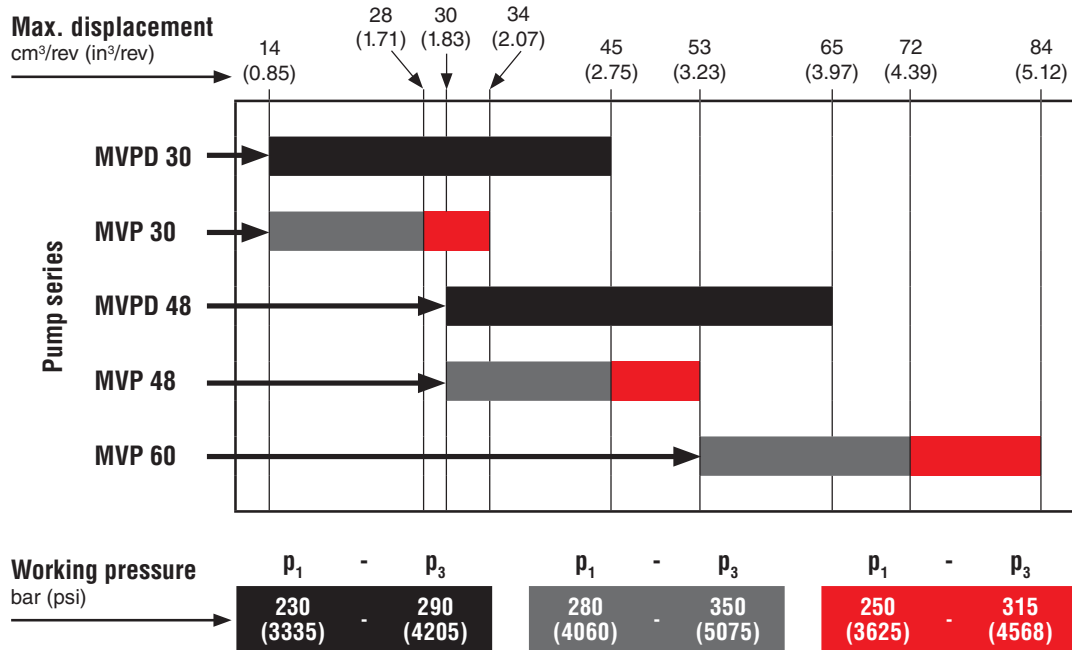


HORIZONTAL MOUNTING		VERTICAL MOUNTING	
	Arrangement inside the tank. Minimum oil level equal or above the pump mounting face. $A \geq 200 \text{ mm (7.874 in)}$		Arrangement inside the tank. Minimum oil level equal or above the pump mounting face. $A \geq 200 \text{ mm (7.874 in)}$
	Arrangement inside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

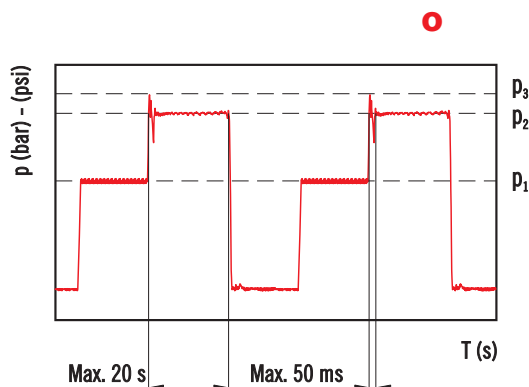
IN= inlet line - D1= drain line - A= min. distance between the line - B+C= permissible suction height - C= line immersion depth

03/06.2011

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.

05/10.2014

TECHNICAL DATA

Technical data with mineral oil

HL or HLP mineral oil based hydraulic fluid to DIN 51524

Replaces: 03/06.2011

Pump type MVP			30-28	30-34	48-45	48-53	60-60	60-72	60-84
Max. displacement (theor.) V _{max}	cm³/rev (in³/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)	max.				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 ⁻¹	@ V _{max} (1)	3500	2900	3000	2500	3000	2700	2500
Max. delivery (theor.)	l/min (US gpm)	@ n _{max}	98 (25.9)	101 (26.7)	135 (35.7)	134 (35.4)	180 (47.6)	194 (51.3)	212 (56.0)
		@ 2000 min ⁻¹	56 (14.8)	70 (18.5)	90 (23.8)	107 (28.3)	120 (31.7)	144 (38.0)	169 (44.7)
		@ 1500 min ⁻¹	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.) (Δp = p _{max} cont.)	kW (HP)	@ 2000 min ⁻¹	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 ⁻¹	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	kgm² (ft² 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)	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)		

05/10.2014

(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 ⁻¹	@ 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 %							

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 ⁻¹	@ $V_{\max}$ (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 ⁻¹	@ $V_{\max}$ (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 %							

Replaces: 03/06.2011

○ 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

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	200 (2900)						
		intermittent	220 (3190)						
		peak	240 (3480)						
Max. speed n_{max}	min ⁻¹	@ 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			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 ⁻¹	@ 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 %)

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 ⁻¹	@ 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			30-28	30-34	48-45	48-53	60-60	60-72	60-84
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

Q	l/min (US gpm)	Flow
M	Nm (lbf in)	Torque
P	kW (HP)	Power
V	cm ³ /rev (in ³ /rev)	Displacement
n	min ⁻¹	Speed
Δp	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

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

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

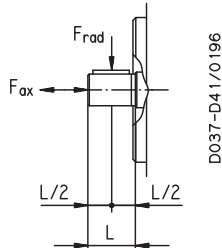
$$M = \frac{M_{theor.}}{\eta_{hm}}$$

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

$$P_{IN} = \frac{P_{OUT}}{\eta_t}$$

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

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	Displacement %					% Variation of the max. speed
psi (bar abs)	65	70	80	90	100	
12 (0,8)	120	115	105	97	90	
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

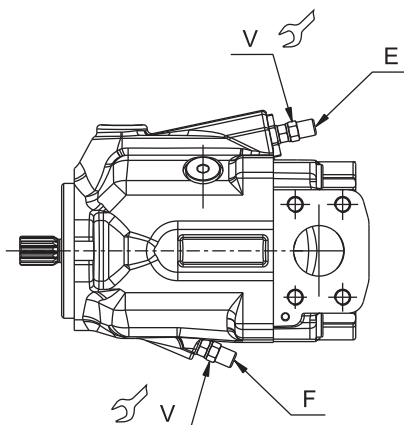
Displacement: 100 %
 Speed: 100 %
 Inlet pressure: 1,0 bar abs. (14.5 psi)

Example 2

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

DISPLACEMENT SETTING

Replaces: 03/06.2011



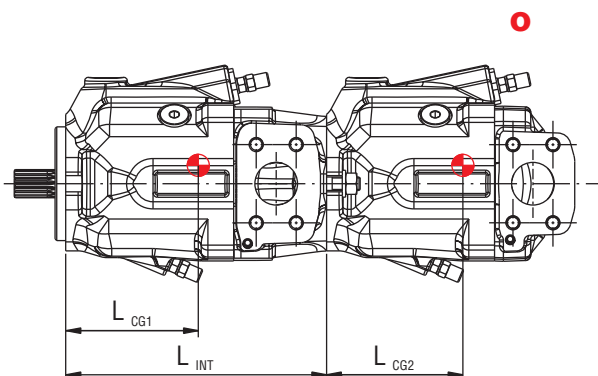
- E:** Max. displacement limiter
F: Min. displacement limiter
G: Min. and Max. displacement limiter (standard)
V: Tightening torque $10^{\pm 1}$ Nm (80 ÷ 97 lbf in)

			MVP 30	MVP 48	MVP 60
Max. displacement setting range	cm ³ /rev (in ³ /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 ³ /rev (in ³ /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 ³ /rev (in ³ /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

05/10.2014



Center of gravity

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

M_{MF} : Load moment on mounting flange

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

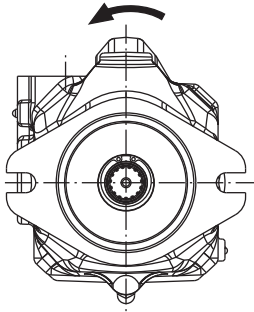
m : Weight (kg)

		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)

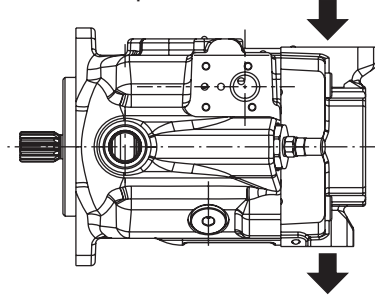
For single pumps refer to L_{CG2} values

PORTS POSITION

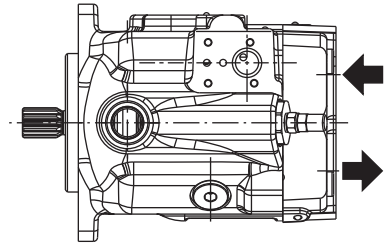
Anti-clock rotation



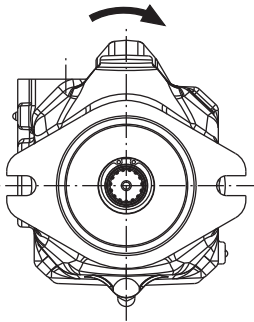
Side ports



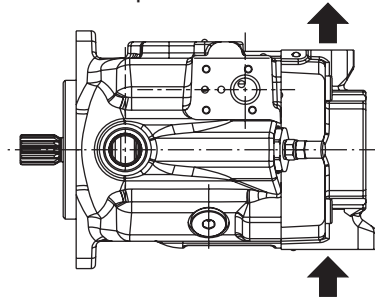
Rear ports



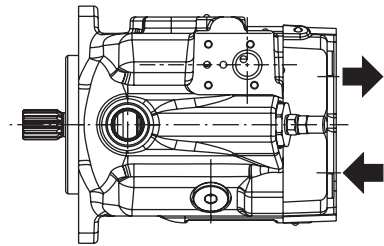
Clockwise rotation



Side ports



Rear ports



03/06.2011

MVP30•28

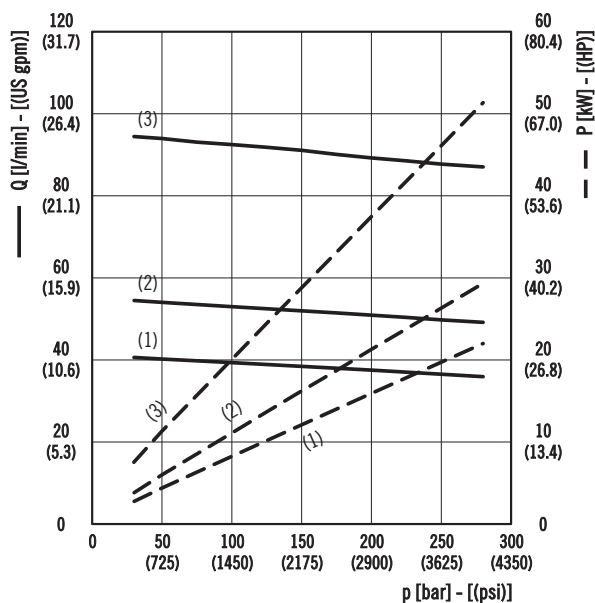
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 3500 min⁻¹

Delivery / power

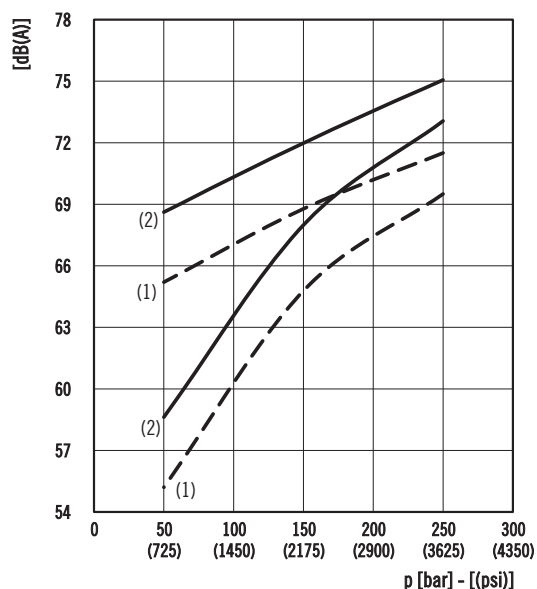
@ max. displacement



Noise level

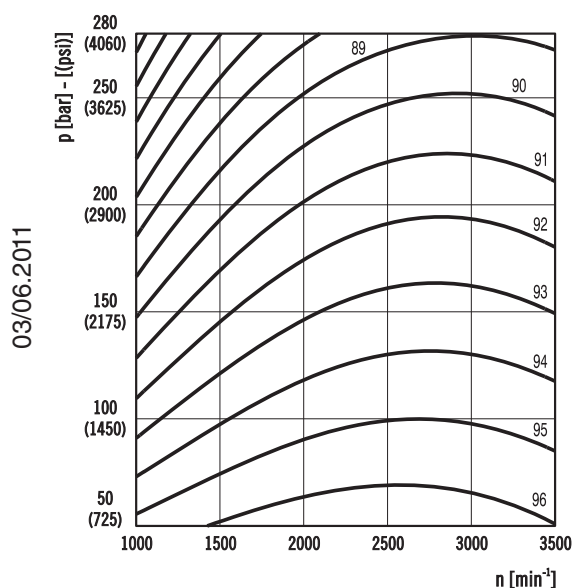
Distance from microphone to pump = 1 m (39.37 in)

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



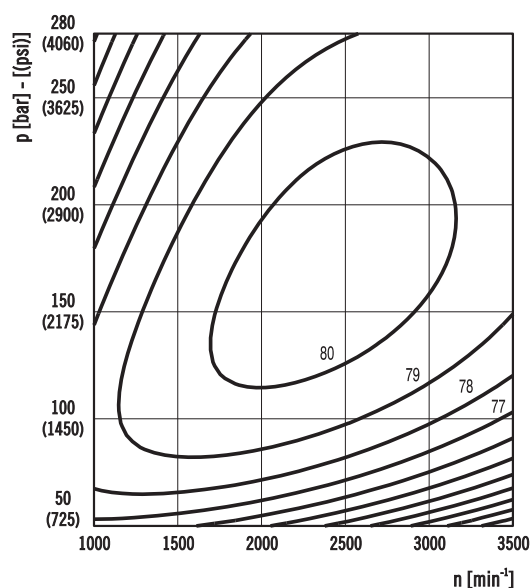
Volumetric efficiency

@ 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

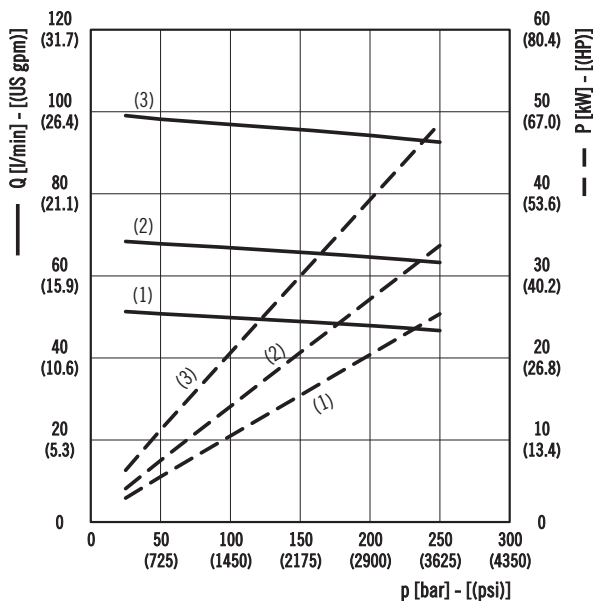
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 2900 min⁻¹

Delivery / power

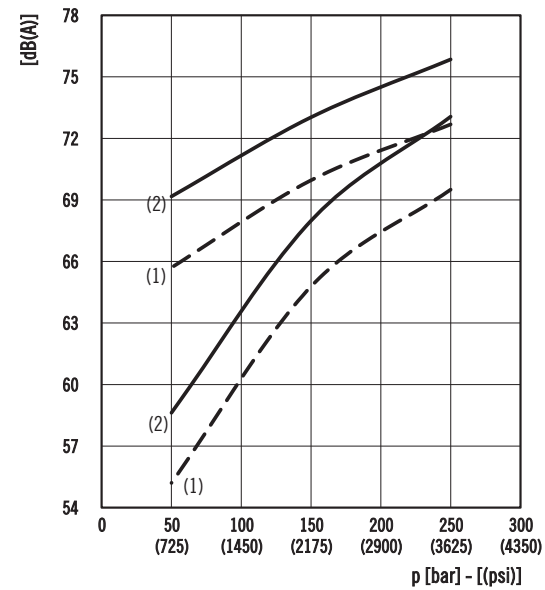
@ max. displacement



Noise level

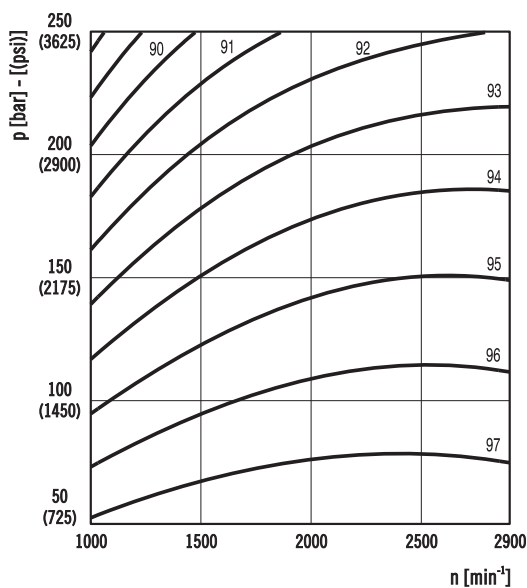
Distance from microphone to pump = 1 m (39.37 in)

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



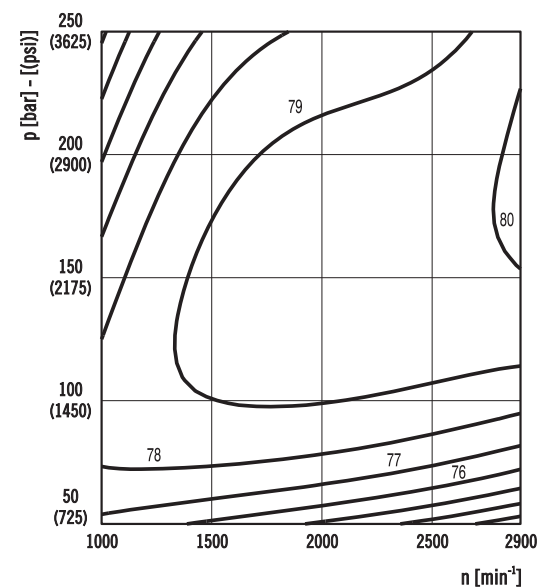
Volumetric efficiency

@ 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

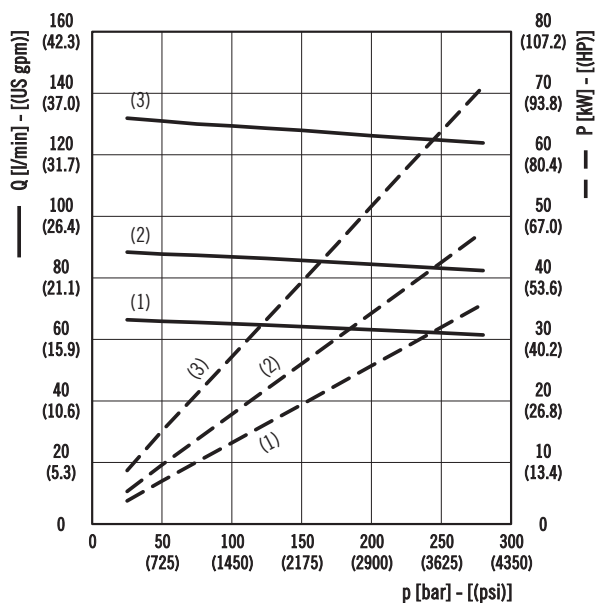
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 3000 min⁻¹

Delivery / power

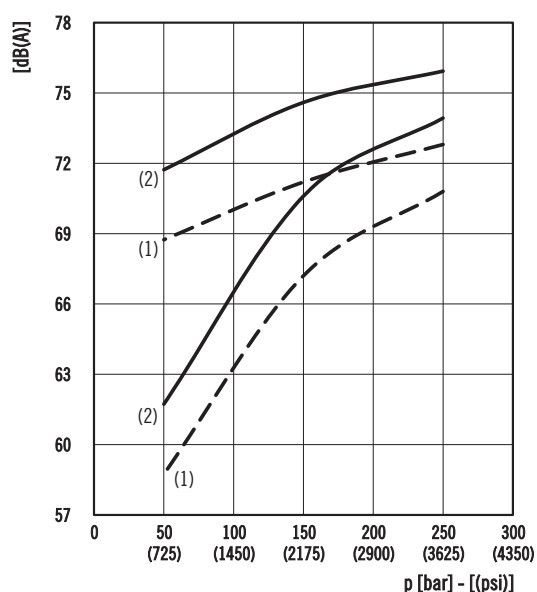
@ max. displacement



Noise level

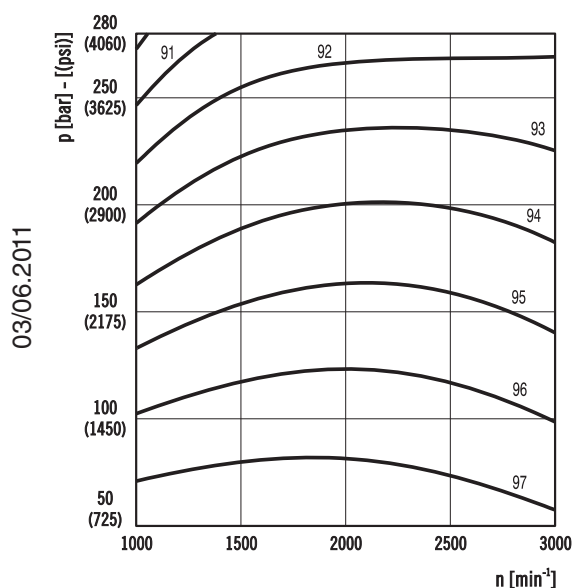
Distance from microphone to pump = 1 m (39.37 in)

