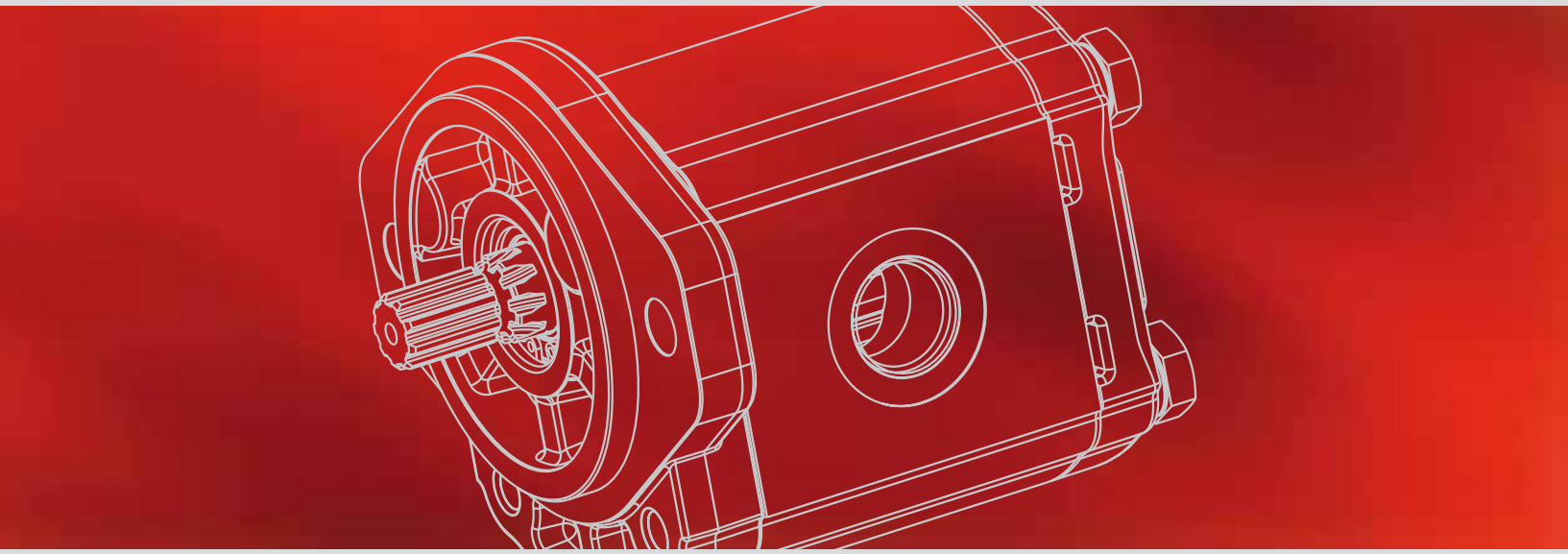
CASAPPA®
FLUID POWER DESIGN

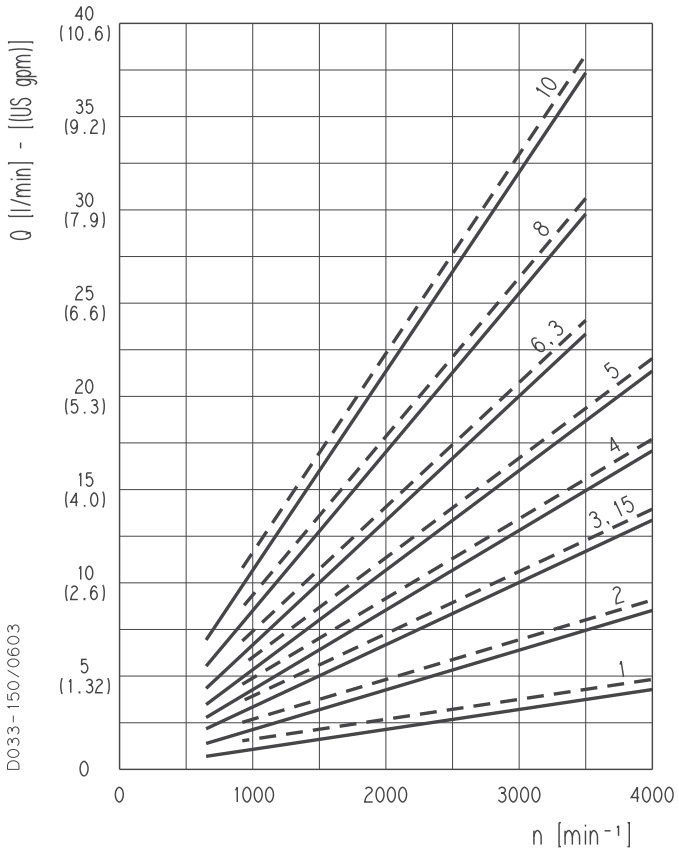


HYDRAULIC GEAR PUMPS AND MOTORS

POLARIS®

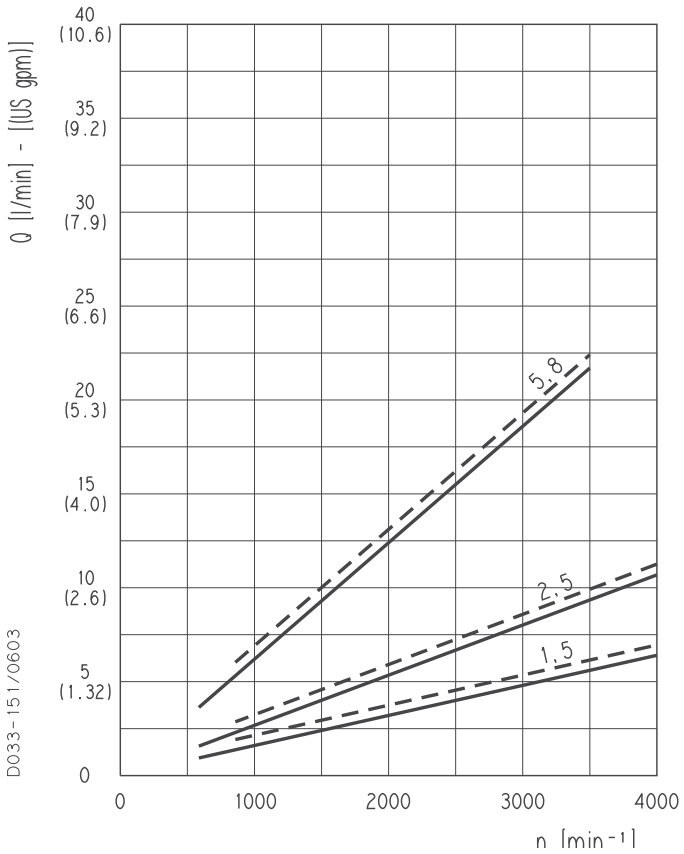
PLM 10 POLARIS 10 GEAR MOTORS PERFORMANCE CURVES

PLM 10



Each curve has been obtained at 122 °F (50°C), using oil with viscosity 168 SSU (36 cSt) at 104 °F (40°C) and at these pressures.

PLM 10•1	——	290 psi (20 bar)
	– –	3770 psi (260 bar)
PLM 10•2	——	290 psi (20 bar)
	– –	3770 psi (260 bar)
PLM 10•3,15	——	290 psi (20 bar)
	– –	3770 psi (260 bar)
PLM 10•4	——	290 psi (20 bar)
	– –	3625 psi (250 bar)
PLM 10•5	——	290 psi (20 bar)
	– –	3625 psi (250 bar)
PLM 10•6,3	——	290 psi (20 bar)
	– –	3335 psi (230 bar)
PLM 10•8	——	290 psi (20 bar)
	– –	2610 psi (180 bar)
PLM 10•10	——	290 psi (20 bar)
	– –	2030 psi (140 bar)

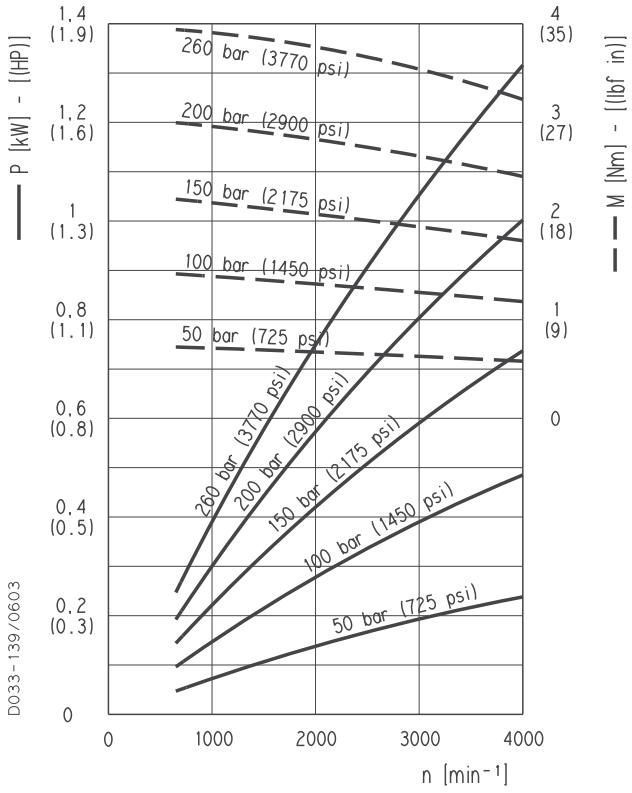


PLM 10•1,5	——	290 psi (20 bar)
	– –	3770 psi (260 bar)
PLM 10•2,5	——	290 psi (20 bar)
	– –	3770 psi (260 bar)
PLM 10•5,8	——	290 psi (20 bar)
	– –	3335 psi (230 bar)

