

PGP 500 Series PGM 500 Series

Single or Multiple Aluminum Pumps and Motors

Catalog HY09-0500/US



- Single or Multiple Pumps and Motors
- Continuous Pressures to 4000 psi
- Pump Flows to 37 gpm
- Motors with outputs to over 60 Hp
- Displacement range: 2 - 52cc (.12 - 3.17 cir)

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

The Parker Hannifin Gear Pump Division Assures:

- Consistent quality
- Technical innovation
- Premier customer service

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- Construction
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- Industrial



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Pump/Motor Products

PGP/PGM 505

- Flows to 8 gpm
- Continuous pressures to 4000 psi
- Speeds to 4000 rpm
- Wide variety of integral valve options
- Single and bi-rotational motors
- Flow dividers

PGP/PGM 511

- Flows to 19 gpm
- Continuous pressures to 4000 psi
- Speeds to 4000 rpm
- Wide variety of integral valve options
- Single and bi-rotational motors
- Flow dividers

PGP/PGM 517

- Flows to 37 gpm
- Continuous pressures to 3600 psi
- Speeds to 3400 rpm
- Wide variety of integral valve options
- Single and bi-rotational motors
- Flow dividers

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

PGP/PGM 500 Series

- **High Performance**
- **High Efficiency**
- **High Pressure Operation**

PGP/PGM 500 series gear pumps/motors are an advanced performance version of the international “bushing block” style pumps. PGP/PGM 500 series pumps/motors offer superior performance, high efficiency and low noise operation at high operating pressures. They are produced in three frame sizes (PGP/PGM 505, PGP/PGM 511, PGP/PGM 517) with displacements ranging from 2 to 52 cm³ (.12 to 3.17 in³/rev). A wide variety of standard options are available to meet specific application requirements worldwide.

Advantages

- **Up to 275 bar (4000 psi) continuous operation**
High strength materials and large journal diameters provide low bearing loads for high pressure operation.
- **Low noise**
PGP/PGM 505 and 517 - 13 tooth gear profile, PGP/PGM 511 – 12 tooth gear profile and optimized flow metering provide reduced pressure pulsation and exceptionally quiet operation.



PGP 500

- **High efficiency**
Pressure balanced bearing blocks assure maximum efficiency under all operating conditions.
- **Application flexibility**
International mounts and connections, integrated valve capabilities and common inlet multiple pump configurations provide unmatched design and application versatility.

Characteristics

Product Features	Description
Pump Type	Heavy-duty, aluminum, external gear
Mounting	SAE, rectangular, thru-bolt, and application specific
Ports	SAE/metric split flange, metric and others
Shaft Style	SAE splined, keyed, tapered, tang and specials.
Speed	500 - 4000 rpm, see tables on pages 5, 11 and 20.
Theoretical Displ.	See tables on pages 5, 11 and 20.
Drive	Drive direct with flexible coupling is recommended.
Axial / Radial Load	Units subject to axial or radial loads should be specified with an outboard bearing. Please contact Product Support for assistance.
Inlet Pressure	Operating range - 0.8 to 2 bar (12-29 psi). Minimum inlet pressure 0.5 bar (7.25 psi).
Outlet Pressure	See tables on pages 5, 11 and 20.
Fluids	Mineral oil, fire resistant fluids: - water-oil emulsions 60/40, HFB - water-glycol, HFC - phosphate-esters, HFD
Fluid Temperature	Range of operating temperature -15 to +80°C (5 to 176° F). Max. permissible operating pressure dependent on fluid temperature. Temperature for cold start -20 to -15°C (-4 to 5° F) at speed ≤ 1500 rpm Max. permissible operating pressure dependent on fluid temperature.

Product Features	Description
Fluid Viscosity	Range of operating viscosity 8 to 1000 mm ² /s max. Permissible operating pressure dependent on viscosity. Viscosity range for cold start 1000 to 2000 centistokes at operating pressure ≤10 bar (145 psi) and speed ≤1500 rpm.
Range of Ambient Temperature	-40°C to +70°C (-40°F to 158°F)
Filtration	According to ISO 4406 Cl. 16/13
Flow Velocity	See table on page 28.
Direction of Rotation (looking at the driveshaft)	Clockwise, counter-clockwise or birotational. Note: Drive pump or motor only in indicated direction of rotation.
Multiple Pump Assemblies	- Available in two, three or four section configurations. - Max. shaft loading must conform to the limitations shown in the shaft loading rating tables on pages 8,15 and 24 in this catalog. - Max. load is determined by adding the torque values for each pumping section that will be simultaneously loaded.
Separate or Common Inlet Capability	Separate inlet configuration: - Each gear housing has individual inlet and outlet ports. Common inlet configuration: - Two gear sets share a common inlet. - Inlet port can be in either section.

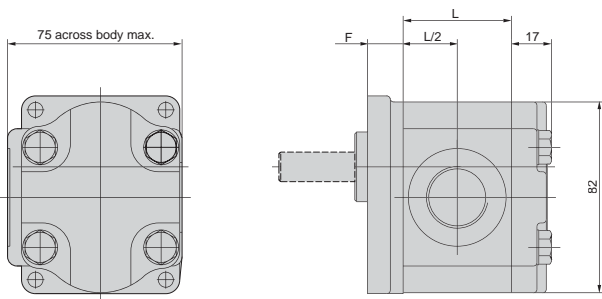
PGP/PGM 505 Specifications

Description	Code	0020	0030	0040	0050	0060	0070	0080	0090	0100	0110	0120
Displacements	cm ³ /rev	2	3	4	5	6	7	8	9	10	11	12
	in ³ /rev	0.12	0.18	0.24	0.31	0.37	0.43	0.49	0.55	0.61	0.67	0.73
Continuous Pressure	bar	275	275	275	275	275	275	275	250	250	250	220
	psi	3988	3988	3988	3988	3988	3988	3988	3625	3625	3625	3190
Intermittent Pressure	bar	300	300	300	300	300	300	300	275	275	275	220
	psi	4350	4350	4350	4350	4350	4350	4350	3988	3988	3988	3190
Minimum Speed @ Max. Outlet Pressure	rpm	500	500	500	500	500	500	500	500	500	500	500
Maximum Speed @ 0 Inlet & Max. Outlet Pressure	rpm	4000	4000	4000	4000	3600	3300	3000	2900	2800	2400	2400
Pump Input Power @ Max. Pressure and 1500 rpm	kW	2	2.3	3	3.8	4.5	5.3	6	6.5	6.9	7.6	8.4
	HP	2.68	3.08	4.02	5.10	6.03	7.11	8.05	8.72	9.25	10.19	11.26
Dimension "L"	mm	38.4	41.1	43.8	46.5	49.1	51.8	54.5	57	59.8	62.5	65.2
	in	1.51	1.62	1.72	1.83	1.93	2.04	2.15	2.24	2.35	2.46	2.57
Approximate Weight ¹⁾	kg	1.72	2.22	2.27	2.32	2.38	2.43	2.48	2.53	2.58	2.63	2.68
	LB	3.80	4.91	5.02	5.13	5.26	5.37	5.48	5.59	5.70	5.81	5.92

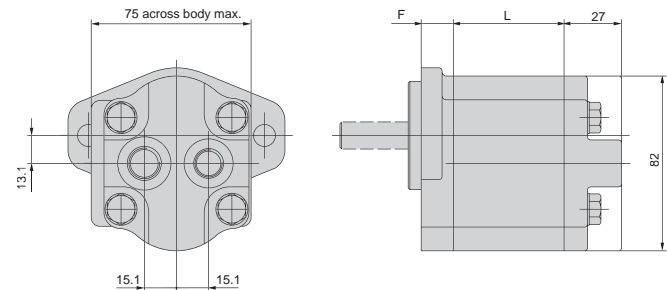
¹⁾ Single pump with Shaft End Cover D3 and non ported Port End Cover.

PGP/PGM 505 Dimensions

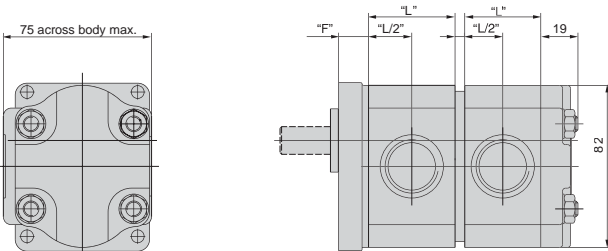
Single Unit PGP/PGM 505



Single Unit PGP/PGM 505 with rear ports



Tandem Unit PGP/PGM 505



NOTE:

Dimension "F" see shaft end covers on page 6
Dimension "L" see table above

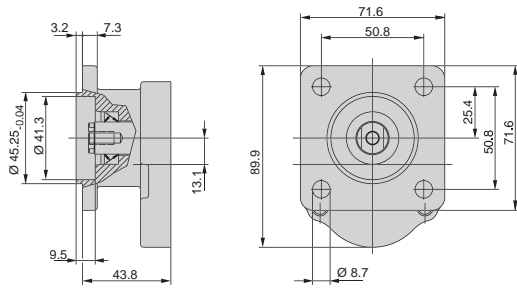
- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

Heavy-Duty Aluminum Pumps and Motors

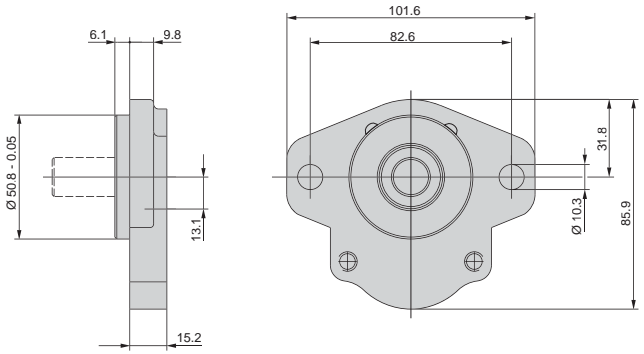
PGP/PGM 500 Series

PGP/PGM 505 Shaft End Covers

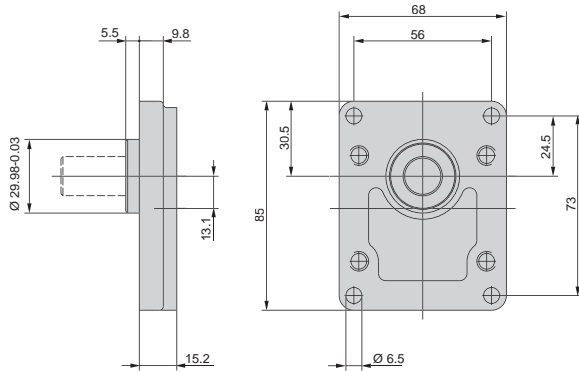
Code A1



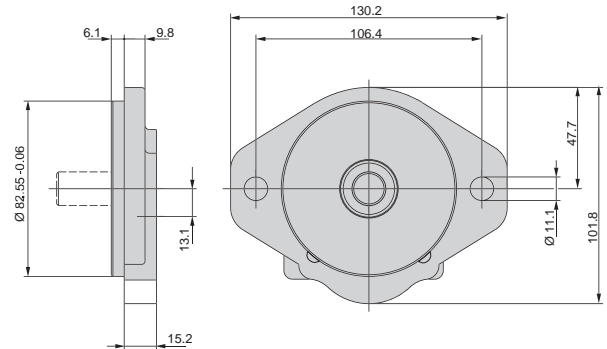
Code H1



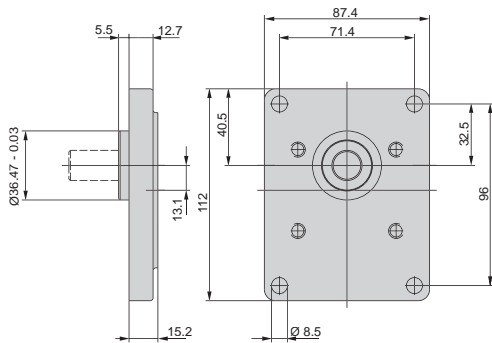
Code D2



Code H2



Code D3



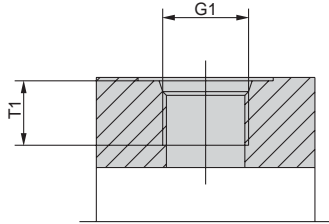
- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 505 Porting

Code D

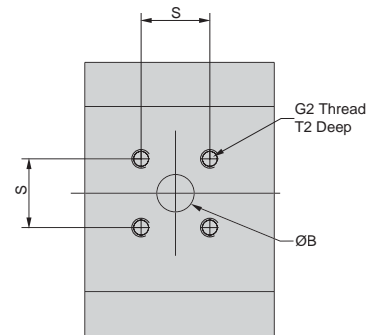
SAE straight thread

See table below for specific port dimensions.



Code K5

4-Bolt flange



- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 505

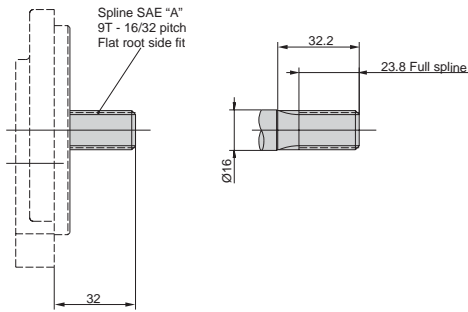
Code	G1	G2	T1	Ø D	S	Ø B	T2
Thread	Thread		Dimensions				
D2	9/16"-18 UNF		12.7				
D3	3/4"-16 UNF		14.3				
D4	7/8"-14 UNF		16.7				
D5	1 1/16"-12 UN		19.0				
K5		1/4"-20 UNC			25.15	14.2	13.0

