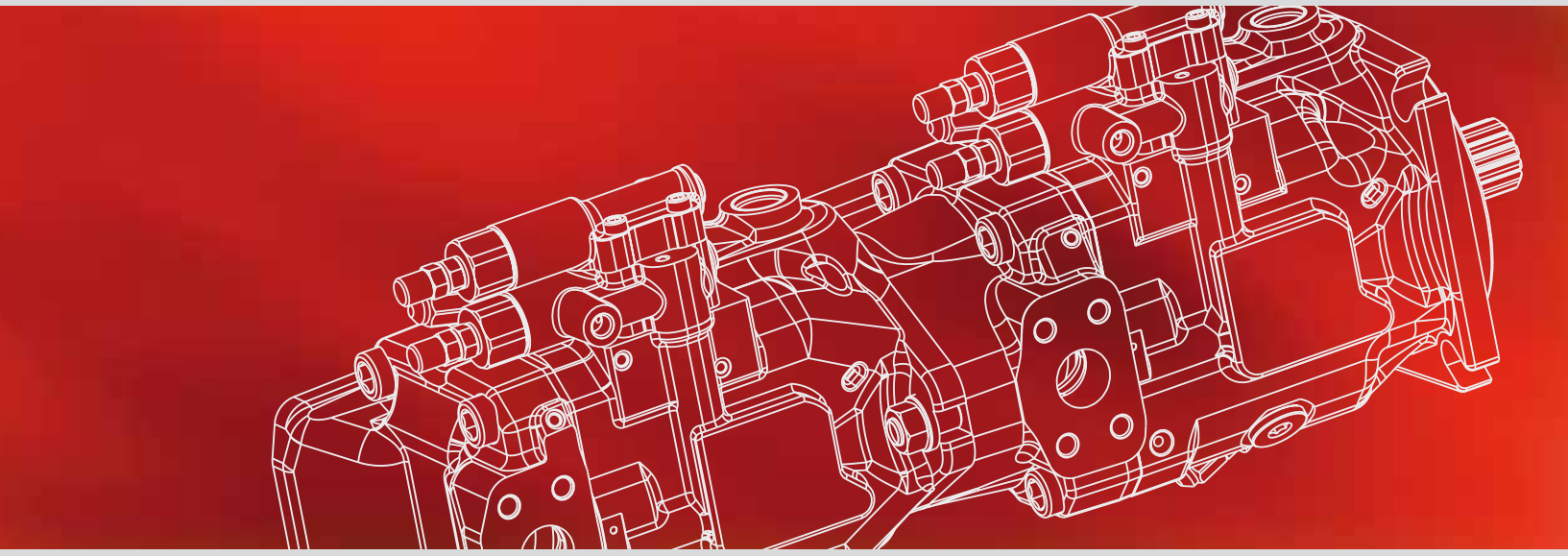
CASAPPA®
FLUID POWER DESIGN



VARIABLE DISPLACEMENTS AXIAL PISTON PUMPS

MVP

INDEX

Replaces: 07/03.2022
O 08/05.2024

O Modification from former edition.

INTRODUCTION

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.

DISPLACEMENTS
From 14 cm^3/rev (0.85 in^3/rev)
To 84,7 cm^3/rev (5.17 in^3/rev)

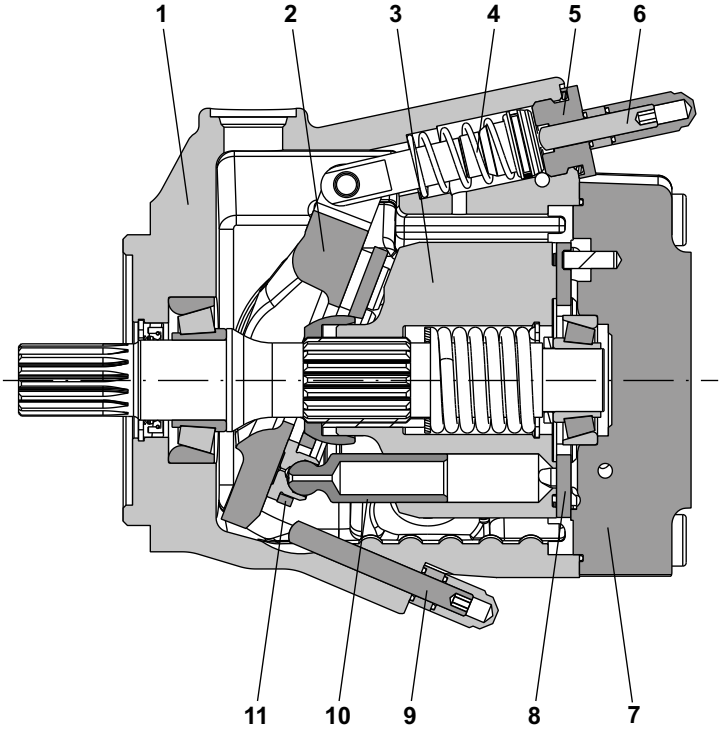
PRESSURE
Max. constant operating pressure 280 bar (4060 psi)
Max. system pressure (relief valve setting) 315 bar (4568 psi)
Max. peak of pressure 350 bar (5075 psi)

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

06/06.2020

- 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 7 ÷ 9. 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)	Δp < 140 (2030)	140 < Δp < 210 (2030) (3045)	Δp > 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 $\beta x_{(c)} \geq 75$ according to ISO 16889	10 µm	10 µm	10 µm

Casappa recommends to use its own production filters:

IKRON® Fluid Filtration

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 pre-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 (12 psi). Inlet pressure less than 0,8 bar (12 psi) 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.

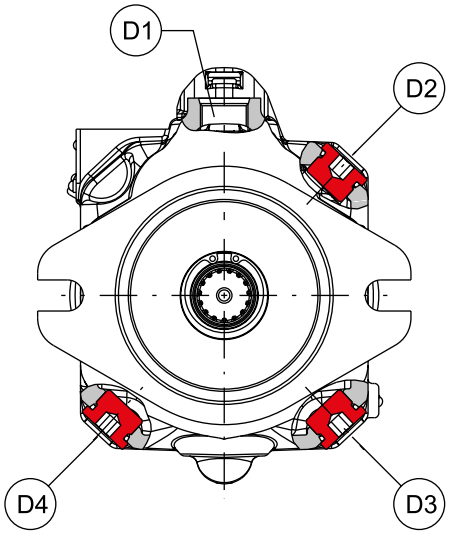
All the temperature are referred to oil with viscosity ISO VG 32 according to DIN 51 519.

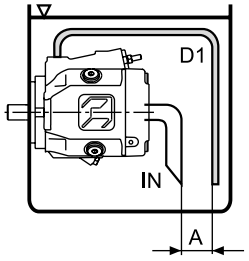
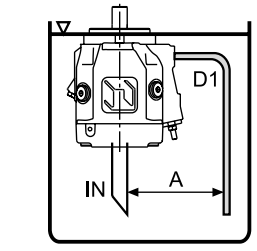
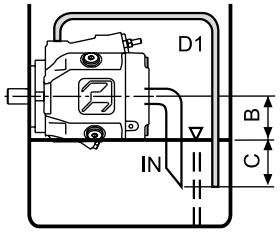
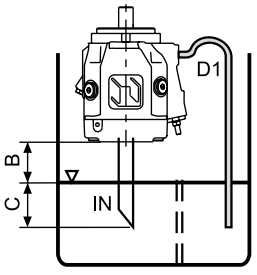
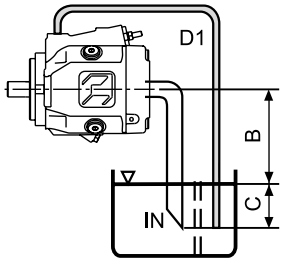
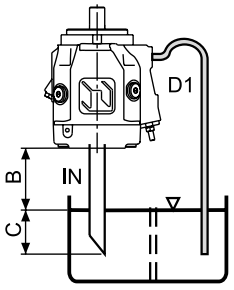
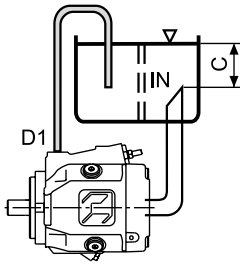
SUGGESTIONS
To prevent cavitation at low temperature we suggest:
- To warm up the tank
- To pressurize the tank
- To oversize the inlet hose

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.



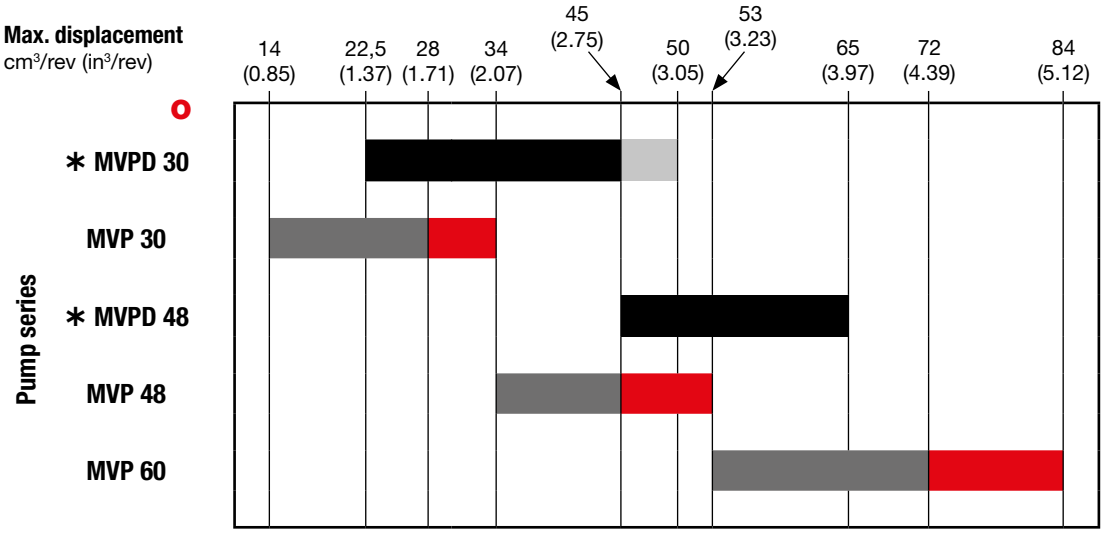
HORIZONTAL MOUNTING		VERTICAL MOUNTING	
	**Arrangement inside the tank.** Minimum oil level equal or above the pump mounting face. A ≥ 200 mm (7.874 in)		**Arrangement inside the tank.** Minimum oil level equal or above the pump mounting face. A ≥ 200 mm (7.874 in)
	**Arrangement inside the tank.** Minimum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

06/06.2020

DISPLACEMENTS AND WORKING PRESSURES RANGE

MVP-MVPD Comparison



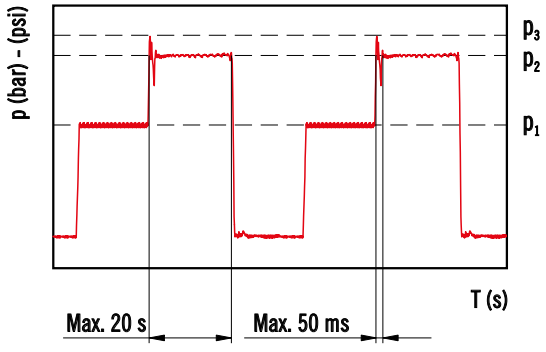
Working pressure
bar (psi)

p2	-	p3	p2	-	p3
260 (3770)	-	290 (4205)	235 (3408)	-	265 (3843)
315 (4568)	-	350 (5075)	280 (4060)	-	315 (4568)

∗: MVPD Series. For more information please consult the respective technical catalogue.

Replaces: 06/06.2020

PRESSURE DEFINITION



p_1 Constant operating pressure
p_2 System pressure (relief valve setting)
p_3 Peak of pressure

The peak of pressure is the max pressure allowed and it corresponds to the overshoot of the relief valve.

Please note that both relief valve setting and overshoot must be lower than their limits.
If the relief setting is compliant but the overshoot is higher than the limit, the relief setting must be decreased until the overshoot is compliant to Casappa limit.

Please contact us for high frequency applications.

08/05.2024

FEATURES

Technical data with mineral oil

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

Replaces: 07/03.2022

Pump type MVP			30-28	30-34	48-45	48-53	60-60	60-72	60-84
Max. displacment (theor.) V_{max}	cm^3/rev (in^3/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)	p_1	280 (4060)	250 (3625)	280 (4060)	250 (3625)	280 (4060)	280 (4060)	250 (3625)
		p_2	315 (4568)	280 (4060)	315 (4568)	280 (4060)	315 (4568)	315 (4568)	280 (4060)
		p_3	350 (5075)	315 (4568)	350 (5075)	315 (4568)	350 (5075)	350 (5075)	315 (4568)
Max. drain line pressure	bar abs. (psi)					1,5 (22)			
Max. speed n_{max}	min^{-1}	@ V_{max} (1)	3500	2900	3000	2500	3000	2700	2300
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)	194 (51.3)
		@ 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)
Max. power (theor.) ($\Delta p = p_{max}$ cont.)	kW (HP)	@ n_{max}	45,7 (61.2)	42,1 (56.4)	63 (84.4)	55,9 (74.9)	84 (112.6)	90,7 (121.5)	81 (108.5)
		@ 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)
Max. torque (theor.)	Nm (lbf in)	@ p_{max} cont.	124,8 (1105)	138,5 (1226)	200,5 (1775)	213,7 (1891)	267,4 (2367)	320,9 (2840)	337 (2983)
		@ 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 rotary group	kgm^2 (ft^2 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)		-25 (-13)		
		max. cont.			80 (176)		110 (230)		
		max. peak			100 (212)		125 (257)		

o 08/05.2024

(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.
Max. speed limit are: MVP 30: 3500 min^{-1} - MVP 48: 3000 min^{-1} - MVP 60: 3000 min^{-1}
Please contact us for different working conditions.

FEATURES

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)	p_1				140 (2030)			
		p_2				150 (2175)			
		p_3				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)	p_1				160 (2320)			
		p_2				170 (2465)			
		p_3				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)	p_1				180 (2610)			
		p_2				195 (2828)			
		p_3				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 %			

05/10.2014

FEATURES

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)	p_1				200 (2900)			
		p_2				220 (3190)			
		p_3				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)	p_1				180 (2610)			
		p_2				195 (2828)			
		p_3				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)	p_1				180 (2610)			
		p_2				195 (2828)			
		p_3				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 %			

05/10.2014

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 %0			

FEATURES

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, Δp, n)		Volumetric efficiency
$\eta_{hm} = \eta_{hm}$ (V, Δp, n)		Hydro-mechanical efficiency
$\eta_t = \eta_v \bullet \eta_{hm}$		Overall efficiency

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

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

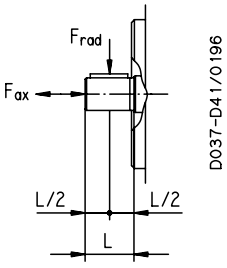
$$M = \frac{M_{theor.}}{\eta_{hm}}$$

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

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

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

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 %				
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

% Variation of the max. speed

03/06.2011

Max. speed must not exceed the limits specified at page 7.

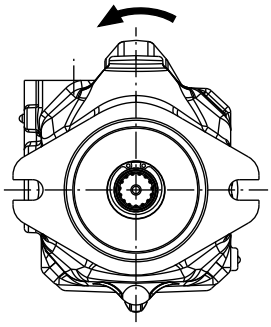
Example 1
Displacement: 100 %
Speed: 100 %
Inlet pressure: 1,0 bar abs. (14.5 psi)

Example 2
Displacement: 80 %
Inlet pressure: 1,0 bar abs. (14.5 psi)
Speed: 115 %

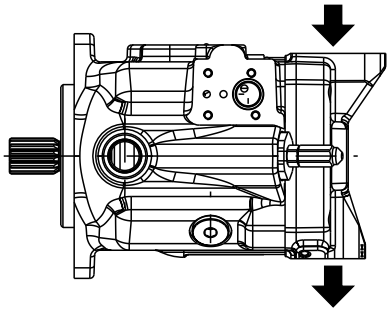
FEATURES

Definition of rotation direction looking at the drive shaft

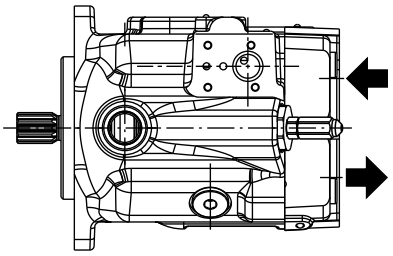
Anti-clockwise rotation



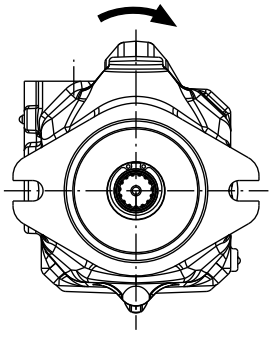
Side ports



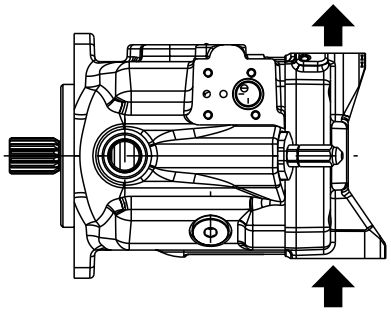
Rear ports



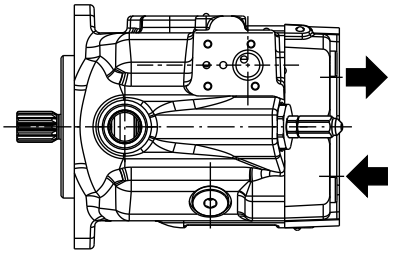
Clockwise rotation



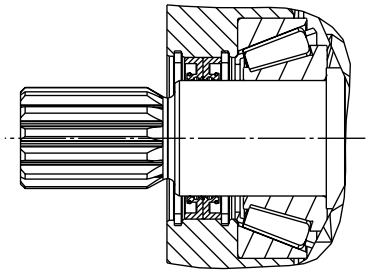
Side ports



Rear ports



DOUBLE SHAFT SEAL OPTION



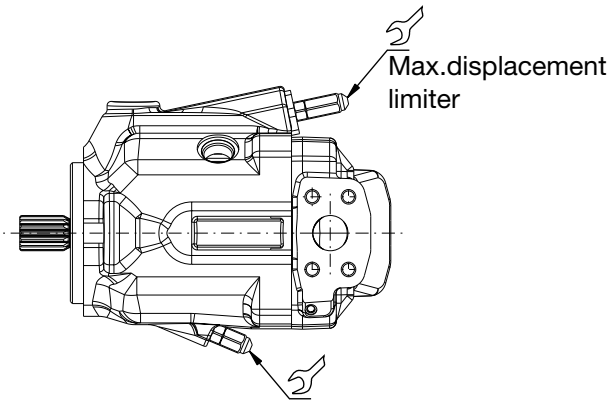
The double shaft seal is available for the following configuration:

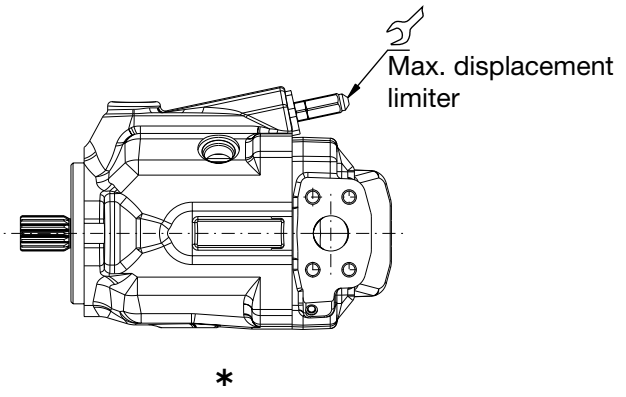
Pump type	MOUNTING FLANGES			
	S1	S5	S7	S8
MVP30	x	x		
MVP48		x		
MVP60			x	x

X Available combination

07/03.2022

DISPLACEMENT SETTING





E: Max. displacement limiter (Min displacement limiter is plugged)

G: Min. and Max. displacement limiter

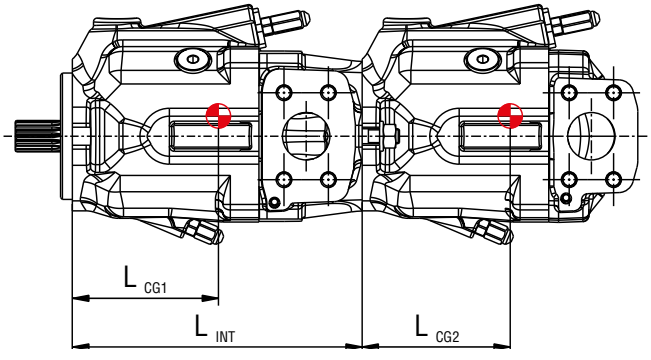
Tightening torque 15$^{\pm 1}$ Nm (124 ÷ 142 lbf in)

* Special body without Min. displacement limiter is available only on request, please contact us for more information

		O	MVP30	MVP48	MVP60
Max. displacement setting range	cm³/rev (in³/rev)	from	14 (0.85)	34 (2.07)	53 (3.23)
		to	34 (2.07)	53 (3.23)	84 (5.12)
Min. displacement setting range	cm³/rev (in³/rev)	from	0	0	0
		to	14 (0.85)	10,7 (0.65)	38,1 (2.32)
One turn of screw changes pump displacement by approximately	cm³/rev (in³/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)

Please contact us for different setting range.

CENTER OF GRAVITY



Center of gravity

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

M_{MF}: Load moment on mounting flange

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

m : Weight (kg)

		MVP30	MVP48	MVP60
L_{CG1}	mm (in)	100 (3.94)	116 (4.57)	120 (4.72)
L_{CG2}	mm (in)	90 (3.54)	99 (3.90)	107 (4.21)
L_{INT}	mm (in)	208 (8.19)	233 (9.17)	253 (9.96)

For single pumps refer to L_{CG2} values
Avarage data, please contact us for specific values.

