

External Gear Pumps Series J

RE 10 094/05.12

AZPJ-...

Fixed pumps
 $V = 12...16 \text{ cm}^3/\text{rev}$

SILENCE PLUS



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Features

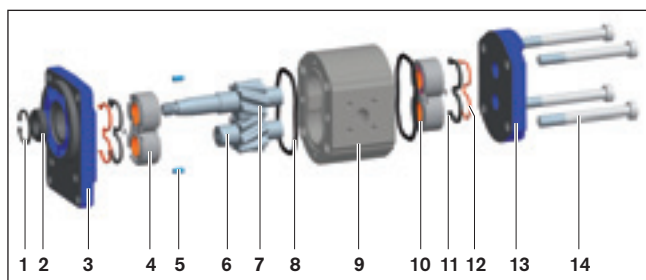
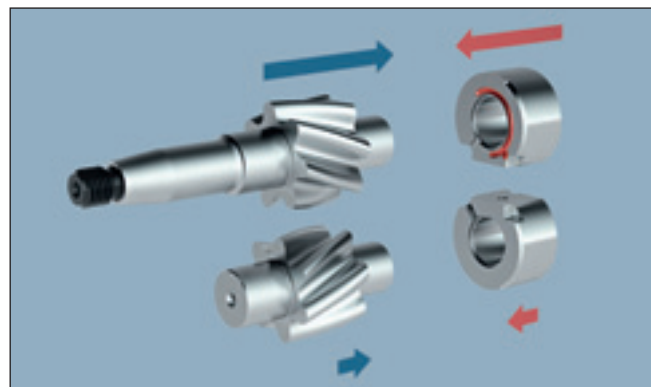
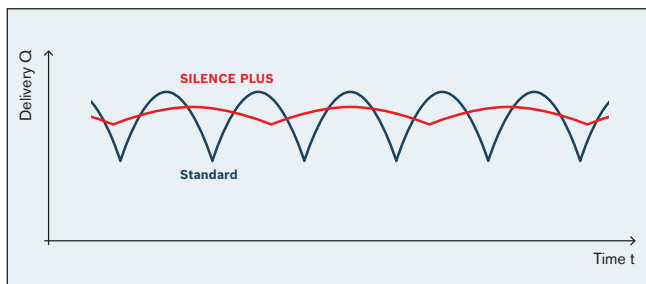
Page	
	– Nominal pressure 280 bar
	– Slide bearings for heavy duty applications
	– Drive shafts to ISO or SAE
	– Combination of several pumps possible
	– Line ports: connection flange
	– very low inherent noise
	– pleasant pitch due to low frequency
	– Optimized pressure pulsation with reduced noise emissions and vibration excitation in the system
	– Consistent high quality
	– Considerably longer service life due to reinforced shaft and case

General

The key task of external gear units is to convert mechanical energy (torque and rotational speed) into hydraulic energy (flow and pressure). In external gear motors this is the other way round. These units are required to be highly efficient in order to avoid unnecessary heat. This efficiency is achieved by means of precision production engineering and pressure sensitive gap sealing.

With the extremely low-noise SILENCE PLUS pumps the inherent noise is reduced by 15 dB (A) in average and, in addition, the flow pulsation about 75%, versus standard external gear pumps.

