

## Gear Pump – High Performance Version

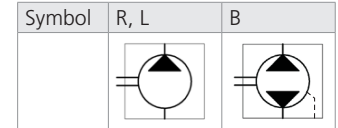
# GP2

Displacement up to 31 cm<sup>3</sup> (1.89 inch<sup>3</sup>) •  $p_{max}$  310 bar (4500 PSI) • Speed from 500 to 4000 RPM

### Technical Features



- › Operating pressure 280 bar, Peak pressure 310 bar
- › High-strength quality aluminum alloys pump with axial play compensation
- › Low noise level in whole operating range
- › High operational reliability and service life for 3000 operation hours
- › High volumetric efficiency up to 98%
- › International standard flanges acc.to SAE, ISO, DIN, GOST



### Technical Data

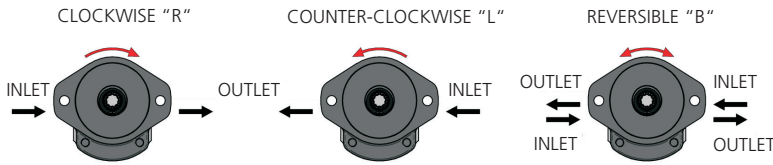
Nominal Size Parameters	Symbol	Unit	Displacement										
			4	5	6	8	10	12	16	20	22	25	31
Actual displacement	$V_g$	[cm <sup>3</sup> ]	4,03	5,00	6,02	8,05	10,00	12,08	16,10	20,12	22,00	25,16	31,21
		[in <sup>3</sup> ]	0.246	0.305	0.367	0.491	0.610	0.737	0.982	1.228	1.344	1.535	1.905
Rotation speed	nominal	$n_n$	1500										
	minimum	$n_{min}$	500										
	maximum	$n_{max}$	4000			3600			3200		3000	2800	2200
Pressure at inlet*	minimum	$p_{1min}$	-0,3 (-4.4 PSI)										
	maximum	$p_{1max}$	0,5 (7.3 PSI)										
Pressure at outlet**	max. continuous	$p_{2n}$	280				260			240	230	200	150
		[PSI]	4061				3771			3481	3336	2901	2176
	maximum	$p_{2max}$	290				280			250	240	220	170
		[PSI]	4206				4061			3626	3481	3191	2466
	peak	$p_3$	310				300			270	250	240	190
		[PSI]	4496				4351			3916	3626	3481	2756
Nominal flow rate (min.) at $n_n$ and $p_{2n}$	$Q_n$	[l·min <sup>-1</sup> ]	5,40	6,44	8,10	11,04	13,40	16,56	22,56	28,20	30,96	35,25	43,71
		[GPM]	1.43	1.70	2.14	2.92	3.54	4.37	5.96	7.45	8.18	9.31	11.55
Maximum flow rate at $n_{max}$ and $p_{2max}$	$Q_{max}$	[l·min <sup>-1</sup> ]	15,68	20,00	23,52	28,22	35,89	42,34	50,18	62,72	61,40	68,60	66,84
		[GPM]	4.14	5.28	6.21	7.45	9.48	11.19	13.26	16.57	16.22	18.12	17.66
Nominal input power (max.) at $n_n$ and $p_{2n}$	$P_n$	[kW]	3,33	4,14	5,00	6,52	8,29	9,06	11,82	11,82	16,29	13,30	13,74
Maximum input power at $n_{max}$ and $p_{2max}$	$P_{max}$	[kW]	8,77	11,86	13,15	15,78	21,32	22,04	26,12	29,02	31,00	26,46	21,91
Weight	m	[kg]	2,6	2,63	2,65	2,75	2,8	2,95	3,1	3,35	3,4	3,5	3,8
		[lbs]	5.73	5.80	5.84	6.06	6.17	6.50	6.83	7.39	7.50	7.72	8.38

- 1) \*Inlet pressure in the reversible design can be up to  $p_1 = p_{2n} - 70$  bar max. External drainage must be used in case of the reversible design.
- 2) \*\*Outlet pressure in the reversible design is 10% lower than shown in the table (depending on operating conditions).
- 3)  $p_{2n}$  maximum continuous pressure - maximum working pressure, at which the pump can be operated without time limitation.
- 4)  $p_{2max}$  maximum pressure - maximum pressure permissible for a short time, max. 20 s.
- 5)  $p_3$  peak pressure - short-time pressure (fractions of a second) arising in case of a sudden change of the operating mode; any excess of this pressure during operation is impermissible.

Gear Pump / Size		GP2 - 4 ...31 ccm
Volumetric efficiency	%	92 ÷ 98
Mechanical efficiency	%	85
Fluid temperature range (NBR)	°C (°F)	-20...80 (-4...176)
Fluid temperature range (FPM)	°C (°F)	-20...120 (-4...248)
Viscosity range	mm <sup>2</sup> /s (SUS)	20 ...80 (97 ...390), 1200 (5849) for cold start
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Max. degree of fluid contamination for $p_2 \leq 200$ bar		Class 21/18/15 acc. to ISO 4406
Max. degree of fluid contamination for $p_2 \geq 200$ bar		Class 20/17/14 acc. to ISO 4406

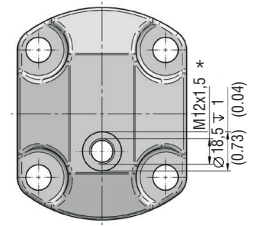
### Direction of rotation, reversible design

Determine direction of rotation by looking at the drive shaft.  
The pump can be used only in the specified direction of rotation.



The pumps B codes (Bi-directional) have an external drainage located in the cover.

Pressure in this port:  
min. -0,3 bar (-4,4 PSI)  
max. +0,5 bar (+7,3 PSI)  
\*Other port thread see section „Ports design“ (page 8).