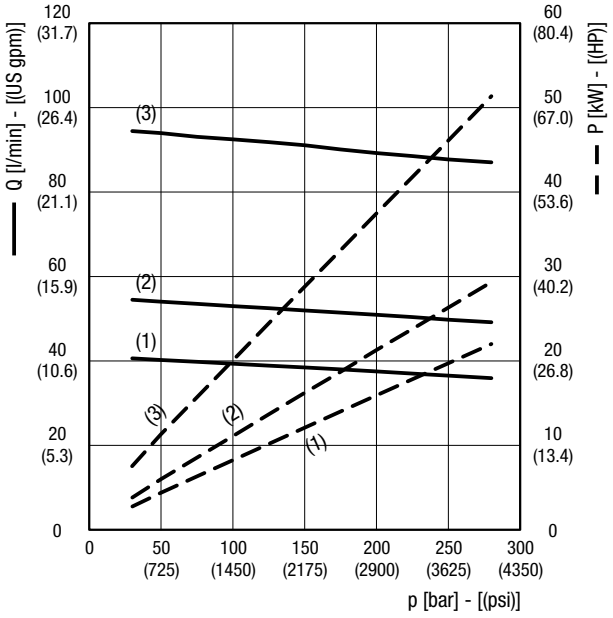
Replaces: 06/06.2020

O 08/05.2024

MVP30•28 OPERATING CURVES

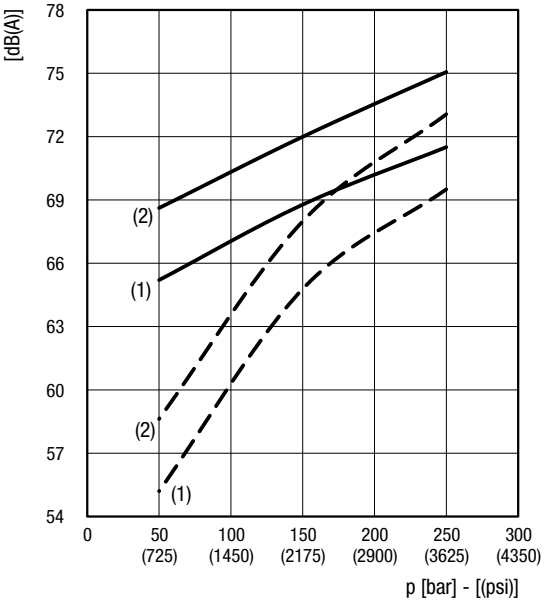
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 3500 min^{-1}

Delivery / power
@ max. displacement

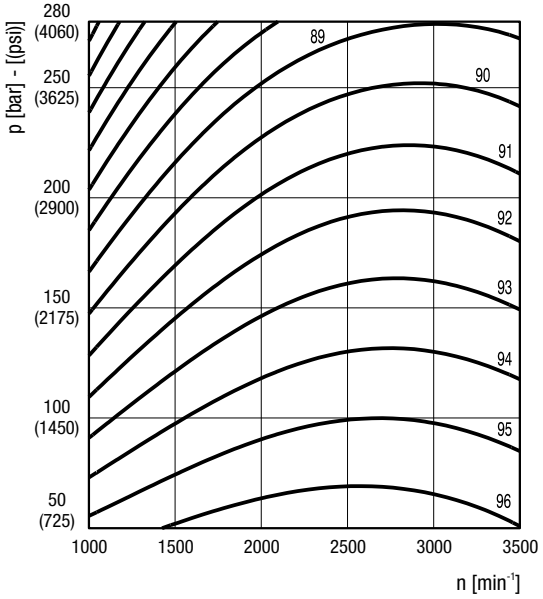


Noise level Distance from microphone to pump = 1 m (39.37 in)

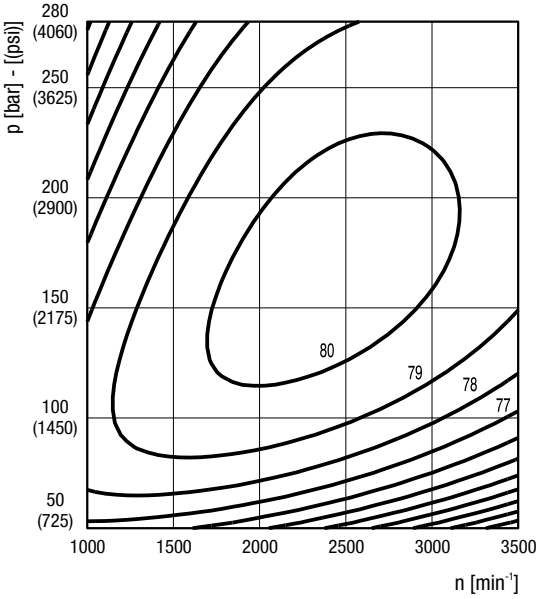
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement

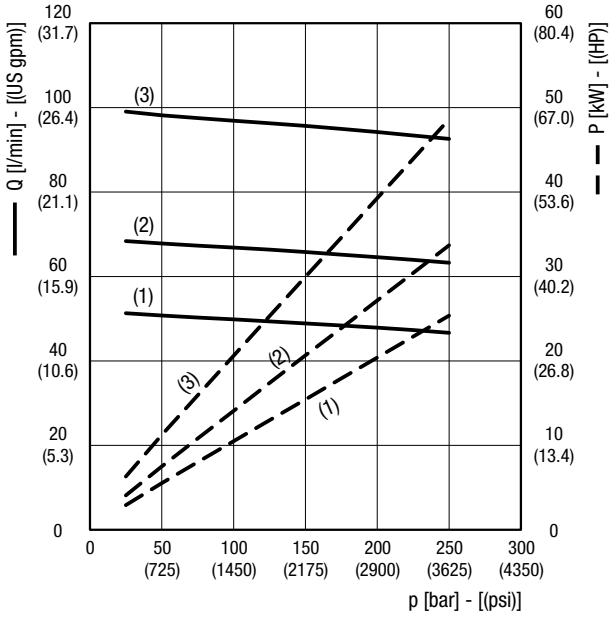


Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

MVP30•34 OPERATING CURVES

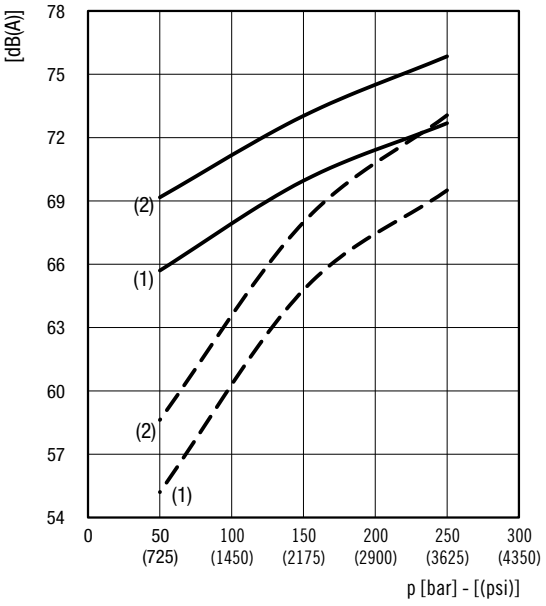
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 2900 min^{-1}

Delivery / power
@ max. displacement

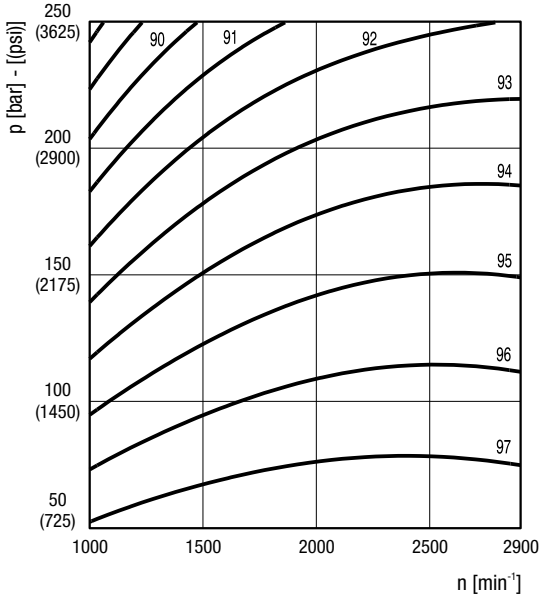


Noise level Distance from microphone to pump = 1 m (39.37 in)

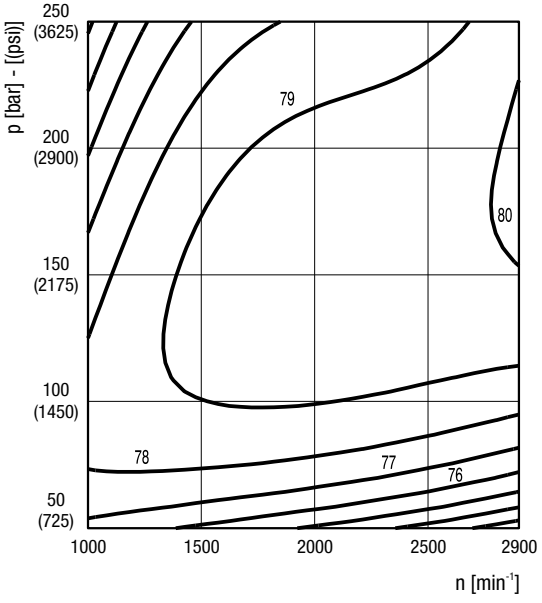
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



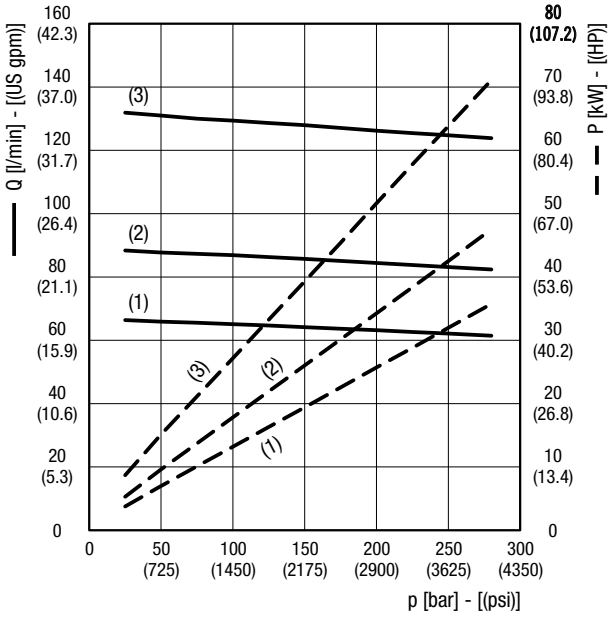
06/06.2020

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

MVP48•45 OPERATING CURVES

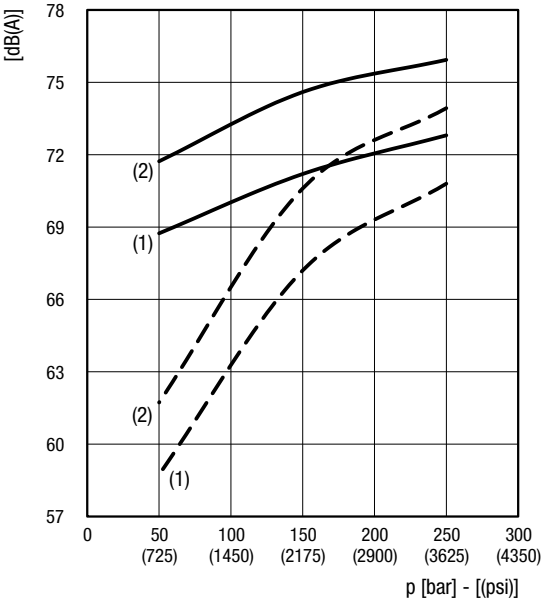
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 3000 min^{-1}

Delivery / power
@ max. displacement

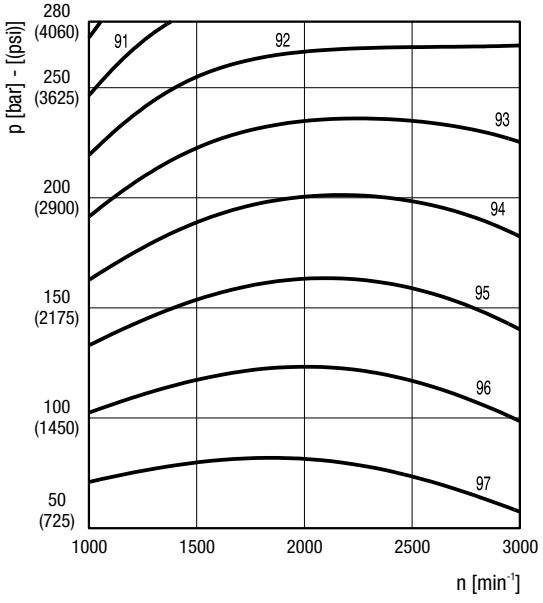


Noise level Distance from microphone to pump = 1 m (39.37 in)

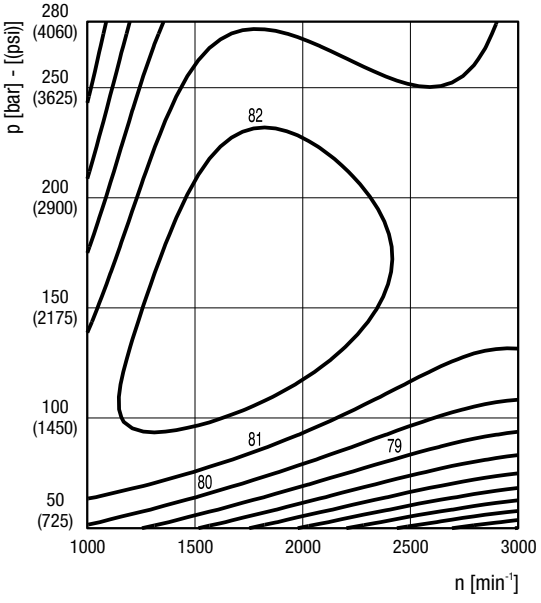
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



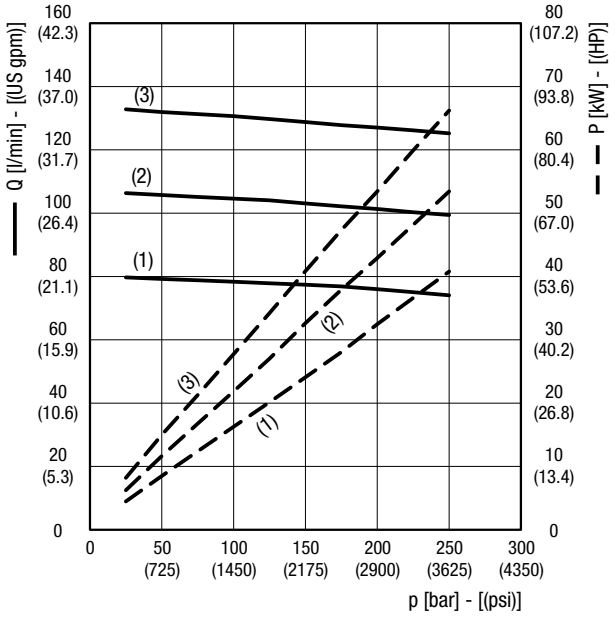
Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

06/06.2020

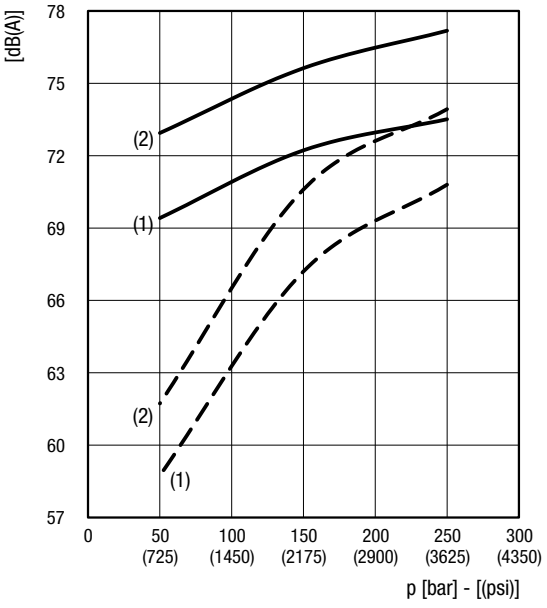
MVP48•53 OPERATING CURVES

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}

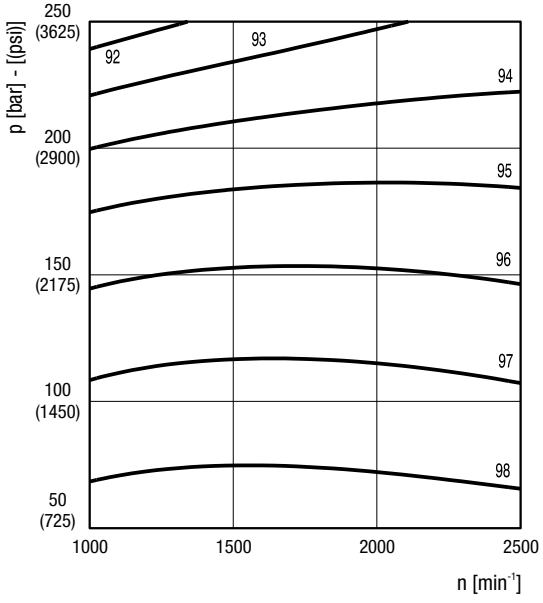
Delivery / power
@ max. displacement



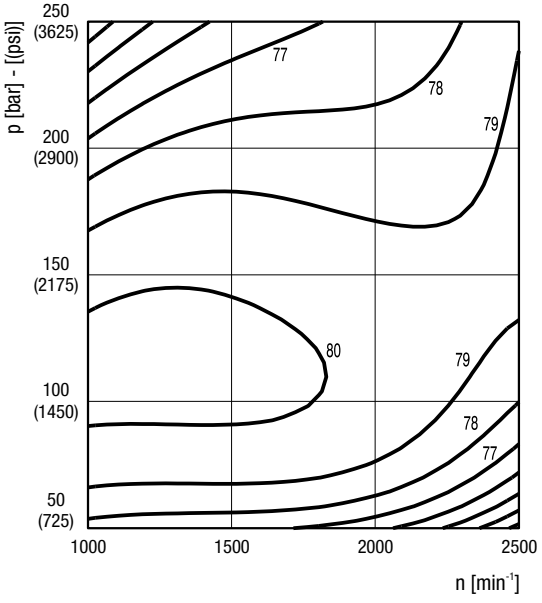
Noise level Distance from microphone to pump = 1 m (39.37 in)
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



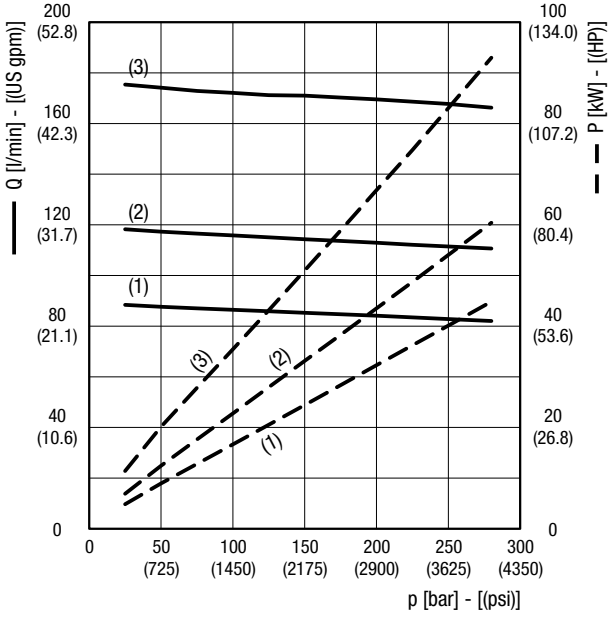
06/06.2020

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

MVP60•60 OPERATING CURVES

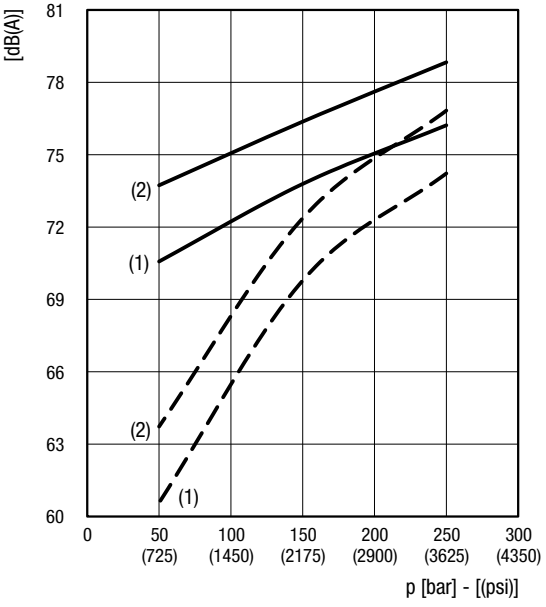
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 3000 min^{-1}

Delivery / power
@ max. displacement

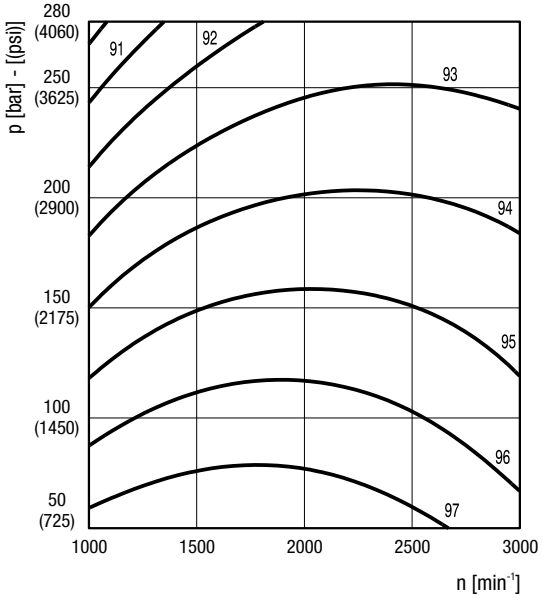


Noise level Distance from microphone to pump = 1 m (39.37 in)

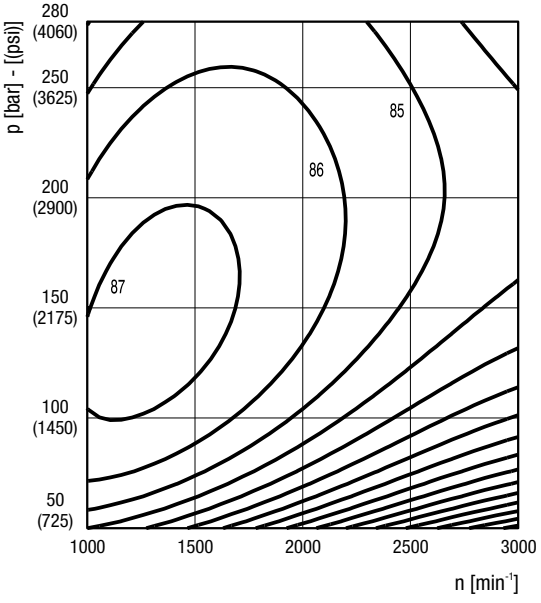
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



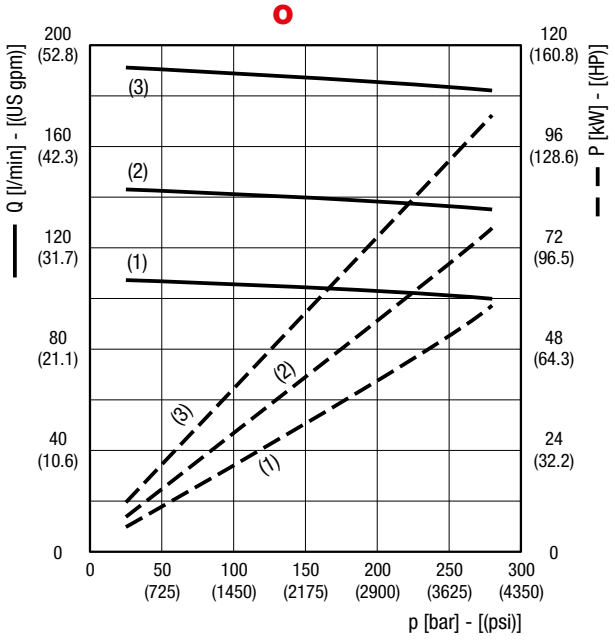
06/06.2020

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

MVP60•72 OPERATING CURVES

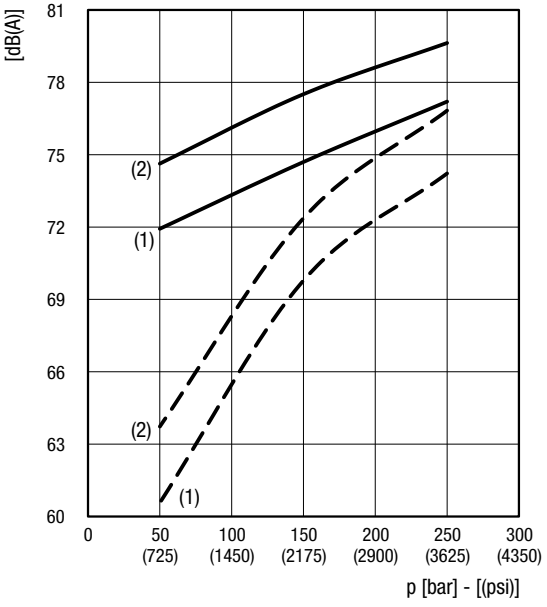
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 2700 min^{-1}

Delivery / power
@ max. displacement

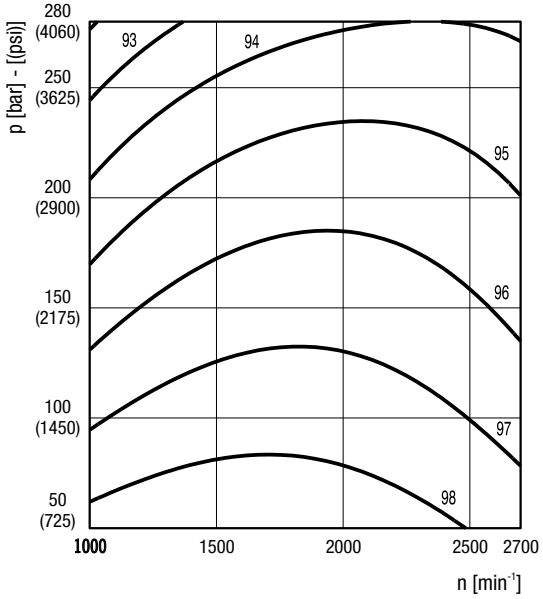


Noise level Distance from microphone to pump = 1 m (39.37 in)

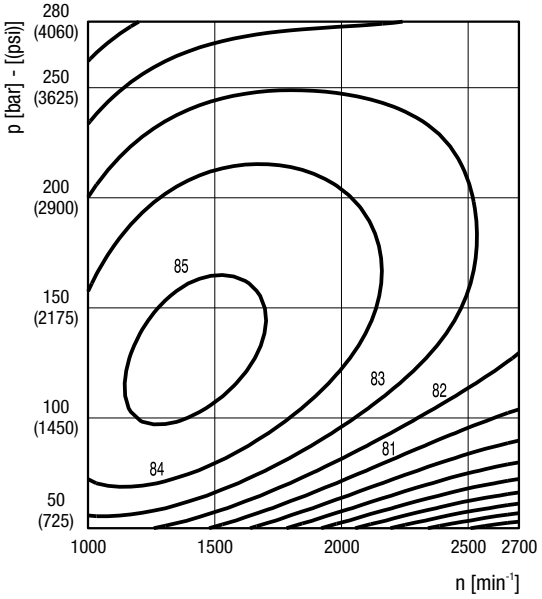
@ max. displacement — — — @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