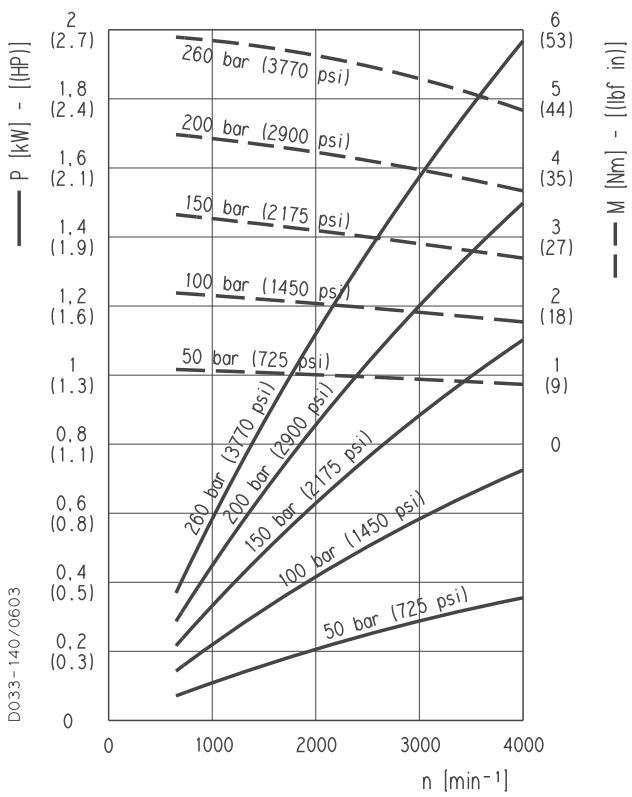
01/10.03

PLM 10 POLARIS 10 GEAR MOTORS PERFORMANCE CURVES

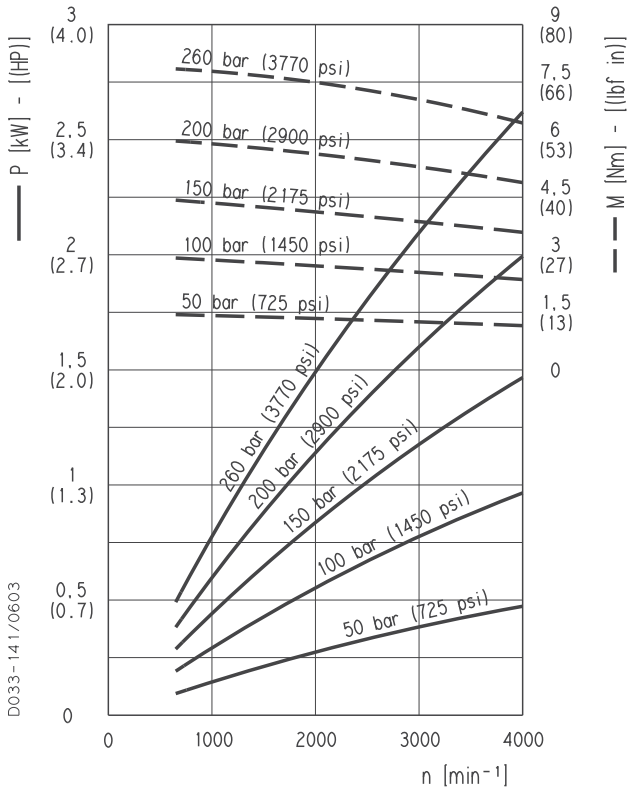
PLM 10•1



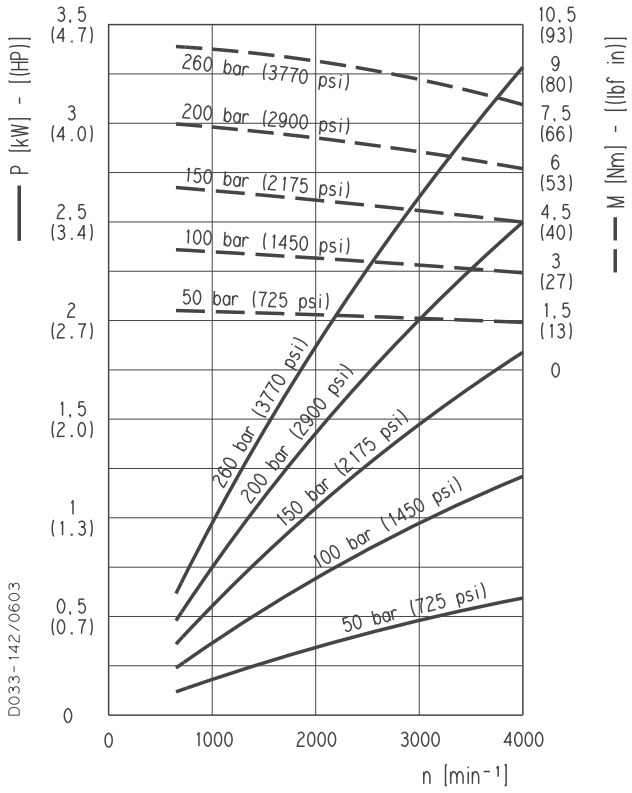
PLM 10•1,5



PLM 10•2



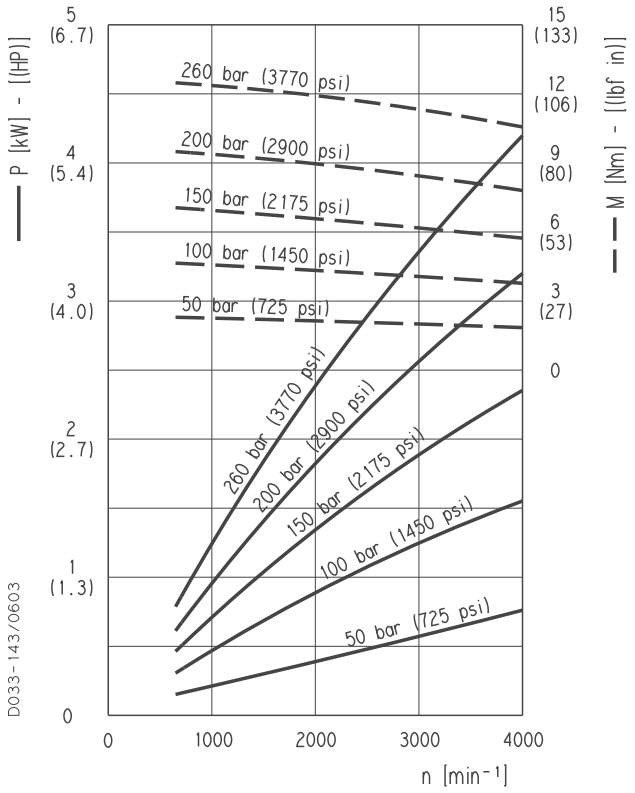
PLM 10•2,5



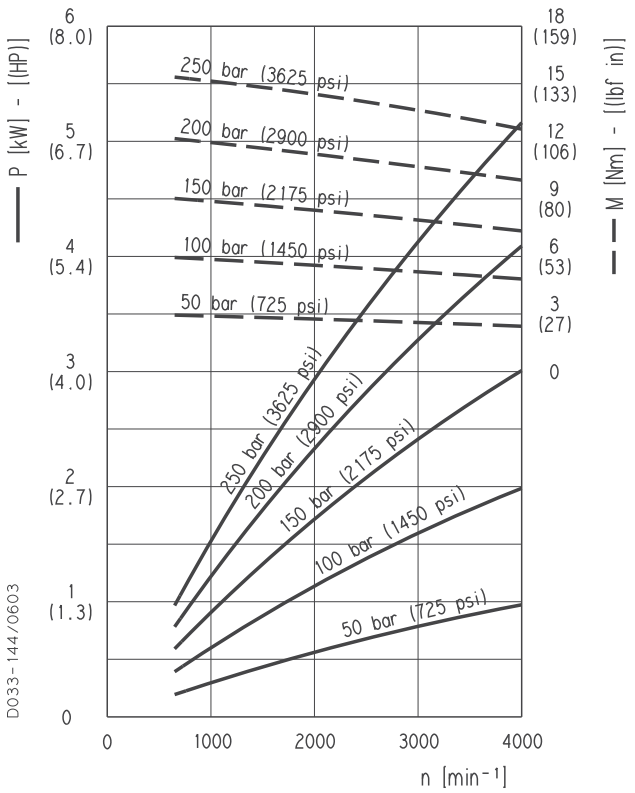
01/10.03

PLM 10 POLARIS 10 GEAR MOTORS PERFORMANCE CURVES

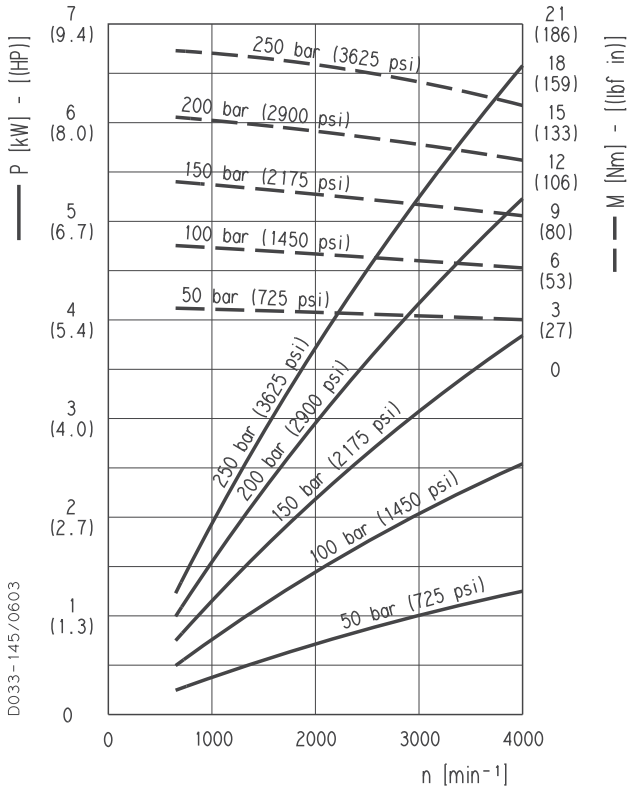
PLM 10•3,15



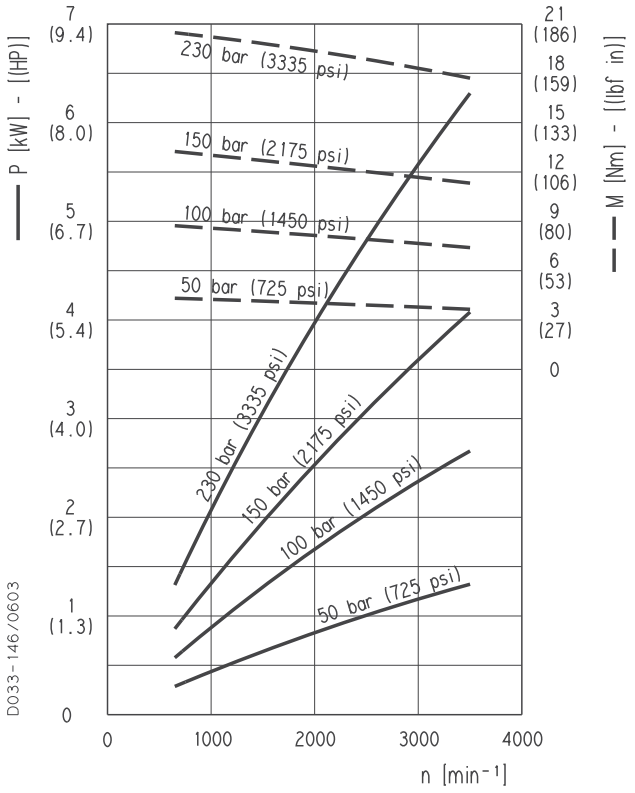