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



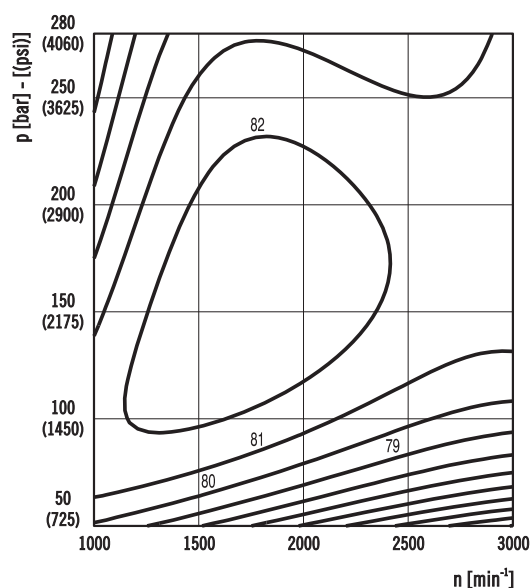
Volumetric efficiency

@ 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

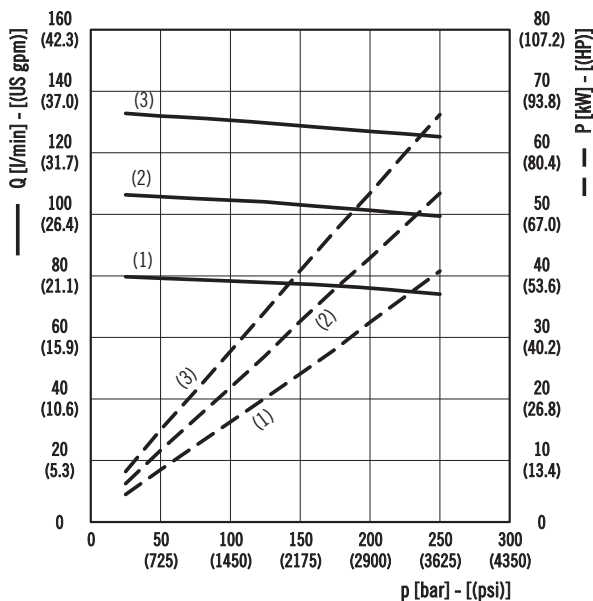
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 2500 min⁻¹

Delivery / power

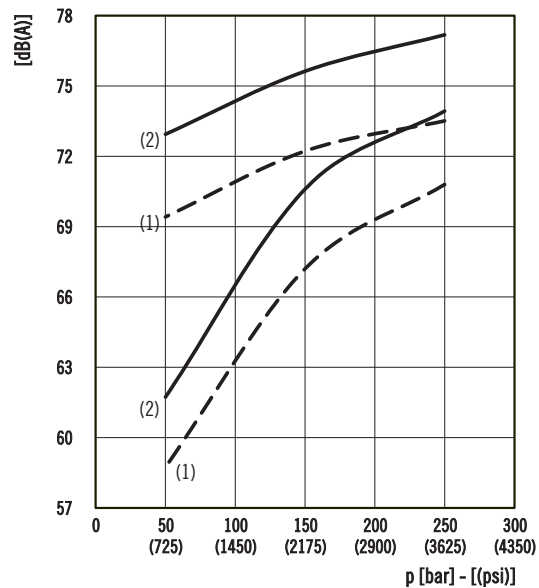
@ max. displacement



Noise level

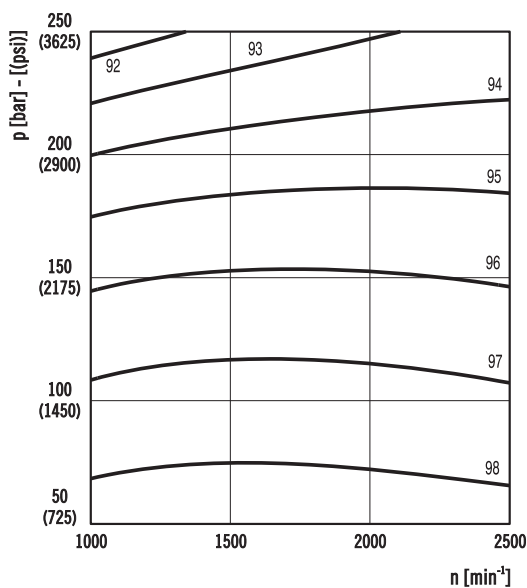
Distance from microphone to pump = 1 m (39.37 in)

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



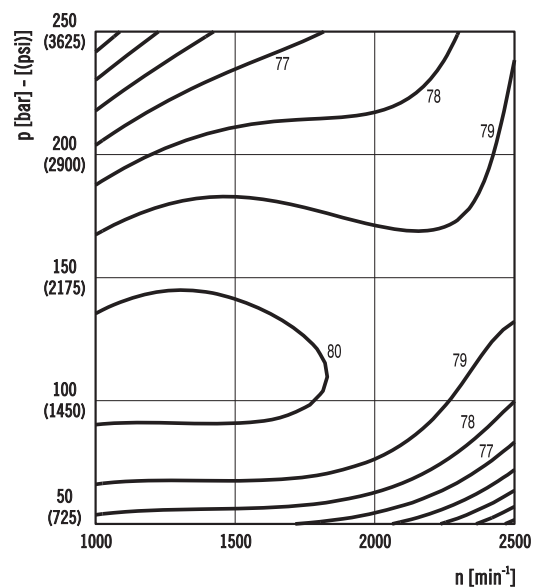
Volumetric efficiency

@ 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

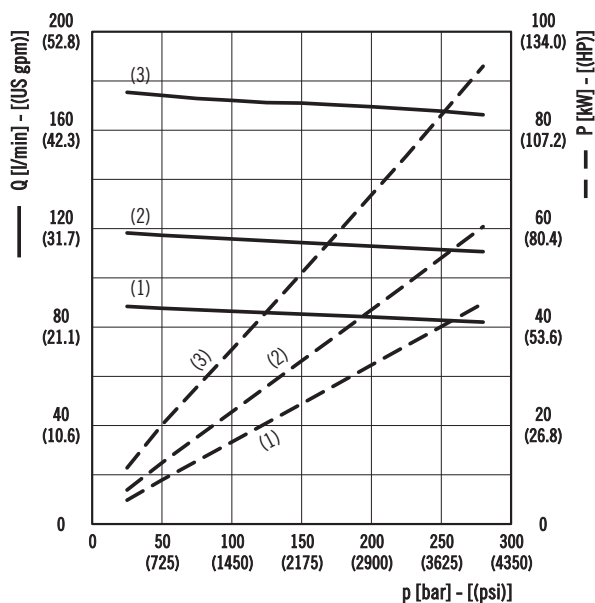
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 3000 min⁻¹

Delivery / power

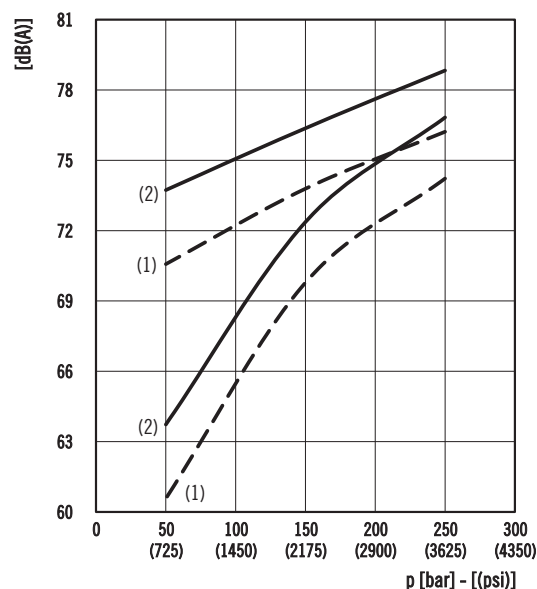
@ max. displacement



Noise level

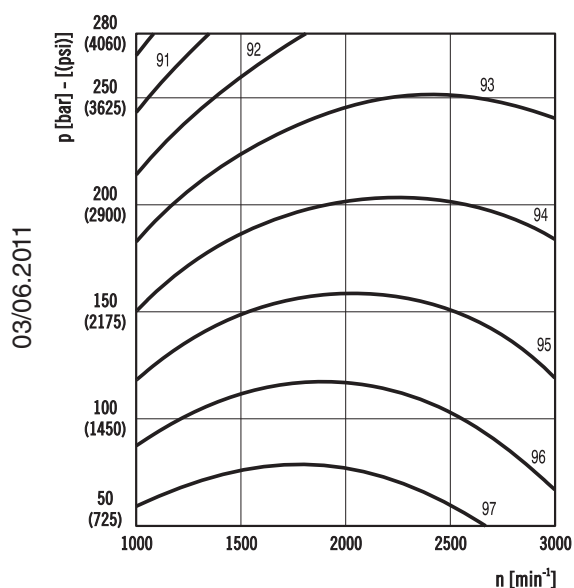
Distance from microphone to pump = 1 m (39.37 in)

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



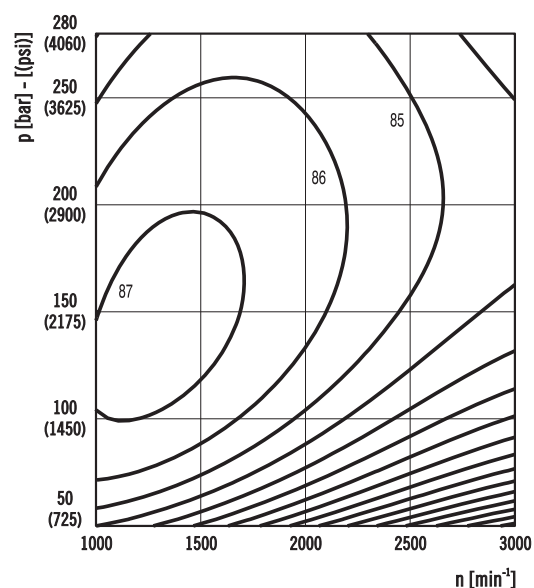
Volumetric efficiency

@ 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

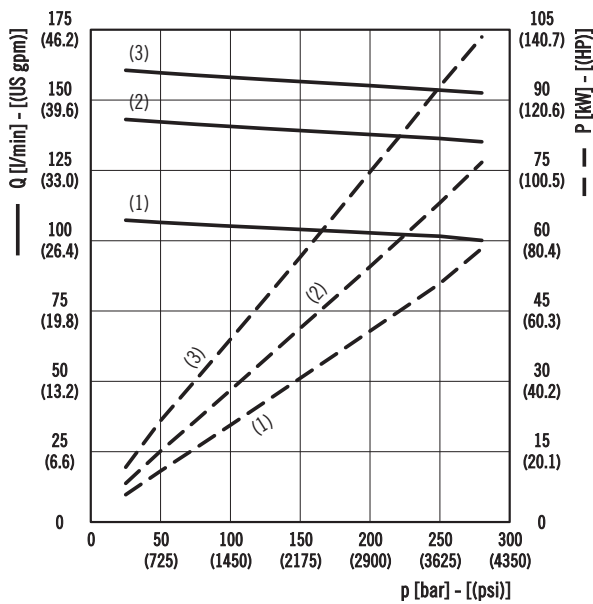
OPERATING CURVES

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⁻¹
- (2) 2000 min⁻¹
- (3) 2700 min⁻¹

Delivery / power

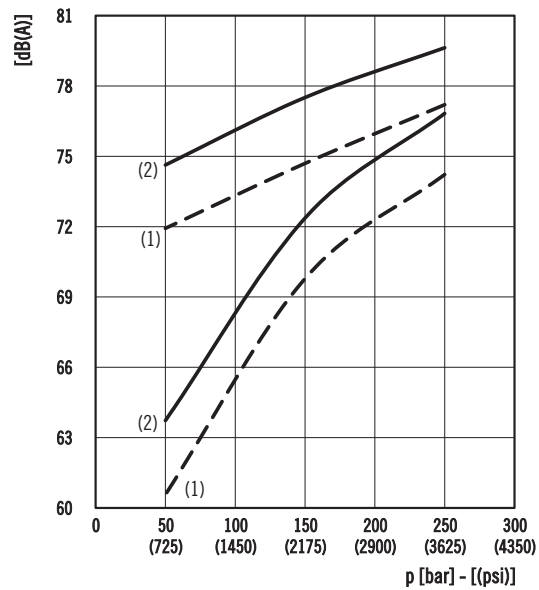
@ max. displacement



Noise level

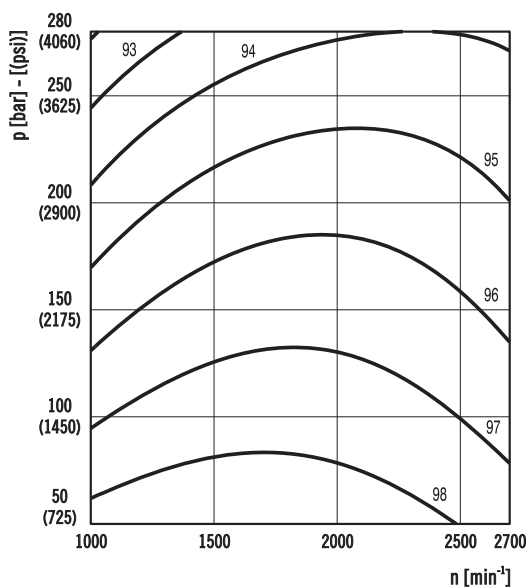
Distance from microphone to pump = 1 m (39.37 in)

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



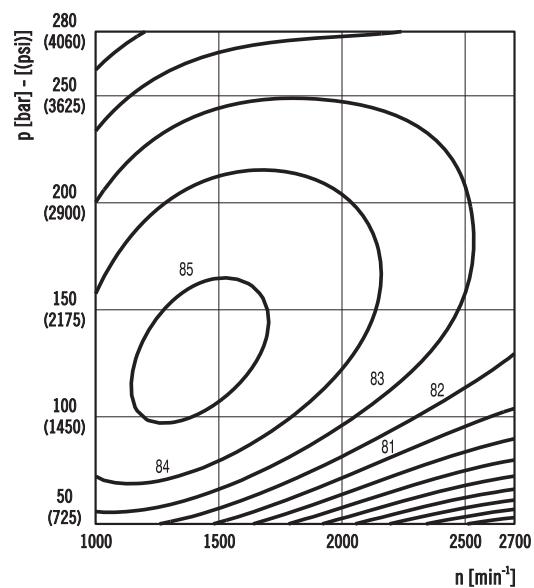
Volumetric efficiency

@ 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:

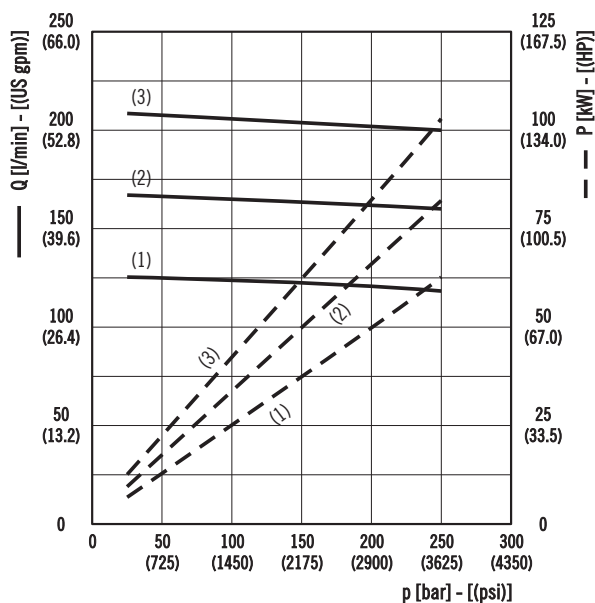
- (1) 1500 min⁻¹
- (2) 2000 min⁻¹
- (3) 2500 min⁻¹



Replaces: 03/06.2011

Delivery / power

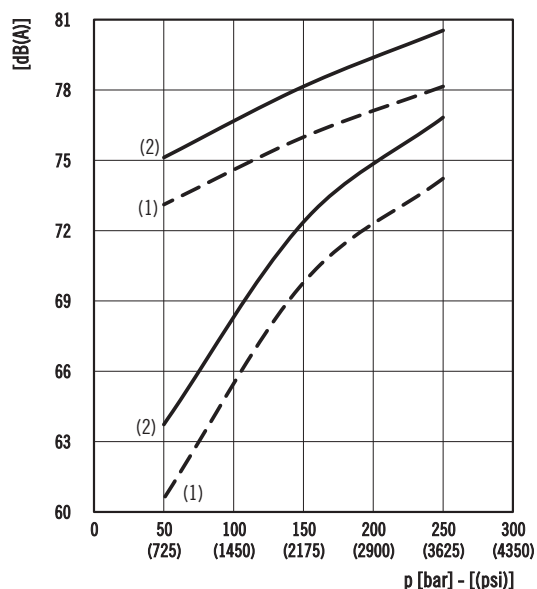
@ max. displacement



Noise level

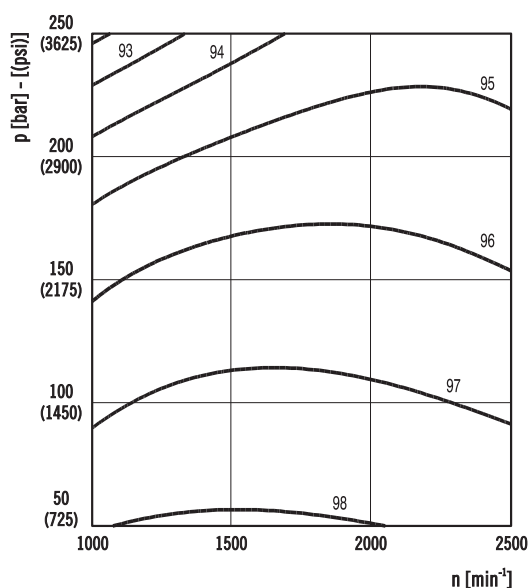
Distance from microphone to pump = 1 m (39.37 in)

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



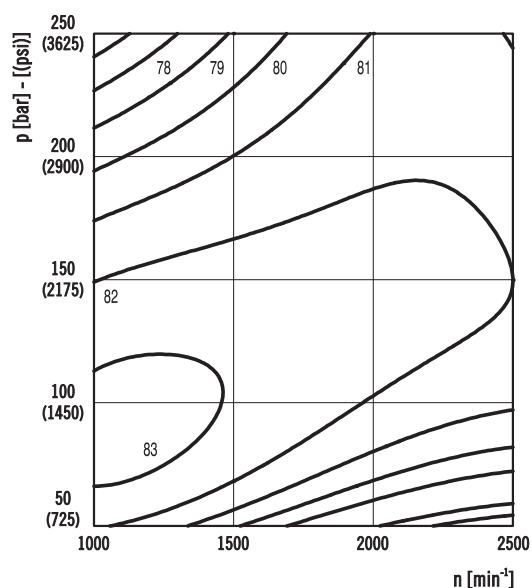
Volumetric efficiency

@ max. displacement



Overall efficiency

@ max. displacement



05/10.2014

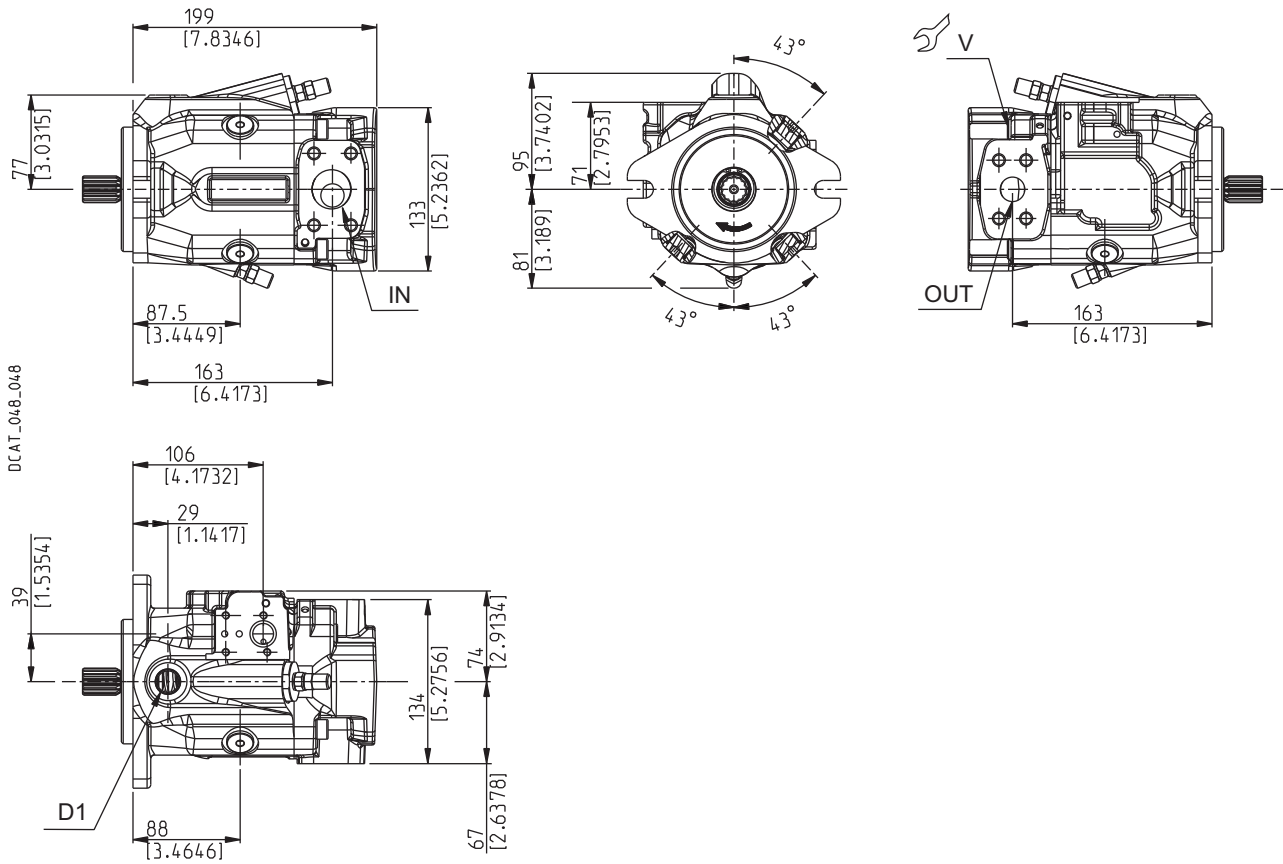
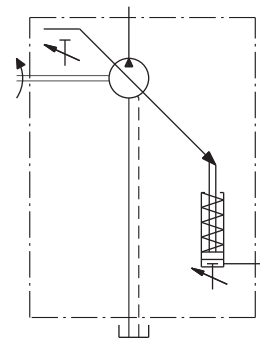
Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