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

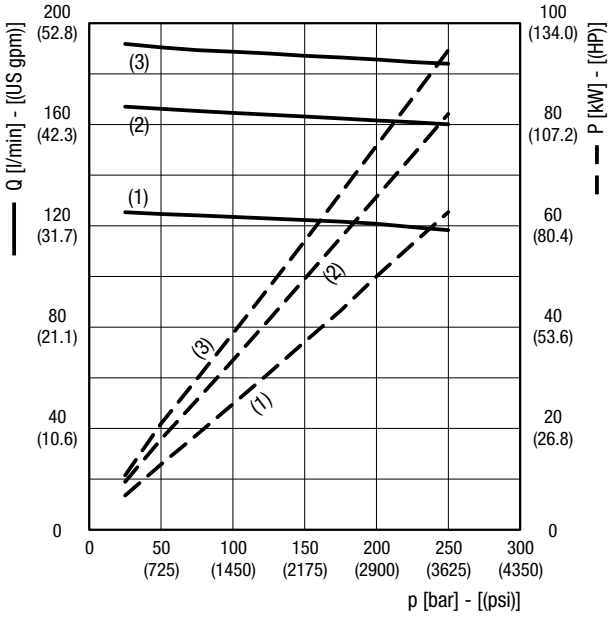
Replaces: 06/06.2020

O 08/05.2024

MVP60•84 OPERATING CURVES

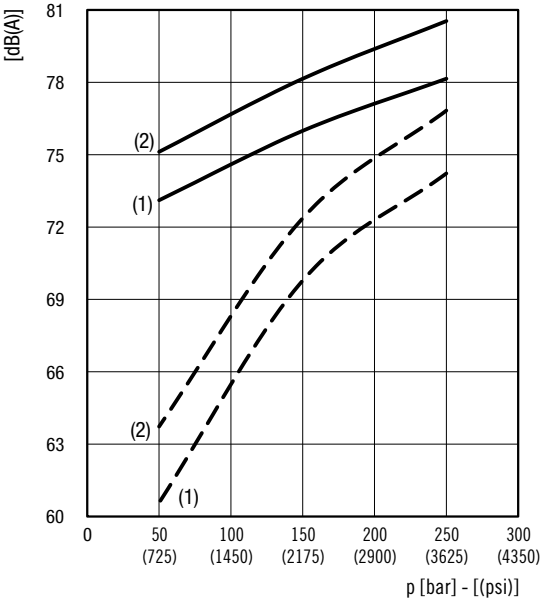
Each curve has been obtained at 50 °C (122 °F), using oil with viscosity 46 cSt (210 SSU) at 40 °C (104 °F) and at these speed: (1) 1500 min^{-1}
(2) 2000 min^{-1}
(3) 2300 min^{-1}

Delivery / power
@ max. displacement

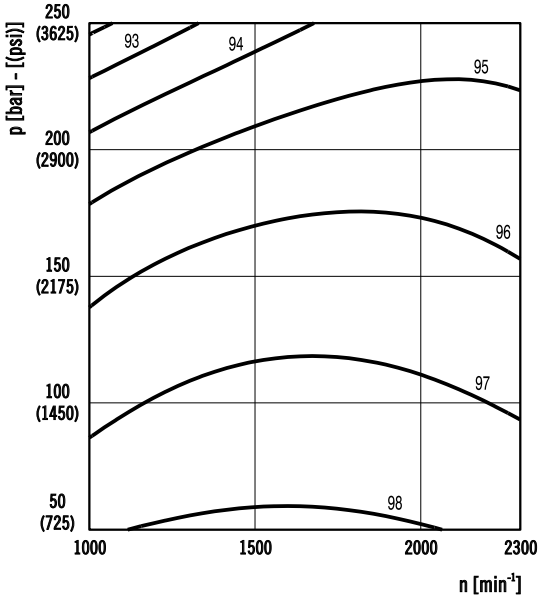


Noise level Distance from microphone to pump = 1 m (39.37 in)

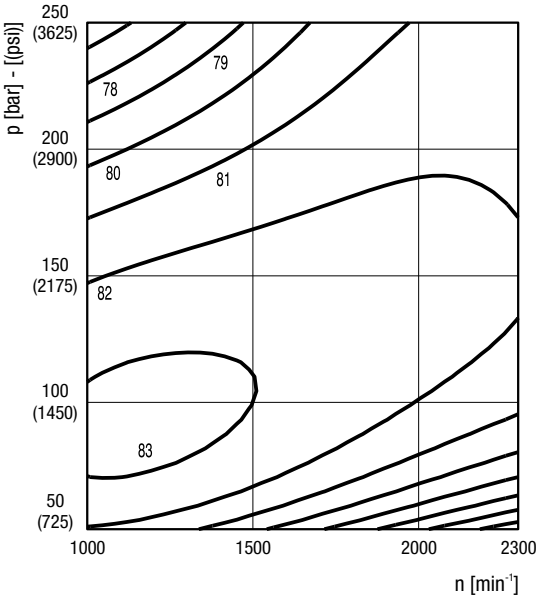
——— @ max. displacement – – – @ min. displacement



Volumetric efficiency
@ max. displacement



Overall efficiency
@ max. displacement



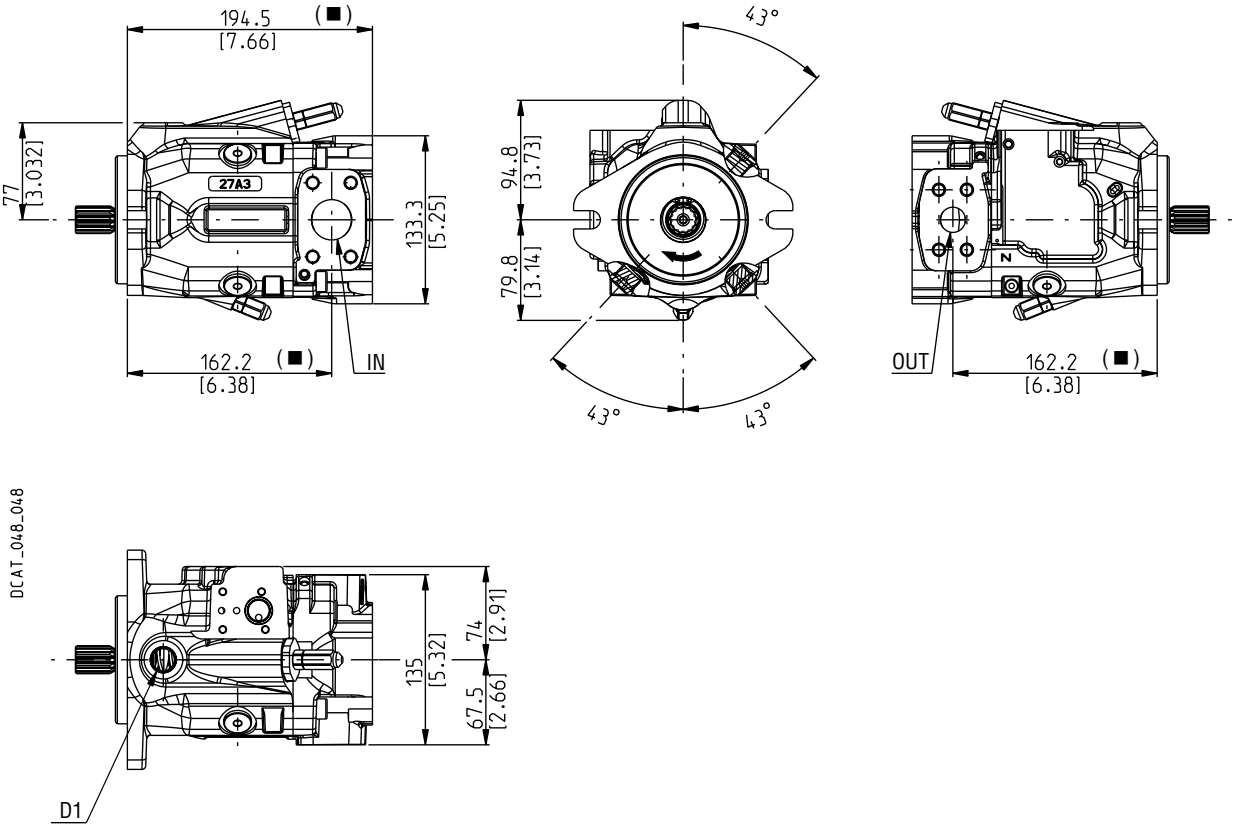
06/06.2020

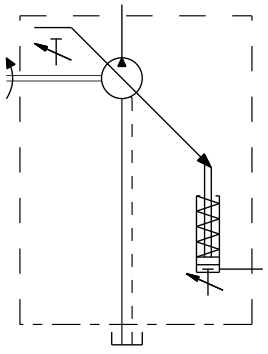
Values shown in the diagrams are indicative only. Actual values may vary depending on the pump configuration.

MVP30 SIDE PORTS - DIMENSIONS L

Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27 mm (1.06 in).



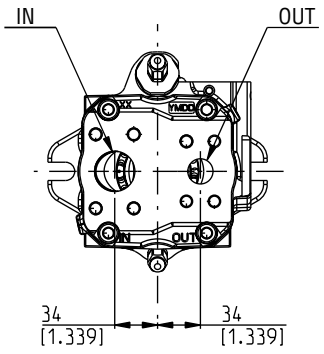


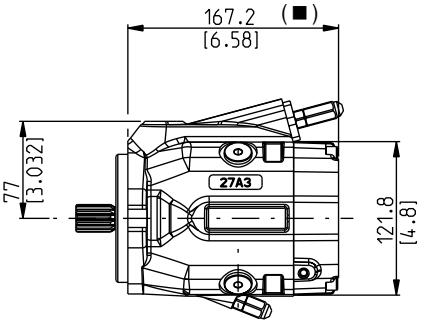
07/03.2022

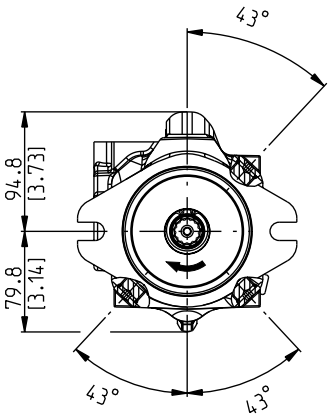
MVP30 REAR PORTS - DIMENSIONS P

Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

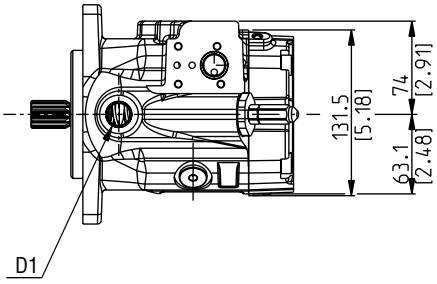
(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27 mm (1.06 in).

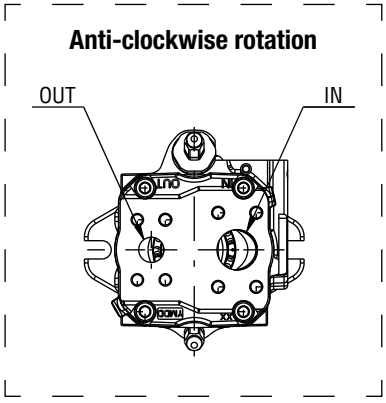


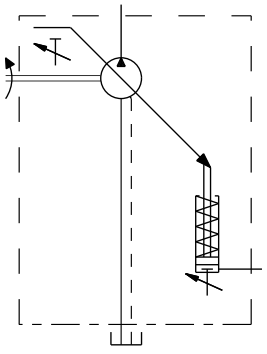




DCAT_048_047







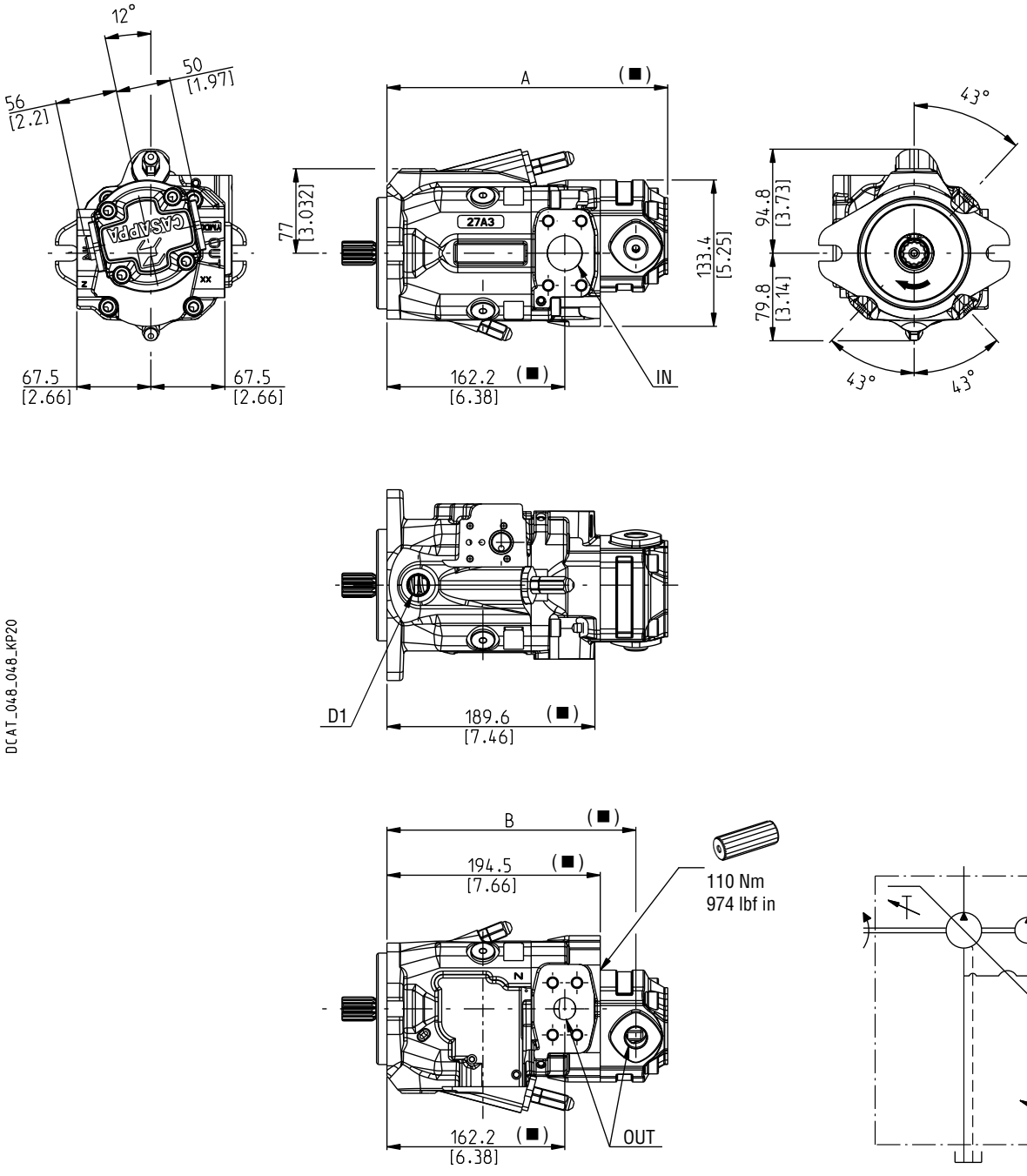
07/03.2022

MVP30/KP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27 mm (1.06 in).



Gear pump KAPPA 20 (for more information please see the respective technical catalogue)

Pump type	4	6,3	8	11,2	14	16	20	Dimensions	
MVP30	247,5 (9.74)	250 (9.84)	252,5 (9.94)	256 (10.08)	260 (10.24)	265,5 (10.45)	272 (10.71)	mm (in)	A
	218,5 (8.60)	221 (8.70)	223,5 (8.80)	227 (8.94)	225,5 (8.86)	231 (9.09)	237,5 (9.35)	mm (in)	B

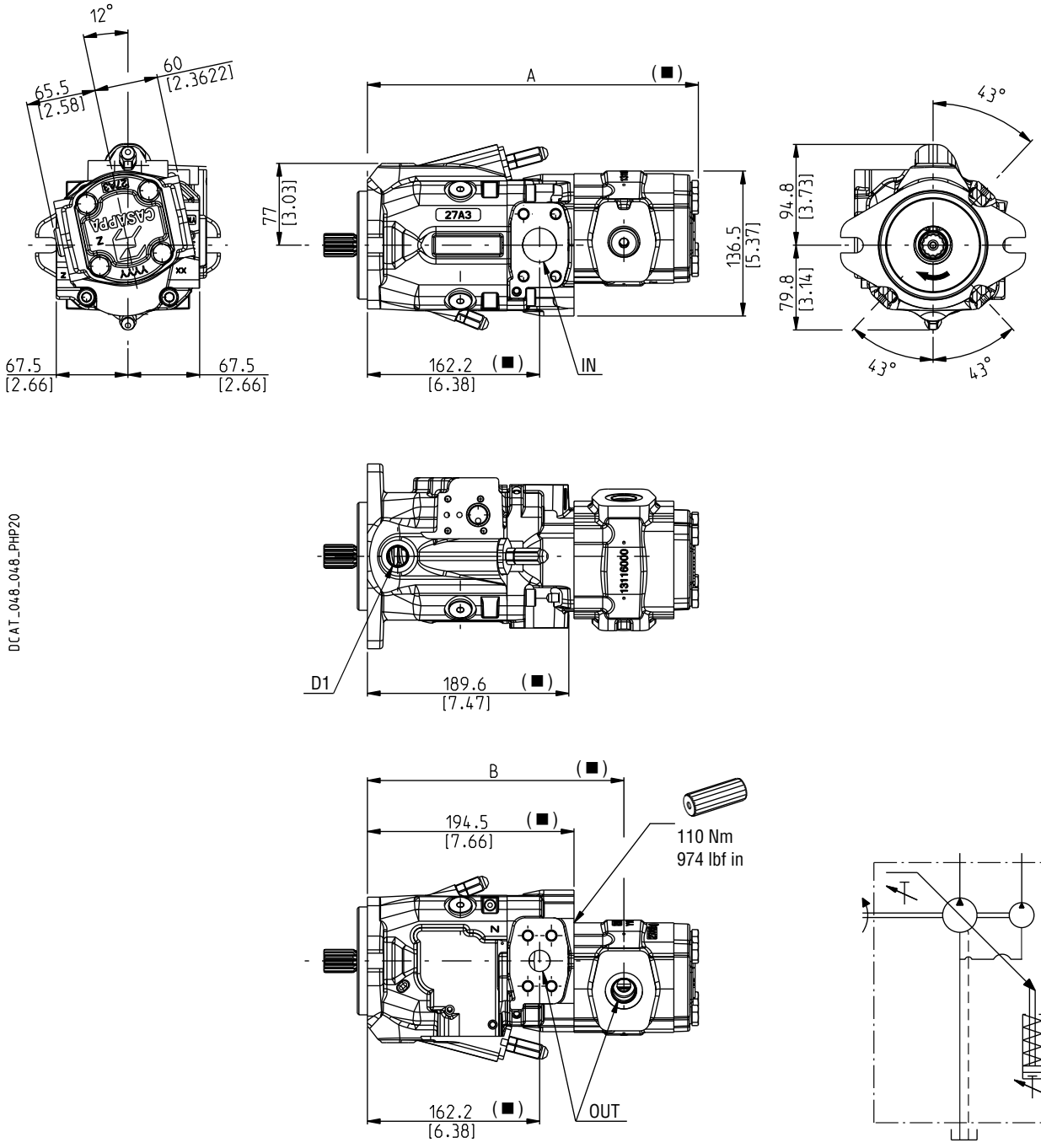
07/03.2022

MVP30/PHP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27 mm (1.06 in).
Also available in
combination with PLP20



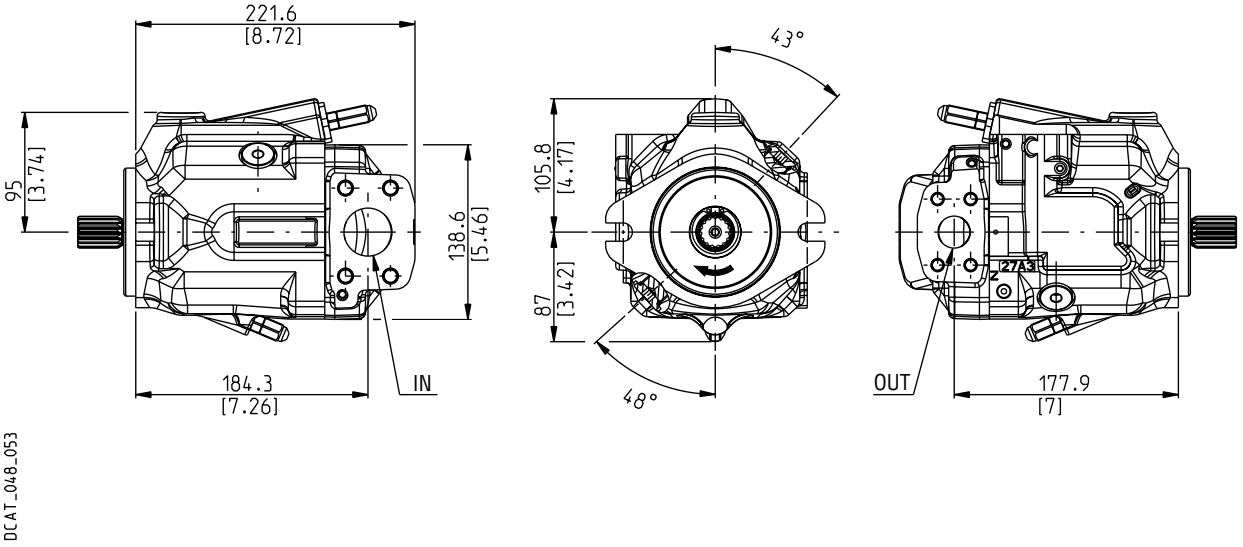
Gear pump POLARIS PH20 (for more information please see the respective technical catalogue)

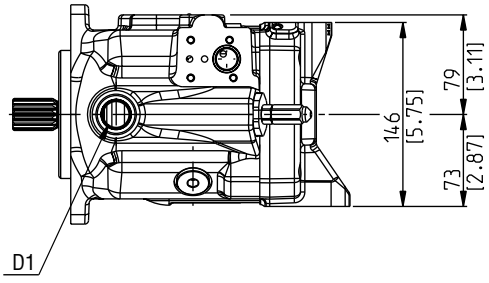
Pump type	8	10,5	11,2	14	16	18	19	20	23	24,5	25	27,8	31,5	Dimensions	
MVP30	274,6 (10.81)	278,6 (10.97)	279,1 (10.99)	284,1 (11.41)	287,6 (11.32)	289,8 (11.41)	291 (11.46)	294,1 (11.58)	297,6 (11.72)	299,9 (11.81)	301,6 (11.87)	304,4 (11.98)	311,6 (12.27)	mm (in)	A
	228 (8.98)	231 (9.09)	231,5 (9.11)	236,5 (9.31)	239,5 (9.43)	230,4 (9.07)	231 (9.09)	232,5 (9.15)	234,2 (9.22)	235,3 (9.26)	236,5 (9.31)	237,9 (9.36)	241,5 (9.51)	mm (in)	B

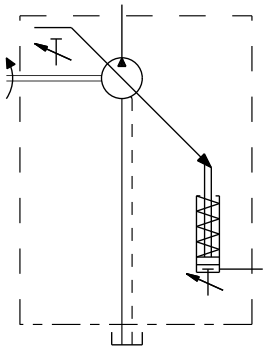
07/03.2022

MVP48 SIDE PORTS - DIMENSIONS L

Drive shafts: see page 33
Mounting flanges: see page 36
Ports: see page 38 ÷ 40



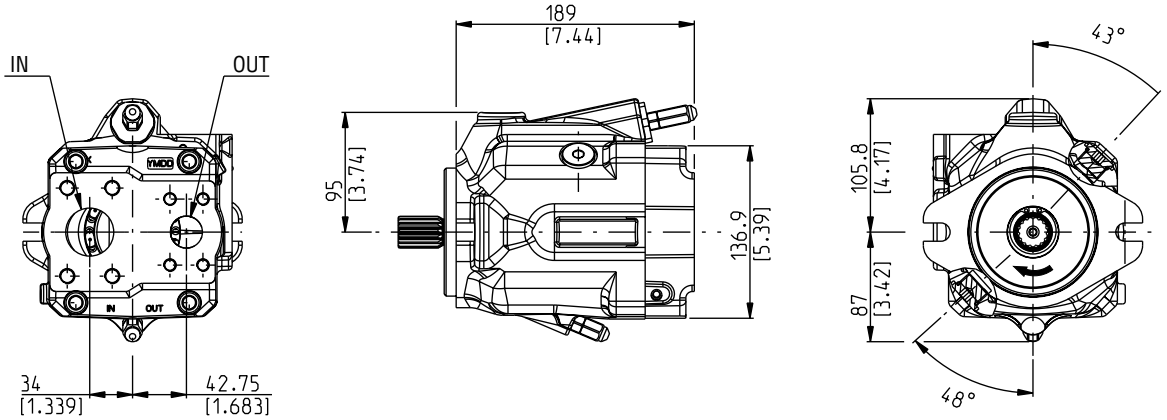




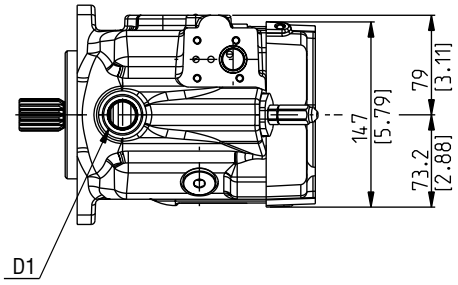
06/06.2020

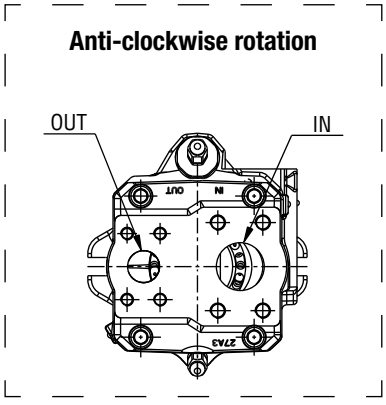
MVP48 REAR PORTS - DIMENSIONS P

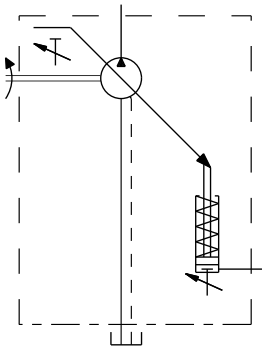
Drive shafts: see page 33
Mounting flanges: see page 36
Ports: see page 38 ÷ 40