PLM 10•4



PLM 10•5



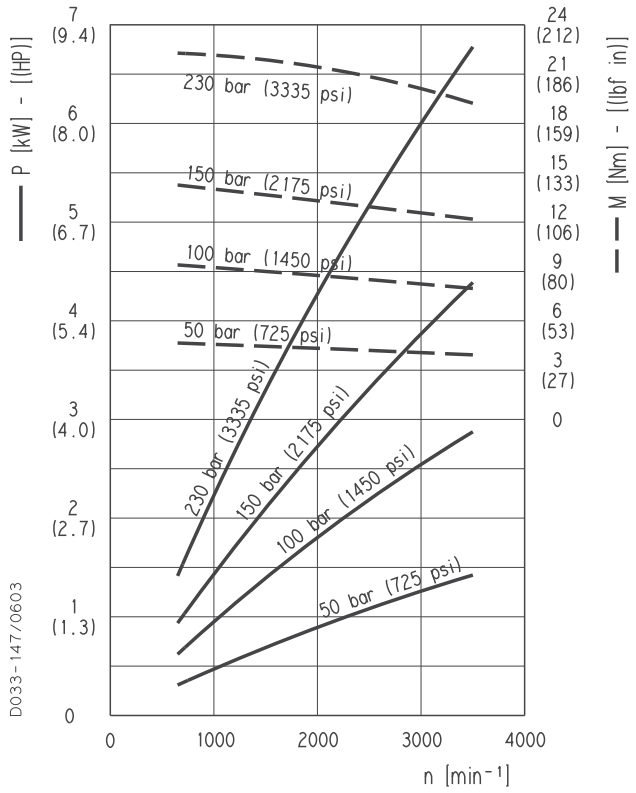
PLM 10•5,8



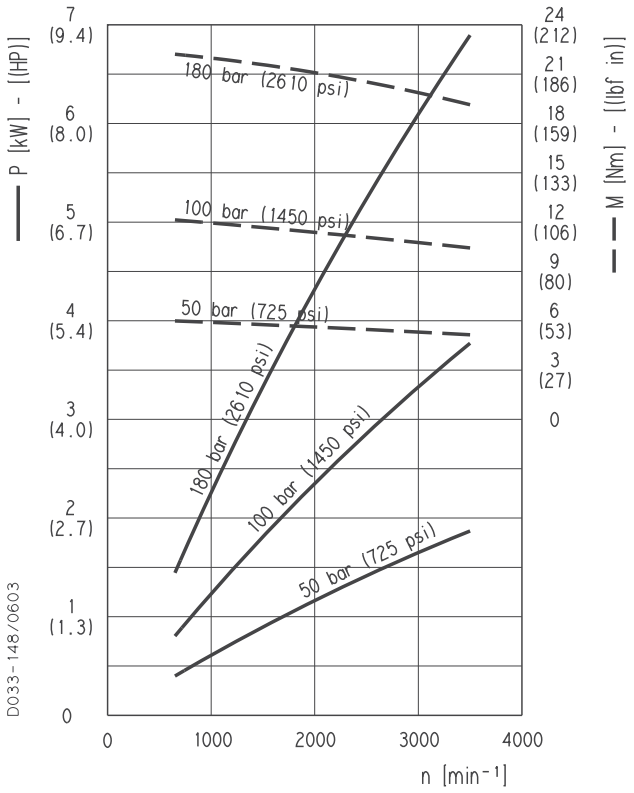
01/10.03

PLM 10 POLARIS 10 GEAR MOTORS PERFORMANCE CURVES

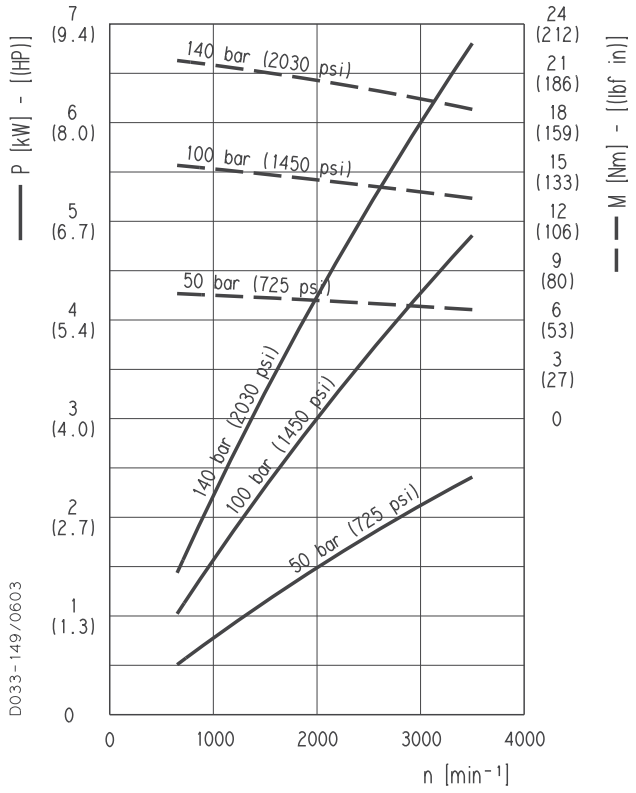
PLM 10•6,3



PLM 10•8

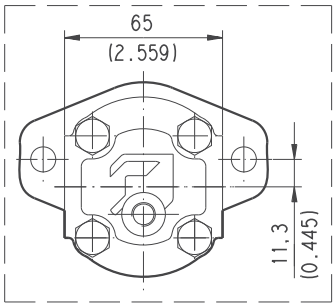


PLM 10•10

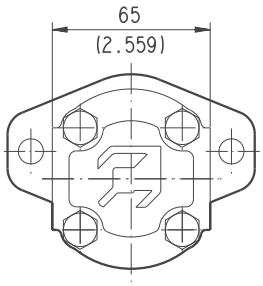


01/10.03

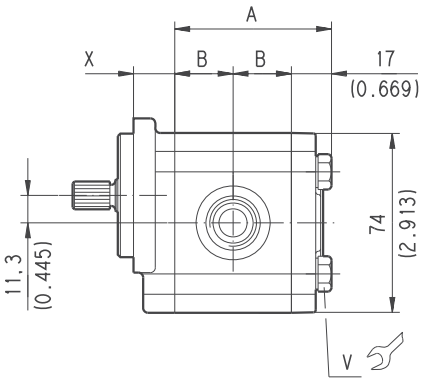
POLARIS 10 — SINGLE UNITS SIDE PORTS — L