The displacement method



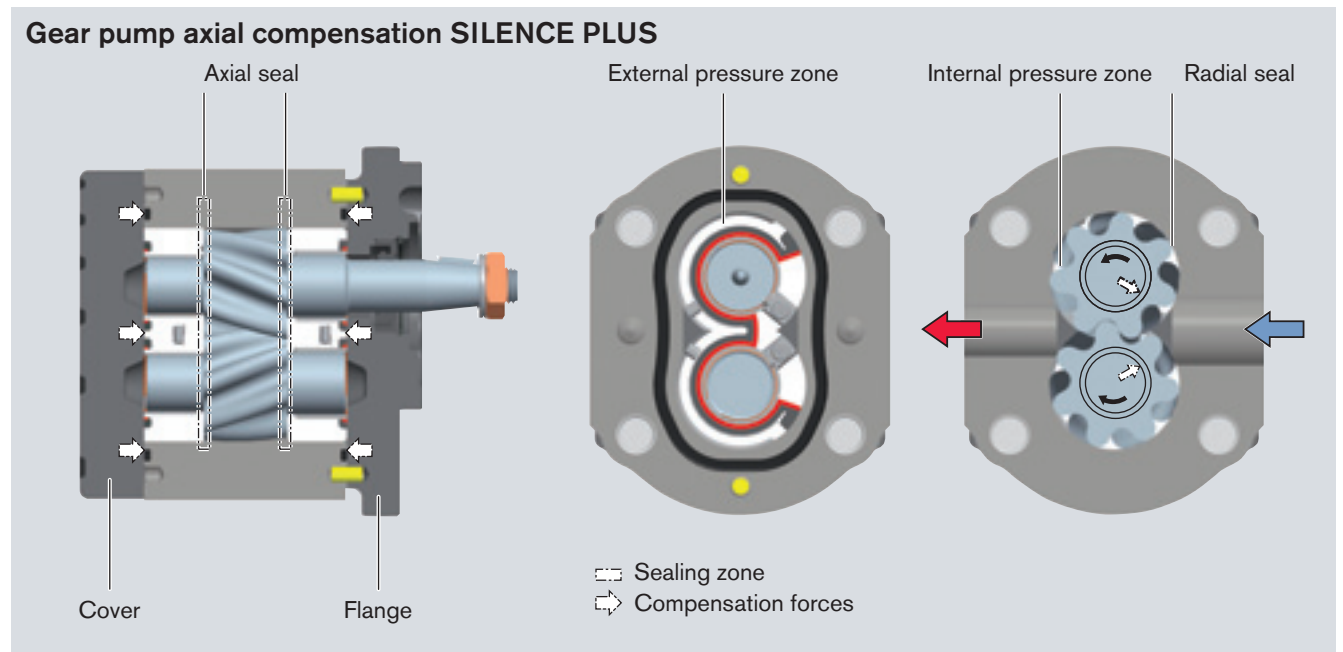
- | | |
|---------------------|--------------------|
| 1 Retaining ring | 8 Case seal |
| 2 Shaft seal ring | 9 Pump case |
| 3 Front cover | 10 Bearing |
| 4 Slide bearing | 11 Axial zone seal |
| 5 Centering pin | 12 Support |
| 6 Gear | 13 End cover |
| 7 Gear (frictional) | 14 Fixing screws |

Continuous tooth contact reduces operating noise: A non-involute rounded tooth profile, combined with helical cut teeth, forms the heart of the SILENCE PLUS. Thanks to permanent tooth contact the fluid is transported almost continuously and noiselessly. The possibility of noise from trapped oil between the tooth flanks is prevented in the first place. Hydrostatic bearing ensures long service life: The high performance and long service life of the SILENCE PLUS is due to a Rexroth patented solution: Hydrostatic grooves provide wear-free compensation for the internal axial forces generated in the helical gear – even at pressures up to 280 bar!

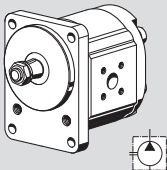
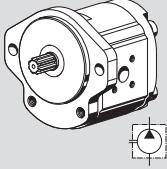
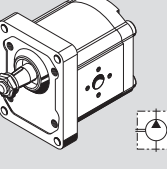
Construction

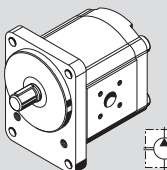
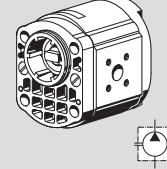
The external gear unit consists essentially of a pair of gears supported in bearing bushings and the case with a front and a rear cover. The drive shaft protrudes from the front cover where it is sealed by the shaft seal ring. The bearing forces are absorbed by special bearing bushings with sufficient elasticity to produce surface contact instead of line contact. They also ensure excellent resistance to galling – especially at low speed. The gears have 7 teeth. This keeps both flow pulsation and noise emission to a minimum.

The internal sealing is achieved by forces which are proportional to delivery pressure. This ensures optimum efficiency. The bearings provide the seal at the ends of the gaps between the teeth which carry the pressurized oil. The sealing zone between the gear teeth and the bearings is controlled by the admission of operating pressure to the rear of the bearing bushings. Special seals form the boundary of the zone. The radial clearance at the tips of the gear teeth is sealed by internal forces pushing them against the case.



Product overview of “SILENCE PLUS standard range”






















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Ordering code

External gear units Single pumps "SILENCE PLUS"




























AZ	P	J	-	x	x	-	016	R	C	B	20	M	B	18009	S xxxx
															Special design *)
Function															Valve adjustment
P = Pump															
Series															200 xx = PRV 200 bar xxx 11 = FCV 11 l/min 18009 = PRV + FCV 180 bar, 9 l/min
2x = Reinforced bearing Ø 20															
Version															Rear cover
1 = Phosphatized, pinned 2 = Chromatized, pinned															
Size (J)															B = Standard D = PRV residual flow internal T = PRV residual flow external E = FCV residual flow external S = FCV residual flow internal V = PRV + FCV
012 = 12.0 cm ³ /rev 014 = 14.0 cm ³ /rev 016 = 16.0 cm ³ /rev															
Direction of rotation															
R = Clockwise L = Counter-clockwise															Seals
															M = NBR P = FKM K = NBR, SSR in FKM

