

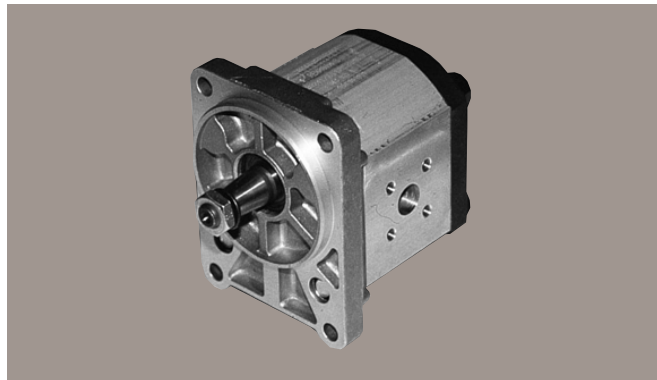
**MANNESMANN  
REXROTH****External gear pump  
Type G2, Series 4X****RE  
10 030/03.00**  
Replaces: 04.99

NS 4 to 22

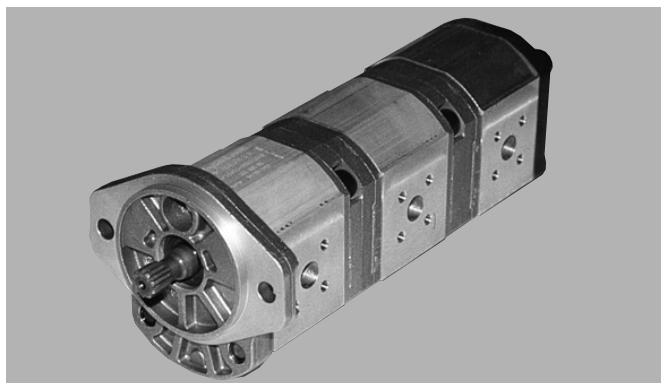
Up to 250 bar

Up to 22.4 cm<sup>3</sup>

- New principle of housing sealing, thereby giving a very long housing service life
- Long seal service life also at maximum temperatures
- Plain bearings for high loads
- Mono-block bearing
- Simple and robust design
- New principle of hydrostatic gap compensation
- Common suction port for double pump, on request
- Mono-block intermediate flange, on request



1 PF 2 G2-4X/011 RC 20 MB

1 PFG2-4X/011 RR 20 MRK +  
1 PFG2-4X/011 LN 20 MDN +  
1 PFG2-4X/008 LN 20 MDLSpecial version (S107) with a common suction port, on request  
2 PF 2 G2-4X/011 + 05 LR 20 MR S107**Functional description, section**

Type G2 hydraulic pumps are self-priming external gear pumps. Their task is to produce a constant flow and at the same time pass on the required forces.

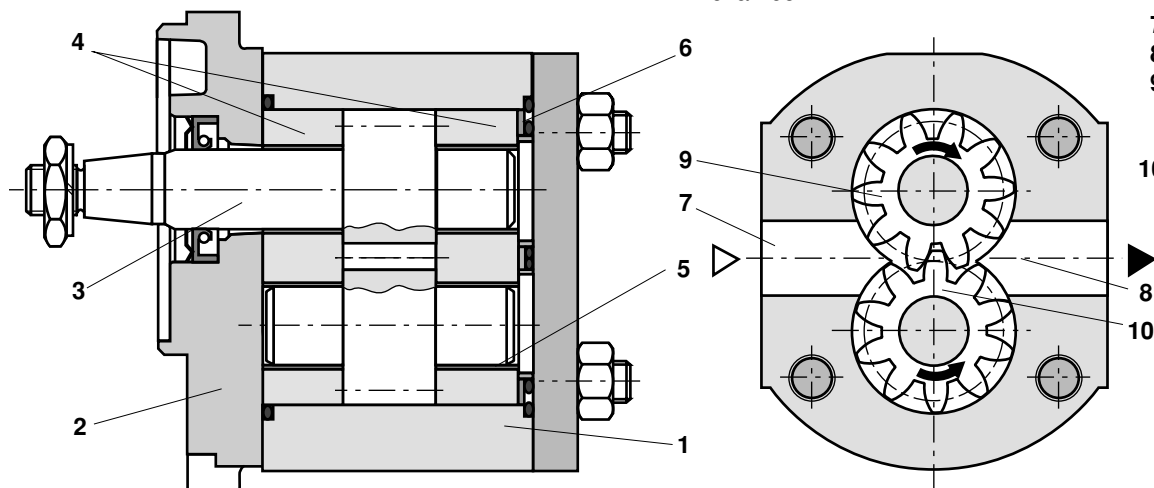
They mainly consist of the housing (1), mounting flange (2), drive shaft (3), 2 bearing blocks (4), bearing bush (5) and discs (6) for the hydrostatic gap compensation.

The gears separating during the rotational movement releases the gear chambers. The negative pressure resulting from this, as well as the atmospheric pressure acting on the pressure fluid

level in the tank causes the pressure fluid to flow to the pump from the tank. This pressure fluid fills the gear chambers and is moved, in the direction of the arrow (see sectional drawing), from the suction to the pressure side.

Here the gears mesh once more and push the pressure fluid out of the gear chambers and prevent return flow to the suction chamber.

In order to avoid hard and jolting running of the pump, small unloading grooves are cut into the sides of the bearing blocks (4). The so called "squashed fluid" is passed into the pressure chamber.



- 7 Suction side
- 8 Pressure side
- 9 Drive gear (clockwise rotation)
- 10 Driven gear

## Ordering details

1 PF 2 G2 - 4X / / / / / / / / / / \*

Series 40 to 49 = 4X  
(40 to 49: unchanged installation and connection dimensions)

(Nominal flow)	NS	
4 cm <sup>3</sup>	4	= 004
5.5 cm <sup>3</sup>	5	= 005
8.2 cm <sup>3</sup>	8	= 008
11 cm <sup>3</sup>	11	= 011
14.1 cm <sup>3</sup>	14	= 014 <sup>1)</sup>
16.2 cm <sup>3</sup>	16	= 016
19 cm <sup>3</sup>	19	= 019 <sup>1)</sup>
22.4 cm <sup>3</sup>	22	= 022

Clockwise rotation = R  
Anti-clockwise rotation = L

Conical shaft 1:5 Ø 17 mm = C  
Splined shaft SAE-A 5/8", 9 teeth = R  
Conical shaft with coupling for single pump, centre/rear pump = N  
Conical shaft 1:5 Ø 20 mm for front bearing = S  
Cylindrical shaft ISO Ø 18 (with 01 ports) = A  
Conical shaft 1:8 Ø 17.4 mm = H

<sup>1)</sup> Nominal sizes 14 and 19 are not available with cylindrical shaft type A

### Ordering examples for single pumps:

1 PF 2 G2-4X/005 RC 20 MB Material No. 07363013

1 PF 2 G2-4X/016 RC 20 MBK Material No. 07363115

(only front pump)

1 PF 2 G2-4X/008 LN 20 MDL Material No. 07363126

(only rear pumps)

### Ordering example for multiple pumps:

1 PF 2 G2-4X/008 RC 20 MBK Material No. 07363109

1 PF 2 G2-4X/004 LN 20 MDL Material No. 07363122

### Combination parts G2/008 + G2/004

Multiple pumps are supplied completely assembled. The combination parts, however, have to be listed as separate items within an order (see ordering details). The material no. of the combination parts is entered during order processing.

It is possible to order the combination parts as a kit on their own. For the ordering codes see the multiple pump's example. The kit consists of 2 tie rods and 2 nuts. The coupling is included within the scope of supply of the rear or centre pump.