### Ordering Code

**GP2 -** [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

**Gear pump serie 2** (4, 5, 6, 8, 10, 12, 16, 20, 22, 25, 31)

**Displacement** (4, 5, 6, 8, 10, 12, 16, 20, 22, 25, 31)

**Direction of rotation**  
Counter clockwise: L  
Clockwise: R  
Bi-directional: B

**Flange design**  
FB, RE, RF, RH, SB, SC, AH, AI, AJ, AK

**Shaft Type**  
CH, CI, CJ, CK, DD, DF, DH, DI, DJ, DK, DL, KH, VL, VJ, VM, VN

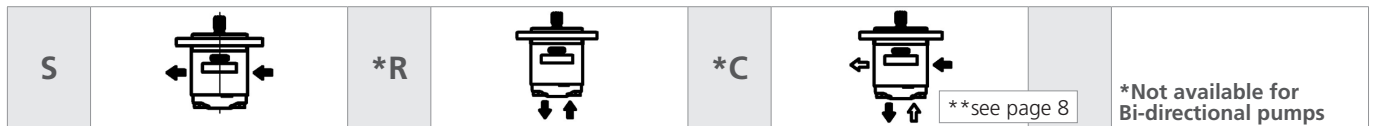
**Shaft seal**  
No designation: standard  
004: without shaft seal

**Seals**  
N: NBR  
V: FPM (Viton)  
H: HNBR

**Inlet / Outlet ports**  
GA, GC, GD, GE, UA, UB, UD, UE, HE, HF, HH, HI, HK, KA, KB, KH, KI, MB, ME, MJ

**Ports orientation**  
S, R, C

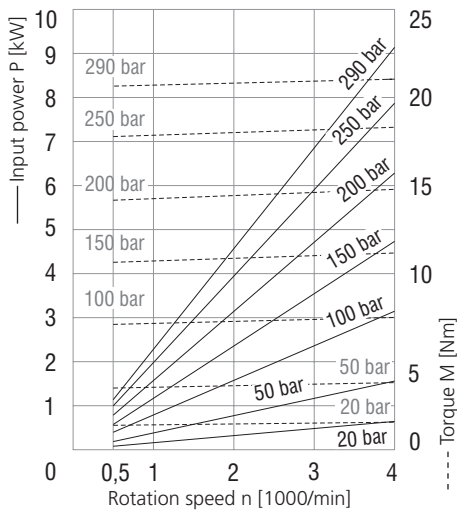
### Ports orientation



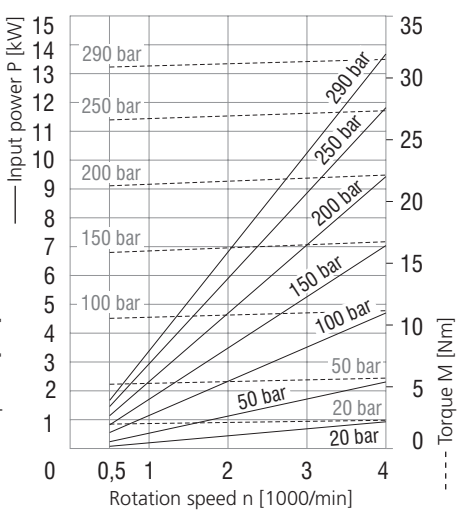
### Combination of Flanges and Shafts

Flange Design	FB	RE	RF	RH	SB	SC	AH	AI	AJ	AK
Shaft Type										
CH		●								
CI		●								
CJ		●								
CK			●				●	●		
DD					●	●				
DF					●	●				
DH					●	●				
DI		●								
DJ			●				●	●		
DK	●									
DL				●						
KH									●	●
VJ					●	●				
VL		●								
VM					●	●				
VN	●									

