

INTRODUCTION

“POLARIS” more than fifty years of Casappa experience in design and production of hydraulic components, characterized by large investments in research and development in order to propose new and personalized solutions to the market.

Our use of CAD 3D in the development of this generation permit us the 3D modelling and the virtual simulation of the behaviour of the components inserted in the hydraulic circuit. This means that the process will take less time and the quality of the products is better.

Polaris pumps and motors are basically composed of a gear housing in aluminium alloy, two gear wheels supported by sleeve bearings and two end plates, the front and the rear cover, either in aluminium or in cast iron with excellent mechanical characteristics.

Our success is based largely on the quality of our product. This guaranties the consistencies of the efficiencies and low level of noise emission during the life of our products.

DISPLACEMENTS

From 1,07 cm³/rev (0.07 in³/rev)

To 91,10 cm³/rev (5.56 in³/rev)

PRESSURE

Max. constant operating pressure 260 bar (3770 psi)

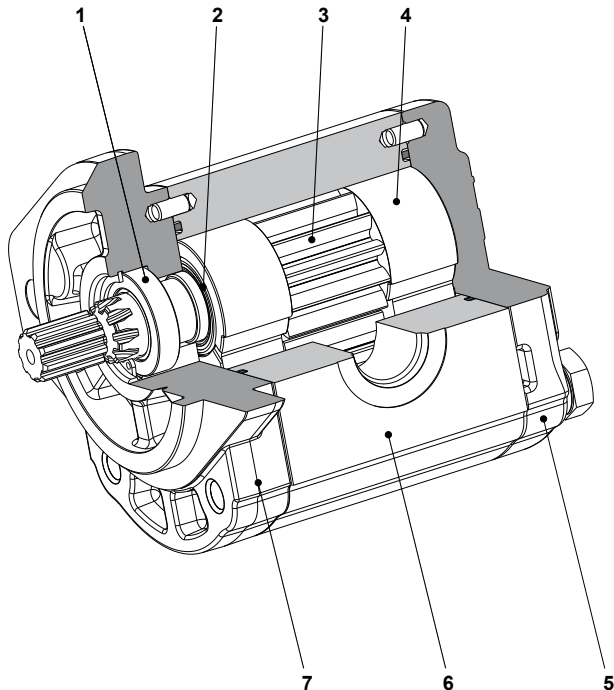
Max. system pressure (relief valve setting) 280 bar (4060 psi)

Max. peak of pressure 300 bar (4350 psi)

SPEED

Max. 4000 min⁻¹

- Available in groups 10, 20 and 30.
- Drive shafts, mounting flanges and ports according to the international standards.
- Combination of multiple pumps in standard version, common inlet and separated stages.
- Integrated outboard bearings for heavy duty application.
- Many types of built-in valves.



TYPICAL APPLICATIONS

- Building & Construction
- Material Handling
- Agriculture
- Forestry
- Turf care & Mowers
- Fan Drive

1	Shaft seal
2	Seal
3	Gear
4	Thrust plate
5	Rear cover
6	Body
7	Mounting flange

INSTRUCTIONS

INSTALLATION

Pump

The direction of rotation of single-rotation pumps must be the same as that of the drive shaft. Check that the coupling flange correctly aligns the transmission shaft and the pump shaft. Flexible couplings should be used (never rigid fittings) which will not generate an axial or radial load on the pump shaft.

Motor

The direction of rotation of single-rotation motors must match circuit connections. Check that the coupling flange correctly aligns the transmission shaft and the motor shaft. Flexible couplings should be used (never rigid fittings) which will not generate an axial or radial load on the motor shaft.

TANK

Tank capacity must be sufficient for the system's operating conditions (~ 3 times the amount of oil in circulation) to avoid overheating of the fluid. A heat exchanger should be installed if necessary. The intake and return lines in the tank must be spaced apart (by inserting a vertical divider) to prevent the return-line oil from being taken up again immediately.

LINES

The lines must have a major diameter which is at least as large as the diameter of pump or motor 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. All return lines must end below the minimum oil level, to prevent foaming. Before connecting the lines, remove any plugs and make sure that the lines are perfectly clean.

HYDRAULIC FLUID

Use hydraulic fluid conforming to viscosity data as specified in the first pages of the catalogue. Avoid using mixtures of different oils which could result in decomposition and reduction of the oil's lubricating power.

FILTERS

We recommend filtering the entire system flow. Filters on suction and return line must be fitted in according to the contamination class as indicated in the first pages of the catalogue. Casappa recommends to use its own production filters:

STORAGE

The storage must be in a dry environment. Max storage time in ideal conditions is 24 months. The ideal storage temperature is between 5 °C (41 °F) and 20 °C (68 °F). No problem in case of temperature between -40 °C (-40 °F) and 50 °C (122 °F). Below -40 °C (-40 °F) please consult our pre-sales department.

STARTING UP

Check that all circuit connections are tight and that the entire system is completely clean. Insert the oil in the tank, using a filter. Bleed the circuit to assist in filling. Set the pressure relief valves to the lowest possible setting. 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.

If the difference between pump or motor temperature and fluid temperature exceeds 10 °C (50 °F), rapidly switch the system on and off to heat it up gradually. Then gradually increase the pressure and speed of rotation until the pre-set operating levels as specified in the catalogue are attained.

COLD START

Cold start is meant short term and low idle. During cold start of the machine the following limits can be applied:

Minimum inlet pressure	0,5 bar abs. (7 psi)
Outlet pressure (pumps) Inlet pressure (motors)	≤ 50 bar (725 psi)
Max drain pressure / Max back pressure for single rotation motors	+ 50% of standard values
Speed	≤ 1500 min ⁻¹
Minimum temperature	-40 °C (-40 °F)
Max oil viscosity	2000 mm ² /s (cSt) [9100 SSU]

If the ambient temperature is lower than -20 °C (-4 °F) the system speed and pressure must be limited until the hydraulic oil temperature exceeds -20 °C (-4 °F).

PERIODICAL CHECKS - MAINTENANCE

Keep the outside surface clean especially in the area of the drive shaft seal. In fact, abrasive powder can accelerate wear on the seal and cause leakage. Replace filters regularly to keep the fluid clean. The oil level must be checked and oil replaced periodically depending on the system's operating conditions.

Replaces: 02/07.2006

FEATURES

Replaces: 02/07.2006

Construction	External gear pumps and motors 3-piece construction
Mounting	EUROPEAN - SAE - GERMAN standard flanges
Ports	Threaded or flanged
Direction of rotation (looking on drive shaft)	Anti-clockwise (S) - clockwise (D) - reversible external drain (R - L) reversible internal drain (B)
Inlet pressure range for pumps	0,7 ÷ 3 bar abs. (10 ÷ 44 psi) If p > 1,5 bar abs. (22 psi) specific shaft sealing have to be applied. Please consult our pre-sales department.
Max back pressure for single rotation motors	5 bar (73 psi) continuous @ min. speed 350 min ⁻¹ 1 bar (14.5 psi) continuous @ max. speed (see page 7)
Max drain line pressure on reversible rotation motors	5 bar (73 psi) continuous @ min. speed 350 min ⁻¹ 1 bar (14.5 psi) continuous @ max. speed (see page 7)
Max back pressure on in series motors	150 bar (2175 psi)
Fluid temperature range	See table (1)
Fluid	Mineral oil based hydraulic fluids to ISO/DIN. For other fluids please consult our pre-sales department
Viscosity range	From 12 to 100 mm ² /s (cSt) [60 to 456 SSU] recommended Up to 750 mm ² /s (cSt) [3410 SSU] permitted
Filtering requirement and recommended fluid contamination	See table (2) page 6

Tab. 1

Type	Fluid composition	Max pressure bar (psi)	Max speed min ⁻¹	Temperature - °C (°F)			Seals (●)	Shaft seals option (◆)
				Min	Max continuous	Max peak		
ISO/DIN	Mineral oil based hydraulic fluid to ISO/DIN	See page 7	See page 7	-25 (-13)	80 (176)	100 (212)	N	D C1
				-25 (-13)	110 (230)	125 (257)	V	
				-25 (-13)	110 (230)	125 (257)	T-PV	

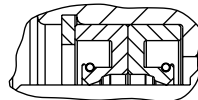
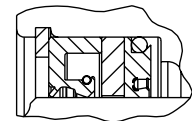
(●) **N** = Buna NBR (standard) - **V** = Viton-FKM - **T-PV** = Hydrogenated buna HNBR seals with Viton-FKM shaft seals (only for PLP20)

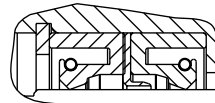
04/10.2020

O
D (◆) shaft seals with wiper seal

C1 (◆) High pressure special shaft seal

Single rotation pumps

Max drain
line pressure:
0,5 bar (7 psi)

Max drain
line pressure:
10 bar (145 psi)
@ 350 min⁻¹

Single rotation motors
Reversible rotation pumps and motors

Max drain
line pressure:
5 bar (73 psi)
@ 350 min⁻¹


FEATURES



Filtration

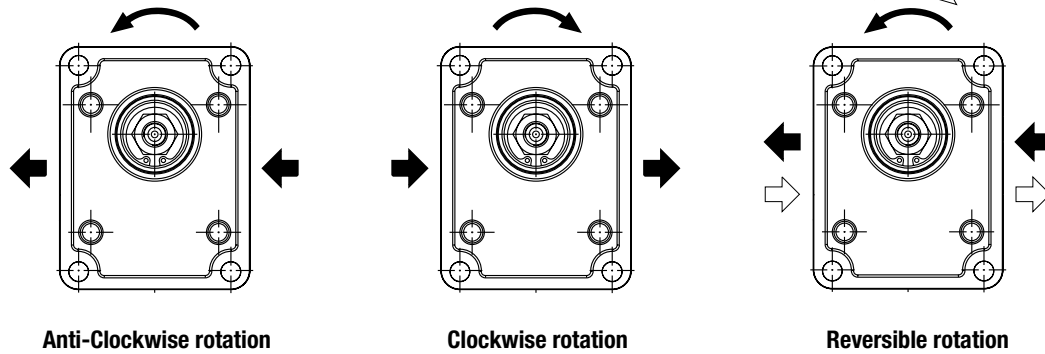
Tab. 2

Working pressure bar (psi)	$\Delta p < 140$ (2030)	$140 < \Delta p < 210$ (2030) (3045)	$\Delta p > 210$ (3045)
Contamination class NAS 1638	10	9	8
Contamination class ISO 4406	21/19/16	20/18/15	19/17/14
Achieved with filter $\beta_{10}(c) \geq 75$ according to ISO 16889	-	10 μm	10 μm
Achieved with filter $\beta_{25}(c) \geq 200$ according to ISO 16889	25 μm	-	-

Casappa recommends to use its own production filters:



DEFINITION OF ROTATION DIRECTION LOOKING AT THE DRIVE SHAFT

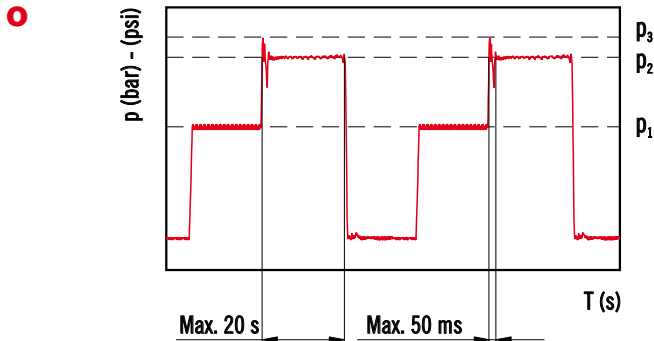


GENERAL NOTES

Available with different inlet and outlet ports.
For more information please consult our pre-sales department.

