

Gear Pumps / Motors

Series PGP / PGM
Fixed Displacement Pumps,
Cast-Iron and Aluminium Designs

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

Characteristics

PGP 500 pumps offer superior performance, high efficiency and low noise operation at high operating pressures. They are produced in four frame sizes (PGP 502, PGP 505, PGP 511, PGP 517) with displacements ranging from 0.8 to 70 cm³/rev. A wide variety of standard options is available to meet specific application requirements.

Heavy-duty aluminium Pumps and Motors Series PGP, PGM 500



Characteristics

- Up to 280 bar continuous operation**
 High strength materials and large journal diameters provide low bearing loads for high pressure operation.
- Low noise**
 PGP 502 - 9 tooth gear profile, PGP 505 and 517 - 13 tooth gear profile, PGP 511 - 12 tooth gear profile and optimized flow metering provide reduced pressure pulsation and exceptionally quiet operation.

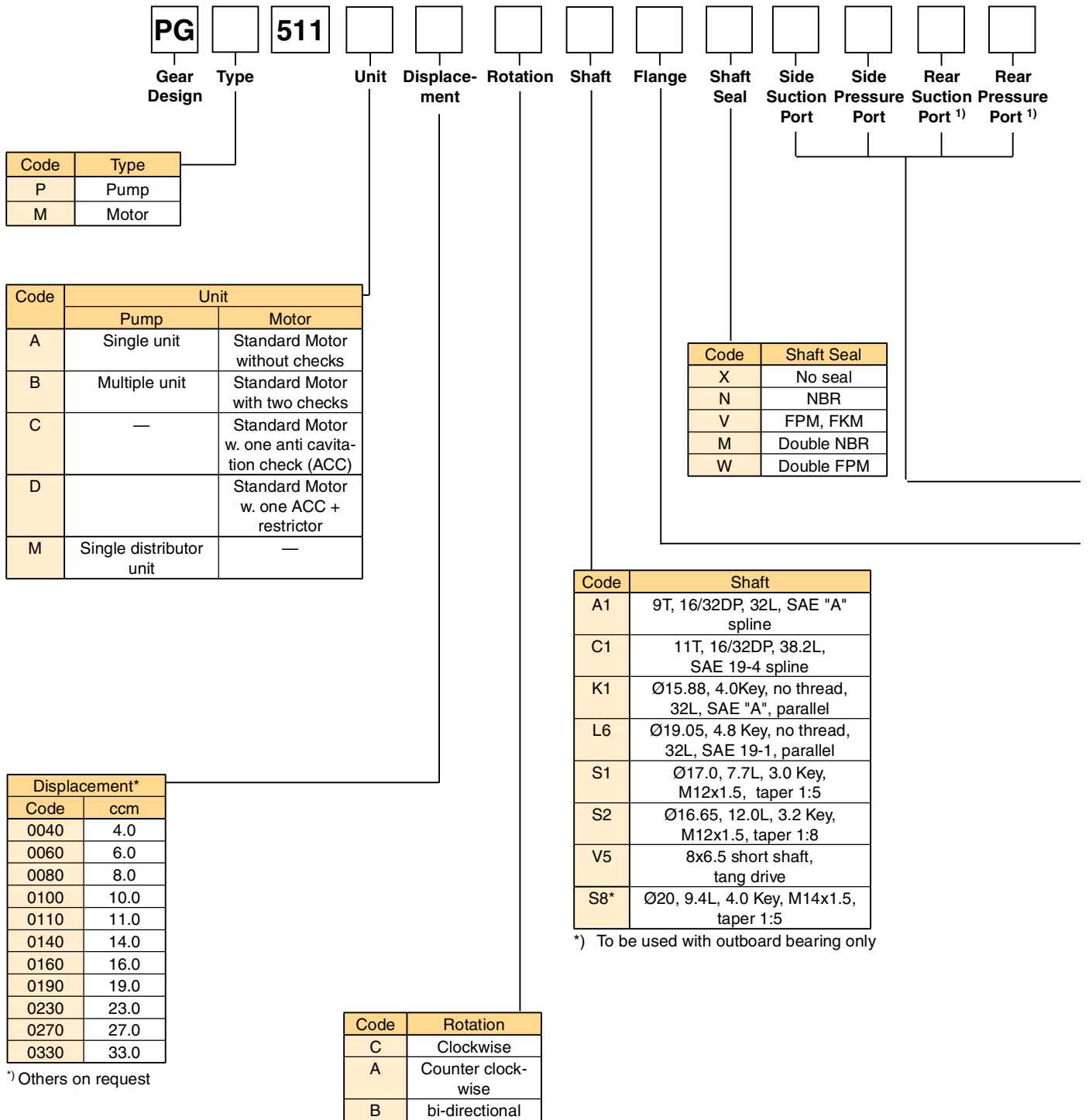
- High efficiency**
 Pressure balanced bearing blocks assure maximum efficiency under all operating conditions.
- Application flexibility**
 International mounts and connections, integrated valve capabilities and common inlet multiple pump configurations provide unmatched design and application versatility.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

Characteristics

Pump type	Heavy-duty, aluminium, external gear.
Mounting	SAE, rectangular, thru-bolt standard specials on request.
Ports	SAE and metric split flanges and others
Shaft style	SAE splined, keyed, tapered, cylindrical tang drive, specials on request
Speed	500 - 5000 rpm, see Technical Data
Theor. displacement	See Technical Data
Drive	Drive direct with flexible coupling is recommended.
Axial / Radial load	Units subject to axial or radial loads must be specified with an outboard bearing.
Inlet pressure	Operating range 0.8 to 2 bar abs. Min. inlet pressure 0.5 bar abs. Short time without load. Consultation is recommended.
Outlet pressure	See Technical Data
Pressure rising rate	Max. 3000 bar/s
Flow velocity	See Nomograph for Pipe Velocity
Hydraulic fluids	Hydraulic oil HLP, DIN 51524-2
Fluid temperature	Range of operating temperature -15 to +80 °C. Max. permissible operating pressure dependent on fluid temperature. Temperature for cold start -20 to -15 °C at speed ≤ 1500 rpm. Max. permissible operating pressure dependent on fluid temperature.

Fluid viscosity	Range of operating viscosity 8 to 1000 mm ² /s (511 & 517) 20 to 1000 mm ² /s (502 & 505) Max. permissible operating pressure dependent on viscosity. Viscosity range for cold start 1000 to 2000 mm ² /s at operating pressure p ≤ 10 bar and speed n ≤ 1500 rpm.
Range of ambient temperature	-40 °C to +70 °C
Filtration	According to ISO 4406 Cl. 19/17/13
Direction of rotation (looking at the drive shaft)	Clockwise, counter-clockwise or double. Attention! Drive pump only in indicated direction of rotation.
Multiple pump assemblies	<ul style="list-style-type: none"> Available in two or three section the limitations shown in the shaft loading rating table in this catalogue. 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: <ul style="list-style-type: none"> Each gear housing has individual inlet and outlet ports. Common inlet configuration: <ul style="list-style-type: none"> Two gear sets share a common inlet.

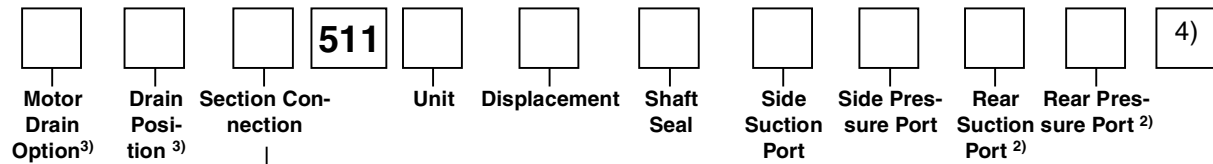
Ordering code



Not all variances of ordering codes can be offered. Please check available part numbers first. For not yet implemented part numbers or special requests please contact Parker Hannifin.

1) Only coded for the last section.