DCAT_048_031





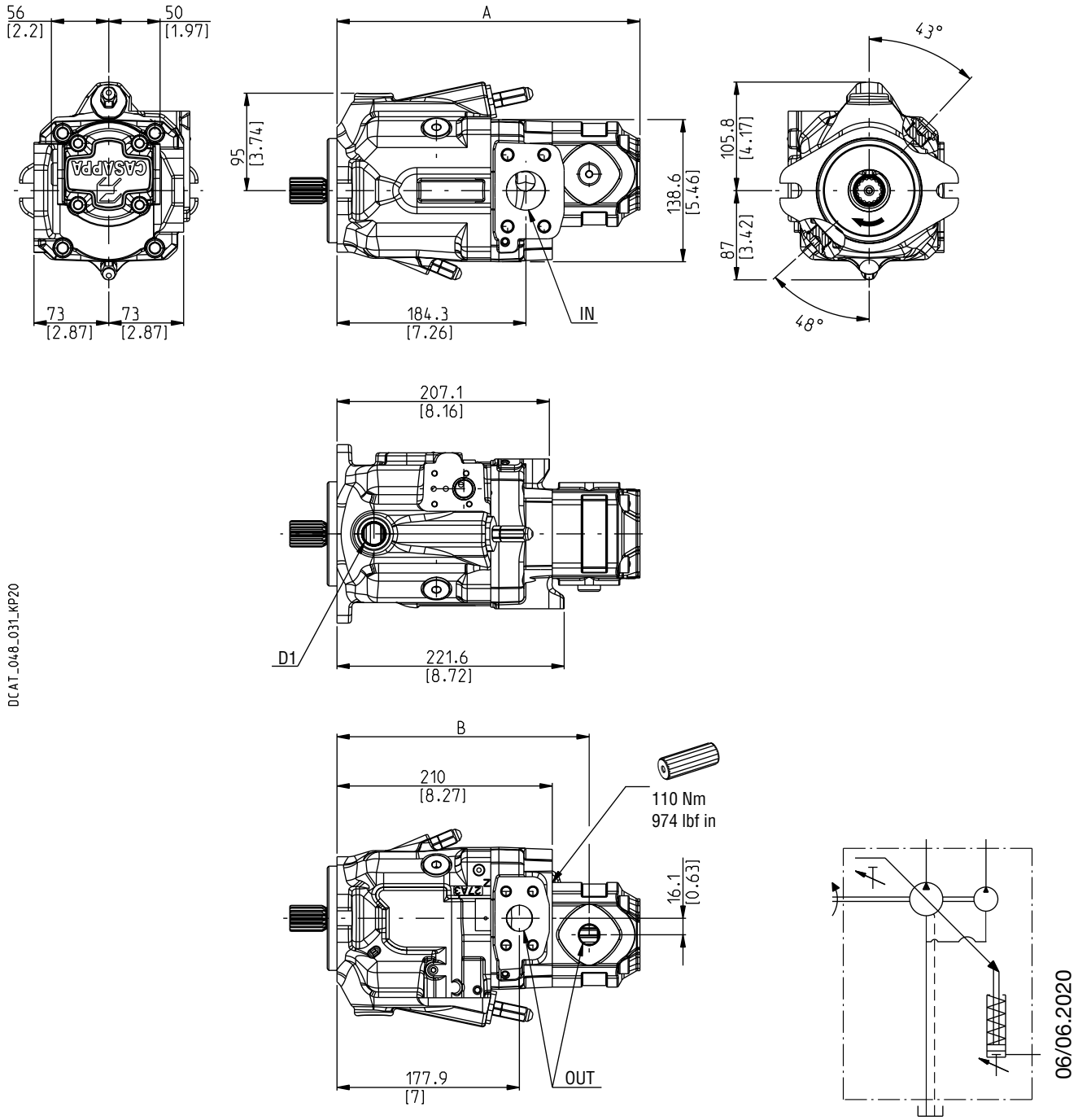


06/06.2020

MVP48/KP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 33
Mounting flanges: see page 36
Ports: see page 38 ÷ 40



06/06.2020

Gear pump KAPPA 20 (for more information please see the respective technical catalogue)

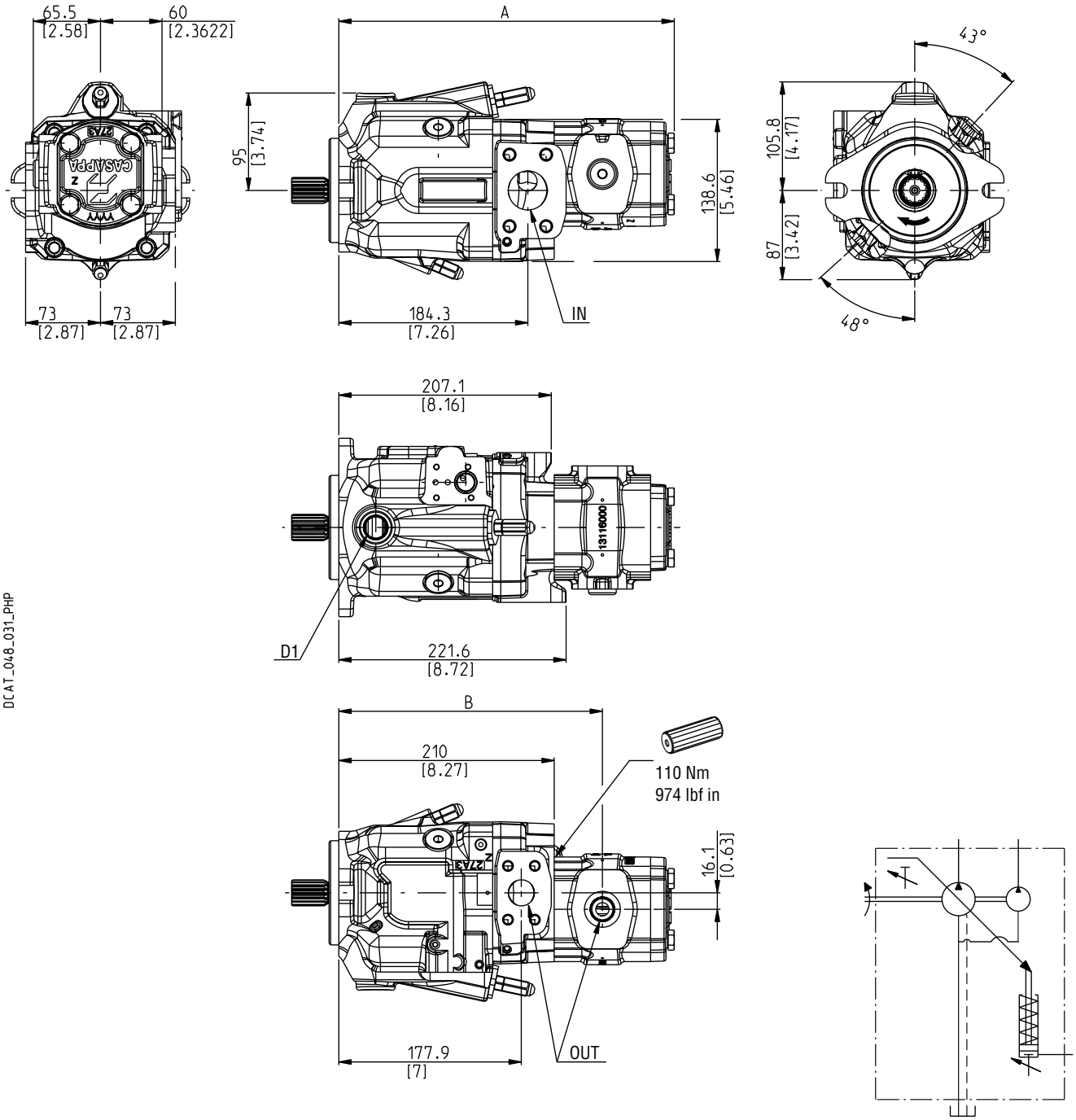
Pump type	4	6,3	8	11,2	14	16	20	Dimensions	
MVP48	263 (10.35)	265,5 (10.45)	268 (10.55)	271,5 (10.69)	275,5 (10.85)	281 (11.06)	287,5 (11.32)	mm (in)	**A**
	234 (9.21)	236,5 (9.31)	239 (9.41)	242,5 (9.55)	241 (9.49)	246,5 (9.70)	253 (9.96)	mm (in)	**B**

MVP48/PHP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 33
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

Also available in
combination with PLP20



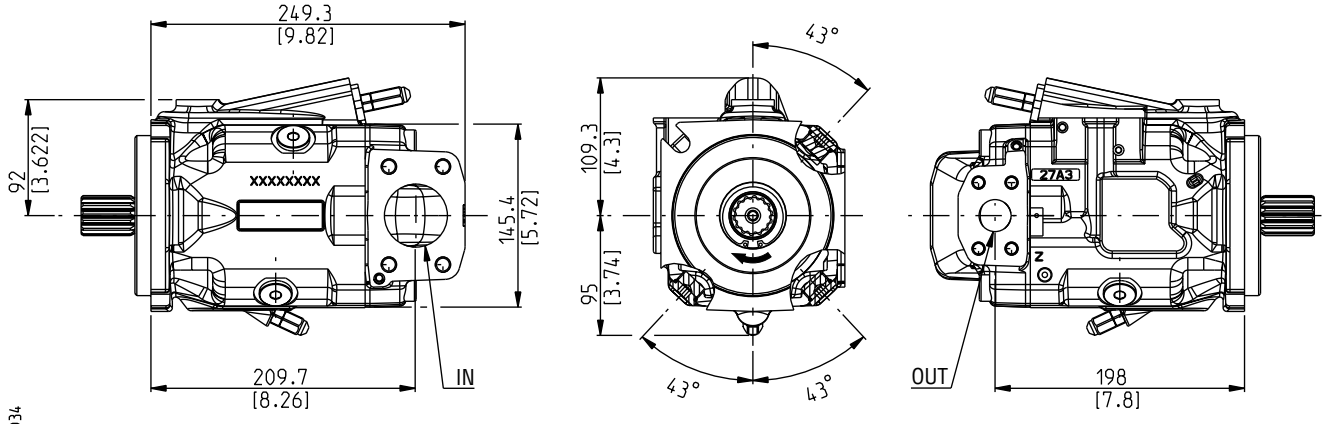
06/06.2020

Gear pump POLARIS PH20 (for more information please see the respective technical catalogue)

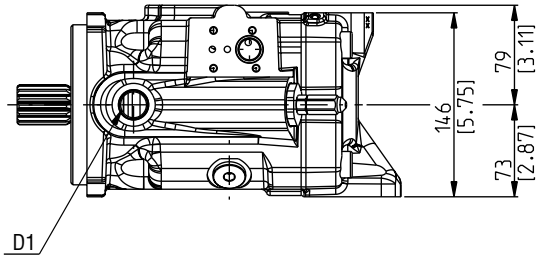
Pump type	8	10,5	11,2	14	16	18	19	20	23	24,5	25	27,8	31,5	Dimensions	
MVP48	290,1 (11.42)	294,1 (11.58)	294,6 (11.60)	299,6 (11.80)	303,1 (11.93)	305,3 (12.02)	306,5 (12.07)	309,6 (12.19)	313,1 (12.33)	315,4 (12.42)	317,1 (12.48)	319,9 (12.59)	327,1 (12.88)	mm (in)	**A**
	243,5 (9.59)	246,5 (9.70)	247 (9.72)	252 (9.92)	255 (10.04)	245,9 (9.68)	246,5 (9.70)	248 (9.76)	249,7 (9.83)	250,8 (9.87)	252 (9.92)	253,4 (9.97)	257 (10.12)	mm (in)	**B**

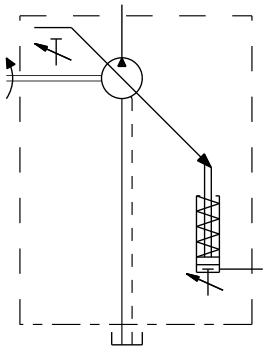
MVP60 SIDE PORTS - DIMENSIONS L

Drive shafts: see page 34 ÷ 35
Mounting flanges: see page 36 ÷ 37
Ports: see page 38 ÷ 40



DCAT_048_034

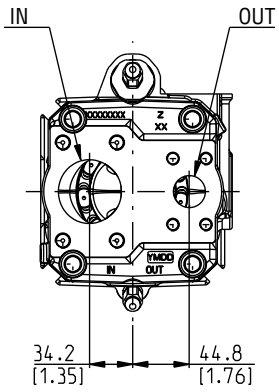


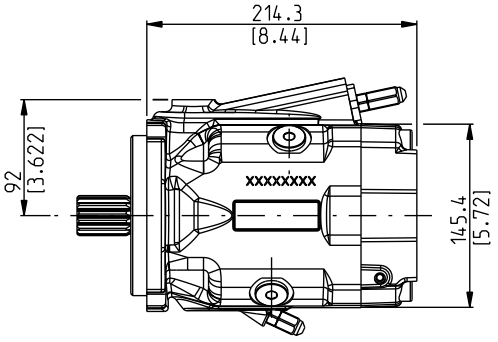


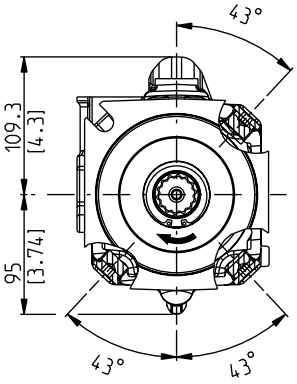
06/06.2020

MVP60 REAR PORTS - DIMENSIONS P

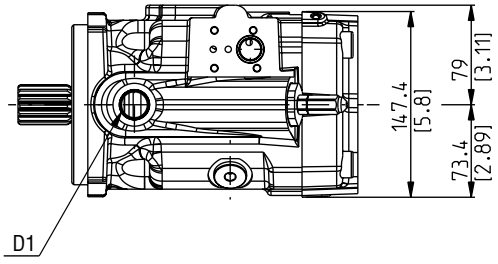
Drive shafts: see page 34 ÷ 35
Mounting flanges: see page 36 ÷ 37
Ports: see page 38 ÷ 40

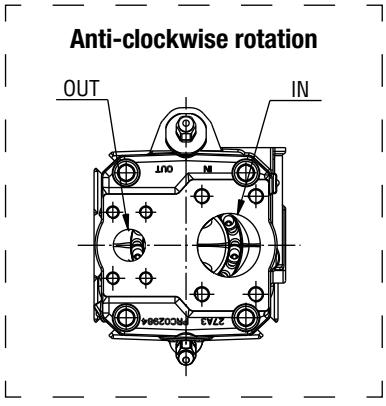


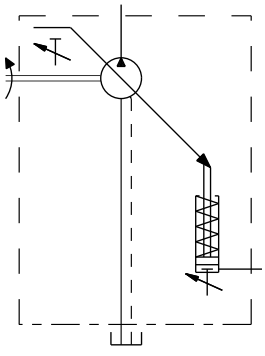




DCAT_048_005





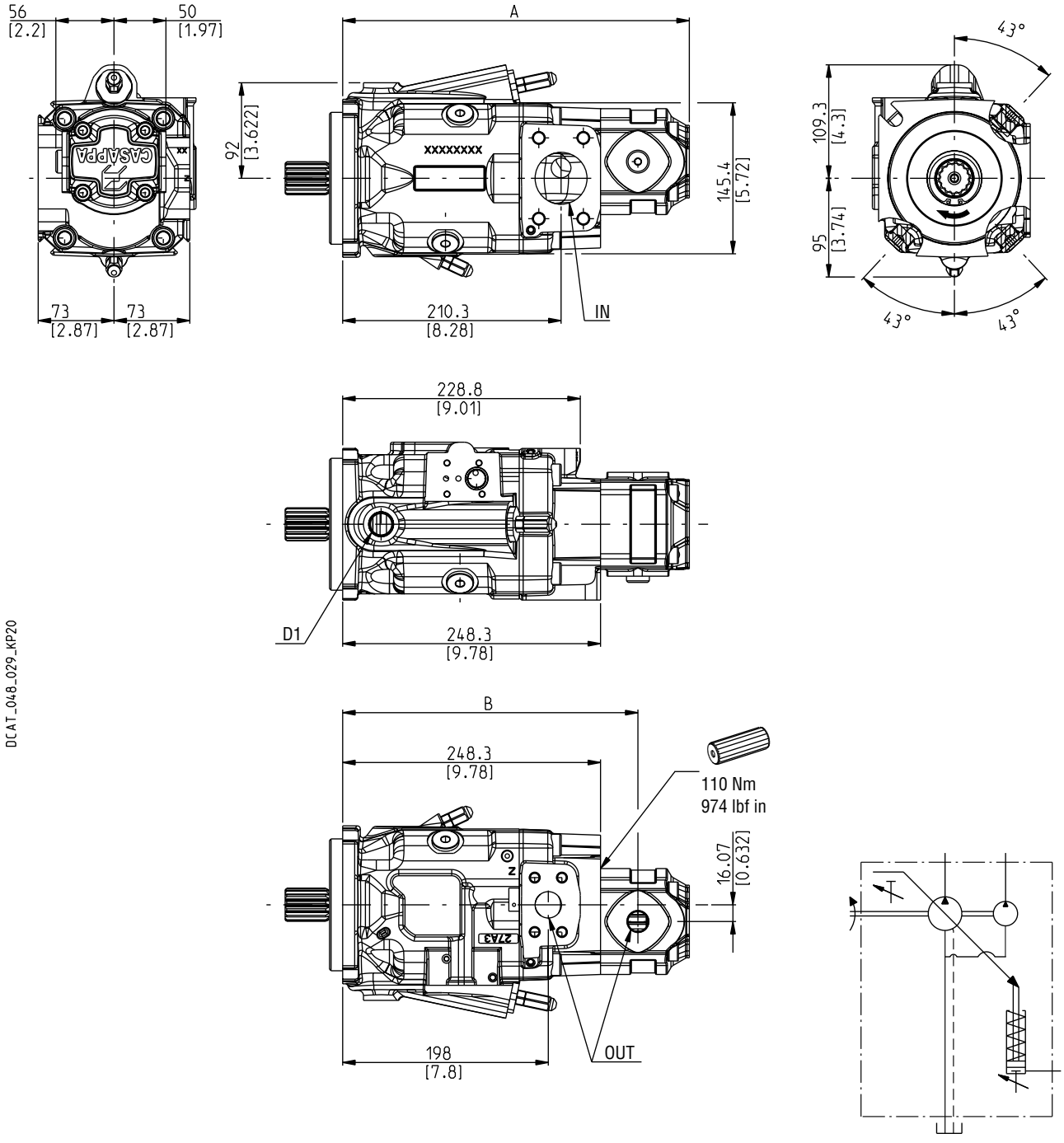


06/06.2020

MVP60/KP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 34 ÷ 35
Mounting flanges: see page 36 ÷ 37
Ports: see page 38 ÷ 40



Gear pump KAPPA 20 (for more information please see the respective technical catalogue)

Pump type	4	6,3	8	11,2	14	16	20	Dimensions	
MVP60	301,3 (11.86)	303,8 (11.96)	306,3 (12.06)	309,8 (12.20)	313,8 (12.35)	319,3 (12.57)	325,8 (12.83)	mm (in)	**A**
	272,3 (10.72)	274,8 (10.82)	277,3 (10.92)	280,8 (11.06)	279,3 (11.00)	284,8 (11.21)	291,3 (11.47)	mm (in)	**B**

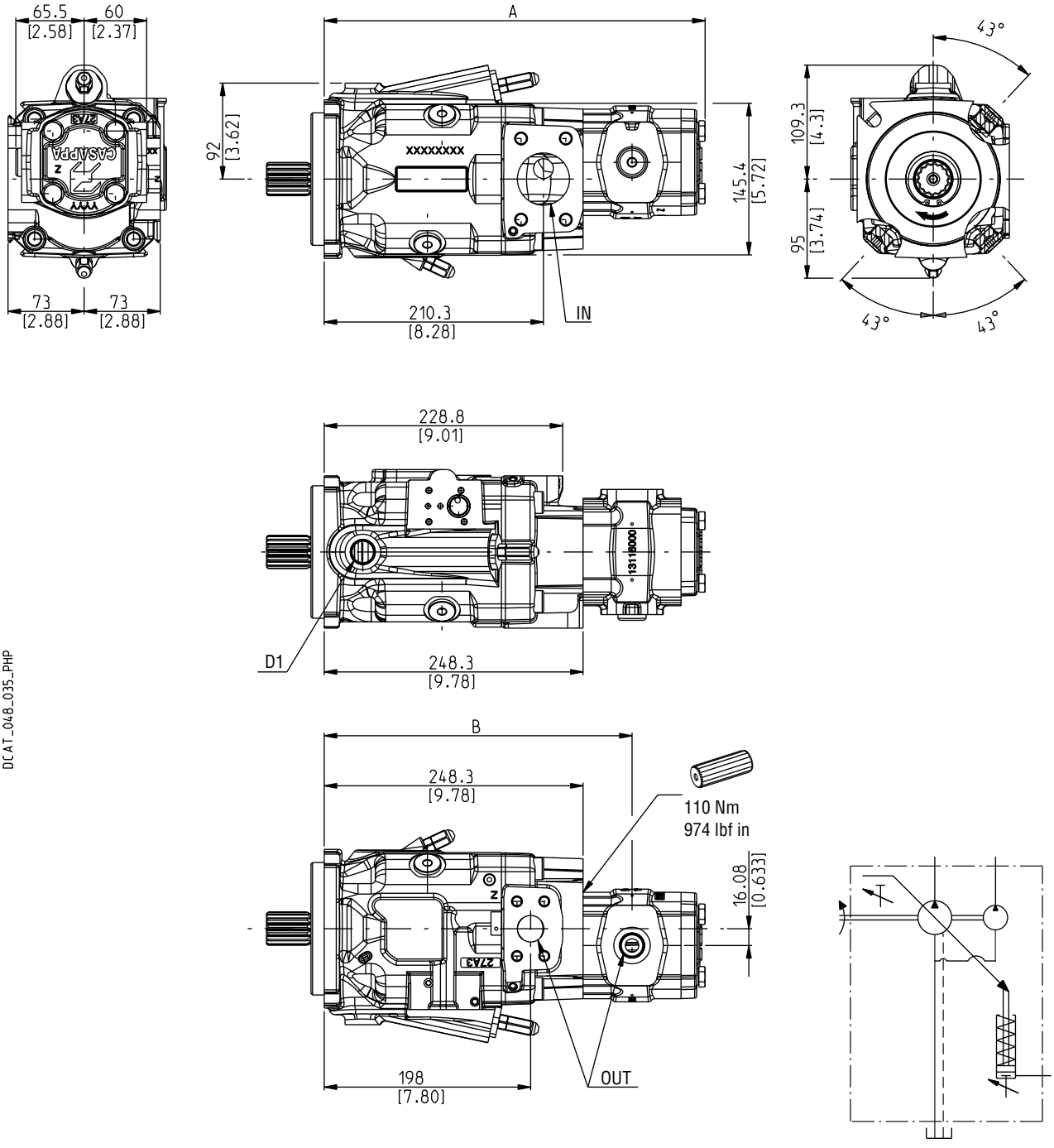
06/06.2020

MVP60/PHP20 MULTIPLE PUMPS - DIMENSIONS L

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

Drive shafts: see page 34 ÷ 35
Mounting flanges: see page 36 ÷ 37
Ports: see page 38 ÷ 40

Also available in combination with PLP20



06/06.2020

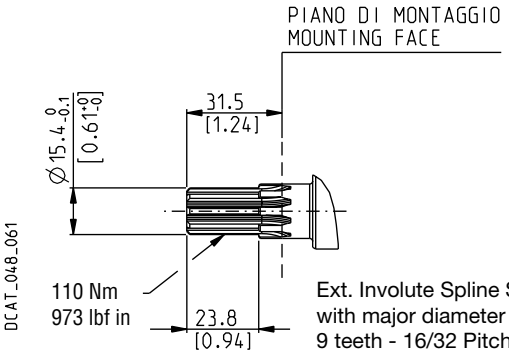
Gear pump POLARIS PH20 (for more information please see the respective technical catalogue)