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.

For high frequency applications please consult our pre-sales department.

FEATURES

04/10.2020

POLARIS 30

Series	Pump type PLP Motor type PLM	Displacement	Max. pressure			Max. speed	Min. speed
			p ₁	p ₂	p ₃		
		cm³/rev (in³/rev)	bar (psi)			min ⁻¹	
POLARIS 30	PL. 30•22	21,99 (1.34)	250 (3625)	270 (3915)	280 (4060)	3000	350
	PL. 30•27	26,70 (1.63)	250 (3625)	270 (3915)	280 (4060)	3000	350
	PL. 30•34	34,55 (2.11)	240 (3480)	260 (3770)	270 (3915)	3000	350
	PL. 30•38	39,27 (2.40)	240 (3480)	260 (3770)	270 (3915)	3000	350
	PL. 30•43	43,98 (2.68)	230 (3335)	250 (3625)	260 (3770)	3000	350
	PL. 30•51	51,83 (3.16)	210 (3045)	230 (3335)	240 (3480)	2500	350
	PL. 30•61	61,26 (3.74)	190 (2755)	210 (3045)	220 (3190)	2500	350
	PL. 30•73	73,82 (4.50)	170 (2465)	190 (2755)	200 (2900)	2500	350
	PL. 30•82	81,68 (4.98)	160 (2320)	170 (2465)	180 (2610)	2200	350
	PL. 30•90	91,10 (5.56)	150 (2175)	160 (2320)	170 (2465)	2200	350

Pressure values in the table refer to side ports unidirectional pumps and motors.
For reversible pumps and motors, max pressures are 250 bar (3600 psi) excepted those with lower pressure values.
For different configurations and working conditions please consult our pre-sales department.

GENERAL DATA PUMPS AND MOTORS



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

Efficiencies		Pumps	Motors
$\eta_v = \eta_v(V, \Delta p, n)$	Volumetric efficiency	($\approx 0,97$)	($\approx 0,96$)
$\eta_{hm} = \eta_{hm}(V, \Delta p, n)$	Hydro-mechanical efficiency	($\approx 0,88$)	($\approx 0,85$)
$\eta_t = \eta_v \cdot \eta_{hm}$	Overall efficiency	($\approx 0,85$)	($\approx 0,82$)

DESIGN CALCULATIONS FOR PUMP

$$Q = Q_{theor.} \cdot \eta_v \quad [l/min]$$

$$Q_{theor.} = \frac{V \cdot n}{1000} \quad [l/min]$$

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

$$M_{theor.} = \frac{\Delta p \cdot V}{62,83} \quad [Nm]$$

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

$$P_{OUT} = \frac{\Delta p \cdot Q}{600} \quad [kW]$$

DESIGN CALCULATIONS FOR MOTOR

$$Q = \frac{Q_{theor.}}{\eta_v} \quad [l/min]$$

$$Q_{theor.} = \frac{V \cdot n}{1000} \quad [l/min]$$

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

$$M_{theor.} = \frac{\Delta p \cdot V}{62,83} \quad [Nm]$$

$$P_{IN} = \frac{\Delta p \cdot Q}{600} \quad [kW]$$

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

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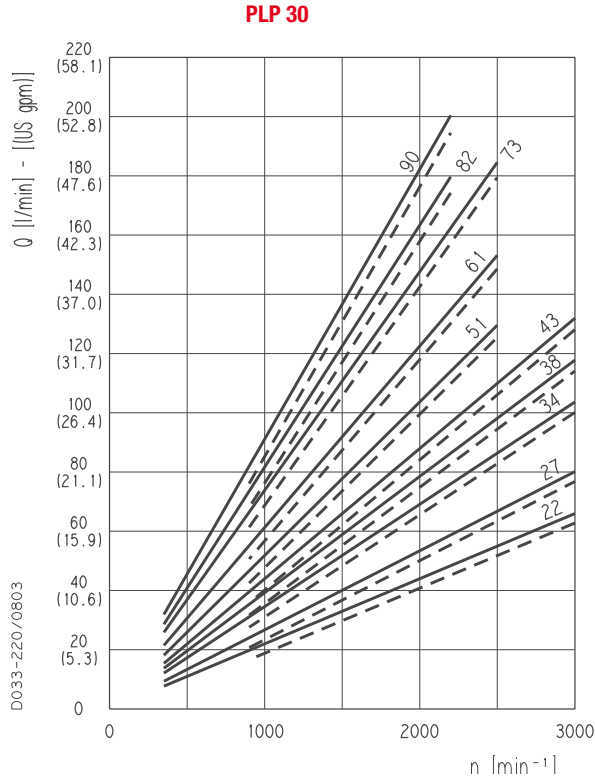
NOTES

Diagrams providing approximate selection data will be found on subsequent pages.

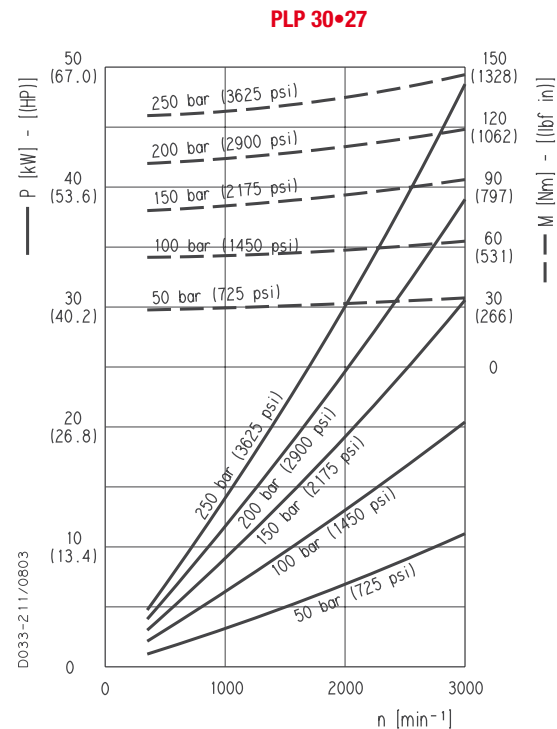
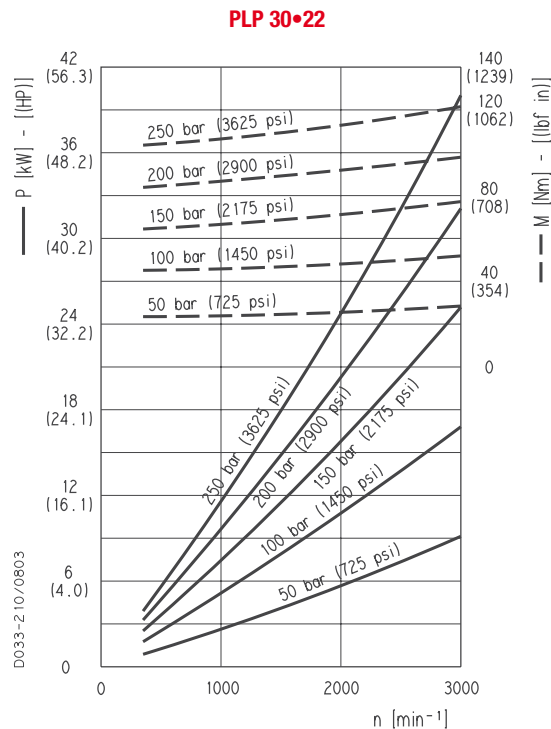
PLP 30

POLARIS 30 GEAR PUMPS PERFORMANCE 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 pressures.



PLP 30•22	—	20 bar (290 psi)
	- - -	250 bar (3625 psi)
PLP 30•27	—	20 bar (290 psi)
	- - -	250 bar (3625 psi)
PLP 30•34	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
PLP 30•38	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
PLP 30•43	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)
PLP 30•51	—	20 bar (290 psi)
	- - -	210 bar (3045 psi)
PLP 30•61	—	20 bar (290 psi)
	- - -	190 bar (2775 psi)
PLP 30•73	—	20 bar (290 psi)
	- - -	170 bar (2465 psi)
PLP 30•82	—	20 bar (290 psi)
	- - -	160 bar (2320 psi)
PLP 30•90	—	20 bar (290 psi)
	- - -	150 bar (2175 psi)

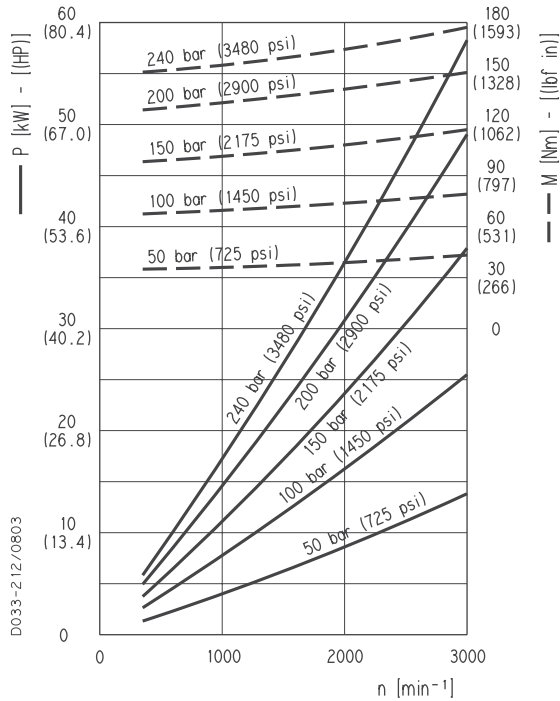


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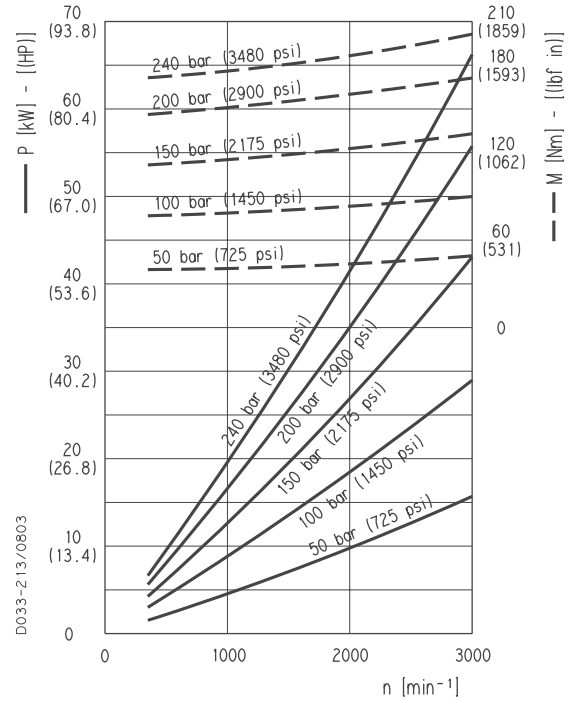
PLP 30