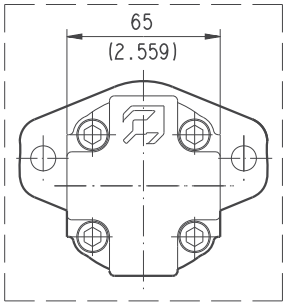
Reversible R



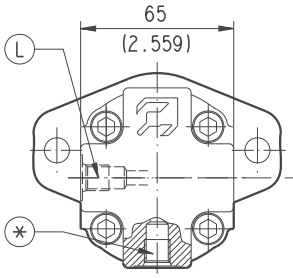
Single rotation S - D



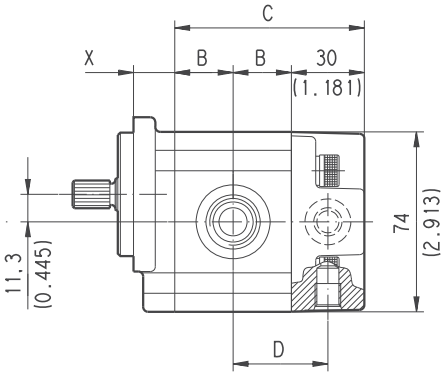
D033-180/0903



Reversible B



Reversible L



Mounting flange type version 0	X
	mm (inch)
E1	14 (0.5512)
E7	14 (0.5512)
E8	14 (0.5512)
B1	14 (0.5512)
K2	11,8 (0.4646)
S0	17 (0.6693)
R8	41 (1.6142)
R9	41 (1.6142)
W9	41 (1.6142)

O For single rotation S - D and reversible rotation R the rear cover is available in cast iron and aluminium.
For reversible rotation B and L the rear cover is in aluminium only.

DRAIN PORTS POSITION
L = Side * = Bottom

DRIVE SHAFTS: see page 52
MOUNTING FLANGE: see page 58 ÷ 60
PORTS: see page. 69 ÷ 74

Mounting flange material	Screw tightening torque O Nm (lbf in)
	V
Aluminium	25 ±2,5 (199 ÷ 243)
Cast iron	

Pump type Motor type	A	B	C	D
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
PL. 10•1	52,2 (2.0551)	17,6 (0.6929)	65,2 (2.5669)	32,6 (1.2835)
PL. 10•1,5	53,8 (2.1181)	18,4 (0.7244)	66,8 (2.6299)	33,4 (1.3150)
PL. 10•2	55,4 (2.1811)	19,2 (0.7559)	68,4 (2.6929)	34,2 (1.3465)
PL. 10•2,5	57 (2.2441)	20 (0.7874)	70 (2.7559)	35 (1.3780)
PL. 10•3,15	59 (2.3228)	21 (0.8268)	72 (2.8346)	36 (1.4173)
PL. 10•4	61,8 (2.4331)	22,4 (0.8819)	74,8 (2.9449)	37,4 (1.4724)
PL. 10•5	65 (2.5591)	24 (0.9449)	78 (3.0709)	39 (1.5354)
PL. 10•5,8	67,6 (2.6614)	25,3 (0.9961)	80,6 (3.1732)	40,3 (1.5866)
PL. 10•6,3	69 (2.7165)	26 (1.0236)	82 (3.2283)	41 (1.6142)
PL. 10•8	74,5 (2.9331)	28,75 (1.1319)	87,5 (3.4449)	43,75 (1.7224)
PL. 10•10	81 (3.1890)	32 (1.2598)	94 (3.7008)	47 (1.8504)

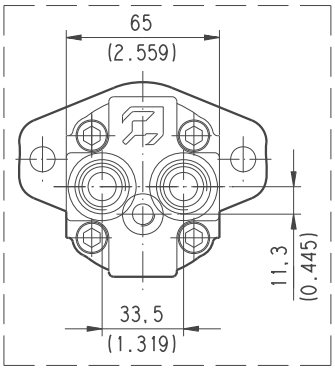
Replaces: 01/10.03

O 02/07.2006

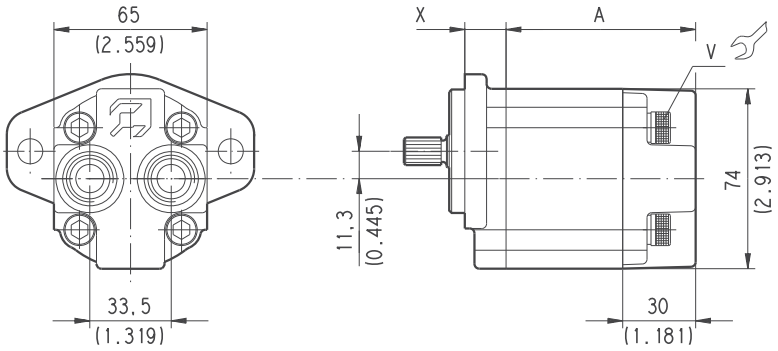
POLARIS 10 — SINGLE UNITS REAR PORTS — P

Replaces: 01/10.03

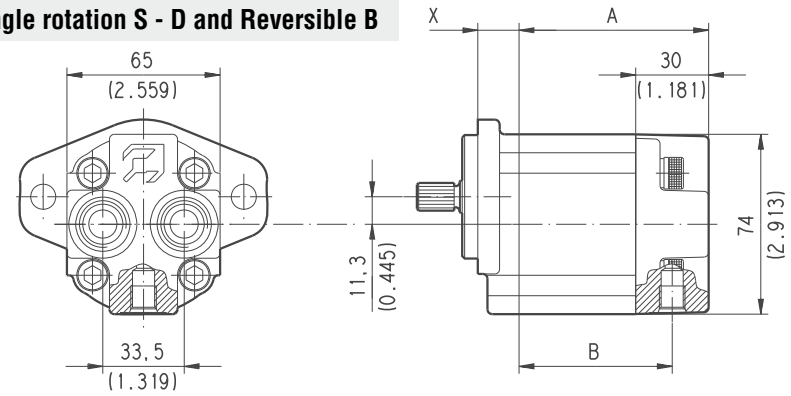
D033-181/0903



Reversible R



Single rotation S - D and Reversible B



Reversible L

Mounting flange type version 0	X
	mm (inch)
E1	14 (0.5512)
E7	14 (0.5512)
E8	14 (0.5512)
B1	14 (0.5512)
K2	11,8 (0.4646)
S0	17 (0.6693)
R8	41 (1.6142)
R9	41 (1.6142)
W9	41 (1.6142)

O Rear cover in aluminium only.

DRIVE SHAFTS: see page 52
MOUNTING FLANGE: see page 58 ÷ 60
PORTS: see page 69 ÷ 74

Mounting flange material	O Screw tightening torque Nm (lbf in)
	V
Aluminium	25 $^{\pm 2,5}$ (199 ÷ 243)
Cast iron	

O 02/07.2006

Pump type Motor type	A	B
	mm (inch)	mm (inch)
PL. 10•1	65,2 (2.5669)	50,2 (1.9764)
PL. 10•1,5	66,8 (2.6299)	51,8 (2.0394)
PL. 10•2	68,4 (2.6929)	53,4 (2.0124)
PL. 10•2,5	70 (2.7559)	55 (2.1654)
PL. 10•3,15	72 (2.8346)	57 (2.2441)
PL. 10•4	74,8 (2.9449)	59,8 (2.3543)
PL. 10•5	78 (3.0709)	63 (2.4803)
PL. 10•5,8	80,6 (3.1732)	65,6 (2.5827)
PL. 10•6,3	82 (3.2283)	67 (2.6378)
PL. 10•8	87,5 (3.4449)	72,5 (2.8543)
PL. 10•10	94 (3.7008)	79 (3.1102)

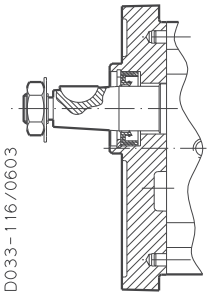
VERSIONS

For each version, the possible combination between drive shafts and mounting flanges are shown on pages 58 ÷ 68.

VERSION 0

Available for group:

10 20 30

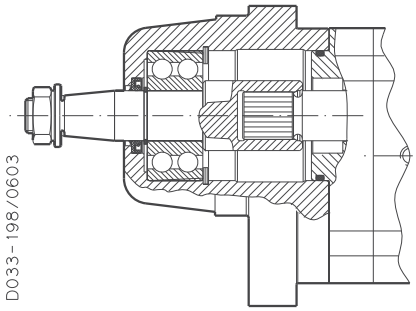


Version for applications without radial and axial load on the drive shaft.