Heavy-Duty Aluminum Pumps and Motors

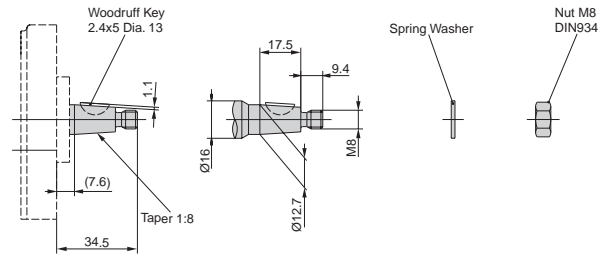
PGP/PGM 500 Series

PGP/PGM 505 Drive Shaft

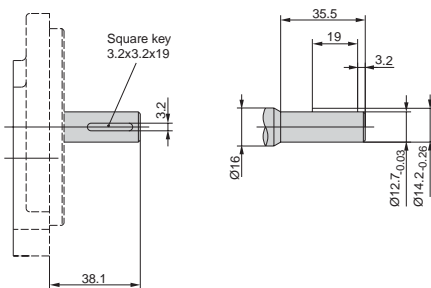
Code A1



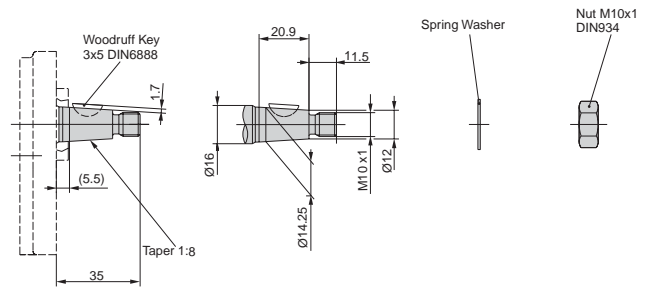
Code Q1



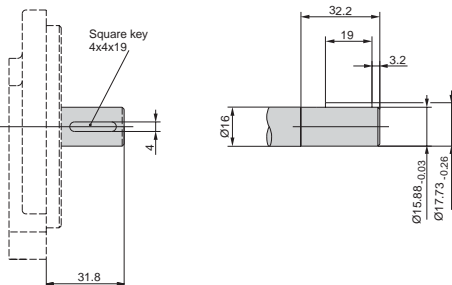
Code J1



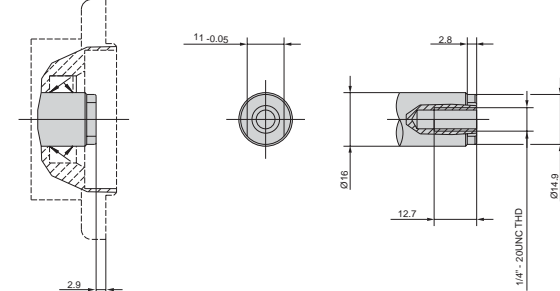
Code Q2



Code K1



Code V4



- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 505 - Shaft Load Capacity

Code	Description	Style	Torque Rating
A1	9T, 16/32 Pitch, SAE "A"	Spline	108Nm/954 in-lb
J1	Ø 12.7, 3.2 Key, No thread, 38L	Parallel	43Nm/380in-lb
K1	Ø 15.88, 4.0 Key. No Thread, 32L, SAE "A"	Parallel	85Nm/751in-lb
Q1	Ø 12.70, 2.4 Key, M 8x1.25, 7.6L	1:8 Taper	43Nm/380in-lb
Q2	Ø 14.25, 3.0 Key, M 10x1, 5.5L	1:8 Taper	68Nm/600in-lb
V4	11x2.8, 1/4UNF	Tang	44Nm/389in-lb
	Tandem Pump/Connecting Shaft	Spline	36Nm/318in-lb

When applying a multiple section pump, the maximum drive shaft load is determined by adding the torque values for each pumping section that will be simultaneously loaded.

$$\text{Torque [in-lb]} = \frac{\text{Displacement [in}^3\text{/rev]} \times \text{Pressure [psi]}}{5.72} \quad \text{Torque [Nm]} = \frac{\text{Displacement [cc/rev]} \times \text{Pressure [bar]}}{57.2}$$

Heavy-Duty Aluminum Pumps and Motors

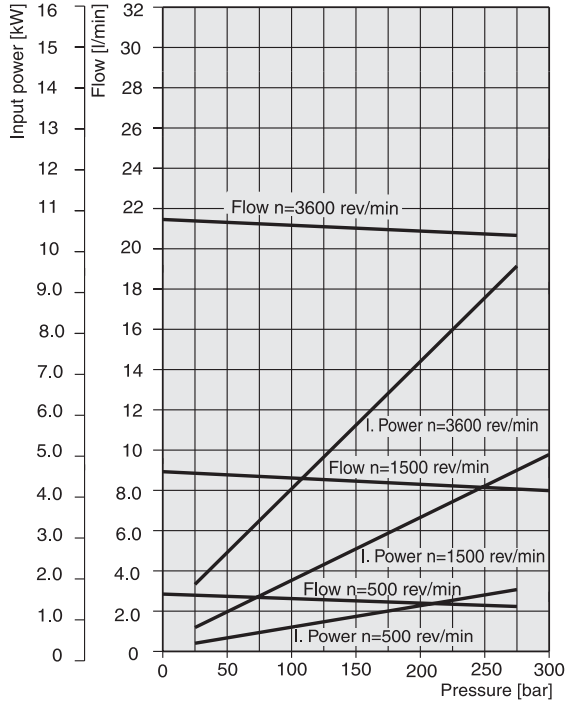
PGP/PGM 500 Series

PGP/PGM 505 - 3.0CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

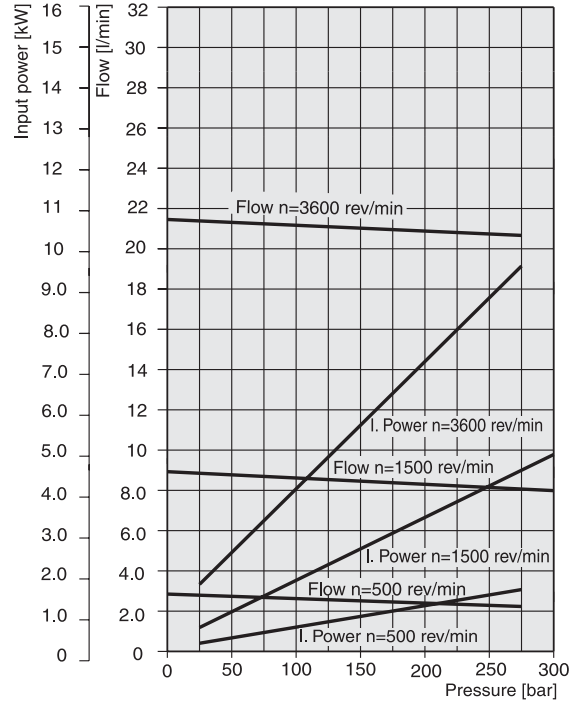


PGP/PGM 505 - 6.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

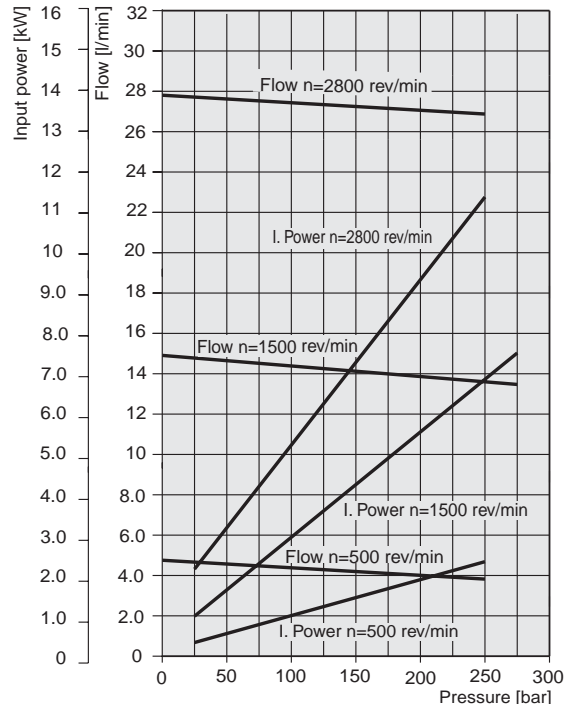


PGP/PGM 505 - 10.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

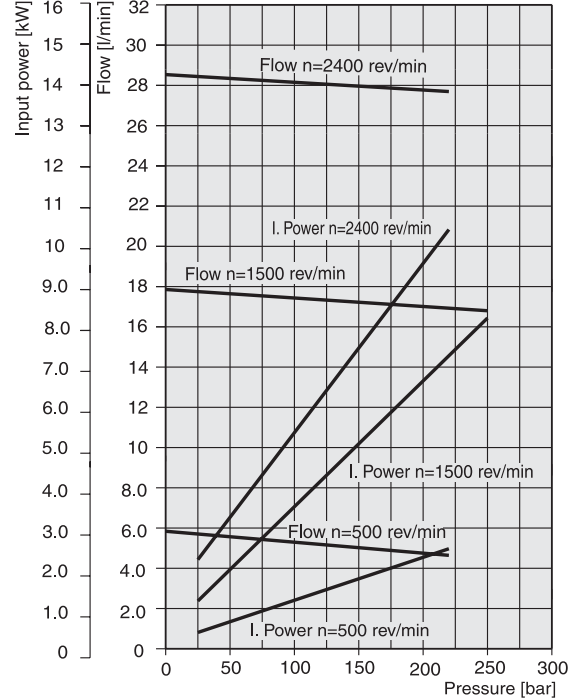


PGP/PGM 505 - 12.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

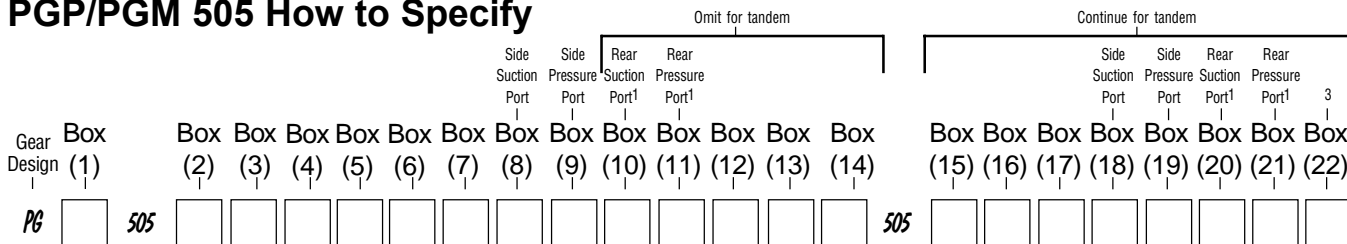


Performance data shown is based upon a series of laboratory tests and is not representative of any one unit.

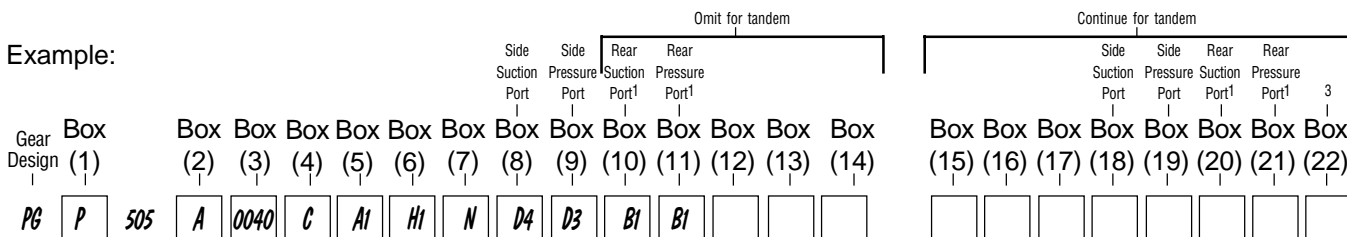
Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

PGP/PGM 505 How to Specify



Example:



Box 1 Pump/Motor	
P	Pump
M	Motor

Boxes 2,15 Unit		
	Pump	Motor
A	Single unit	Standard Motor w/o checks
B	Multiple unit	Standard Motor w/ two checks
C	—	Standard Motor w/one anti cavitation check (ACC)
M	Single distributor unit	—
N	Multiple distributor unit	—

Boxes 3,16 Displacement	
0020	2.0 ccm
0030	3.0 ccm
0040	4.0 ccm
0050	5.0 ccm
0060	6.0 ccm
0070	7.0 ccm
0080	8.0 ccm
0100	10.0 ccm
0110	11.0 ccm
0120	12.0 ccm

Boxes 4 Rotation	
C	Clockwise
A	Counter clockwise
B	Bi-directional

Box 5 Shaft	
A1	9T, 16/32 Pitch, 32L, SAE "A" spline
A2	9T, 20/40 Pitch, 27L, SAE "AA" spline
J1	Ø12.7, 3.2 Key, no thread, 38L, parallel
K1	Ø15.88, 4.0 Key, no thread, 32L, SAE "A", parallel
Q1	Ø12.7, 7.6L, 2.4 Key, M8x1.25, taper 1:8
Q2	Ø14.25, 5.5L, 3.0 Key, M10x1, taper 1:8
V4	11x2.8, 1/4UNF for flange code A1, tang drive

Box 6 Shaft End Covers	
A1	50.8x50.8 - Ø45.25 4bolt square flange
D2	56.0x73.0 - Ø30.0 rectangular
D3	71.4x96.0 - Ø36.47 rectangular
H1	82.5 - Ø50.8 SAE "A-A" 2bolt flange
H2	106.4 - Ø82.55 SAE "A" 2bolt flange

Boxes 7,17 Shaft Seal	
X	No seal
N	NBR
V	FPM, FKM
M	Double NBR
W	Double FPM

Boxes 8,9,10,11,18,19,20,21 Port Options	
B1	No ports
D2	9/16" - 18 UNF thread
D3	3/4" - 16 UNF thread
D4*	7/8" - 14 UNF thread
D5*	1 1/16" - 12UN thread
K5*	14.2mm, 25.15, 1/4" - 20UNC, square flange

*Not usable for rear ports

Box 12 Motor Drain Option ²	
B1	No drain
A	7/16"-20 UNF thread
C	9/16"-18 UNF thread

Box 13 Drain Position ²	
2	Drain on bottom
3	Drain on top
4	Rear drain

Box 14 Section Connection	
S	Separate inlets
C	Common inlets

NOTES:

- 1 Only coded for the last section.
- 2 Only for motors
- 3 For further "B" triple unit repeat displacement, shaft seal between sections, side suction port, side pressure port, rear suction port, rear pressure port.
4. Dimensions are in millimeters except where noted.

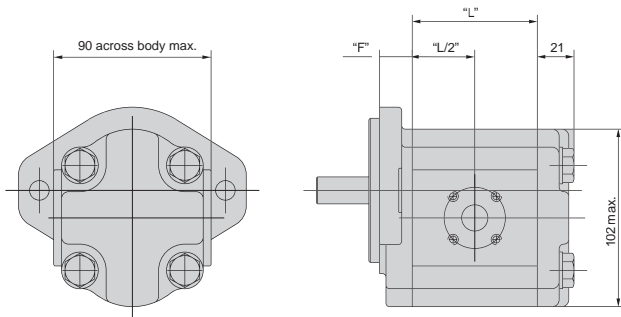
PGP/PGM 511 Specifications

Description	Code	0060	0070	0080	0100	0110	0140	0160	0180	0190	0210	0230	0270	0280	0310
Displacements	cm ³ /rev	6	7	8	10	11	14	16	18	19	21	23	27	28	31
	in ³ /rev	0.37	0.43	0.49	0.61	0.67	0.85	0.98	1.10	1.16	1.28	1.40	1.65	1.71	1.89
Continuous Pressure	bar	275	275	275	275	275	275	275	275	275	235	235	190	185	165
	psi	3988	3988	3988	3988	3988	3988	3988	3988	3988	3408	3408	2755	2683	2393
Intermittent Pressure	bar	300	300	300	300	300	300	300	300	300	255	255	210	200	180
	psi	4350	4350	4350	4350	4350	4350	4350	4350	4350	3698	3698	3045	2900	2610
Minimum Speed @ Max. Outlet Pressure	rpm	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Maximum Speed @ 0 Inlet & Max. Outlet Pressure	rpm	4000	4000	4000	3600	3600	3300	3000	3000	3000	2800	2800	2400	2300	2300
Pump Input Power @ Max. Pressure and 1500 rpm	kW	4.5	5.25	6	7.5	8.3	10.5	12	13.5	14.3	14.4	14.7	14.9	15.8	16.7
	HP	6.03	7.04	8.05	10.06	11.1	14.0	16.0	18.1	19.1	19.3	19.7	19.9	21.1	22.4
Dimension "L"	mm	51.8	53.3	54.9	57.9	59.4	64	67	70.1	71.6	76.6	77.6	83.7	84.2	89.8
	in	2.04	2.10	2.16	2.28	2.34	2.52	2.64	2.76	2.82	3.02	3.06	3.30	3.31	3.54
Approximate Weight ¹⁾	kg	3.4	3.44	3.47	3.55	3.57	3.71	3.79	3.89	3.91	3.95	4.06	4.21	4.23	4.37
	LB	7.51	7.60	7.67	7.85	7.89	8.20	8.38	8.60	8.64	8.73	8.97	9.30	9.35	9.66

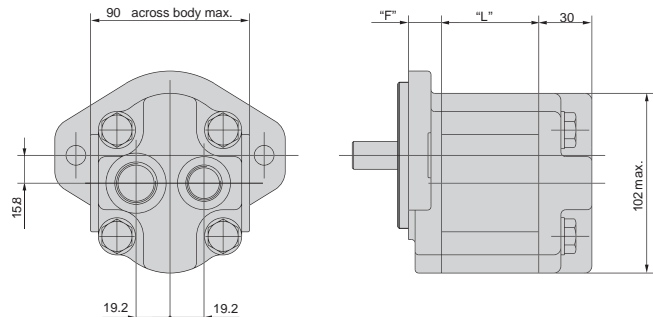
¹⁾ Single pump with Shaft End Cover Q1 and non ported Port End Cover.