Ordering code



Code	Section Connection
S	Separate inlets
C	Common inlets

Code	Drain Position
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

Code	Motor Drain Option
B1	no drain
A ²⁾	7/16-20 UNF thread
C	9/16-18 UNF thread
G	1/4 BSP thread
N ²⁾	M10x1 metric thread
P ²⁾	M12x1.5 metric thread

2) Non standard, on request only

Code	Flange
D3	71.4x96.0 - Ø36.47 rectangular
D4	72.0x100.0 - Ø80 rectangular
H2	106.4 - Ø82.55 SAE "A" 2 bolt flange
H3	146.1 - Ø101.6 SAE "B" 2 bolt flange
Q1 ²⁾	60.0x60.0 - Ø52.0 w/o seal ,O' thru bolt flange
Q2	60.0x60.0 - Ø50.0 w. seal ,O' thru bolt flange
Q3 ²⁾	60.0x60.0 - Ø52.0 w/o seal ,O' thru bolt flange
Q4	60.0x60.0 - Ø50.0 w. seal ,O', thru bolt flange
F4	72.0x100.0 - Ø80.0 rect., w. OBB and cont. drive shaft

2) Non standard, on request only

Code	Port Options	Code	Port Options
B1	No ports	L1*	13 mm-Ø30 mm-M6 diamond
D2 ²⁾	9/16 - 18 UNF thread	L2*	19 mm-Ø40 mm-M8 diamond
D3 ²⁾	3/4 - 16 UNF thread	N1 ²⁾ *	1/2"-5/16-18UNC SAE Split Flange
D4 ²⁾	7/8 - 14 UNF thread	N2 ²⁾ *	3/4"-3/8-16UNC SAE Split Flange
D5 ²⁾	1 1/16 - 12 UN thread	N3 ²⁾ *	1"-3/8-16UNC SAE Split Flange
D6 ²⁾ *	1 5/16 - 12 UN thread	N4 ²⁾ *	1 1/4"-7/16-14UNC SAE Split Flange
D7 ²⁾ *	1 5/8 - 12 UN thread	P1*	12.7 mm - M8 Metric Split Flange
E2	3/8 - 19 BSP thread	P2*	19.0 mm - M10 Metric Split Flange
E3	1/2 - 12 BSP thread	P3*	25.4 mm - M10 Metric Split Flange
E4*	5/8 - 14 BSP thread	P4*	31.8 mm - M10 Metric Split Flange
E5*	3/4 - 14 BSP thread		
E6*	1 - 11 BSP thread		
E7*	1 1/4 - 11 BSP thread		
G1 ²⁾	M14x1.5 thread		
G3 ²⁾	M18x1.5 thread		
G4 ²⁾	M22x1.5 thread		
G5 ²⁾ *	M26x1.5 thread		
G7 ²⁾ *	M30x1.5 thread		
J3 ²⁾ *	8mm - Ø30mm - M6 square		
J4 ²⁾ *	12mm - Ø30mm - M6 square		
J5*	15mm - Ø40mm - M6 square		
J6 ²⁾ *	15mm - Ø40mm - M8 square		
J7*	20mm - Ø40mm - M6 square		
J8*	18mm - Ø55mm - M8 square		
J9*	26mm - Ø55mm - M8 square		

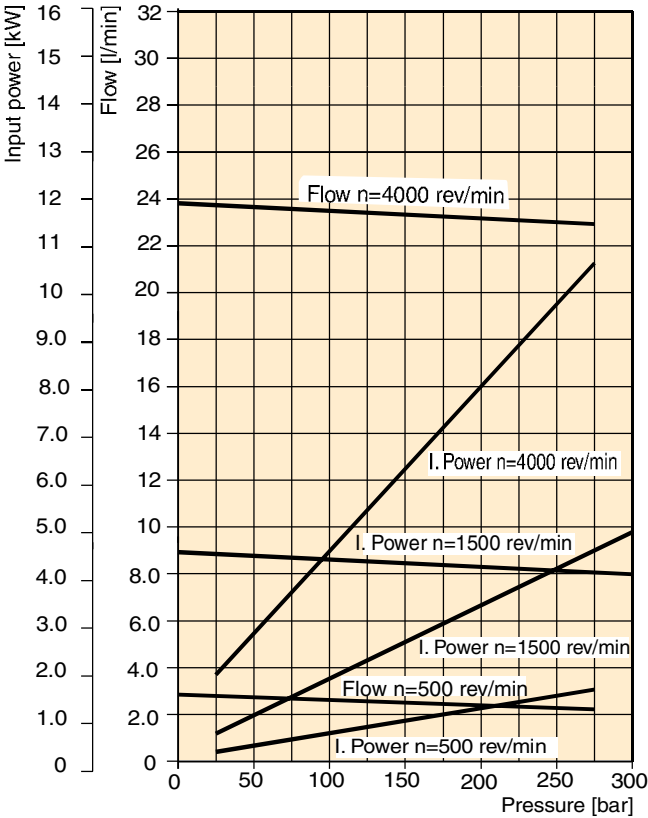
2) Non standard, on request only

*) Not usable for rear ports

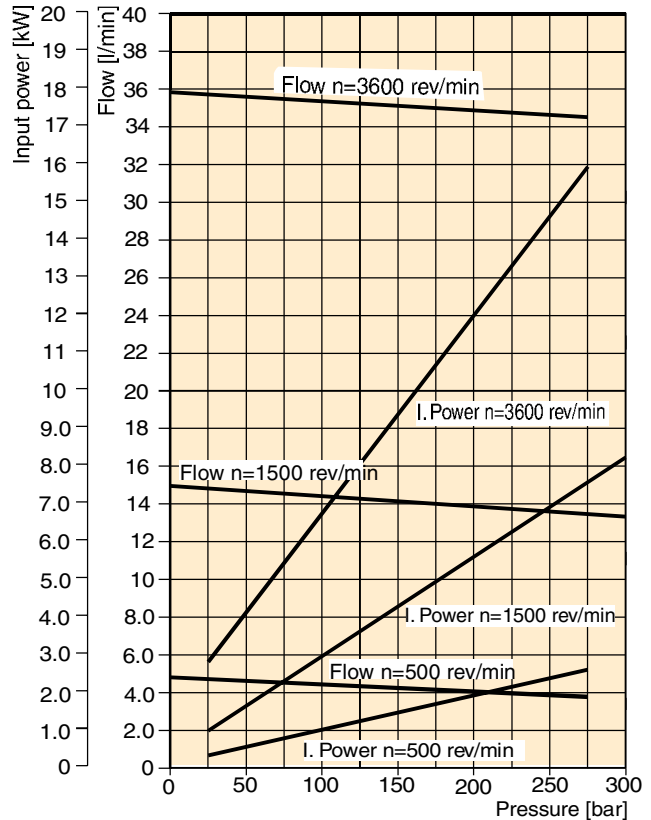
3) Only for motors

4) For further "B" triple unit repeat displacement, shaft seal between sections, side suction port, side pressure port, rear suction port, rear pressure port.