VERSION W8

Available for group:

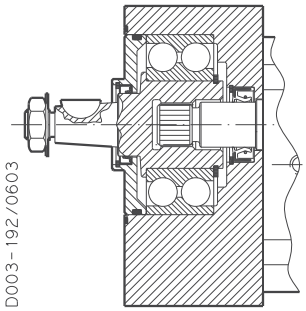
20



VERSION 4

Available for group:

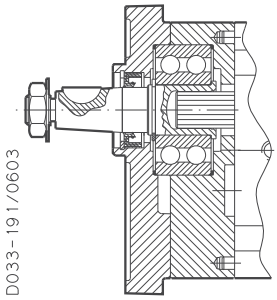
20



VERSION 5

Available for group:

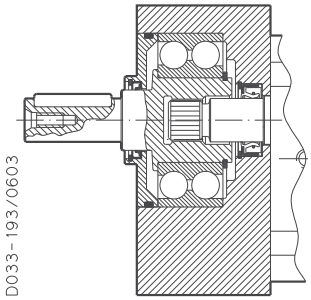
20



VERSION 6

Available for group:

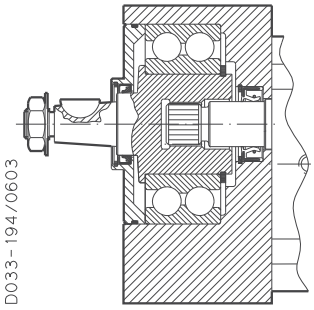
20



VERSION 7

Available for group:

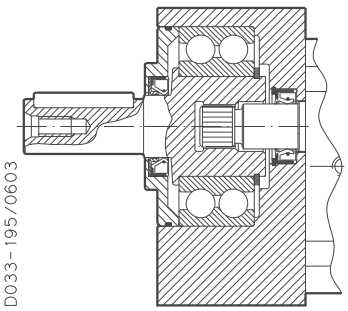
20



VERSION 8

Available for group:

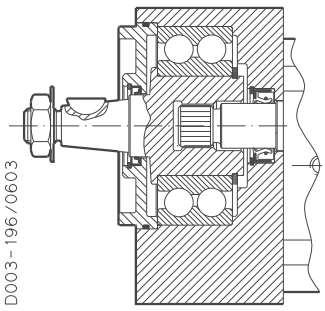
20



VERSION 9

Available for group:

20



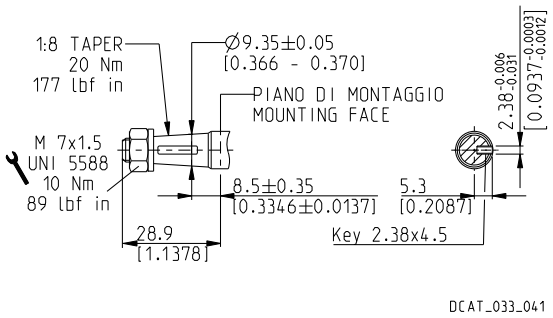
For the outboard bearing life expectancy, diagrams providing approximate selection data well be found on subsequent pages.
For particular applications please consult our technical sales department.

01/10.03

POLARIS 10 DRIVE SHAFTS

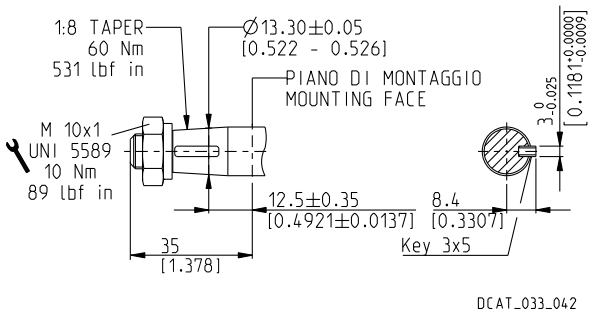
EUROPEAN TAPERED 1:8 81

Mounting face refer to flange code **E1**



EUROPEAN TAPERED 1:8 86

Mounting face refer to flange code **E7**

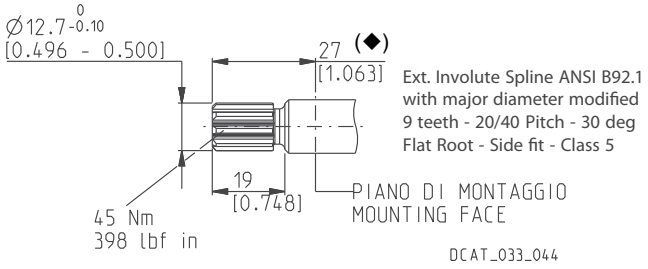


SAE "AA" SPLINE 02

Not available with size:

10•8	With flange: E1, E8, K2, S0
10•1,5 - 10•2,5 - 10•5,8	With flange: R8, R9

Mounting face refer to flange code **R9**



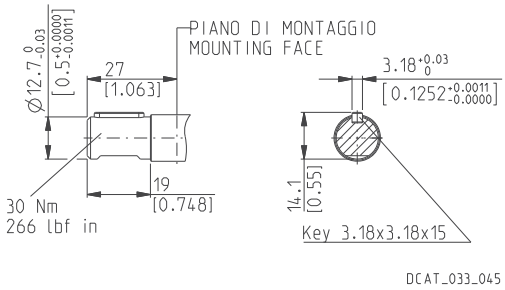
(◆) 24 (0.9449) with flange code S0

SAE "AA" STRAIGHT 30

Not available with size:

10•1,5 - 10•2,5 - 10•5,8	With flange: E7, B1, K2, R8, R9
10•2,5 - 10•5,8	With flange: S0

Mounting face refer to flange code **S0**

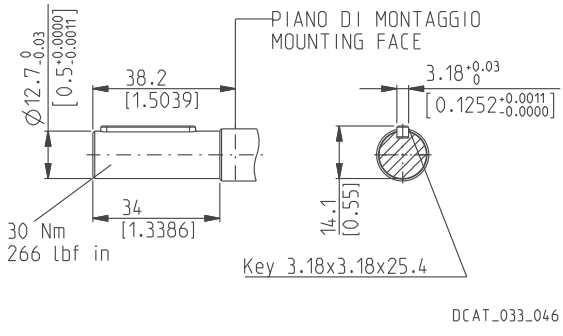


SAE STRAIGHT 36

Not available with size:

10•1,5 **10•2,5**

Mounting face refer to flange code **R8**

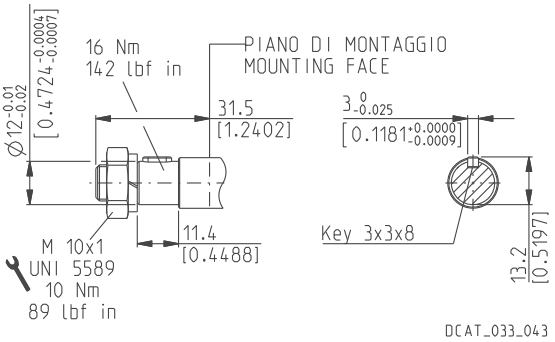


STRAIGHT 29

Not available with size:

10•5,8

Mounting face refer to flange code **E8**

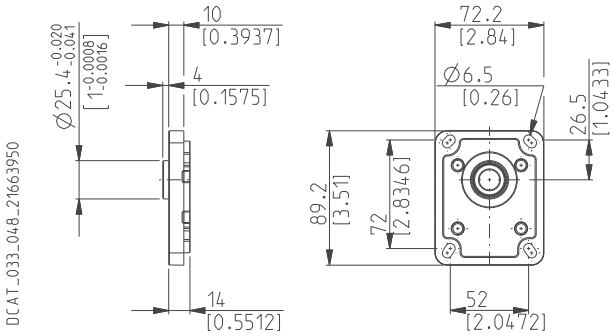


01/10.03

POLARIS 10 MOUNTING FLANGES AND TABLE OF COMPATIBILITY

EUROPEAN E1

Material: cast iron and aluminium O

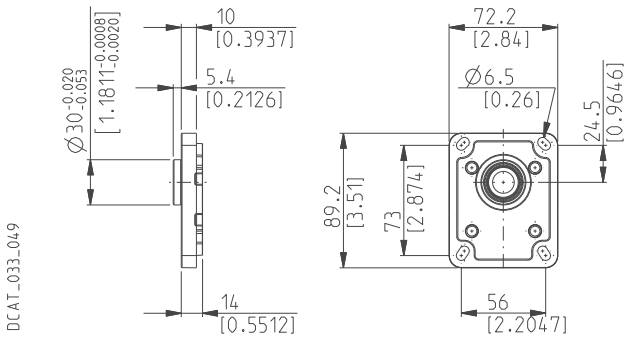


VERSIONS See page 47	DRIVE SHAFTS See page 52 81	02	29	86
0	#	x	x	x

Standard combination
x Available combination

EUROPEAN E7

Material: cast iron and aluminium O

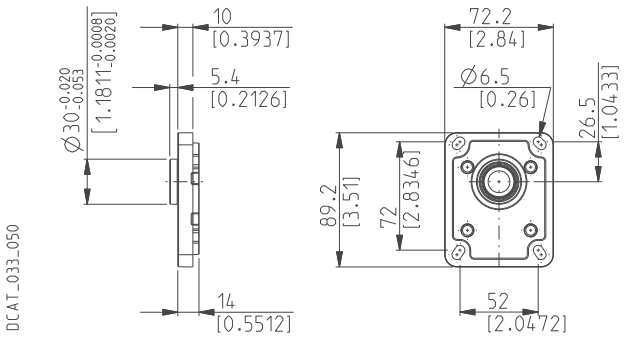


VERSIONS See page 47	DRIVE SHAFTS See page 52 86	29	30
0	#	x	x

Standard combination
x Available combination

EUROPEAN E8

Material: cast iron and aluminium O

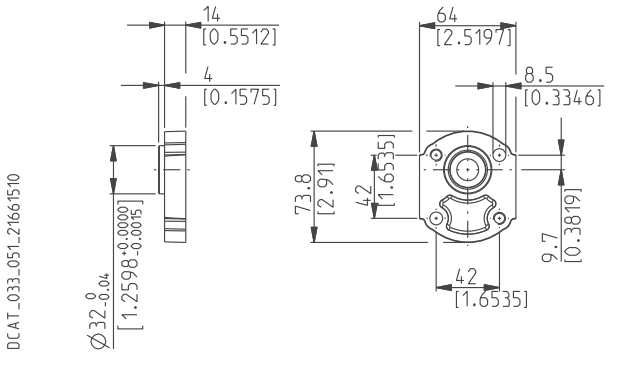


VERSIONS See page 47	DRIVE SHAFTS See page 52 29	02
0	#	x

Standard combination
x Available combination

GERMAN 2 BOLTS B1

Material: aluminium O



VERSIONS See page 47	DRIVE SHAFTS See page 52 30	86
0	#	x

Standard combination
x Available combination

Replaces: 01/10.03

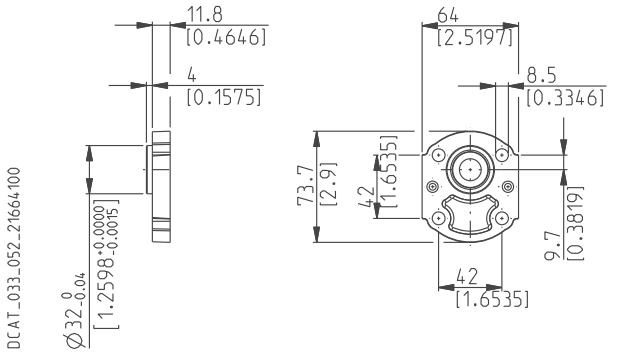
O 02/07.2006

POLARIS 10 MOUNTING FLANGES AND TABLE OF COMPATIBILITY

Replaces: 01/10.03

GERMAN 4 BOLTS K2

Material: aluminium O

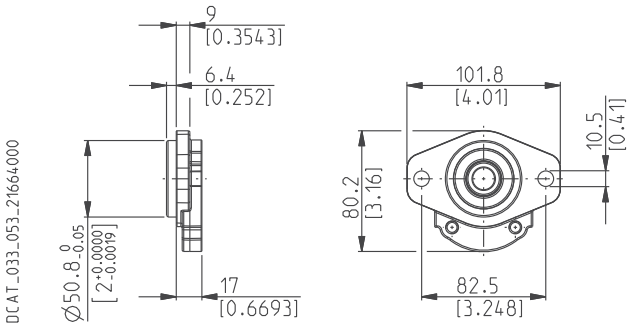


VERSIONS See page 47	DRIVE SHAFTS See page 52 02	30
0	x	x

Standard combination
x Available combination

SAE "A-A" 2 BOLTS S0

Material: cast iron and aluminium O



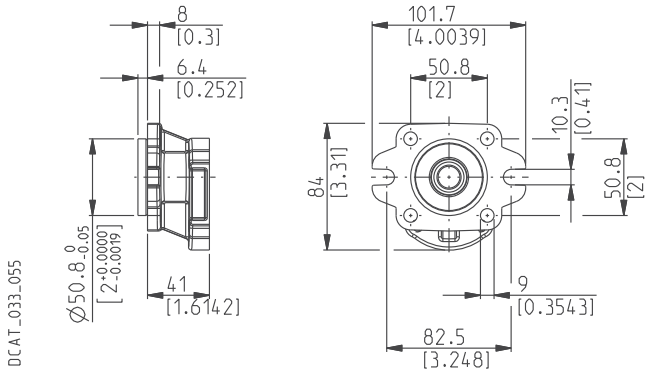
VERSIONS See page 47	DRIVE SHAFTS See page 52 30	02	86
0	#	x	x

Standard combination
x Available combination

O 02/07.2006

SAE "A-A" 2-4 BOLTS R9

Material: cast iron O

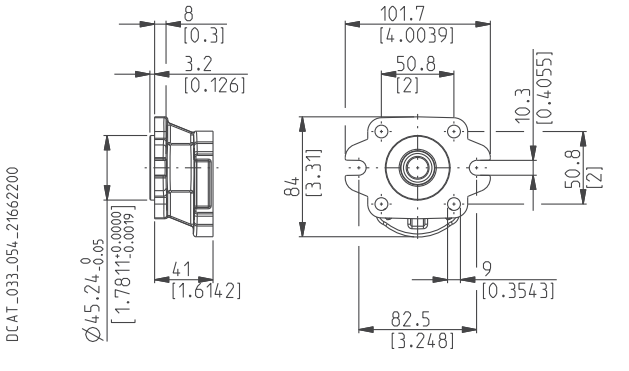


VERSIONS See page 47	DRIVE SHAFTS See page 52 02	30	36
0	#	x	#

Standard combination
x Available combination

SAE 2-4 BOLTS R8

Material: cast iron O



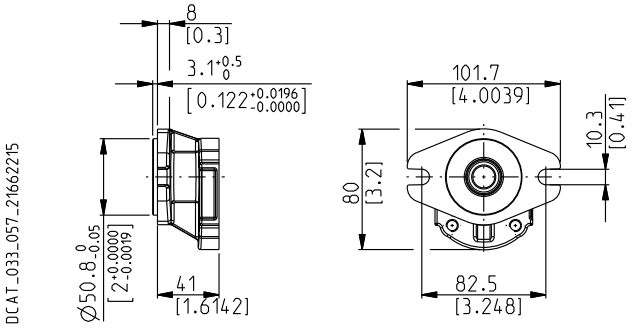
VERSIONS See page 47	DRIVE SHAFTS See page 52 02	30	36
0	#	x	#

Standard combination
x Available combination

POLARIS 10 MOUNTING FLANGES AND TABLE OF COMPATIBILITY

SAE 2 BOLTS W9

Material: cast iron O



	DRIVE SHAFTS See page 52
VERSIONS See page 47	36
0	#

Standard combination

X Available combination

Replaces: 01/10.03

O 02/07.2006

IN/OUT PORTS TYPE

	SIDE PORTS												REAR PORTS			
PORTS TYPE	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. 10•1	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•1,5	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•2	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•2,5	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•3,15	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•4	BB	BA							GC	GC	OB	OA	GC	GC	OB	OA
PL. 10•5	BB	BA							GD	GD	OB	OA	GD	GD	OB	OA
PL. 10•5,8	BB	BA							GD	GD	OB	OA	GD	GD	OB	OA
PL. 10•6,3	BB	BA							GD	GD	OB	OA	GD	GD	OB	OA
PL. 10•8	BB	BA							GD	GD	OC	OB	GD	GD	OB	OB
PL. 10•10	BB	BA							GD	GD	OC	OB	GD	GD	OB	OB
PL. 20•4	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•6,3	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•7,2	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•8	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•9	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•10,5	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•11,2	BE	BC	EA	EA	MA	MA	SA	SA	GD	GD	OC	OC	GD	GD	OC	OC
PL. 20•14	BE	BC	EB	EA	MB	MA	SB	SA	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•16	BE	BC	EB	EA	MB	MA	SB	SA	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•19	BE	BC	EB	EA	MB	MA	SB	SA	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•20	BE	BC	EB	EA	MB	MA	SB	SA	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•24,5	BE	BC	EB	EA	MC	MB	SC	SB	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•25	BE	BC	EB	EA	MC	MB	SC	SB	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•27,8	BE	BC	EB	EA	MC	MB	SC	SB	GE	GD	OD	OC	GE	GD	OD	OC
PL. 20•31,5	BE	BC	EB	EA	MC	MB	SC	SB	GE	GD	OD	OC	GE	GD	OD	OC
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•46	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				

01/10.03

EXTERNAL DRAIN PORTS

	SIDE PORTS						REAR PORTS	
IN/OUT PORTS TYPE	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	-	-

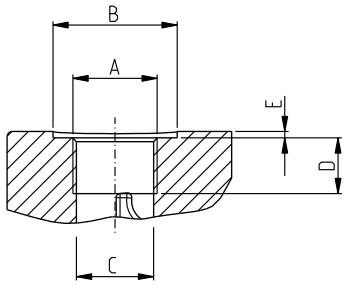
DRAIN PORTS SIZES

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	
			mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf 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)

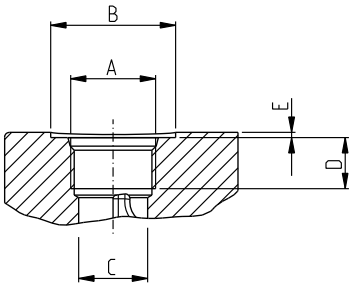


DCAT_006_026_21064779

METRIC STRAIGHT THREAD PORTS ISO 6149 — METRIC

Metric thread ISO 60° conforms to ISO/R 262

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



DCAT_006_027_21060524

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	
		mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)
03	7/16"-20 UNF-2B	21 (0.8267)	9,5 (0.3740)	14 (0.5512)	1 (0.0394)	12 $^{+1}$ (106 ÷ 115)

Other drain ports are shown on subsequent pages.