MVP30

SIDE PORTS - DIMENSIONS

L

Drive shafts: page 32
Mounting flanges: page 36



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

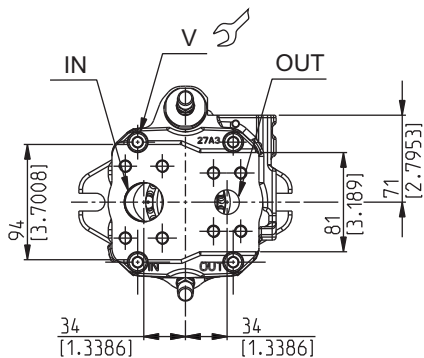
03/06.2011

MVP30

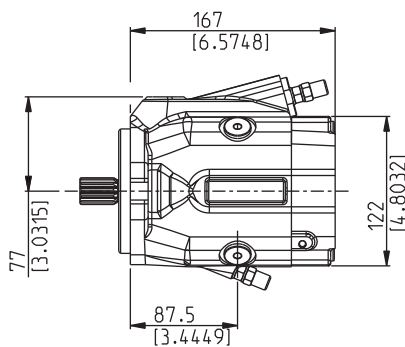
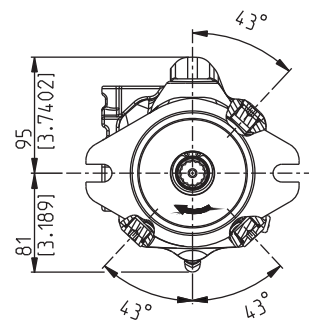
REAR PORTS - DIMENSIONS

P

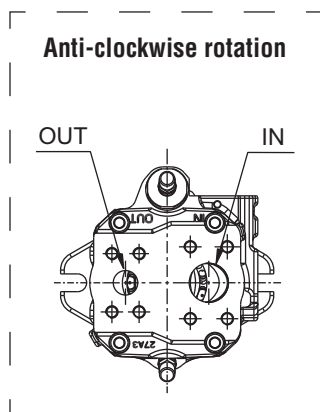
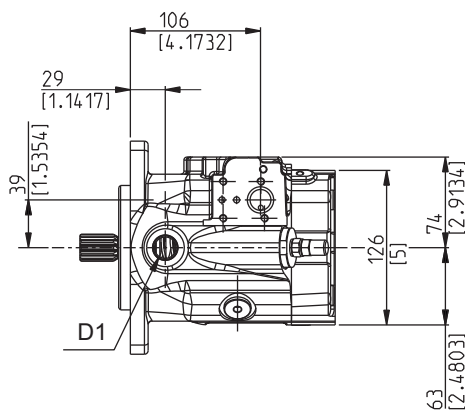
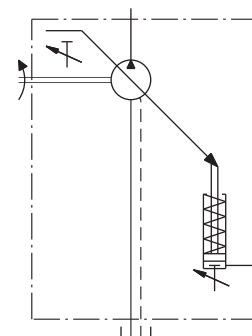
Drive shafts: page 32
Mounting flanges: page 36



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

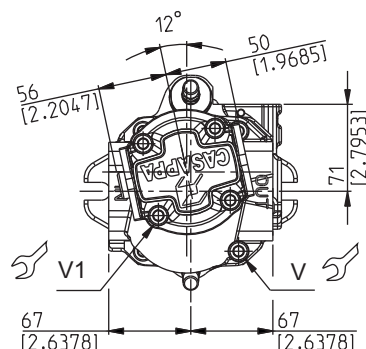
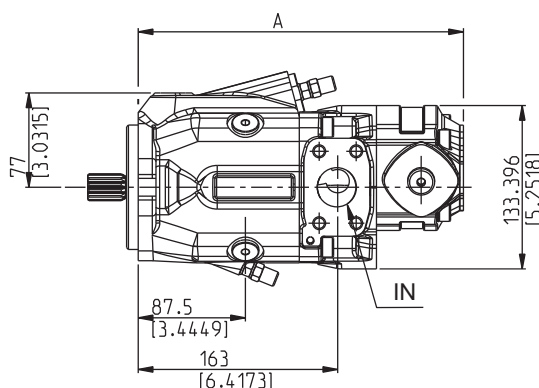
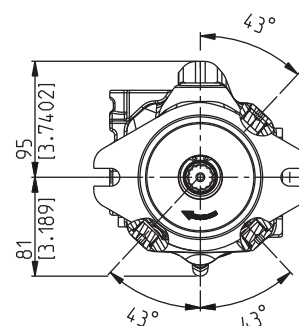
Common inlet intermediate flange:

MVP code **P7**

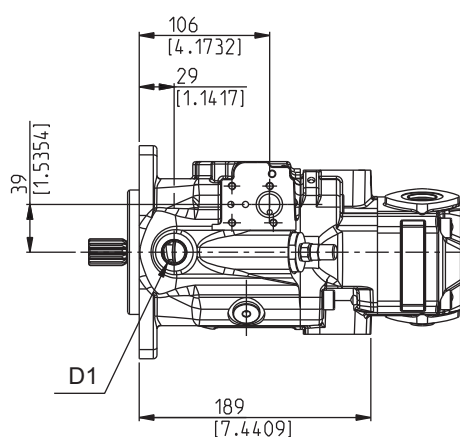
KP20 code **N5**

Drive shafts: page 32

Mounting flanges: page 36



DCAT_048_048_KP20



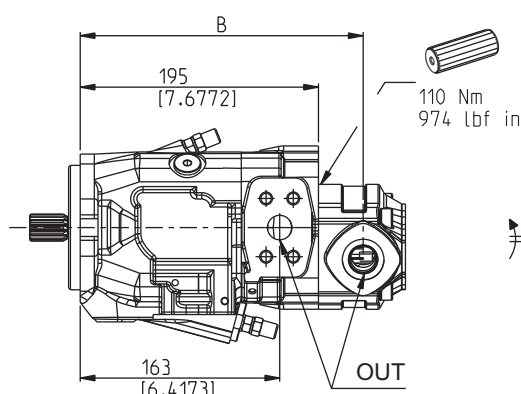
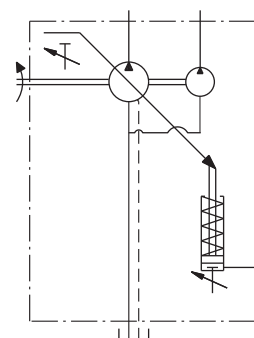
Screws tightening torque Nm (lbf in)

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

Ports (Nominal size)

IN	OUT	D1
MVP 1" 1/4	MVP 3/4"	KP20 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
MVP30	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) A
	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

MVP30/PHP20

MULTIPLE PUMPS - DIMENSIONS

L

Common inlet intermediate flange:

MVP code **I7**

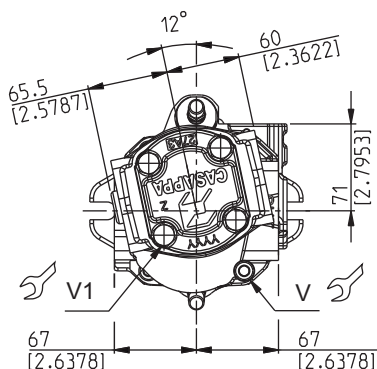
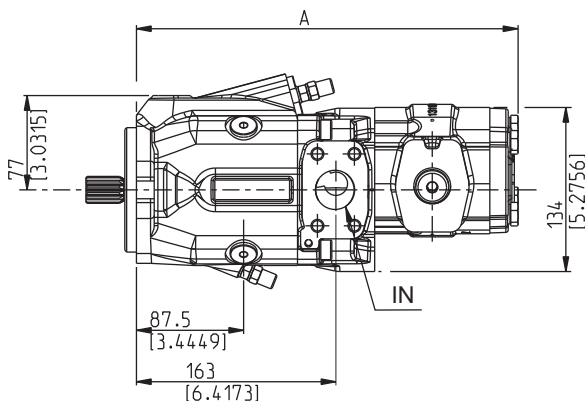
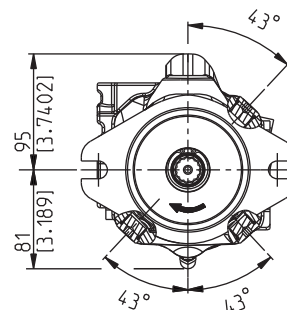
PHP20 code **S7**

Drive shafts: page 32

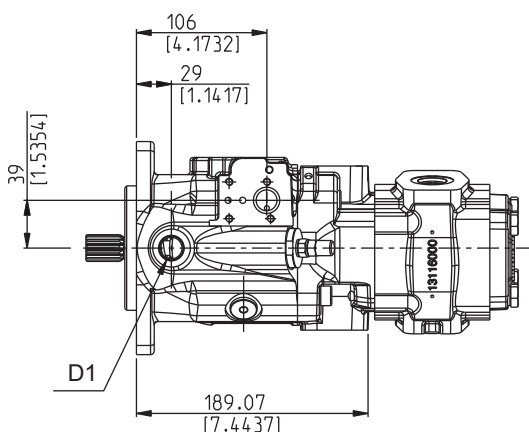
Mounting flanges: page 36

Also available in

combination with PLP20



DCAT_048_048_PHP



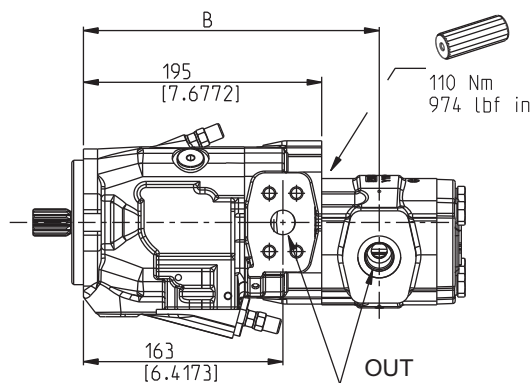
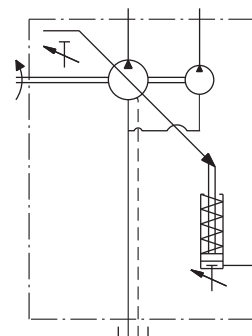
Screws tightening torque Nm (lbf in)

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

Dimensions at page 38 ÷ 39



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

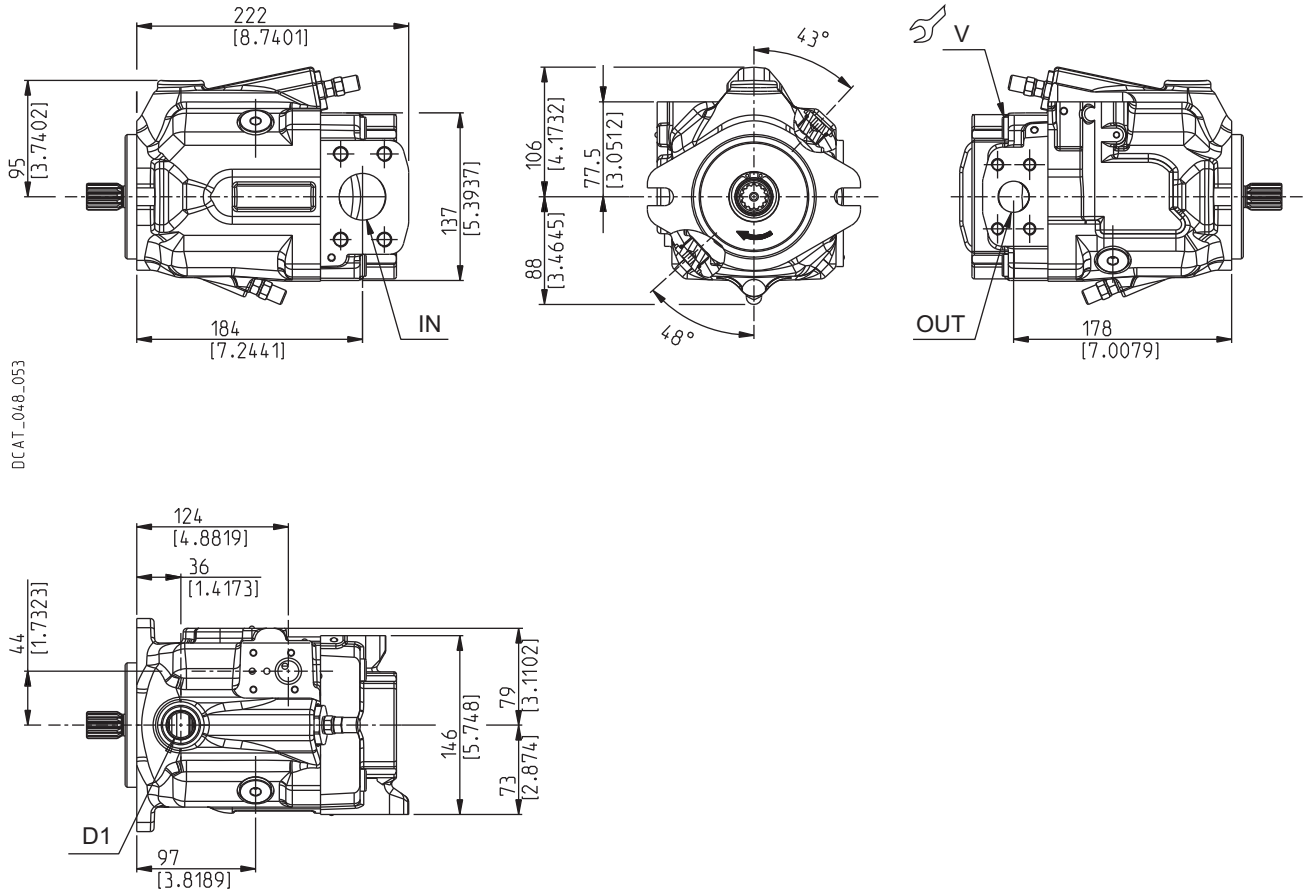
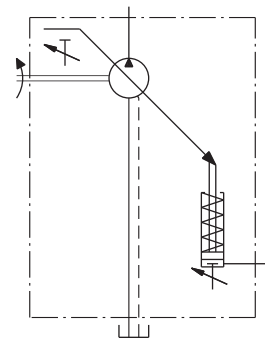
Pump type	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions
MVP30	291,5 (11.4764)	294,6 (11.5984)	297,9 (11.7283)	300,2 (11.8189)	302,6 (11.9134)	305,3 (12.0197)	312,6 (12.3071)	mm (in) A
	231,45 (9.1122)	233 (9.1732)	234,65 (9.2382)	235,8 (9.2835)	237 (9.3307)	238,35 (9.3839)	242 (9.5276)	mm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

MVP48

SIDE PORTS - DIMENSIONS

L

Drive shafts: page 33
Mounting flanges: page 36



Screws tightening torque Nm (lbf in)

V
100 ± 10 (797 $\div$ 974)

Ports (Nominal size)

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

Dimensions at page 38 $\div$ 39

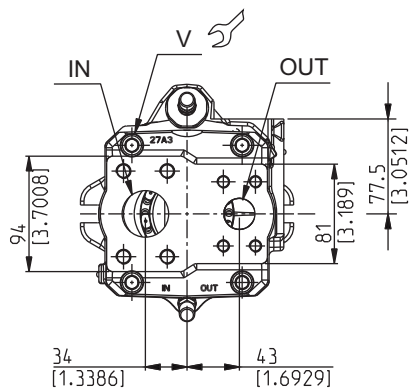
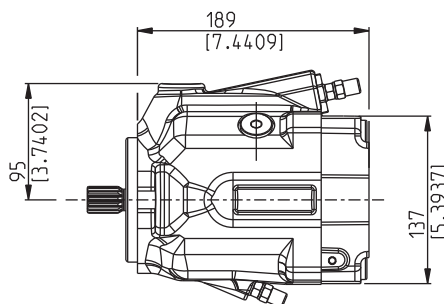
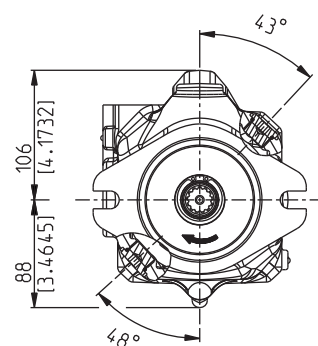
03/06.2011

MVP48

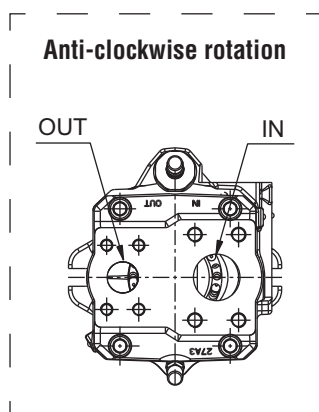
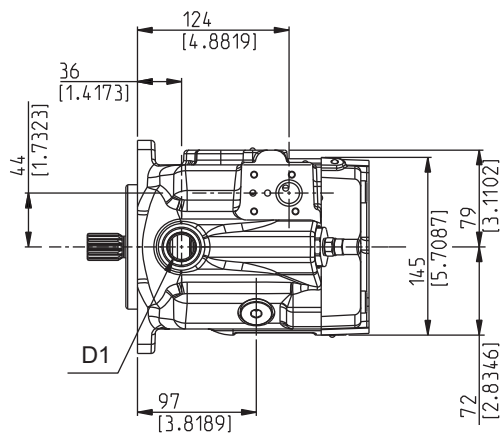
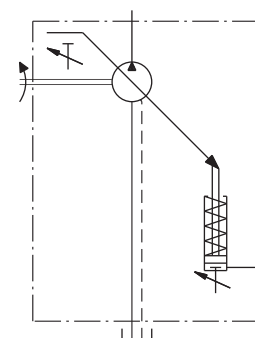
REAR PORTS - DIMENSIONS

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

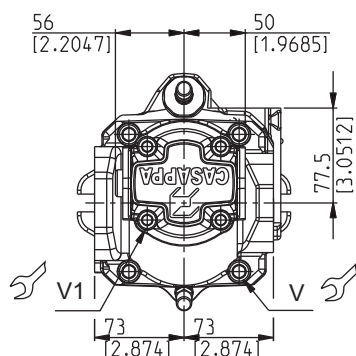
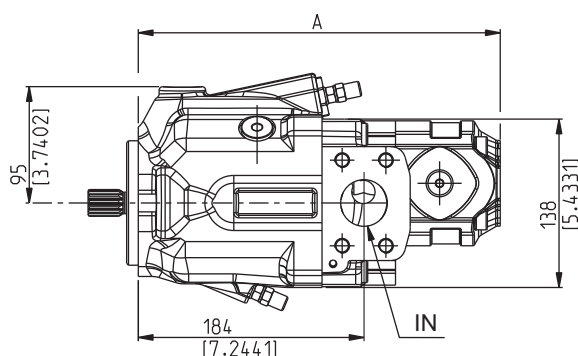
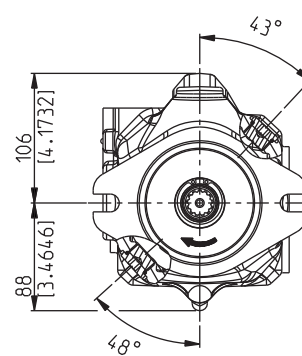
Common inlet intermediate flange:

MVP code **P7**

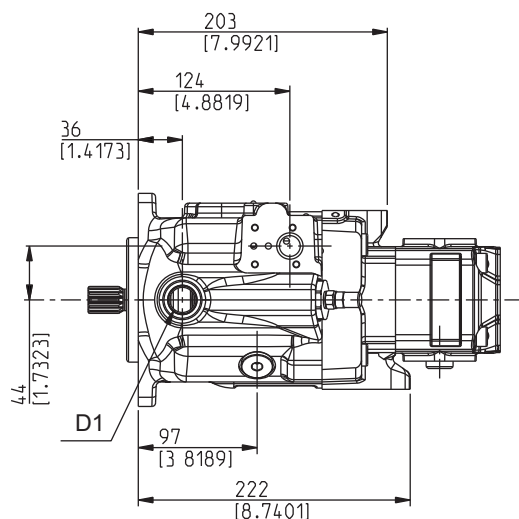
KP20 code **N5**

Drive shafts: page 33

Mounting flanges: page 36



DCAT_048_031_KP20



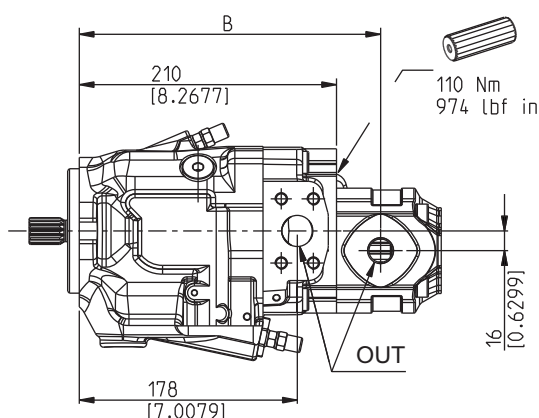
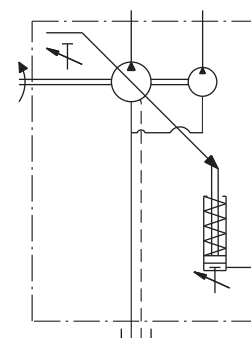
Screws tightening torque Nm (lbf in)

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
MVP48	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) A
	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

MVP48/PHP20

MULTIPLE PUMPS - DIMENSIONS

L

Common inlet intermediate flange:

MVP code **I7**

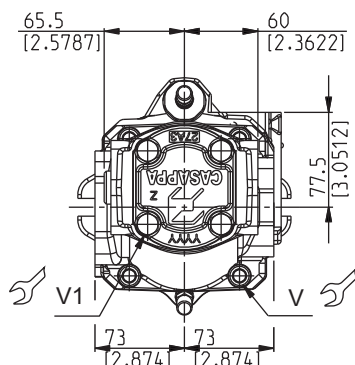
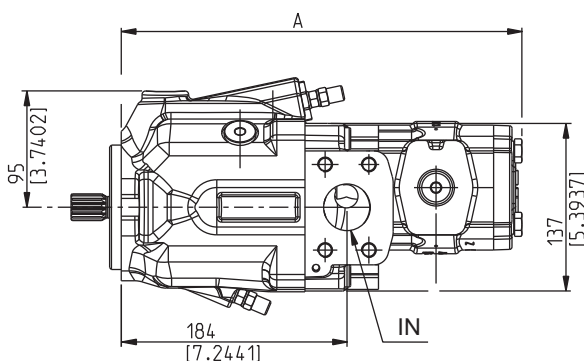
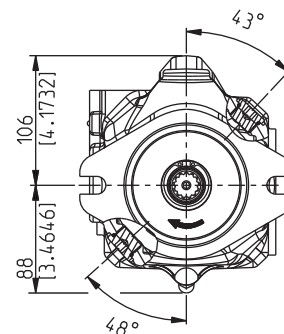
PHP20 code **S7**