1 PF 2 G2-4X/022 RC 20 MBK Material No. 07363119

1 PF 2 G2-4X/011 LN 20 MDN Material No. 07363296

1 PF 2 G2-4X/005 LN 20 MDL Material No. 07363124

### Combination parts G2/022 + G2/011 + G2/005

Further details in clear text

No code = Single pump  
K = Front pump for combination  
L = Rear pump for combination  
N = Centre pump for combination

B = Rectangular flange Ø 80 mm  
P = 2-hole fixing Ø 50 mm  
R = SAE-A-2-hole flange Ø 82.5 mm  
M = 2-hole fixing Ø 52 mm  
O = Rectangular flange Ø 36.5 mm  
A = Front bearing Ø 80 mm  
D = Combination flange for G2 (rear and centre pump)  
H = Combination flange for G3, G4

M = NBR seals up to 80 °C  
K = FKM shaft seal ring other seals NBR (connection to diesel engines)

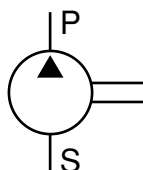
20 = Suction and pressure port square flange, metric mounting threads  
01 = Pipe thread to ISO 228/1 (with cylindrical shaft A)  
30 = Suction and pressure port square flange, metric mounting threads at the vertical and horizontal connection axis (Italian version)

**Note:** Only pump types which are listed in the catalogue sheets and have material numbers are available. Other types on request.

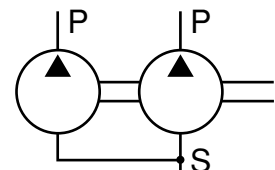
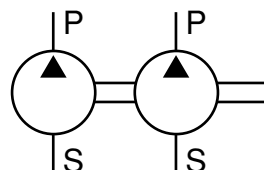
Flange fittings for pipe connections and pump mounting brackets to catalogue sheet RE 32 110 for rectangular flanges version "B" have to be ordered separately.

## Symbols

### Single pump



### Double pump



On request

**Technical data** (for applications outside these parameters, please consult us)

**Pressure fluid:** Mineral oil to catalogue sheet RE 07 075.  
For operation with HFC-, HFD-, HETG-, HEPG- and HEES fluids see RE 10 025-S.

**Pressure fluid temperature range:** - 15 to + 80 °C.  
For higher temperatures please consult us

**Ambient temperature range:** - 15 to + 60 °C

**Viscosity range:**  
10 to 300 mm<sup>2</sup>/s (recommended viscosity range)  
1000 mm<sup>2</sup>/s (permissible start-up viscosity)

**Maximum permissible degree of contamination** of the pressure fluid is to NAS 1638, class 10. We, therefore, recommend a filter with a minimum retention rate of  $\beta_{20} \geq 100$ . To ensure a long service life we recommend class 9, NAS 1638; achievable with a filter retention rate of  $\beta_{10} \geq 100$ .

**Drive type:** Elastic operating, for other drive types please consult us

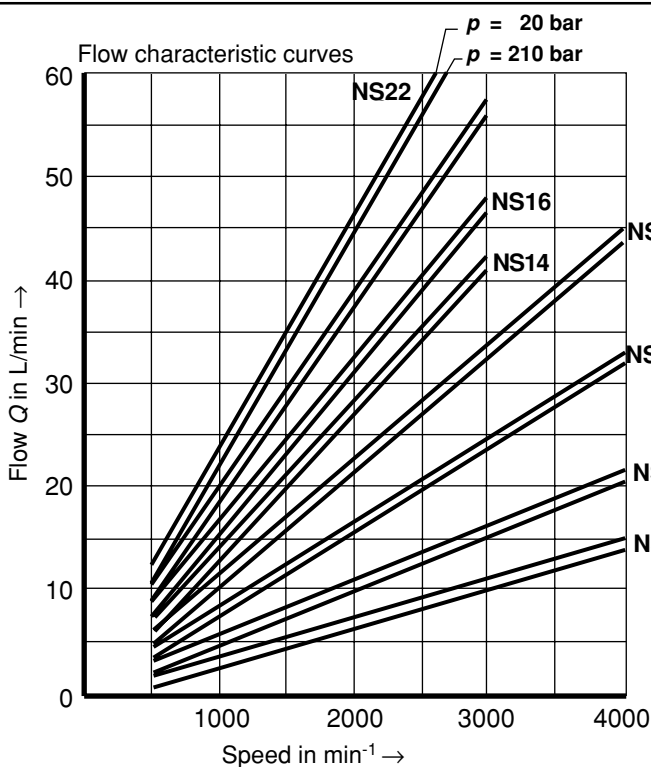
**Installation:** Optional

**Direction of rotation:** The pump must only be driven in the given direction of rotation

**Weight:** See table for individual pump types

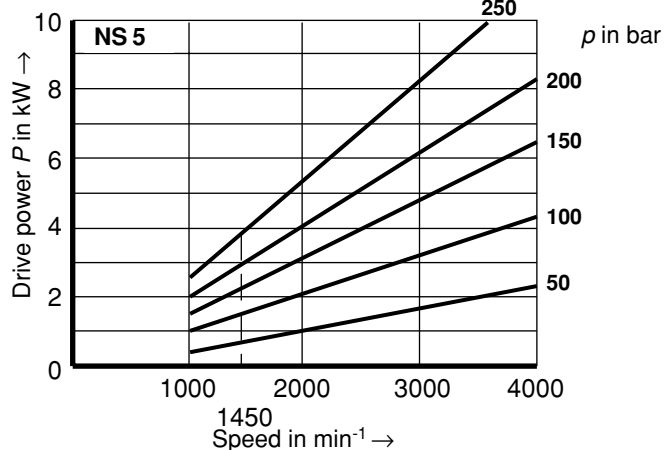
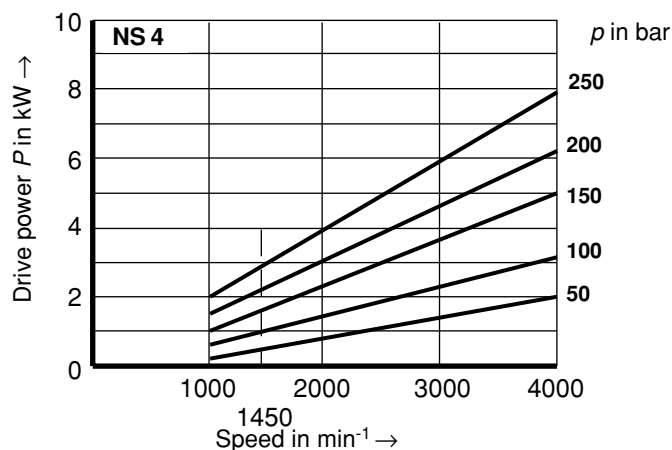
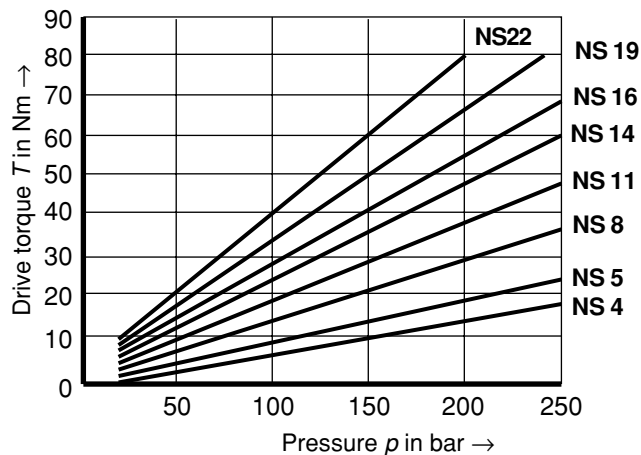
<b>Nominal size</b>		4	5	8	11	14	16	19	22
<b>Nominal flow</b>	cm <sup>3</sup>	4	5.5	8.2	11	14.1	16.2	19	22.4
<b>Operating pressure, inlet:</b> absolute pressure	bar	<i>p</i> <sub>abs</sub> min 0.7 <i>p</i> <sub>abs</sub> max 3.0							
<b>Max. continuous pressure <i>p</i><sub>1</sub></b>	bar	250	250	250	250	250	250	240	210
<b>Max. peak pressure <i>p</i><sub>2</sub> (10<sup>6</sup> peaks)</b>	bar	275	275	275	275	275	275	270	230
<b>Max. speed at continuous pressure <i>p</i><sub>1</sub></b>	min <sup>-1</sup>	5000	4000	4000	4000	3500	3000	3000	2500
<b>Min. speed at <i>p</i> = 180 bar</b>	min <sup>-1</sup>	1000	1000	700	500	500	500	500	500
<b>Min. speed at <i>p</i><sub>1</sub></b>	min <sup>-1</sup>	1200	1200	1000	700	700	700	700	700