01/10.03

PORTS SIZE

Tightening torque for low pressure side port

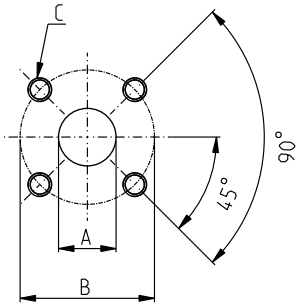
Tightening torque for high pressure side port [values obtained at 5075 psi (350 bar)]

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	B	C		
	mm (in)	mm (in)	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)



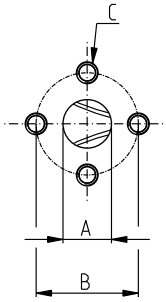
DCAT_033_028_17681888

EUROPEAN FLANGED PORTS - 4 Bolts — EUROPEAN

Metric thread ISO 60° conforms to ISO/R 262

CODE	A	B	C		
	mm (in)	mm (in)	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)
			M 8 (◆) 18 (0.7087)	15 +1 (◆) (133 ÷ 142)	15 +1 (◆) (133 ÷ 142)
ED	27 (1.0630)	51 (2.0079)	M 10 18 (0.7087)	20 +1 (177 ÷ 186)	30 +2,5 (266 ÷ 288)
EF	33 (1.2992)	62 (2.4409)	M 12 18 (0.7087)	25 +1 (221 ÷ 230)	50 +2,5 (443 ÷ 465)

(◆) For POLARIS 30



DCAT_006_024_21060533

01/10.03

PORTS SIZES

Tightening torque for low pressure side port

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

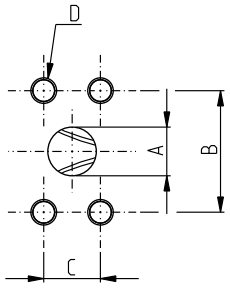
For reversible rotation, please consult only the tightening torque for high pressure side port

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI — SSM

Metric thread ISO 60° to ISO/R 262

CODE	A mm (in)	B mm (in)	C mm (in)	D 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 14 (0.5512)	15 +1 (133 ÷ 142)	15 +1 (133 ÷ 142)
				M 8 (◆) 22 (0.8661)	20 +1 (◆) (177 ÷ 186)	20 +1 (◆) (177 ÷ 186)
MB	19 (0.7480)	47,6 (1.8740)	22,2 (0.8740)	M 10 14 (0.5512)	20 +1 (177 ÷ 186)	25 +1 (266 ÷ 288)
				M 10 (◆) 22 (0.8661)	20 +1 (◆) (177 ÷ 186)	35 +2,5 (◆) (310 ÷ 332)
MC	25,4 (1.0000)	52,4 (2.0630)	26,2 (1.0315)	M 10 14 (0.5512)	20 +1 (177 ÷ 186)	25 +1 (266 ÷ 288)
				M 10 (◆) 22 (0.8661)	20 +1 (◆) (177 ÷ 186)	35 +2,5 (◆) (310 ÷ 332)
MD	30,5 (1.2008)	58,7 (2.3110)	30,2 (1.1890)	M 10 15 (0.5906)	20 +1 (177 ÷ 186)	30 +2,5 (266 ÷ 288)
				M 10 (◆) 22 (0.8661)	20 +1 (◆) (177 ÷ 186)	35 +2,5 (◆) (310 ÷ 332)
ME	39,3 (1.5472)	69,8 (2.7480)	35,7 (1.4055)	M 12 22 (0.8661)	30 +2,5 (266 ÷ 288)	60 +5 (531 ÷ 575)
MF	51 (2.0079)	77,8 (3.0630)	42,9 (1.6890)	M 12 22 (0.8661)	30 +2,5 (266 ÷ 288)	60 +5 (531 ÷ 575)

(◆) For POLARIS 30



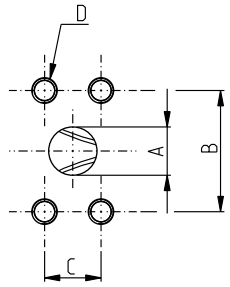
DCAT_006_025_21064252

SAE FLANGED PORTS J518 - Standard pressure series 3000 PSI — SSS

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

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

(◆) For POLARIS 30



DCAT_006_028_21060740

01/10.03

PORTS SIZES

Tightening torque for low pressure side port

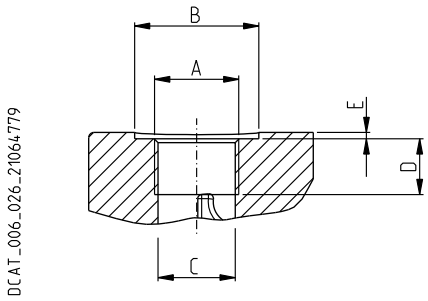
Tightening torque for high pressure side port [values obtained at 5075 psi (350 bar)]

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

Replaces: 01/10.03

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		
			mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf in)
GC O	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 O	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

O 02/07.2006

PORTS SIZES

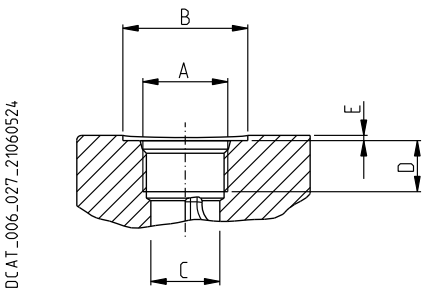
Tightening torque for low pressure side port

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		
			mm (in)	mm (in)	mm (in)	mm (in)	Nm (lbf in)	Nm (lbf 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

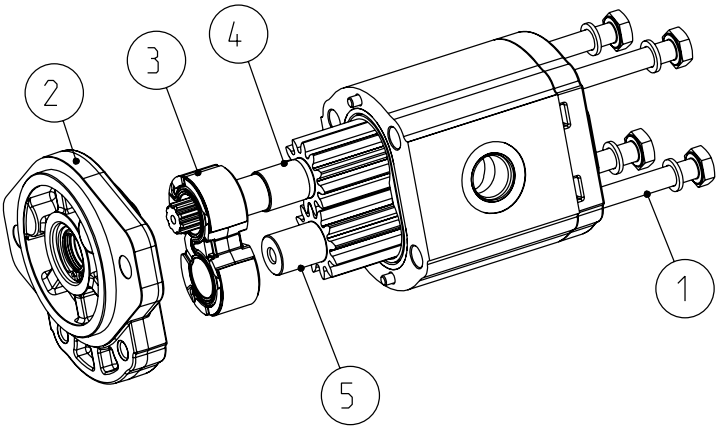
01/10.03

CHANGING ROTATION

Example of changing rotation: from PLP20 pump clockwise to counterclockwise

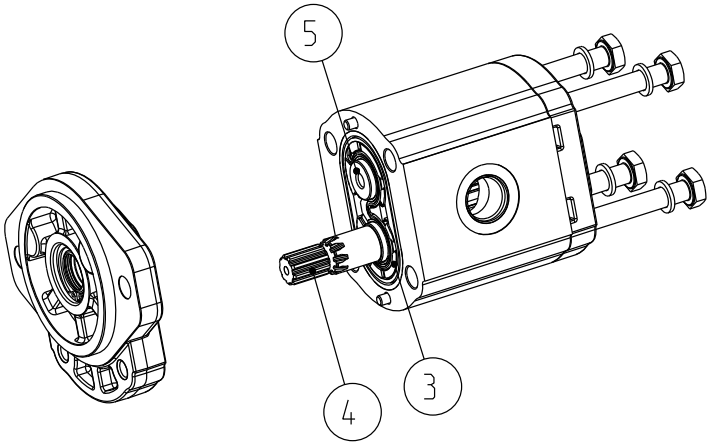
To change rotation of Polaris unidirectional pumps and motors it is necessary to operate in the following way:

1. Clean the pump externally with care.
2. Loosen, and remove, the clamp bolts (1).
3. Coat the sharp edges of the drive shaft (4) with adhesive tape and smear a layer of clean grease on the shaft end extension to avoid damaging the lip of the shaft seal when removing the mounting flange.
4. Remove the mounting flange (2), taking care to keep the flange as straight as possible during removal. If the flange is stuck, tap around the edge with a fibre or rubber mallet in order to break away from the body. Ensure that while removing the front mounting flange, the drive shaft and other components remain in position.



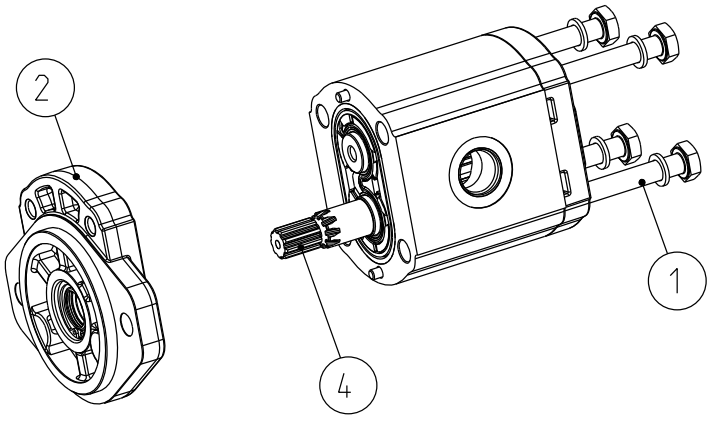
DCA7_033_040

5. Ease the drive gear (4) up to facilitate removal the front plate (3), taking care that the precision ground surfaces do not become damaged, and remove the drive gear.
6. Remove the driven gear (5) without overturning. The rear plate has not to be removed.