Drive shafts: page 33

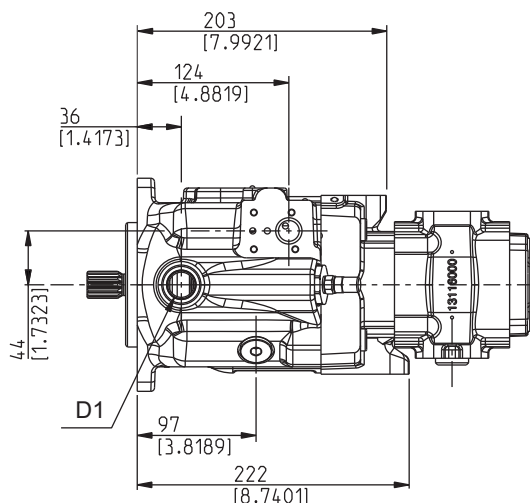
Mounting flanges: page 36

Also available in

combination with PLP20



DCAT_048_031_PHP



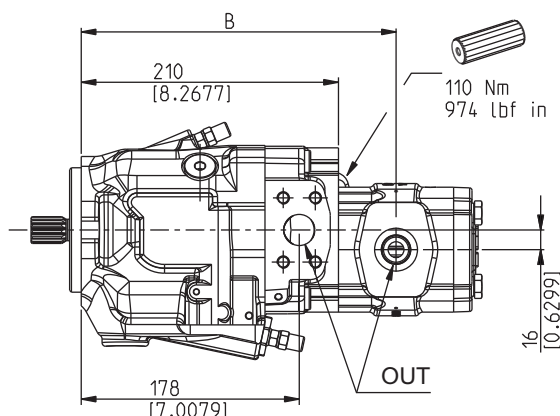
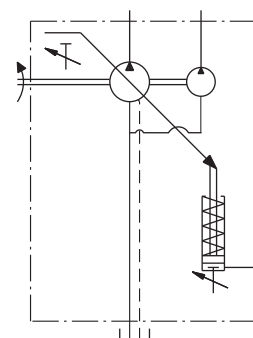
Screws tightening torque Nm (lbf in)

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

Dimensions at page 38 ÷ 39



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

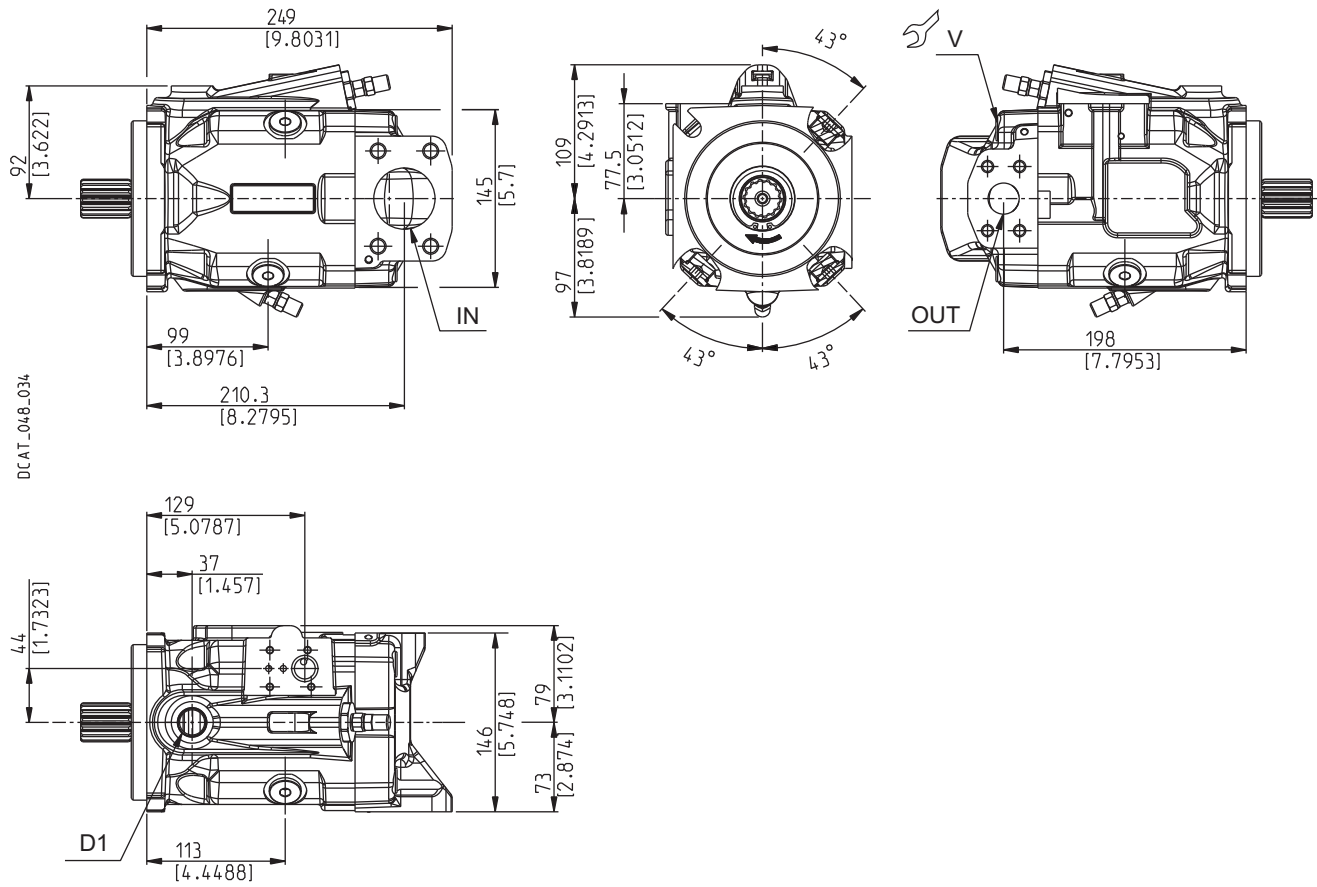
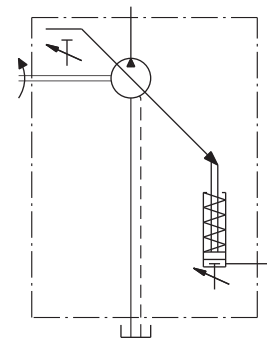
Pump type	20•19	20•20	20•23	20•24,5	20•25	20•27,8	20•31,5	Dimensions
MVP48	306,5 (12.0669)	309,6 (12.1890)	312,9 (12.3189)	315,2 (12.4094)	317,6 (12.5039)	320,3 (12.6102)	327,6 (12.8976)	mm (in) A
	246,45 (9.7028)	248 (9.7638)	249,65 (9.8287)	250,8 (9.8740)	252 (9.9213)	253,35 (9.9744)	257 (10.1181)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

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

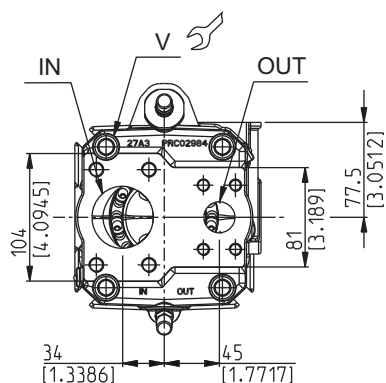
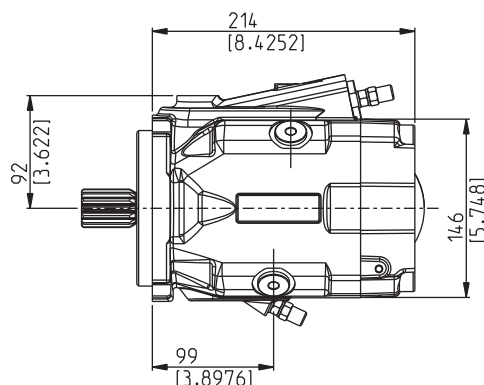
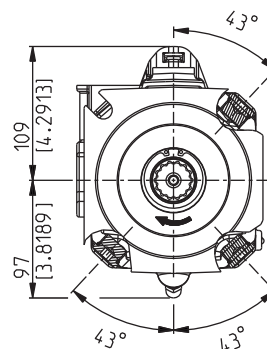
03/06.2011

MVP60

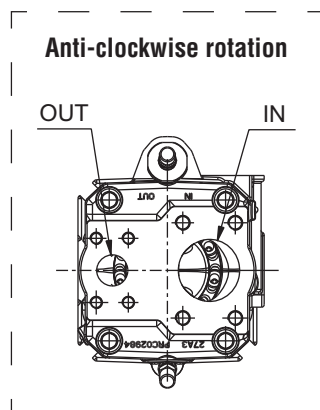
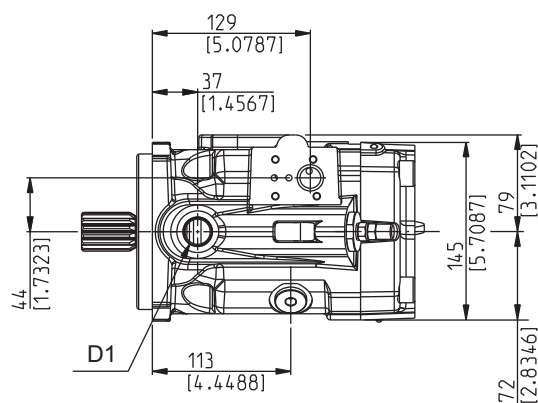
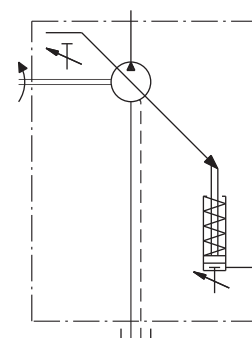
REAR PORTS - DIMENSIONS

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

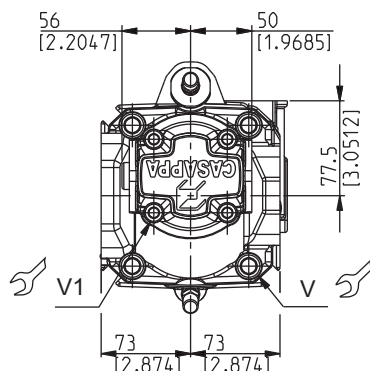
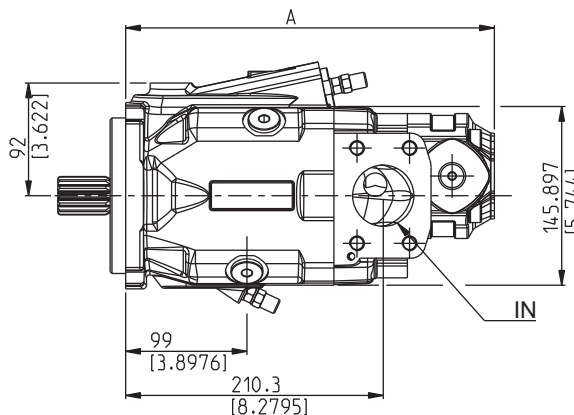
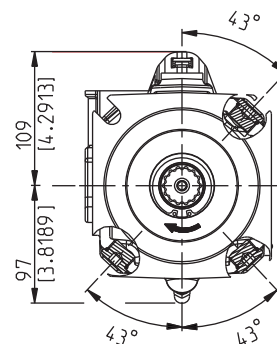
Common inlet intermediate flange:

MVP code **P7**

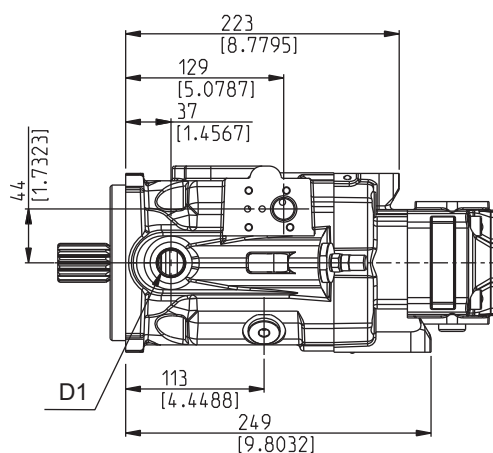
KP20 code **N5**

Drive shafts: page 34 ÷ 35

Mounting flanges: page 36 ÷ 37



DCAT_048_029_KP20



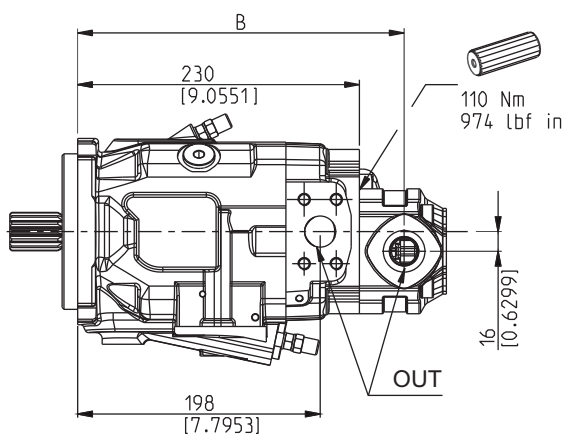
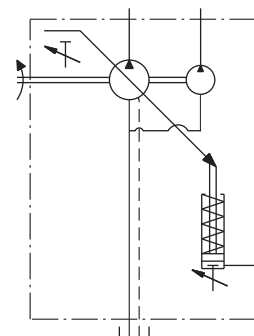
Screws tightening torque Nm (lbf in)

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

Ports (Nominal size)

IN	OUT	D1
MVP 2"	MVP 1"	KP20 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	
MVP60	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)	A
	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

MVP60/PHP20

MULTIPLE PUMPS - DIMENSIONS

L

Common inlet intermediate flange:

MVP code **I7**

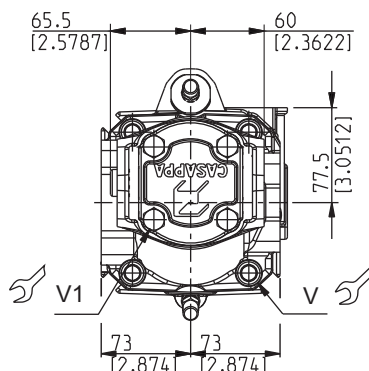
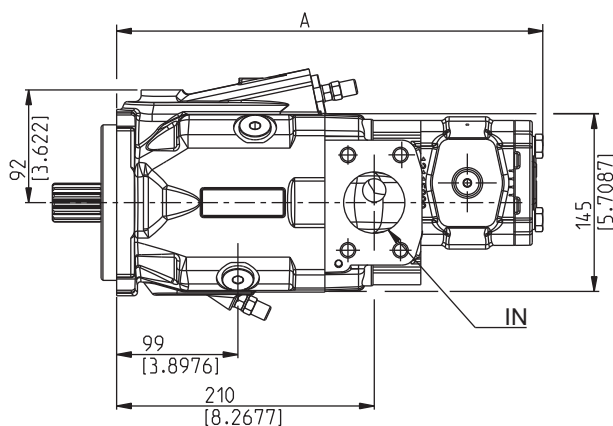
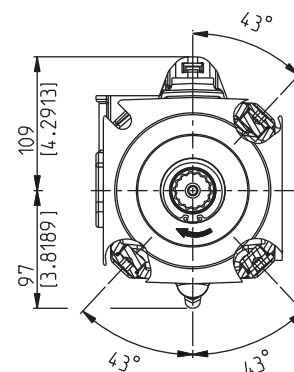
PHP20 code **S7**

Drive shafts: page 34 ÷ 35

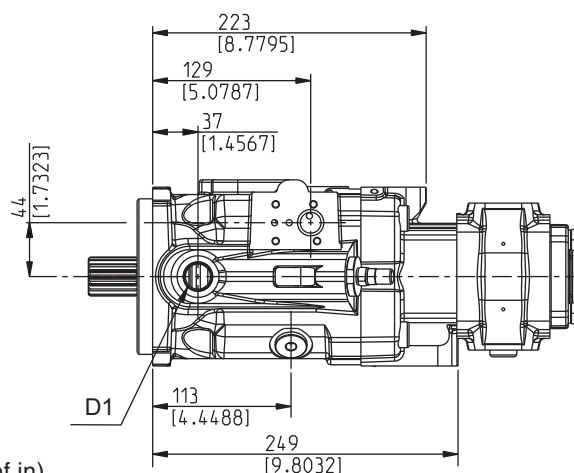
Mounting flanges: page 36 ÷ 37

Also available in

combination with PLP20



DCAT_048_035_PHP



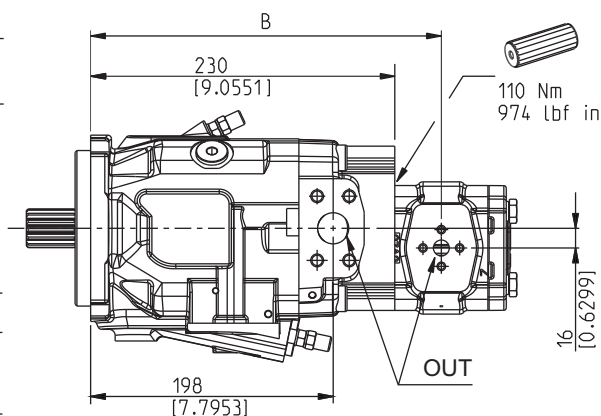
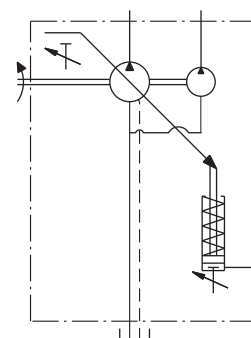
Screws tightening torque Nm (lbf in)

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

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
MVP60	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) A
	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

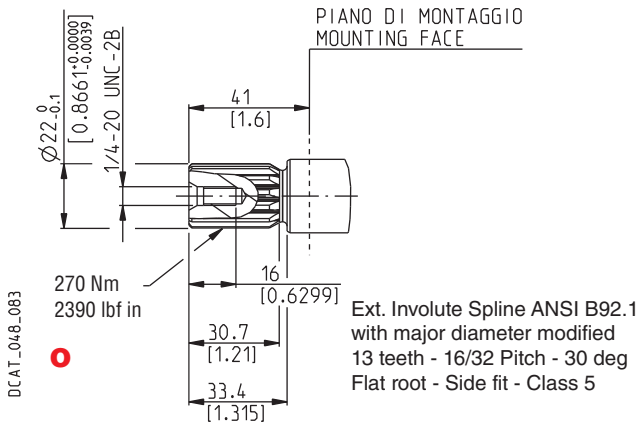
MVP30

DRIVE SHAFTS

SAE "B" SPLINE

04

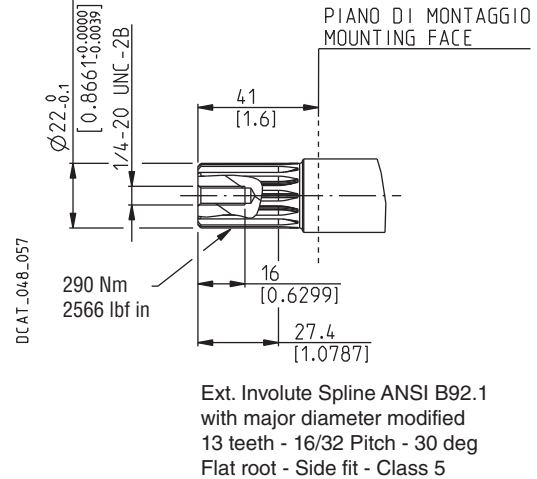
Mounting face refers to flange code **S5**



SAE "B" SPLINE

4R

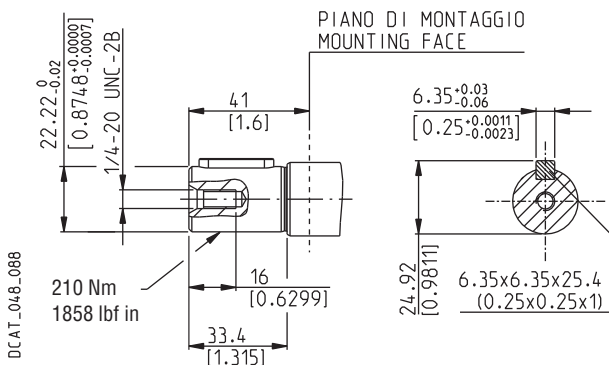
Mounting face refers to flange code **S5**



SAE "B" STRAIGHT

32

Mounting face refers to flange code **S5**



Replaces: 03/06.2011

05/10.2014

For different drive shafts, please consult our technical department.

MVP48

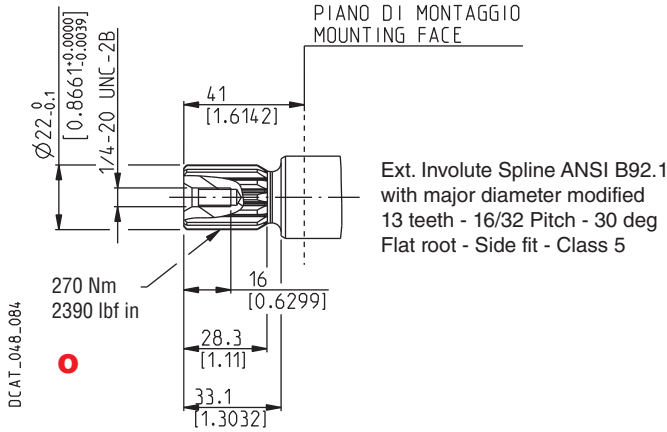
DRIVE SHAFTS

SAE "B" SPLINE

04

Mounting face refers to flange code S5

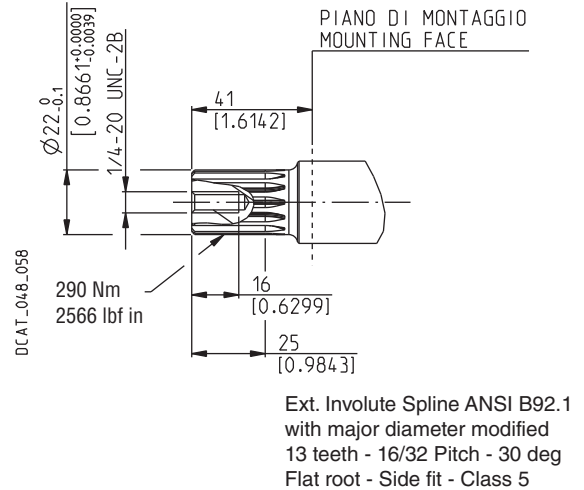
Replaces: 03/06.2011



SAE "B" SPLINE

4R

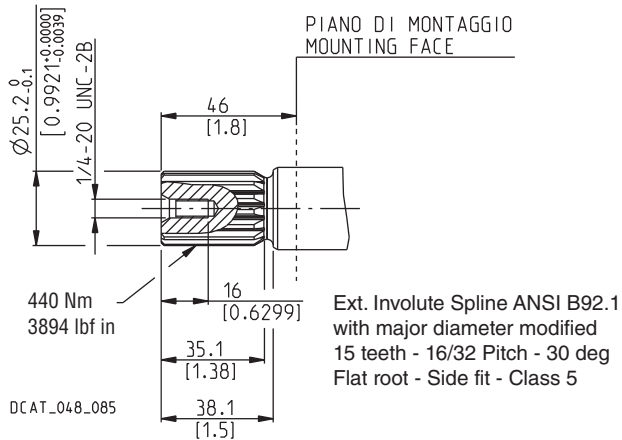
Mounting face refers to flange code S5



SAE "BB" SPLINE

05

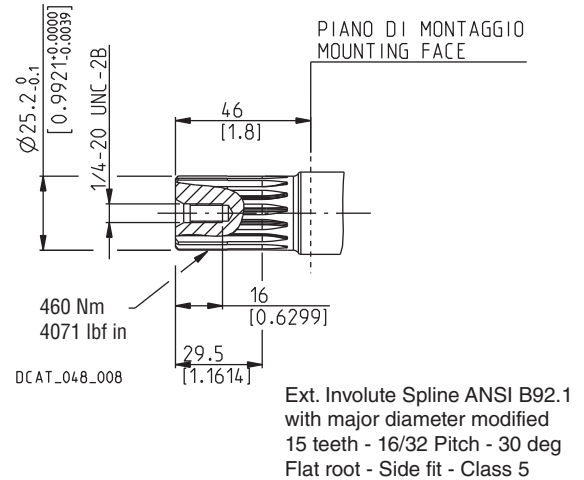
Mounting face refers to flange code S5



SAE "BB" SPLINE

5R

Mounting face refers to flange code S5

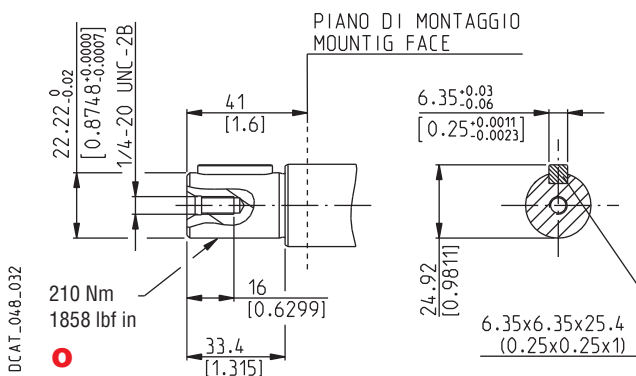


SAE "B" STRAIGHT

32

Mounting face refers to flange code S5

05/10.2014



For different drive shafts, please consult our technical department.