PGP/PGM 511 Dimensions

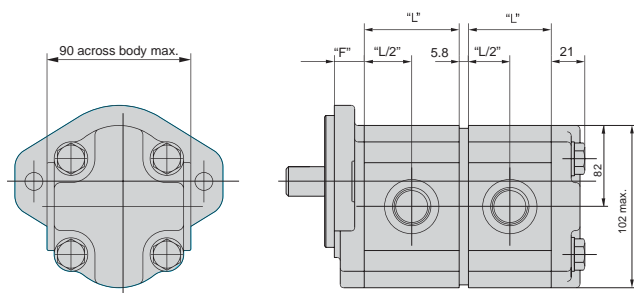
Single Unit PGP/PGM 511



Single Unit PGP/PGM 511 with rear ports



Tandem Unit PGP/PGM 511



NOTE:

Dimension "F" see shaft end covers on page 12
Dimension "L" see table above

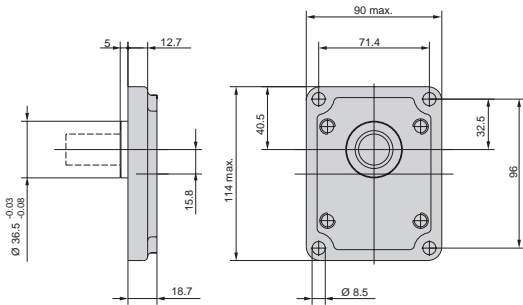
- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

Heavy-Duty Aluminum Pumps and Motors

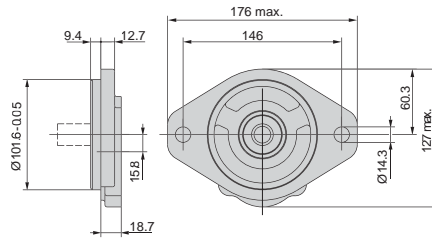
PGP/PGM 500 Series

PGP/PGM 511 Shaft End Covers

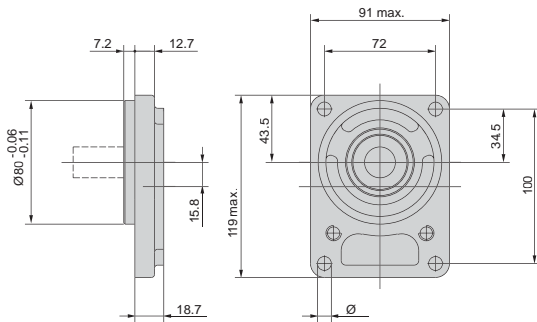
Code D3



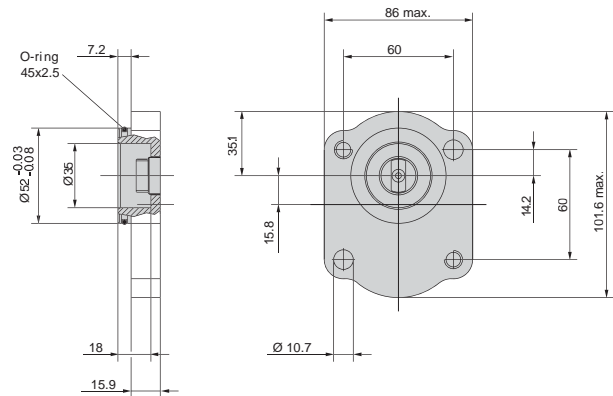
Code H3



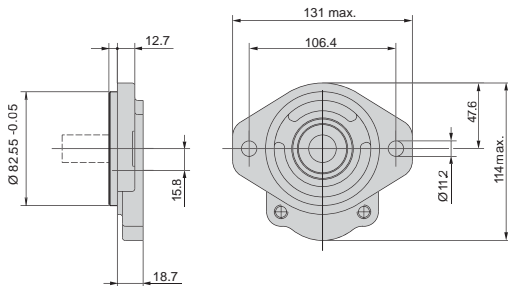
Code D4



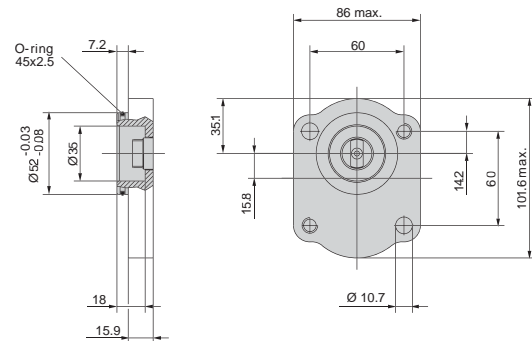
Code Q1



Code H2



Code Q3



- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 511 Porting

Code D

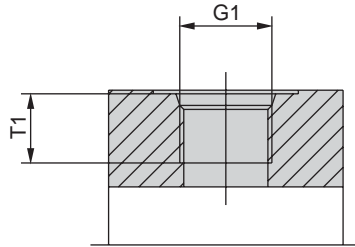
SAE straight thread

See table at right for specific port dimensions.

Code H

ISO metric straight

See table at right for specific port dimensions.



Code	G1 Thread	T1 Dimensions
D2	9/16"-18 UNF	12.7
D3	3/4"-16 UNF	14.3
D4	7/8"-14 UNF	16.7
D5	1 1/16"-12 UN	19.0
D6	1 5/16"-12 UN	19.0
D7	1 5/8"-12 UN	19.0
D8	1 7/8"-12 UN	19.0
H1	M 14x1.5	11.5
H2	M 16x1.5	13.0
H3	M 18x1.5	14.5
H4	M 22x1.5	15.5
H6	M 27x2	19.0
H8	M 33x2	19.0

Code N

SAE Split flange

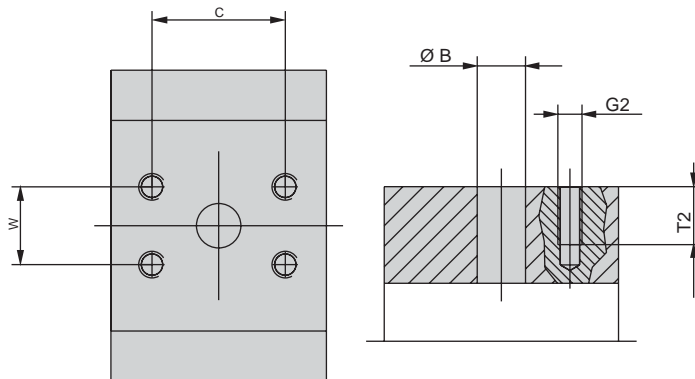
See table at right for specific port dimensions.

Code P

SAE Split flange

metric thread

See table at right for specific port dimensions.



Code	G2 Thread	Dimensions			
		Ø B	C	W	T2
N1	5/16"-18 UNC	12.7	38.10	17.48	15.0
N2	3/8"-16 UNC	19.0	47.63	22.23	14.0
N3	3/8"-16 UNC	25.4	52.37	26.19	20.6
N4	7/16"-14 UNC	31.8	58.72	30.17	20.6
P1	M 8x1.25	12.7	38.10	17.48	15.0
P2	M 10x1.50	19.0	47.63	22.23	20.6
P3	M 10x1.50	25.4	52.37	26.19	21.4
P4	M 10x1.50	31.8	58.72	30.17	20.6
P5	M 12x1.75	38.1	69.82	35.71	20.6

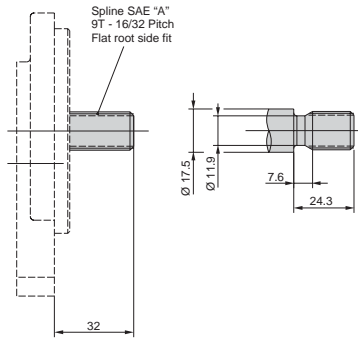
- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

Heavy-Duty Aluminum Pumps and Motors

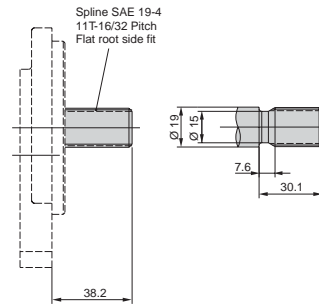
PGP/PGM 500 Series

PGP/PGM 511 Drive Shaft

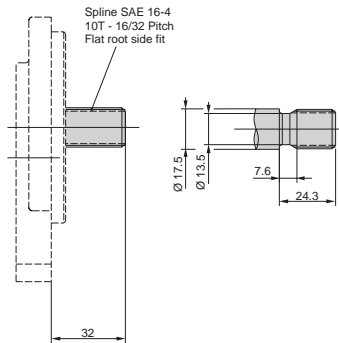
Code A1



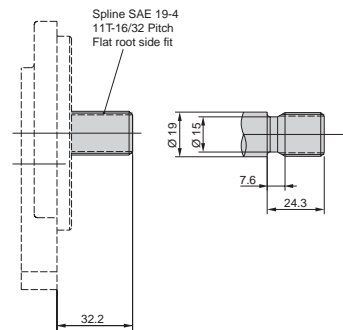
Code C1



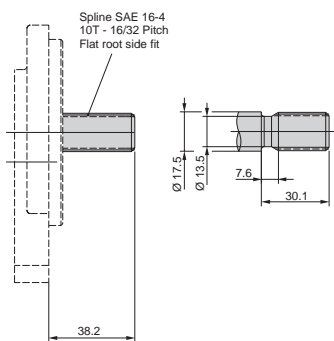
Code B1



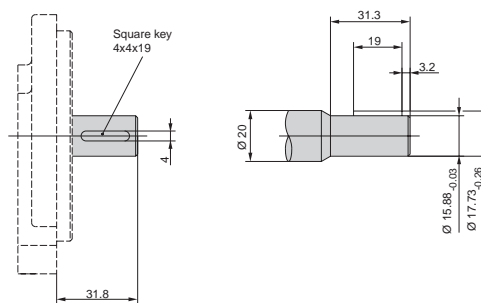
Code C2



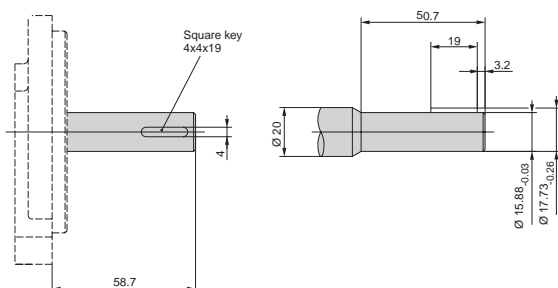
Code B2



Code K1



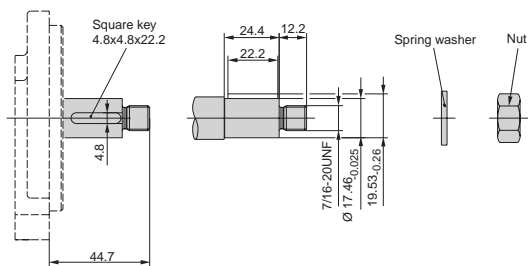
Code K4



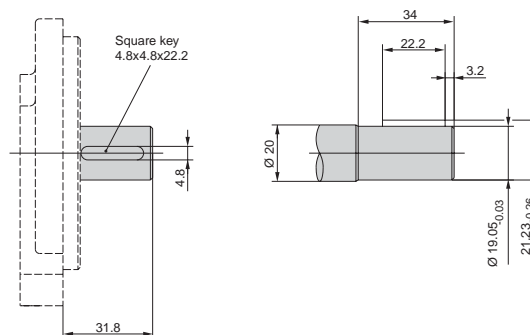
- Notes: 1. Dimensions are in millimeters.
2. Dimensions are nominal except where noted.
3. Subscript and/or superscript numbers are tolerances.
4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 511 Drive Shaft

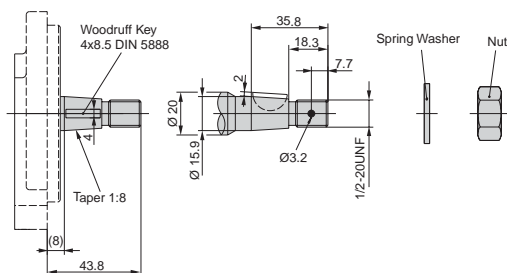
Code L1



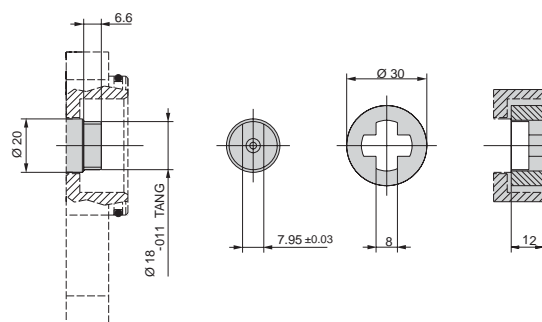
Code L6



Code R1



Code V5



- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 511 - Shaft Load Capacity

Code	Description	Style	Torque Rating
A1	9T, 16/32 Pitch, 32L, SAE "A"	Spline	86Nm/759in-lb
B1	10T, 16/32 Pitch, 32L, SAE "A"	Spline	124Nm/1095in-lb
B2	10T, 16/32 Pitch, 38.2L, SAE "A"	Spline	124Nm/1095in-lb
C1	11T, 16/32 Pitch, 38.2L, SAE 19-4	Spline	184Nm/1625in-lb
C2	11T, 16/32 Pitch, 38.2L, SAE 19-4	Spline	184Nm/1625in-lb
K1	Ø 15.88 4.0 Key, no thread, 32L, SAE "A"	Parallel	75Nm/662in-lb
K4	Ø 15.88, 3.95 Key, no thread, 58.7L	Parallel	75Nm/662in-lb
L1	Ø 17.46, 4.8 Key, 7/16UNF ext., 44.2L	Parallel	112Nm/989in-lb
L6	Ø 19.05, 4.8 Key, no thread, 32L, SAE 19-1	Parallel	145Nm/1280in-lb
R1	Ø 15.9, 43.8L, 4.0 Key, 1/2UNF, SAE "A"	1:8 Taper	156Nm/1377in-lb
V5	8x6.6 Short Shaft	Tang Drive	60Nm/530in-lb
	Tandem pump Connecting Shaft	Spline	110Nm/971in-lb