Drive shafts			Front cover			Line ports				
Suitable front cover										
C	Tapered key shaft 1 : 5		B	P	B	Square flange Centering Ø 80 mm		20	Rectangular flange	
H	Tapered key shaft 1 : 8		O		R	SAE J 744 82-2 A 2-bolt flange Ø 82.55 mm		30	Rectangular flange	
N	Dihedral claw		M		P	2-bolt mounting Centering Ø 50 mm				
Q	Straight keyed shaft SAE J 744 16-1		R		O	Square flange Centering Ø 36.47 mm				
R	Splined shaft SAE J 744 16-4 9T		R	C	C	SAE J 744 101-2 B 2-bolt flange Ø 101.6 mm				
P	Splined shaft SAE J 744 19-4 11T		R	C	M	2-bolt mounting Centering Ø 52 mm with seal ring				
F	Splined shaft DIN 5482 B 17 x 14		B	P	A	Outboard bearing Ø 80 mm, Type 1				
S	Tapered key shaft 1 : 5 for flange A		A	G	N	2-bolt mounting Centering Ø 50 mm				
A	Straight keyed shaft ISO Ø 18 mm		B		T	4-bolt mounting Centering Ø 52 mm with seal ring				
					G	Outboard bearing Ø 80 mm, Type 2				

Not all variants can be selected by using ordering code! Please select the required pump by using the selection tables (standard types) or after consultation with Bosch Rexroth! Special options are possible upon request.

Ordering code

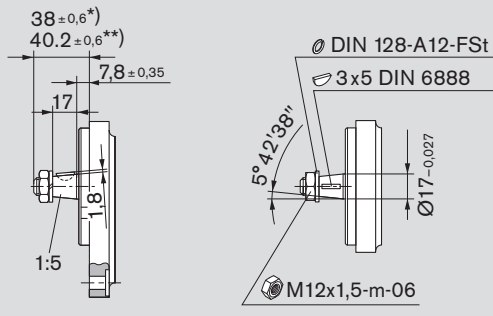
External gear units Multiple pumps

AZ	P	GGSS	-	x	x	-	032/022/016/005	R	C	B	20	20	20	20	K	B
Function P = Pump Series B = 1.0...7.1 cm ³ /rev *) F = 4.0...28 cm ³ /rev N = 20.0...36 cm ³ /rev G = 22.5...100 cm ³ /rev S = 4.0...28 cm ³ /rev **) T = 20.0...36 cm ³ /rev U = 22.5...63 cm ³ /rev J = 12.0...16 cm ³ /rev ***) Series , relates to pump section 1 1x = Standard bearing 2x = Reinforced bearing Version , relates to pump section 1 1 = Phosphatized, pinned 2 = Chromatized, pinned Size corresponding to each series Direction of rotation R = cw, L = ccw							*) Standard **) SILENCE ***) SILENCE PLUS			Rear cover relates to last pump section B = Standard Seals M = NBR P = FKM K = NBR, SSR in FKM Shaft seal relate to pump section 1						
Drive shafts relates to pump part 1							Front cover relates to pump part 1				Line ports every pump parts					
Series B:							Suitable front cover									
H	Tapered key shaft 1 : 8			O	O	Square flange Centering Ø 25.38 mm			02	Thread, metric DIN 3852 T1						
Series F, S, J:																
C	Tapered key shaft 1 : 5			B	B	Square flange Centering Ø 80 mm			20	Rectangular flange						
H	Tapered key shaft 1 : 8			O	O	Square flange Centering Ø 36.47 mm			30	Rectangular flange						
R	Splined shaft SAE J 744 16-4 9T			R	R	SAE J 744 82-2 A Centering Ø 82.55 mm 2-bolt mounting										
Series N, T:																
C	Tapered key shaft 1 : 5			B	B	Square flange Centering Ø 100 mm			07	Square flange SAE Thread, metric						
D	Splined shaft SAE J 744 22-4 13T			C	C	SAE J 744 101-2 B Centering Ø 101.6 mm 2-bolt mounting			20	Rectangular flange						
N	Dihedral claw			M	M	Centering Ø 52 mm with seal ring										
Series G, U:																
C	Tapered key shaft 1 : 5			B	B	Square flange Centering Ø 105 mm			07	Square flange SAE Thread, metric						
D	Splined shaft SAE J 744 22-4 13T			C	C	SAE J 744 101-2 B Centering Ø 101.6 mm 2-bolt mounting			20	Rectangular flange						
H	Tapered key shaft 1 : 8			O	O	Square flange Centering Ø 50.78 mm										