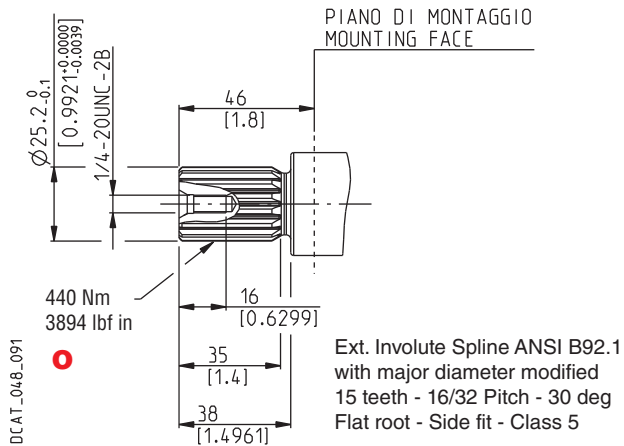
MVP60

DRIVE SHAFTS

SAE "BB" SPLINE

05

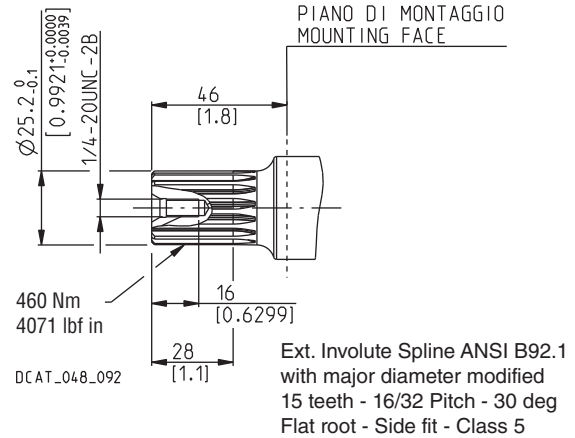
Mounting face refers to flange code **S5**



SAE "BB" SPLINE

5R

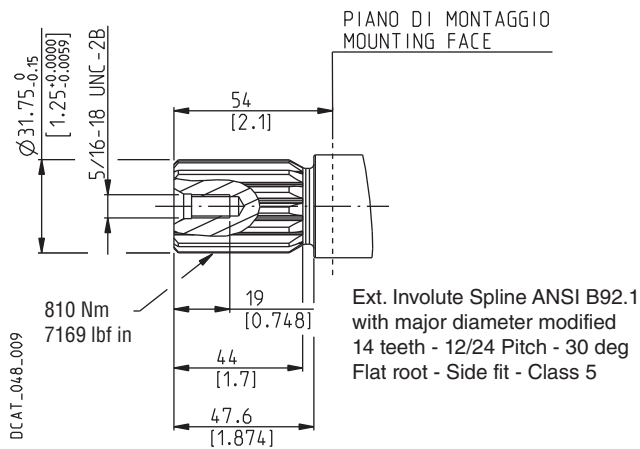
Mounting face refers to flange code **S5**



SAE "C" SPLINE

06

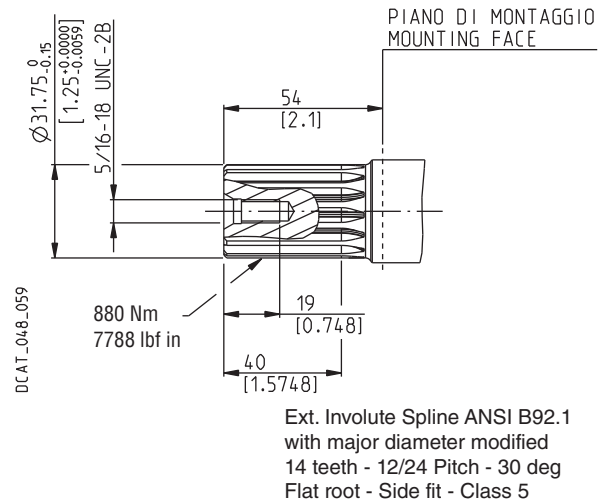
Mounting face refers to flange code **S7** and **S8**



SAE "C" SPLINE

6R

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



Replaces: 03/06.2011

05/10.2014

For different drive shafts, please consult our technical department.

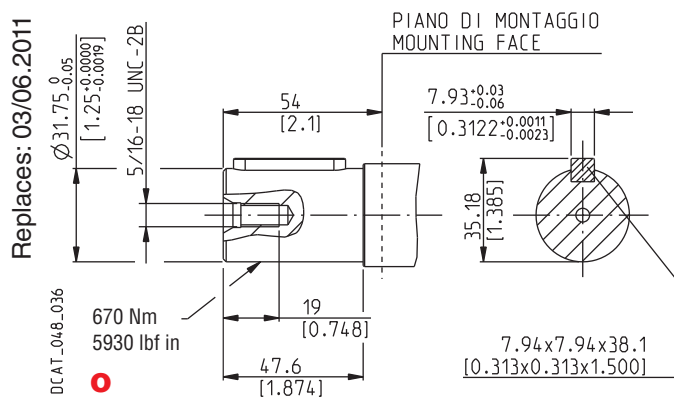
MVP60

DRIVE SHAFTS

SAE "C" STRAIGHT

34

Mounting face refers to flange code **S8**



05/10.2014

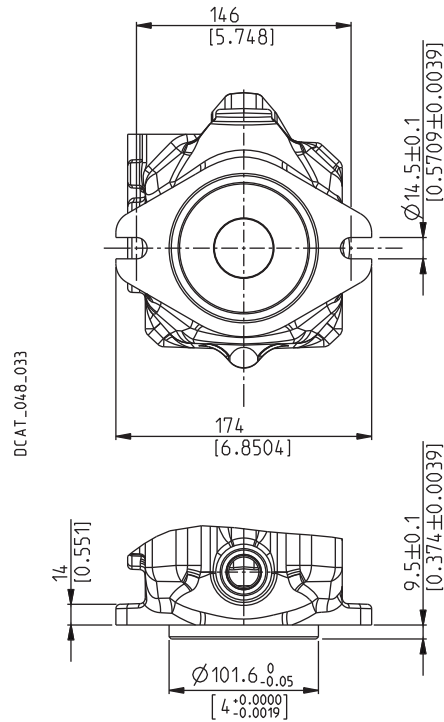
For different drive shafts, please consult our technical department.

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE "B" 2 HOLES

S5

Conforms to SAE J744



DRIVE SHAFTS See page 32 ÷ 35

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

X Available combination

Replaces: 03/06.2011

05/10.2014

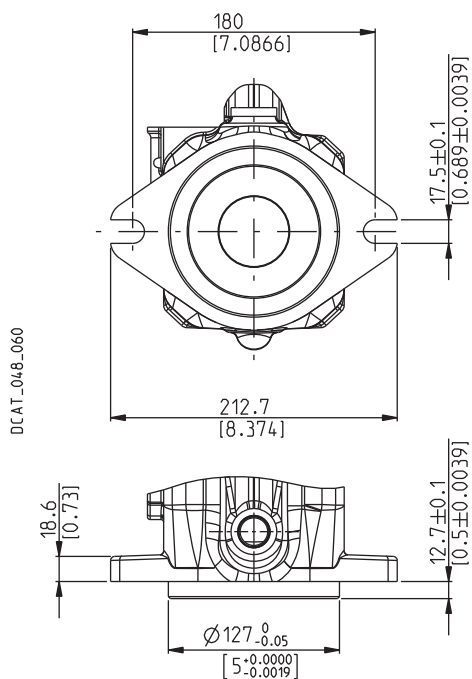
MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE "C" 2 HOLES

S7

Conforms to SAE J744

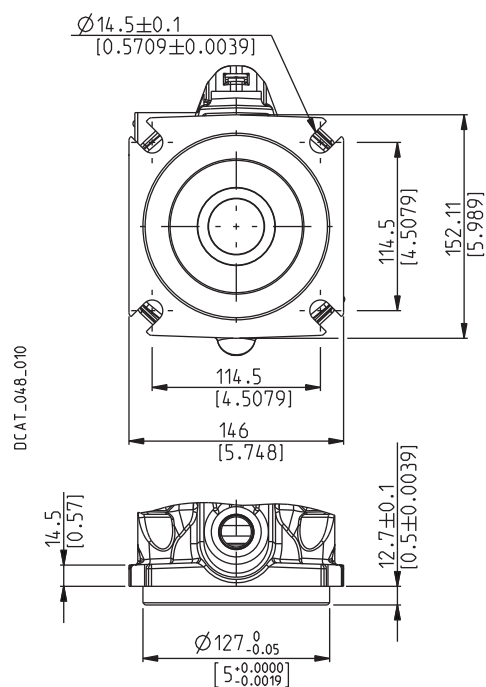
○



SAE "C" 4 HOLES

S8

Conforms to SAE J744



○

DRIVE SHAFTS

See page 34 ÷ 35

Pump type	05	5R	06	6R	34
MVP 60	X	X	X	X	X

X Available combination

○

DRIVE SHAFTS

See page 34 ÷ 35

Pump type	05	5R	06	6R	34
MVP 60	X	X	X	X	X

X Available combination

Replaces: 03/06.2011

○ 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



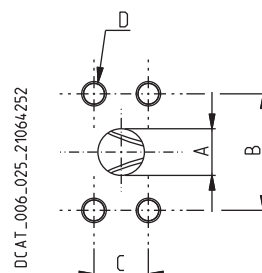
Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]

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)
MB	3/4"	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	M 10 17 (0.6693)	—	45 ^{+2,5} (398 ÷ 420)
MC	1"	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	M 10 17 (0.6693)	—	30 ^{+2,5} (266 ÷ 288)
MD	1" 1/4	32 (1.2598)	58,7 (2.3110)	30,2 (1.1890)	M 10 17 (0.6693)	20 ⁺¹ (177 ÷ 186)	—
ME	1" 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	M 12 20 (0.7874)	30 ^{+2,5} (266 ÷ 288)	—
MF	2"	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	M 12 20 (0.7874)	30 ^{+2,5} (266 ÷ 288)	—



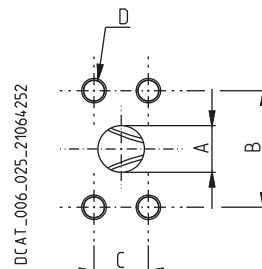
DCAT_006_025_21064252

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)
SB	3/4"	20 (0.7874)	47,6 (1.8740)	22,2 (0.8740)	3/8 - 16 UNC-2B 17 (0.6693)	—	30 ^{+2,5} (266 ÷ 288)
SC	1"	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	3/8 - 16 UNC-2B 17 (0.6693)	—	35 ^{+2,5} (310 ÷ 332)
SD	1" 1/4	32 (1.2598)	58,7 (2.3110)	30,2 (1.1890)	7/16 - 14 UNC-2B 17 (0.6693)	25 ⁺¹ (221 ÷ 230)	—
SE	1" 1/2	38,1 (1.5000)	69,8 (2.7480)	35,7 (1.4055)	1/2 - 13 UNC-2B 20 (0.7874)	30 ^{+2,5} (266 ÷ 288)	—
SF	2"	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	1/2 - 13 UNC-2B 20 (0.7874)	30 ^{+2,5} (266 ÷ 288)	—



DCAT_006_025_21064252

03/06.2011

PORTS SIZES



Tightening torque for low pressure side port



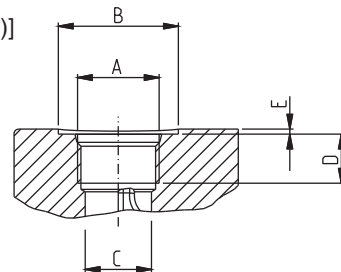
Tightening torque for high pressure side port [values obtained at 350 bar (5075 psi)]

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

(X) = Load sensing port

(●) = Drain port

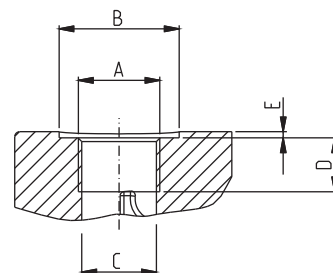
(◆) = KP20 / PHP20 outlet port

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		
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
GA (X)	1/8"	G 1/8	—	8,75 (0.3444)	12 (0.4724)	—	—	5 ^{+0,25} (44 ÷ 46)
GD (●)	1/2"	G 1/2	30 (1.1811)	19 (0.7480)	17 (0.6693)	2 (0.0787)	20 ⁺¹ (177 ÷ 186)	—
GD (◆)	1/2"	G 1/2	—	19 (0.7480)	17 (0.6693)	—	—	50 ^{+2,5} (443 ÷ 465)

(X) = Load sensing port

(●) = Drain port

(◆) = KP20 / PHP20 outlet port

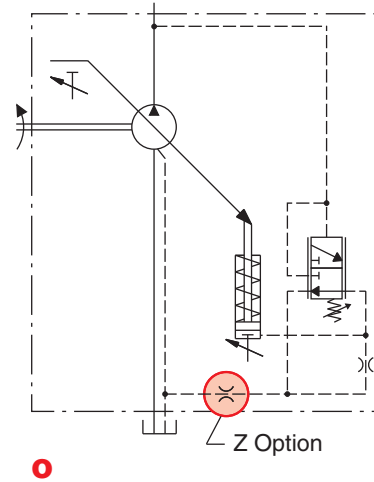
03/06.2011

PRESSURE COMPENSATOR

RPO

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

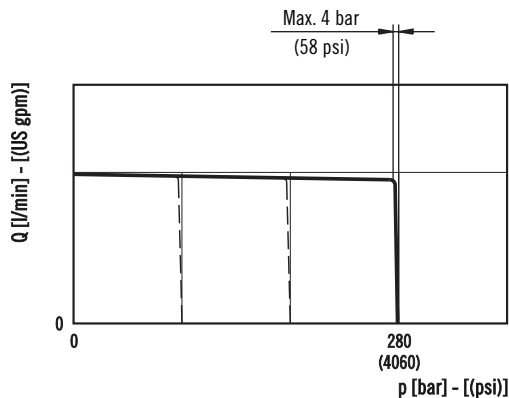
Compensator type	Pump type	Pressure setting range	Standard setting
		bar (psi)	bar (psi)
RPO	MVP 30-28	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP 30-34	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	MVP 48-45	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP 48-53	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	MVP 60-60	80 ÷ 280 (1160 ÷ 4060)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



Replaces: 03/06.2011

OPERATING CURVES

Curves have been obtained at the speed of 1500 min⁻¹ and oil temperature 50 °C (122 °F).



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.

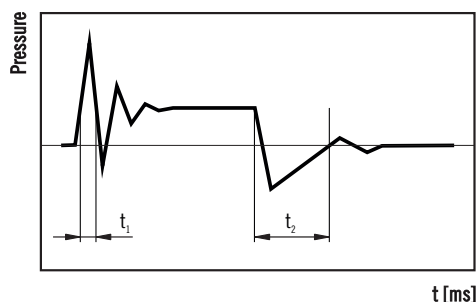
The use of the damping restrictor must be evaluated and approved by Casappa technical sales department for the specific application.

REMOTE CONTROL

For remote pressure compensator LS3 see page 50.

RESPONSE AND RECOVERY TIME

According to SAE J745 (using outlet pressure).



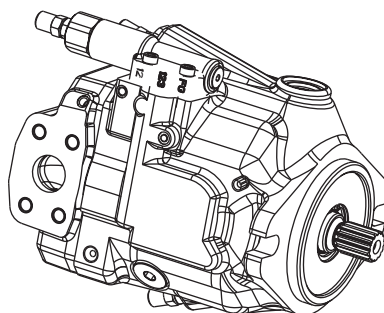
	t_1	t_2
Pump type	Response time [ms] (off stroke)	Recovery time [ms] (on stroke)
MVP 30	46	150
MVP 48	48	150
MVP 60	50	150

05/10.2014

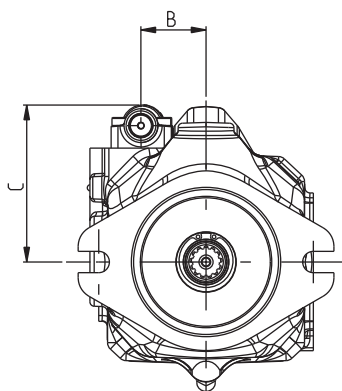
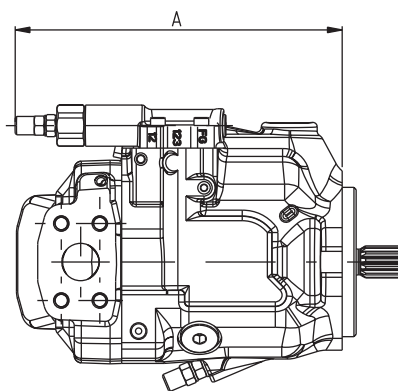
PRESSURE COMPENSATOR

RPO

Replaces: 03/06.2011



DCAT_048_04.1



05/10.2014

O

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

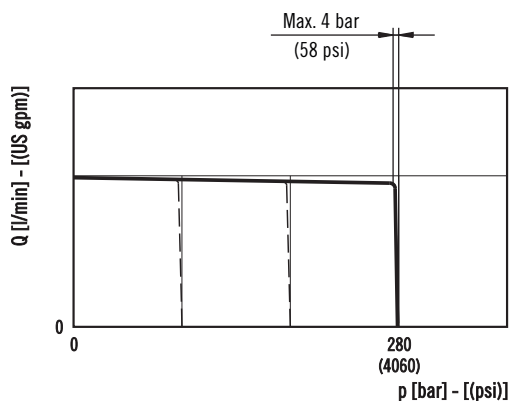
PRESSURE COMPENSATOR

RP1

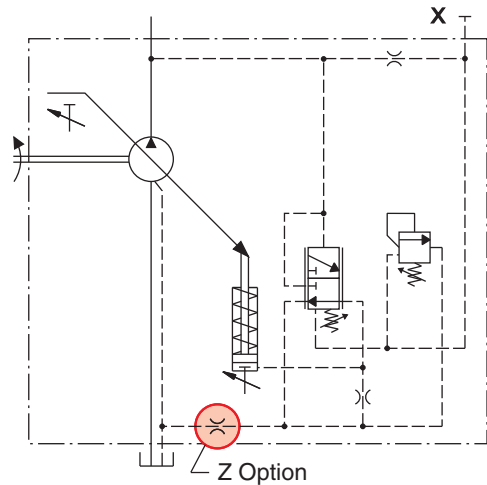
Regulates the pump displacement automatically to maintain the pressure below the fixed pre-adjusted limit.
Designed to work at high frequency ≥ 1 cycle/min and/or at pressure > 280 bar (4060 psi).

OPERATING CURVES

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



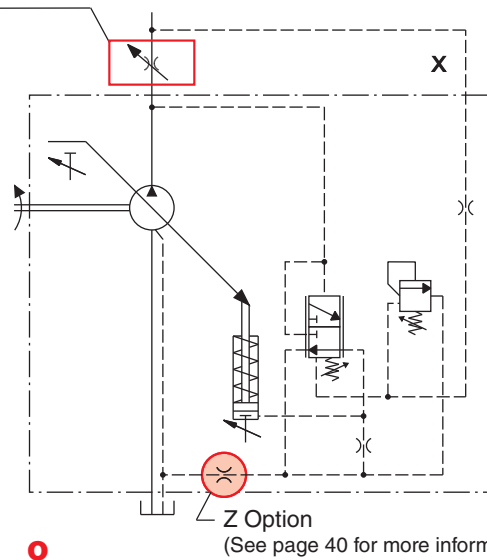
RP1



Replaces: 04/01.2012

RP1 - LS2 (with flow control)

Not included
in supply

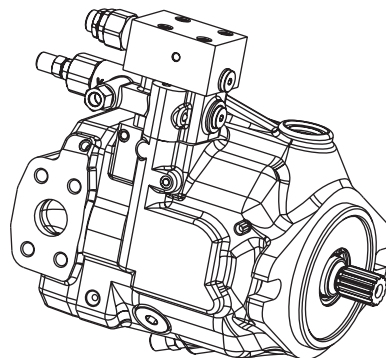


05/10.2014

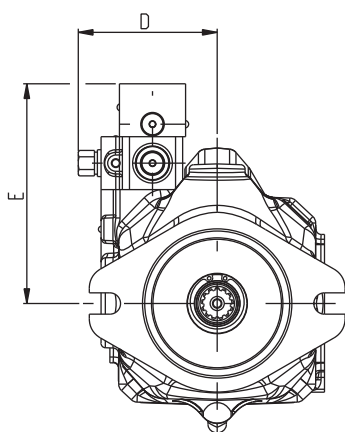
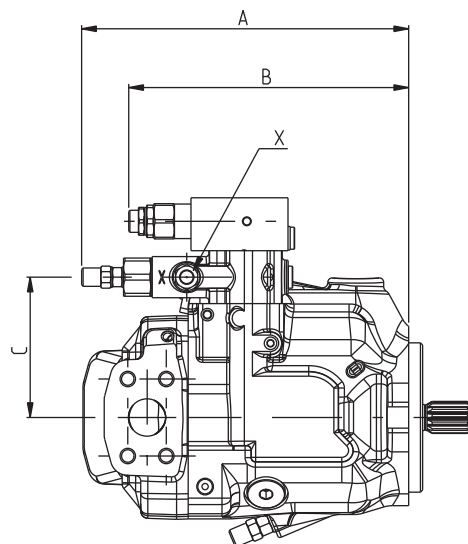
PRESSURE COMPENSATOR

RP1

Replaces: 03/06.2011



DCAT_048_045



RP1 - LS2 configuration shown.