POLARIS 30 GEAR PUMPS PERFORMANCE CURVES

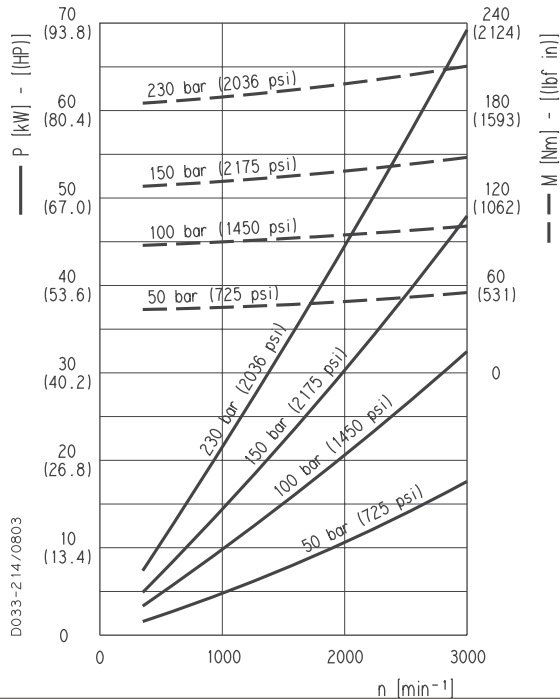
PLP 30•34



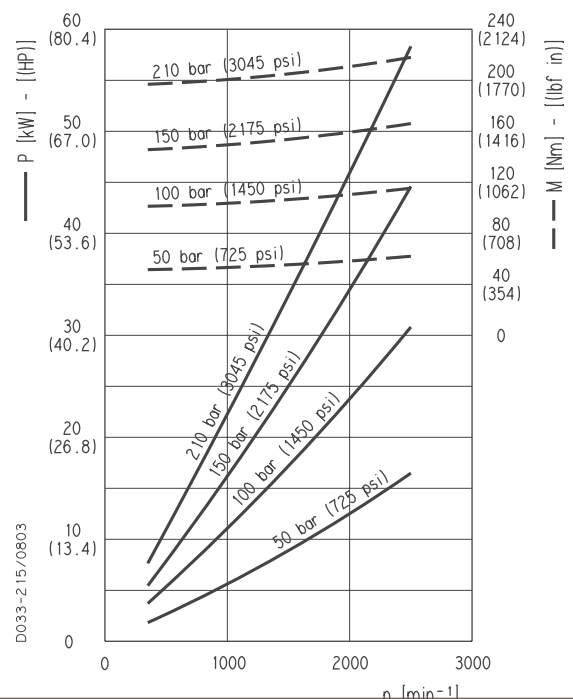
PLP 30•38



PLP 30•43



PLP 30•51

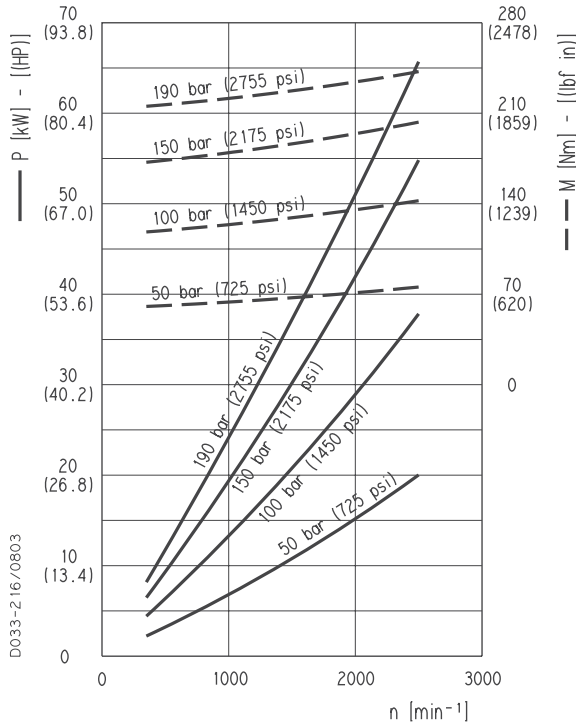


Yazım/Besim Hatelerinden Firmamız Sorumludur

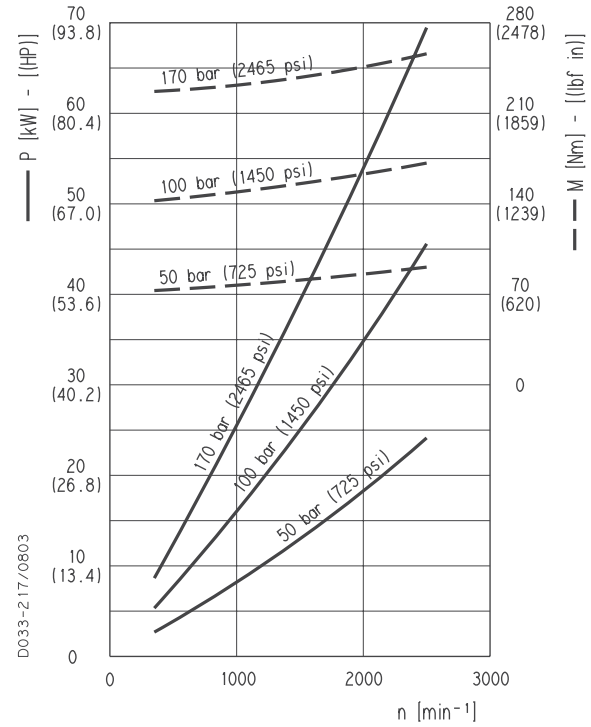
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POLARIS 30 GEAR PUMPS PERFORMANCE CURVES

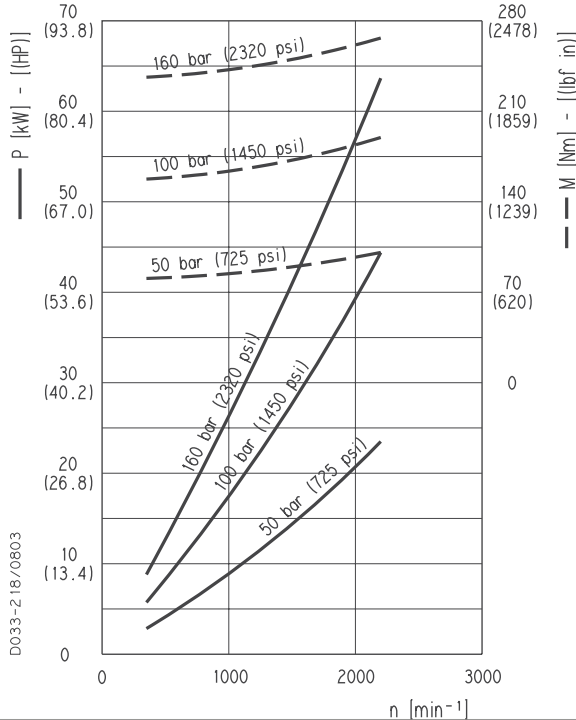
PLP 30•61



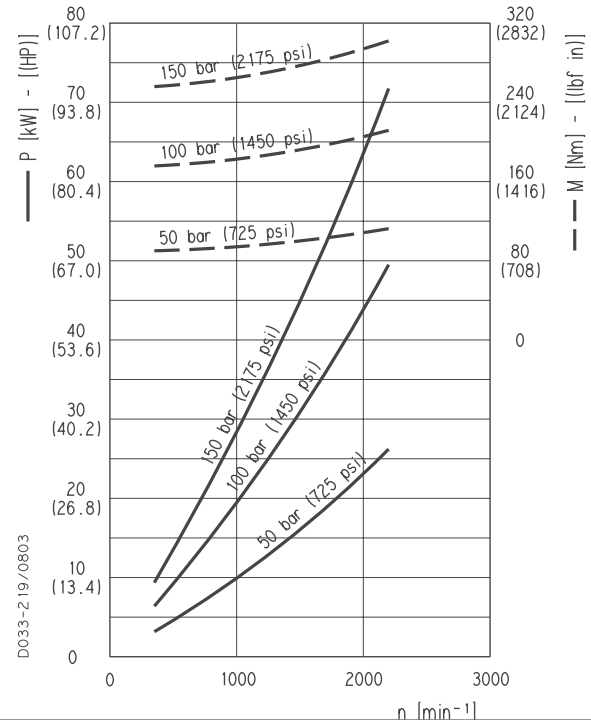
PLP 30•73



PLP 30•82



PLP 30•90

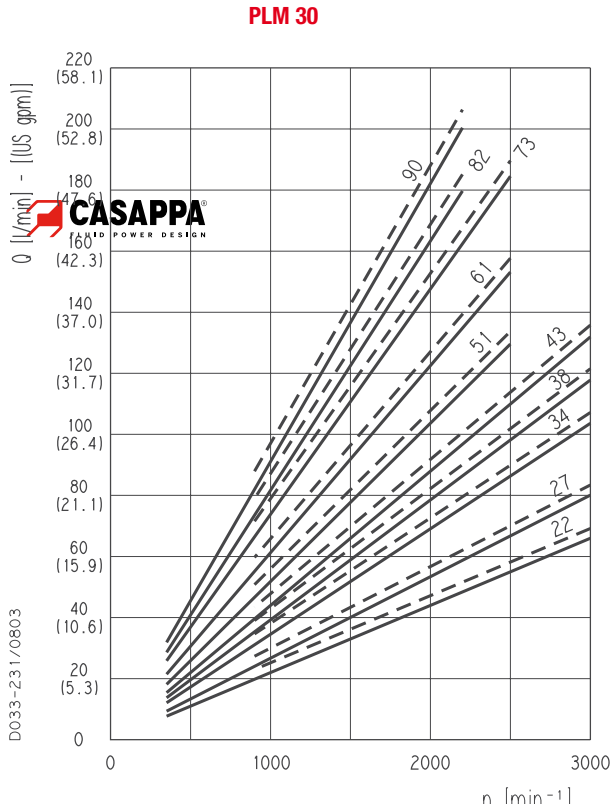


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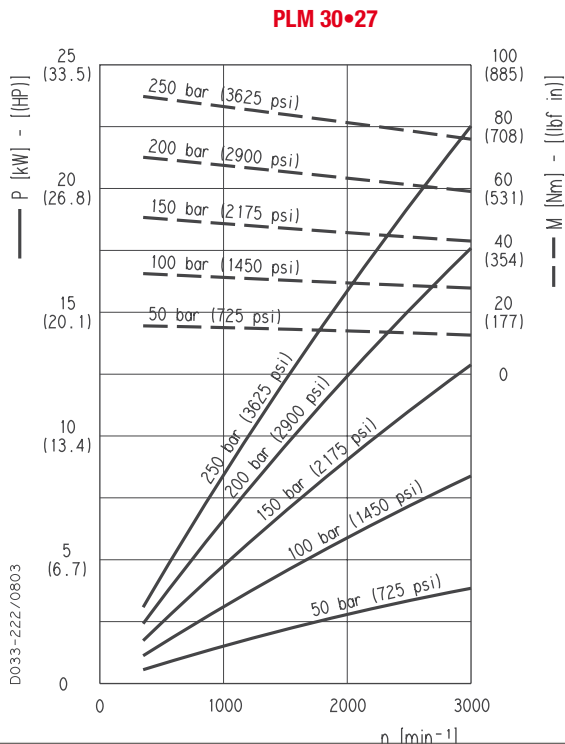
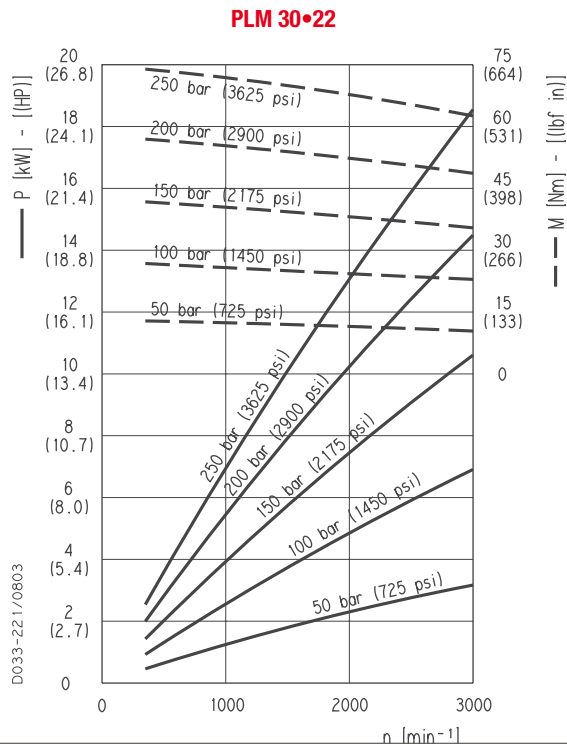
PLM 30