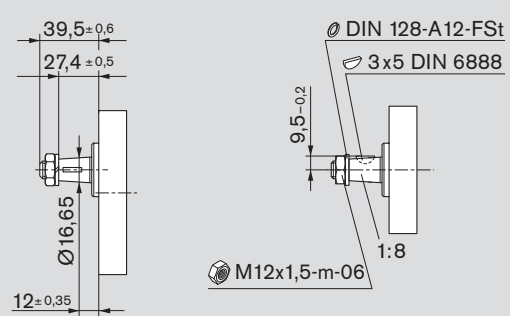
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Drive shafts

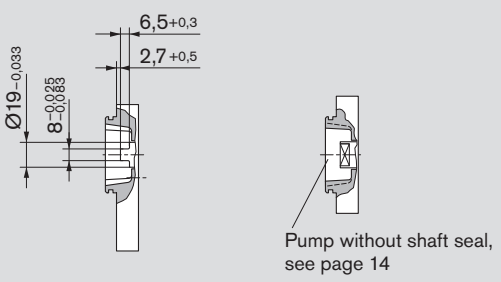
C



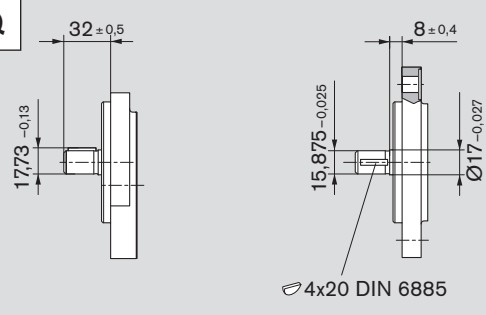
H



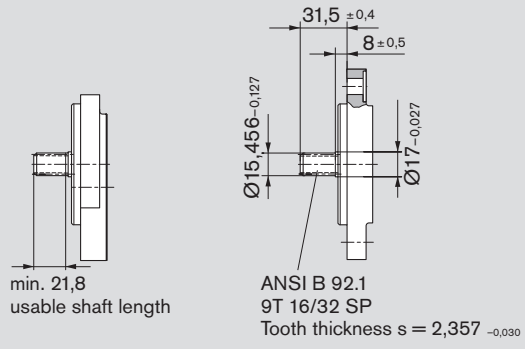
N



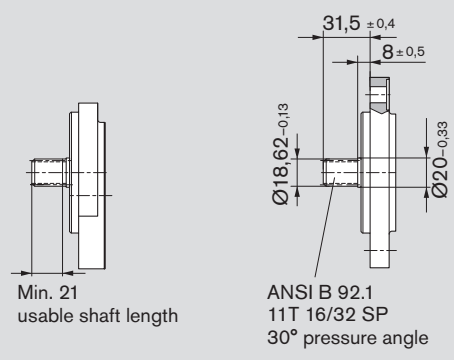
Q



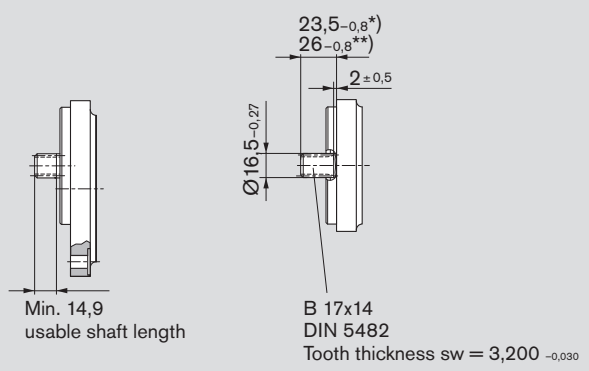
R



P

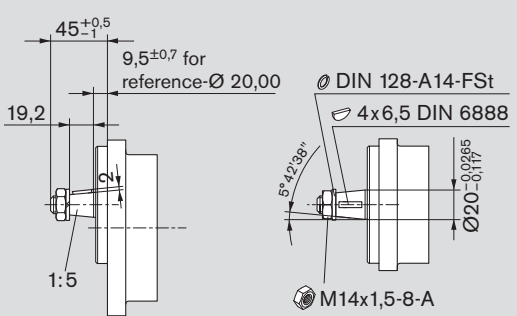


F

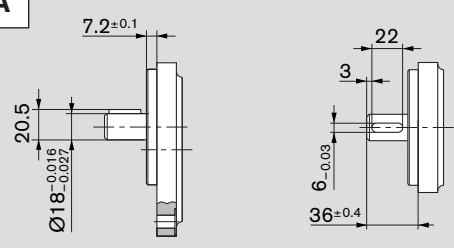


*) in combination with front cover **B**
) in combination with front cover **P

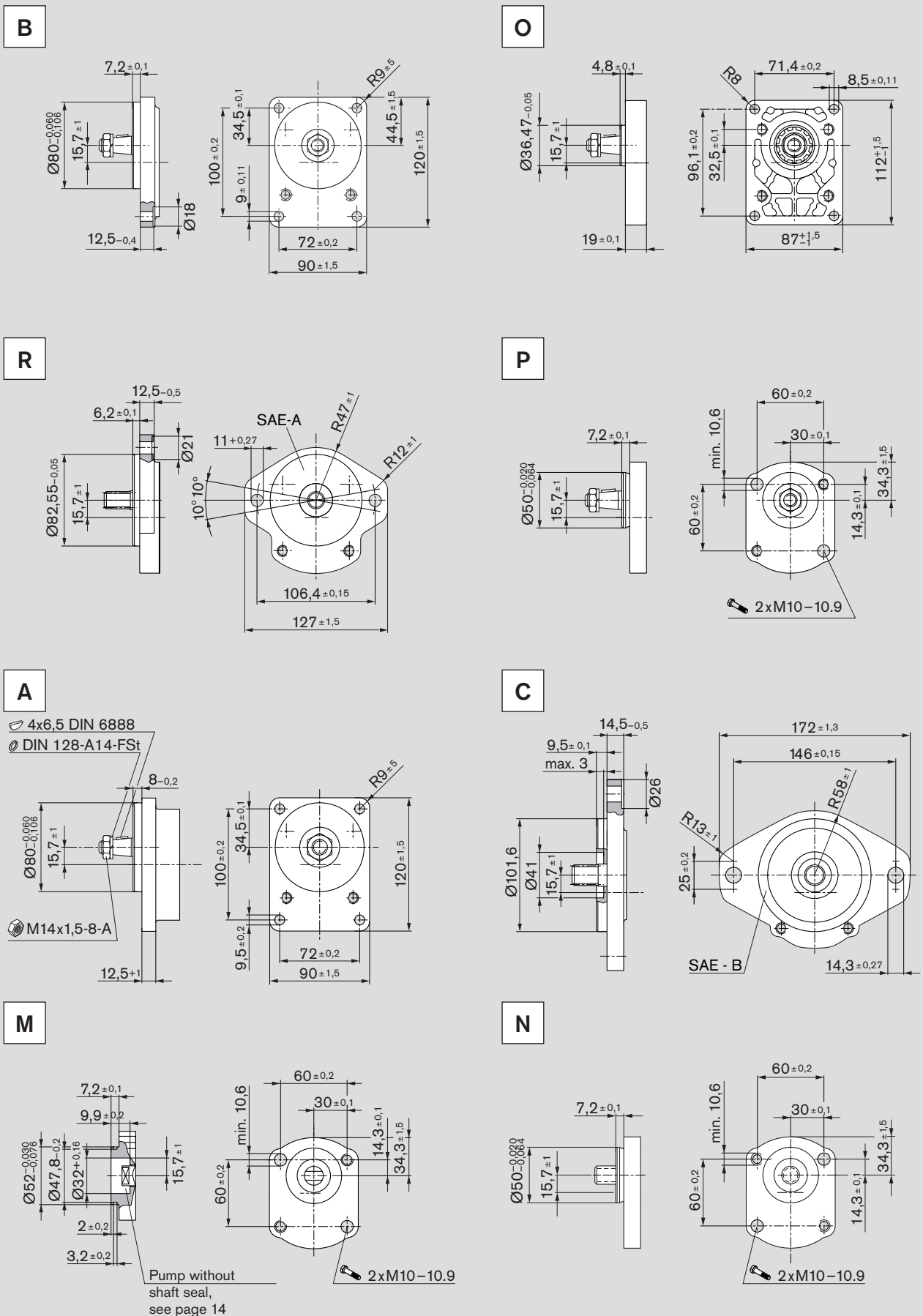
S



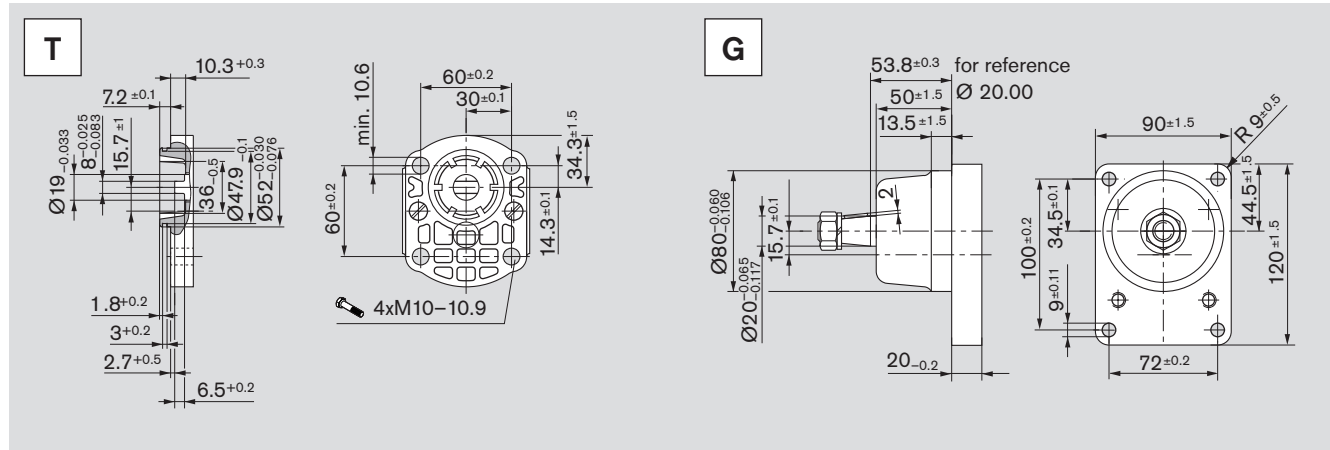
A



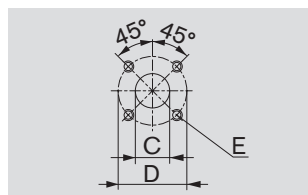
Front cover



Front cover (continued)

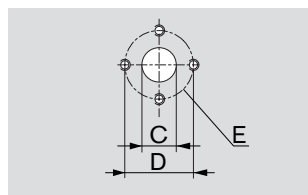


Line ports



20 Rectangular flange

Ordering code	Size	Pressure side			Suction side		
		C	D	E	C	D	E
20	12...16 cm ³	15	35	M6, depth 13	20	40	M6, depth 13

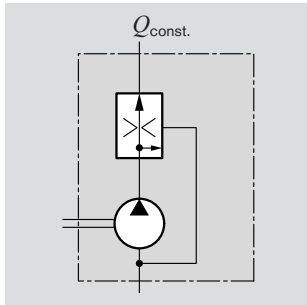


30 Rectangular flange