05/10.2014

O

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

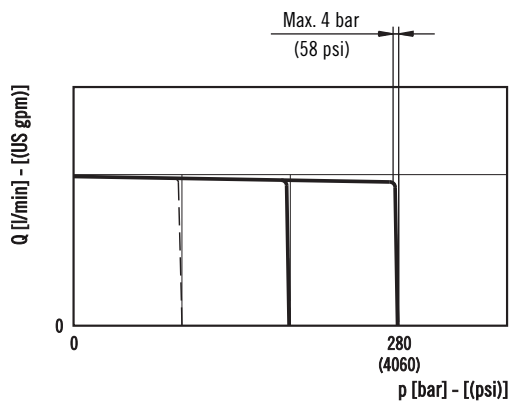
DUAL SETTING PRESSURE COMPENSATOR

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

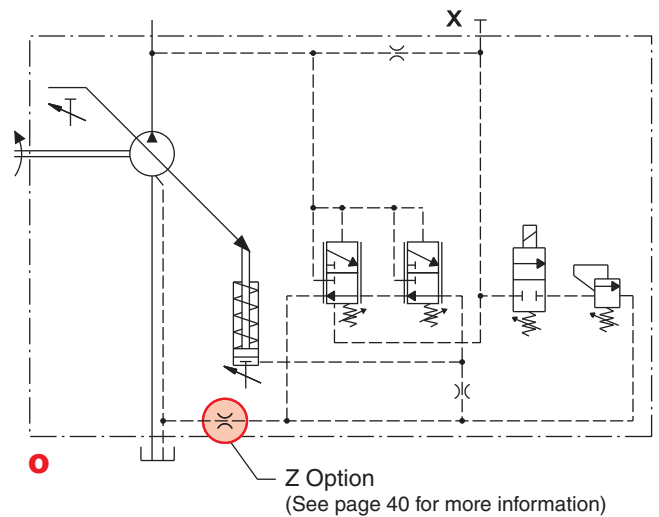
Curves have been obtained at the speed of 1500 min⁻¹ and oil temperature 50 °C (122 °F).



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

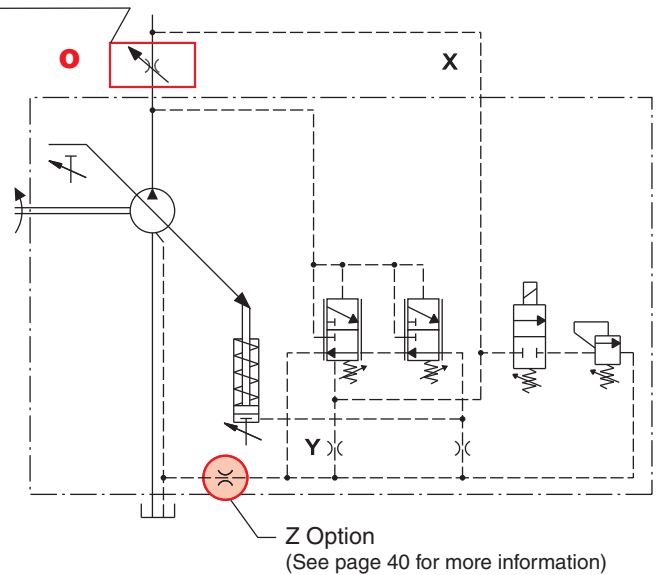
RP2



Replaces: 04/01.2012

RP2 - LS2 (with flow control)

Not included in supply

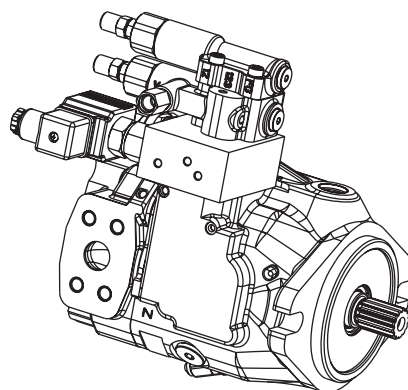
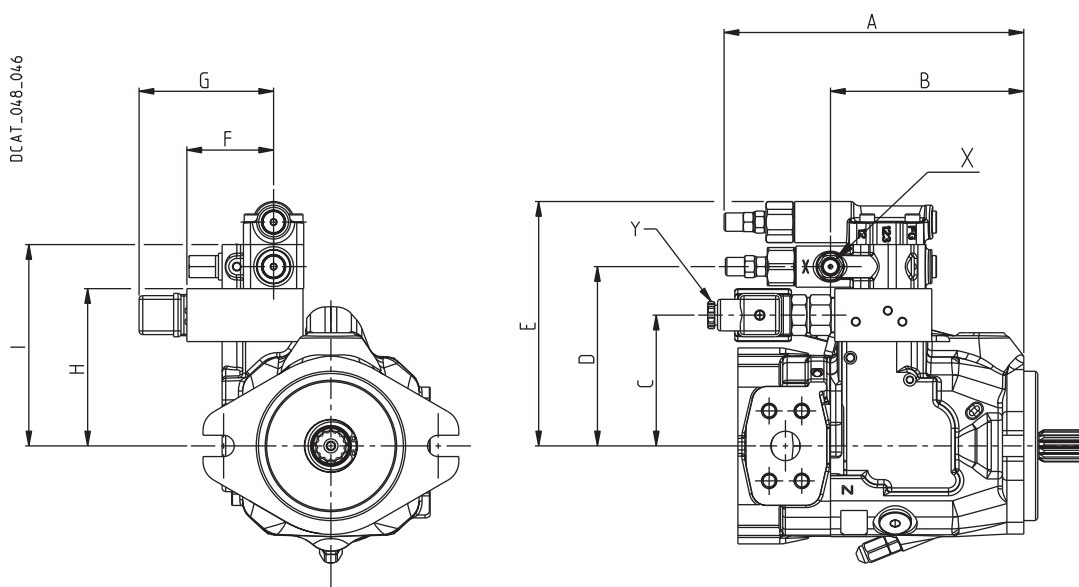


05/10.2014

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)
MVP 30	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)
MVP 48	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)
MVP 60	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.

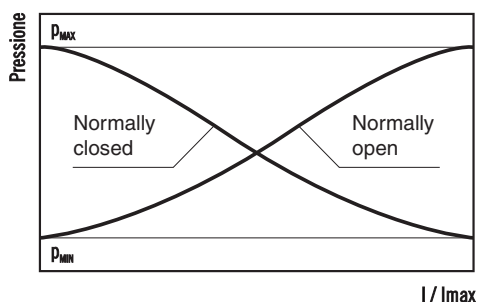
ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR

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⁻¹ and oil temperature 50 °C (122 °F).

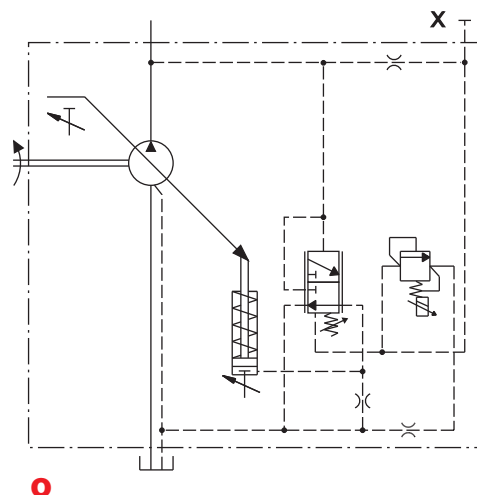


VALVE FEATURES

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	

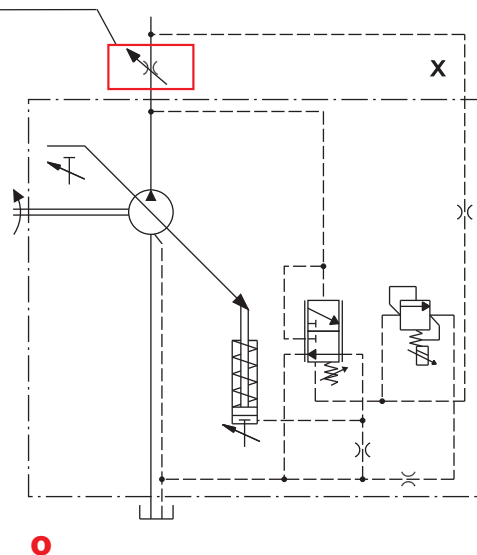
PEC



Replaces: 03/06.2011

PEC - LS2 (with flow control)

Not included in supply

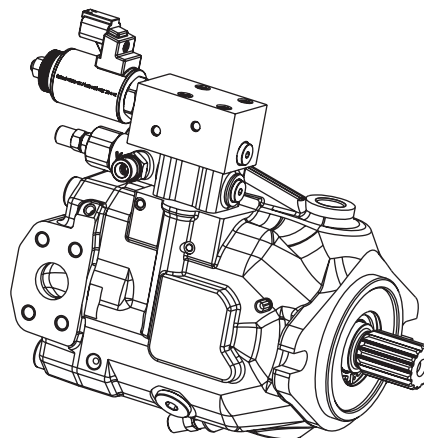
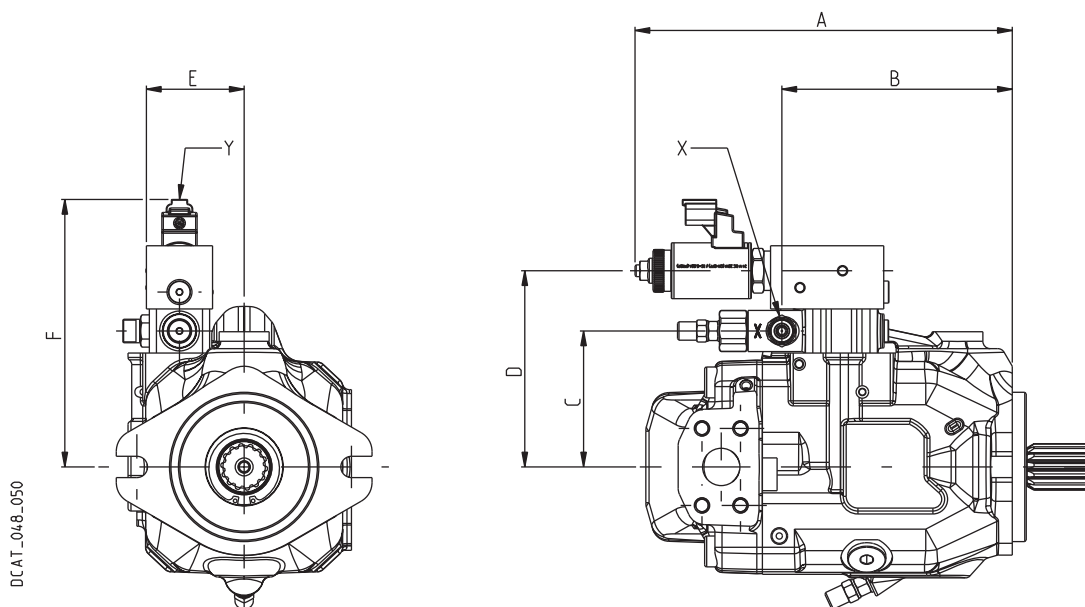


05/10.2014

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)
MVP 30	232 (9.1339)	132 (5.1969)	86 (3.3858)	127 (5.0000)	61 (2.4016)	144 (5.6693)
MVP 48	251 (9.8819)	151 (5.9449)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)
MVP 60	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

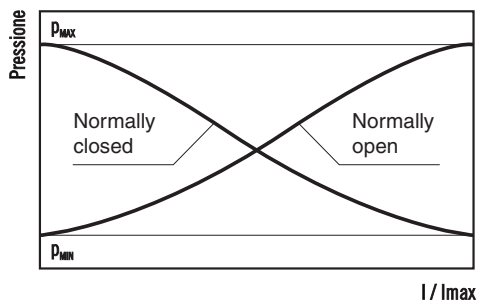
ELECTRO-PROPORTIONAL PRESSURE COMPENSATOR PLUS ANGULAR SENSOR **PECA**

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⁻¹ and oil temperature 50 °C (122 °F).

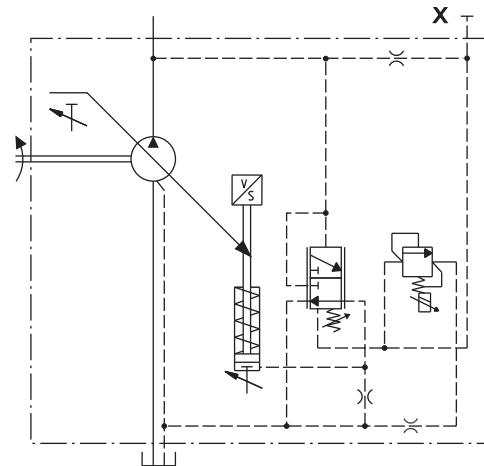


VALVE FEATURES

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

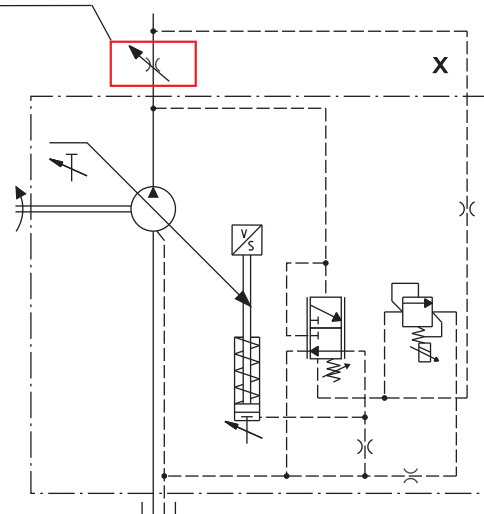
Volt	12 V (+/- 10%)	24 V (+/- 10%)
Limit current	1,7 A	0,85 A
Dither frequency	150 Hz	150 Hz
Operating temperature	-40 °C ÷ 100 °C (-40 °F ÷ 212 °F)	
Connector type	DIN 43 650 / ISO 4400 DEUTSCH DT04-2P	
Angular sensor connector type	DEUTSCH DTM04-4P	

PECA

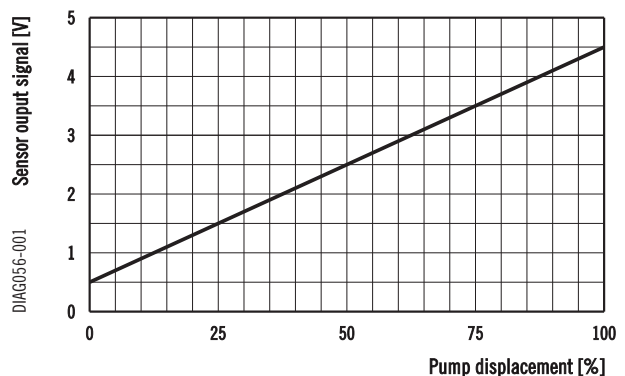


PEC - LS2 (with flow control)

Not included in supply

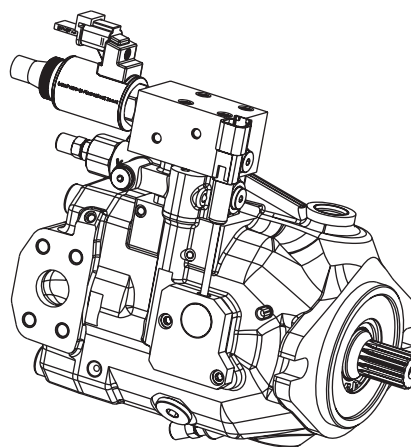
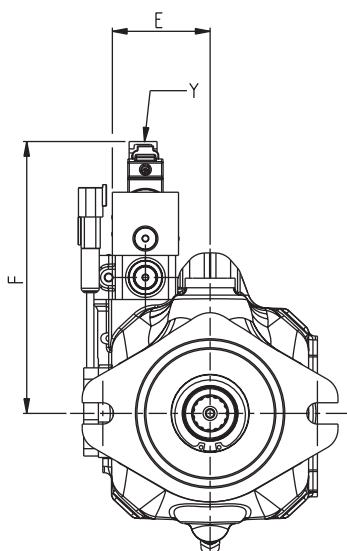


ANGULAR SENSOR

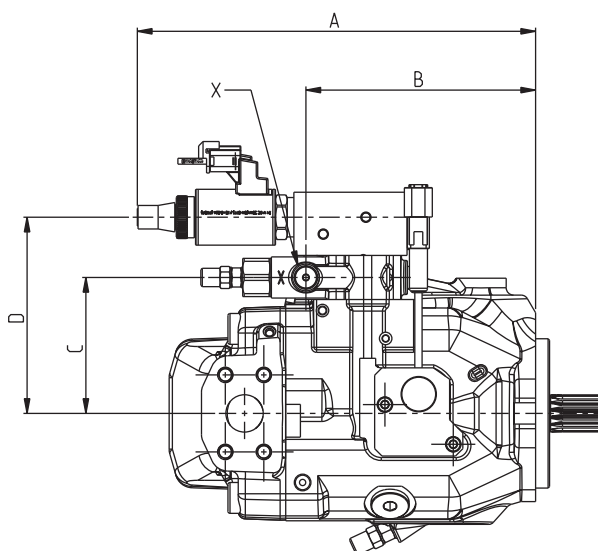


05/10.2014

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)
MVP 30	232 (9.1339)	132 (5.1969)	86 (3.3858)	127 (5.0000)	61 (2.4016)	144 (5.6693)
MVP 48	251 (9.8819)	151 (5.9449)	92 (3.6220)	133,5 (5.2559)	66 (2.5984)	156 (6.1417)
MVP 60	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)
LS0 (■)	RPO	○	
LS2 (◆)	RPO	12 ÷ 40 (174 ÷ 580)	14 (203)
LS3 (●)	RPO		

(■): 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 $\approx 1,3 \div 1,5$ l/min (0.34 ÷ 0.40 US gpm)

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

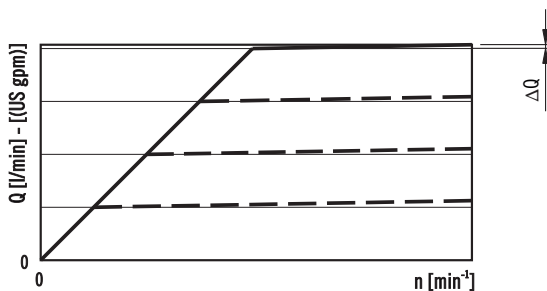
NOTES ○

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

OPERATING CURVES

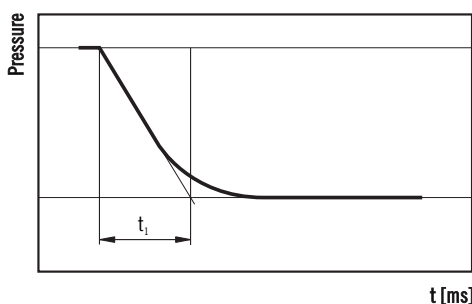
Curves have been obtained at the speed of 1500 min⁻¹ and oil temperature 50 °C (122 °F).

Curve at variable speed

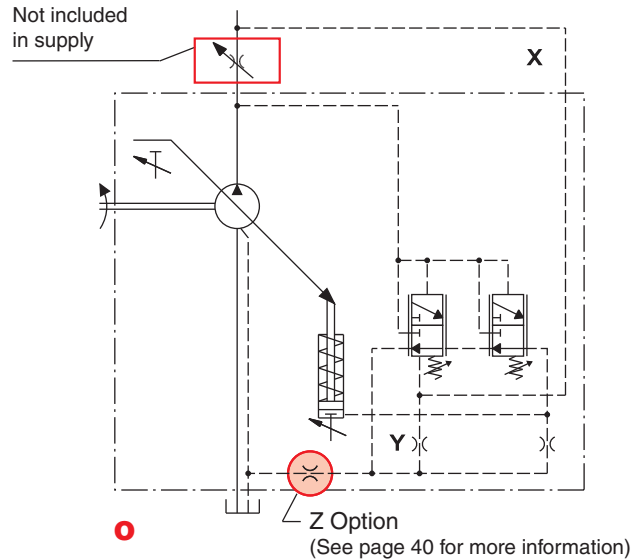


RESPONSE TIME

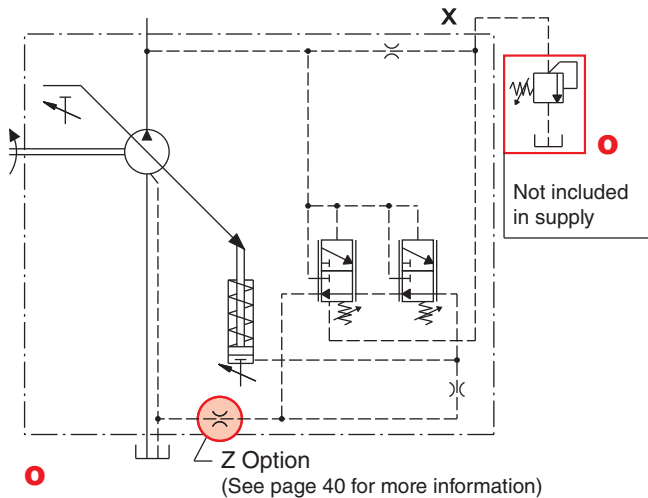
According to SAE J745 (using outlet pressure).