When applying a multiple section pump, the maximum drive shaft load is determined by adding the torque values for each pumping section that will be simultaneously loaded.

$$\text{Torque [in-lb]} = \frac{\text{Displacement [in}^3\text{/rev]} \times \text{Pressure [psi]}}{5.72}$$

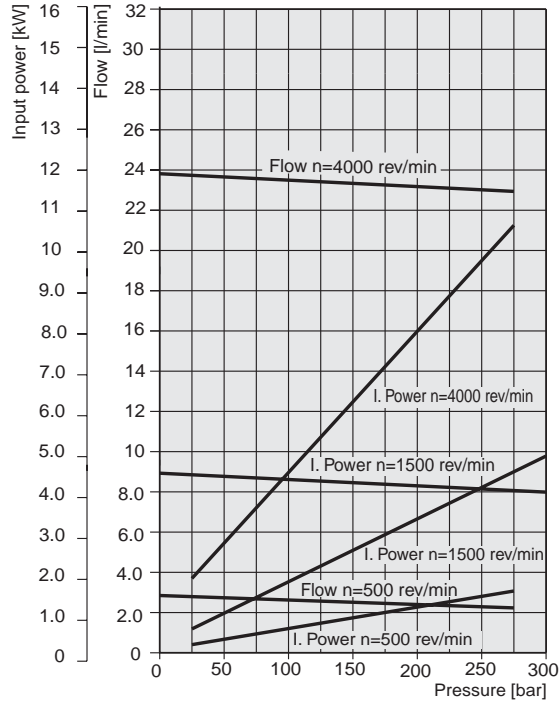
$$\text{Torque [Nm]} = \frac{\text{Displacement [cc/rev]} \times \text{Pressure [bar]}}{57.2}$$

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

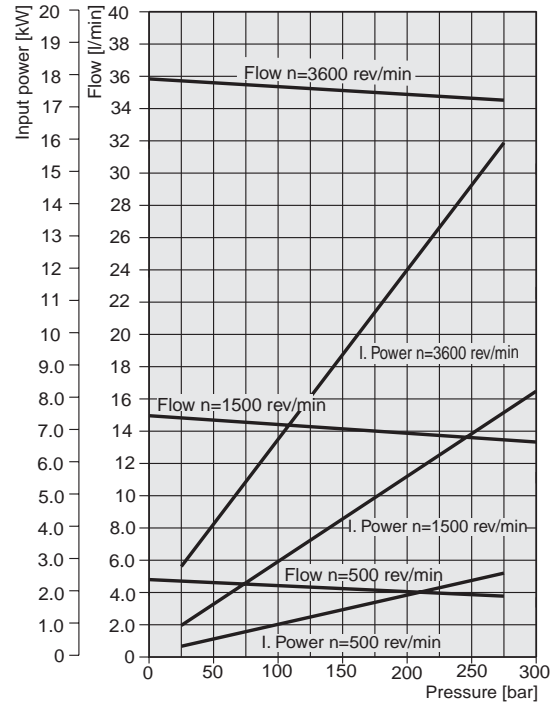
PGP/PGM 511 - 6.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$
 Viscosity = $36\text{mm}^2/\text{s}$
 Inlet Pressure = $0.9 + 0.1$ bar absolute



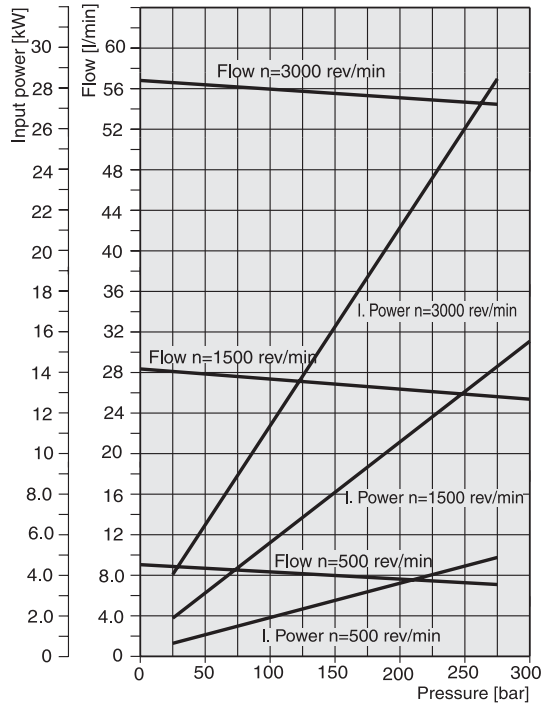
PGP/PGM 511 - 10.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$
 Viscosity = $36\text{mm}^2/\text{s}$
 Inlet Pressure = $0.9 + 0.1$ bar absolute



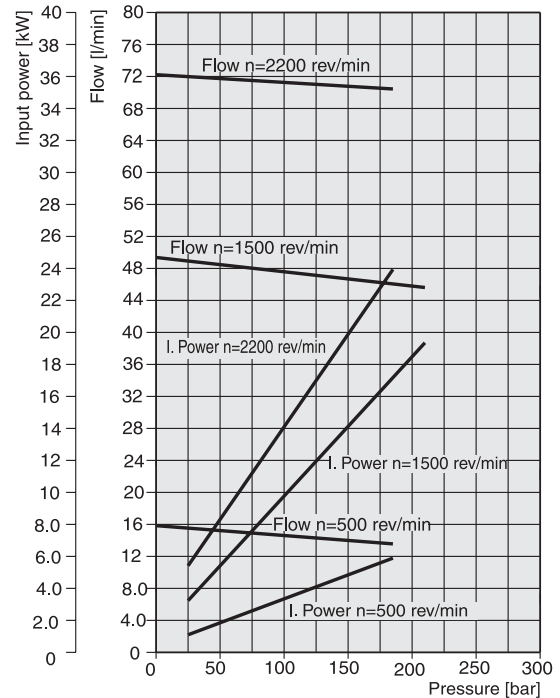
PGP/PGM 511 - 19.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$
 Viscosity = $36\text{mm}^2/\text{s}$
 Inlet Pressure = $0.9 + 0.1$ bar absolute



PGP/PGM 511 - 33.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$
 Viscosity = $36\text{mm}^2/\text{s}$
 Inlet Pressure = $0.9 + 0.1$ bar absolute

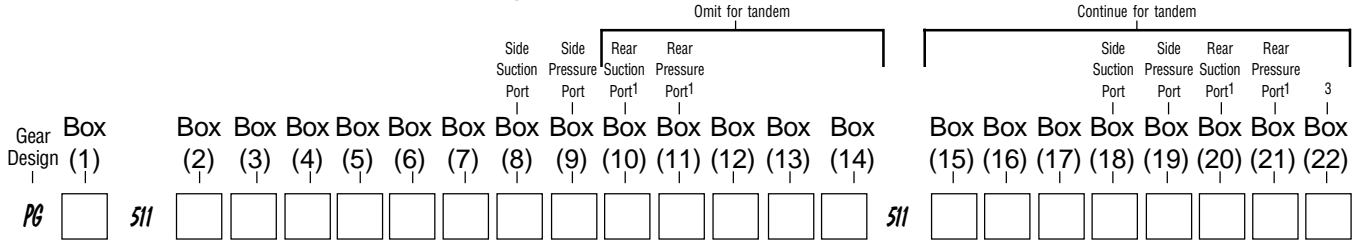


Performance data shown is based upon a series of laboratory tests and is not representative of any one unit.

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

PGP/PGM 511 How to Specify



Box 1 Pump/Motor	
P	Pump
M	Motor
F	Flow divider

Boxes 2,15 Unit		
	Pump	Motor
A	Single unit	Standard Motor w/o checks
B	Multiple unit	Standard Motor w/ two checks
C	—	Standard Motor w/one anti cavitation check (ACC)
D	—	Standard Motor w. one ACC + restrictor
M	Single distributor unit	—
N	Multiple distributor unit	—
S *	Single split gear unit	—
T *	Multiple split gear unit	—

Boxes 3,16 Displacement	
0060	6.0 ccm
0070	7.0 ccm
0080	8.0 ccm
0100	10.0 ccm
0110	11.0 ccm
0140	14.0 ccm
0160	16.0 ccm
0180	18.0 ccm
0190	19.0 ccm
0210	21.0 ccm
0230	23.0 ccm
0270	27.0 ccm
0280	28.0 ccm
0310	31.0 ccm

Box 4 Rotation	
C	Clockwise
A	Counter clockwise
B	Bi-directional

Box 5 Shaft	
A1	9T, 16/32 Pitch, 32L, SAE "A" spline
B1	10T, 16/32 Pitch, 32L spline
B2	10T, 16/32 Pitch, 38.2L spline
C1	11T, 16/32 Pitch, 38.2L, SAE 19-4 spline
C2	11T, 16/32 Pitch, 32.2L, SAE 19-4 spline
K1	Ø15.88, 4.0 Key, no thread, 32L, SAE "A", parallel
K4	Ø15.88, 4.0 Key, no thread, 58.7L, parallel
L1	Ø17.46, 4.8 Key, 7/16" UNF ext., 44.7L, parallel
L6	Ø19.05, 4.8 Key, no thread, 32L, parallel
R1	Ø15.9, 8.0L, 4.0 Key, 1/2" UNF, SAE "A", taper 1:8
V5	8x6.5 short shaft, tang drive

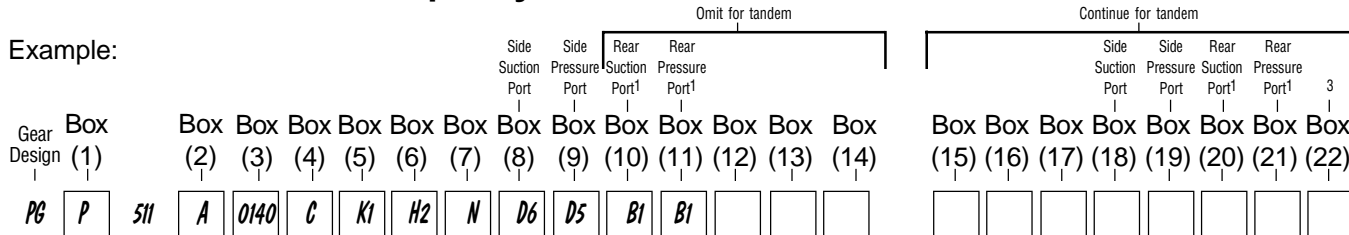
* Only for displacement codes 0060 to 0280

NOTES:

- 1 Only coded for the last section.
- 2 Only for motors
- 3 For further "B" triple unit repeat displacement, shaft seal between sections, side suction port, side pressure port, rear suction port, rear pressure port.

PGP/PGM 511 How to Specify

Example:



Box 6 Shaft End Covers	
D3	71.4x96.0 - Ø36.47 rectangular
D4	72.0x100.0 - Ø80 rectangular
H2	106.4 - Ø82.55 SAE "A" 2bolt flange
H3	146.1 - Ø101.6 SAE "B" 2bolt flange
Q1	60.0x60.0 - Ø52.0 w/o seal , O' thrubolt flange
Q2	60.0x60.0 - Ø50.0 w. seal , O' thrubolt flange
Q3	60.0x60.0 - Ø52.0 w/o seal , O' thrubolt flange
Q4	60.0x60.0 - Ø50.0 w. seal , O',thrubolt flange
J5	H2 with slots, spec 2bolt
F3	71.4x96.0 - Ø36.47 rect., w. OBB and cont. drive shaft
F4	72.0x100.0 - Ø80.0 rect., w. OBB and cont. drive shaft
L2	106.4 - Ø82.55 SAE "A" 2bolt, w. OBB + cont. drive shaft
L3	146.1 - Ø101.6 SAE "B" 2bolt, w. OBB + cont. drive shaft
L5	106.4 - Ø82.55 SAE "A" 2bolt, w. OBB + int. drive shaft
L6	146.1 - Ø101.6 SAE "B" 2bolt, w. OBB + int. drive shaft

Boxes 8,9,10,11,18,19,20,21 Port Options	
B1	No ports
D2	9/16" - 18 UNF thread
D3	3/4" - 16 UNF thread
D4	7/8" - 14 UNF thread
D5	1 1/16" - 12UN thread
D6*	1 5/16" - 12 UN thread
D7*	1 5/8" - 12 UN thread
D8*	1 7/8" - 12 UN thread
H1	M 14x1.5 thread
H2	M 16x1.5 thread
H3	M 18x1.5 thread
H4	M 22x1.5 thread
H6*	M 27x2 thread
H8*	M 33x2 thread
N1*	1/2"-5/16"-18UNC SAE Split Flange
N2*	3/4"-3/8"-16UNC SAE Split Flange
N3*	1 3/8"-16UNC SAE Split Flange
N4*	1 1/4"-7/16-14UNC SAE Split Flange
P1*	12.7mm - M8 Metric Split Flange
P2*	19.0mm - M10 Metric Split Flange
P3*	25.4mm - M10 Metric Split Flange
P4*	31.8mm - M10 Metric Split Flange
P5*	38.1mm - M12 Metric Split Flange

*Not usable for rear ports.

Box 12 Motor Drain Option ²	
B1	No drain
C	9/16-18 UNF thread

Box 13 Drain Position ²	
2	Drain on bottom
3	Drain on top
4	Rear drain
5	Drain right view on drive shaft
6	Drain left view on drive shaft

Box 14 Section Connection	
S	Separate inlets
C	Common inlets

Boxes 7,17 Shaft Seal	
X	No seal
N	NBR
V	FPM, FKM
M	Double NBR
W	Double FPM

NOTES:

- Only coded for the last section.
- Only for motors
- For further "B" triple unit repeat displacement, shaft seal between sections, side suction port, side pressure port, rear suction port, rear pressure port.