Pump type	8	10,5	11,2	14	16	18	19	20	23	24,5	25	27,8	31,5	Dimensions	
MVP60	328,4 (12.93)	332,4 (13.09)	332,9 (13.11)	337,9 (13.30)	341,4 (13.44)	343,6 (13,53)	344,8 (13.57)	347,9 (13.70)	351,4 (13.83)	353,7 (13.93)	355,4 (13.99)	358,2 (14.10)	365,4 (14.39)	mm (in)	**A**
	281,8 (11.09)	284,8 (11.21)	285,3 (11.23)	290,3 (11.43)	293,3 (11.55)	284,2 (11.19)	284,8 (11.21)	286,3 (11.27)	288 (11.34)	289,1 (11.38)	290,3 (11.43)	291,7 (11.48)	295,3 (11.63)	mm (in)	**B**

MVP30 DRIVE SHAFTS

SAE "A" SPLINE 03

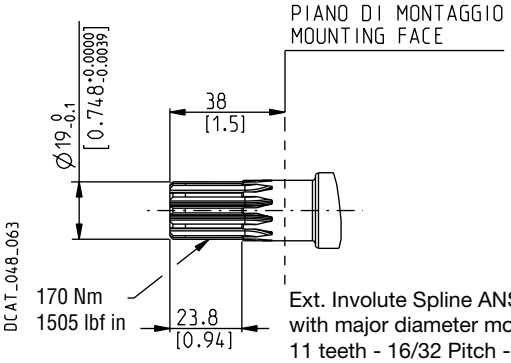
Mounting face refers to flange code **S1**



Ext. Involute Spline SAE J498B
with major diameter modified
9 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 1

SAE SPLINE 07

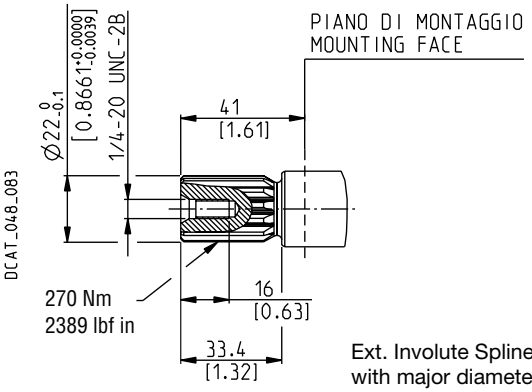
Mounting face refers to flange code **S1**



Ext. Involute Spline ANSI B92.1
with major diameter modified
11 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "B" SPLINE 04

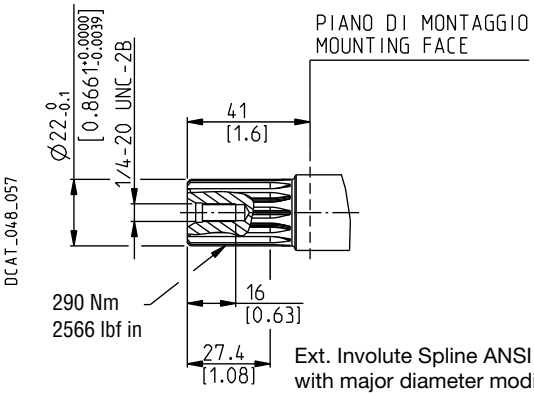
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "B" SPLINE 4R

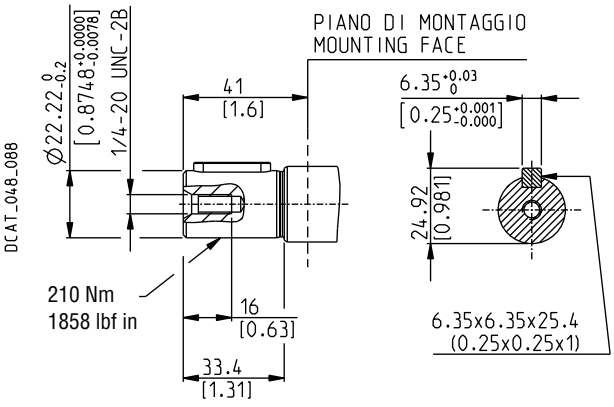
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "B" STRAIGHT 32

Mounting face refers to flange code **S5**



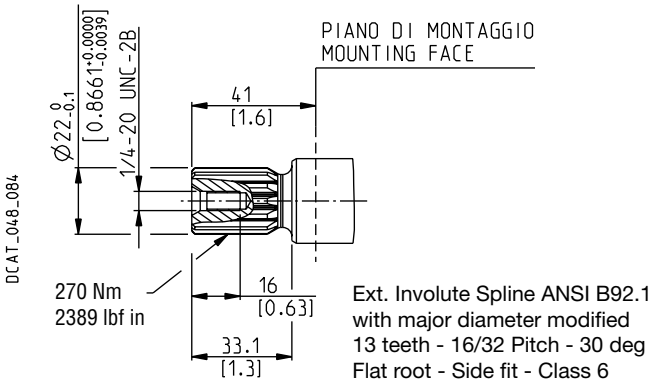
Please contact us for different drive shafts.

07/03.2022

MVP48 DRIVE SHAFTS

SAE "B" SPLINE 04

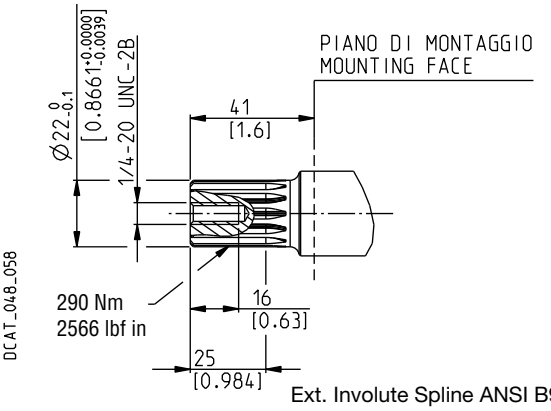
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "B" SPLINE 4R

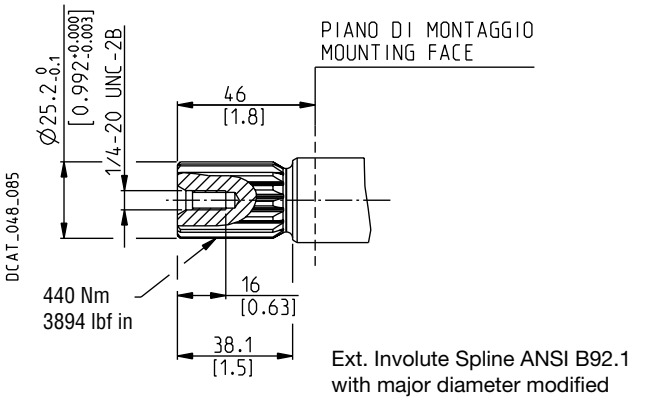
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "BB" SPLINE 05

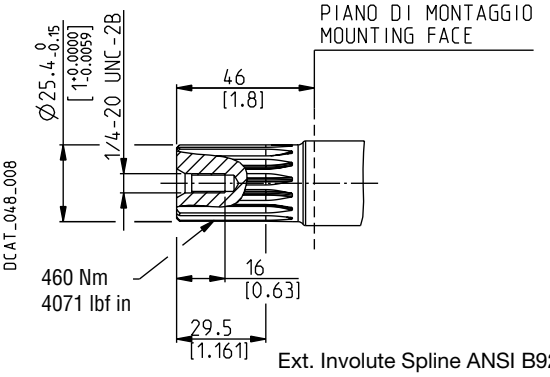
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
15 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "BB" SPLINE 5R

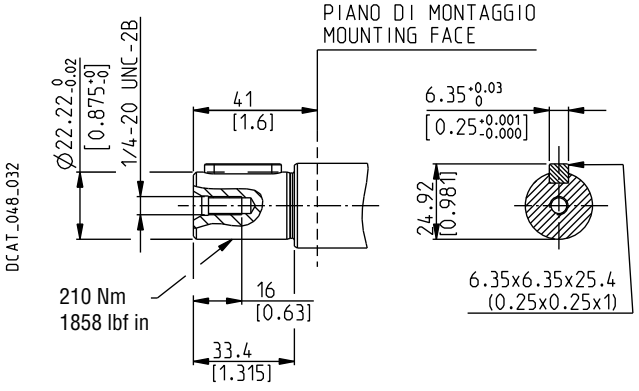
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
15 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE "B" STRAIGHT 32

Mounting face refers to flange code **S5**



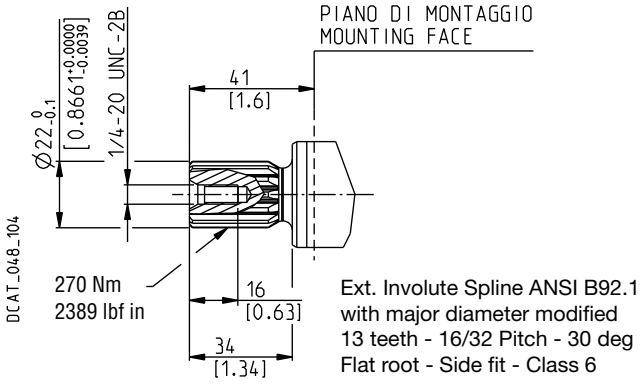
Please contact us for different drive shafts.

07/03.2022

MVP60 DRIVE SHAFTS

SAE “B” SPLINE 04

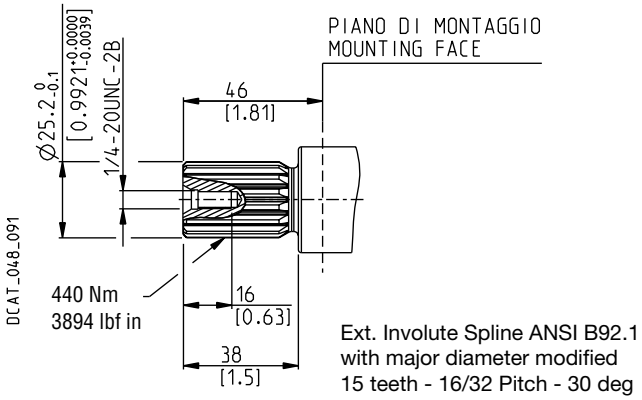
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
13 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE “BB” SPLINE 05

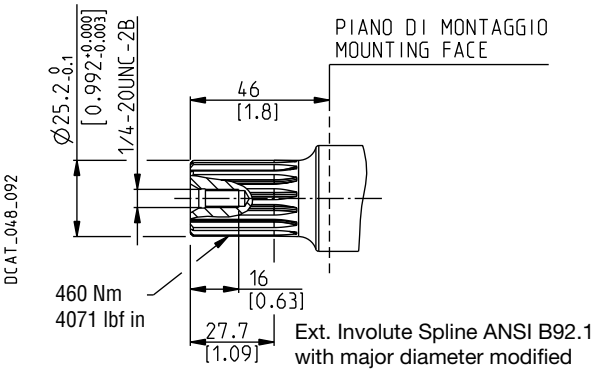
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
15 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE “BB” SPLINE 5R

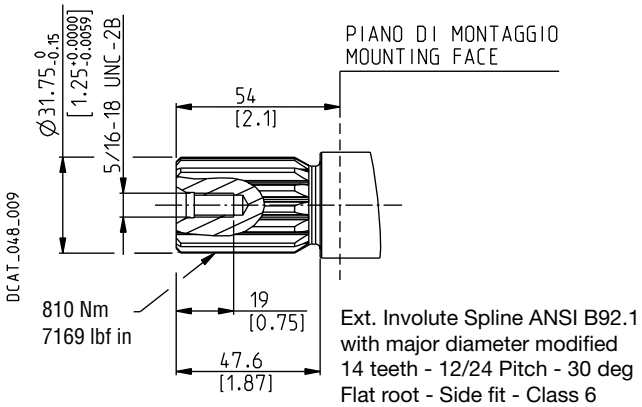
Mounting face refers to flange code **S5**



Ext. Involute Spline ANSI B92.1
with major diameter modified
15 teeth - 16/32 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE “C” SPLINE 06

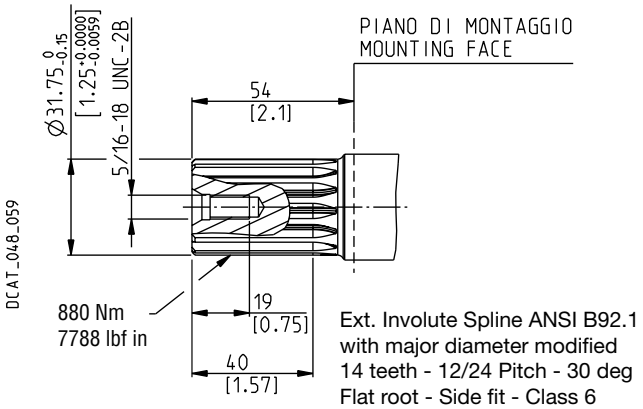
Mounting face refers to flange code **S7** and **S8**



Ext. Involute Spline ANSI B92.1
with major diameter modified
14 teeth - 12/24 Pitch - 30 deg
Flat root - Side fit - Class 6

SAE “C” SPLINE 6R

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



Ext. Involute Spline ANSI B92.1
with major diameter modified
14 teeth - 12/24 Pitch - 30 deg
Flat root - Side fit - Class 6

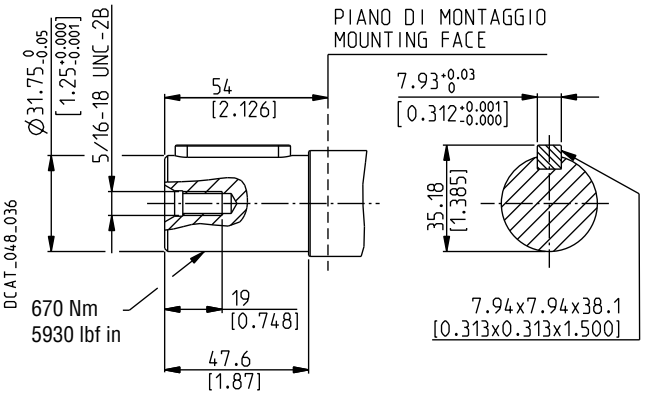
Please contact us for different drive shafts.

07/03.2022

MVP60 DRIVE SHAFTS

SAE “C” STRAIGHT 34

Mounting face refers to flange code **S8**



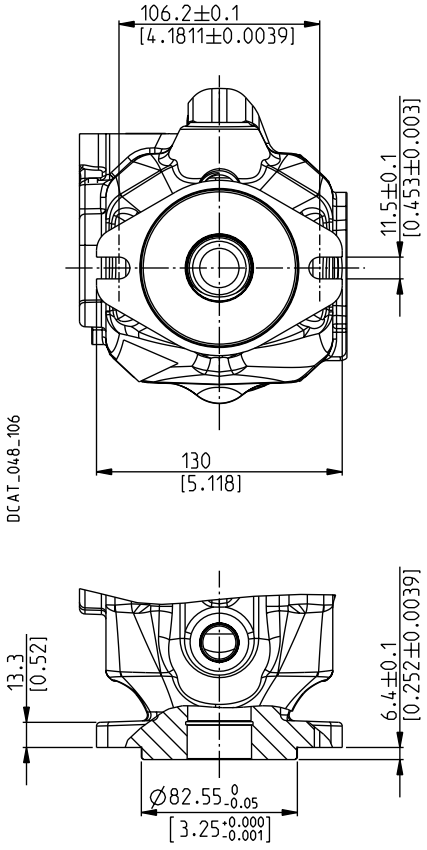
07/03.2022

Please contact us for different drive shafts.

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

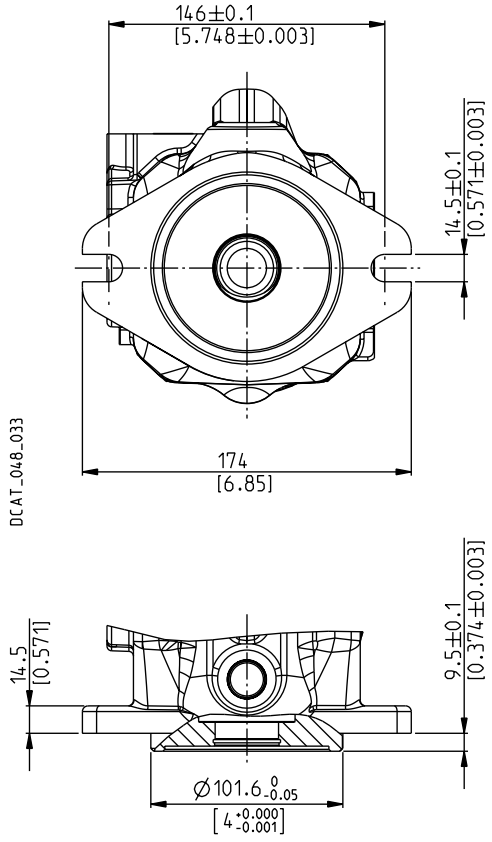
SAE "A" 2 HOLES — S1

Conforms to SAE J744



SAE "B" 2 HOLES — S5

Conforms to SAE J744



Pump type	DRIVE SHAFTS See page 32		
	03	07	04
MVP30	X	X	X

X Available combination

Pump type	DRIVE SHAFTS See page 32 ÷ 35							
	04	4R	32	05	5R	06	6R	34
MVP30	X	X	X					
MVP48	X	X	X	X	X			
MVP60	X			X	X	X	X	X

X Available combination

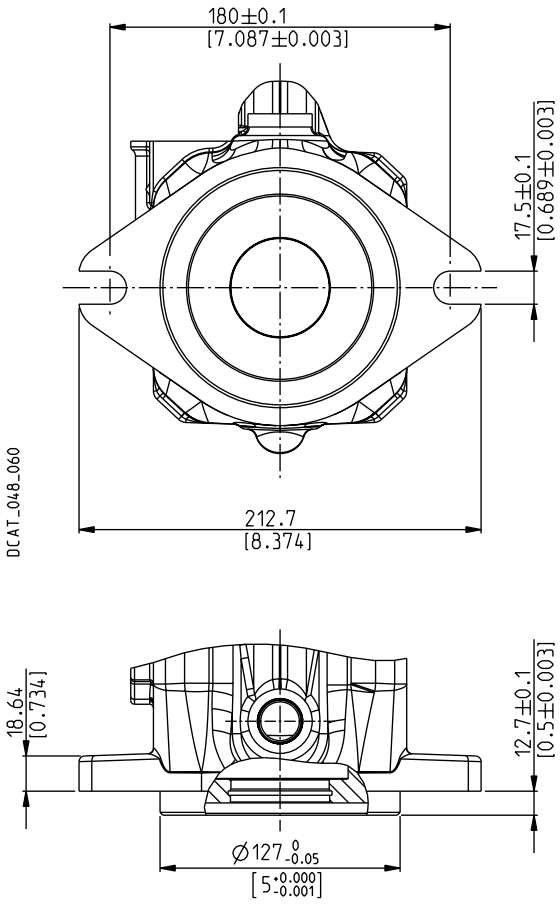
06/06.2020

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

Replaces: 06/06.2020

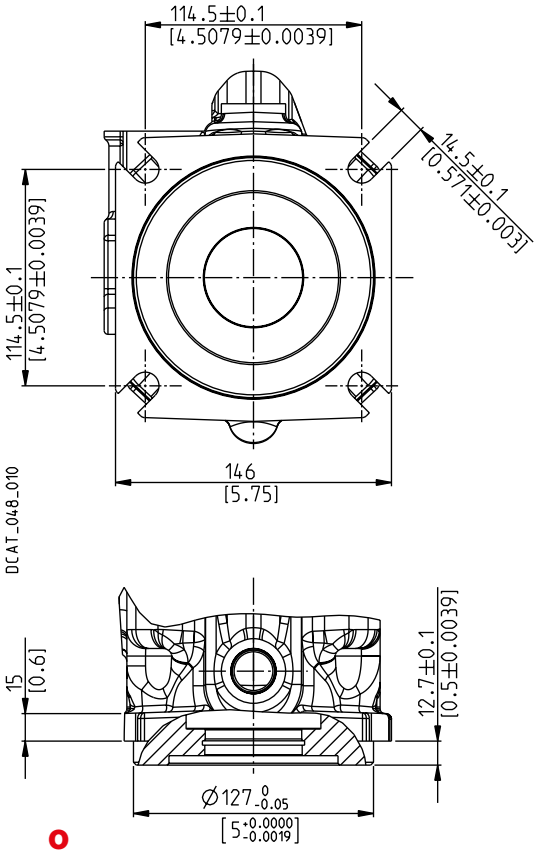
SAE “C” 2 HOLES — S7

Conforms to SAE J744



SAE “C” 4 HOLES — S8

Conforms to SAE J744



Pump type	04	05	5R	06	6R	34
MVP60	X	X	X	X	X	X

DRIVE SHAFTS
See page 34 ÷ 35

X Available combination

Pump type	04	05	5R	06	6R	34
MVP60	X	X	X	X	X	X

DRIVE SHAFTS
See page 34 ÷ 35

X Available combination

O 08/05.2024

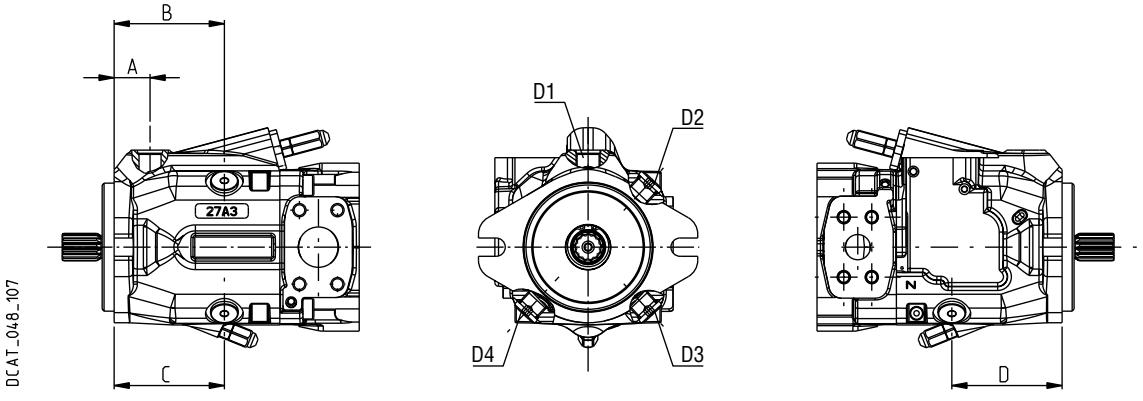
PORTS TYPE

Ports type	INLET / OUTLET PORTS						DRAIN PORTS		LOAD SENSING PORTS (X)		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 - D2 - D3 - D4		X	X	OUT	OUT
MVP30	MD	MB	SD	SB	OG (■)	OD (■)	—	OB	GA	03	GD	OC
MVP48	ME	MC	SE	SC	OH (■)	OF (■)	GD	OC	GA	03	GD	OC
MVP60	MF	MC	SF	SC	MF	OF	GD	OC	GA	03	GD	OC

(X) Load sensing port. Please contact us for more information.
(●) Standard.
(■) Only for rear ports.

DRAIN PORTS POSITION

(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27 mm (1.06 in).