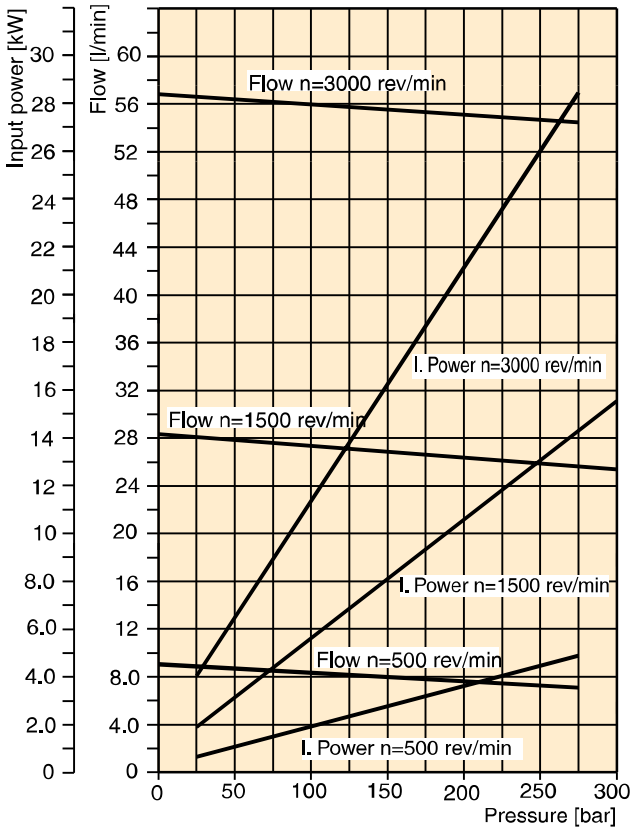
PGP/PGM 511 - 6.0 CC



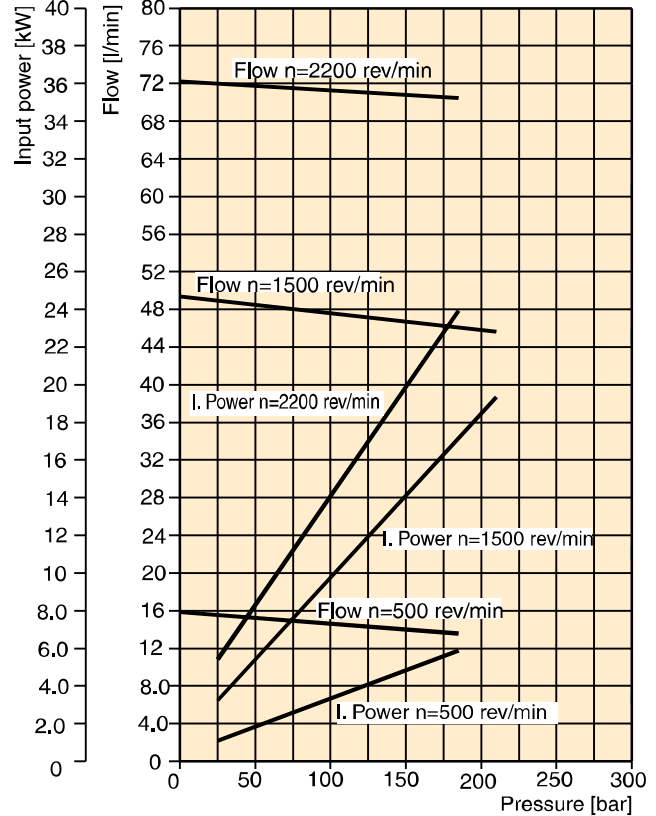
PGP 511 - 10.0 CC



PGP/PGM 511 - 19.0 CC



PGP 511 - 33.0 CC



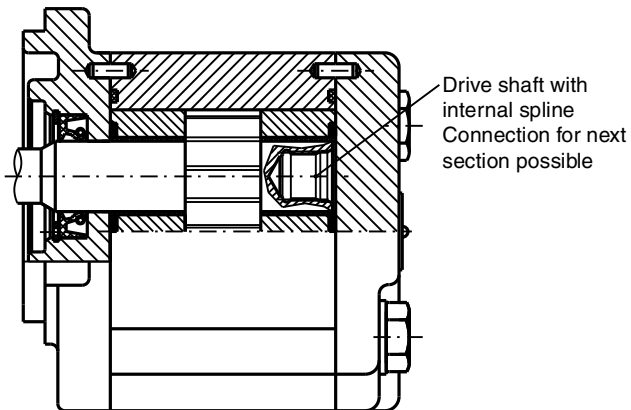
Fluid Temperature = $45 \pm 2^\circ\text{C}$
 Viscosity = $36 \text{ mm}^2/\text{s}$
 Inlet Pressure = $0.9 + 0.1 \text{ bar absolute}$

PGP/PGM 511 Specification - Standard Displacements

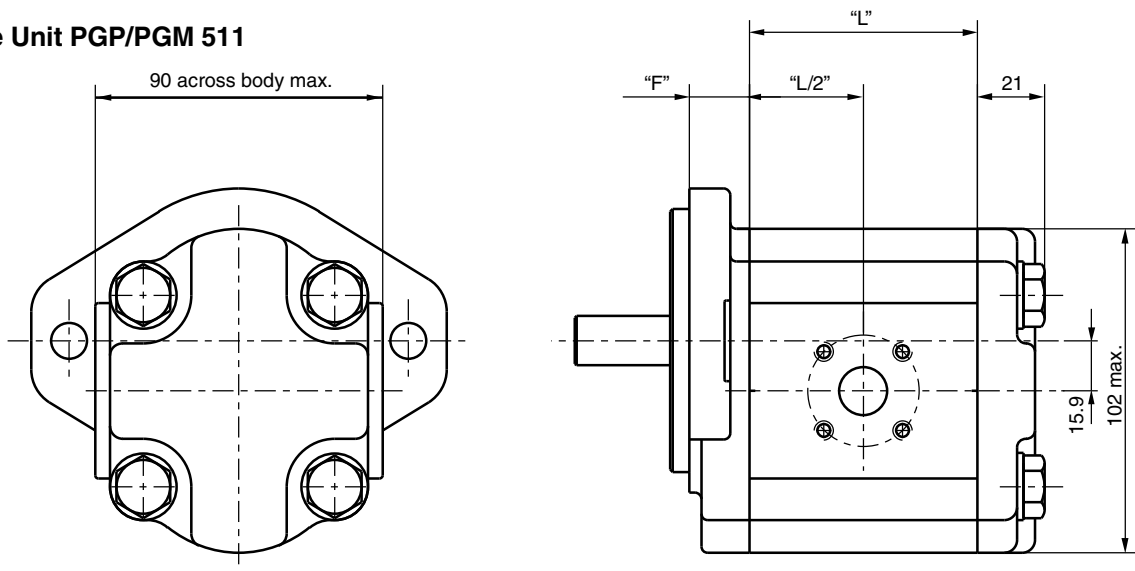
Pump Displacement	Code	0060	0080	0100	0110	0140	0160	0190	0230	0270	033
	cm ³ /rev	6.0	8.0	10.0	11.0	14.0	16.0	19.0	23.0	27.0	33.0
Max. Continuous Pressure	bar	250	250	250	250	250	250	250	225	190	155
Minimum Speed @ 0 Inlet & Max. outlet pressure	rpm	500	500	500	500	500	500	500	500	500	500
Maximum Speed @ 0 Inlet & Max. outlet pressure	rpm	3500	3500	3500	3500	3500	3500	3250	2750	2350	2000
Pump Input Power @ Max. Pressure and 1500 rpm	kW	4.5	6.0	7.5	8.3	10.5	12.0	14.3	14.7	14.9	17.3
Dimension "L"	mm	50.1	53.3	56.5	58.0	62.8	65.9	70.6	76.9	83.2	92.6
Approximate Weight ¹⁾	kg	3.40	3.47	3.55	3.57	3.71	3.79	3.91	4.06	4.21	4.45