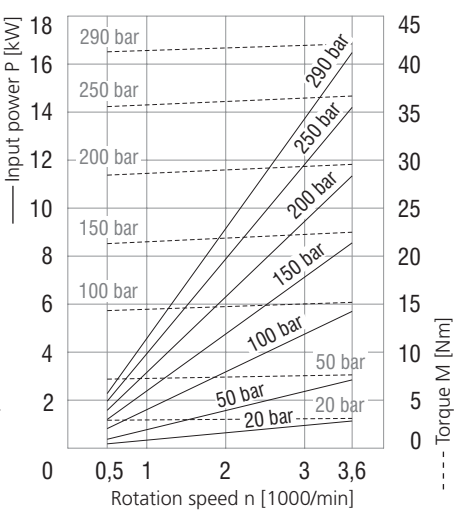
### 4 ccm



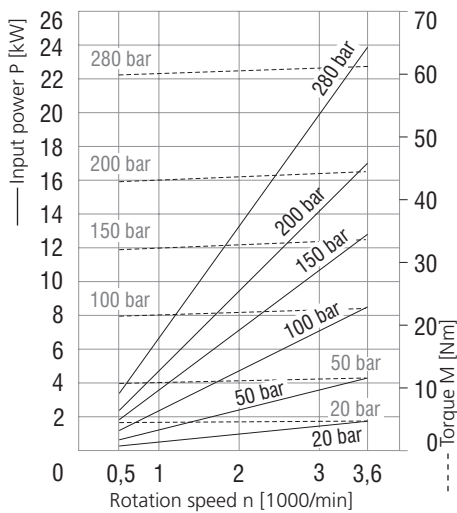
### 6 ccm



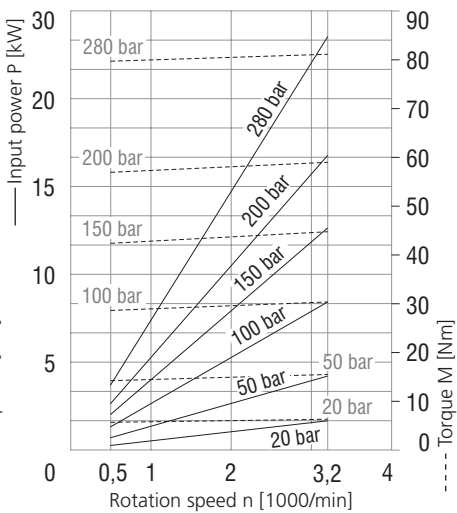
### 8 ccm



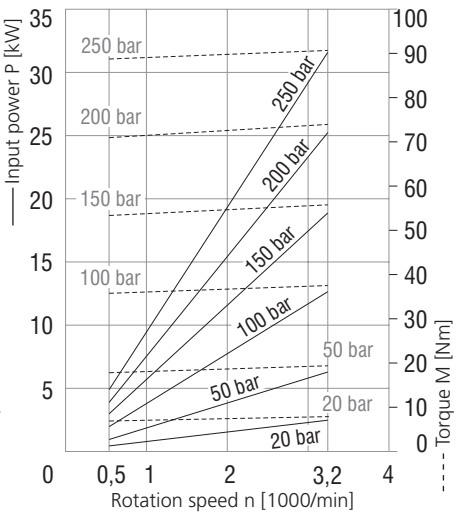
### 12 ccm



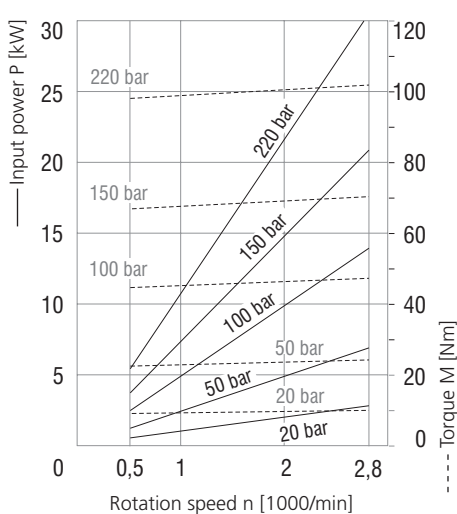
### 16 ccm



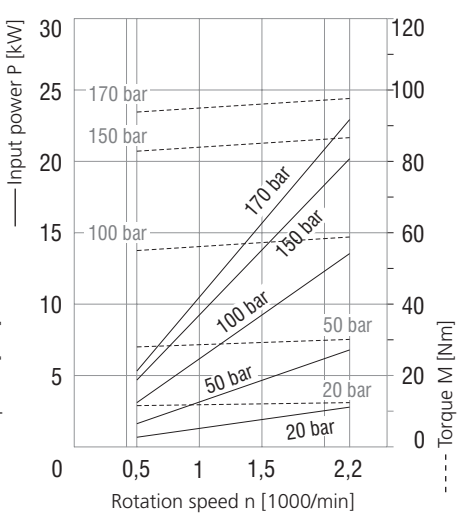
### 20 ccm



### 25 ccm



### 31 ccm



Ordering Code - Multiple Version

**GP2** - [ ] / [ ] / [ ] - [ ] - [ ] - [ ] [ ] / [ ] / [ ] - [ ] [ ]

**Gear pump serie P**

Front pump (shaft side) Middle pump Rear pump

**Displacement**

4	10	
5	12	22
6	16	25
8	20	31

**Direction of rotation**

Counter clockwise L  
Clockwise R  
Bi-directional B