LS0 - LS2



LS3 - Remote pressure compensator



ΔQ max

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

t_i

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

According to SAE J745 (using outlet pressure)

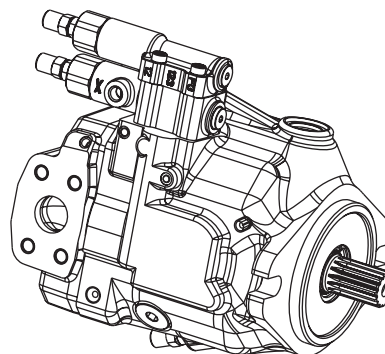
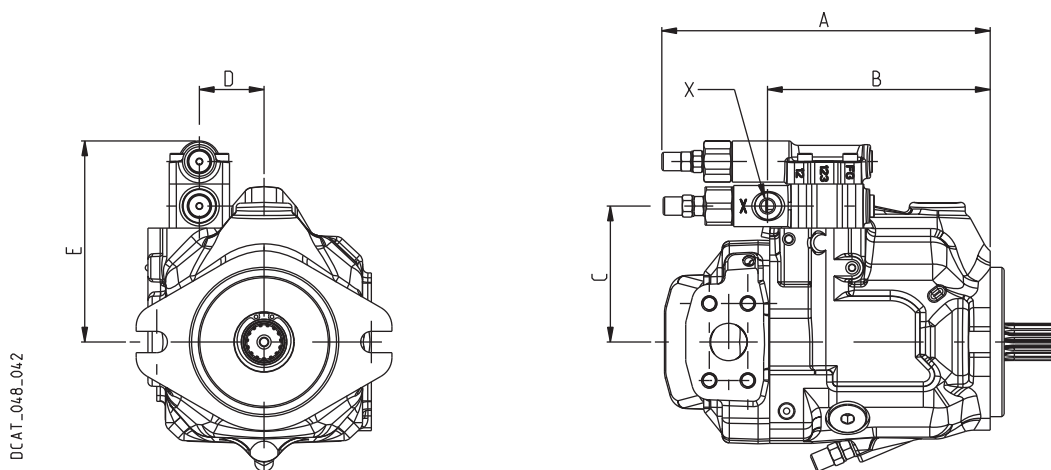
Replaces: 04/01.2012

○ 05/10.2014

FLOW COMPENSATOR (Load-sensing)

LS

Replaces: 03/06.2011



DCAT_048_042

05/10.2014

O

Pump type	A	B	C	D	E
	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)
MVP 30	204 (8.0315)	131,5 (5.1772)	89 (3.5039)	59,5 (2.3425)	136 (5.3543)
MVP 48	223 (8.7795)	151 (5.9449)	95,5 (3.7598)	64,5 (2.5394)	143 (5.6299)
MVP 60	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)
MVP 30	45 (398)	7.1 (9,5)
MVP 48	61 (540)	9.6 (12,9)
MVP 60	97 (859)	15.2 (20,4)

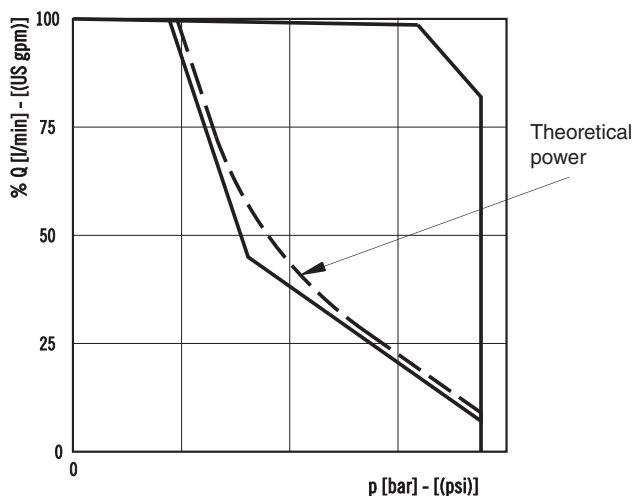
(●) @ 1500 min⁻¹

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⁻¹].

NOTES

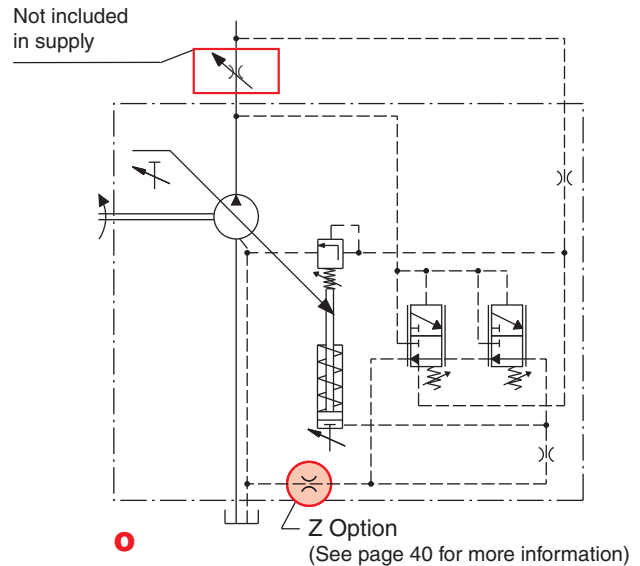
Available without pressure compensator RP.
For more information, please consult our technical sales department.

OPERATING CURVES



RN0 - Standard

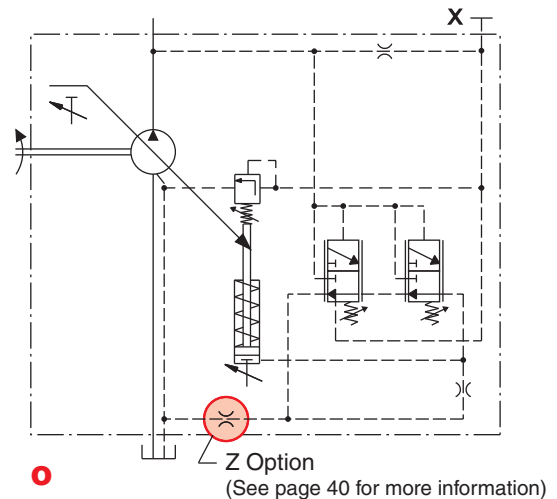
Torque limitation for closed center valve.



Replaces: 04/01.2012

RN1 - Internal pilot

Torque limitation for open center valve.

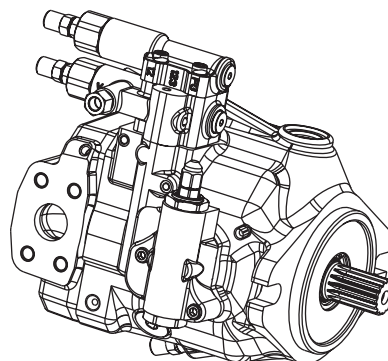
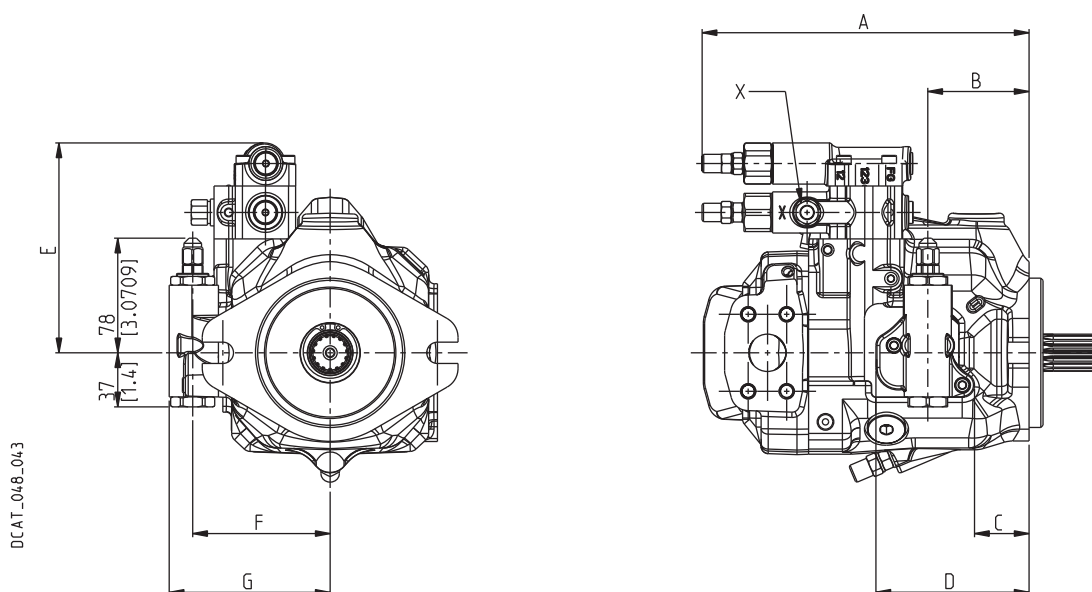


05/10.2014

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)
MVP 30	204 (8.0315)	77 (3.0315)	45 (1.7717)	111 (4.3701)	136 (5.3543)	89,5 (3.5236)	105,5 (4.1535)
MVP 48	223 (8.7795)	69 (2.7165)	37 (1.4567)	103 (4.0551)	143 (5.6299)	93,5 (3.6811)	109,5 (4.3110)
MVP 60	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.

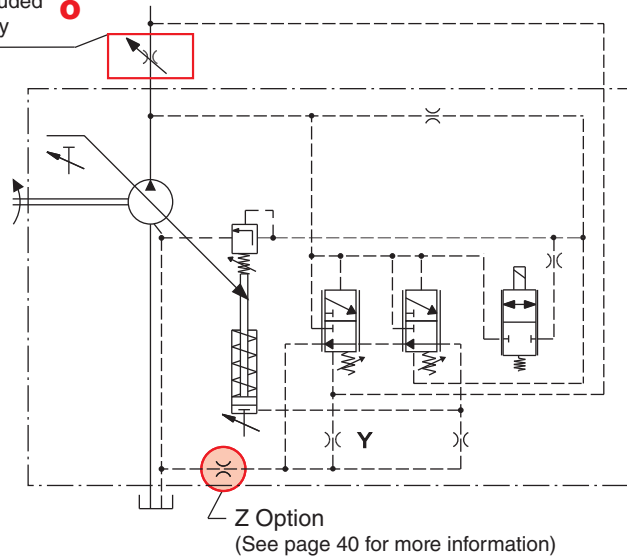
Pump type	Min. torque	Min. power (●)
	Nm (lbf in)	kW (HP)
MVP 30	45 (398)	7.1 (9,5)
MVP 48	61 (540)	9.6 (12,9)
MVP 60	97 (859)	15.2 (20,4)

(●) @ 1500 min⁻¹

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).

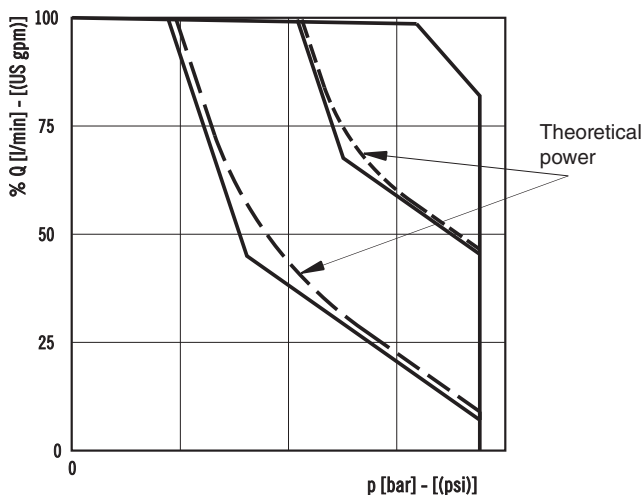
When ordering the torque limiter please specify the requested value of torque [eg. 70 Nm (620 lbf in)] or the requested power and speed [eg. 10 kW (13.4 HP) at 1500 min⁻¹].

Not included
in supply



Replaces: 04/01.2012

OPERATING CURVES



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

Connector type

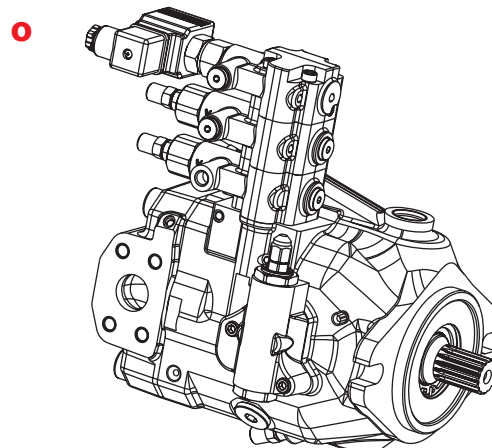
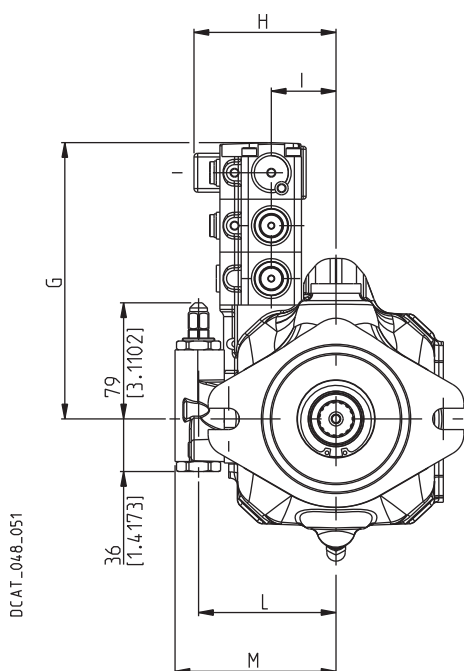
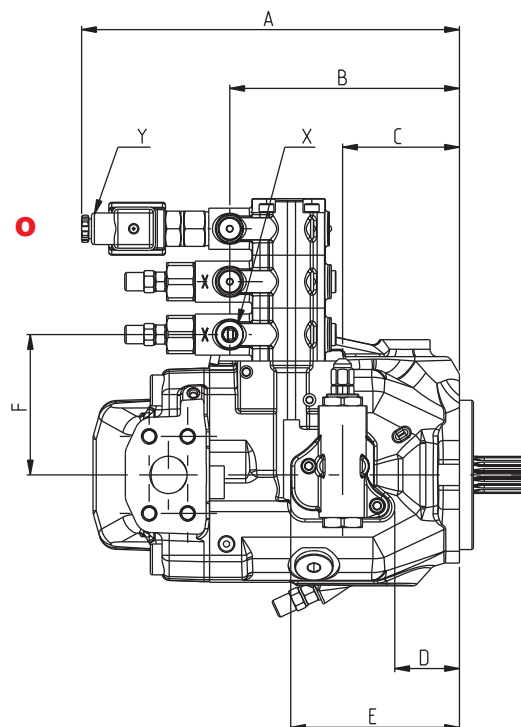
DIN 43 650 / ISO 4400
DEUTSCH DT04-2P

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)
MVP 30	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)
MVP 48	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)
MVP 60	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)

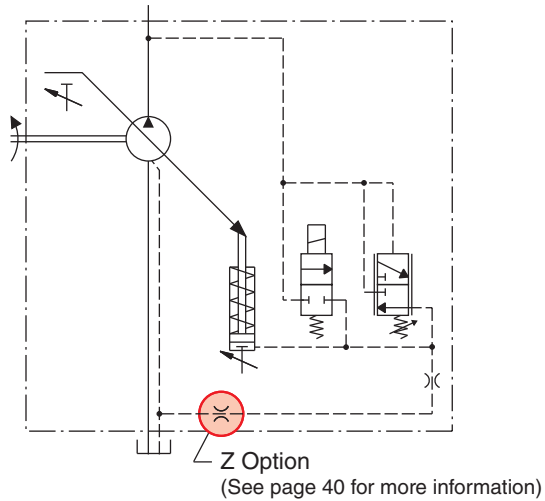
X: Load-sensing port. Dimensions at page 38 ÷ 39

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

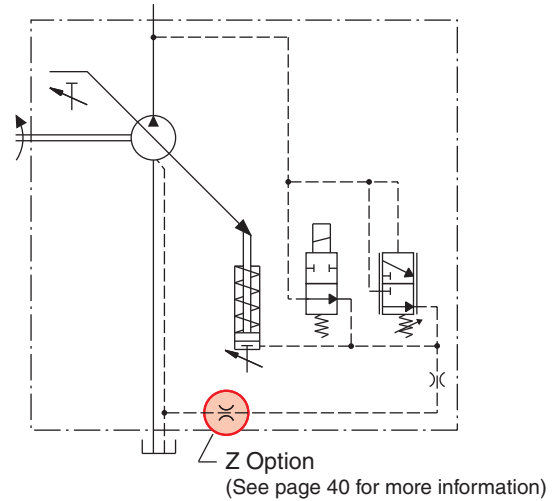
UNLOADING VALVE

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
U1	Normally closed	12 VDC
U2	Normally closed	24 VDC
U3	Normally closed	24 VAC
U4	Normally closed	110 VAC
U5	Normally closed	220 VAC
U6	Normally open	12 VDC
U7	Normally open	24 VDC
U8	Normally open	24 VAC
U9	Normally open	110 VAC
U10	Normally open	220 VAC

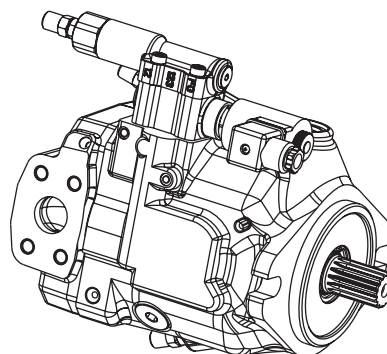
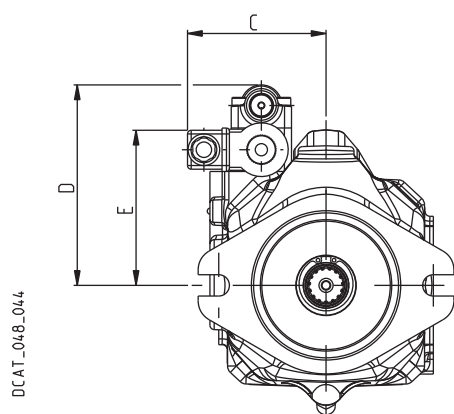
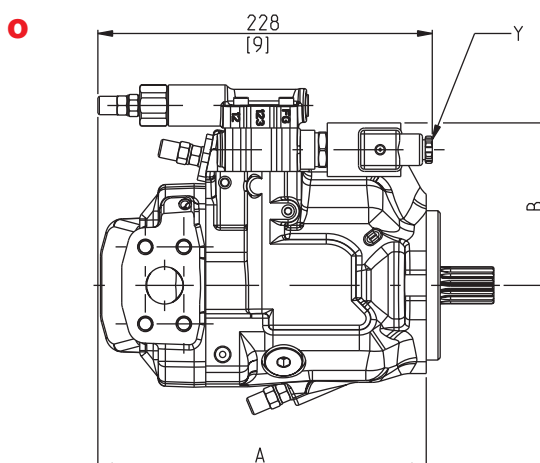
Connector type	DIN 43 650 / ISO 4400
----------------	-----------------------

● 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)
MVP 30	204 (8.0315)	104 (4.0945)	89 (3.5039)	130 (5.1181)	99 (3.8976)
MVP 48	223 (8.7795)	110,5 (4.3504)	94 (3.7008)	137 (5.3937)	105,5 (4.1535)
MVP 60	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.

NOTES

03/06.2011

MULTIPLE PUMPS

THROUGH DRIVE

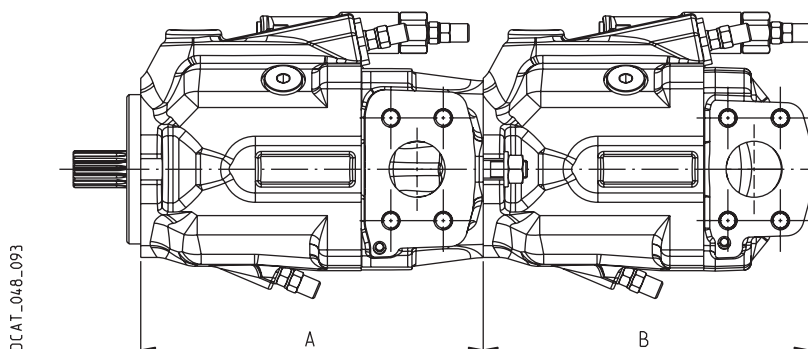
MVP through drive axial piston pumps offer the flexibility to obtain different groups able to supply several hydraulic systems. The operating characteristics of each assembled pumps are the same as the corresponding single pumps according to the following conditions:

- 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.

M	Nm (lbf in)	Torque
V	cm ³ /rev (in ³ /rev)	Displacement
Δp	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.

A			
Pump type	Flanged for	Code	
MVP 30	SAE A	AS1	
	SAE B	AS5	
MVP 48	SAE B	AS5	
MVP 60	SAE B	AS5	

MVP30

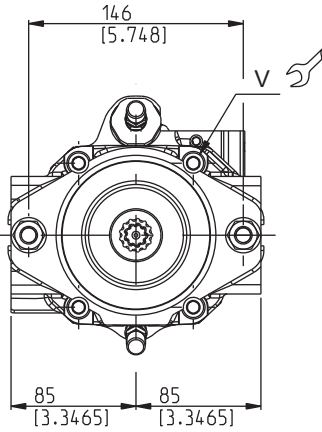
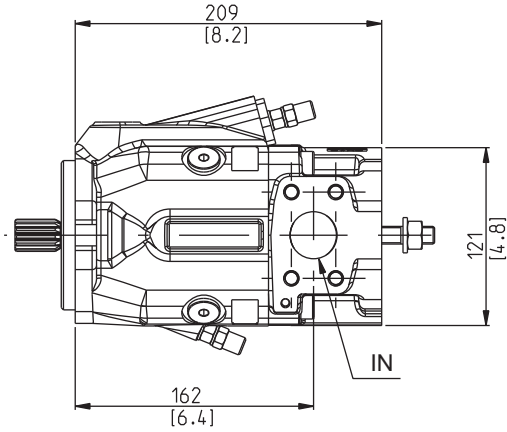
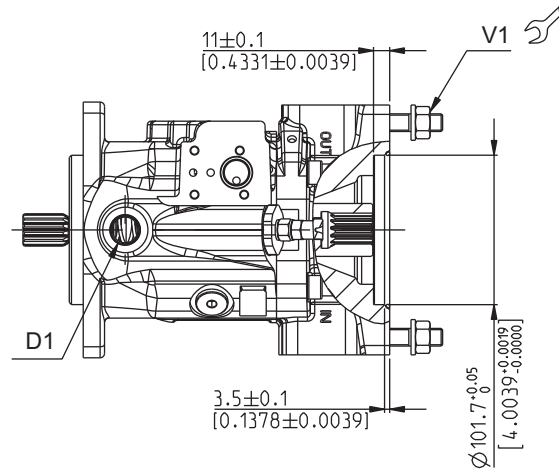
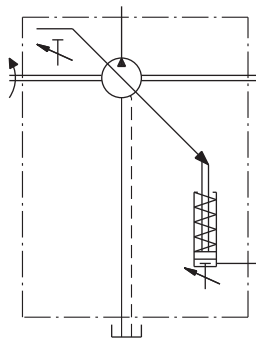
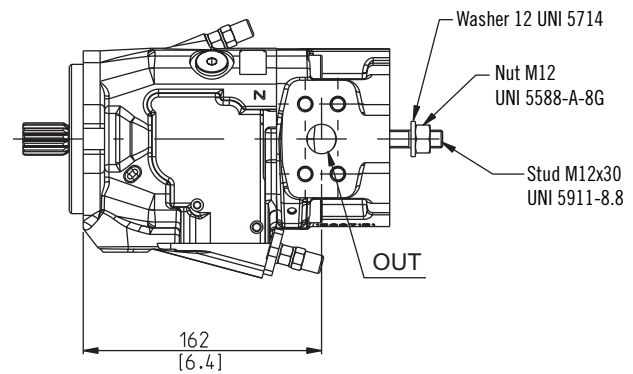
FRONT SECTION - DIMENSIONS