¹⁾ Single pump with Flange Q1 and Port end cover B1

Distributor Unit PGP 511



Single Unit PGP/PGM 511

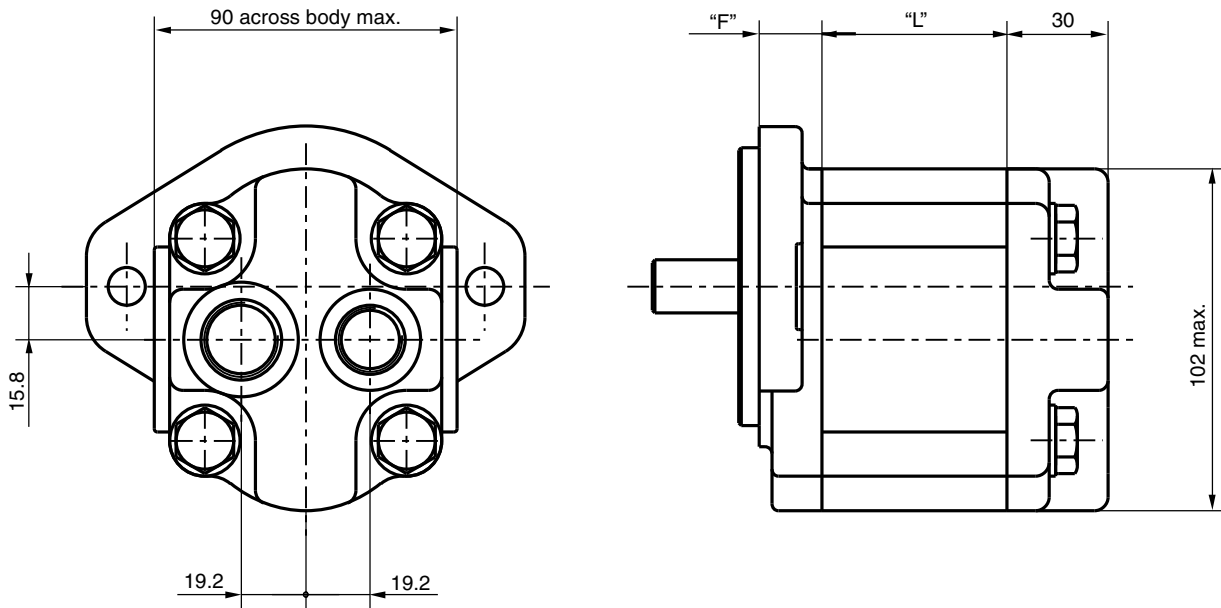


Dimension "L" see table above

Dimension "F" see flanges on pages 31 to 34

Dimension Shafts see pages 38 to 40

Single Unit PGP/PGM 511 with rear ports

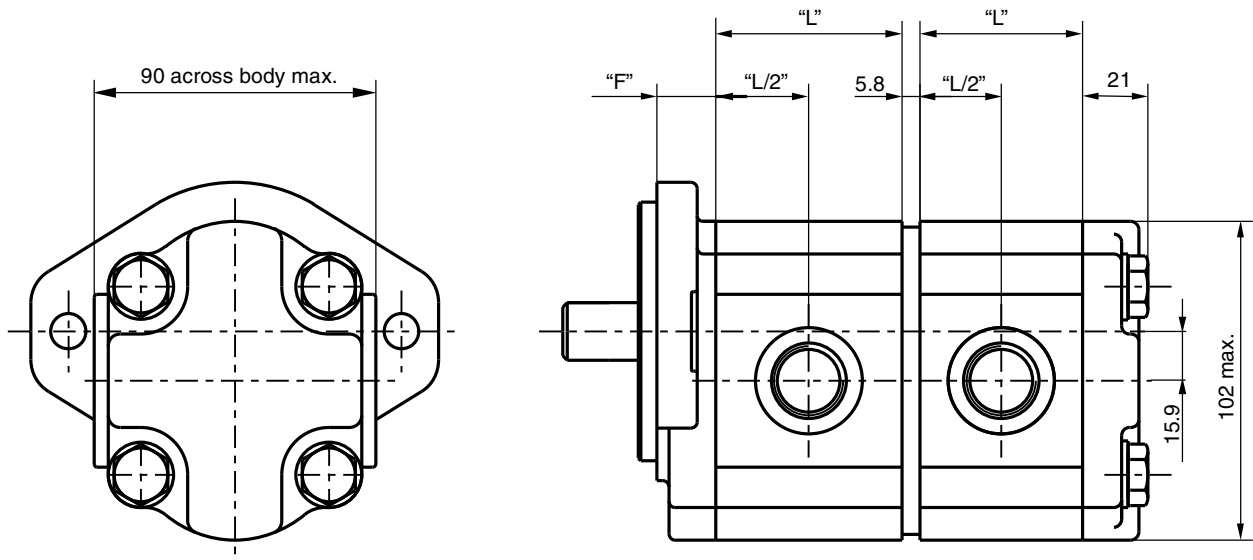


Dimension "L" see table on page 29

Dimension "F" see flanges on pages 31 to 34

Dimension Shafts see pages 38 to 40

Tandem Unit PGP/PGM 511



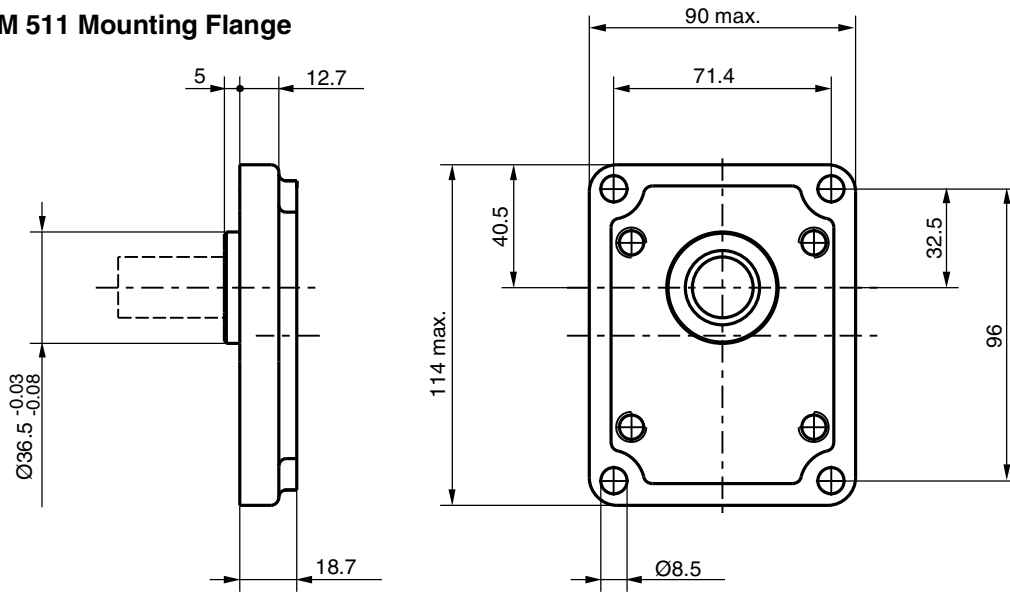