**Shaft seal**

No designation standard  
004 without shaft seal

**Seals**

NBR  
FPM (Viton)  
HNBR

MB UA HH  
ME UB HI  
MJ UD KA  
GA UE KB  
GC HE KC  
GD HF KD  
GE HK

**Inlet / Outlet ports**

Always from left: Inlet - Outlet

**Ports orientation**

Use blind plug for not used ports

S  
C

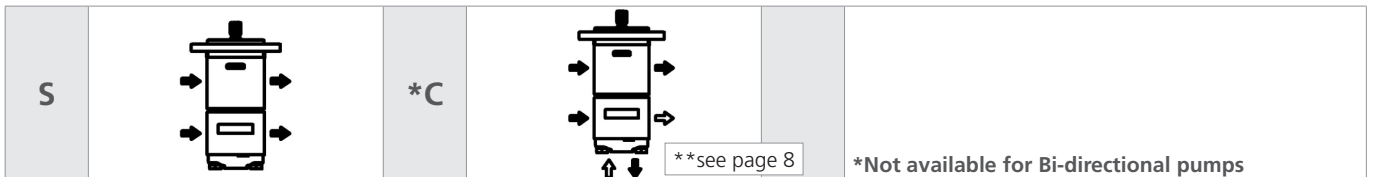
FB SC  
RE AH  
RF AI  
RH AJ  
SB AK

CH DI  
CI DJ VL  
CJ DK VJ  
CK DL VM  
DD KH VN

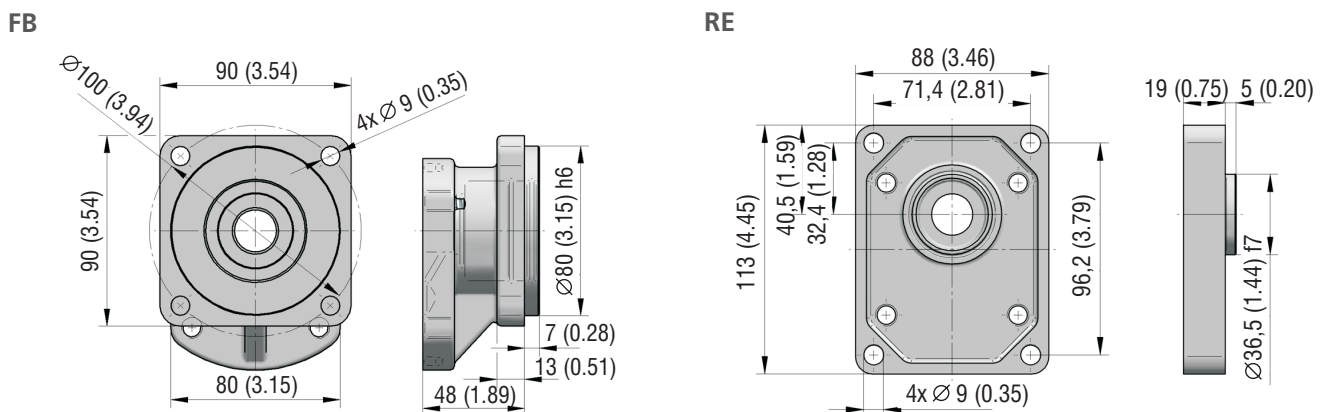
**Flange design**

**Shaft Type**

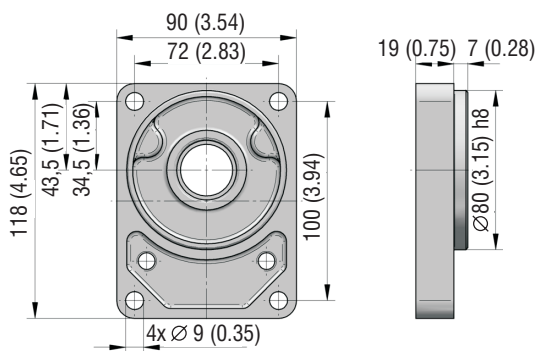
Ports orientation



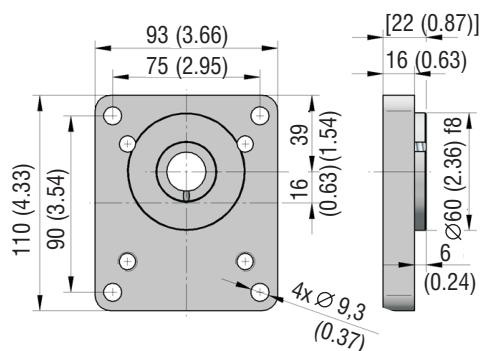
Flange design in millimeters (inches)