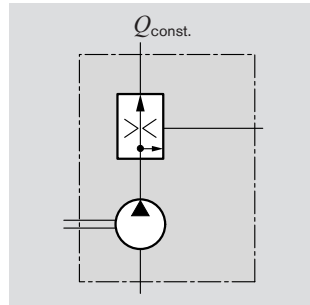
Ordering code	Size	Pressure side			Suction side		
		C	D	E	C	D	E
30	12...16 cm ³	13.5	30.2	M6, depth 13	20.0	39.7	M8, depth 13

Gear pumps with integral valves

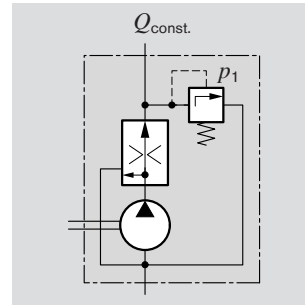
In order to reduce external pipework it is possible to incorporate a flow-control valve or pressure-relief valve in the rear cover of the gear pump. A typical application of this is in the supply of hydraulic oil in power steering systems. The pump delivers a constant flow irrespective of the speed at which it is driven. The excess flow is either returned internally to the suction port or distributed externally to other items of equipment.



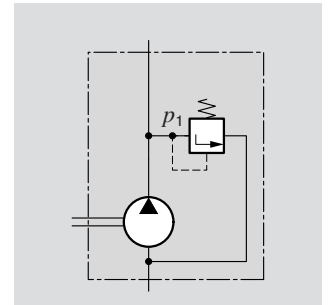
3-way flow-control valve.
Excess flow returned to suction line
 $Q_{const.} = 2...30 \text{ l/min}$



3-way flow-control valve.
Excess flow distributed externally; loadable
 $Q_{const.} = 2...30 \text{ l/min}$



3-way flow-control valve with pressure-relief valve.
Excess flow returned to suction line
 $Q_{const.} = 2...30 \text{ l/min}$
 $p_1 = 100...180 \text{ bar}$



Pressure-relief valve.
Discharge returned to suction line
 $p_1 = 5...250 \text{ bar}$

Ordering code

S	xxx17
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E	xxx12
---	-------

V	15011
---	-------

D	180xx
---	-------

Design calculations for pumps

The design calculations for pumps are based on the following parameters:

V [cm ³ /rev]	Displacement
Q [l/min]	Delivery
p [bar]	Pressure
M [Nm]	Drive torque
n [rev/min]	Drive speed
P [kW]	Drive power

It is also necessary to allow for different efficiencies such as:

η_v	Volumetric efficiency
η_{hm}	Hydraulic-mechanical efficiency
η_t	Overall efficiency

The following formulas describe the various relationships. They include correction factors for adapting the parameters to the usual units encountered in practice.