Dimension "L" see table on page 29

Dimension "F" see flanges on pages 31 to 34

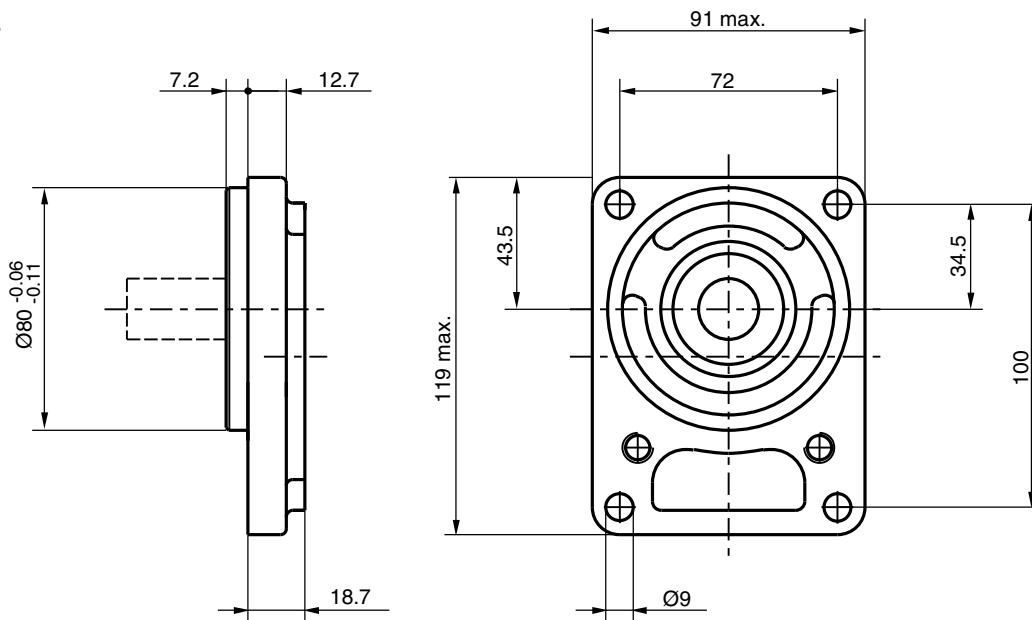
Dimension Shafts see pages 38 to 40

PGP/PGM 511 Mounting Flange

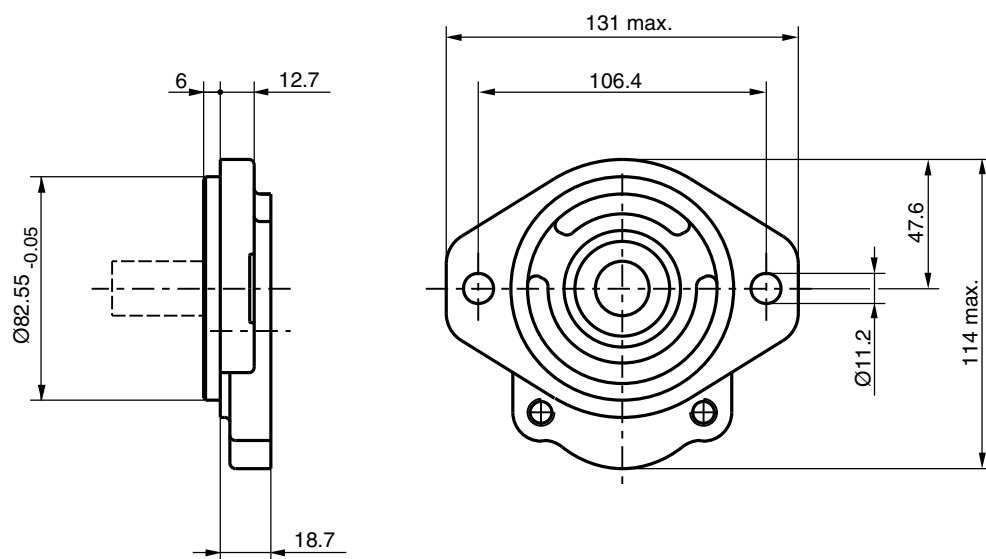
Code D3



Code D4

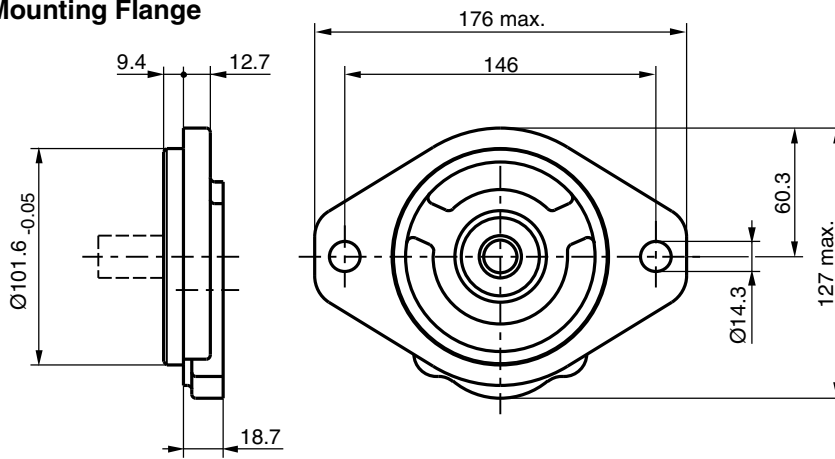


Code H2

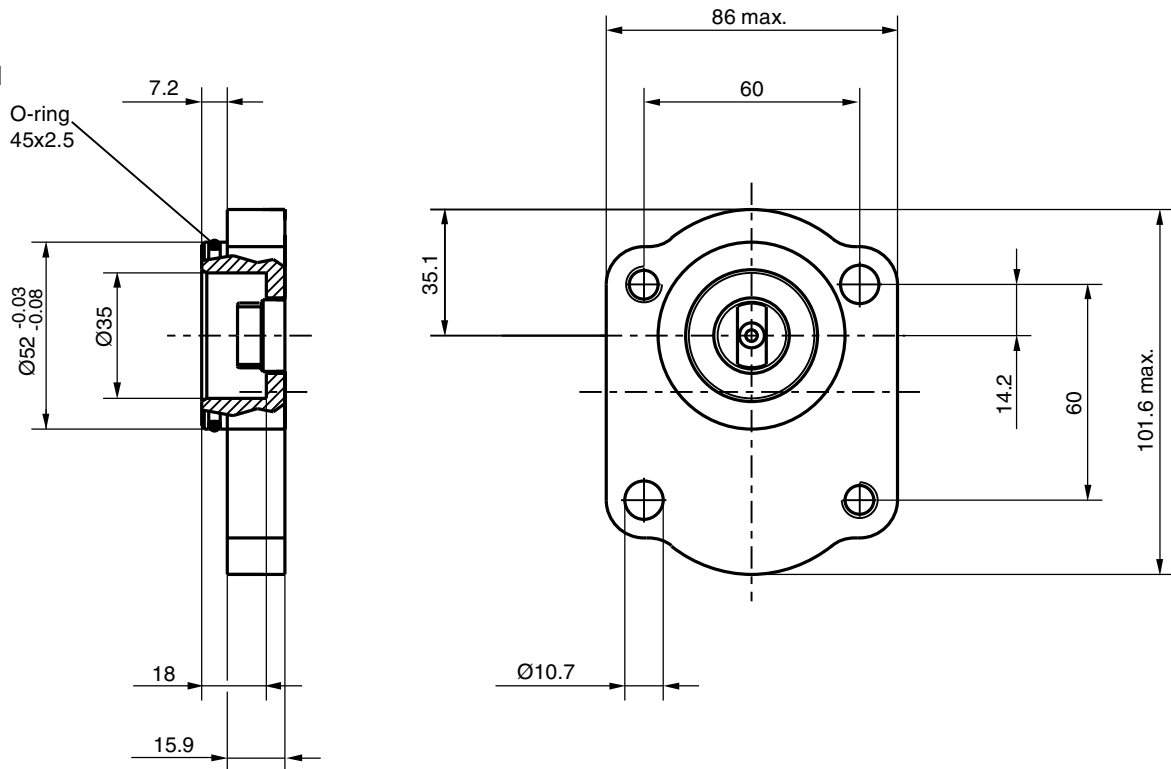


PGP/PGM 511 Mounting Flange

Code H3

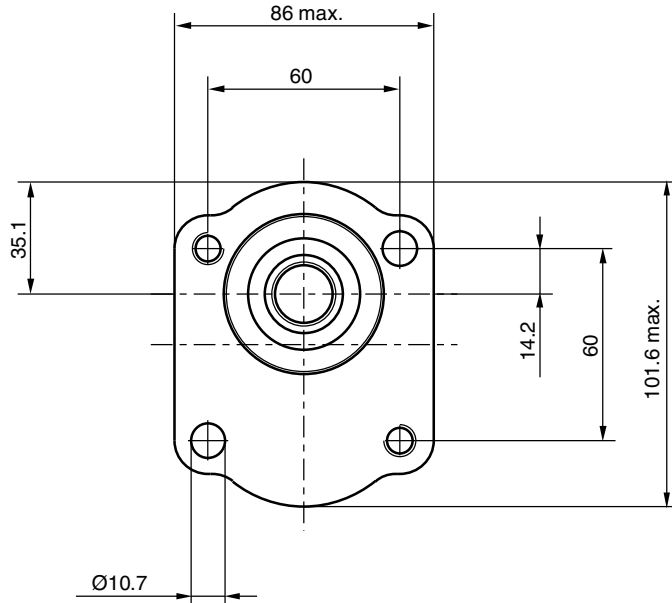
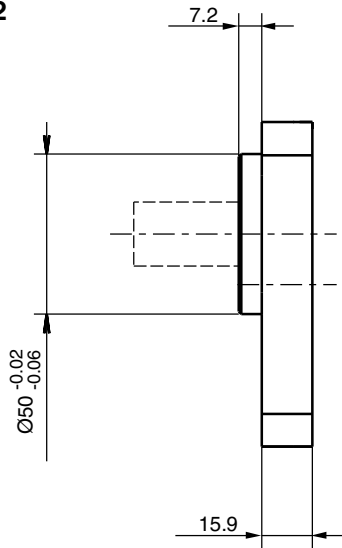


Code Q1

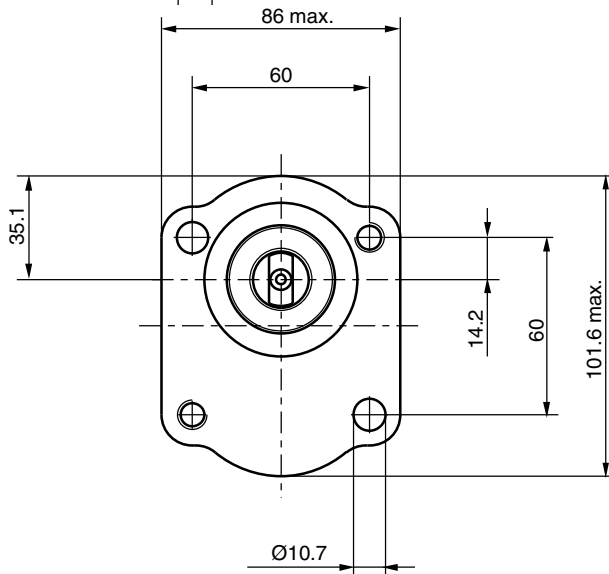
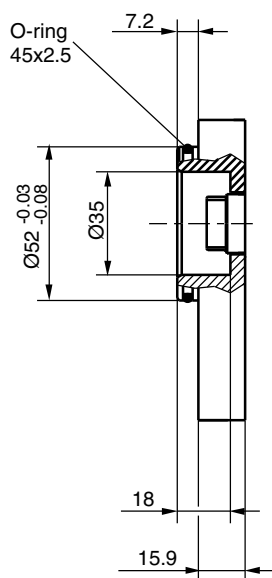