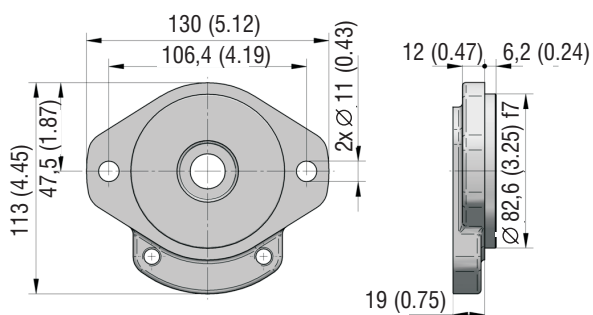
RF



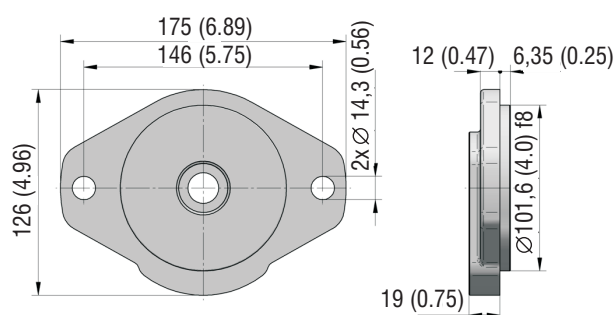
RH



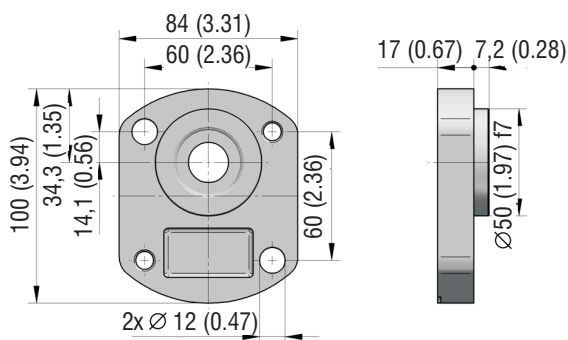
SB



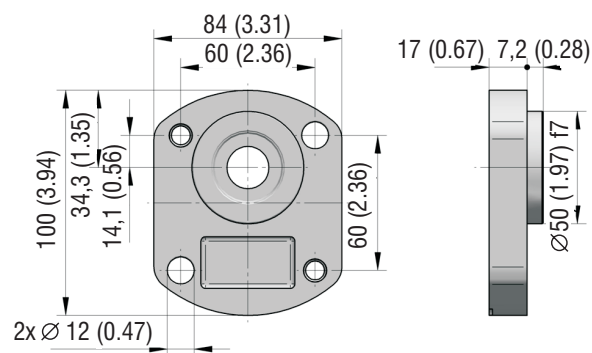
SC



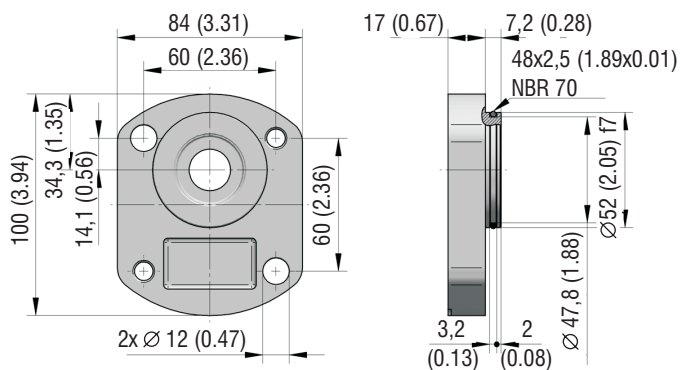
AH



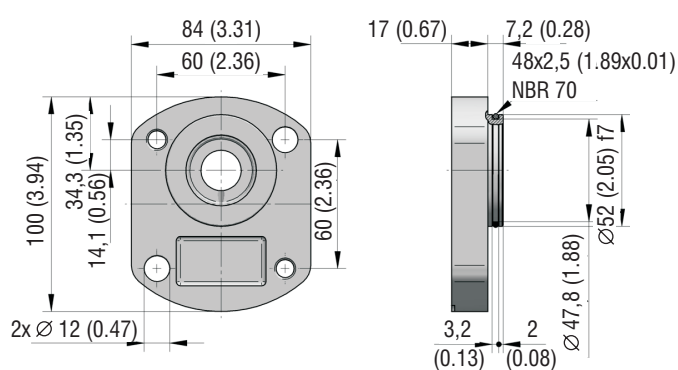
AI

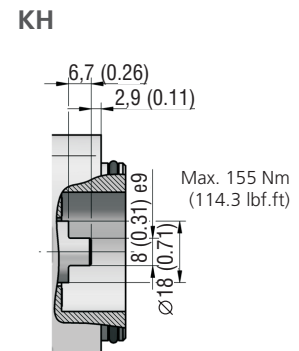
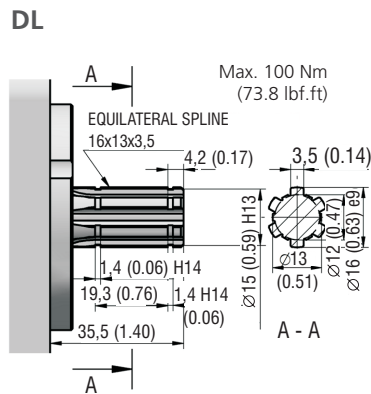
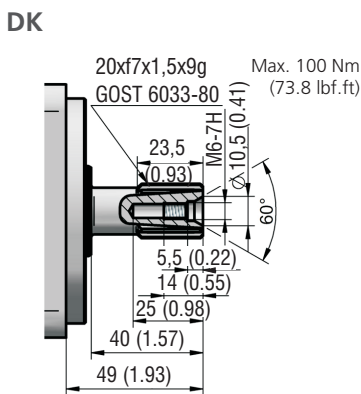
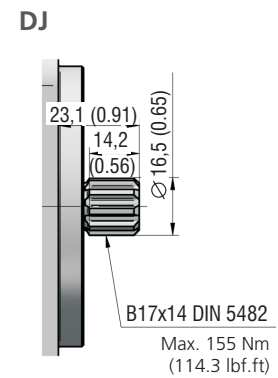
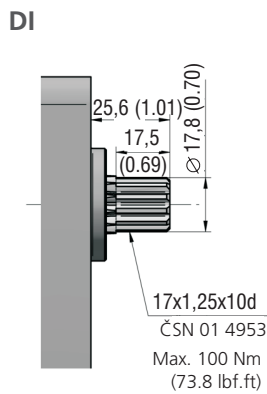
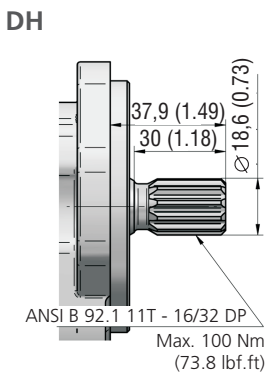
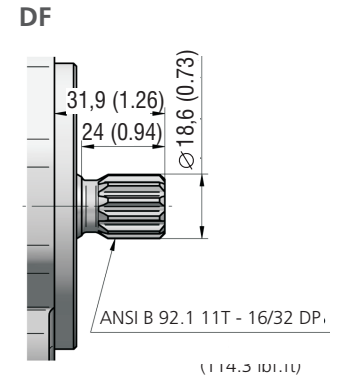
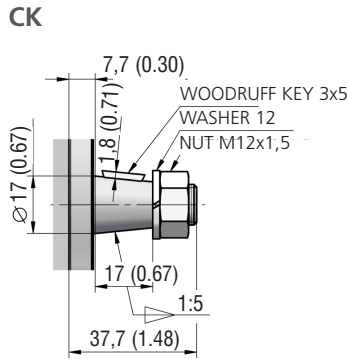
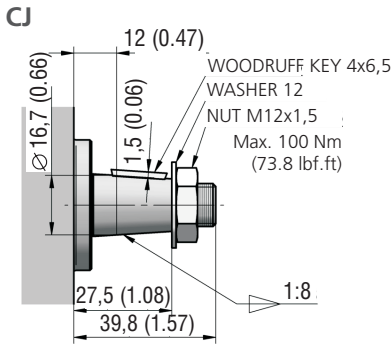
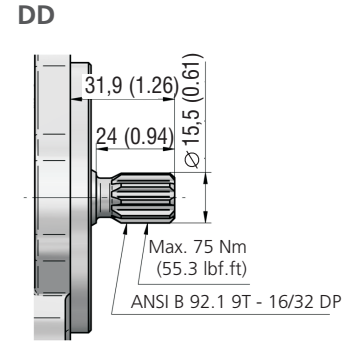
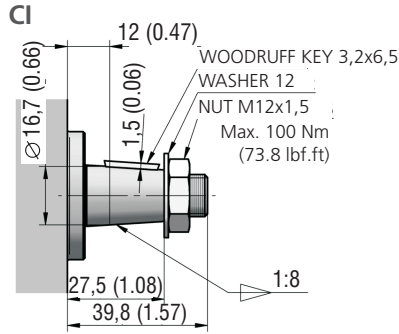
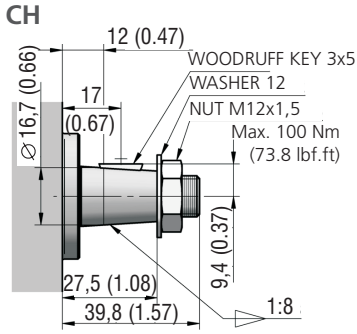