Pump type	A	B	C	D
	mm (in)	mm (in)	mm (in)	mm (in)
MVP30	28,5 (1.12) (■)	87,5 (3.44) (■)	87,5 (3.44) (■)	87,5 (3.44) (■)
MVP48	36 (1.42)	97 (3.82)	—	97 (3.82)
MVP60	37 (1.46)	113 (4.45)	99 (3.90)	99 (3.90)

07/03.2022

PORTS TYPE

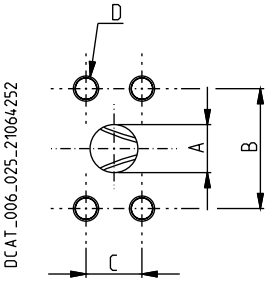
Tightening torque for low pressure side port

Tightening torque for high pressure side port

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

Metric thread ISO 60° conforms to ISO/R 262

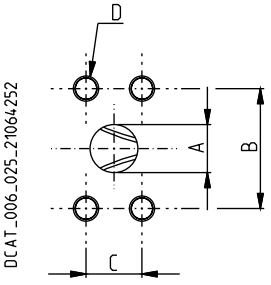
CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
MB	3/4”	20 (0.79)	47,6 (1.87)	22,2 (0.87)	M 10 17 (0.67)	–	45 $^{+2,5}$ (398 ÷ 420)
MC	1”	25,4 (1.00)	52,4 (2.06)	26,2 (1.03)	M 10 17 (0.67)	–	30 $^{+2,5}$ (266 ÷ 288)
MD	1” 1/4	32 (1.26)	58,7 (2.31)	30,2 (1.19)	M 10 17 (0.67)	20 $^{+1}$ (177 ÷ 186)	–
ME	1” 1/2	38,1 (1.50)	69,8 (2.75)	35,7 (1.41)	M 12 20 (0.79)	30 $^{+2,5}$ (266 ÷ 288)	–
MF	2”	51 (2.01)	77,8 (3.06)	42,9 (1.69)	M 12 20 (0.79)	30 $^{+2,5}$ (266 ÷ 288)	–



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

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

CODE	Nominal size	A	B	C	D		
		mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
SB	3/4”	20 (0.79)	47,6 (1.87)	22,2 (0.87)	3/8 - 16 UNC-2B 17 (0.67)	–	30 $^{+2,5}$ (266 ÷ 288)
SC	1”	25,4 (1.00)	52,4 (2.06)	26,2 (1.03)	3/8 - 16 UNC-2B 17 (0.67)	–	35 $^{+2,5}$ (310 ÷ 332)
SD	1” 1/4	32 (1.26)	58,7 (2.31)	30,2 (1.19)	7/16 - 14 UNC-2B 17 (0.67)	25 $^{+1}$ (221 ÷ 230)	–
SE	1” 1/2	38,1 (1.50)	69,8 (2.75)	35,7 (1.41)	1/2 - 13 UNC-2B 20 (0.79)	30 $^{+2,5}$ (266 ÷ 288)	–
SF	2”	51 (2.01)	77,8 (3.06)	42,9 (1.69)	1/2 - 13 UNC-2B 20 (0.79)	30 $^{+2,5}$ (266 ÷ 288)	–



03/06.2011

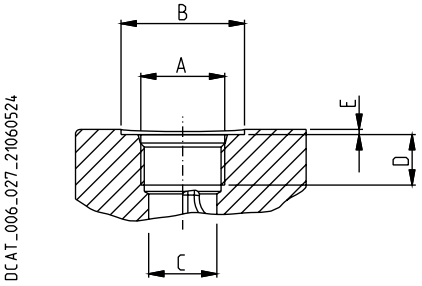
PORTS TYPE

Tightening torque for low pressure side port

Tightening torque for high pressure side port

SAE STRAIGHT THREAD PORTS J514 — ODT

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

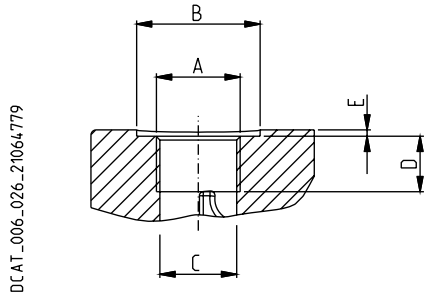


CODE	Nominal size	A	ØB	ØC	D	E		
		mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
03 (X)	1/4”	7/16” - 20 UNF - 2B	—	9,5 (0.37)	—	—	—	12 +1 (106 ÷ 115)
0B (●)	1/2”	3/4” - 16 UNF - 2B	33 (1.30)	17 (0.67)	—	1 (0.04)	20 +1 (177 ÷ 186)	—
0C (●)	5/8”	7/8” - 14 UNF - 2B	35 (1.38)	20,5 (0.81)	—	2 (0.08)	30 +2,5 (266 ÷ 288)	—
0C (◆)			34 (1.34)	20,5 (0.81)	17 (0.67)	0,5 (0.02)	—	70 +5 (620 ÷ 664)
0D	3/4”	1 1/16” - 12 UNF - 2B	—	—	20 (0.79)	—	—	120 +10 (1062 ÷ 1151)
0F	1”	1 5/16” - 12 UNF - 2B	—	30,5 (1.20)	20 (0.79)	—	—	170 +10 (1505 ÷ 1593)
0G	1” 1/4	1 5/8” - 12 UNF - 2B	—	—	20 (0.79)	—	70 +5 (620 ÷ 664)	—
0H	1” 1/2	1 7/8” - 12 UNF - 2B	—	45 (1.77)	20 (0.79)	—	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



CODE	Nominal size	A	ØB	ØC	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 (0.34)	12 (0.47)	—	—	5 +0,25 (44 ÷ 46)
GD (●)	1/2”	G 1/2	30 (1.18)	19 (0.75)	17 (0.67)	2 (0.08)	20 +1 (177 ÷ 186)	—
GD (◆)			—	19 (0.75)	17 (0.67)	—	—	50 +2,5 (443 ÷ 465)

(X) = Load sensing port - (●) = Drain port - (◆) = KP20 / PHP20 outlet port

06/06.2020

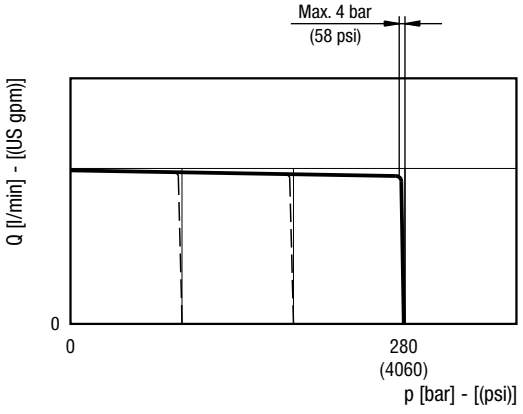
PRESSURE COMPENSATOR RP0

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

Compensator type	Pump type	Pressure setting range	Standard setting
		bar (psi)	bar (psi)
RP0	**MVP30-28**	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP30-34	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	MVP48-45	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP48-53	80 ÷ 250 (1160 ÷ 3625)	250 (3625)
	MVP60-60	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP60-72	80 ÷ 280 (1160 ÷ 4060)	280 (4060)
	MVP60-84	80 ÷ 250 (1160 ÷ 3625)	250 (3625)

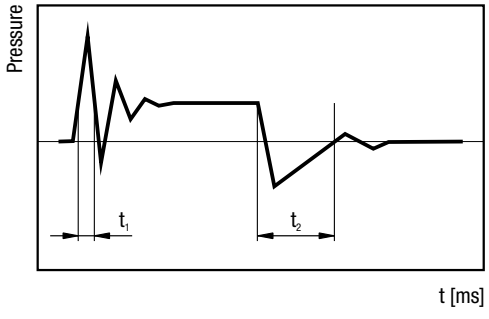
OPERATING CURVES

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



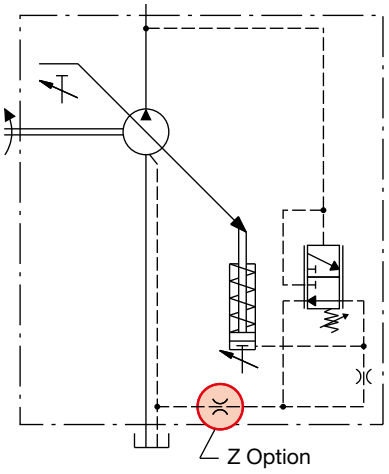
RESPONSE AND RECOVERY TIME

According to SAE J745 (using outlet pressure).



NOTES

Please contact us for more information.



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 46.

	t_1	t_2
Pump type	Response time [ms] (off stroke)	Recovery time [ms] (on stroke)
MVP30	46	150
MVP48	48	150
MVP60	50	150

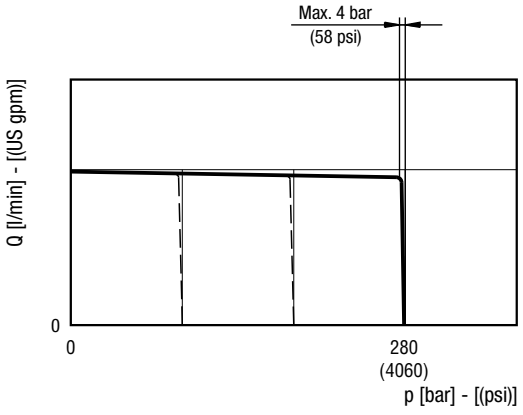
05/10.2014

PRESSURE COMPENSATOR RP1

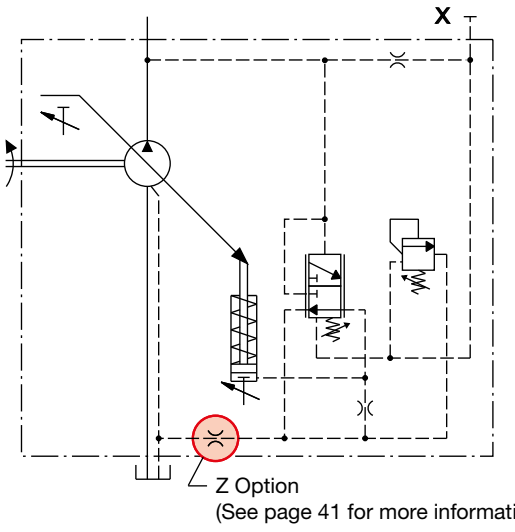
Regulates the pump displacement automatically to mantain the pressure below the fixed pre-adjusted limit.
Designed to work at high frequency ≥ 2 cycle/min and/or at pressure > 280 bar (4060 psi).

OPERATING CURVES

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

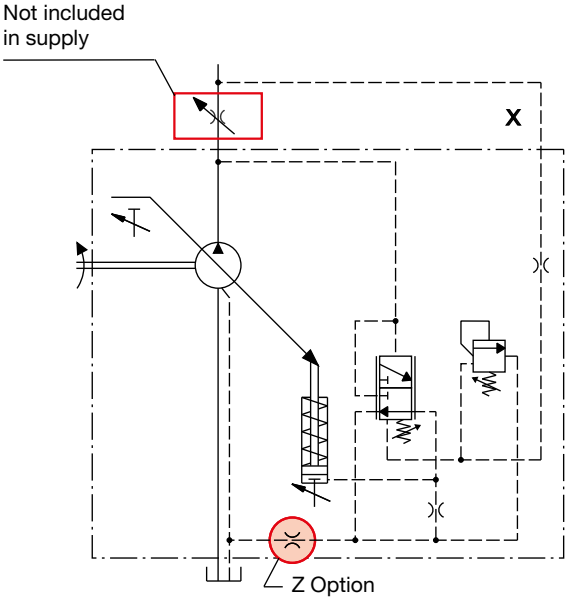


RP1



(See page 41 for more information)

RP1 - LS2 (with flow control)



(See page 41 for more information)

05/10.2014

NOTES

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Please contact us for more information.

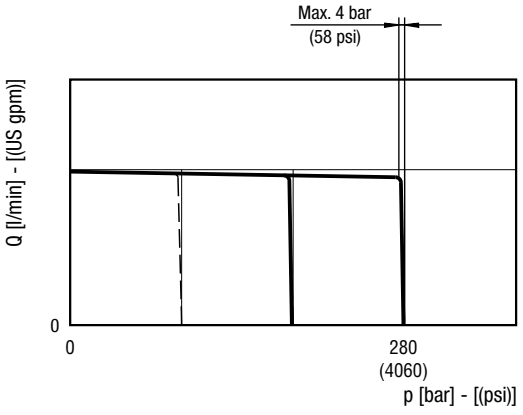
DUAL SETTING PRESSURE COMPENSATOR RP2

Replaces: 06/06.2020

Regulates the pump displacement automatically to mantain 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).

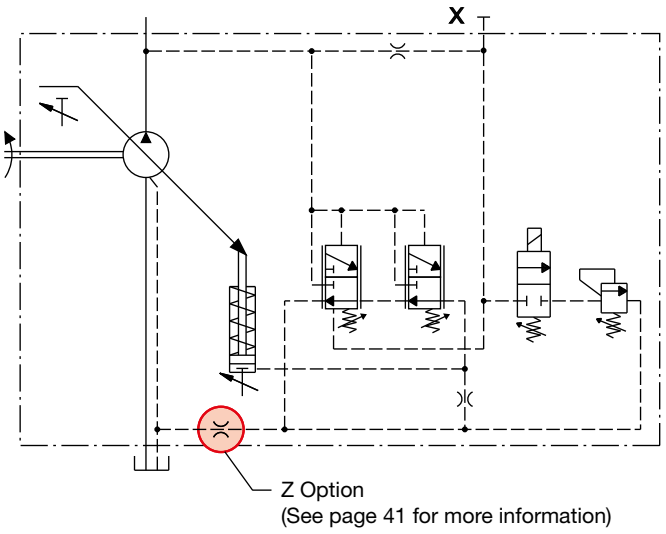


VALVE FEATURES

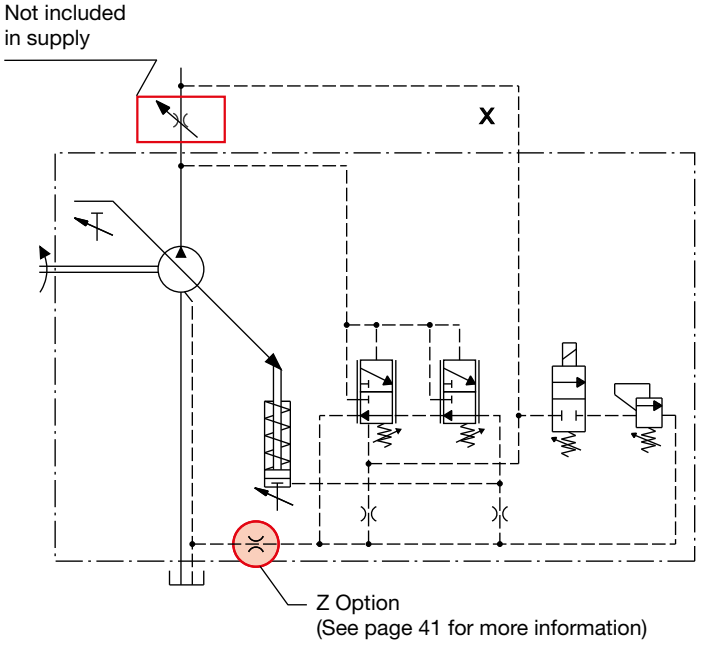
Valve code	Arrangement	Voltage
1	Normally closed	12 V DC
2	Normally closed	24 V DC
6	Normally open	12 V DC
7	Normally open	24 V DC

O 08/05.2024

RP2



RP2 - LS2 (with flow control)



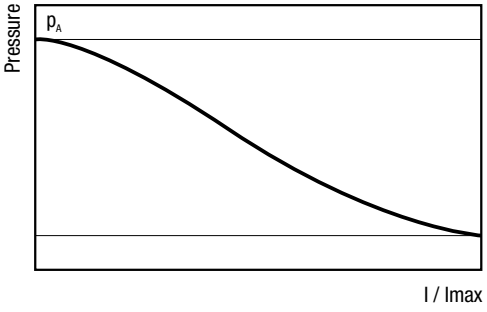
NOTES O

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Connectors availabitliy at page 52.
Please contact us for more information.

PRESSURE ELECTRONIC COMPENSATOR PEC

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

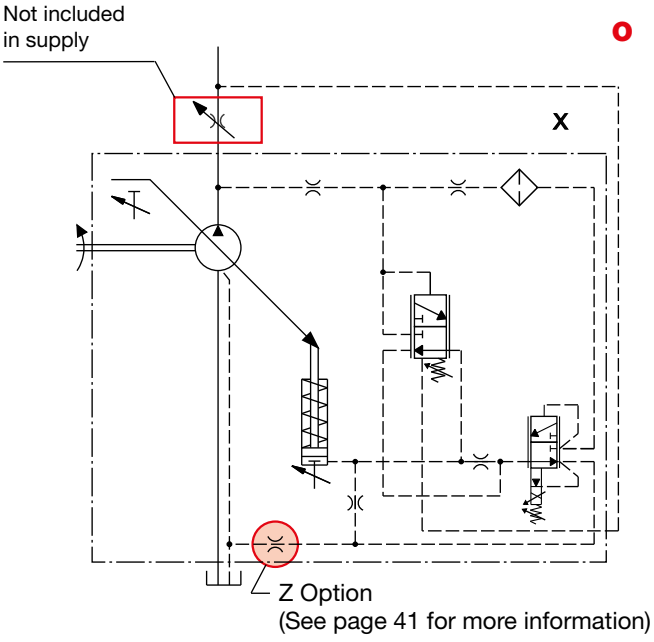
OPERATING CURVES



VALVE FEATURES

Valve code	Arrangement	Voltage
1	Normally closed	12 V DC
2	Normally closed	24 V DC

PEC - LS2 (with flow control)



Replaces: 06/06.2020

08/05.2024

NOTES

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Connectors availabitliy at page 52.
Please contact us for more information.

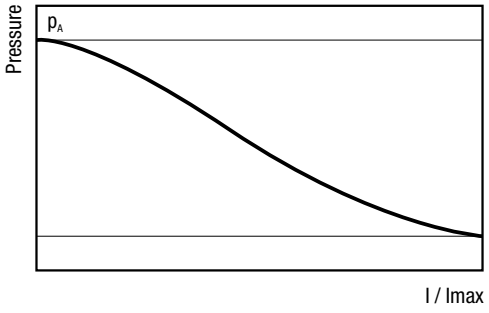
PRESSURE ELECTRONIC COMPENSATOR PLUS ANGULAR SENSOR PECA

Replaces: 06/06.2020

Regulates the pump displacement automatically to mantain 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 control with variable setting (variable Load-Sensing)
- Electronic torque limiter with variable torque setting
- Power limiter
- Working modes

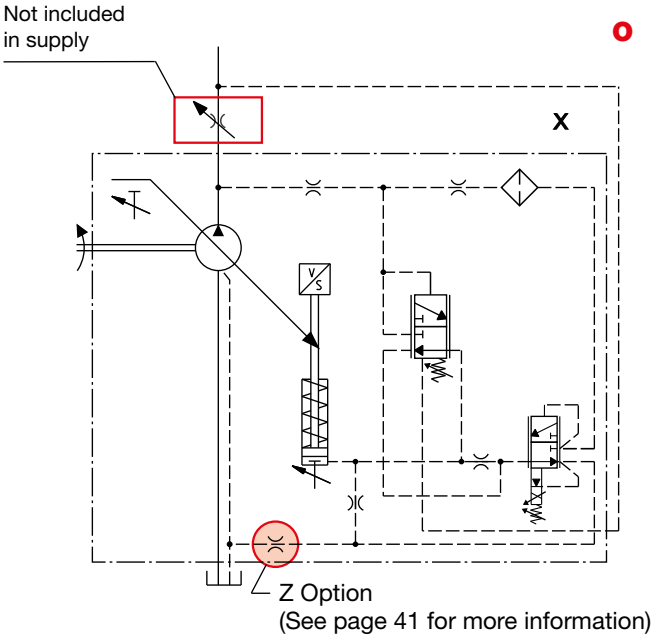
OPERATING CURVES



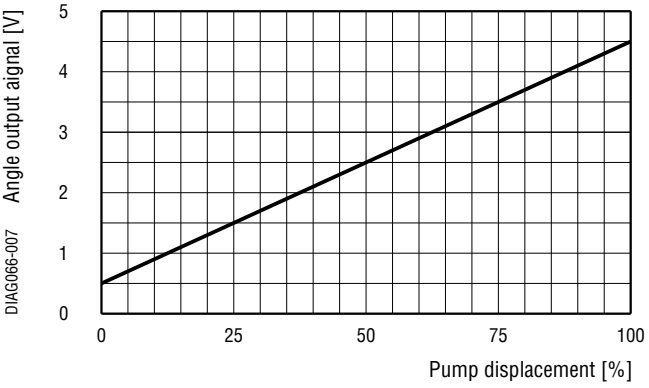
VALVE FEATURES

Valve code	Arrangement	Voltage
1	Normally closed	12 V DC
2	Normally closed	24 V DC

PECA - LS2 (with flow control)



ANGULAR SENSOR



08/05.2024

NOTES

Not available with MVP30.
X: Load-sensing port. Dimensions at page 38 ÷ 40.
Connectors availabitliy at page 52.
Please contact us for more information.

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 (■)	**RP0**	12 ÷ 40 (174 ÷ 580)	14 (203)
LS2 (◆)	**RP0**		
LS3 (●)	**RP0**		

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

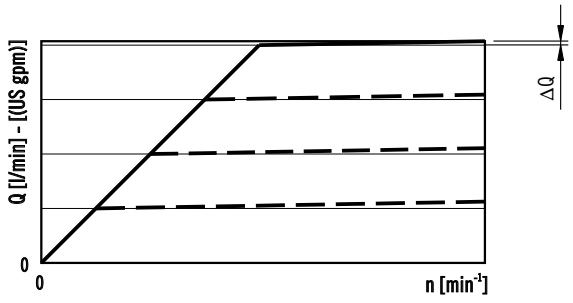
Pilot flow ≈ 1,3 ÷ 1,5 l/min (0.34 ÷ 0.40 US gpm)

In standard setting conditions 14 bar (203 psi) the stand-by pressure is $15^{\pm 2}$ bar ($218^{\pm 29}$ psi).

OPERATING CURVES

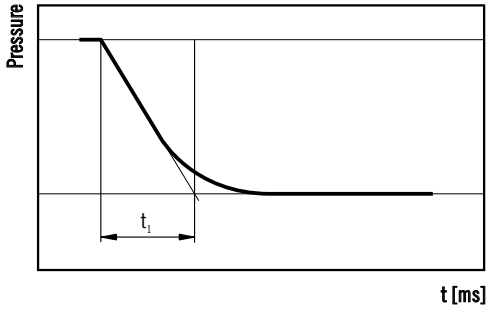
Curves have been obtained at the speed of 1500 min^{-1} and oil temperature 50 °C (122 °F).

Curve at variable speed



RESPONSE TIME

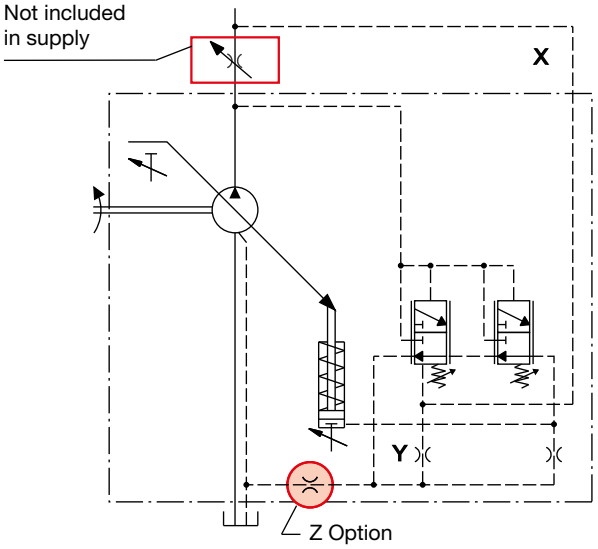
According to SAE J745 (using outlet pressure).



NOTES

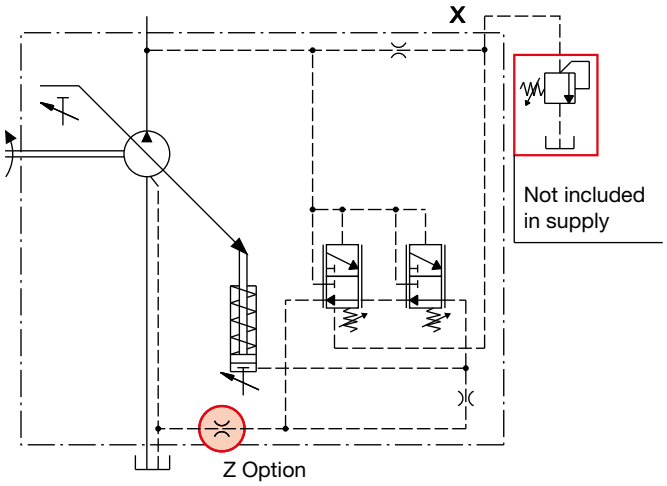
X: Load-sensing port. Dimensions at page 38 ÷ 40.
Available without pressure compensator RP.
Please contact us for more information.

LS0 (Bleed open) - LS2 (Bleed closed)



(See page 41 for more information)

LS3 - Remote pressure compensator



(See page 41 for more information)

	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_1
Pump type	Response time [ms] - (off stroke)
MVP 30	120
MVP 48	120
MVP 60	120

According to SAE J745 (using outlet pressure)

05/10.2014

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.

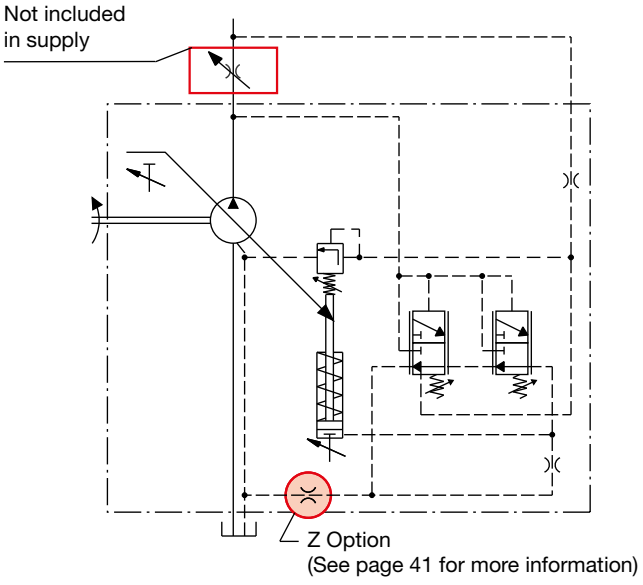
Pump type	Min. torque	Min. power (●)
	Nm (lbf in)	kW (HP)
MVP30	45 (398)	7.1 (9,5)
MVP48	61 (540)	9.6 (12,9)
MVP60	97 (859)	15.2 (20,4)

(●) @ 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}].

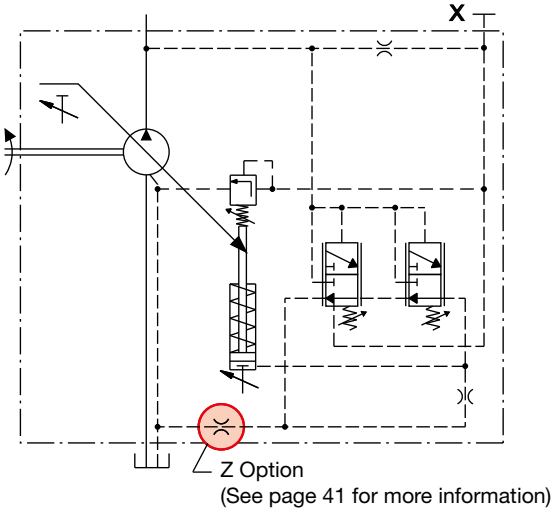
RN0 - Standard

Torque limitation for closed center valve.