PGP/PGM 511 Mounting Flange

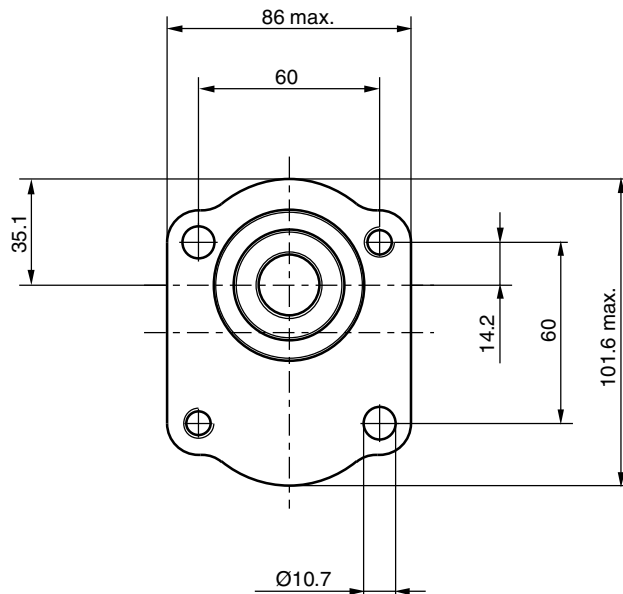
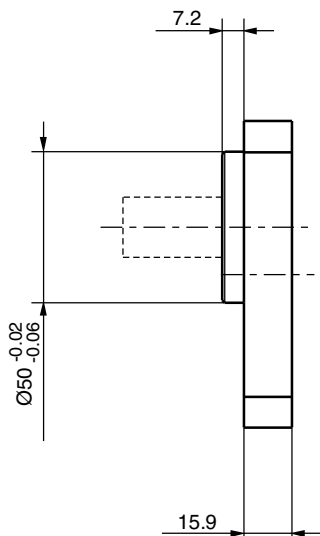
Code Q2



Code Q3

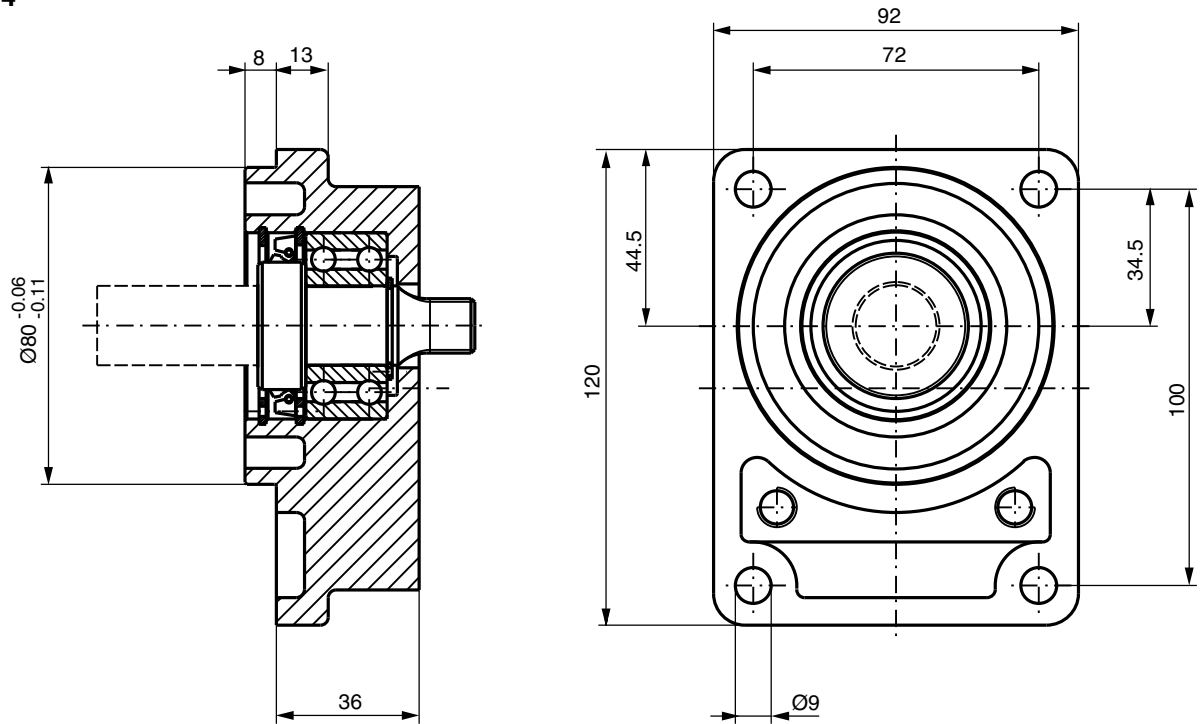


Code Q4



PGP/PGM 511 Mounting Flange

Code F4



Outboard Bearing PGP-PGM 511

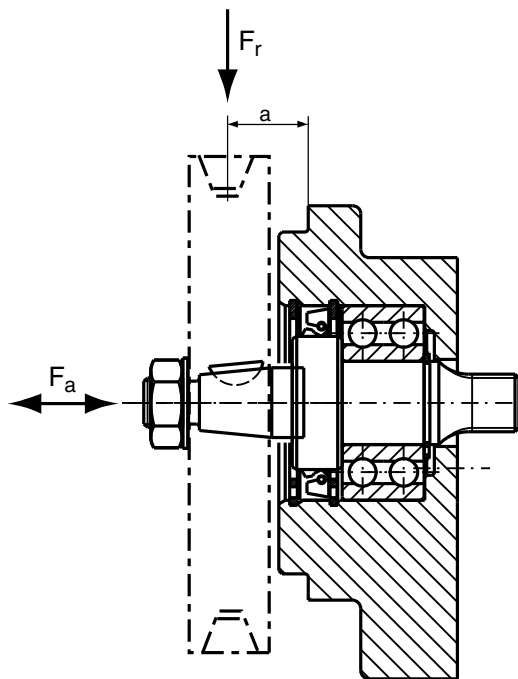
Bearing loads for code F4

Units subject to axial or radial loads, for instance drive with V-belts or gear wheels, must be specified with an outboard bearing.

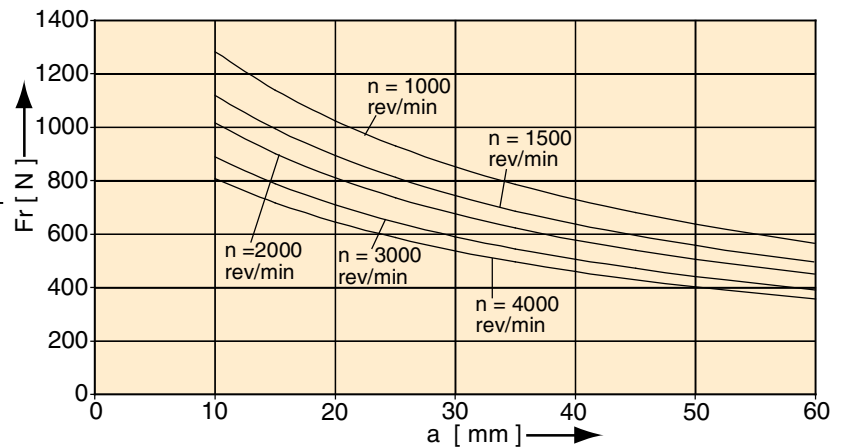
The diagrams below show the maximum axial or radial loads that can be tolerated referred to a bearing life of $L_H = 1000$ h.

F_r is reduced by $0,7 F_a$ when axial loading is applied.