**Characteristic curves** (measured at  $\nu = 41 \text{ mm}^2/\text{s}$  and  $\vartheta = 50 \text{ °C}$ )

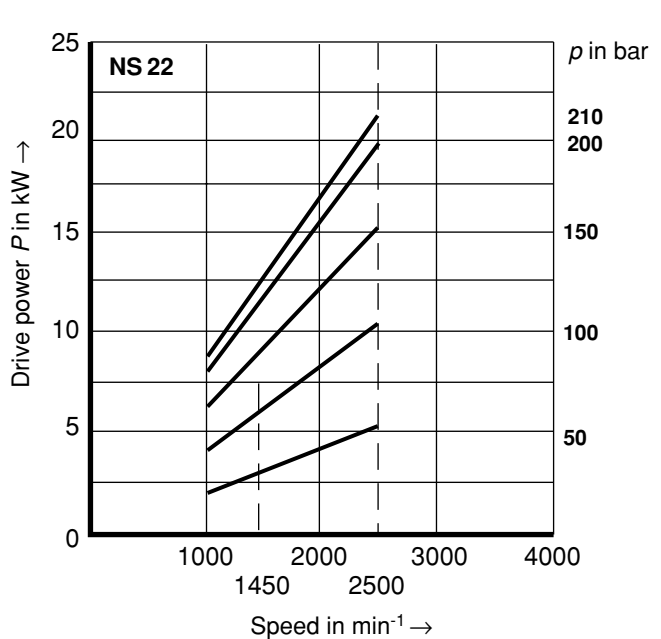
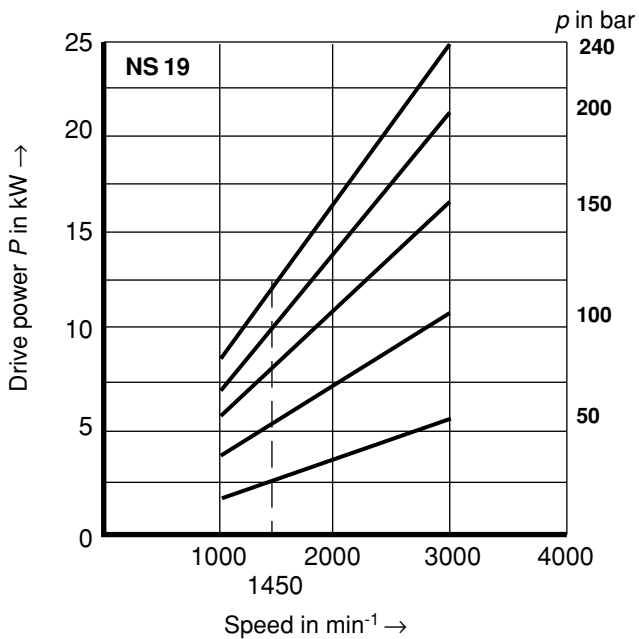
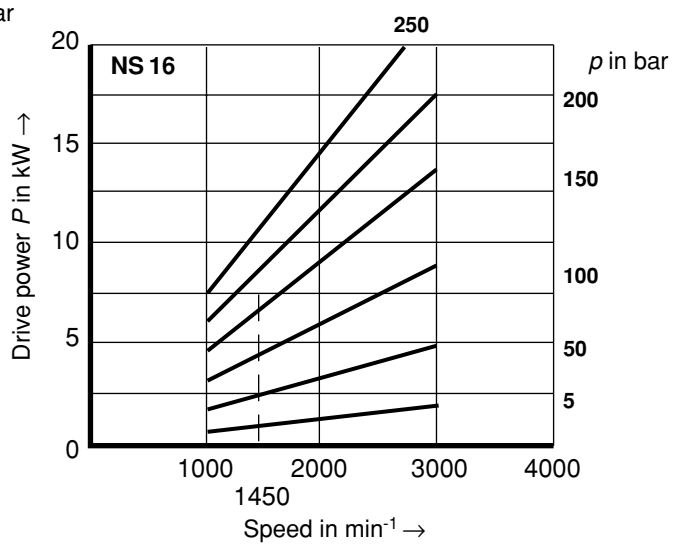
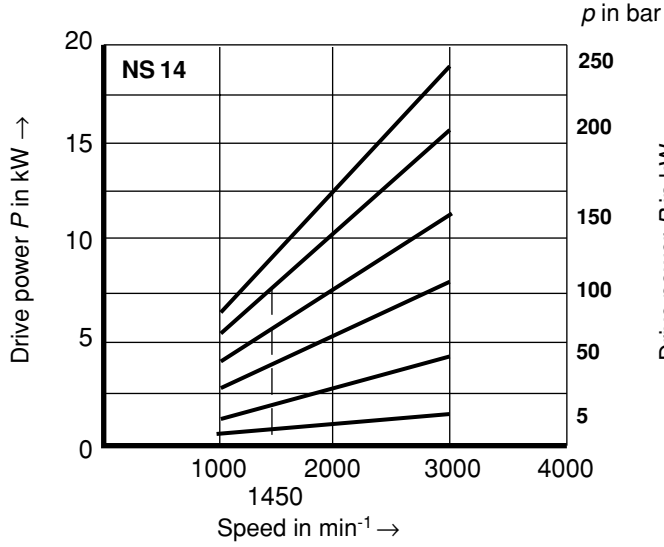
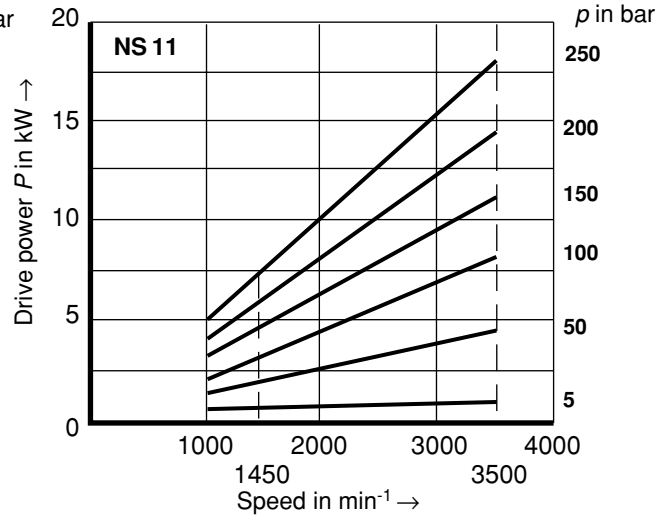
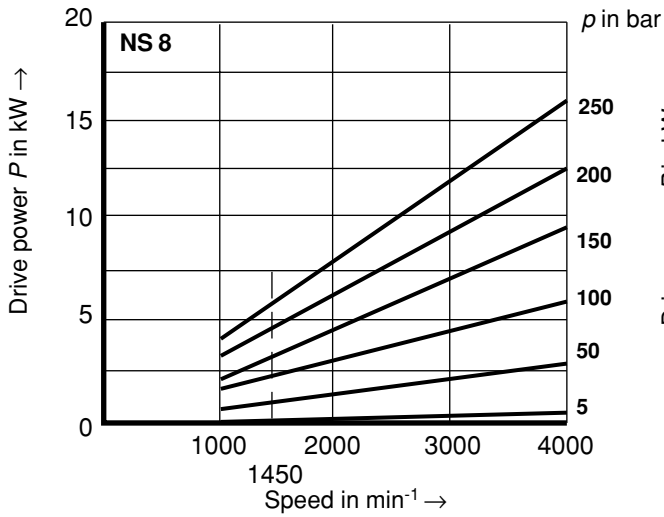