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

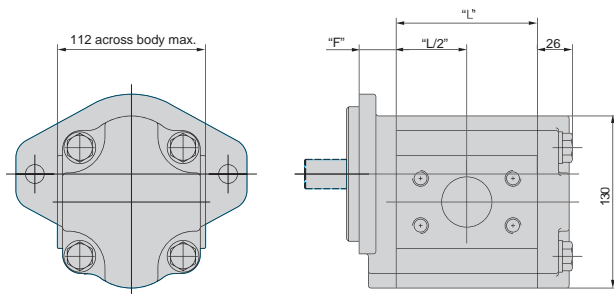
PGP/PGM 517 Specifications

Description	Code	0140	0160	0190	0230	0250	0280	0330	0360	0380	0440	0520
Displacements	cm ³ /rev	14	16	19	23	25	28	33	36	38	44	52
	in ³ /rev	0.85	0.98	1.16	1.40	1.53	1.71	2.01	2.20	2.32	2.68	3.17
Continuous Pressure	bar	250	250	250	250	250	250	250	250	250	220	200
	psi	3625	3625	3625	3625	3625	3625	3625	3625	3625	3190	2900
Intermittent Pressure	bar	275	275	275	275	275	275	275	275	255	220	215
	psi	3988	3988	3988	3988	3988	3988	3988	3988	3698	3190	3118
Minimum Speed @Max. Outlet Pressure	rpm	500	500	500	500	500	500	500	500	500	500	500
Maximum Speed @ 0 Inlet & Max. Outlet Pressure	rpm	3400	3400	3300	3300	3100	3100	3100	3000	3000	2800	2600
Pump Input Power @ Max. Pressure and 1500 rpm	kW	9.6	11	13.1	15.8	17.2	19.3	22.7	24.6	26.1	27	28.6
	HP	12.87	14.75	17.57	21.19	23.07	25.88	30.44	32.99	35.00	36.21	38.35
Dimension "L"	mm	68.3	70.3	73.3	77.4	79.4	82.4	87.5	90.5	92.5	98.6	106.7
	in	2.69	2.77	2.89	3.05	3.13	3.24	3.44	3.56	3.64	3.88	4.20
Approximate Weight *	kg	7.92	8	8.12	8.29	8.37	8.5	8.7	8.83	8.91	9.16	9.49
	LB	17.50	17.68	17.95	18.32	18.50	18.79	19.23	19.51	19.69	20.24	20.97

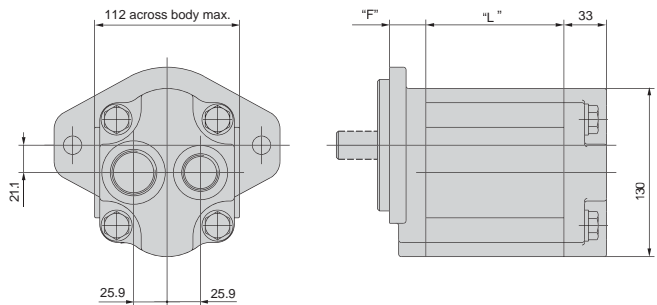
*Single pump with Shaft End Cover H3 and non ported Port End Cover.

PGP/PGM 517 Dimensions

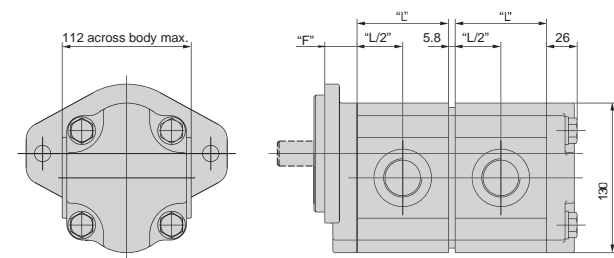
Single Unit PGP/PGM 517



Single Unit PGP/PGM 517 with rear ports



Tandem Unit PGP/PGM 517



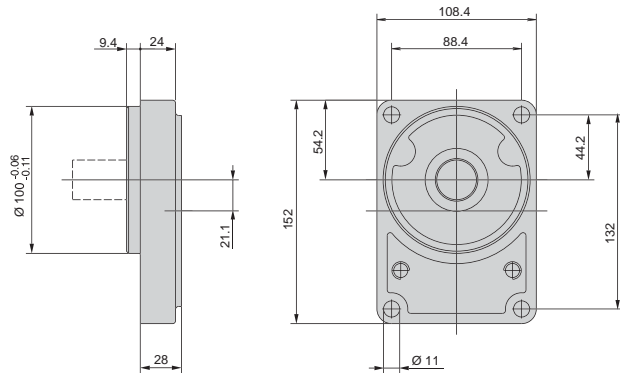
NOTE:

Dimension "F" see shaft end covers on page 21
Dimension "L" see table above

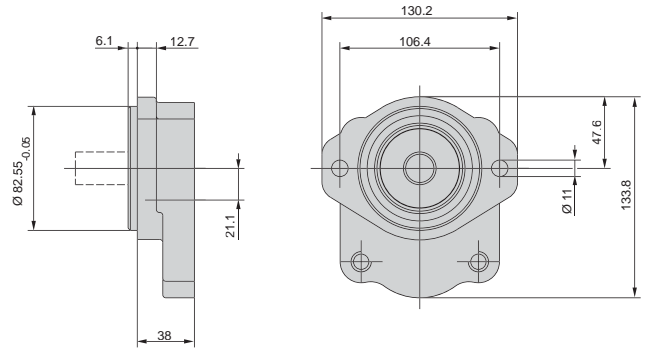
- Notes: 1. Dimensions are in millimeters.
2. Dimensions are nominal except where noted.
3. Subscript and/or superscript numbers are tolerances.
4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 517 Shaft End Covers

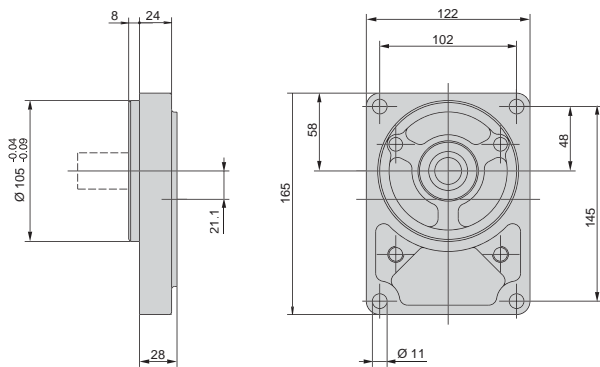
Code D5



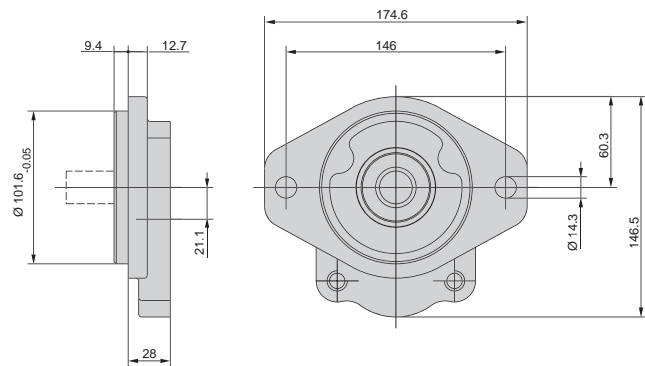
Code H2/L2



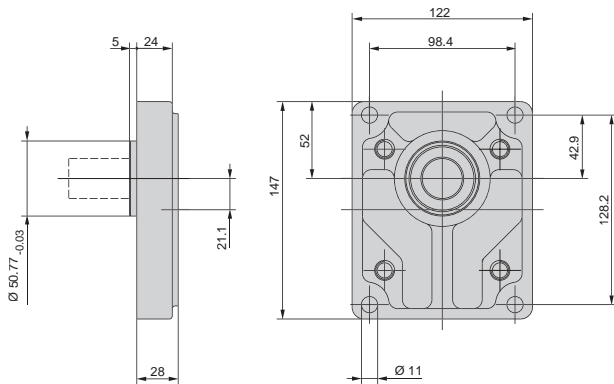
Code D6



Code H3



Code D7



- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

Heavy-Duty Aluminum Pumps and Motors

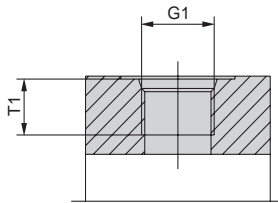
PGP/PGM 500 Series

PGP/PGM 517 Porting

Code D

SAE straight thread

See table below for specific port dimensions.



PGP/PGM 517

Code	G1	T1
Thread	Dimensions	
D2	9/16"-18 UNF	12.7
D3	3/4"-16 UNF	14.3
D4	7/8"-14 UNF	16.7
D5	1 1/16"-12 UN	19.0
D6	1 5/16"-12 UN	19.0
D7	1 5/8"-12 UN	19.0
D8	1 7/8"-12 UN	19.0

Code N

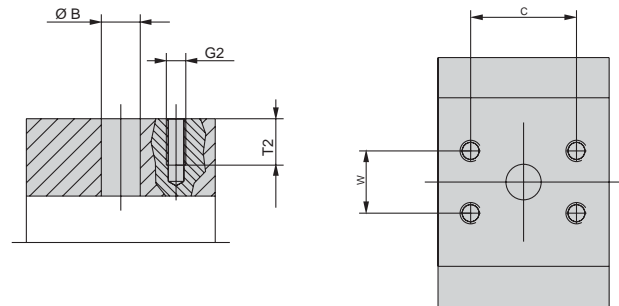
SAE split flange

See table below for specific port dimensions.

Code P

SAE split flange metric thread

See table below for specific port dimensions.



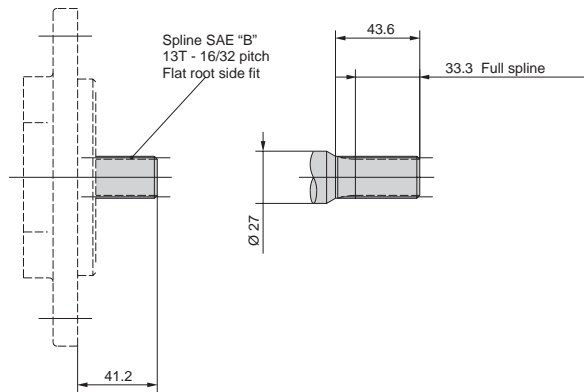
PGP/PGM 517

Code	G2 Thread	Ø B	C	W	T2
N1	5/16"-18 UNC	12.7	38.10	17.48	15.0
N2	3/8"-16 UNC	19.0	47.63	22.23	14.0
N3	3/8"-16 UNC	25.4	52.37	26.19	20.6
N4	7/16"-14 UNC	31.8	58.72	30.17	20.6
N5	1/2"-13 UNC	38.1	69.82	35.71	20.6
P1	M 8x1.25	12.7	38.10	17.48	15.0
P2	M 10x1.50	19.0	47.63	22.23	20.6
P3	M 10x1.50	25.4	52.37	26.19	21.4
P4	M 10x1.50	31.8	58.72	30.17	20.6
P5	M 12x1.75	38.1	69.82	35.71	20.6

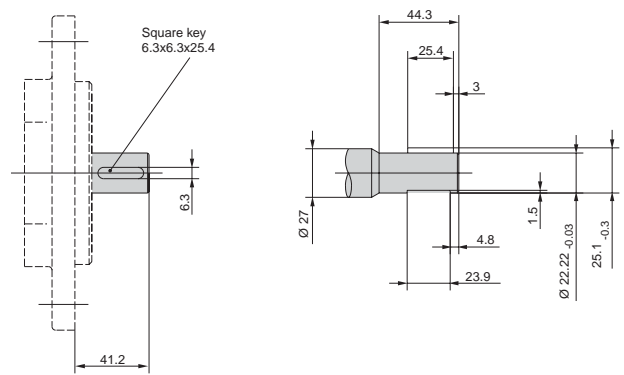
- Notes: 1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 517 Drive Shaft

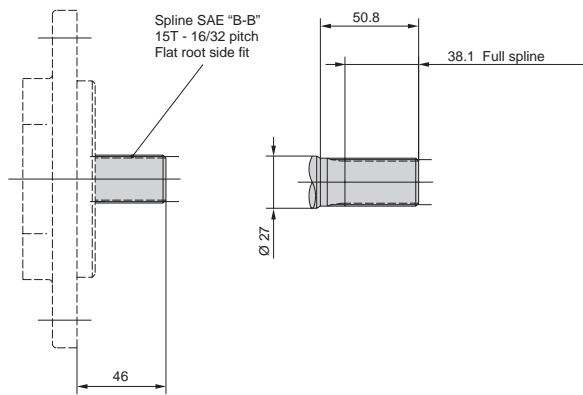
Code D1



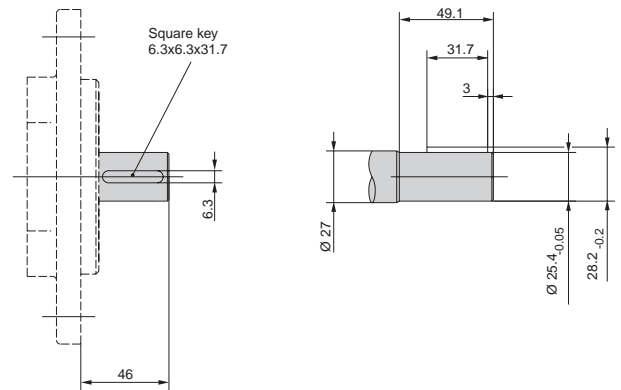
Code M1



Code E1



Code M2



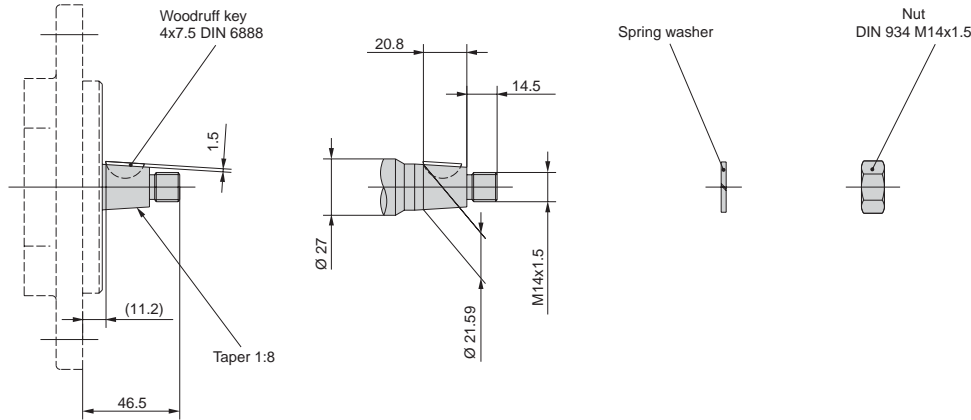
- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

PGP/PGM 517 Drive Shaft

Code T1



- Notes:
1. Dimensions are in millimeters.
 2. Dimensions are nominal except where noted.
 3. Subscript and/or superscript numbers are tolerances.
 4. To convert from millimeters to inches, divide millimeters by 25.4.