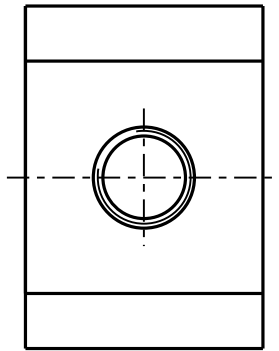
Outboard Bearing Code F4



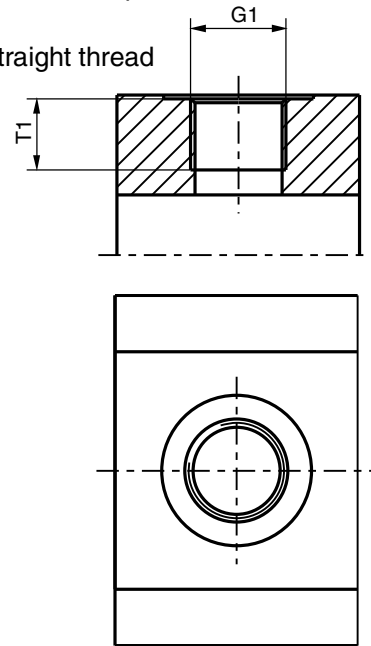
Shaft load for outboard bearings PGP/PGM 511



PGP/PGM 511 Porting



Code E
 British Standard Pipe
Code G
 Metric straight thread

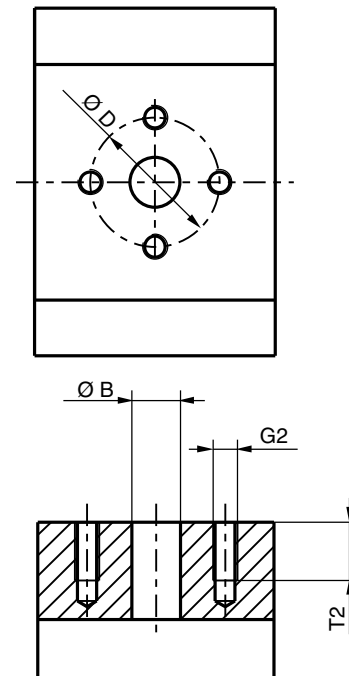


Code D
 SAE straight thread

PGP/PGM 511

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
E2	3/8-19 BSP	12.0
E3	1/2-14 BSP	14.0
E4	5/8-14 BSP	16.3
E5	3/4-16 BSP	16.0
E6	1-11 BSP	18.0
E7	1 1/4-11 BSP	20.0
G1	M 14x1.5	12.0
G3	M 18x1.5	12.0
G4	M 22x1.5	14.0
G5	M 26x1.5	16.0
G7	M 30x1.5	12.0

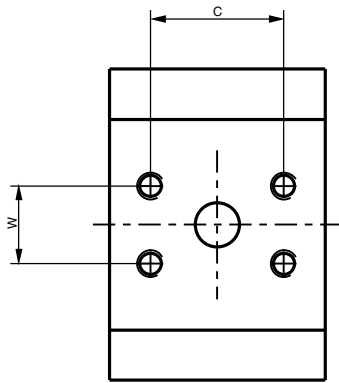
Code L
 4-Bolt flange



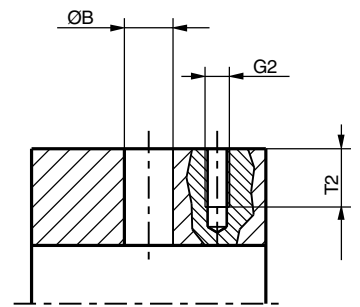
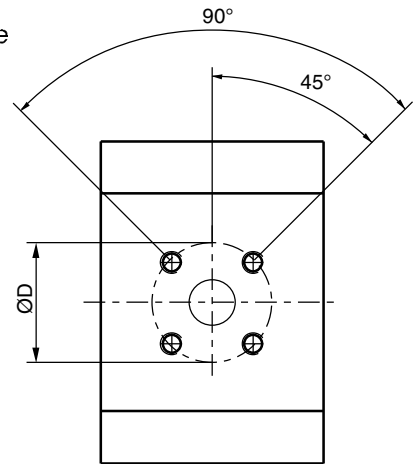
PGP/PGM 511 Porting

Code N
 SAE Split flange

Code P
 SAE Split flange
 metric thread



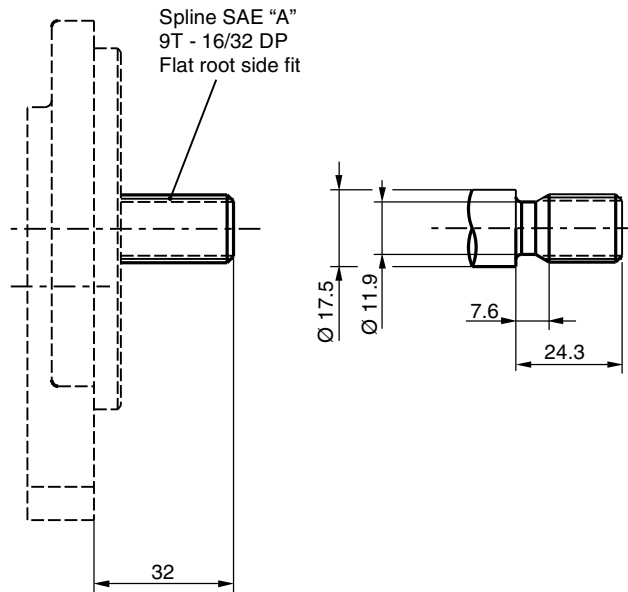
Code J
 European flange



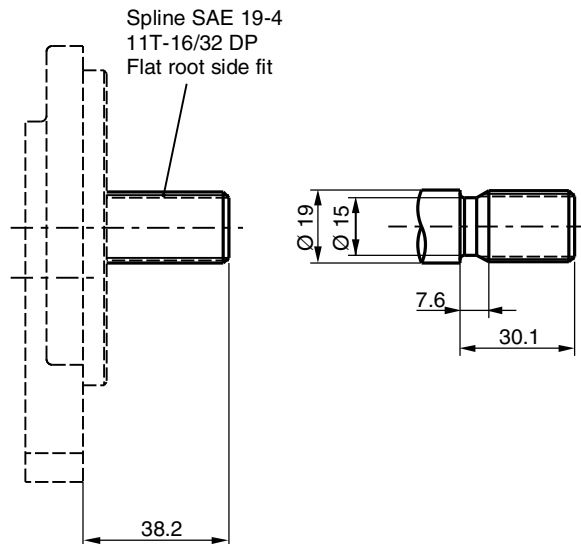
PGP/PGM 511

Code	G2	Ø B	Ø D	S	C	W	T2
	Thread						
J3	M6	8.0	30.0				12.0
J4	M6	12.0	30.0				12.0
J5	M6	15.0	35.0				12.5
J6	M8	15.0	40.0				15.0
J7	M6	20.0	40.0				13.0
J8	M8	18.0	55.0				15.0
J9	M8	26.0	55.0				15.0
K1	5/16-18 UNF	19.0		30.48			15.0
K2	M8	19.0		30.48			15.0
K3	M6	19.0		32.00			13.0
K4	M6	16.0		25.15			13.0
L1	M6	13.0	30.0				13.0
L2	M8	19.0	40.0				15.0
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	M8	12.7			38.10	17.48	15.0
P2	M10	19.0			47.63	22.23	20.6
P3	M10	25.4			52.37	26.19	21.4
P4	M10	31.8			58.72	30.17	20.6