**Permissible torque at the drive shaft**

- A** = Cylindrical shaft Ø 18 mm  $T_{\text{max}} = 70 \text{ Nm}$
- C** = Conical shaft 1: 5 Ø 17 mm  $T_{\text{max}} = 150 \text{ Nm}$
- R** = Splined shaft SAE-A 5/8"  $T_{\text{max}} = 110 \text{ Nm}$
- N** = Shaft with claw coupling  $T_{\text{max}} = 70 \text{ Nm}$
- S** = Conical shaft 1: 5 Ø 20 mm for font bearing  $T_{\text{max}} = 70 \text{ Nm}$
- H** = Conical shaft 1: 8 Ø 17.4 mm  $T_{\text{max}} = 150 \text{ Nm}$



**Characteristic curves** (measured at  $v = 41 \text{ mm}^2/\text{s}$  and  $\vartheta = 50 \text{ }^\circ\text{C}$ )



**Noise pressure level** (measured at  $n = 1450 \text{ min}^{-1}$ ,  $v = 41 \text{ mm}^2/\text{s}$  and  $\vartheta = 50 \text{ }^\circ\text{C}$ )

$\rho$ in bar \ NS	4	5	8	11	14	16	19	22
5	57	59	59	59	62	62	62.5	62
50	58.5	60	60	60	64	66.5	67	66
100	59	61	61	62	65.5	68	69.5	67
150	60	62	62	64.5	66.5	69	70.5	68.5
200	61	63	63.5	66	68	69.5	70	69
250	61.5	64.5	65	68	69.5	70.5	71	-

Measured in at anechoic chamber to DIN 45 635 part 26, in dB(A).  
Distance microphone - pump = 1 m

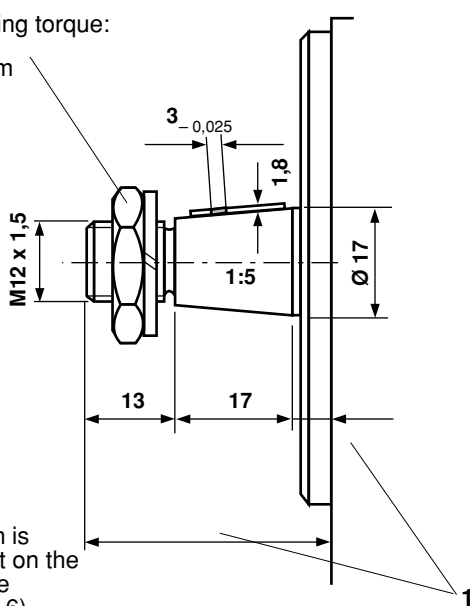
**Shaft end**

(Dimensions in mm)

**C**

Conical shaft 1: 5,  $\varnothing 17 \text{ mm}$

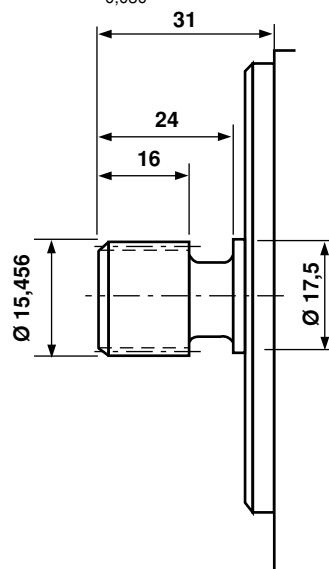
Tightening torque:  
 $70^{+10}_0 \text{ Nm}$



1 Dimension is dependent on the flange type (see page 6)

**R**

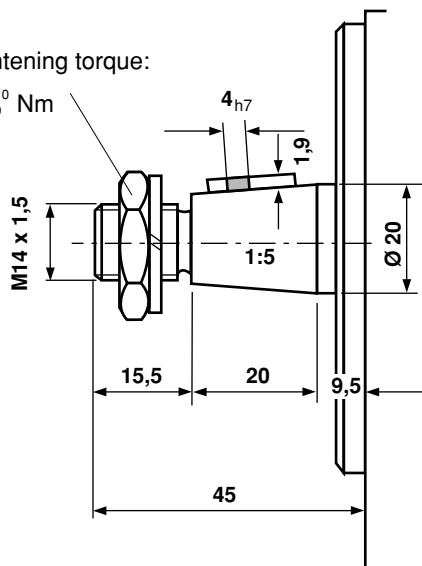
Splined shaft SAE-A 5/8", 9 teeth, 16/32 D/P  
tooth thickness  $t = 2.357_{-0,030}$



**S**

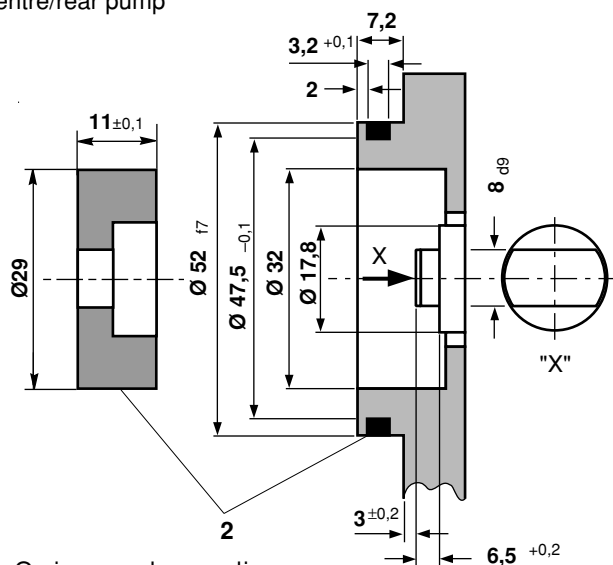
Conical shaft 1: 5,  $\varnothing 20 \text{ mm}$   
for front bearing

Tightening torque:  
 $70^{+10}_0 \text{ Nm}$



**N**

Shaft with claw coupling for single pump,  
centre/rear pump



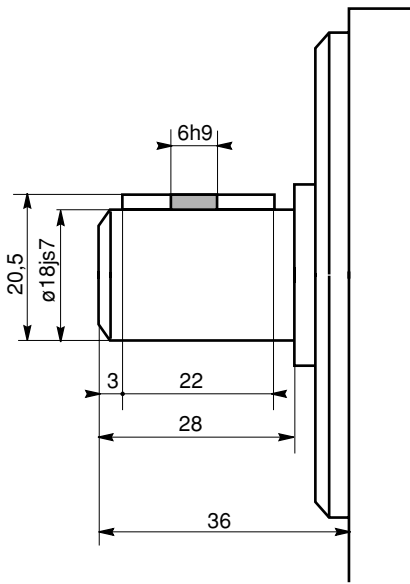
2 O-ring and coupling are included within the scope of supply

**Shaft end**

(Dimensions in mm)

**A**

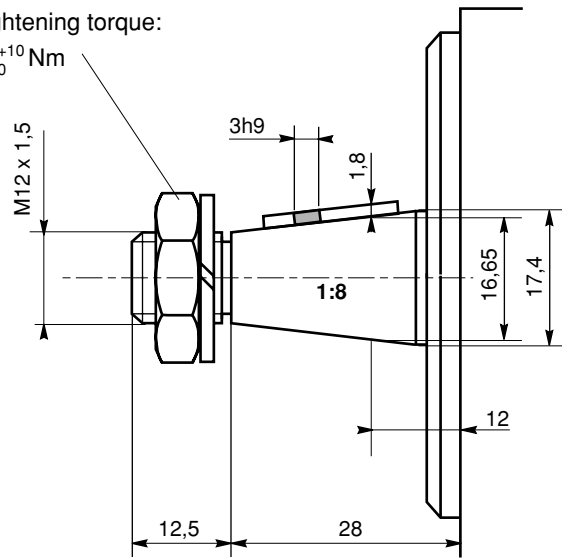
Cylindrical shaft ISO  $\varnothing$  18 mm