POLARIS 30 GEAR MOTORS PERFORMANCE 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 pressures.



PLM 30•22	—	20 bar (290 psi)
	- - -	250 bar (3625 psi)
PLM 30•27	—	20 bar (290 psi)
	- - -	250 bar (3625 psi)
PLM 30•34	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
PLM 30•38	—	20 bar (290 psi)
	- - -	240 bar (3480 psi)
PLM 30•43	—	20 bar (290 psi)
	- - -	230 bar (3335 psi)
PLM 30•51	—	20 bar (290 psi)
	- - -	210 bar (3045 psi)
PLM 30•61	—	20 bar (290 psi)
	- - -	190 bar (2775 psi)
PLM 30•73	—	20 bar (290 psi)
	- - -	170 bar (2465 psi)
PLM 30•82	—	20 bar (290 psi)
	- - -	160 bar (2320 psi)
PLM 30•90	—	20 bar (290 psi)
	- - -	150 bar (2175 psi)

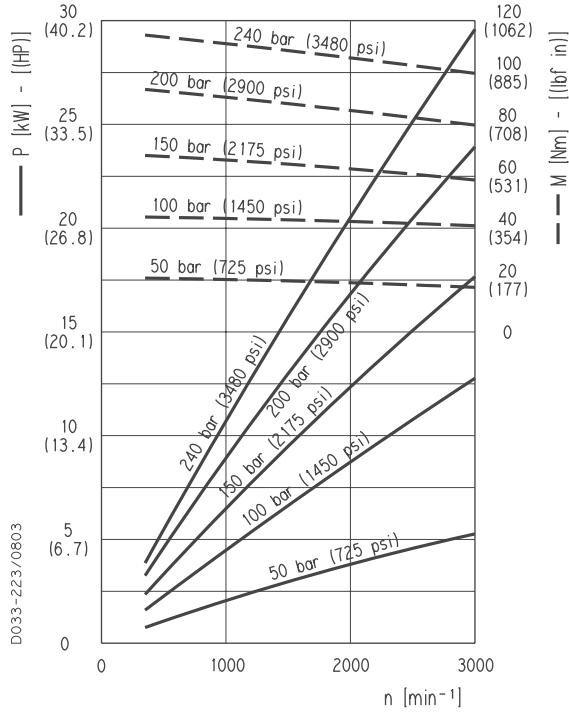


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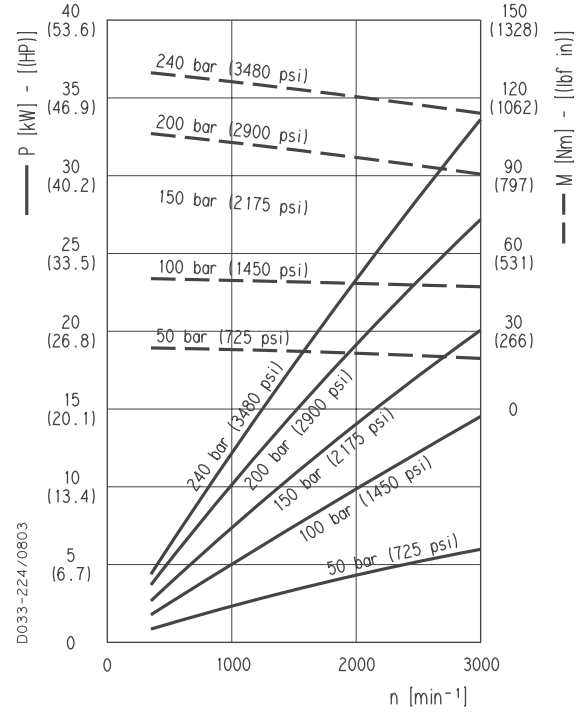
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POLARIS 30 GEAR MOTORS PERFORMANCE CURVES

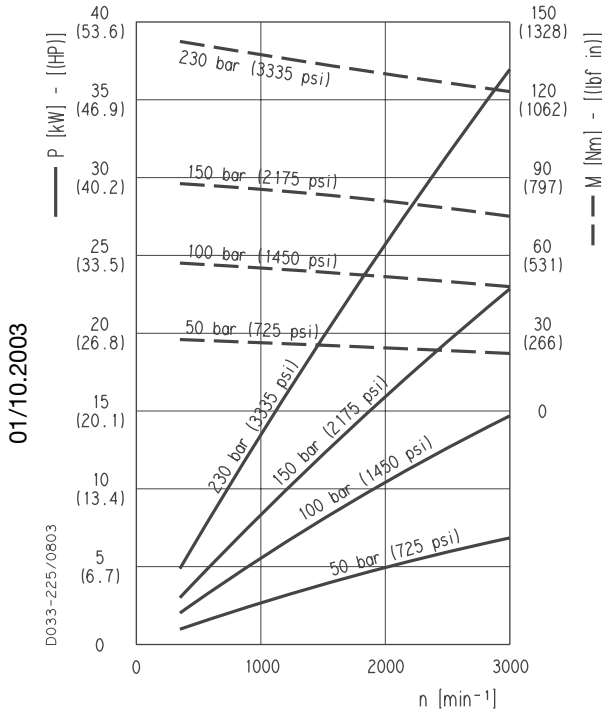
PLM 30•34



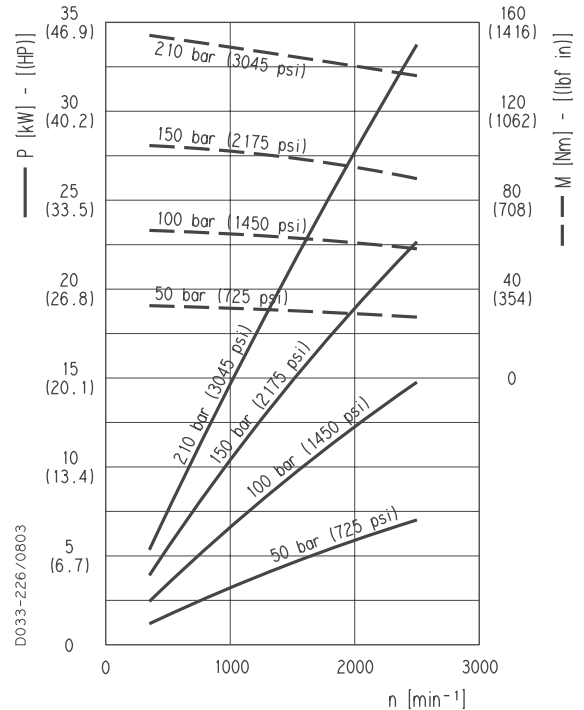
PLM 30•38



PLM 20•43



PLM 20•51

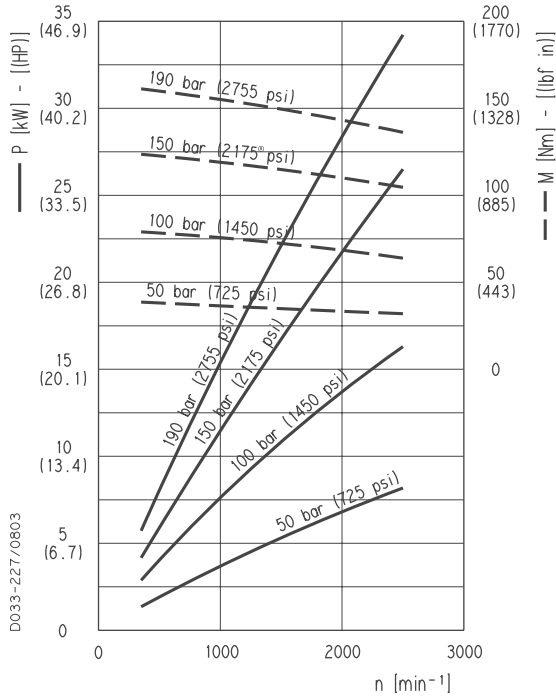


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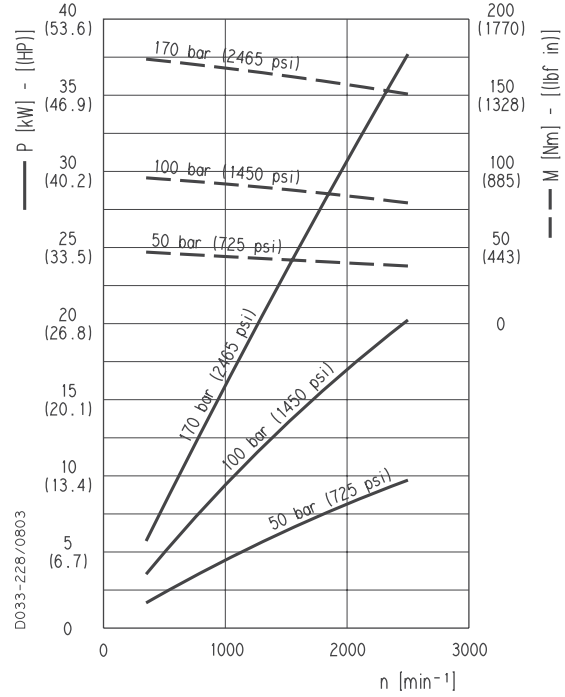
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POLARIS 30 GEAR MOTORS PERFORMANCE CURVES