AS1

Through drive SAE A

Drive shafts: page 32
Mounting flanges: page 36

The drawing shows a front section with clockwise rotation



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

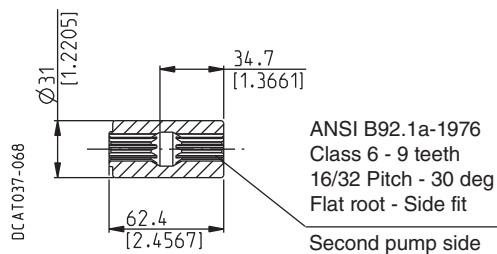
MVP30

COUPLINGS - DIMENSIONS

SAE "A" SPLINE

03

Available with flange code **AS1**

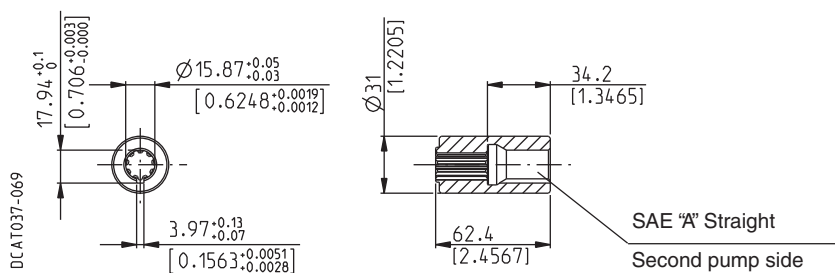


MAX 100 Nm (885 lbf in)

SAE "A" STRAIGHT

31

Available with flange code **AS1**



MAX 70 Nm (620 lbf in)

MVP30

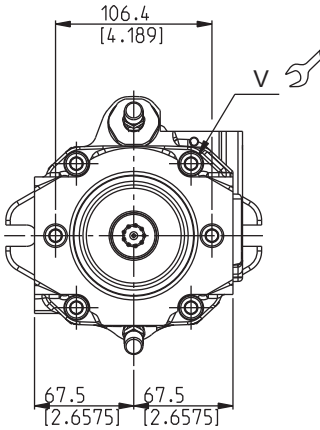
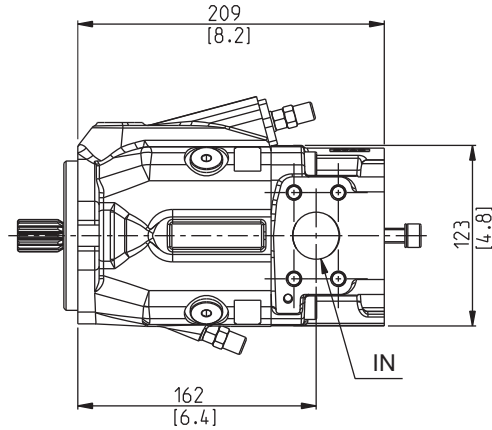
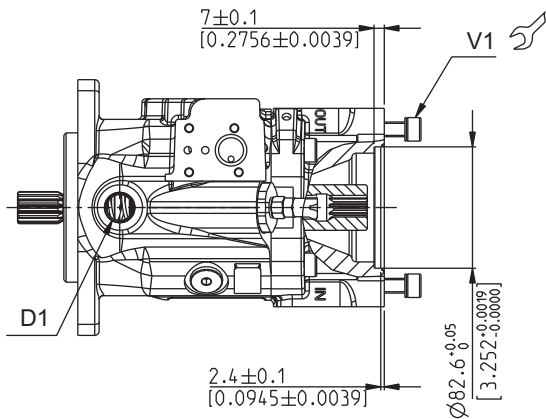
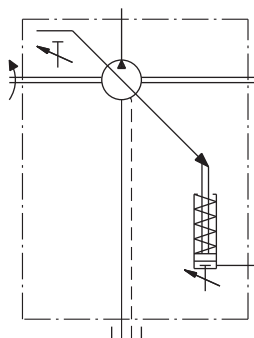
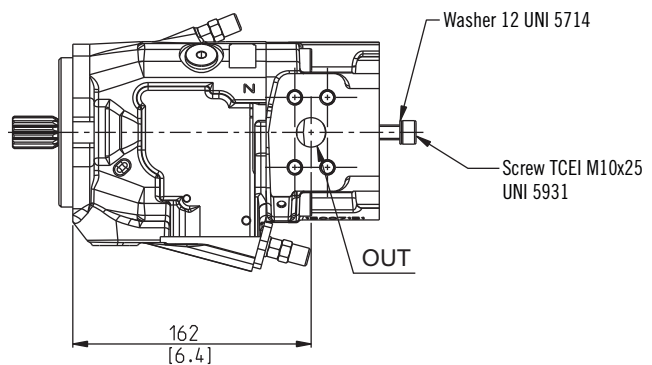
FRONT SECTION - DIMENSIONS

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

MVP30

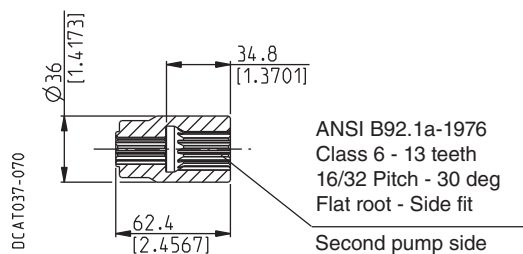
COUPLINGS - DIMENSIONS

AS5

SAE "B" SPLINE

04

Available with flange code **AS5**

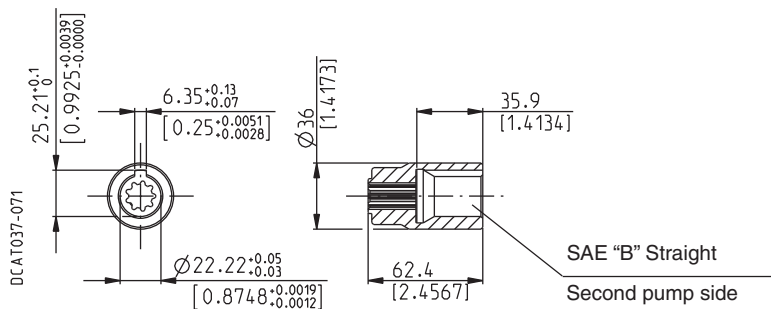


MAX 100 Nm (885 lbf in)

SAE "B" STRAIGHT

32

Available with flange code **AS5**



MAX 100 Nm (885 lbf in)

MVP48

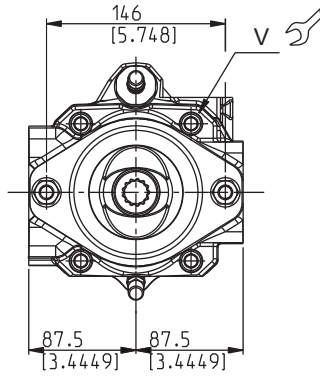
FRONT SECTION - DIMENSIONS

AS5

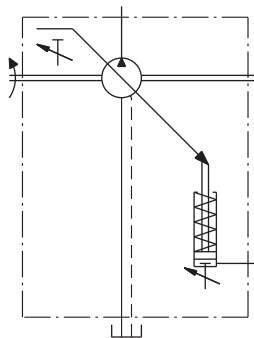
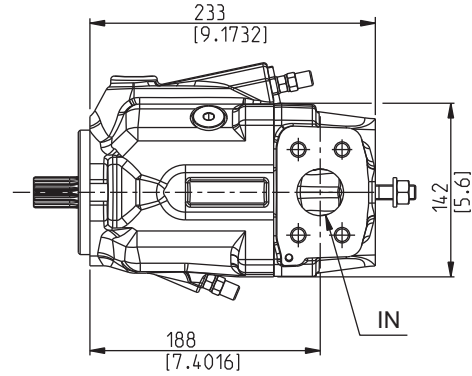
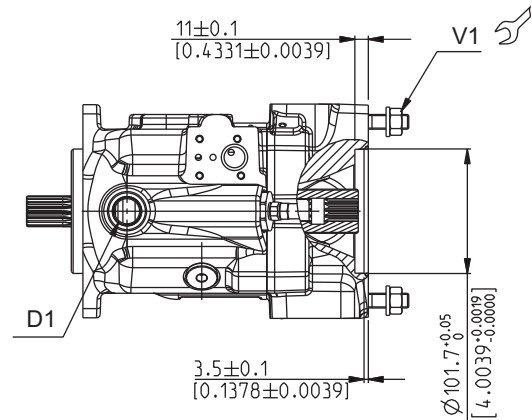
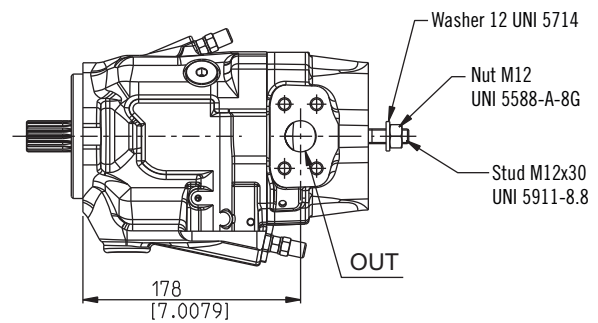
Through drive SAE B

Drive shafts: page 33
Mounting flanges: page 36

The drawing shows a front section with clockwise rotation



DCAT_048_038



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

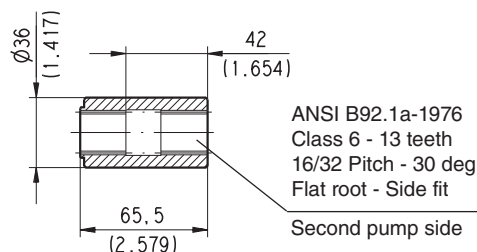
SAE "B" SPLINE

04

Available with flange code **AS5**

Replaces: 03/06.2011

D037-D61/0196



MAX 200 Nm (1770 lbf in)

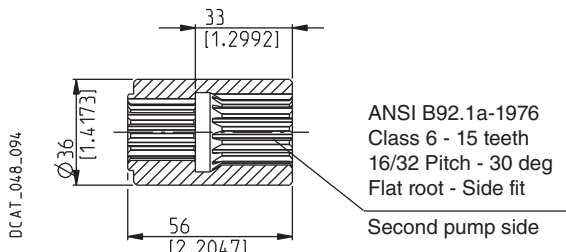
0

SAE "BB" SPLINE

05

Available with flange code **AS5**

0



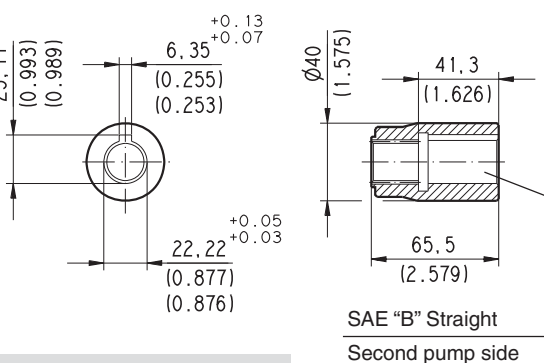
MAX 250 Nm (2213 lbf in)

SAE "B" STRAIGHT

32

Available with flange code **AS5**

D037-D62/0196



MAX 250 Nm (2213 lbf in)

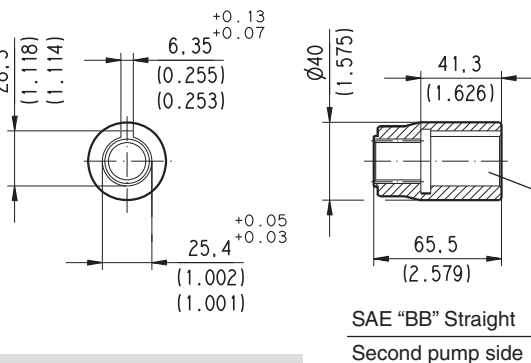
0

SAE "BB" STRAIGHT

33

Available with flange code **AS5**

D037-D64/0196



MAX 250 Nm (2213 lbf in)

05/10.2014

0

MVP60

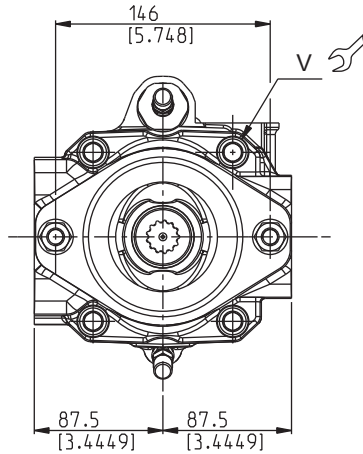
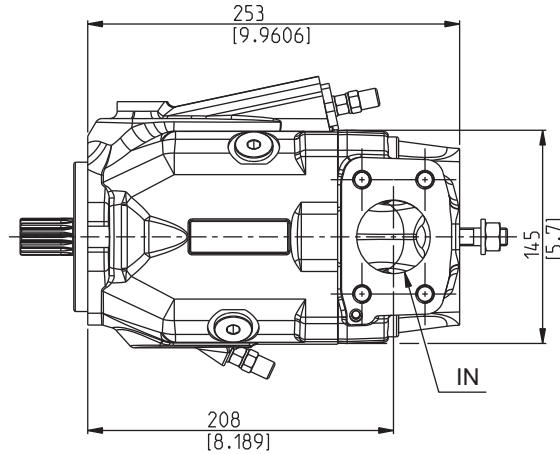
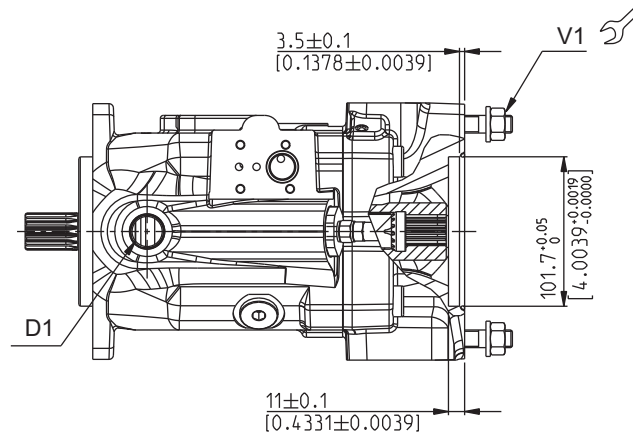
FRONT SECTION - DIMENSIONS

AS5

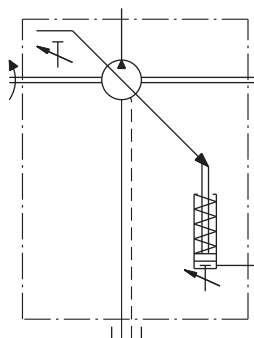
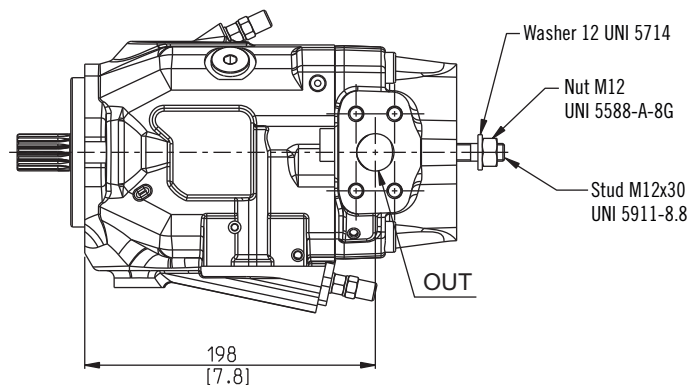
Through drive SAE B

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

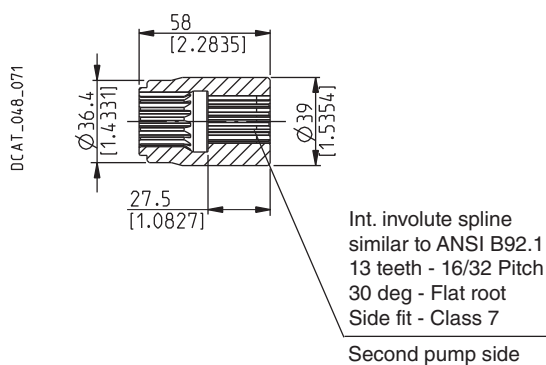
MVP60

COUPLINGS - DIMENSIONS

SAE "B" SPLINE

04

Available with flange code **AS5**



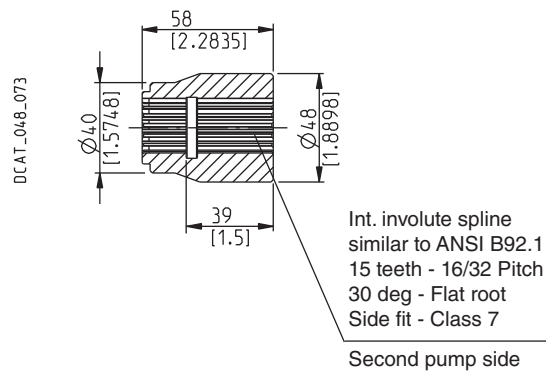
MAX 200 Nm (1770 lbf in)



SAE "BB" SPLINE

05

Available with flange code **AS5**



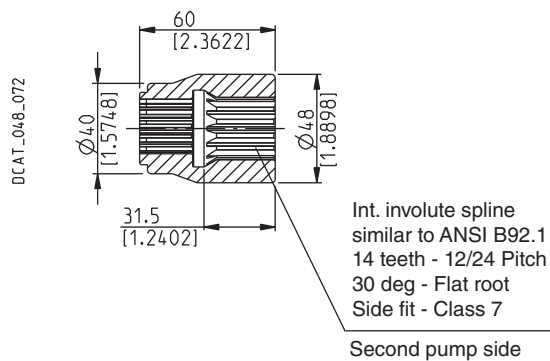
MAX 250 Nm (2213 lbf in))



SAE "C" SPLINE

06

Available with flange code **AS5**

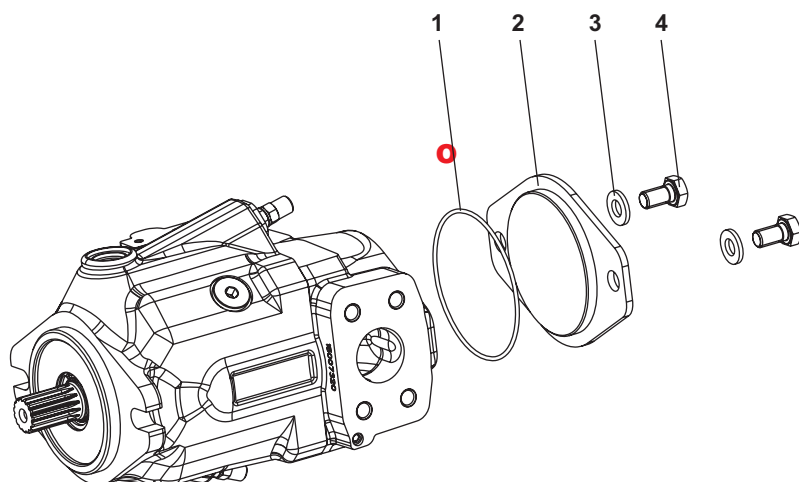


MAX 430 Nm (3806 lbf in)



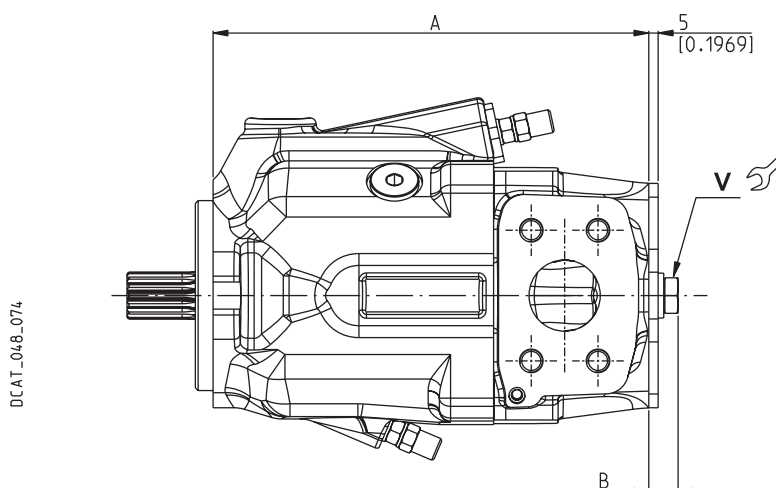
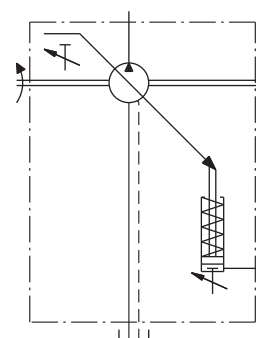
FRONT SECTION KIT COVER

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



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

Screws tightening torque Nm (lbf in)

V
20 ± 1 (159 ÷ 195)

Replaces: 03/06.2011

05/10.2014

NOTES

05/10.2014

HOW TO ORDER SINGLE PUMPS

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

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

2	Rotation	Code
Anti-clockwise		S
Clockwise		D

3	Drive shaft (a)	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 (a)	Code
SAE "B" 2 holes		S5
SAE "C" 2 holes		S7 
SAE "C" 4 holes		S8

5	Ports position	Code
Side		L
Rear		P

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

(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	O 11	12	13
Pressure compensator	RP0 -			Z -		G
Pressure compensator	RP1 -			Z -		G
Pressure compensator with flow control	RP1 -		LS2 -	Z -		G
Dual setting pressure compensator	RP2 -	1 -		Z -	S -	G
Dual setting pressure compensator with flow control	RP2 -	1 -	LS2 -	Z -	S -	G
Flow compensator	LS0 -			Z -		G
Flow compensator for remote control	LS2 -			Z -		G
Pressure compensator for remote control	LS3 -			Z -		G

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

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

Code	Flow control option (b)	10
LS2	Flow compensator	

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

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

Code	Displacement limiter	13
G	Min. and Max. displacement limiter	

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

	8	9	10	11	12	13	14	15	16						
Electro-proportional pressure compensator	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

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

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

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

Code	Flow control option (a)	11
LS0	Flow compensator	
LS2	Flow compensator for remote control	

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

Code	Displacement limiter	13
G	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	

- (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

05/10.2014

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

Common inlet

O

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
Pump type	Nominal size	
	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

O 05/10.2014

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

Replaces: 03/06.2011

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

O

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

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

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

2	Rotation	Code
Anti-clockwise		S
Clockwise		D

3	Drive shaft (b)	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 (b)	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	Code
Pump type	Nominal size	
	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
SAE FLANGED PORTS UNC THREAD (SSS)		
MVP 30	1" 1/4	3/4" SD/SB
MVP 48	1" 1/2	1" SE/SC
MVP 60	2"	1" SF/SC

Code	Inlet/outlet ports	6
Nominal size		
Inlet IN	Outlet OUT	Pump type
SAE 3000	SAE 3000	
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 (c)	10
AS1	SAE "A" 2 holes	
AS5	SAE "B" 2 holes	

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

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

Replaces: 03/06.2011

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HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/PISTON PUMP

Replaces: 03/06.2011

Code	Second torque limiter setting (#)	13
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (#)	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.

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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)

NOTES

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