**H**

Conical shaft 1:8,  $\varnothing$  17.4 mm

Tightening torque:  
70<sup>+10</sup><sub>0</sub> Nm



**Unit dimensions, ordering details (dimensions in mm, A = preferred types)**

**1 PF 2 G2-4X/... <sup>R</sup>/<sub>L</sub> A 01 MB**

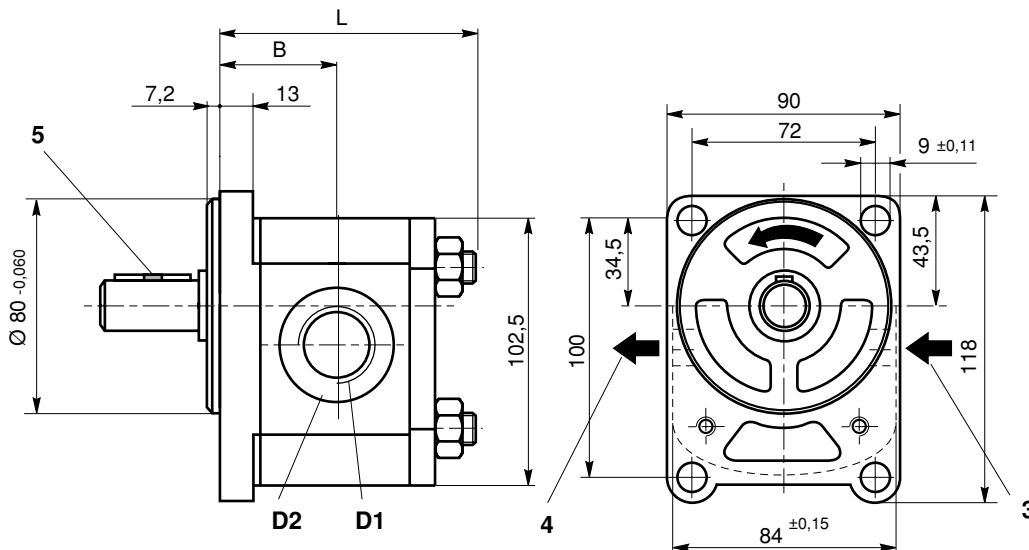
Nominal size (see table)

Direction of rotation:

Clockwise = R  
Anti-clockwise = L

Cylindrical shaft  
 $\varnothing$ 18mm

Nom. size	Dimensions				Material No.		Weight in kg
	L	B	D1	D2	Clockwise	Anti-clockwise	
004	88	42.25	G 1/2	34	07530566	07530567	2.7
005	93	41.5	G 1/2	34	07530568	07530569	2.7
008	93	45.25	G 1/2	34	07530570	07530571	2.8
011	98	47.25	G 3/4	42	07530572	07530573	3.0
016	108	49	G 3/4	42	07530574	07530575	3.0
022	118	55.5	G 3/4	42	07530576	07530577	3.5



**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft end.  
With clockwise rotation version "R" the suction and pressure ports are exchanged!

**3** Suction side **5** Cylindrical shaft  
**4** Pressure side  $\varnothing$  18

**Unit dimensions, ordering details (dimensions in mm, A = preferred types)**

**1 PF 2 G2-4X/... R L C 20 MB**

Nom. size (see table)

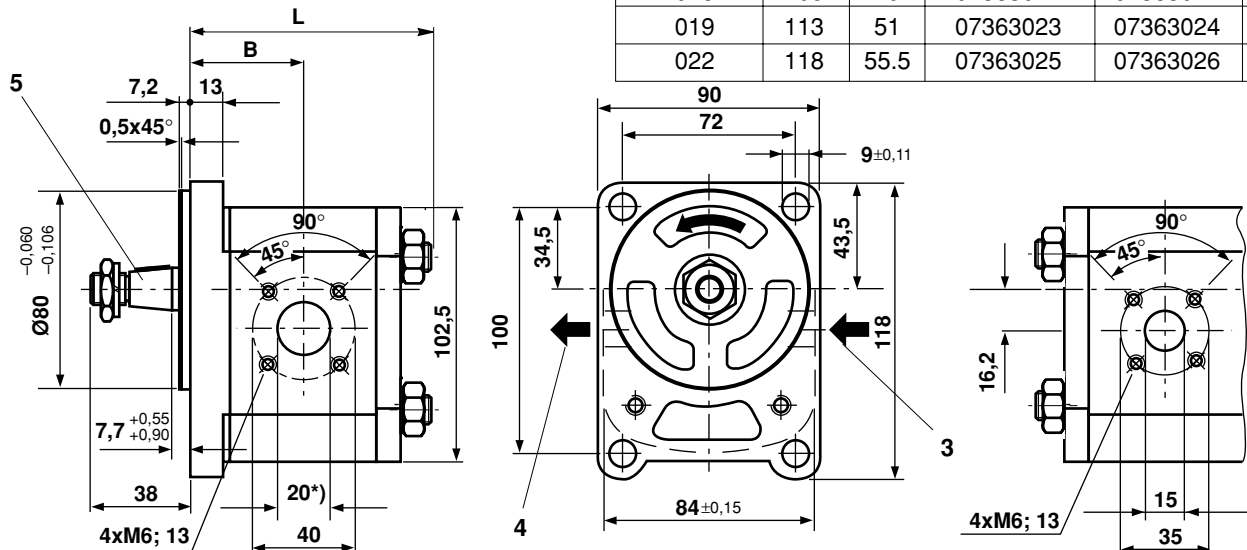
Direction of rotation:

Clockwise = R

Anti-clockwise = L

Conical shaft  
1 : 5; Ø 17 mm

Nom. size	Dimensions		Material No.		Weight in kg
	L	B	Clockwise	Anti-clockwise	
004	88	42.25	07363011	07363012	2.4
005	93	41.5	07363013	07363014	2.5
008	93	45.25	07363015	07363016	2.6
011	98	47.25	07363017	07363018	2.7
014	103	49.5	07363019	07363020	2.8
016	108	49	07363021	07363022	2.9
019	113	51	07363023	07363024	3.1
022	118	55.5	07363025	07363026	3.3



\*) Ø15 with nom. sizes 4 and 5

**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft end.

With clockwise rotation version "R" the suction and pressure ports are exchanged!

3 Suction side 5 Tapered shaft

4 Pressure side 1 : 5; Ø 17 mm

(see page 5)

**1 PF 2 G2-4X/... R L C 20 KP**

Nominal size (see table)

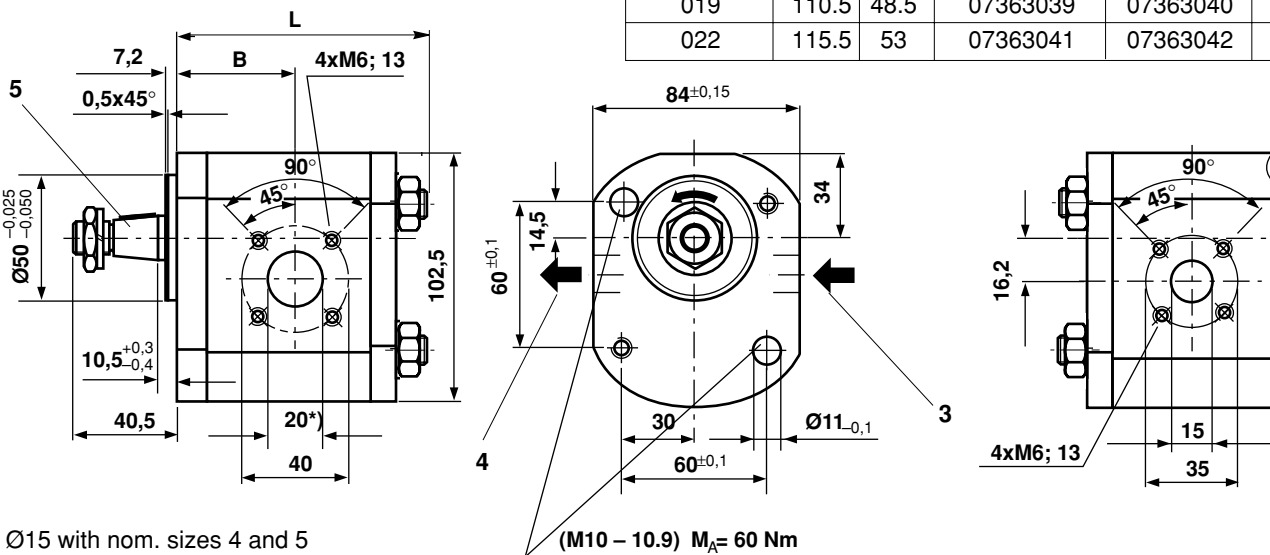
Direction of rotation:

Clockwise = R

Anti-clockwise = L

Conical shaft  
1 : 5; Ø 17 mm

Nom. size	Dimensions		Material No.		Weight in kg
	L	B	Clockwise	Anti-clockwise	
004	85.5	39.75	07363027	07363028	2.7
005	90.5	39	07363029	07363030	2.7
008	90.5	42.75	07363031	07363032	2.8
011	95.5	45	07363033	07363034	3.0
014	100.5	47	On request		3.0
016	105.5	46.5	07363037	07363038	3.0
019	110.5	48.5	07363039	07363040	3.2
022	115.5	53	07363041	07363042	3.5



\*) Ø15 with nom. sizes 4 and 5

**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft end.

With clockwise rotation version "R" the suction and pressure ports are exchanged!

3 Suction side 5 Tapered shaft

4 Pressure side 1 : 5; Ø 17 mm

(see page 5)

**Unit dimensions, ordering details (dimensions in mm, A = preferred types)**

**1 PF 2 G2-4X/... R L R 20 MR**

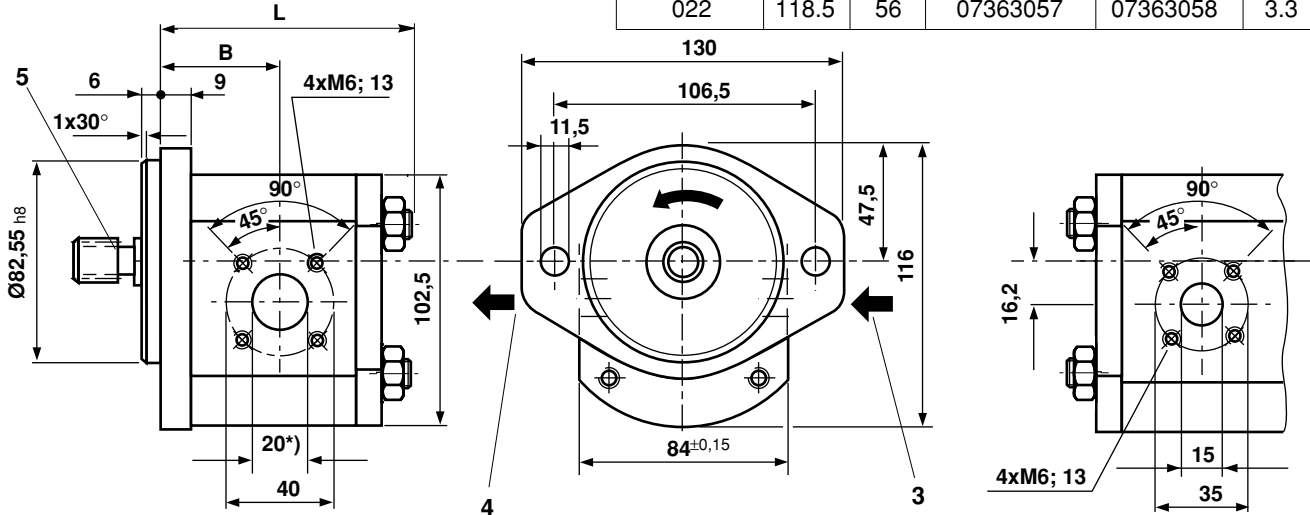
Nominal size (see table)

Direction of rotation:

Clockwise = R  
Anti-clockwise = L

Splined shaft  
SAE-A 5/8"  
9 teeth

Nom. size	Dimensions		Material No.		Weight in kg
	L	B	Clockwise	Anti-clockwise	
004	88.5	42.75	07363043	07363044	2.6
005	93.5	42	07363045	07363046	2.6
008	93.5	45.75	07363047	07363048	2.8
011	98.5	47.75	07363049	07363050	2.9
014	103.5	50	07363051	07363052	3.0
016	108.5	49.5	07363053	07363054	3.1
019	113.5	51.5	07363055	07363056	3.2
022	118.5	56	07363057	07363058	3.3



\*) Ø 15 with nom. sizes 4 and 5

**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft.  
With clockwise rotation version "R" the suction and pressure ports are exchanged!

3 Suction side 5 Splined shaft  
4 Pressure side (see page 5)

**1 PF 2 G2-4X/... R L N 20 MM**

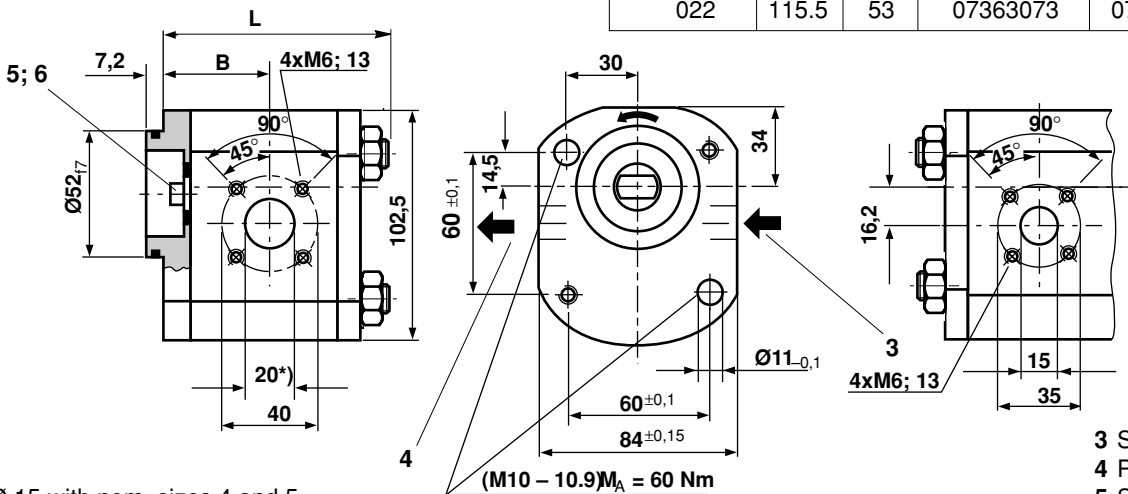
Nom. size (see table)

Direction of rotation:

Clockwise = R  
Anti-clockwise = L

Shaft  
with tongued coupling

Nom. size	Dimensions		Material No.		Weight in kg
	L	B	Clockwise	Anti-clockwise	
004	85.5	39.75	07363059	07363060	2.6
005	90.5	39	07363061	07363062	2.6
008	90.5	42.75	07363063	07363064	2.7
011	95.5	45	07363065	07363066	3.0
014	100.5	47	On request		3.0
016	105.5	46.5	07363069	07363070	3.0
019	110.5	48.5	07363071	07363072	3.0
022	115.5	53	07363073	07363074	3.5



\*) Ø 15 with nom. sizes 4 and 5

**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft.  
With clockwise version "R" the suction and pressure ports are exchanged!