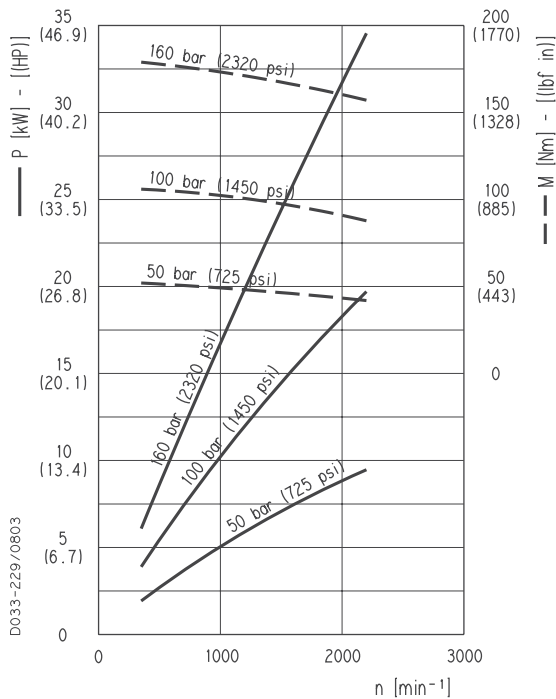
PLM 30•61



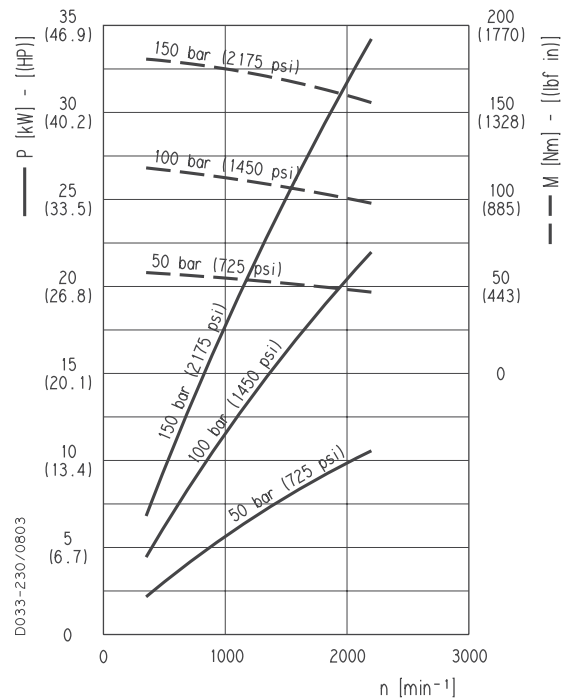
PLM 30•73



PLM 30•82



PLM 30•90



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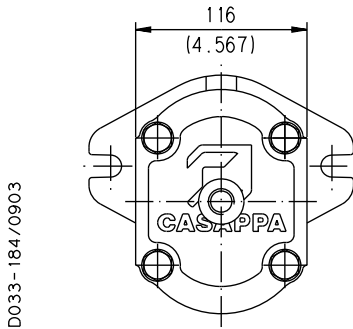
POLARIS 30

SINGLE UNITS DIMENSIONS - SIDE PORTS

L

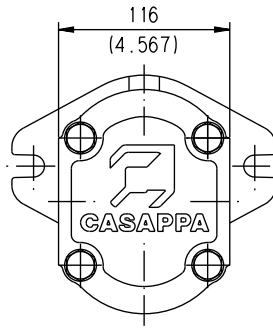
Drive shafts: page 56 ÷ 57
Mounting flange: for X dimension see
page 67 ÷ 69

Ports availability: European, Split, Gas,
SAE German. See page 70

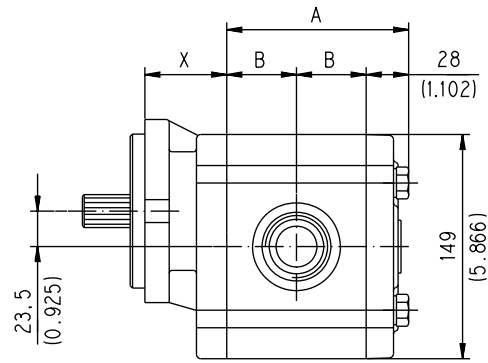


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Reversible R



Single rotation S - D



O

Replaces: 03/02.2012

Rear cover in cast iron only.

Pump type	A	B
Motor type	mm (in)	mm (in)
PL 30•22	106 (4.1732)	39 (1.5354)
PL 30•27	109 (4.2913)	40,5 (1.5945)
PL 30•34	114 (4.4882)	43 (1.6929)
PL 30•38	117 (4.6063)	44,5 (1.7520)
PL 30•43	120 (4.7244)	46 (1.8110)
PL 30•51	125 (4.9212)	48,5 (1.9094)
PL 30•61	131 (5.1575)	51,5 (2.0276)
PL 30•73	139 (5.4724)	55,5 (2.1850)
PL 30•82	144 (5.6693)	58 (2.2835)
PL 30•90	150 (5.9055)	61 (2.4016)

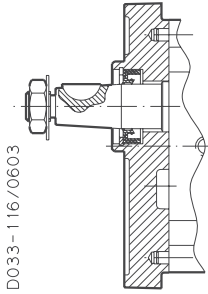
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OUTBOARD BEARING OPTIONS

For each version, the possible combination between drive shafts and mounting flanges are shown on pages 58 ÷ 69.
For the outboard bearing life expectancy, diagrams providing approximate selection data will be found on subsequent pages.
For particular applications please consult our pre-sales department.

PLP 10 - 20 - 30

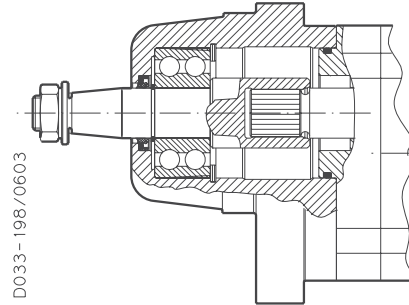
VERSION 0



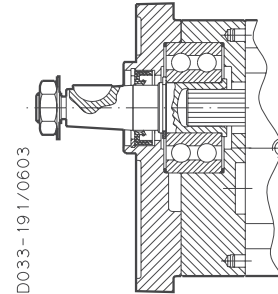
Version for applications without radial and axial load on the drive shaft.

PLP20 VERSION W8

Only available in 55 W8

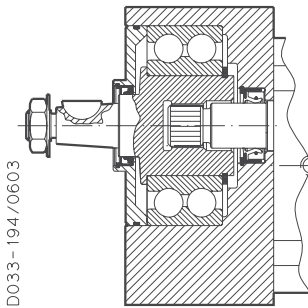


PLP20 VERSION 5



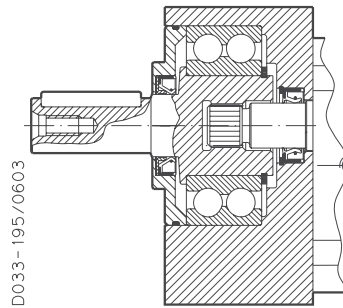
PLP20 VERSION 7

Only available in 82 E2



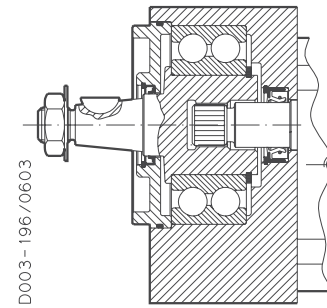
PLP20 VERSION 8

Only available in B1 E2



PLP20 VERSION 9

Only available in 55 B2



Replaces: 01/09.2019

04/10.2020

POLARIS 30

DRIVE SHAFTS

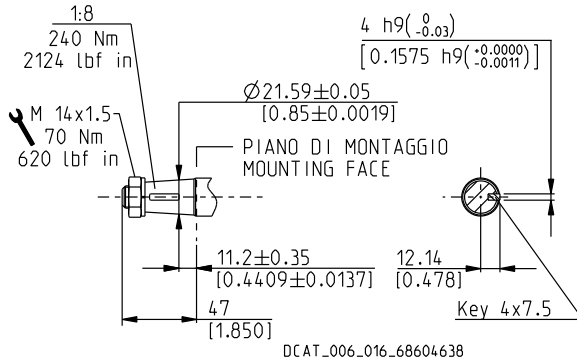
EUROPEAN TAPERED 1:8

83

Not available with size:

30•82 30•90

Mounting face refer to flange code E3



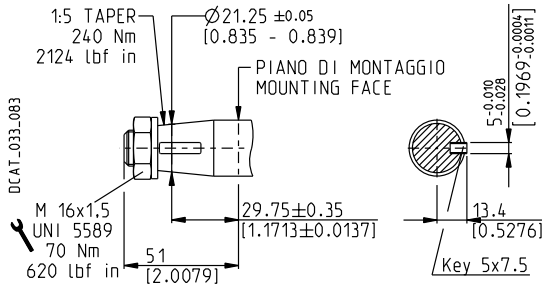
GERMAN TAPERED 1:5

56

Not available with size:

30•61 30•73 30•82 30•90

Mounting face refer to flange code B3



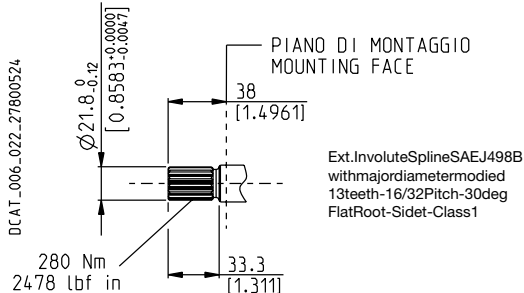
SAE "B" SPLINE

A8

Not available with size:

30•82 30•90

Mounting face refer to flange code U3



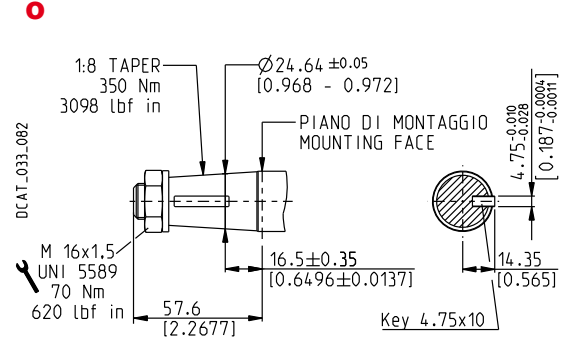
EUROPEAN TAPERED 1:8

84

Not available with size:

30•22 30•34

Mounting face refer to flange code E4



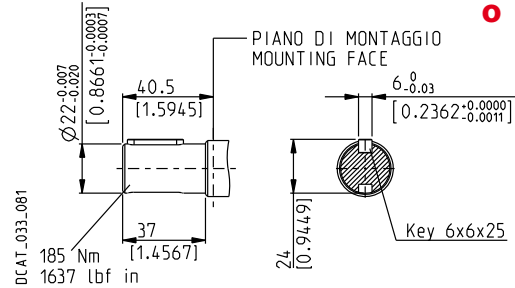
STRAIGHT

41

Not available with size:

30•82 30•90

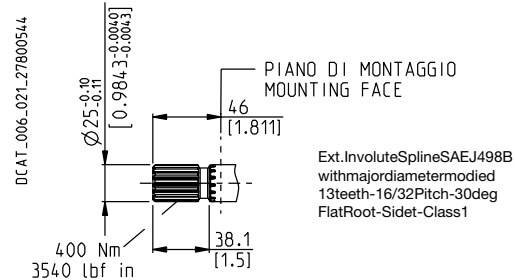
Mounting face refer to flange code E3



SAE "BB" SPLINE

A5

Mounting face refer to flange code U3



Replaces: 01/10.2003

04/10.2020

POLARIS 30

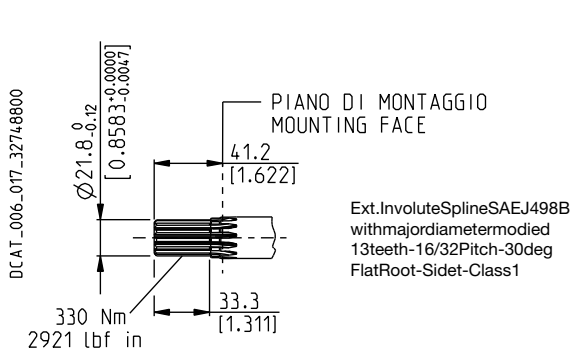
DRIVE SHAFTS

SAE "B" SPLINE

04

Mounting face refer to flange code **S5**

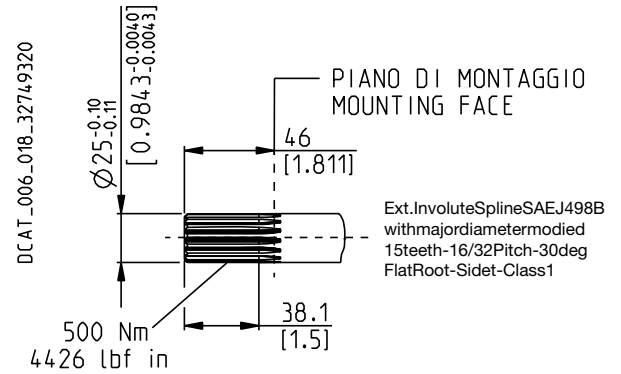
Replaces: 01/10.2003



SAE "BB" SPLINE

05

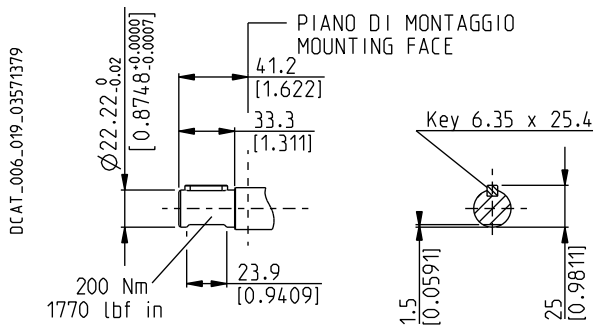
Mounting face refer to flange code **S5**



SAE "B" STRAIGHT

32

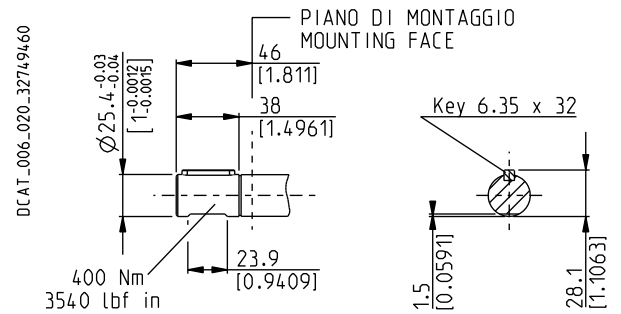
Mounting face refer to flange code **S5**



SAE "BB" STRAIGHT

33

Mounting face refer to flange code **S5**



POLARIS 30

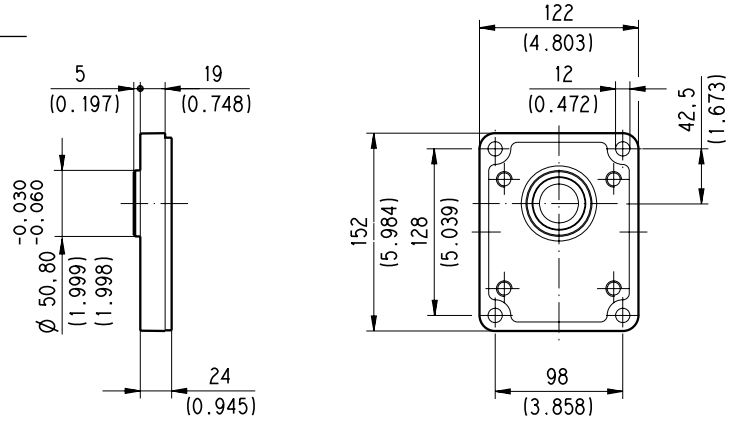
MOUNTING FLANGES AND TABLE OF COMPATIBILITY

EUROPEAN

E3

Material: cast iron

D033-199/0706



DRIVE SHAFTS

See page 56 ÷ 57

VERSIONS See page 48	83	41	04	05	32	33	A5	A8
0	#	#	X	X	X	X	X	X

Standard combination

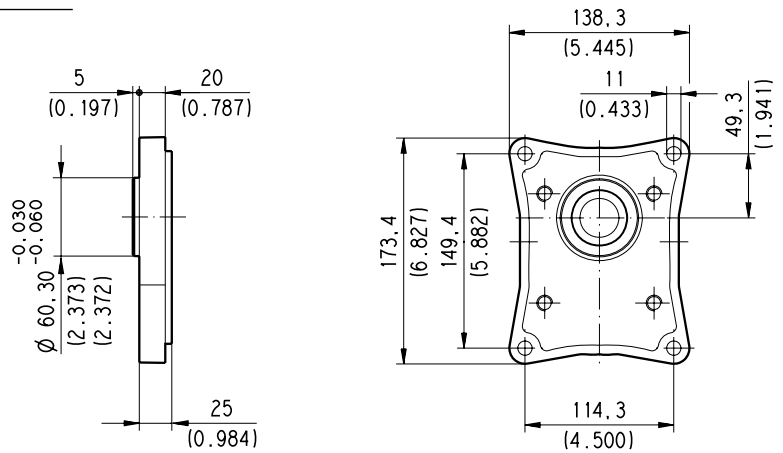
X Available combination

EUROPEAN

E4

Material: cast iron

D033-200/0703



DRIVE SHAFTS

See page 56

VERSIONS See page 48	84	41	A5	A8
0	#	X	X	X

Standard combination

X Available combination

02/07.2006

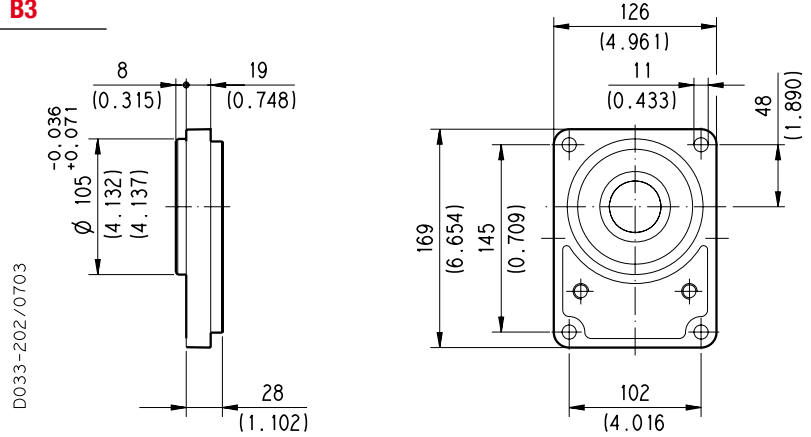
POLARIS 30

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

GERMAN

B3

Material: cast iron



DRIVE SHAFTS

See page 56

VERSIONS See page 48	56	83	A5	A8
0	#	X	X	X

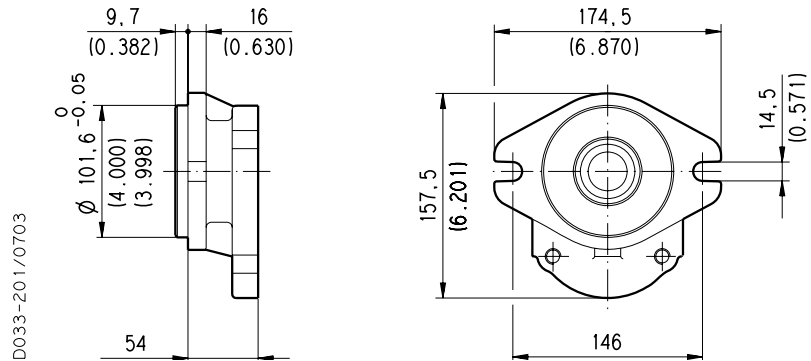
Standard combination

X Available combination

SAE "B" 2 BOLTS

S5

Material: cast iron



DRIVE SHAFTS

See page 57

VERSIONS See page 48	04	05	32	33
0	#	#	#	#

Standard combination

X Available combination

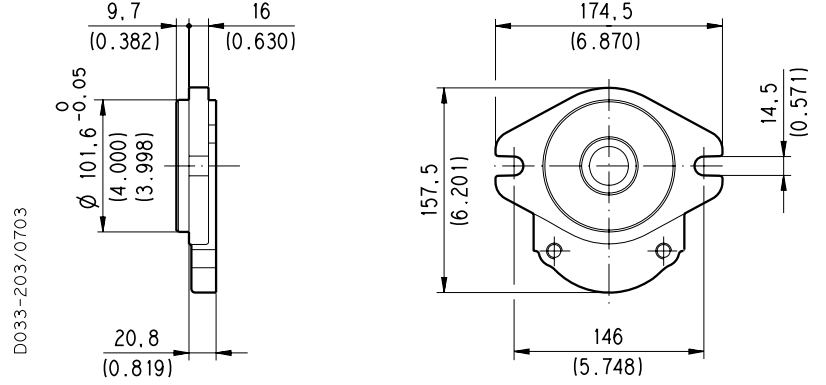
POLARIS 30

MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE "B" 2 BOLTS

U3

Material: cast iron



DRIVE SHAFTS

See page 56

VERSIONS See page 48	A5	A8	83
0	#	#	x

Standard combination

x Available combination

PORTS POSITION AND TYPE

PORTS TYPE	SIDE PORTS												REAR PORTS			
	German		European		Split SSM		Spit SSS		Gas BSPP		SAE ODT		Gas BSPP		SAE ODT	
Pump type	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Motor type	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN
PL. 30•22	BM	BL	ED	EB	MB	MA	SB	SA	GF	GF	OF	OD				
PL. 30•27	BM	BL	ED	EB	MC	MB	SC	SB	GF	GF	OF	OD				
PL. 30•34	BM	BL	ED	EB	MC	MB	SC	SB	GF	GF	OF	OD				
PL. 30•38	BM	BL	ED	EB	MD	MC	SD	SC	GF	GF	OG	OF				
PL. 30•43	BM	BL	ED	EB	MD	MC	SD	SC	GF	GF	OG	OF				
PL. 30•51	BM	BL	ED	EB	MD	MC	SD	SC	GF	GF	OG	OF				
PL. 30•61	BM	BL	ED	EB	ME	MD	SE	SD	GG	GF	OH	OG				
PL. 30•73	BM	BL	EF	ED	ME	MD	SE	SD	GG	GF	OH	OG				
PL. 30•82	BM	BL	EF	ED	ME	MD	SE	SD	GH	GG	OH	OG				
PL. 30•90	BM	BL	EF	ED	MF	ME	SF	SE	GH	GG	OH	OG				