Caution: Diagrams providing approximate selection data will be found on subsequent pages.

$$Q = V \cdot n \cdot \eta_v \cdot 10^{-5}$$

$$p = \frac{M \cdot \eta_{hm}}{1.59 \cdot V}$$

$$P = \frac{p \cdot Q}{6 \cdot \eta_t}$$

$$V = \frac{Q}{n \cdot \eta_v} \cdot 10^5$$

$$M = \frac{1.59 \cdot V \cdot p}{\eta_{hm}}$$

$$Q = \frac{6 \cdot P \cdot \eta_t}{p}$$

$$n = \frac{Q}{V \cdot \eta_v} \cdot 10^5$$

$$M = \frac{1.59 \cdot V \cdot p}{\eta_{hm}}$$

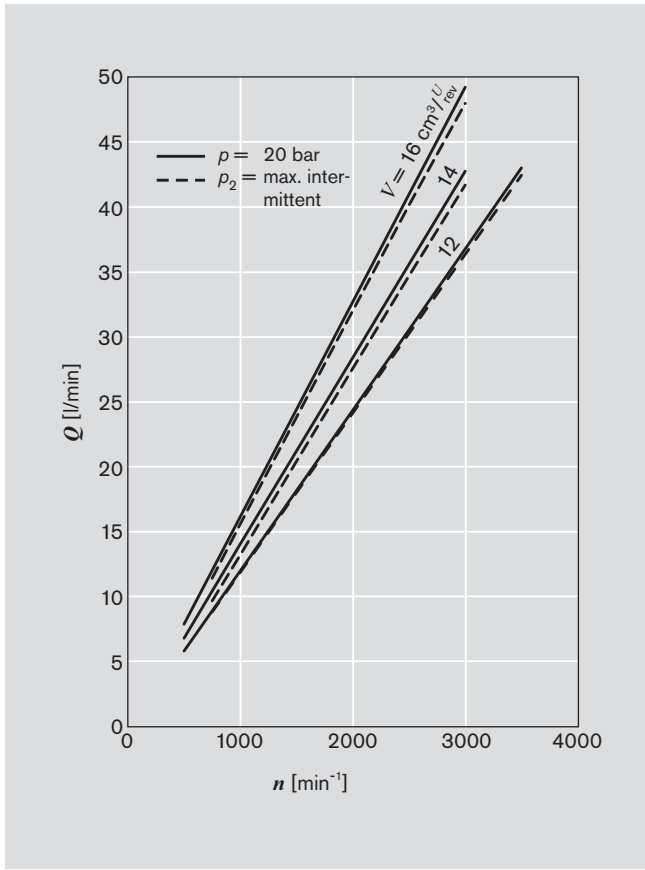
$$p = \frac{6 \cdot P \cdot \eta_t}{Q}$$

[%]	n — η_v — Q	V [cm ³ /rev]	Q [l/min]	p [bar]
	M — η_{hm} — P	n [rev/min]	P [kW]	M [Nm]
	P — η_t — $p \cdot Q$			

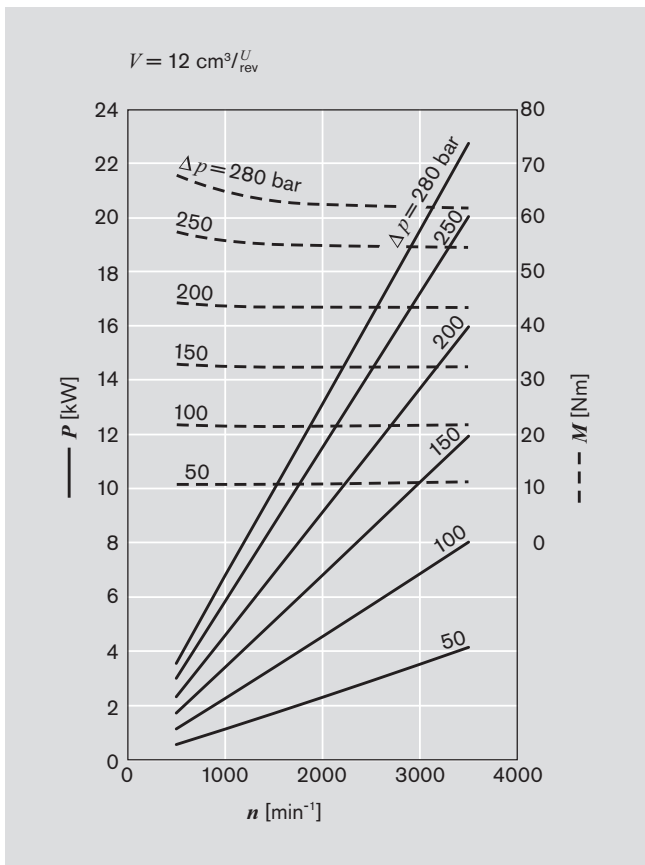
Caution: η [%] e.g. 95 [%]