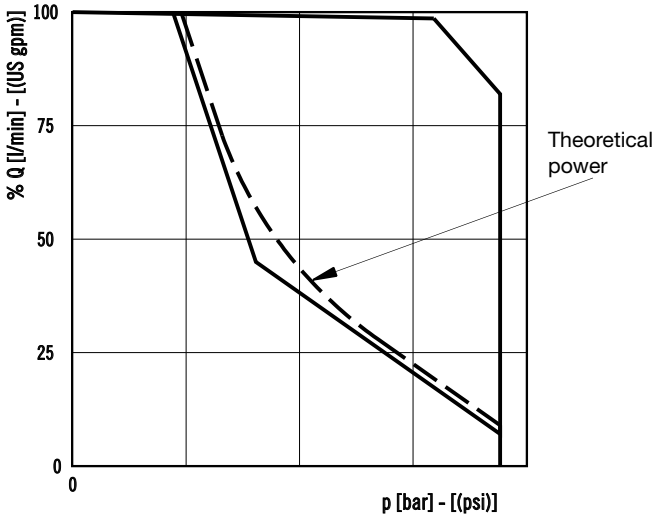


RN1 - Internal pilot

Torque limitation for open center valve.



OPERATING CURVES



NOTES

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Available without pressure compensator RP.
Please contact us for more information.

DUAL SETTING TORQUE LIMITER RN2

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

Pump type	Min. torque	Min. power (●)
	Nm (lbf in)	kW (HP)
MVP30	45 (398)	7.1 (9,5)
MVP48	61 (540)	9.6 (12,9)
MVP60	97 (859)	15.2 (20,4)

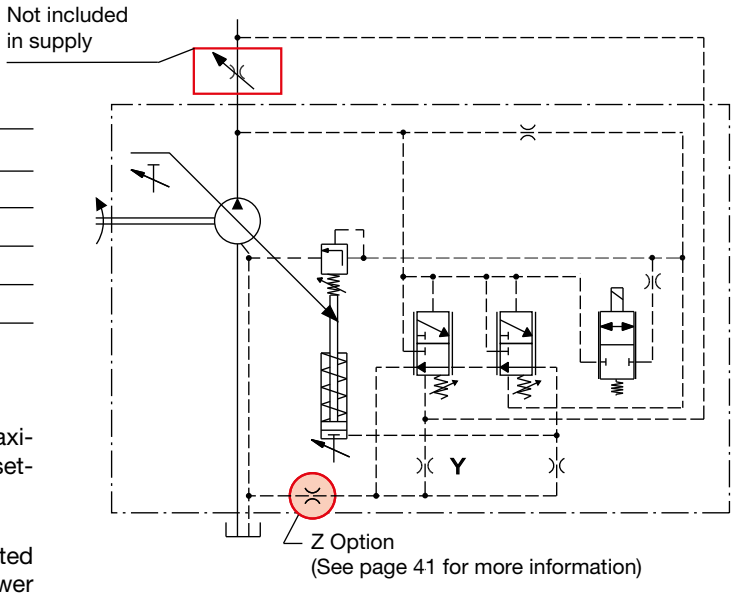
(●) @ 1500 min^{-1}

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}].

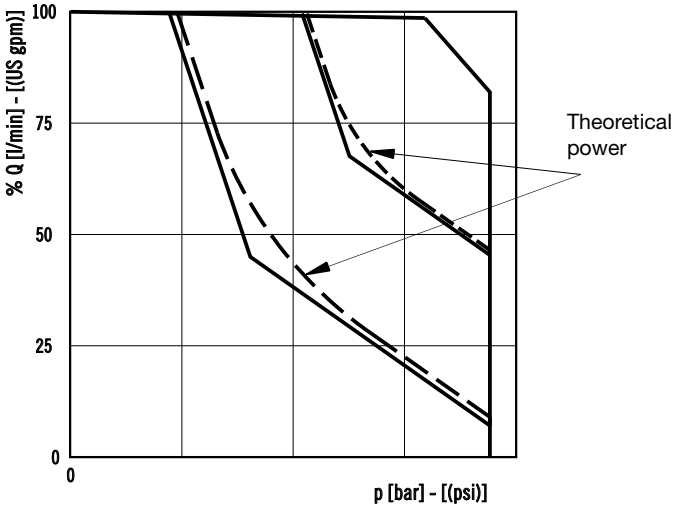
RN2-LS0 / RN2-LS2

For LS2 configuration Y is plugged.



Replaces: 05/10.2014

OPERATING CURVES



VALVE FEATURES

Valve code	Arrangement	Voltage
1	Normally closed	12 V DC
2	Normally closed	24 V DC
6	Normally open	12 V DC
7	Normally open	24 V DC

O 08/05.2024

NOTES O

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Connectors availabitliy at page 52.
Please contact us for more information.

HIGH PERFORMANCE TORQUE LIMITER RN3

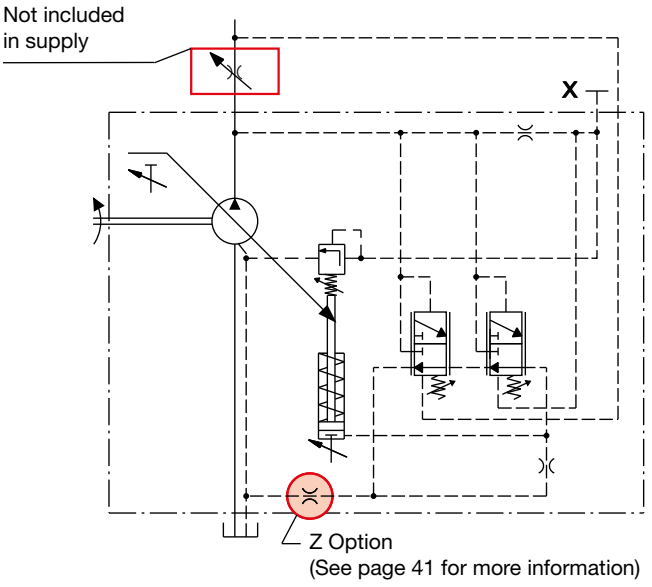
Regulates the pump displacement according to the system pressure, to maintain the pre-adjusted torque value and protect the prime mover from overload.
This version is optimized for LS systems. With the standard torque limiter RN0, in case of a high flow through the LS main valve the torque absorbed by the pump can be slightly lower than the pre-adjusted torque value, resulting in a lower flow.
The RN3 version grants the pre-adjusted torque value even at high flow through the LS main valve.
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)
MVP30	45 (398)	7.1 (9,5)
MVP48	61 (540)	9.6 (12,9)
MVP60	97 (859)	15.2 (20,4)

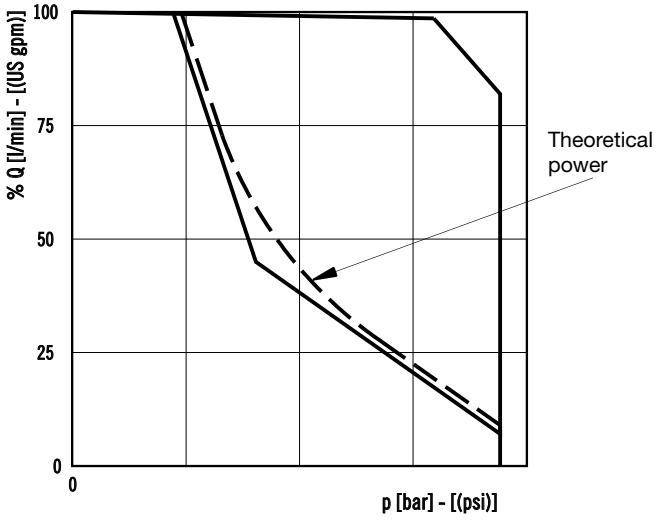
(●) @ 1500 min^{-1}

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}].

RN3 - Special version



OPERATING CURVES



06/06.2020

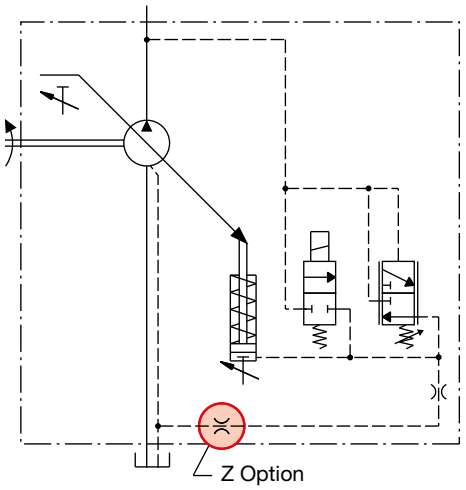
NOTES

X: Load-sensing port. Dimensions at page 38 ÷ 40.
Available without pressure compensator RP.
Please contact us for more information.

UNLOADING VALVE U..

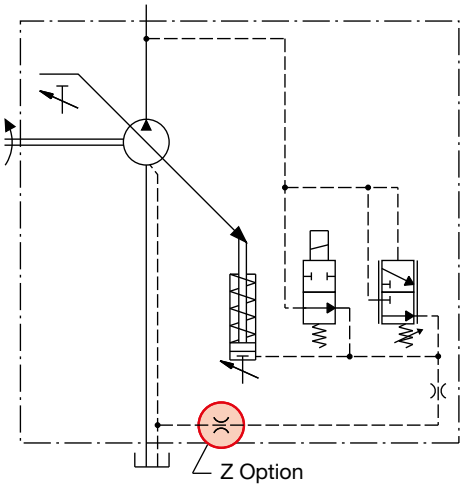
Replaces: 06/06.2020

NC (normally closed)



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

NA (normally open)



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

VALVE FEATURES

Valve code	Arrangement	Voltage
U1	Normally closed	12 V DC
U2	Normally closed	24 V DC
U6	Normally open	12 V DC
U7	Normally open	24 V DC

O 08/05.2024

NOTES O

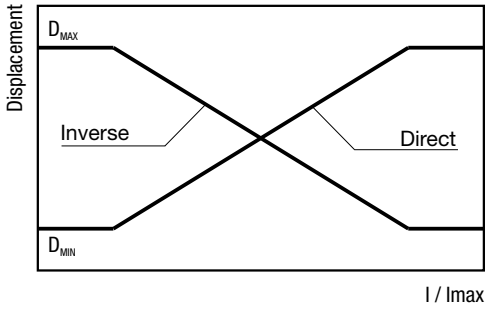
Available without pressure compensator RP.
Connectors availabitliy at page 52.
Please contact us for other connectors and more information.

ELECTRO-PROPORTIONAL DISPLACEMENT COMPENSATOR DEC

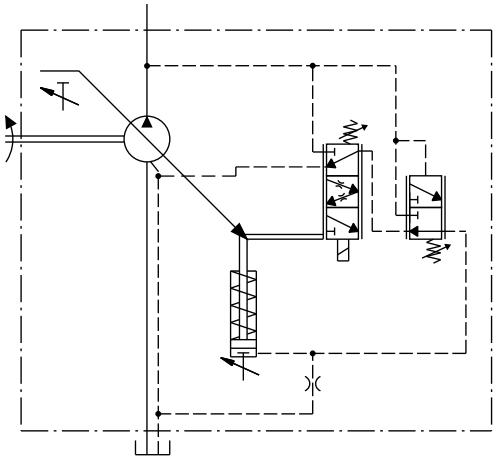
Regulates the pump displacement automatically to maintain it below the variable limit set through a command current signal.

Replaces: 06/06.2020

OPERATING CURVES



DEC



VALVE FEATURES

Valve code	Arrangement	Voltage
1	Inverse	12 V DC
2	Inverse	24 V DC
6	Direct	12 V DC
7	Direct	24 V DC

O 08/05.2024

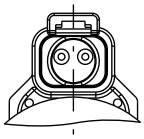
NOTES O

Connectors availabitliy at page 52.
Please contact us for more information.

CONNECTORS

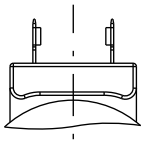
CONNECTOR: Deutsch DT04-2P **D**

Protection: IP69K with mating connector mounted



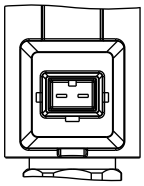
CONNECTOR: DIN 43650 **S**

Protection: IP65 with mating connector mounted



CONNECTOR: Junior Timer **JT**

Protection: IP67 with mating connector mounted



COILS FEATURES

Connector type	**D** (Deutsch DT04-2P) **S** (DIN 43650) **JT** (Junior timer)	
Voltage	12 V DC	24 V DC
Power	30 W	34 W
Resistance @ 20 °C (68 °F)	4,9 ± 3% Ω	17,1 ± 5% Ω
Dither frequency	150 Hz	150 Hz
Operating temperature	-30 ÷ 110 °C (-22 ÷ 230 °F)	-30 ÷ 110 °C (-22 ÷ 230 °F)

08/05.2024

MULTIPLE PUMPS WITH THROUGH DRIVE

THROUGH DRIVE

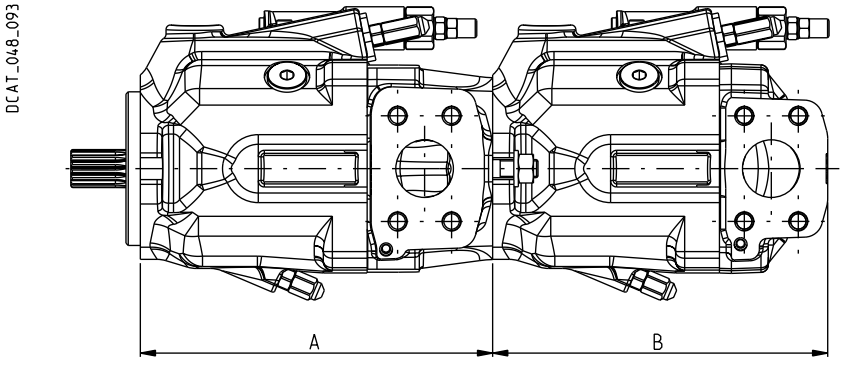
MVP through drive axial piston pumps offer the flexibility to obtain different groups able to supply several hydraulic systems. The operating characteristics of each assembled pumps are the same as the corresponding single pumps according to the following conditions:

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, Δp, n)		Hydro-mechanical efficiency

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

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.

06/06.2020

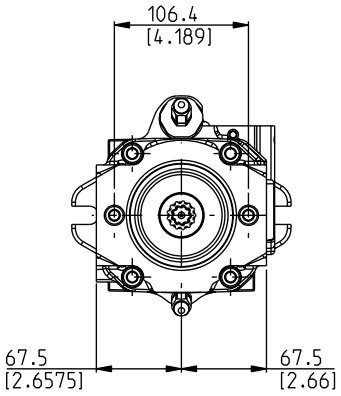
A		
Pump type	Flanged for	Code
MVP30	SAE A	**AS1**
	SAE B	**AS5**
MVP48	SAE B	**AS5**
MVP60	SAE B	**AS5**

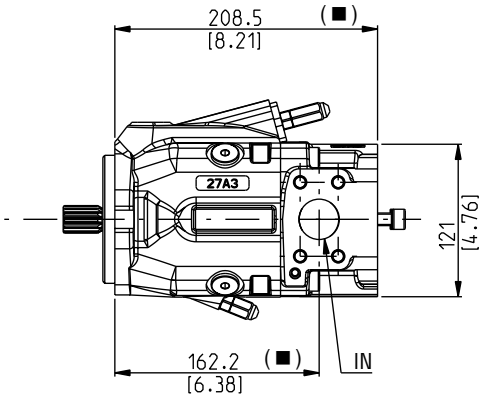
MVP30 FRONT SECTION - DIMENSIONS AS1

Through drive SAE A

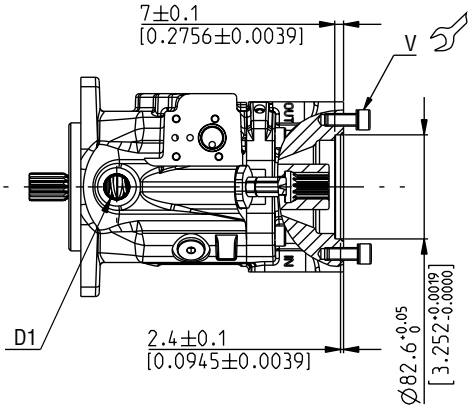
Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

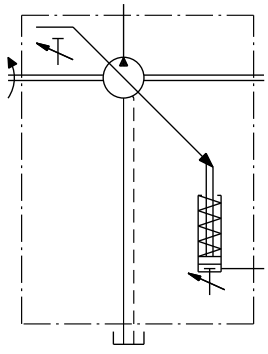
(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27mm (1.06 in).
The drawing shows a front section with clockwise rotation

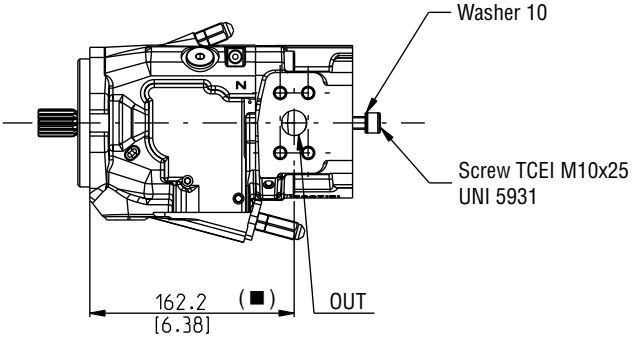




DCAT_048_103







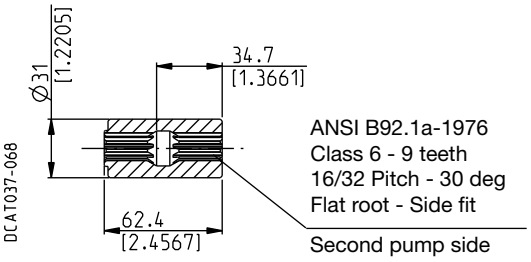
07/03.2022

Screws tightening torque Nm (lbf in)
V
70 ±7 (558 ÷ 682)

MVP30 COUPLINGS - DIMENSIONS

SAE “A” SPLINE 03

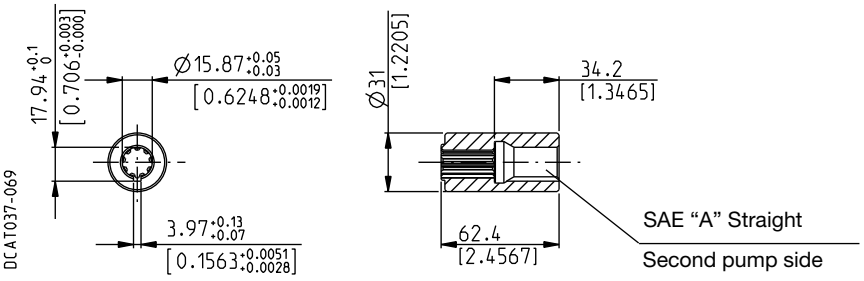
Available with flange code **AS1**



MAX 100 Nm (885 lbf in)

SAE “A” STRAIGHT 31

Available with flange code **AS1**



MAX 70 Nm (620 lbf in)

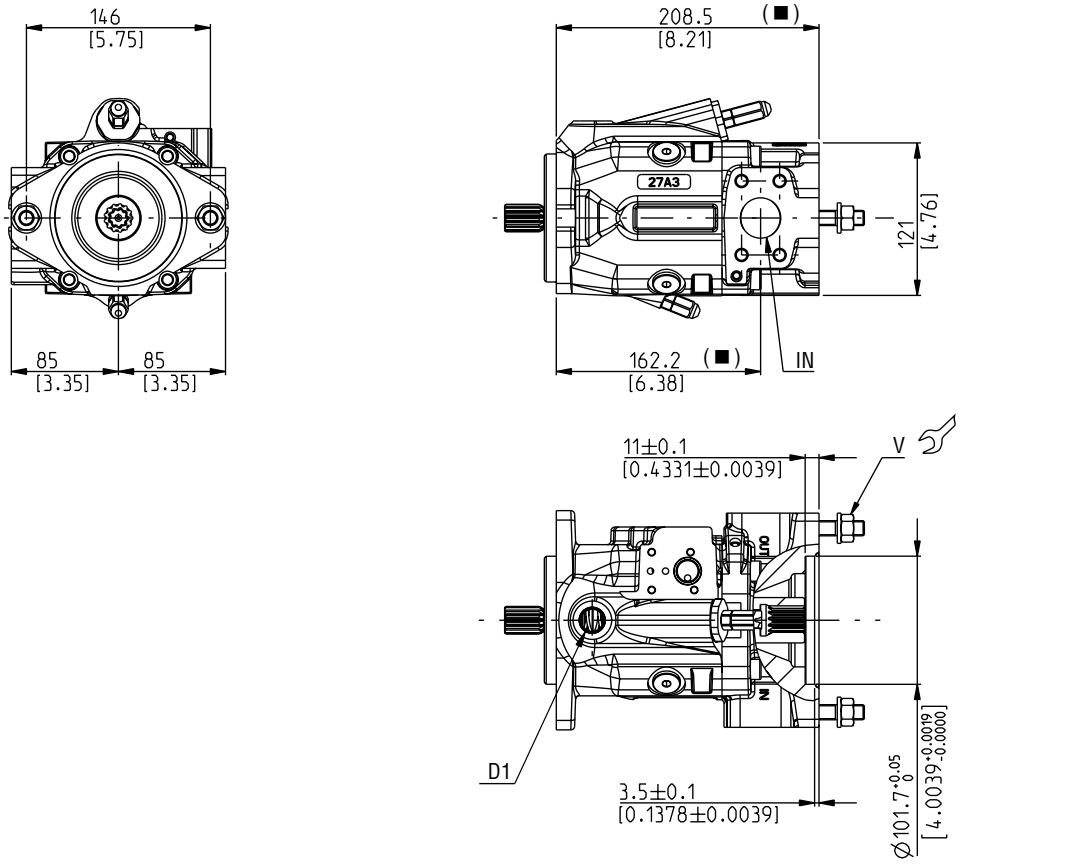
05/10.2014

MVP30 FRONT SECTION - DIMENSIONS AS5

Through drive SAE B

Drive shafts: see page 32
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

(■)
Dimension refer to S5 mounting flange.
For S1 flange add 27mm (1.06 in).
The drawing shows a front section with clockwise rotation



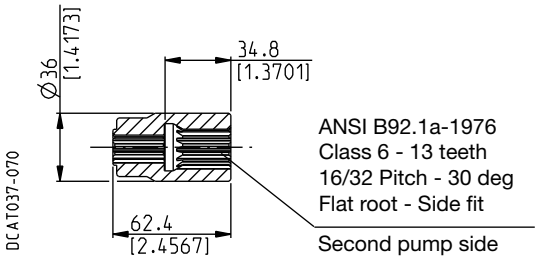
Screws tightening torque Nm (lbf in)
V
100 ±10 (797 ÷ 974)

07/03.2022

MVP30 COUPLINGS - DIMENSIONS

SAE “B” SPLINE 04

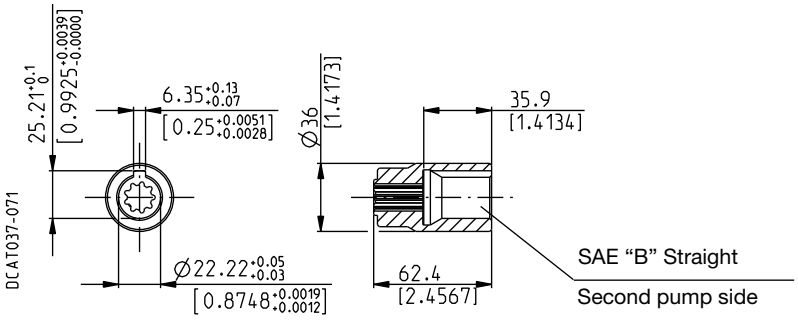
Available with flange code **AS5**



MAX 100 Nm (885 lbf in)

SAE “B” STRAIGHT 32

Available with flange code **AS5**



MAX 100 Nm (885 lbf in)