**Attention:** With NS 19 and 22 pressure limitation due to maximum permissible torque (see page 3).

3 Suction side  
4 Pressure side  
5 Shaft with claw coupling (see page 5)  
6 Pump without shaft seal ring



**Unit dimensions, ordering details**

(Dimensions in mm)

**1 PF 2 G2-4X/... R S 20 MA**

Nominal size (see table)

Direction of rotation:

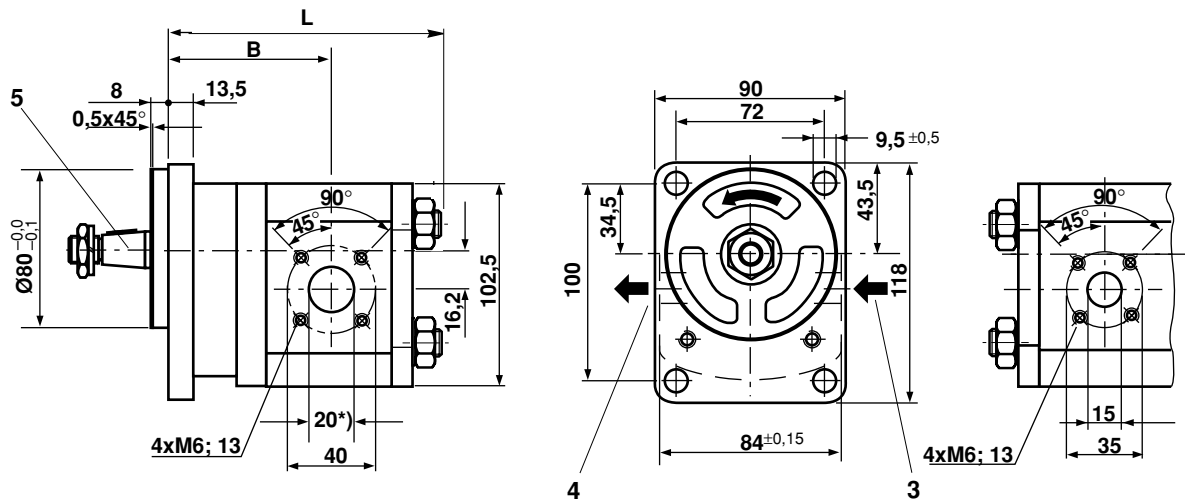
Clockwise = R

Anti-clockwise = L

Conical shaft  
1:5; Ø 20 mm

Pump with front bearing  
to take up radial  
and axial forces  
(see below)

Nom. size	Dimensions		Material No.		Weight in kg
	L	B	Clockwise	Anti-clockwise	
004	117.5	71.5	07363075	07363076	3.4
005	122.5	71	07363077	07363078	3.4
008	122.5	74.75	07363079	07363080	3.5
011	127.5	77	07363081	07363082	3.8
014	132.5	79	On request		3.8
016	137.5	78.5	07363085	07363086	3.8
019	142.5	80.5	07363087	07363088	3.8
022	147.5	85	07363089	07363090	4.3

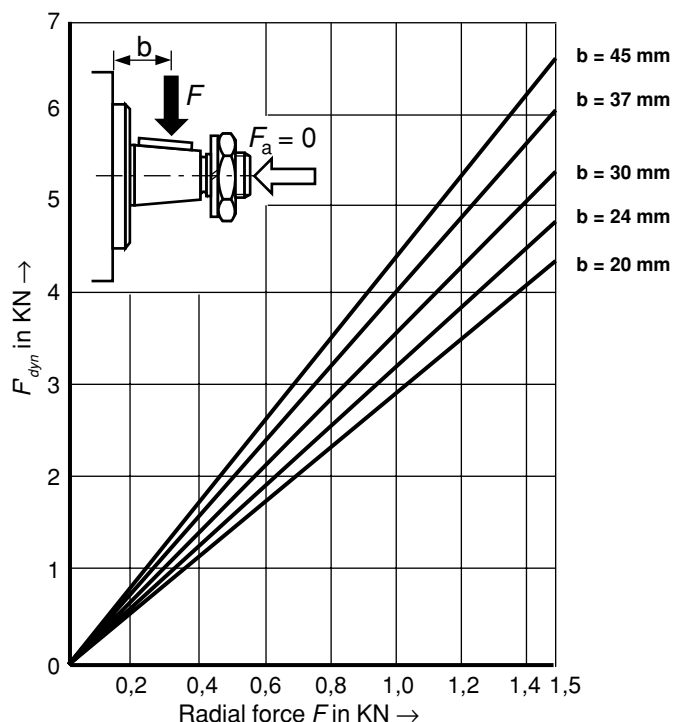


\*) Ø 15 with nominal sizes 4 and 5

**Direction of rotation:** Anti-clockwise (version "L") viewed on the shaft end.  
With clockwise rotation version "R" the suction and pressure ports are exchanged!  
**Attention:** With NS 19 and 22 pressure limitation due to maximum permissible torque at the front bearing (see page 3).

**3** Suction side  
**4** Pressure side  
**5** Conical shaft  
1 : 5; Ø 20 mm  
(see page 5)

**Front bearing, theoretical service life**



$$L_h = \frac{10^6}{n \cdot 60} \left( \frac{C_{dyn}}{F'_{dyn}} \right)^3$$

- $n$  = Speed in  $\text{min}^{-1}$
- $L_h$  = Theoretical bearing life in hours
- $F'_{dyn}$  = Equivalent dynamic load
- $C_{dyn}$  = Dynamic load constant 21,2 kN

**Unit dimensions, ordering details (Dimensions in mm, A= preferred types)**

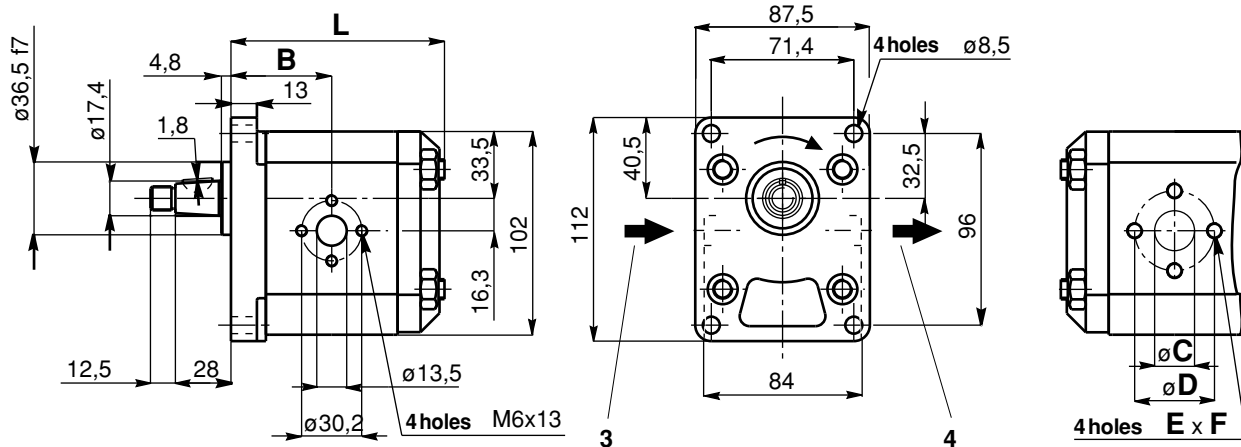
**1 PF 2 G2-4X/... R H 30 MO**

Nominal size  
(see table)