PGP/PGM 517 - Shaft Load Capacity

Code	Description	Style	Torque Rating
D1	13T, 16/32 Pitch, 41.2L, SAE "B"	Spline	345Nm/3046in-lb
E1	15T, 16/32 Pitch, 46L, SAE "B-B"	Spline	530Nm/4680in-lb
M1	Ø 22.2, 6.3 Key, no thread, 41.2L, SAE "B"	Parallel	251Nm/2216in-lb
M2	Ø 25.4, 6.3 Key, no thread, 46L, SAE "B-B"	Parallel	395Nm/3488in-lb
T1	Ø 21.59, 46.5L, 4.0 Key, M14x1.5	1:8 Taper	250Nm/2207in-lb
	Tandem pump Connecting Shaft	Spline	228Nm/2013in-lb

When applying a multiple section pump, the maximum drive shaft load is determined by adding the torque values for each pumping section that will be simultaneously loaded.

$$\text{Torque [in-lb]} = \frac{\text{Displacement [in}^3\text{/rev]} \times \text{Pressure [psi]}}{5.72} \quad \text{Torque [Nm]} = \frac{\text{Displacement [cc/rev]} \times \text{Pressure [bar]}}{57.2}$$

Heavy-Duty Aluminum Pumps and Motors

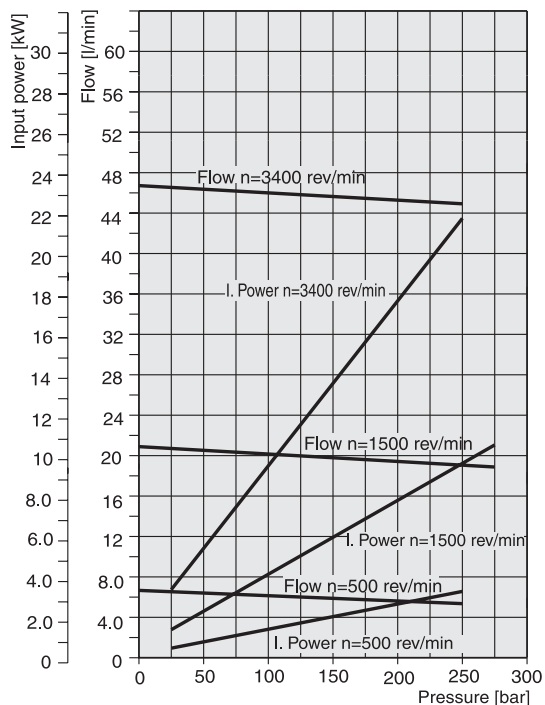
PGP/PGM 500 Series

PGP/PGM 517- 14.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

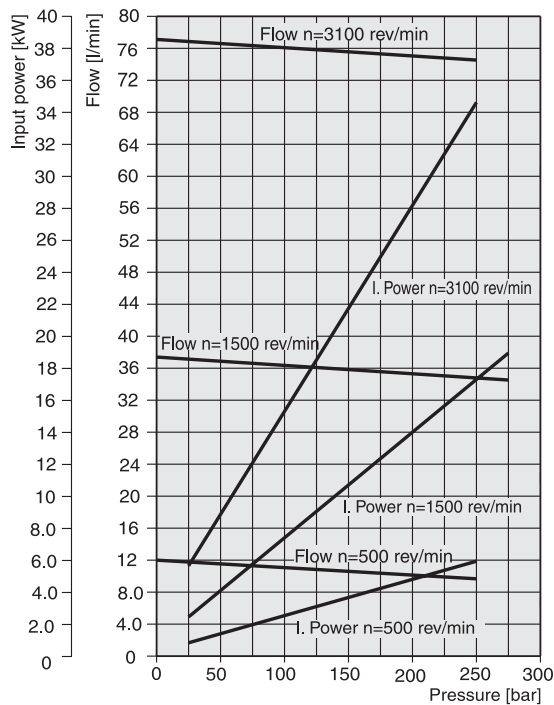


PGP/PGM 517 -25.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

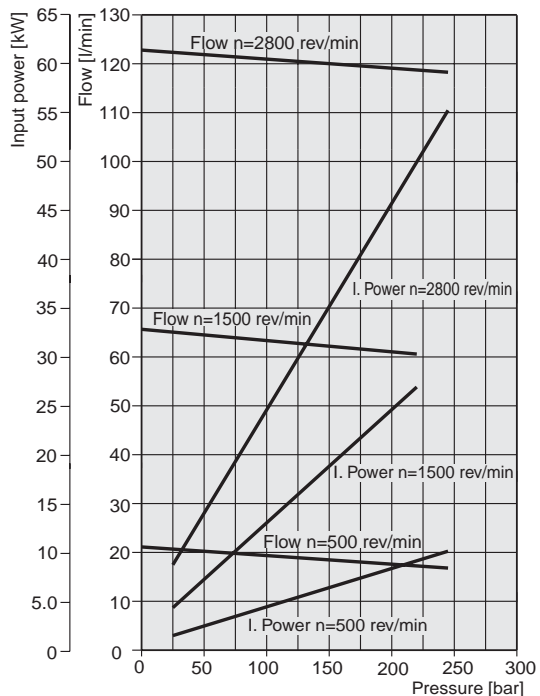


PGP/PGM 517 - 44.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

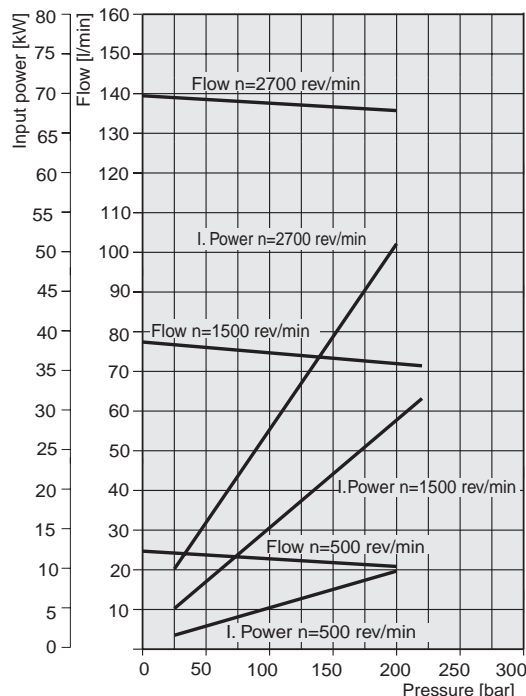


PGP/PGM 517- 52.0 CC

Fluid Temperature = $45 \pm 2^\circ\text{C}$

Viscosity = $36\text{mm}^2/\text{s}$

Inlet Pressure = $0.9 + 0.1$ bar absolute

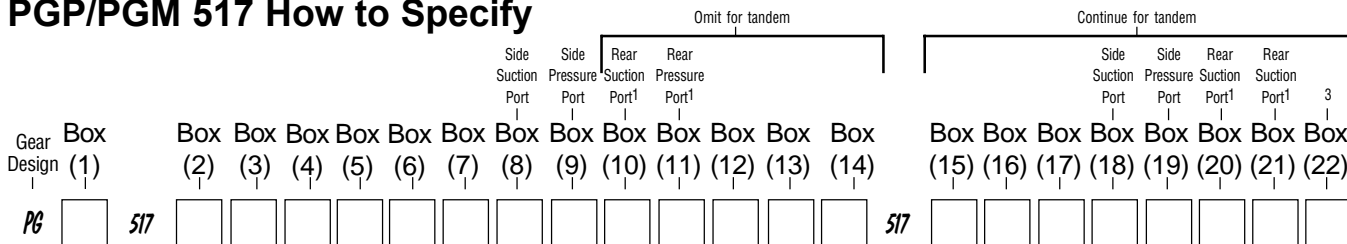


Performance data shown is based upon a series of laboratory tests and is not representative of any one unit.

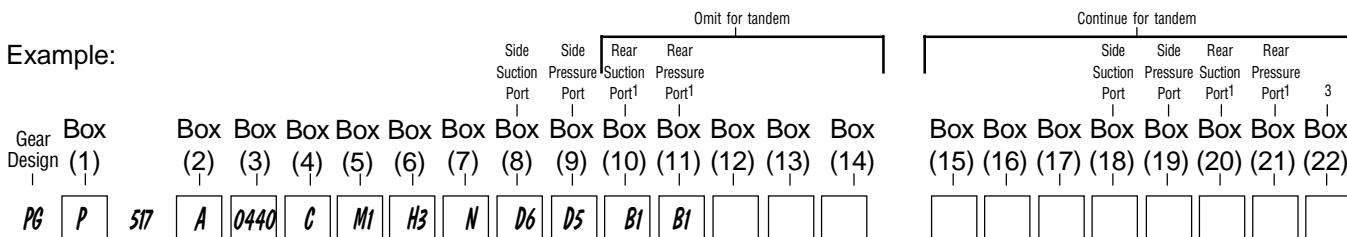
Heavy-Duty Aluminum Pumps and Motors

PGP/PGM 500 Series

PGP/PGM 517 How to Specify



Example:



Box 1 Pump/Motor	
P	Pump
M	Motor
F	Flow divider

Boxes 2,15 Unit		
	Pump	Motor
A	Single unit	Standard Motor w/o checks
B	Multiple unit	Standard Motor w/ two checks
C	—	Standard Motor w/one anti cavitation check (ACC)
M	Single distributor unit	—
N	Multiple distributor unit	—

Boxes 3,16 Displacement	
0140	14 ccm
0160	16 ccm
0190	19 ccm
0230	23 ccm
0250	25 ccm
0280	28 ccm
0330	33 ccm
0360	36 ccm
0380	38 ccm
0440	44 ccm
0520	52 ccm

Box 4 Rotation	
C	Clockwise
A	Counter clockwise
B	Bi-directional

Box 5 Shaft	
D1	13T, 16/32 Pitch, 41.2L, SAE "B" spline
E1	15T, 16/32 Pitch, 46L, SAE "B-B" spline
M1	Ø22.2, 6.3 Key, no thread, 41.2L, SAE "B", parallel
M2	Ø25.4, 6.3 Key, no thread, 46L, SAE "B-B", parallel
T1	Ø21.59, 11.2L, 4.0 Key, M14x1.5, taper 1:8

Box 6 Shaft End Covers	
D5	88.4x132.0 - Ø99.94 rectangular
D6	102.0x145.0 - Ø104.96 rectangular
D7	98.4x128.2 - Ø50.77 rectangular
H2	106.4 - Ø82.55 SAE "A" 2bolt flange
H3	146.1 - Ø101.6 SAE "B" 2bolt flange

Boxes 7,17 Shaft Seal	
X	No seal
N	NBR
V	FPM, FKM
M	Double NBR
W	Double FPM

NOTES:

- 1 Only coded for the last section.
- 2 Only for motors
- 3 For further "B" triple unit repeat displacement, shaft seal between sections, side suction port, side pressure port, rear suction port, rear pressure port.

Boxes 8,9,10,11,18,19,20,21 Port Options	
B1	No ports
D3	3/4" - 16 UNF thread
D4	7/8" - 14 UNF thread
D5	1 1/16" - 12UN thread
D6*	1 5/16" - 12 UN thread
D7*	1 5/8" - 12 UN thread
D8*	1 7/8" - 12 UN thread
N1*	1/2", 5/16" - 18UNC SAE Split Flange
N2*	3/4", 3/8" - 6UNC SAE Split Flange
N3*	1", 3/8" - UNC SAE Split Flange
N4*	1 1/4"-7/16", 14UNC SAE Split Flange
N5*	1 1/2"-7/16", 13UNC SAE Split Flange
P1*	12.7mm - M8 Metric Split Flange
P2*	19.0mm - M10 Metric Split Flange
P3*	25.4mm - M10 Metric Split Flange
P4*	31.8mm - M10 Metric Split Flange
P5*	38.1mm - M12 Metric Split Flange

*Not usable for rear ports

Box 12 Motor Drain Option ²	
B1	No drain
C	9/16-18 UNF thread
P	M12x1.5 metric thread

Box 13 Drain Position ²	
2	Drain on bottom
3	Drain on top
4	Rear drain

Box 14 Section Connection	
S	Separate inlets
C	Common inlets

Integral Valve Options and Market Experience

This appendix provides overviews of the valves currently offered as well as options that are available from the wide range of Parker gear pumps and motors. Many valves are already in production for OEM customers on specific pumps or motors, while others have been supplied for prototype evaluation. A few valves are derivatives of valves already in production and can be produced for OEM customers. Parker's integral valve program was developed in response

to requests from our OEM customers to reduce the number and total cost of components on their machines. We addressed this challenge by integrating the valves required for machine functions into our hydraulic pumps and motors. This integration has reduced the number of purchased components, eliminated many of the hydraulic hoses and associated fittings (and potential leak points), and reduced assembly labor costs on the production line.

Applications:	Implement Pumps (Single)	Implement Pumps (Tandem)	Triple and Quad Pumps	Two Stage Pumps	Power Steering Pumps	Power Steering/Fan Drive Pumps	Fan Drive Pumps	Direct Acting Relief Valves	Pilot Operated Relief Valves	Load Sensing Relief Valves	Solenoid Unloading Relief Valves	Unloaders for Tandem Pumps	Priority Flow Dividers	Load Sense Priority Valves	Single Accumulator Charge Pumps	Dual Accumulator Charge Pumps	Single Accumulator Charge Valves	Dual Accumulator Charge Valves	Load Sense Charge Valves	Modulating Brake Valves	Hydraulic Motors	Motors with Integral Relief Valves	Motors with Cross Port Relief Valves	Motors with Integral By-Pass Valves	Steering & Accumulator Charge Valve (STAC)	Custom Valve Manifolds	Brake Valve	Check Valve & Restrictor
Materials Handling																												
Electric Lift Trucks	•	•		•				•	•				•	•	•		•									•		
I.C. Powered Lift Trucks	•	•		•					•	•			•	•												•		
Rough Terrain Lift Trucks	•	•		•						•			•	•	•	•	•	•	•	•						•		
Turf Care and Grasscutting																												
Reel Commercial Mowers	•	•	•	•	•	•	•	•	•		•		•	•								•	•	•		•		•
Rotary Commercial Mowers	•	•	•	•	•	•	•	•	•		•		•	•								•	•	•		•		•
Heavy Duty Industrial Mowers	•	•	•	•	•	•	•	•	•		•		•	•							•	•	•	•		•	•	•
Construction Equipment																												
Road Construction	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wheel Loaders		•		•	•	•	•	•	•			•	•	•	•	•	•	•	•	•					•	•		
Backhoe-Loaders		•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•					•	•		
Cranes and Winches	•	•	•	•	•	•	•	•	•		•		•	•							•	•	•	•		•	•	
Haul Trucks			•	•	•									•	•	•	•	•	•	•	•	•	•			•		
Truck, Bus & Rec. Vehicles				•	•	•	•	•					•	•							•	•	•	•		•		
Municipal, Street Sweepers	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