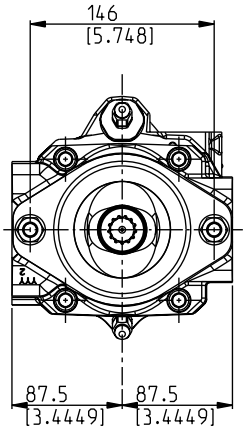
05/10.2014

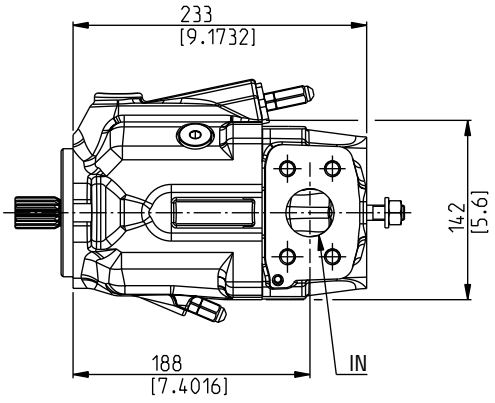
MVP48 FRONT SECTION - DIMENSIONS AS5

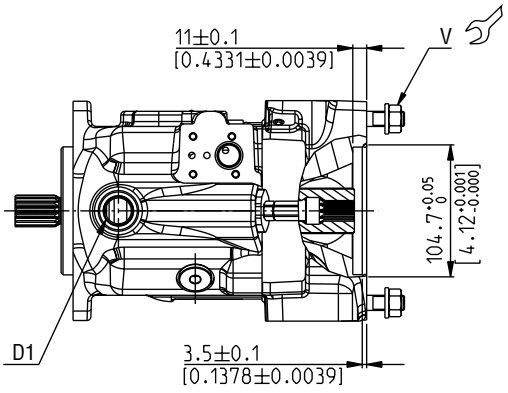
Through drive SAE B

Drive shafts: see page 33
Mounting flanges: see page 36
Ports: see page 38 ÷ 40

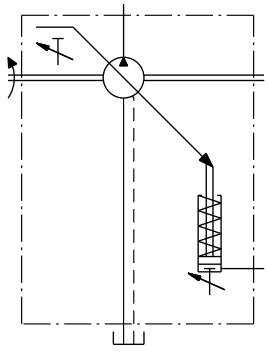
The drawing shows a front section with clockwise rotation

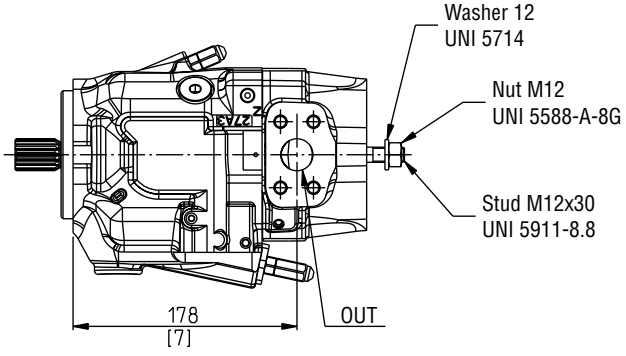






DCAT_048_038





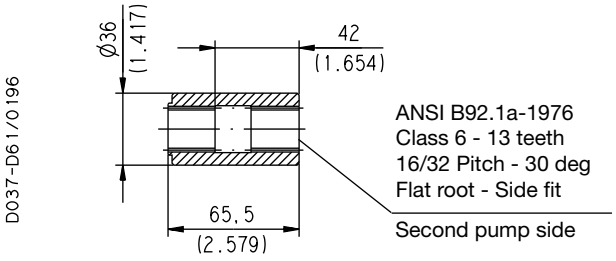
Screws tightening torque Nm (lbf in)
V
100 ±10 (797 ÷ 974)

06/06.2020

MVP48 COUPLINGS - DIMENSIONS

SAE “B” SPLINE 04

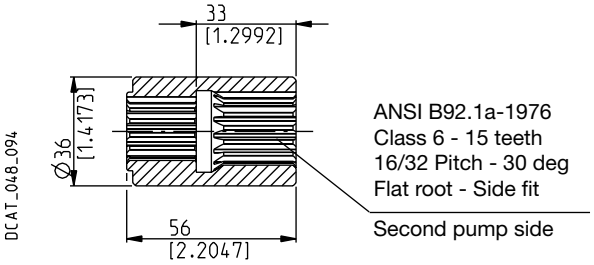
Available with flange code **AS5**



MAX 200 Nm (1770 lbf in)

SAE “BB” SPLINE 05

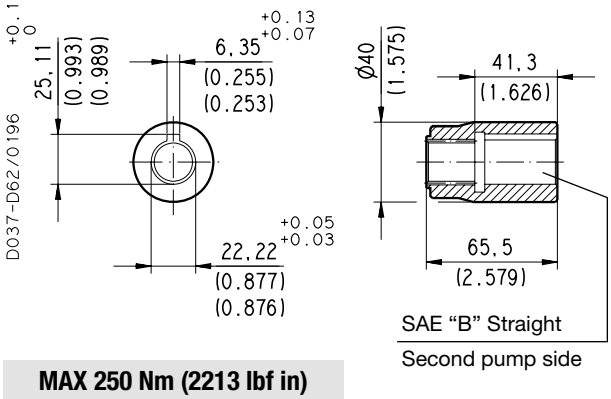
Available with flange code **AS5**



MAX 250 Nm (2213 lbf in)

SAE “B” STRAIGHT 32

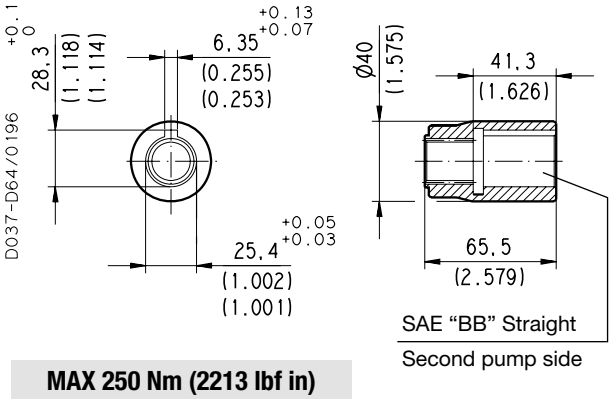
Available with flange code **AS5**



MAX 250 Nm (2213 lbf in)

SAE “BB” STRAIGHT 33

Available with flange code **AS5**



MAX 250 Nm (2213 lbf in)

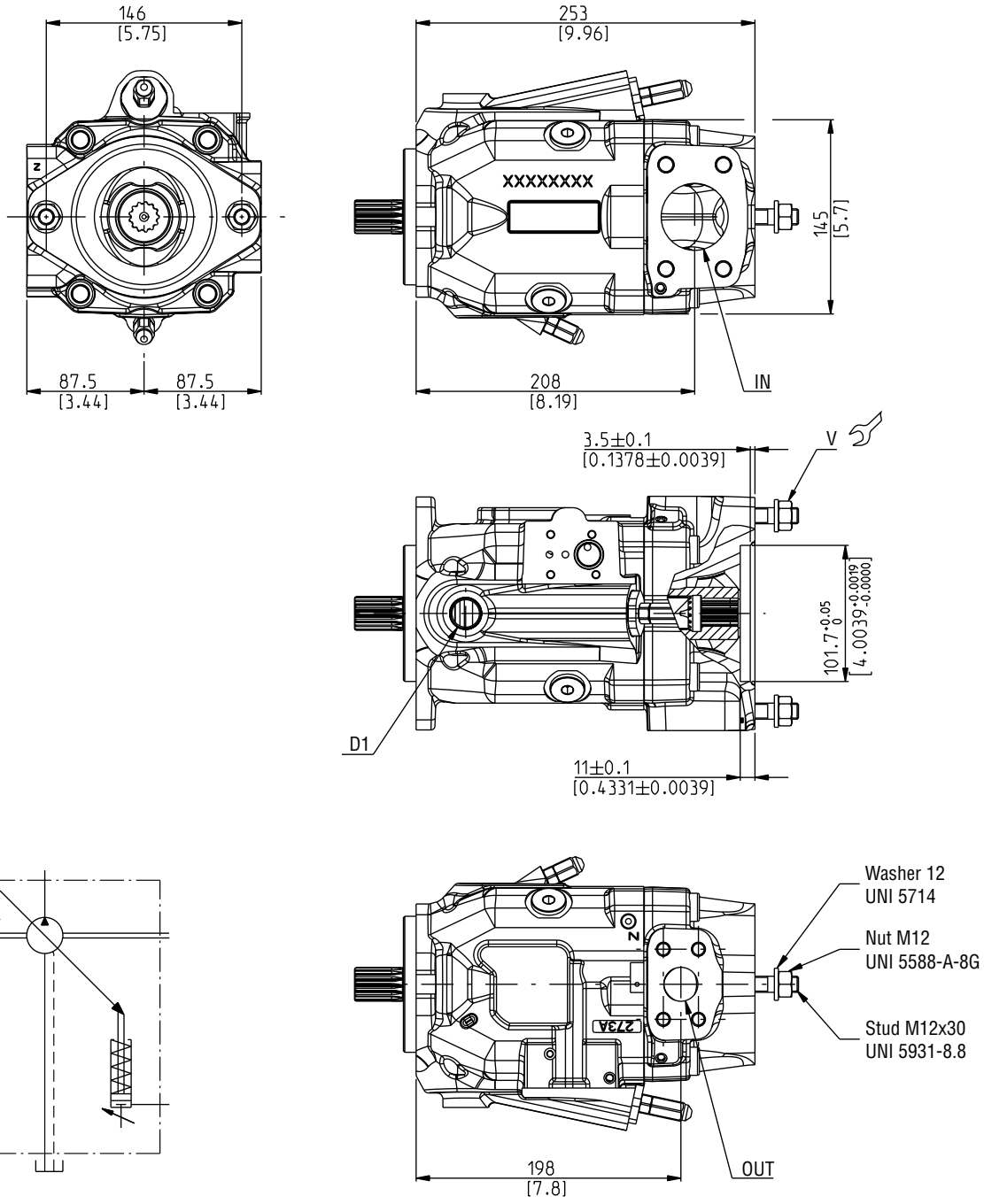
05/10.2014

MVP60 FRONT SECTION - DIMENSIONS AS5

Through drive SAE B

Drive shafts: see page 34 ÷ 35
Mounting flanges: see page 36 ÷ 37
Ports: see page 38 ÷ 40

The drawing shows a front section with clockwise rotation



DCAT_048_040

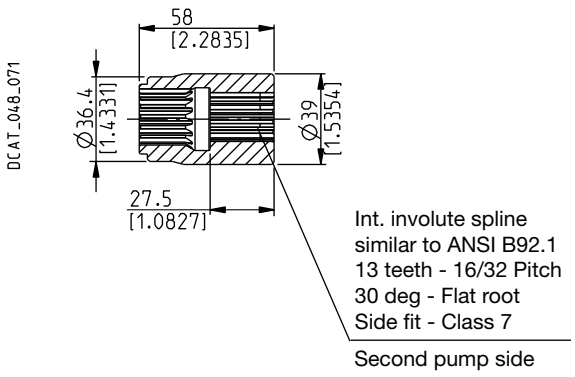
06/06.2020

Screws tightening torque Nm (lbf in)
V
100 ±10 (797 ÷ 974)

MVP60 COUPLINGS - DIMENSIONS

SAE “B” SPLINE 04

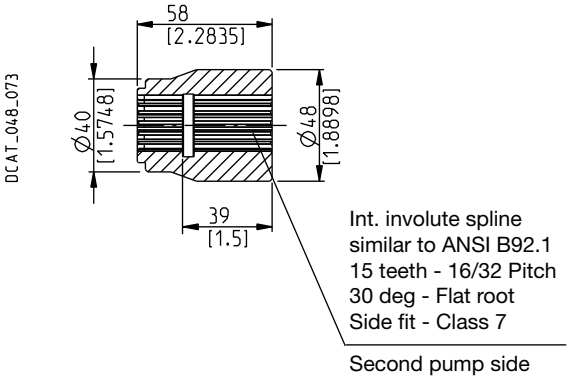
Available with flange code **AS5**



MAX 200 Nm (1770 lbf in)

SAE “BB” SPLINE 05

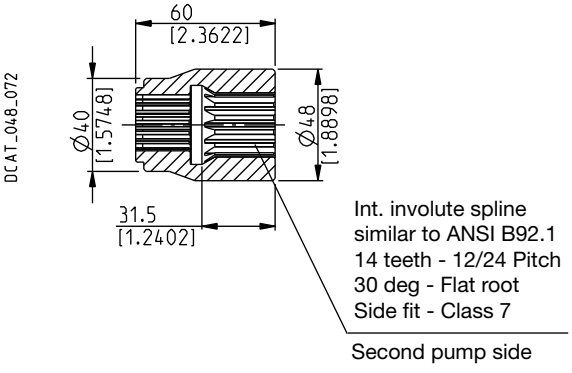
Available with flange code **AS5**



MAX 250 Nm (2213 lbf in)

SAE “C” SPLINE 06

Available with flange code **AS5**

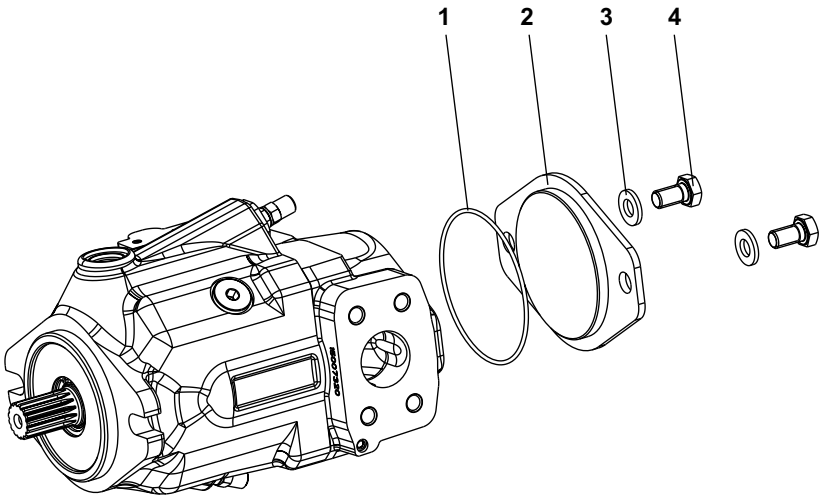


MAX 430 Nm (3806 lbf in)

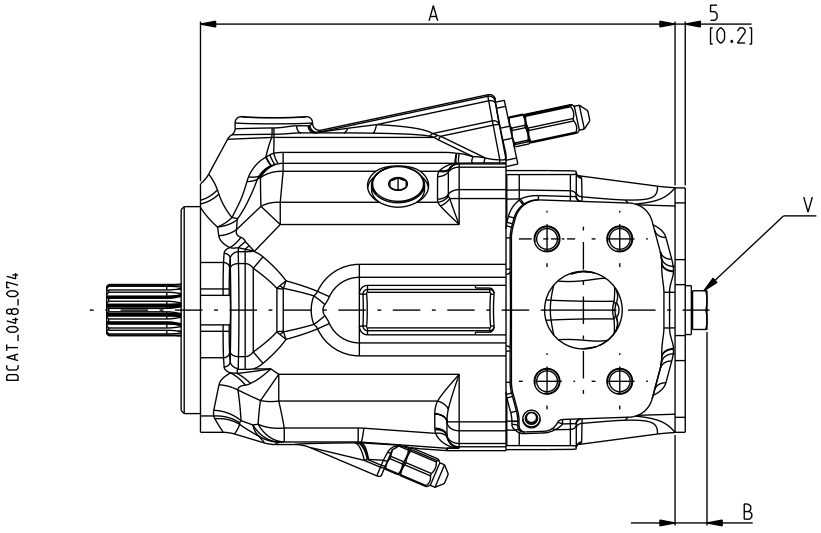
05/10.2014

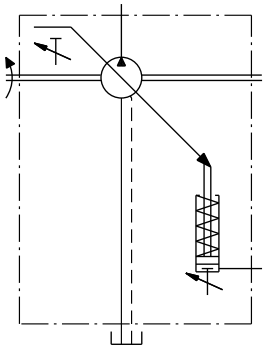
FRONT SECTION KIT COVER

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



Kit part brake down
1 - Seal
2 - Flange
3 - Washers
4 - Screws





Front section					Kit cover
Pump type	Flanged for	Code	**A** mm (in)	**B** mm (in)	Code
MVP30	SAE A	AS1	236 (9.2913)	14 (0.5512)	**62100006**
MVP30	SAE B	AS5	209 (8.2283	16 (0.6299)	**62100007**
MVP48			233 (9.1732)		
MVP60			253 (9.9606)		

Screws tightening torque Nm (lbf in)
V
20 ±1 (159 ÷ 195)

05/10.2014

NOTES

06/06.2020

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 cm³/rev (1.74 in³/rev)	MVP 30-28
34,8 cm³/rev (2.12 in³/rev)	MVP 30-34
45 cm³/rev (2.75 in³/rev)	MVP 48-45
53,7 cm³/rev (3.28 in³/rev)	MVP 48-53
60 cm³/rev (3.66 in³/rev)	MVP 60-60
72 cm³/rev (4.39 in³/rev)	MVP 60-72
84,7 cm³/rev (5.17 in³/rev)	MVP 60-84

2 Rotation	Code
Anti-clockwise	S
Clockwise	D

3 Drive shaft (a)	Code
SAE “A” spline (9 teeth)	03
SAE spline (11 teeth)	07
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 “A” 2 holes	S1
SAE “B” 2 holes	S5
SAE “C” 2 holes	S7
SAE “C” 4 holes	S8

5 Ports position	Code
Side	L
Rear	P

Code	6 Inlet/outlet ports		
	Nominal size		Pump type
	Inlet IN SAE 3000	Outlet OUT 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)			
OG/OD (b)	1” 1/4	3/4”	MVP 30
OH/OF (b)	1” 1/2	1”	MVP 48
MF/OF	2”	1”	MVP 60

Code	7 Seals
N	Buna (standard)
V	Viton

Code	8 Regulators
...	See how to order on page 65 ÷ 67

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

(b) Only for rear ports

06/06.2020

HOW TO ORDER REGULATORS

PRESSURE COMPENSATORS - FLOW COMPENSATORS (Load-sensing)

Replaces: 07/03.2022

	8		9		10		11		12		13		14
Pressure compensator	RP0	-					Z	-			G	-	DP
Pressure compensator	RP1	-					Z	-			G	-	DP
Pressure compensator with flow control	RP1	-			LS2	-	Z	-			G	-	DP
Dual setting pressure compensator	RP2	-	1	-			Z	-	S	-	G	-	DP
Dual setting pressure compensator with flow control	RP2	-	1	-	LS2	-	Z	-	S	-	G	-	DP
Flow compensator	LS0	-					Z	-			G	-	DP
Flow compensator for remote control	LS2	-					Z	-			G	-	DP
Pressure compensator for remote control	LS3	-					Z	-			G	-	DP

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	Code
Normally closed 12 V DC		1
Normally closed 24 V DC		2
Normally open 12 V DC		6
Normally open 24 V DC		7

Code	Flow control option	10
LS2	Flow compensator	

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

Code	O Connector type	12
D	Deutsch DT04-2P	
S	DIN 43650	
JT	Junior timer	

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

Code	Double shaft seal option	14
	Without double shaft seal (standard - no code)	
DP	Double shaft seal (availability at page 11)	

O 08/05.2024

ORDER EXAMPLE

MVP60 pump with dual setting pressure compensator:
MVP60.60S-05S5-LMF/MC-N-RP2-1-S-G-DP

HOW TO ORDER REGULATORS

ELECTRO-PROPORTIONAL PRESSURE AND DISPLACEMENT COMPENSATORS - UNLOADING VALVES

	8		9		10		11		12	13		14		15		16		17
Pressure electronic compensator with flow control	PEC	-	1	-	A	-	LS2	-		...	/	...	-	D	-	G	-	DP
Pressure electronic compensator plus angular sensor with flow control	PECA	-	1	-	A	-	LS2	-		...		...	-	D	-	G	-	DP
Unloading valve	U..	-							Z	-				S		G	-	DP
Electro-proportional displacement compensator	DEC	-	1	-			LS2	-						D	-	G	-	DP

Replaces: 07/03.2022

8	Regulators type (a)	Code
Pressure electronic compensator		PEC
Pressure electronic compensator and swashplate angular sensor (a)		PECA
Unloading valve - Normally closed 12 V DC		U1
Unloading valve - Normally closed 24 V DC		U2
Unloading valve - Normally open 12 V DC		U6
Unloading valve - Normally open 24 V DC		U7
Electro-proportional displacement compensator		DEC

9	Valve type	Code
Normally closed 12 V DC		1
Normally closed 24 V DC		2

10	Position	Code
Position 0°		A
Position 90°		B

11	Flow control option	Code
Flow compensator for remote control		LS2

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

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

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

Code	Connector type	15
D	Deutsch DT04-2P	
S	DIN 43650	
JT	Junior timer	

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

Code	Double shaft seal option	17
	Without double shaft seal (standard - no code)	
DP	Double shaft seal (availability at page 11)	

08/05.2024

ORDER EXAMPLE

MVP60 pump with pressure electronic compensator with flow control:

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

(a) PECA: not available with MVP 30

HOW TO ORDER REGULATORS

TORQUE LIMITERS

Replaces: 07/03.2022

	8		9		10		11		12		13		14		15		16		17
Torque limiter - standard	RN0	-							Z	-	G	-	DP	-	...	/			...
Torque limiter - internal pilot	RN1	-							Z	-	G	-	DP	-	...	/			...
Dual setting torque limiter with flow control	RN2	-	1	-	S	-	LS0	-	Z	-	G	-	DP	-	...	/	...	/	...
Dual setting torque limiter with remote flow control	RN2	-	1	-	S	-	LS2	-	Z	-	G	-	DP	-	...	/	...	/	...
High performance torque limiter	RN3	-							Z	-	G	-	DP	-	...	/			...

8	Regulators type	Code
Torque limiter - standard		RN0
Torque limiter - internal pilot		RN1
Dual setting torque limiter with flow control		RN2
High performance torque limiter		RN3

9	Valve type	Code
Normally closed 12 V DC		1
Normally closed 24 V DC		2
Normally open 12 V DC		6
Normally open 24 V DC		7

10	Connector type	O	Code
Deutsch DT04-2P			D
DIN 43650			S
Junior timer			JT

11	Flow control option	Code
Flow compensator		LS0
Flow compensator for remote control		LS2

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

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

Code	Double shaft seal option	14
	Without double shaft seal (standard - no code)	
DP	Double shaft seal (availability at page 11)	

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

Code	Second torque limiter setting (a)	16
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (b)	17
...	Please specify the requested speed value	

O 08/05.2024

(a) Refer to page 47 ÷ 49 for more information

(b) 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-DP-150/200/2100

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

Common inlet

1	2	3	4	5	6	7	8 ...	9	10	11	7	12	13	14	15	
MVP30-28	S	-	04	S5	-	L	MD/MB	-	N	-	...	-	G	-	DP	-	P7	-	A	(| # | / | # | / | # |)	/

Front section

KP20-6,3	S	-			-	L	**/GD	-											N5	-	N	-	P					

Rear section

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	6 Inlet/outlet ports		
	Nominal size		Pump type
	Inlet IN	Outlet OUT	
	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
	—	—	MVP 48
MF/OF	2”	1”	MVP 60

Code	7 Seals
N	Buna (standard)
V	Viton

Code	8 Regulators
...	See how to order on page 65 ÷ 67

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

Code	10 Double shaft seal option
	Without double shaft seal (standard - no code)
DP	Double shaft seal (availability at page 11)

Code	11 Intermediate flange
FRONT SECTION	
P7	Flanged for KP20
I7	Flanged for PHP20
REAR SECTION	
N5	Kappa 20 (common inlet)
S7	Polaris PHP 20 (common inlet)

Code	12 Sections
A	Front
P	Rear

07/03.2022

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/GEAR PUMP

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

Code	Second torque limiter setting (#)	14
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (#)	15
...	Please specify the requested speed value	

Omit code only if ordering assembled multiple pumps

(#) Only for torque limiter. Refer to page 67 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-LMF/MC-N-RN1-G-DP-I7-A (100/2500)**

Rear section — **PHP 20.23S-L **/GD-S7-N-P**

ASSEMBLED DOUBLE PUMP

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

07/03.2022

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/PISTON PUMP

Through drive

1	2	3	4	5	6	7	8 ...	9	10	11	12	13	14	15	
MVP 60-60	S	-	05	S5	-	L	MF/MC	-	N	-	...	-	G	-	AS5	-	04	-	DP	(# | / | # | / | #)	/

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

Code	7 Seals
N	Buna (standard)
V	Viton

Code	8 Regulators
...	See how to order on page 65 ÷ 67

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

Code	10 Intermediate flange (c)
AS1	SAE “A” 2 holes
AS5	SAE “B” 2 holes

Code	11 Coupling (d)
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	12 Double shaft seal option
	Without double shaft seal (standard - no code)
DP	Double shaft seal (availability at page 11)

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

07/03.2022

HOW TO ORDER MULTIPLE PUMPS - PISTON PUMP/PISTON PUMP

Code	Second torque limiter setting (#)	14
...	Please specify the requested torque value in Nm	

Code	Torque limiter setting speed (#)	15
...	Please specify the requested speed value	

(a) Displacements on page 64

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

(c) Intermediate flanges on page 53

(d) Couplings availability:
MVP30 on page 55 and 57
MVP48 on page 59
MVP60 on page 61

Omit code only if ordering assembled multiple pumps

(#) Only for torque limiter. Refer to page 67 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-LMF/MC-N-RN2-1-S-LS2-G-AS5/04-DP (70/85/2600)**

Rear section — **MVP 30.34S-04S5-LMD/MB-N-LS0-Z-G**

ASSEMBLED DOUBLE PUMP

MVP 60.60S-06S8-LMF/MC-N-RN2-1-S-LS2-G-DP (70/85/2600)/ MVP 30.34S-04S5-LMD/MB-N-LS0-Z-G

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

INDIVIDUAL SECTIONS

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

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

ASSEMBLED DOUBLE PUMP

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

07/03.2022

MVP 08 T A Edition: 08/05.2024 Replaces: MVP 07 T A

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