AJ

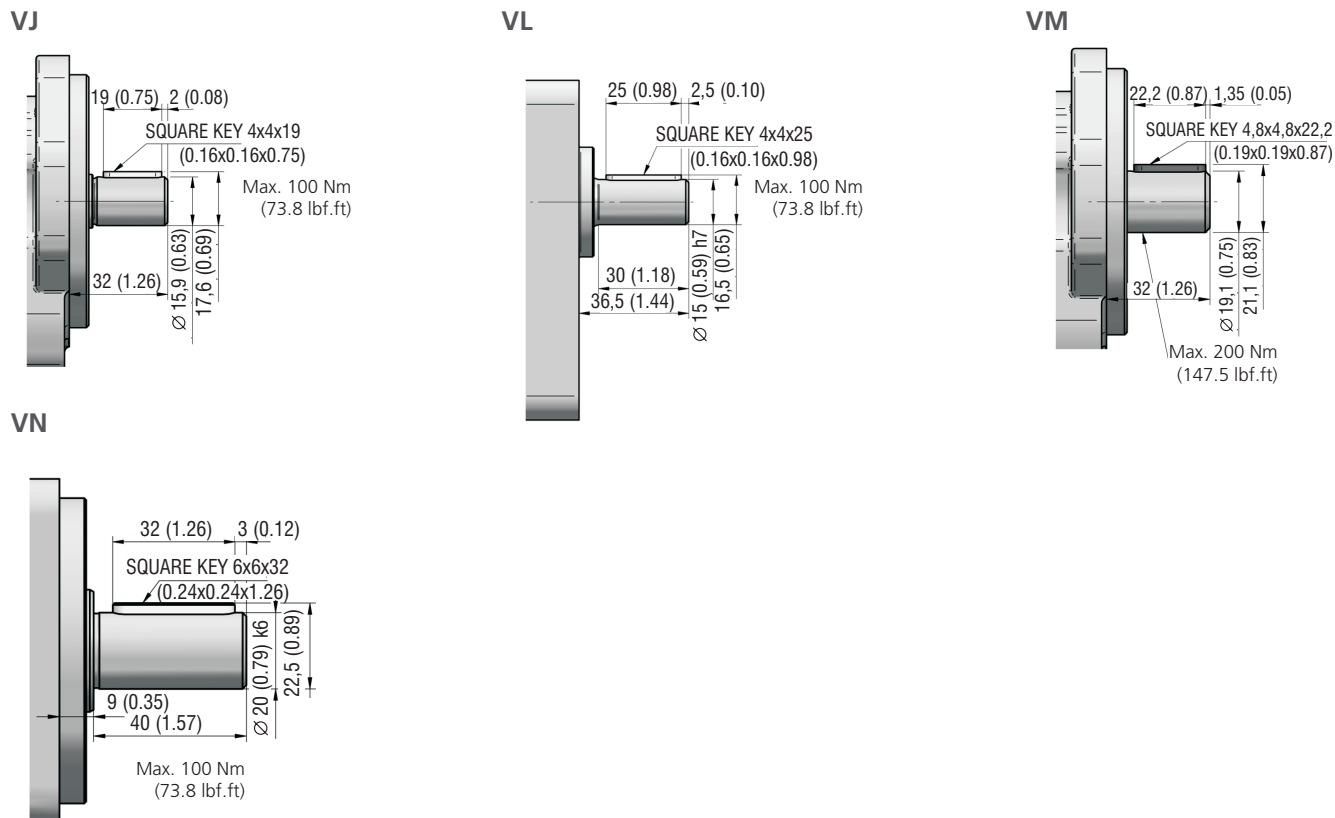


AK



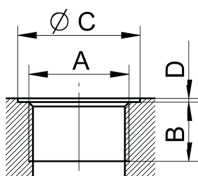


### Shaft design in millimeters (inches)



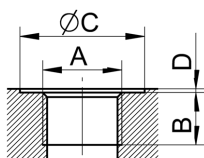
### Ports design in millimeters (inches)

#### Metric thread according to ISO 6149



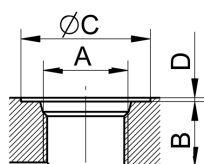
Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		A	B	C	D		A	B	C	D
ALL	MJ	M27x2	16 (0.63)	33 (1.30)	1 (0.04)	ME	M18x1,5	14 (0.55)	24 (0.94)	1 (0.04)

#### BSPP pipe thread according to ISO 228 -1



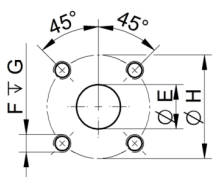
Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		A	B	C	D		A	B	C	D
to 10 (0.61)	GC	G1/2	14 (0.55)	33 (1.30)	1 (0.04)	GC	G1/2	14 (0.55)	33 (1.30)	1 (0.04)
10-25 (0.61-1.53)	GD	G3/4	16 (0.63)	39 (1.53)						
above 25 (1.53)	GE	G1	18 (0.71)	45 (1.77)						

#### UNF thread according to SAE



Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		A	B	C	D		A	B	C	D
to 10 (0.61)	UD	7/8-14 UNF-2B	17 (0.67)	34 (1.34)	1 (0.04)	UD	7/8-14 UNF-2B	17 (1.04)	33 (1.30)	1 (0.04)
11-31 (0.67-1.89)	UE	1-1/16-12 UNF-2B	19 (0.75)	41 (1.61)						

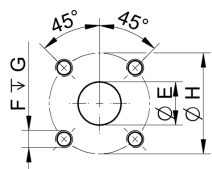
**Flanged fittings according to DIN 8901/8902**



Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		E	F	G	H		E	F	G	H
ALL	HF	20 (0.79)	M6	13 (0.51)	40 (1.57)	HE	15 (0.59)	M6	13 (0.51)	35 (1.38)
	HK	25 (0.98)	M8	13 (0.51)	55 (2.17)					

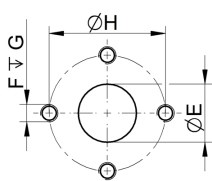
Note: H10H05 - for multiple version - for with one common inlet

**Flanged fittings - „square“**



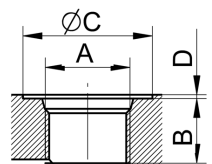
Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		E	F	G	H		E	F	G	H
ALL	HI	20 (0.79)	M8	13 (0.51)	40 (1.57)	HH	13,5 (0.53)	M6	13 (0.51)	30 (1.18)

**Flanged fittings - „cross“**



Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension				Outlet Code	Dimension			
		E	F	G	H		E	F	G	H
ALL	KB	20 (0.79)	M8	13 (0.51)	40 (1.57)	KA	13,5 (0.53)	M6	13 (0.51)	30 (1.18)
to 10 (0.61)	KH	14 (0.55)			38 (1.50)	KH	14 (0.55)	M8		38 (1.50)
above 10 (0.61)	KI	19 (0.75)								

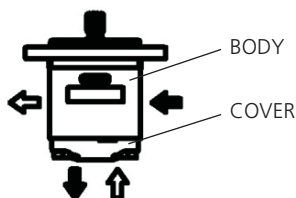
**Drains:**



Displacement [cm <sup>3</sup> (in <sup>3</sup> )]	Inlet Code	Dimension			
		A	B	C	D
ALL	MB	M12x1,5	12 (0.47)	20 (0.79)	1 (0.04)
	GA	G1/4	12 (0.47)	45 (1.77)	
	UA	7/16-20 UNF-2B	13 (0.51)	21 (0.83)	
	UB	9/16-18 UNF-2B	14 (0.55)	25 (0.98)	

Standard Drain port thread: MB for „M“ Suction / Pressure Ports  
 GA for „G“ Suction / Pressure Ports  
 UA for „U“ Suction / Pressure Ports  
 Other combination on request

**\*\*Port orientation**



Only threaded ports (M, G, U) can be made in the cover.  
 If all 4 ports are required, describe them in the code.

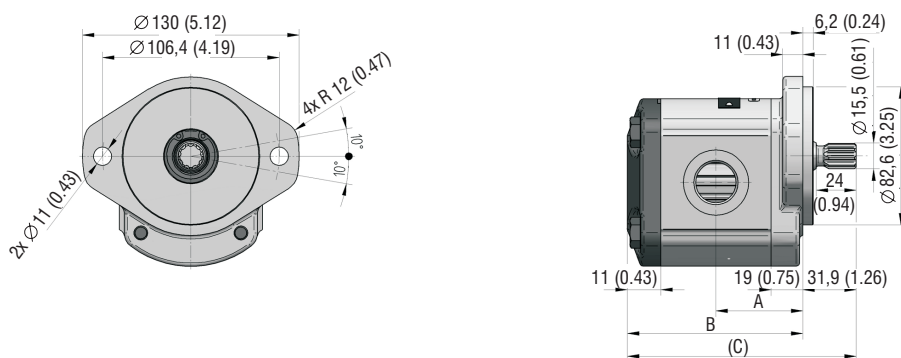
Sample: GP2-20R-RECH-CGDGDGCGC-N

For Suction port in Cover, Pressure port in Body: GP2-20R-RECH-CGDGC-N006  
 For Suction port in Body, Pressure port in Cover: GP2-20R-RECH-CGDGC-N005

Other combinations for instance two suction ports, one pressure port describe in the order beside the code.  
 GP2-20R-RECH-CGDGDGCGC-N Two suction ports, Pressure port in the Body.