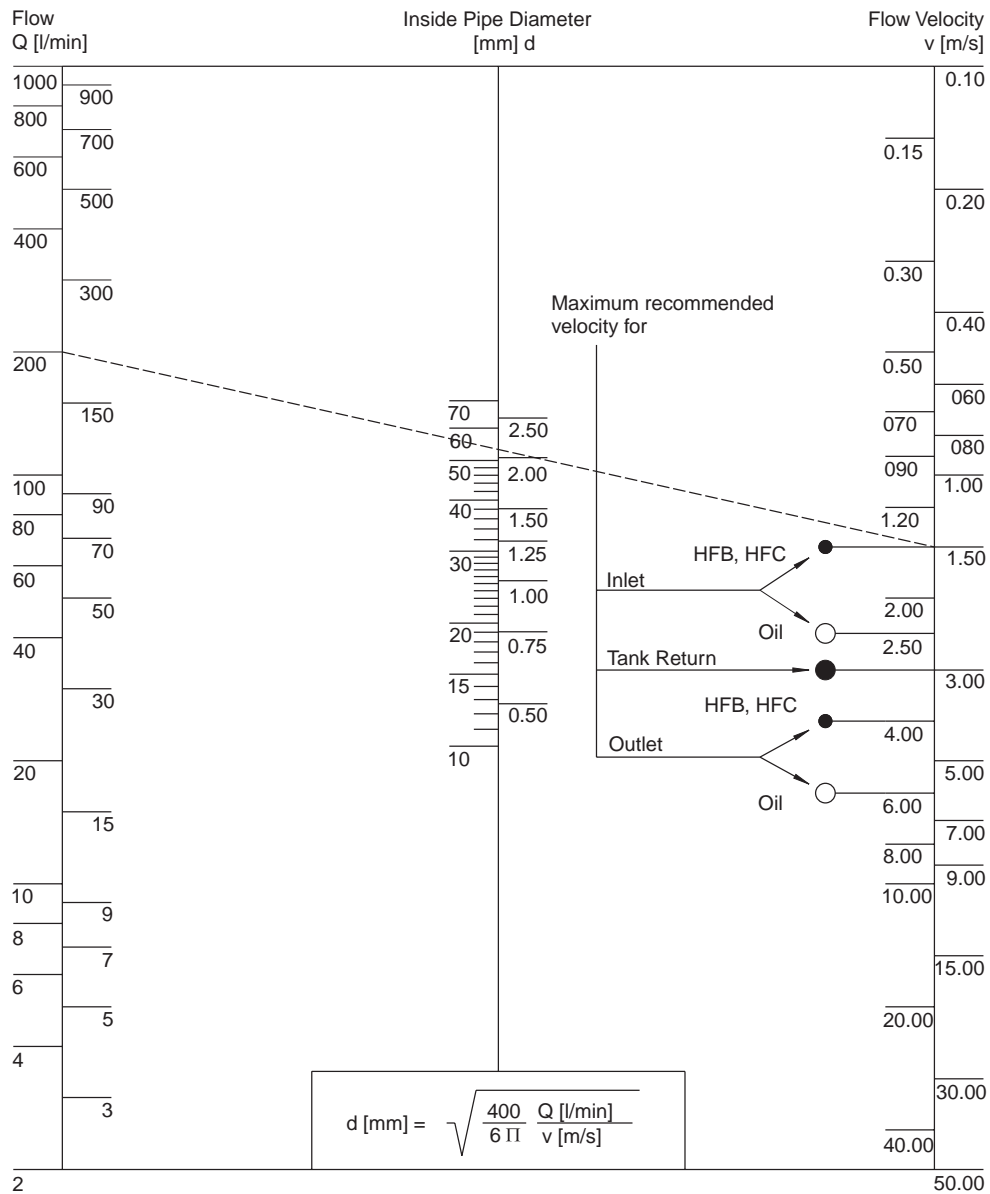
Heavy-Duty Aluminum Pumps and Motors

PGP 500 Series

List of available pump combinations - PGP 505, PGP 511 and PGP 517

First pump	Second pump		
	PGP 505	PGP 511	PGP 517
PGP 505	X		
PGP 511		X	
PGP 517	X	X	X

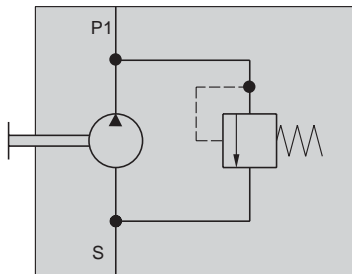
Nomograph for Pipe Velocity



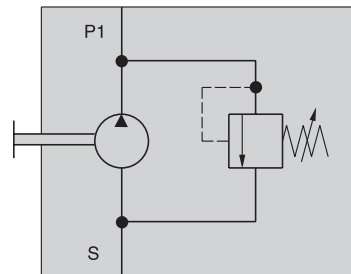
Integral Valve Options - PGP 505, PGP 511 and PGP 517

VALVE TYPE	PGP		
	505	511	517
Pressure Relief Valve	X	X	X
Load Sensing Pressure Relief Valve		X	X
Solenoid Unloading Pressure Relief Valve		X	X
Pressure Unloading Relief Valve (Port Mounted)		X	X
Solenoid Unloading Relief Valve (Port Mounted)		X	X
Priority Flow Divider		X	X
Priority Flow Divider (Port Mounted)		X	X
Load Sensing Priority Valve		X	X
Load Sensing Priority Valve (Port Mounted)		X	X
Two - Stage Pump	X	X	X
Single Accumulator Charge Valve		X	
Dual Accumulator Charge Valve		X	
Steering and Accumulator Charge Valve (STAC)			

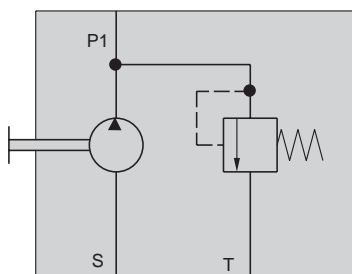
Pressure Relief Valve - PGP 505, PGP 511 and PGP 517



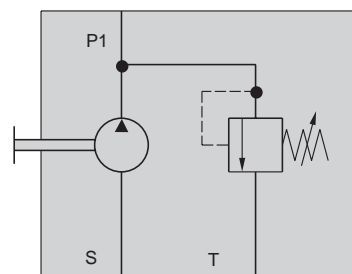
non adjustable, internal vent



adjustable, internal vent



non adjustable, external tank port



adjustable, external tank port

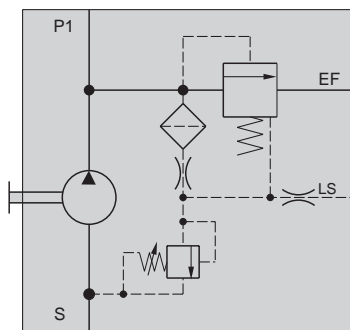
Variations: PGP 505, PGP 511 and PGP 517

- Non adjustable, internal vent
- Non adjustable, external tank port
- Adjustable, internal vent
- Adjustable, external tank port

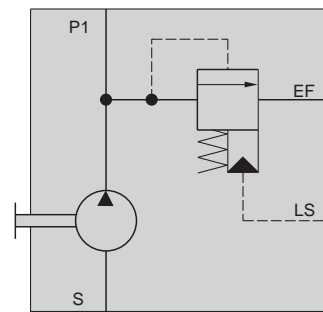
Heavy-Duty Aluminum Pumps and Motors

PGP 500 Series

Load-Sense Pressure-Relief Valve - PGP 511 and PGP 517



Detailed Symbol

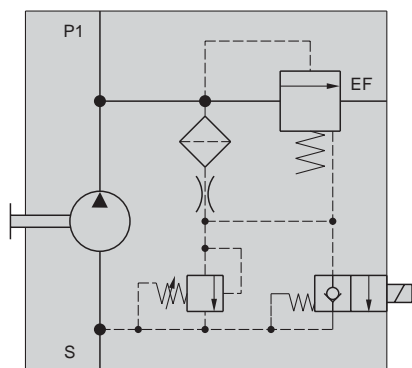


Simplified Symbol

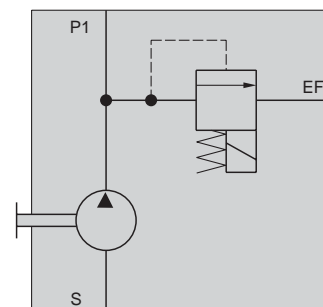
Variations:	PGP 511	
	Integral with pump	70 l/min
	With solenoid unloading	
	PGP 517	
	Integral with pump,	100 l/min
	With solenoid unloading	
Press. Range:	Stand-by pressure setting	5 bar
	Max. setting	250 bar
Max. Flow:	PGP 511	70 l/min
	PGP 517	100 l/min

Comments:
The Load-Sense feature allows the gear pump and integral valve to be used with load-sense directional valves. This feature also allows remote adjustment of the pump pressure up to the limit set by the internal pilot relief. Conversion to the pilot-operated relief valve is achieved by plugging the Load-Sense (LS) port. The pump body requires an outlet port. This pump and valve assembly can also be used with a small, external, direct-acting relief valve for remote pressure control of the pump.

Solenoid Unloading Pressure Relief Valve - PGP 511 and PGP 517



Normally closed (N/C)



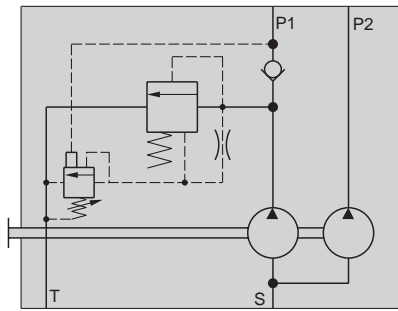
Simplified Symbol

Detailed Symbol  Normally opened (N/O)

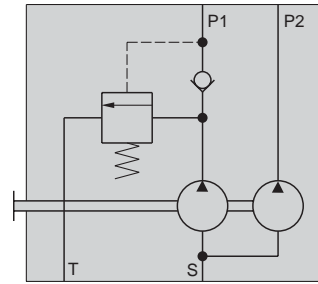
Variations:	PGP 511 and PGP 517	
	Specify voltage and whether N/O or NC	
Press. Range:	Stand-by pressure setting	5 bar
	Max. setting	250 bar
Max. Flow:	PGP 511	70 l/min
	PGP 517	100 l/min

Comments:
This valve utilizes the same casting, main spool and pilot relief as the Load-Sense, Pressure-Relief Valve. A small, solenoid-operated, cartridge valve vents the internal pilot flow to the pump inlet to unload the main spool. The outlet port is in the pump body and the excess flow (EF) is connected to the reservoir via the heat exchanger and/or the return-line filter.

Unloading Relief Valve, Pressure-Operated - PGP 511 and PGP 517



Detailed Symbol



Simplified Symbol

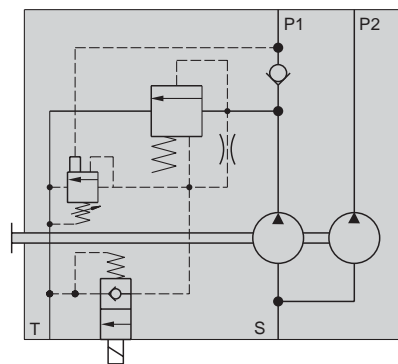
Variations: **PGP 511 and PGP 517**
Port mounted, integral with pump

Press. Range: Stand-by pressure setting 5 bar
Max. setting 250 bar
Min setting 55 bar

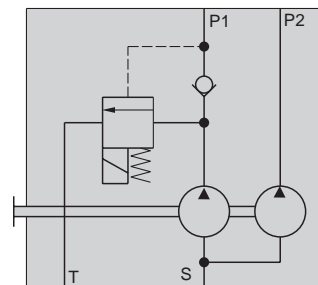
Max. Flow: 80 l/min

Comments:
This valve permits pressure unloading of the first section in the tandem. The valve may also be remote mounted for use with tandem or dual pumps. The flow from port P1 is typically combined with the flow from port P2. This valve is often used on construction machinery, such as backhoe loaders, wheel loaders and cranes. Its purpose is to provide high flow (from both sections of the tandem) at low or medium pressures and high pressure with reduced flow (from the rear section only). This allows maximum productivity of the machine in relation to the power available to the pump.

Unloading Relief Valve, Solenoid-Operated - PGP 511 and PGP 517



Detailed Symbol



Simplified Symbol

Variations: **PGP 511 and PGP 517**
Port mounted, integral with pump

Press. Range: Stand-by pressure setting 5 bar
Max. setting 250 bar
Min setting 55 bar

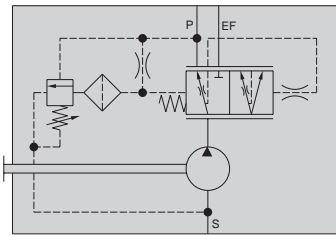
Max. Flow: 80 l/min

Comments:
This valve permits pressure or solenoid unloading of the first section in a tandem. The valve may also be remote mounted for use with tandem or dual pumps. The flow from port P1 is typically combined with the flow from port P2. This valve is often used on construction machinery, such as backhoe loaders, wheel loaders and cranes. Its purpose is to provide high flow (from both sections of the tandem) at low or medium pressures and high pressure with reduced flow (from the rear section only). This allows maximum productivity of the machine in relation to the power available to the pump.

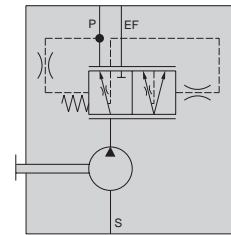
Heavy-Duty Aluminum Pumps and Motors

PGP 500 Series

Priority Flow Divider - PGP511 and PGP517



With Pilot Priority Relief Valve



Without Priority Relief Valve

Variations: **PGP 511 and PGP 517 Rear Mounted Versions:**
 Without priority relief; With full flow priority relief (not shown) With pilot priority relief valve

PGP 511 and PGP 517

Port Mounted Version:

Without priority relief

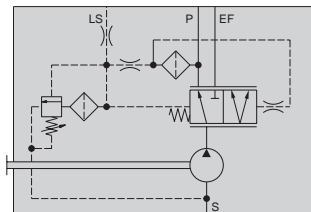
Press. Range: Priority Port Min. setting 35 bar
 Priority Port Max. setting 210 bar
 Extended Flow Max. equal to max. rating of pump

Max. Flow: **Valve for PGP 511 & Port Mounted Version**
 Priority Flow Max. 32 l/min
 Extended Flow Max. 70 l/min
 Max. input flow 70 l/min
PGP 517 Valve
 Priority Flow Max. 45 l/min
 Extended Flow Max. 100 l/min
 Max. input flow 100 l/min

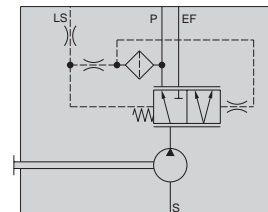
Comments:

The Priority Flow Divider provides constant and specified flow for power steering or other priority functions. The balance of flow produced by the pump is available from the excess flow (EF) port for additional functions, such as open-center, directional-control valves, fan drives, etc.

Load-Sense Priority Valve - PGP 511 and PGP 517



With Priority Relief Valve and for Dynamic LS Signal



Without Priority Relief Valve and for Dynamic LS Signal

Variations: **PGP511 and PGP517 Rear Mounted Versions:**
 Without relief, static LS signal;
 With pilot relief, dynamic LS signal
 Without relief, dynamic LS signal;
 With pilot relief, dynamic LS signal

PGP 511 and PGP 517

Port Mounted Versions:

Without relief, static LS signal;
 Without relief, dynamic LS signal

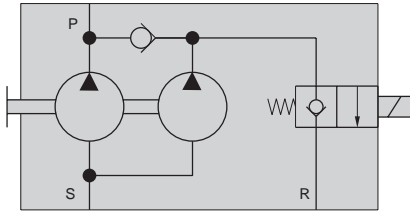
Press. Range: Priority Port Min. setting 35 bar
 Priority Port Max. setting 210 bar
 Extended Flow Max. equal to max. rating of pump

Max. Flow: **PGP 511 Valve & Port Mounted Version**
 Priority Flow Max. 32 l/min
 Extended Flow Max. 70 l/min
 Max. input flow 70 l/min
PGP 517 Valve
 Priority Flow Max. 45 l/min
 Extended Flow Max. 100 l/min
 Max. input flow 100 l/min

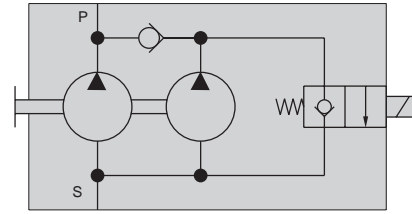
Comments:

The Load-Sense Priority Valve provides priority flow on demand, typically for load-sense power steering. The balance of the flow produced by the pump is available from the excess flow (EF) port for additional functions, such as open-center directional-control valves, fan drives, etc. When the power steering is idle, full pump flow is available for these functions. The selection of the pilot relief and the static or dynamic signal is dependent on the characteristics of the steering unit.