01/10.2003

EXTERNAL DRAIN PORTS

IN/OUT PORTS TYPE	SIDE PORTS						REAR PORTS	
	German	European	Split SSM	Spit SSS	Gas BSPP	SAE ODT	Gas BSPP	SAE ODT
PL. 10	GA	-	-	-	GA	03	GA	03
PL. 20	TA	GB	GB	03	GB	03	GB	03
PL. 30	GC	GC	GC	OA	GC	OA	-	-

DRAIN PORTS SIZES



Tightening torque for low pressure side port

GAS STRAIGHT THREAD PORTS

BSPP

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

CODE	NOMINAL SIZE	A	Ø B	Ø C	D	E	Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)	
GA	1/8"	G 1/8	16,5 (0.6496)	8,75 (0.3444)	12 (0.4724)	1 (0.0394)	5 ^{+0,25} (44 ÷ 46)
GB	1/4"	G 1/4	21,5 (0.8465)	12 (0.4724)	15 (0.5906)	1,5 (0.0591)	15 ⁺¹ (133 ÷ 142)

METRIC STRAIGHT THREAD PORTS ISO 6149

METRIC

Metric thread ISO 60° conforms to ISO/R 262

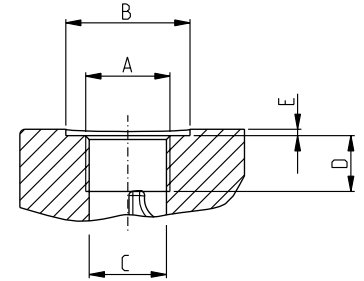
CODE	A	Ø B	Ø C	D	E	Nm (lbf in)
		mm (in)	mm (in)	mm (in)	mm (in)	
TA	M 10x1	22 (0.8661)	9 (0.3543)	13 (0.5118)	0,5 (0.0197)	10 ^{+0,5} (89 ÷ 93)

SAE STRAIGHT THREAD PORTS J514

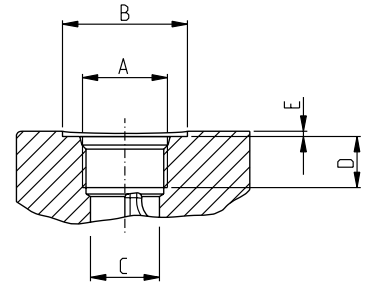
ODT

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

CODE	A	Ø B	Ø C	D	E	Nm (lbf in)
		mm (in)	mm (in)	mm (in)	mm (in)	
03	7/16"-20 UNF-2B	21 (0.8267)	9,5 (0.3740)	14 (0.5512)	1 (0.0394)	12 ⁺¹ (106 ÷ 115)



DCAT_006_026_21064779



DCAT_006_027_21060524

01/10.2003

Other drain ports are shown on subsequent pages.

Yazım/Basım Hatalarından Firmamız Sorumludur

PORTS SIZE



Tightening torque for low pressure side port



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

For reversible rotation, please consult only the tightening torque for high pressure side port

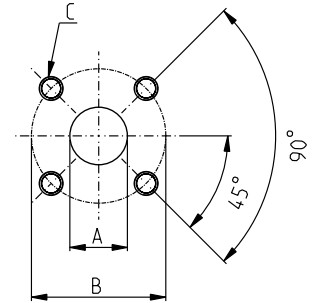
GERMAN FLANGED PORTS - 4 Bolts

GERMAN

Metric thread ISO 60° conforms to ISO/R 262

CODE	A mm (in)	B mm (in)	C Thread Depth mm (in)	 Nm (lbf in)	 Nm (lbf in)
BA	8 (0.3150)	30 (1.1811)	M6 12 (0.4724)	8 ^{+0,5} (71 ÷ 75)	8 ^{+0,5} (71 ÷ 75)
BB	13 (0.5118)	30 (1.1811)	M6 12 (0.4724)	8 ^{+0,5} (71 ÷ 75)	8 ^{+0,5} (71 ÷ 75)
BC	15 (0.5906)	35 (1.3780)	M6 12 (0.4724)	8 ^{+0,5} (71 ÷ 75)	8 ^{+0,5} (71 ÷ 75)
BE	20 (0.7874)	40 (1.5748)	M6 12 (0.4724)	8 ^{+0,5} (71 ÷ 75)	8 ^{+0,5} (71 ÷ 75)
BL	19 (0.7480)	55 (2.1654)	M8 18 (0.7087)	15 ⁺¹ (133 ÷ 142)	20 ⁺¹ (177 ÷ 186)
BM	27 (1.0630)	55 (2.1654)	M8 18 (0.7087)	15 ⁺¹ (133 ÷ 142)	20 ⁺¹ (177 ÷ 186)

DCAT_033_028_17681868



EUROPEAN FLANGED PORTS - 4 Bolts

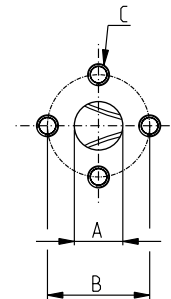
EUROPEAN

Metric thread ISO 60° conforms to ISO/R 262

CODE	A mm (in)	B mm (in)	C Thread Depth mm (in)	 Nm (lbf in)	 Nm (lbf in)
EA	13 (0.5118)	30 (1.1811)	M 6 13 (0.5118)	8 ^{+0,5} (71 ÷ 75)	8 ^{+0,5} (71 ÷ 75)
EB	19 (0.7480)	40 (1.5748)	M 8 14 (0.5512)	15 ⁺¹ (133 ÷ 142)	15 ⁺¹ (133 ÷ 142)
ED	27 (1.0630)	51 (2.0079)	M 8 (◆) 18 (0.7087)	15 ⁺¹ (◆) (133 ÷ 142)	15 ⁺¹ (◆) (133 ÷ 142)
EF	33 (1.2992)	62 (2.4409)	M 10 18 (0.7087)	20 ⁺¹ (177 ÷ 186)	35 ^{+2,5} (310 ÷ 332)
			M 12 18 (0.7087)	25 ⁺¹ (221 ÷ 230)	50 ^{+2,5} (443 ÷ 465)

(◆) For POLARIS 30

DCAT_006_024_21060533



01/10.2003

PORTS SIZES



Tightening torque for low pressure side port



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

For reversible rotation, please consult only the tightening torque for high pressure side port

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI

SSM

Metric thread ISO 60° to ISO/R 262

CODE	A	B	C	D		
	mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
MA	12,5 (0.4921)	38,1 (1.50)	17,5 (0.6890)	M 8	15 ⁺¹	15 ⁺¹
				14 (0.5512)	(133 ÷ 142)	(133 ÷ 142)
				M 8 (◆)	20 ⁺¹ (◆)	20 ⁺¹ (◆)
MB	19 (0.7480)	47,6 (1.8740)	22,2 (0.8740)	22 (0.8661)	(177 ÷ 186)	(177 ÷ 186)
				M 10	20 ⁺¹	25 ⁺¹
				14 (0.5512)	(177 ÷ 186)	(266 ÷ 288)
MC	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	M 10 (◆)	20 ⁺¹ (◆)	35 ^{+2,5} (◆)
				22 (0.8661)	(177 ÷ 186)	(310 ÷ 332)
				M 10	20 ⁺¹	25 ⁺¹
MD	30,5 (1.2008)	58,7 (2.3110)	30,2 (1.1890)	14 (0.5512)	(177 ÷ 186)	(266 ÷ 288)
				M 10 (◆)	20 ⁺¹ (◆)	35 ^{+2,5} (◆)
				22 (0.8661)	(177 ÷ 186)	(310 ÷ 332)
ME	39,3 (1.5472)	69,8 (2.7480)	35,7 (1.4055)	M 12	30 ^{+2,5}	60 ⁺⁵
				22 (0.8661)	(266 ÷ 288)	(531 ÷ 575)
MF	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	M 12	30 ^{+2,5}	60 ⁺⁵
				22 (0.8661)	(266 ÷ 288)	(531 ÷ 575)

(◆) For POLARIS 30

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI

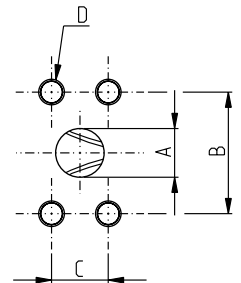
SSS

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

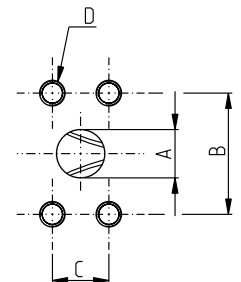
CODE	A	B	C	D		
	mm (in)	mm (in)	mm (in)	Thread Depth mm (in)	Nm (lbf in)	Nm (lbf in)
SA	12,5 (0.4921)	38,1 (1.50)	17,5 (0.6890)	5/16-18 UNC-2B	15 ⁺¹	15 ⁺¹
				14 (0.5512)	(133 ÷ 142)	(133 ÷ 142)
				5/16-18 UNC-2B (◆)	20 ⁺¹ (◆)	20 ⁺¹ (◆)
SB	19 (0.7480)	47,6 (1.8740)	22,2 (0.8740)	22 (0.8661)	(177 ÷ 186)	(177 ÷ 186)
				3/8-16 UNC-2B	20 ⁺¹	20 ⁺¹
				14 (0.5512)	(177 ÷ 186)	(177 ÷ 186)
SC	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	3/8-16 UNC-2B (◆)	30 ^{+2,5} (◆)	20 ⁺¹ (◆)
				22 (0.8661)	(266 ÷ 288)	(177 ÷ 186)
				3/8-16 UNC-2B	20 ⁺¹	25 ⁺¹
SD	30,5 (1.2008)	58,7 (2.3110)	30,2 (1.1890)	14 (0.5512)	(177 ÷ 186)	(221 ÷ 230)
				3/8-16 UNC-2B (◆)	20 ⁺¹ (◆)	30 ^{+2,5} (◆)
				22 (0.8661)	(177 ÷ 186)	(266 ÷ 288)
SE	39,3 (1.5472)	69,8 (2.7480)	35,7 (1.4055)	7/16-14 UNC-2B	20 ⁺¹	45 ^{+2,5}
				22 (0.8661)	(177 ÷ 186)	(398 ÷ 420)
SF	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	1/2-13 UNC-2B	30 ^{+2,5}	70 ⁺⁵
				22 (0.8661)	(266 ÷ 288)	(620 ÷ 664)

(◆) For POLARIS 30

DCAT_006_025_21064252



DCAT_006_028_21060740



01/10.2003

PORTS SIZE



Tightening torque for low pressure side port



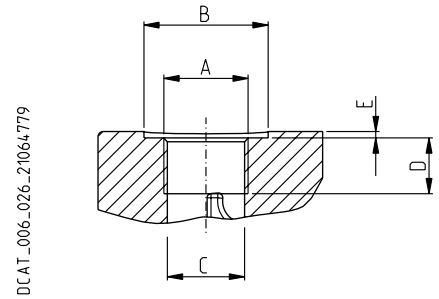
Tightening torque for high pressure side port [values obtained at 5075 psi (350 bar)]

For reversible rotation, please consult only the tightening torque for high pressure side port