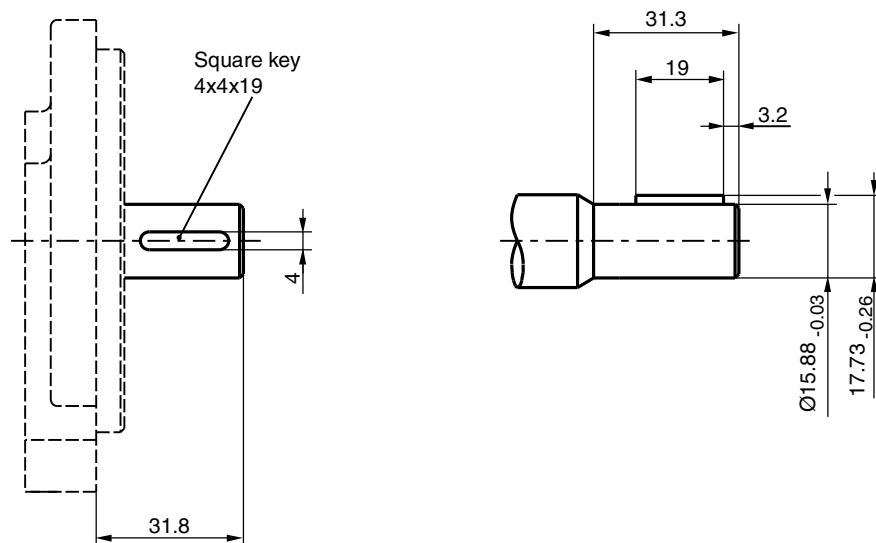
PGP/PGM 511 Drive Shaft
Code A1



Code C1

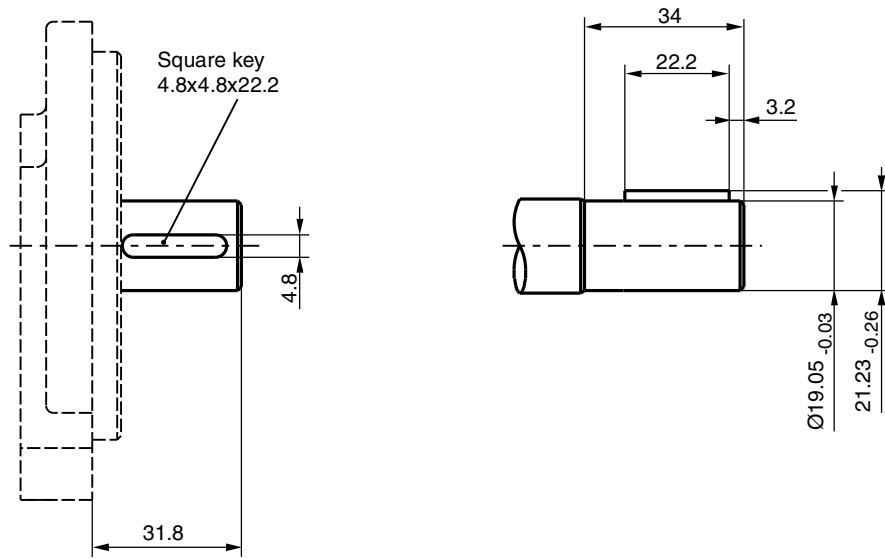


Code K1

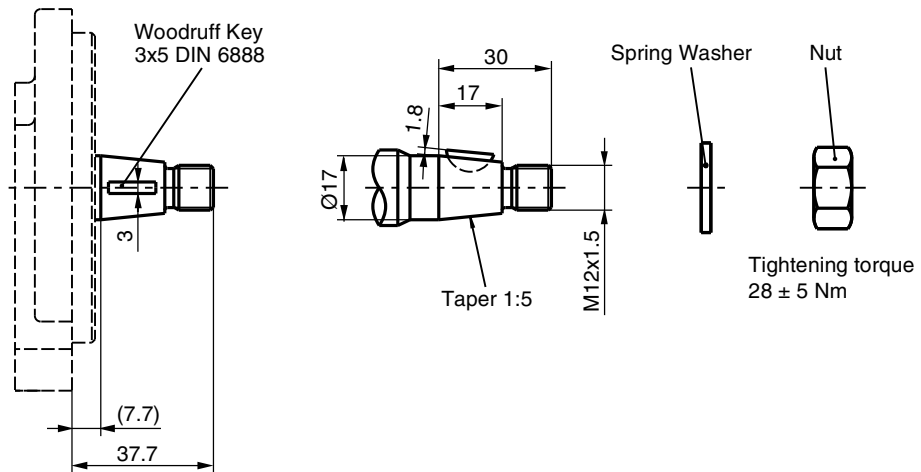


PGP/PGM 511 Drive Shaft

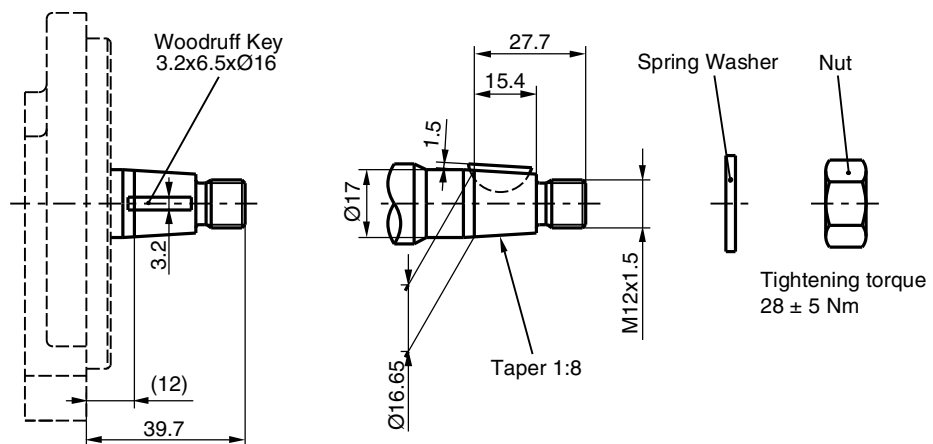
Code L6



Code S1

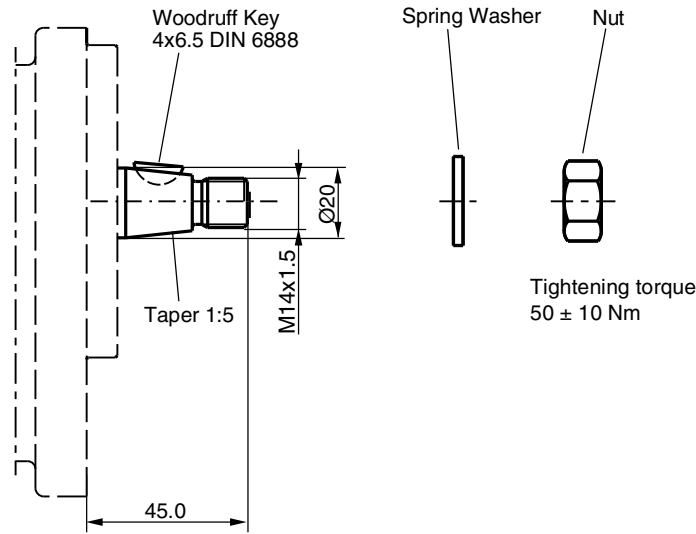


Code S2

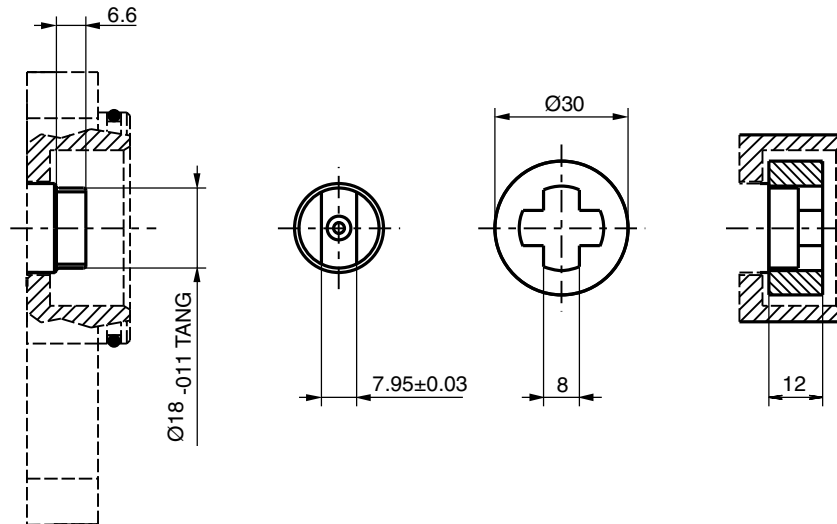


PGP/PGM 511 Drive Shaft

Code S8



Code V5



PGP/PGM 511 - Shaft Load Capacity

Code	Description	Torque Rating [Nm]
A1	9T, 16/32DP, 32L, SAE“A” spline	86
C1	11T, 16/32DP, 38.2L, SAE 19-4 spline	184
K1	Ø15.88, 4.0 KEY, no thread, 32L, SAE“A” parallel	75
L6	Ø19.05, 4.8 KEY, no thread, 32L, SAE 19-1 parallel	145
S1	Ø17.0, 7.7L, 3.0 KEY, M12x1.5 taper 1:5	193
S2	Ø16.65, 12.0L, 3.2 KEY, M12x1.5 taper 1:8	198
S8	Ø20, 9.4L, 4.0 KEY, M14x1.5 taper 1:5	110
V5	8x6.5 short shaft tang drive	60
	Multiple pump connection shaft	110

$$\text{Torque [Nm]} = \frac{\text{Displacement [cm}^3\text{/rev]} \times \text{Pressure [bar]}}{57.2}$$