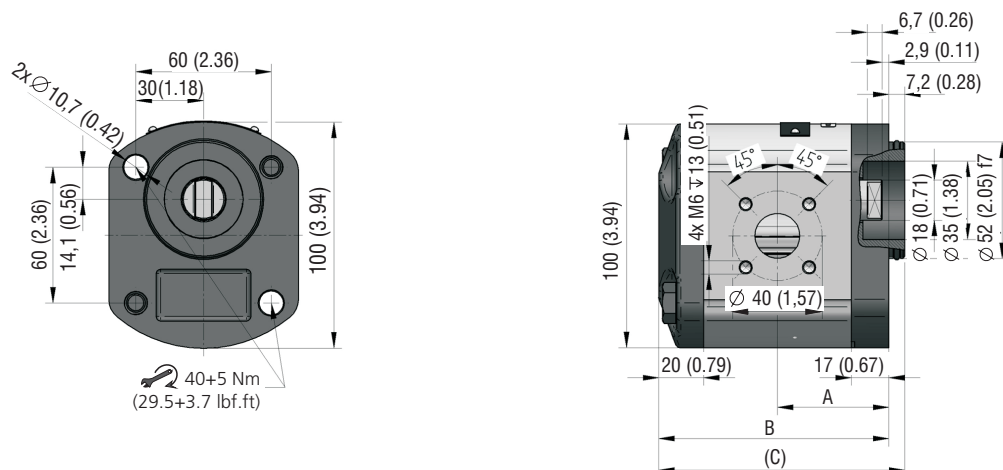


GP2-\*R-SBDD-SG\*G\*-N



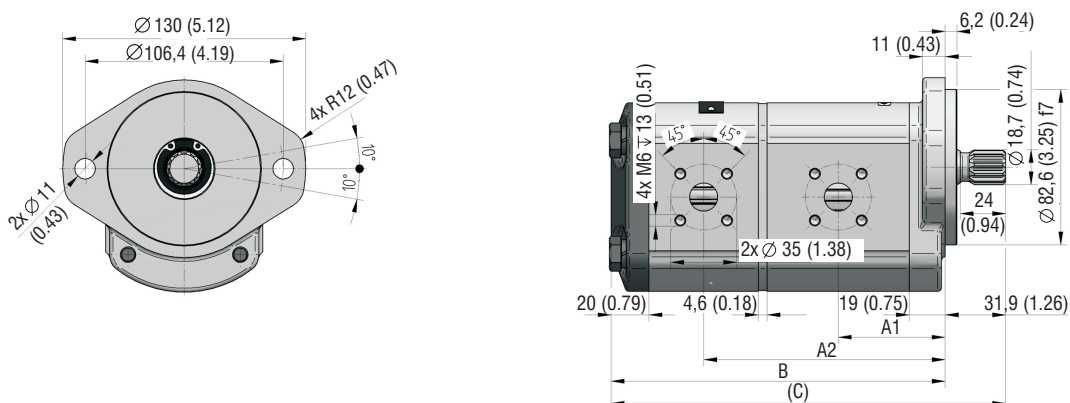
Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A	B	C	Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A	B	C
4 (0.24)	42,5 (1.67)	86,0 (3.39)	118,1 (4.65)	16 (0.98)	51,9 (2.04)	104,9 (4.13)	137,0 (5.39)
6 (0.37)	44,0 (1.73)	89,2 (3.51)	121,3 (4.78)	20 (1.22)	55,0 (2.17)	111,2 (4.38)	143,3 (5.64)
8 (0.49)	45,6 (1.80)	92,3 (3.63)	124,4 (4.90)	25 (1.53)	59,0 (2.32)	119,1 (4.69)	151,2 (5.95)
12 (0.73)	48,8 (1.92)	98,6 (3.88)	130,7 (5.15)	31 (1.89)	63,7 (2.51)	128,5 (5.06)	160,6 (6.32)

GP2-\*R-AJKH-SH\*H\*-N



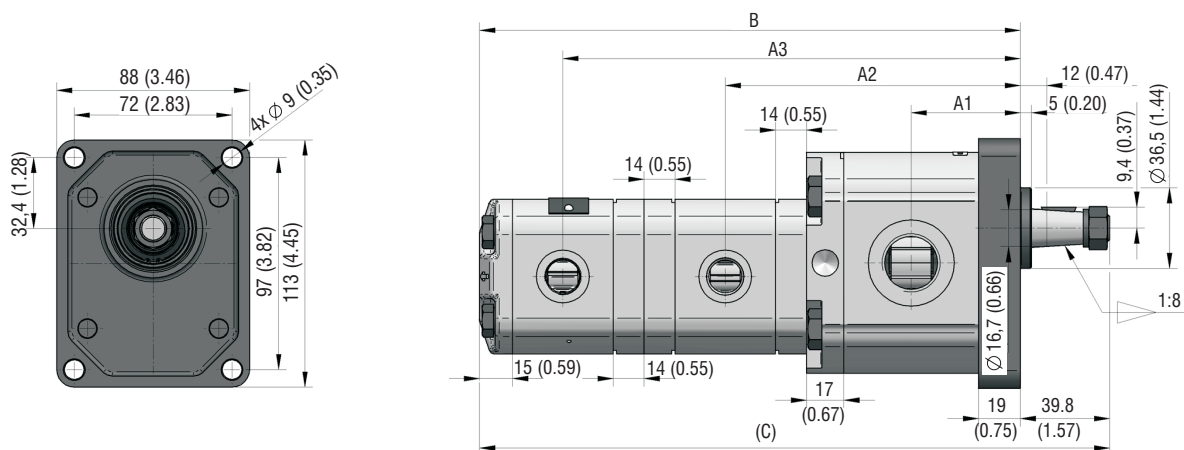
Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A	B	C	Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A	B	C
4 (0.24)	40,5 (1.59)	84,0 (3.31)	91,2 (3.59)	16 (0.98)	49,9 (1.96)	102,9 (4.05)	110,1 (4.33)
6 (0.37)	42,0 (1.65)	87,2 (3.43)	94,4 (3.72)	20 (1.22)	53,0 (2.09)	109,2 (4.30)	116,4 (4.58)
8 (0.49)	43,6 (1.72)	90,3 (3.56)	97,5 (3.84)	25 (1.53)	57,0 (2.24)	117,1 (4.61)	124,3 (4.89)
12 (0.73)	46,8 (1.84)	96,6 (3.80)	103,8 (4.09)	31 (1.89)	61,7 (2.43)	126,5 (4.98)	133,7 (5.26)

GP2-\*/L-SBDF-SH\*H\*/H\*H\*-N



Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A1	A2	B	C
6 / 6 (0.37 / 0.37)	44,0 (1.73)	98,8 (3.89)	143,9 (5.67)	175,8 (6.92)
8 / 8 (0.49 / 0.49)	45,6 (1.80)	103,5 (4.07)	150,2 (5.91)	182,1 (7.17)
12 / 6 (0.73 / 0.37)	48,8 (1.92)	108,2 (4.26)	153,3 (6.04)	185,2 (7.29)
16 / 4 (0.98 / 0.24)	51,9 (2.04)	113,0 (4.45)	156,5 (6.16)	188,4 (7.42)
20 / 6 (1.22 / 0.37)	55,0 (2.17)	120,8 (4.76)	165,9 (6.53)	197,8 (7.79)

GP2-12/GP1-2,5/2,5L-RECH-SGDGC/GBGB/GBGB-N



Displacement [cm <sup>3</sup> (in <sup>3</sup> )/rev]	A1	A2	A3	B	C
12 / 2,5 / 2,5 (0.73 / 0.15 / 0.15)	48,8 (1.92)	130,3 (5.13)	199,8 (7.87)	235,6 (9.28)	275,4 (10.84)