GAS STRAIGHT THREAD PORTS

BSPP

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



CODE	Nominal size	A	Ø B	Ø C	D	E	Nm (lbf in)	Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)		
GC	3/8"	G 3/8	30 (#) (1.1811)	15 (0.5906)	10 (#) (0.3937)	2 (#) (0.0787)	15 ⁺¹ (#) (133 ÷ 142)	—
			—	—	14 (0.5512)	—	15 ⁺¹ (133 ÷ 142)	25 ⁺¹ (221 ÷ 230)
GD	1/2"	G 1/2	—	19 (0.7480)	14 (0.5512)	—	20 ⁺¹ (177 ÷ 186)	50 ^{+2,5} (443 ÷ 465)
			—	—	17 (◆) (0.6693)	—	—	—
GE	3/4"	G 3/4	—	24,5 (0.9646)	18 (0.7087)	—	30 ^{+2,5} (266 ÷ 288)	90 ⁺⁵ (797 ÷ 841)
GF	1"	G 1	—	30,5 (1.2008)	18 (0.7086)	—	50 ^{+2,5} (443 ÷ 465)	130 ⁺¹⁰ (1151 ÷ 1239)
GG	1" 1/4	G 1 1/4	—	39 (1.5354)	22 (0.8661)	—	60 ⁺⁵ (531 ÷ 575)	170 ⁺¹⁰ (1505 ÷ 1593)
GH	1" 1/2	G 1 1/2	—	45 (1.7716)	24 (0.9448)	—	70 ⁺⁵ (620 ÷ 664)	210 ⁺¹⁵ (1859 ÷ 1992)

= Drain port

(◆) For POLARIS 20

PORTS SIZES



Tightening torque for low pressure side port



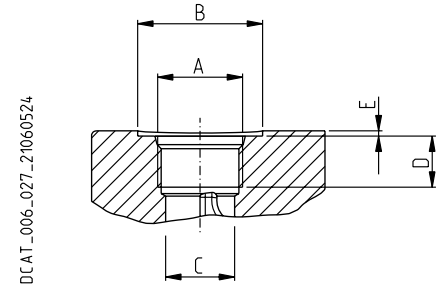
Tightening torque for high pressure side port [values obtained at 5075 psi (350 bar)]

For reversible rotation, please consult only the 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	Ø B	Ø C	D	E	Nm (lbf in)	Nm (lbf in)
			mm (in)	mm (in)	mm (in)	mm (in)		
OA	3/8"	9/16" - 18 UNF - 2B	26 (1.0236)	13 (0.5118)	15 (0.5906)	1 (0.03934)	15 ⁺¹ (133 ÷ 142)	25 ⁺¹ (221 ÷ 230)
						2 (#) (0.0787)	15 ⁺¹ (#) (133 ÷ 142)	—
OB	1/2"	3/4" - 16 UNF - 2B	32 (1.2598)	17,5 (0.690)	15 (0.5906)	—	20 ⁺¹ (177 ÷ 186)	45 ^{+2,5} (398 ÷ 420)
OC	5/8"	7/8" - 14 UNF - 2B	35 (1.3780)	20,5 (0.8071)	15 (◆) (0.5906)	0,5 (0.0197)	30 ^{+2,5} (266 ÷ 288)	70 ⁺⁵ (620 ÷ 664)
					17 (0.6693)			
OD	3/4"	1 1/16" - 12 UNF - 2B	42 (1.6535)	24,8 (0.9764)	20 (0.7874)	0,5 (0.0197)	40 ^{+2,5} (354 ÷ 376)	120 ⁺¹⁰ (1062 ÷ 1151)
OF	1"	1 5/16" - 12 UNF - 2B	49 (1.9291)	30,5 (1.2008)	20 (0.7874)	0,5 (0.0197)	60 ⁺⁵ (531 ÷ 575)	170 ⁺¹⁰ (1505 ÷ 1593)
OG	1" 1/4	1 5/8" - 12 UNF - 2B	58 (2.2835)	39,1 (1.5394)	20 (0.7874)	0,5 (0.0197)	70 ⁺⁵ (620 ÷ 664)	200 ⁺¹⁵ (1770 ÷ 1858)
OH	1" 1/2	1 7/8" - 12 UNF - 2B	65 (2.5591)	45 (1.7717)	20 (0.7874)	0,5 (0.0197)	100 ⁺⁵ (885 ÷ 929)	270 ⁺¹⁵ (2389 ÷ 2522)

(#) = Drain port

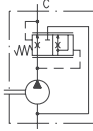
(◆) For POLARIS 10

VALVE OPTIONS

PRIORITY VALVE

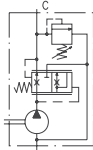
P1

Costant delivery and internal recirculation of excess flow.



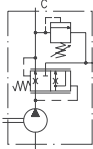
P2

Costant delivery at controlled pressure. Internal recirculation of excess flow and drain valve.



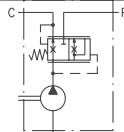
P3

Costant delivery at controlled pressure. Excess flow and drain valve must be connected to tank.



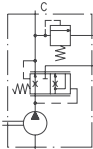
P4

Costant delivery and excess flow can both be used under load.



P5T

Costant delivery at controlled pressure with drain valve connected to tank. Excess flow can be used under load.

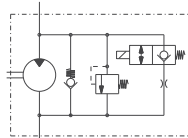


ELECTRIC VALVE FOR MOTORS

O

UNL

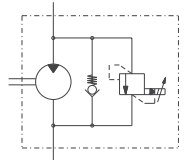
By-pass valve normally closed with max. pressure relief valve and anti-cavitation valve.



O

PRV

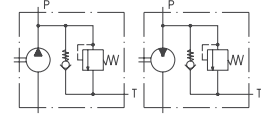
Proportional relief valve and anti-cavitation valve.



MAX PRESSURE RELIEF VALVE

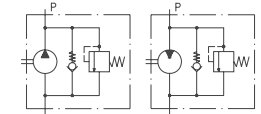
VPEF..

Fixed setting with external drain.



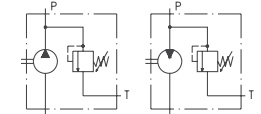
VPIF..

Fixed setting with internal drain.



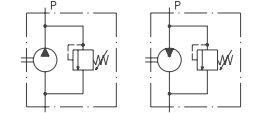
VPER..

Adjustable setting with external drain.



VPIR..

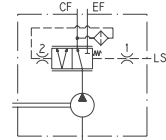
Adjustable setting with internal drain.



LOAD SENSING VALVE

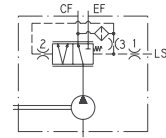
...

Static.



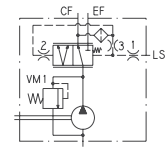
...

Dynamic.



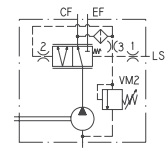
...

Dynamic with relief valve fitted on the main line.



...

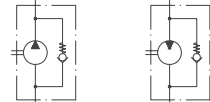
Dynamic with relief valve fitted on controlled line.



CHECK VALVE

V8

Anti-cavitation valve.



◆ For more information please consult our built-in valves technical catalogue and our pre-sales department

Yazım/Besim Hatelerinden Firmamız Sorumlu Değildir

HOW TO ORDER POLARIS 30 SINGLE UNITS

1	2	3	4	5	6	7	8	9	10					
PLP 30-22	R	0	-	83	E3	-	L	ED/EB	-	N	-	C	-	FS

1	Type	Pump type	Motor type
21,99 cm³/rev (1.34 in³/rev)		PLP 30-22	PLM 30-22
26,70 cm³/rev (1.63 in³/rev)		PLP 30-27	PLM 30-27
34,55 cm³/rev (2.11 in³/rev)		PLP 30-34	PLM 30-34
39,27 cm³/rev (2.40 in³/rev)		PLP 30-38	PLM 30-38
43,98 cm³/rev (2.68 in³/rev)		PLP 30-43	PLM 30-43
51,83 cm³/rev (3.16 in³/rev)		PLP 30-51	PLM 30-51
61,26 cm³/rev (3.74 in³/rev)		PLP 30-61	PLM 30-61
73,82 cm³/rev (4.50 in³/rev)		PLP 30-73	PLM 30-73
81,68 cm³/rev (4.98 in³/rev)		PLP 30-82	PLM 30-82
91,10 cm³/rev (5.56 in³/rev)		PLP 30-90	PLM 30-90

2	Rotation	Code
Left		S
Right		D
Reversible rear external drain		R

3	Versions - Outboard bearing options	Code
Without outboard bearing		0

4	Drive shaft	Code
European tapered 1:8		83
European tapered 1:8		84
German tapered 1:5		56
Straight		41
SAE "B" spline		A8
SAE "BB" spline		A5
SAE "B" spline		04
SAE "BB" spline		05
SAE "B" straight		32
SAE "BB" straight		33

5	Mounting flange	Code
European		E3
European		E4
German		B3
SAE "B" 2 bolt		S5
SAE "B" 2 bolt		U3

6	Ports position	Code
Side		L

Code	Ports IN/OUT	7
GERMAN FLANGED PORTS		
Side	Type	
BM/BL	PLP 30	22-27-34-38-43
BL/BM	PLM 30	46-51-61-73-82-90
EUROPEAN FLANGED PORTS		
Side	Type	
ED/EB	PLP 30	22-27-34-38-43
EB/ED	PLM 30	46-51-61
EF/ED	PLP 30	73-82-90
ED/EF	PLM 30	
SAE FLANGED PORTS (SSM)		
Side	Type	
MB/MA	PLP 30	22
MA/MB	PLM 30	
MC/MB	PLP 30	27-34
MB/MC	PLM 30	
MD/MC	PLP 30	38-43-46-51
MC/MD	PLM 30	
ME/MD	PLP 30	61-73-82
MD/ME	PLM 30	
MF/ME	PLP 30	90
ME/MF	PLM 30	
SAE FLANGED PORTS (SSS)		
Side	Type	
SB/SA	PLP 30	22
SA/SB	PLM 30	
SC/SB	PLP 30	27-34
SB/SC	PLM 30	
SD/SC	PLP 30	38-43-46-51
SC/SB	PLM 30	
SE/SD	PLP 30	61-73-82
SD/SE	PLM 30	
SF/SE	PLP 30	90
SE/SF	PLM 30	
GAS STRAIGHT THREAD PORTS (BSPP)		
Side	Type	
GF/GF	PLP 30	22-27-34-38-43-46-51
GG/GF	PLM 30	
GG/GF	PLP 30	61-73
GF/GG	PLM 30	
GH/GG	PLP 30	82-90
GG/GH	PLM 30	

02/07.2006

HOW TO ORDER POLARIS 30 SINGLE UNITS

Replaces: 01/10.2003

7	Ports IN/OUT	Code
SAE STRAIGHT THREAD PORTS (ODT)		
	Type	Rear
22-27-34	PLP 30	OF/OD
	PLM 30	OD/OF
38-43-46-51	PLP 30	OG/OF
	PLM 30	OF/OG
61-73-82-90	PLP 30	OH/OG
	PLM 30	OG/OH
8	Seals (a)	Code
	Buna (standard)	N
	Viton	V
9	Shaft seal options	Code
	Standard seal with wiper seal	D
	High back pressure seal	C1
10	Shaft arrangement	Code
	Female spline	FS

- (a) Choose the seals according to the temperature shown on page 5.