Two - Stage Pump - PGP 505, PGP 511 and PGP 517



With External Tank Port (recommended)



With Internal Vent to Pump Inlet

Variations: **PGP 505, PGP 511 and PGP 517**
 With internal vent to inlet
 With external tank port
 Note: Specify solenoid voltage

Press. Range: To application requirements

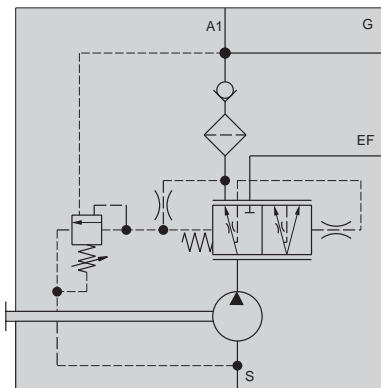
Rated Flow: A variety of solenoid valves are available. Selection of valve size and flow rate is in accord with application requirements.

Comments:

The Parker Two-Stage or High-Low Pump is a tandem unit with equal or dissimilar displacements. A two-position/two-way valve in the rear cover allows for rear pump unloading. This pump is applied when the prime mover (engine or electric motor) has limited power. When high pressure is required, the rear section is unloaded to the pump inlet or the tank. When high flow is required at low or medium pressure, the flow of both sections is combined at the outlet port P. In both cases, the displacements and pressure selected are to be within the power limits of the prime mover.

Note: When the internal vent to the inlet is selected, caution is suggested to prevent extended periods of operation in the unloaded position. The heat generated may lower the fluid viscosity below the minimums required for the pump, which could possibly damage it.

Single Accumulator Charge Valve - PGP 511



Variations: **PGP 511**
 Integral with pump 70 l/min

Press. Range: A1, G Ports Min. setting 35 bar
 A1, G Ports Max. setting 210 bar
 Extended Flow Max. equal to max. rating of pump

Max. Flow: **PGP 511 Valve**
 Charge Flow Max. 32 l/min
 Extended Flow Max. 70 l/min
 Max. Input Flow 70 l/min

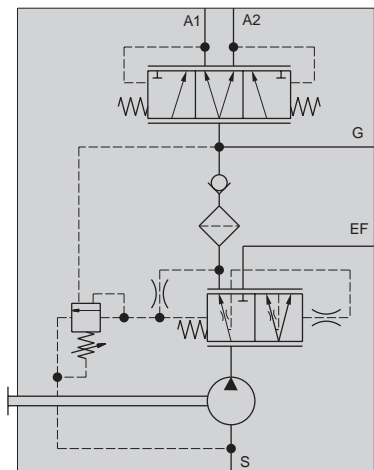
Comments:

The Single Accumulator Charge Valve (SACV) provides priority flow to charge the accumulator for vehicle brakes or any application, which requires stored hydraulic energy. The SACV has an integral, differential, pilot-relief valve to provide a wide variety of cut-in/cut-out pressure ratios. Typical ratios are 80%, 70%, 60% and 50%. Custom ratios are available for OEM applications as are a variety of port locations and sizes. The balance of the pump flow at the excess flow (EF) port is available for an open-circuit, directional-control valve, a fan drive, or other ancillary functions.

Heavy-Duty Aluminum Pumps and Motors

PGP 500 Series

Dual Accumulator Charge Valve - PGP 511



Variations: PGP 511 Integral with pump 70 l/min

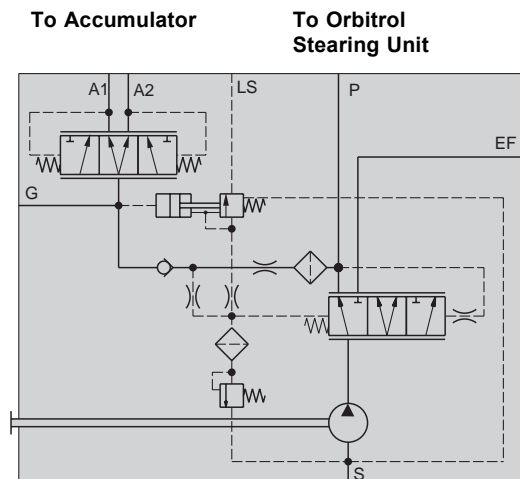
Press. Range: A1, A2, G Ports Min. setting 35 bar
 A1, A2 G Ports Max. setting 210 bar
 Extended Flow Max. equal to max. rating of pump

Max. Flow: PGP 511 Valve
 Charge Flow Max. 32 l/min
 Extended Flow Max. 70 l/min
 Max. Input Flow 70 l/min

Comments:

The Dual Accumulator Charge Valve provides priority flow to charge two accumulators for dual-circuit vehicle brakes or for any application, which requires stored hydraulic energy. This valve has an integral, differential, pilot-relief valve to provide a wide variety of cut-in/cut-out pressure ratios. Typical ratios are 80%, 70%, 60% and 50%. Custom ratios are available for OEM applications. An inverse shuttle spool isolates the two circuits so that pressure and oil volume are maintained in one circuit, should the other experience a break in the hydraulic line. A variety of port locations and sizes are available.

Steering & Accumulator Charge (STAC) Valve



Variations: Stand Alone (Line-mounted)
 Single or dual accumulator charge circuit
 (Dual circuit schematic shown)

Press. Range: A1, A2, Port Min. setting 35 bar
 A1, A2, Port Max. setting 210 bar
 Priority Port Max. setting 210 bar
 Extended Flow Max. equal to max. rating of pump
 Steering stand-by pressure up to 20 bar

Rated Flows: Total Charge Flow up to 60 l/min
 depending on stand-by pressure
 Priority Port 45 l/min
 Extended Flow Max. 100 l/min
 Max. Input Flow 100 l/min

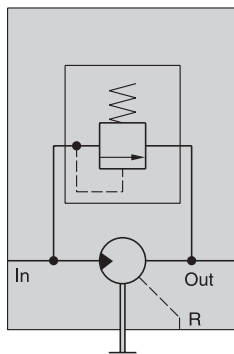
Comments:

The combined LS Priority Valve and Accumulator Charge Valve provide equal priority flow to the load-sense power steering and to charge one or more accumulators for the hydraulic vehicle brakes. Excess pump flow is available from the EF port for the implement hydraulics, fan drives or other services. The accumulator charge function has a differential, pilot-relief valve to provide a wide variety of cut-in/cut-out pressure ratios. Typical ratios are 80%, 70%, 60% and 50%. Custom ratios are available for OEM applications. Steering relief pressure (at port P) must be equal to or greater than maximum charge cut-out pressure. Valve is available with inverse shuttle for dual-circuit braking systems (above schematic) or without inverse shuttle for single-braking systems.

Motors - PGM 505, PGM 511 and PGM 517

Valve type	PGM		
	505	511	517
Single Pressure-Relief Valve	X	X	X
Single Pressure-Relief Valve with Anti-Cavitation		X	X
Cross Port-Pressure Relief Valve		X	
Cross Port-Pressure Relief Valve with Anti-Cavitation		X	
Solenoid Unloading Pressure-Relief Valve for Motors		X	
Brake Valve		X	
Check Valve and Restrictor		X	

Single Pressure-Relief Valve - PGM 505 and PGM 517



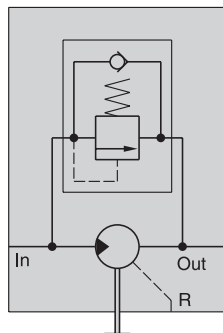
Variations: **PGM 505 and PGM 511 with Integral**
 With internal or external drain
 Adjustable and non adjustable

Press. Range: Min. setting 25 bar
 Max. setting 250 bar

Comments:

This integral relief valve protects the motor from over-pressurization. It can also be used in series with the main system relief valve to limit the pressure differential and output torque of the motor.

Single Pressure-Relief Valve with Anti-Cavitation - PGM 511 and PGM 517



Variations: **PGM 511**
 Non adjustable, with reverse flow check
 With internal or external drain

PGM 517
 Adjustable, with reverse flow check
 With internal or external drain

Press. Range: Min. setting 25 bar
 Max. setting 250 bar

Applications: Compressor drives, fan drives, mower blade drives and water pump drives

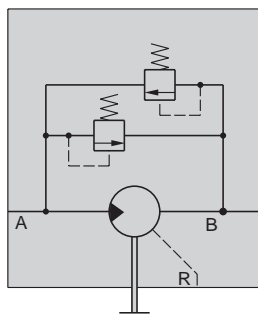
Comments:

This integral relief valve protects the motor from over-pressurization. It can also be used in series with the main system relief valve to limit the pressure differential and output torque of the motor. The check valve allows the motor and driven load to "spool down" when the fluid supply is shut off or reduced, due to engine speed fluctuations. In series operation, the check valve permits the motor to come to a controlled stop, if the outlet flow is suddenly blocked. This check valve reduces the risk of damaging the motor or blowing a hydraulic line. Motors fitted with this valve are available with side or rear-facing ports.

Heavy-Duty Aluminum Pumps and Motors

PGP 500 Series

Cross-Port Pressure-Relief Valve - PGM 511



Variations: PGM 511

Adjustable with shims
With internal or external drain

Press. Range: Max. setting 250 bar

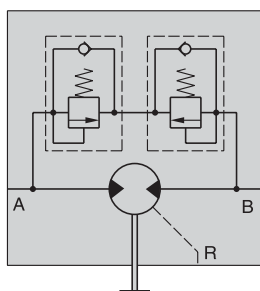
Max. Flow: 30 l/min

Applications: Mower reel drives and all low-medium power reversible drives

Comments:

This valve provides integral, cross-port relief to protect the motor from over-pressurization and to limit torque in both directions of rotation. It can also be used in series with other motors downstream, when using an external drain case. By adding or removing shims it is possible to limit change to the factory-set pressure. In order to minimize overall length of the unit, side ports are standard.

Cross-Port Pressure-Relief Valve with Anti-Cavitation - PGM 511



Variations: PGM 511

Non adjustable, with reverse flow check
With internal or external drain

Press. Range: Min setting 25 bar

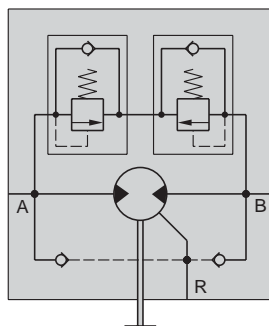
Max. setting 250 bar

Applications: Mower blade drives, water pump drives and reversible hydrostatic transmissions

Comments:

Motors fitted with this relief valve may be applied in series or in a hydrostatic transmission. The relief valve provides a limit to the pressure differential and the output torque. The check valves allow flow to return to the inlet of the motor to prevent cavitation. It is available with side, rear, or a combination of side and rear ports.

Cross-Port Pressure-Relief Valve with Anti-Cavitation - PGM 511



Variations: PGM 511

Non adjustable, with reverse flow check
With internal or external drain

Press. Range: Min setting 25 bar

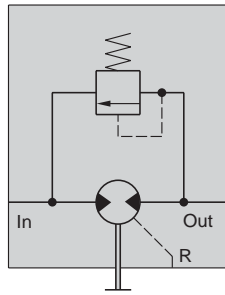
Max. setting 250 bar

Applications: Mower blade drives, water pump drives, reversible hydrostatic transmissions, vibration drives on vibratory rollers and winches

Comments:

This motor has a cross-port relief valve and anti-cavitation check valves in the case drain passages. Motors with this configuration are suitable for open-circuit applications with closed-center valves and hydrostatic transmissions. When the motor and load are limited by the relief valve, the anti-cavitation checks allow internal leakage to be returned to the inlet side of the motor. For winches, make-up flow at low pressure is introduced into the case.

Brake Valve - PGM 511



Variations: **PGM 511**
Adjustable with shims
With internal or external drain

Press. Range: Max. setting 250 bar

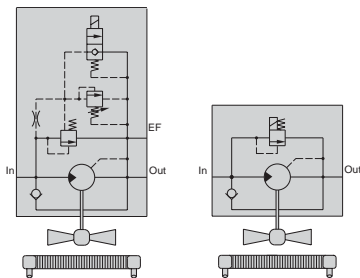
Max. Flow: 30 l/min

Applications: Mower blade drives, winch drives, and blower drives

Comments:

Parker motors are available with brake valves to provide controlled braking of the motor and load. The pressure setting of the valve and the stored energy in the load will jointly determine the time to stop the motor. Brake valves must be used with the appropriate, directional-control valves, which are usually closed-center valves rather than motor spools.

Solenoid Unloading Pressure-Relief Valve for Motors - PGM 511



Variations: **PGM 511**
With internal return for single motor operation
With tank port for series motor operation
Specify solenoid voltage, whether N/O or N/C

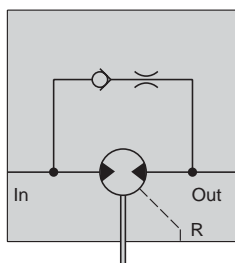
Press. Range: Stand-by pressure differential 5 bar
Max. setting 250 bar

Max. Flow: **PGM 511** 70 l/min

Comments:

A small, solenoid-operated cartridge valve, similar to those used on the PGP511 and PGP517 vents the internal pilot to the motor outlet to unload the main spool. The outlet port is connected to the tank via the filter and the heat exchanger (if installed). The motor control can be set to provide low-speed operation, rather than coming to a full stop. This allows for a quiet fan start from approximately 100 rpm. The solenoid in the valve is available for normally-open or normally-closed operation. The anti-cavitation check valve allows motor spool-down, when the engine is shut down while the fan is running.

Check Valve and Restrictor - PGM 511



Variations: **PGM 511**
Metered flow from motor outlet to inlet

Press. Range: Max. setting 250 bar

Max. Flow: 30 l/min

Applications: Mower blade drives, winch drives, and blower drives

Comments:

The Check Valve and Restrictor are used to control pressure spikes between motors in a series circuit. The check valve allows the motor and driven load to “spool-down” when the fluid supply is shut off or reduced due to engine speed fluctuations. In series operation, the check valve permits the motor to come to a controlled stop, if the outlet flow is suddenly blocked. This check valve reduces the risk of damaging the motor or blowing a hydraulic line. The restrictor permits operation in reverse for cleaning debris or backlapping of the cutters.

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Parker Hannifin Corporation

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