DCA7_033_029

7. Re-locate the driven gear (5) in the position previously occupied by the drive gear (4)
8. Re-locate the drive gear (4) in the position previously occupied by the driven gear (5).
9. Replace the front plate (3) in its original position.
10. Gently wipe the machined surface of the mounting flange (2) and the body with a flat hand stone.
11. Refit the front mounting flange (2) turned 180° from its original position.
12. Refit the clamp bolts (1) with the washers and tighten in a crisscross pattern with the following torque value:
    70 $^{+5}$ Nm (620 ÷ 664 lbf in) with cast iron cover.
    45 $^{+5}$ Nm (398 ÷ 443 lbf in) with one or both cover in aluminium.
13. Check that the pump rotates freely when the drive shaft (4) is turned by hand. If not a pressure plate seal may be pinched.
14. The pump is ready for installation with the original rotation reversed.



DCA7_033_011

01/10.03

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) wich 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.

FILTERS O

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:

IKRON® Fluid Filtration

HYDRAULIC FLUID

Use hydraulic fluid conforming to ISO/DIN standards, having viscosity 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.

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. In the difference between pump or motor temperature and fluid temperature exceeds 50°F (10 °C), 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.

PERIODICAL CHECKS - MAINTENANCE

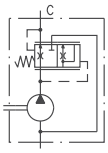
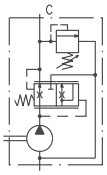
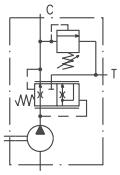
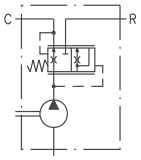
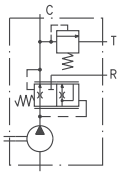
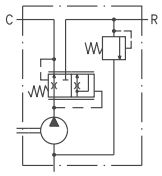
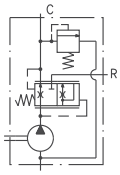
Keep the outside surface clean especially in the area of the drive shaft seal. In fact, abrasive powder can accelerate wear on the seal and cause leakage. Replace filters regularly to keep the fluid clean. The oil level must be checked and oil replaced periodically depending on the system's operating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

Replaces: 01/10.03

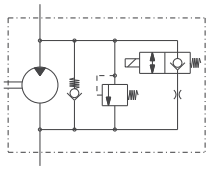
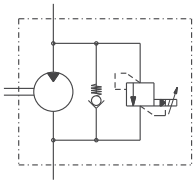
O 02/07.2006

VALVE OPTIONS (◆)

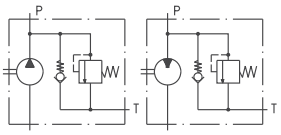
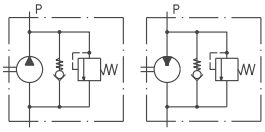
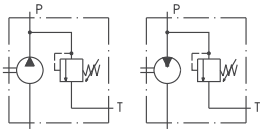
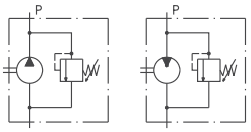
PRIORITY VALVE

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.	
P7	Costant delivery. Excess flow at controlled pressure can be used under load. Internal recirculation of drain valve.	
P9	Costant delivery at controlled pressure. Internal recirculation of valve drain. Excess flow can be used under load.	

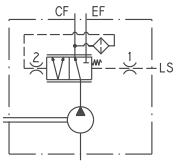
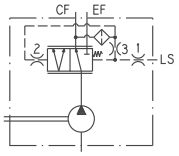
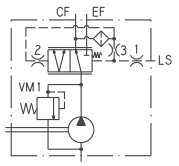
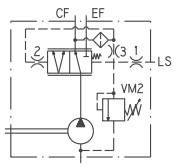
ELECTRIC VALVE FOR MOTORS

EC08..	By-pass valve normally closed with max. pressure relief valve and anti-cavitation valve.	
DBVSA..	Proportional relief valve and anti-cavitation valve.	

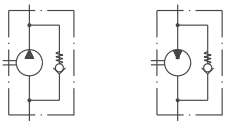
MAX PRESSURE RELIEF VALVE

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 technical sales department.

01/10.03

HOW TO ORDER POLARIS 10 SINGLE UNITS

1	2	3		4	5		6	7		8		9		10		11	12		13
PLP 10-1	L	0	-	81	E1	-	L	BB/BA	-	N	-	EL	-	C	-	L	GA	-	FS

1 Type	Pump type	Motor type
0.07 in³/rev (1,07 cm³/rev)	PLP 10-1	PLM 10-1
0.10 in³/rev (1,60 cm³/rev)	PLP 10-1,5	PLM 10-1,5
0.13 in³/rev (2,13 cm³/rev)	PLP 10-2	PLM 10-2
0.16 in³/rev (2,67 cm³/rev)	PLP 10-2,5	PLM 10-2,5
0.20 in³/rev (3,34 cm³/rev)	PLP 10-3,15	PLM 10-3,15
0.26 in³/rev (4,27 cm³/rev)	PLP 10-4	PLM 10-4
0.33 in³/rev (5,34 cm³/rev)	PLP 10-5	PLM 10-5
0.38 in³/rev (6,20 cm³/rev)	PLP 10-5,8	PLM 10-5,8
0.41 in³/rev (6,67 cm³/rev)	PLP 10-6,3	PLM 10-6,3
0.52 in³/rev (8,51 cm³/rev)	PLP 10-8	PLM 10-8
0.65 in³/rev (10,67 cm³/rev)	PLP 10-10	PLP 10-10

2 Rotation	Code
Left	S
Right	D
Reversible rear external drain	R
Reversible side external drain	L
Reversible internal drain	B

3 Version	Code
Without outboard bearing	0

4 Drive shaft	Code
European tapered 1:8	81
European tapered 1:8	86
SAE "AA" spline (9 teeth)	02
SAE "AA" straight	30
SAE straight	36
Straight	29

5 Mounting flange	Code
European	E1
European	E7
European	E8
German 2 bolt	B1
German 4 bolt	K2
SAE "AA" 2 bolt	S0
SAE "AA" 2-4 bolt	R9
SAE 2-4 bolt	R8
SAE 2 bolt	W9

Code	6 Ports position
L	Side
P	Rear

Code	7 Ports IN/OUT		
GERMAN FLANGED PORTS			
Side	Rear		Type
BB/BA		PLP 10	1-1,5-2-2,5-3,15 4-5-5,8-6,3-8-10
BA/BB		PLM 10	
GAS STRAIGHT THREAD PORTS (BSPP)			
Side	Rear		Type
GC/GC	GC/GC	PLP 10	1-1,5-2-2,5-3,15-4
		PLM 10	
GD/GD	GD/GD	PLP 10	5-5,8-6,3-8-10
		PLM 10	
SAE STRAIGHT THREAD PORTS (ODT)			
Side	Rear		Type
OB/OA	OB/OA	PLP 10	1-1,5-2-2,5-3,15-4 5-5,8-6,3
OA/OB	OA/OB	PLM 10	
OC/OB	OB/OB	PLP 10	8-10
OB/OC	OB/OB	PLM 10	

Code	8 Seals (a)
N	Buna (standard)
V	Viton

Code	O 9 Cover options (b)
	Cast iron mounting flange and rear cover (standard - no code)
E	Aluminium mounting flange and cast iron rear cover
L	Cast iron mounting flange and aluminium rear cover
EL	Aluminium mounting flange and rear cover

Code	10 Shaft seal options
C	High back pressure seal with wiper seal
D	Standard seal with wiper seal
H	High back pressure seal

Replaces: 01/10.03

O 02/07.2006

HOW TO ORDER POLARIS 10 SINGLE UNITS

11	Drain port position - Rev. Rotation L	Code
Side drain with side port position		L
Side drain with bottom port position		*

12	Drain port		Code
IN/OUT GERMAN FLANGED PORTS			
Type		Side	Rear
1-1,5-2-2,5-3,15 4-5-5,8-6,3-8-10	PLP 10 PLM 10	GA	
IN/OUT GAS STRAIGHT THREAD PORTS (BSPP)			
Type		Side	Rear
1-1,5-2-2,5-3,15 4-5-5,8-6,3-8-10	PLP 10 PLM 10	GA	GA
IN/OUT SAE STRAIGHT THREAD PORTS (ODT)			
Type		Side	Rear
1-1,5-2-2,5-3,15 4-5-5,8-6,3-8-10	PLP 10 PLM 10	03	03

13	Shaft arrangement	Code
Female spline		FS

(a) Choose the seals according to the temperature shown on page 4.

(b) Mounting flange material on page 58 ÷ 60
Rear cover material on page 32 ÷ 33

O

Replaces: 01/10.03

O 02/07.2006

PL 03 T A Edition: 03/02.2012 Replaces: PL 02 T A

CASAPPA®
FLUID POWER DESIGN

Headquarters:
CASAPPA S.p.A.
Via Balestrieri, 1
43044 Lemignano di Collecchio
Parma (Italy)
Tel. (+39) 0521 30 41 11
Fax (+39) 0521 80 46 00
IP Videoconferencing
E-mail: info@casappa.com
www.casappa.com