Direction of rotation:  
Clockwise = R  
Anti-clockwise = L

Conical shaft  
1:8; Ø 17.4 mm

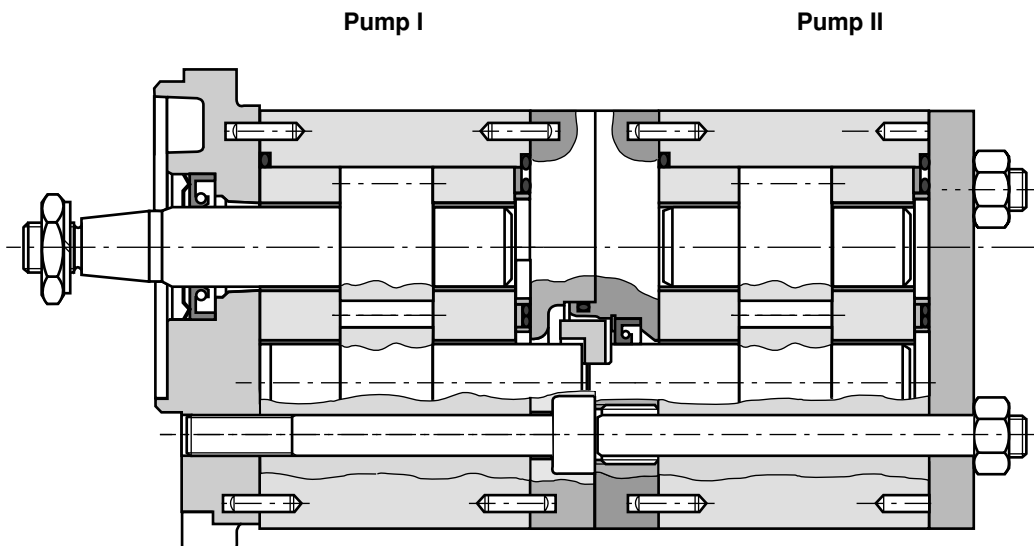
NS	Dimensions						Material No.		Weight in kg
	B	L	C	D	E	F	Clockwise	Anti-clockwise	
004	41.8	87.5	13.5	30.2	M6	13	07530858	On request	2.6
005	41	92.5	13.5	30.2	M6	13	07530859	On request	2.6
008	44.8	92.5	13.5	30.2	M6	13	07530860	On request	2.8
011	46.8	97.5	13.5	30.2	M6	13	07530861	07530887	2.9
014	49	102.5	20	39.7	M8	16	07530862	On request	3.0
016	48.5	107.5	20	39.7	M8	16	07530863	On request	3.1
019	50.5	112.5	20	39.7	M8	16	07530864	On request	3.2
022	55	117.5	20	39.7	M8	16	07530865	On request	3.3



**Direction of rotation:** Clockwise (version "R") viewed on the shaft end.  
With anti-clockwise rotation version "L" the suction and pressure ports are exchanged!

- 3 Suction side
- 4 Pressure side
- 5 Conical shaft  
1:8 ; Ø 17.4 mm  
(see page 6)

**Multiple pumps type G2, series 4X**

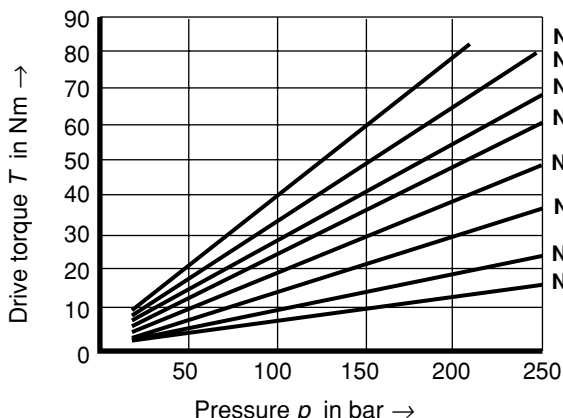


**Technical data** (for applications outside these parameters, please consult us)

- The same general parameters apply as with single pumps (see page 3)
- Weight:** See table of individual pump types  
Combination parts: plus 0.4 kg

**Please note with multiple pumps the following is of particular importance:**

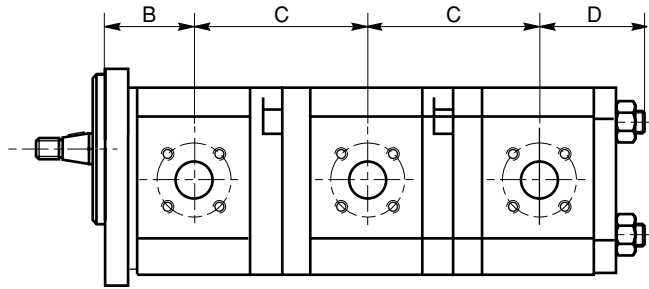
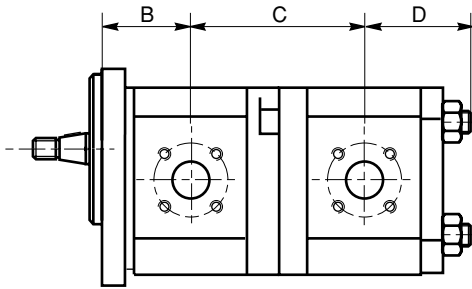
- Nominal size 4 cannot be used as pump 1.
- Pump I should have a higher load than pump II (pressure x flow).
- The individual pumps are separated on the suction side by a shaft seal ring (pumps can draw from different tanks).
- The drive shafts and the coupling piece between the pumps have limitations with regard to the transferable torque (see below).
- When selecting the multiple pumps it must be ensured that the sum of the torques does not exceed the permissible values.



**Permissible torques at shaft end:**

- A** = Cylindrical shaft Ø 18 mm  $T_{max} = 70 \text{ Nm}$
- C** = Conical shaft 1 : 5; Ø 17 mm  $T_{max} = 150 \text{ Nm}$
- R** = Splined shaft SAE-A 5/8"  $T_{max} = 110 \text{ Nm}$
- H** = Conical shaft 1 : 8; Ø 17.4 mm  $T_{max} = 150 \text{ Nm}$
- N** = Shaft with tongued coupling  $T_{max} = 70 \text{ Nm}$
- Coupling between pump I and pump II  $T_{max} = 70 \text{ Nm}$

**Multiple pumps (Dimensions in mm, A = preferred types)**



1 PF 2 G2-4X/ ... RC 20 MBK

1 PF 2 G2-4X/ ... LN 20 MDN

1 PF 2 G2-4X/ ... LN 20 MDL

Nominal size  
(see table)

Ports (01, 20)

Direction of rotation:

Clockwise = R  
Anti-clockwise = L

Shaft ends (A, C, N, R)

Dim. C and D

		Front pump							Dim. D
		Dim. C							
		005	008	011	014	016	019	022	
Rear pump	004	84.75	84.5	86.5	88.75	92.25	94.25	94.75	46.0
	005	84	83.75	85.75	88	91.5	93.5	94	51.5
	008		87.5	89.5	91.75	95.25	97.25	97.75	48.0
	011			91.5	93.75	97.25	99.25	99.75	51.0
	014				96	99.5	101.5	99.75	53.5
	016					99	101	101.5	59.0
	019						103	103.5	62
	022							108	62.5

Dim. B: see single pump

Material numbers for front centre and rear pumps

		004	005	008	011	014	016	019	022
Front pump	RC20MBK	NA	07363107	07363109	07363111	07363113	07363115	07363117	07363119
	RR20MRK	NA	07363151	07363153	07363155	07363157	07363159	07363161	07363163
	RC20KPK	NA	07363137	07363139	07363141	07363143	07363145	07363147	07363149
	RA01MBK	NA	07530581	07530583	07530585	NA	07530587	NA	07530589
Centre pump	LN20MDN	NA	07363286	07363294	07363296	07363298	07363300	07363302	07363304
	LN01MDN	NA	07530601	07530602	07530603	NA	07530604	NA	07530605
Rear pump	LN20MDL	07363122	07363124	07363126	07363128	07363130	07363132	07363134	07363136
	LN01MDL	07530611	07530612	07530613	07530614	NA	07530615	NA	07530616

		004	005	008	011	014	016	019	022
Front pump	LC20MBK	NA	07363108	07363110	07363112	07363114	07363116	07363118	07363120
	LR20MRK	NA	07363152	07363154	07363156	07363158	07363160	07363162	07363164
	LC20KPK	NA	07363138	07363140	07363142	07363144	07363146	07363148	07363150
	LA01MBK	NA	07530582	07530584	07530586	NA	07530588	NA	07530590
Centre pump	RN20MDN	NA	07363291	07363293	07363297	07363295	07363301	07363299	07363303
	RN01MDN	NA	07530606	07530607	07530608	NA	07530609	NA	07530610
Rear pump	RN20MDL	07363121	07363123	07363125	07363127	07363129	07363131	07363133	07363135
	RN01MDL	07530617	07530618	07530619	07530620	NA	07530621	NA	07530622

NA. Not available



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