Performance charts

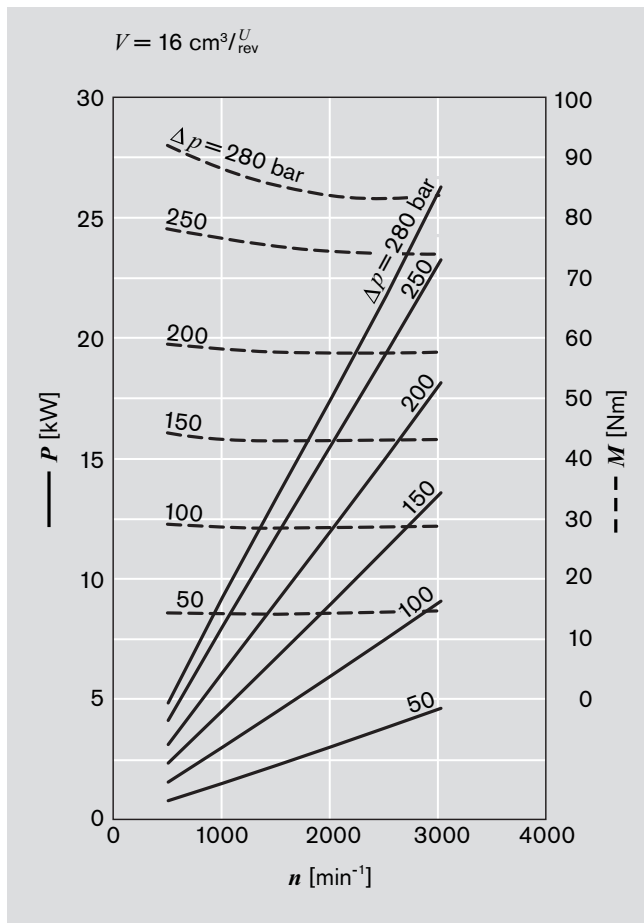
$\nu = 32 \text{ mm}^2/\text{s}, \vartheta = 50^\circ\text{C}$



$Q = f(n, V)$ incl. η_v
 $P = f(n, p)$ — incl. η_t
 $M = f(n, p)$ - - - incl. η_{hm}



Performance charts (continued)



Noise charts

Noise level dependent on rotational speed, pressure range between 10 bar and pressure value p_2 (see page 15 Specifications table).

Oil data: $\nu = 32 \text{ mm}^2/\text{s}$, $\vartheta = 50^\circ\text{C}$.

Sound pressure level calculated from noise measurements made in the sound absorbent measuring room compliant with DIN 45635, Part 26.

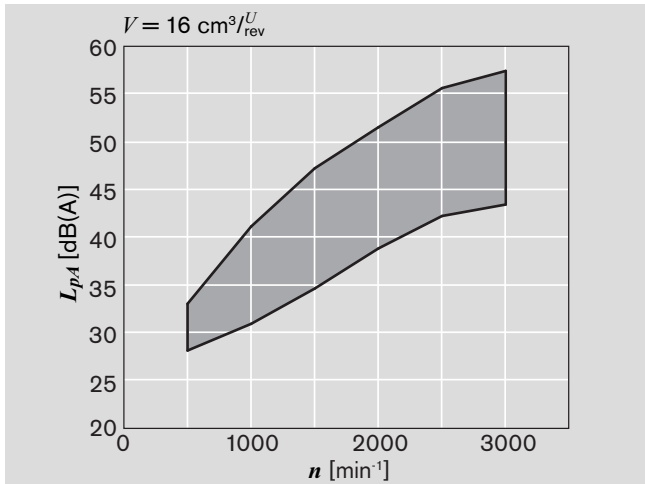
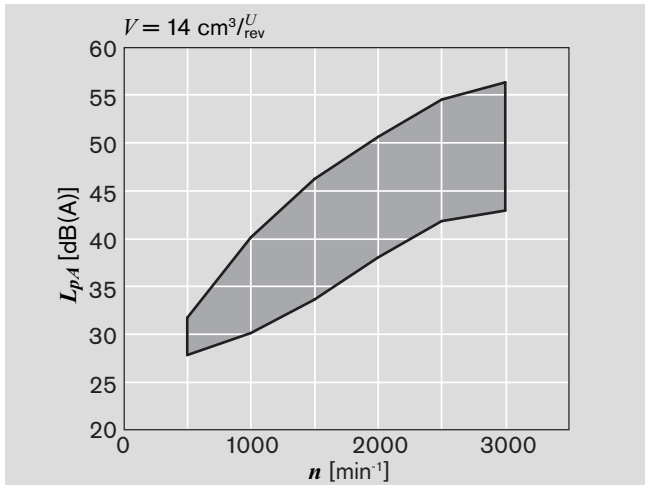
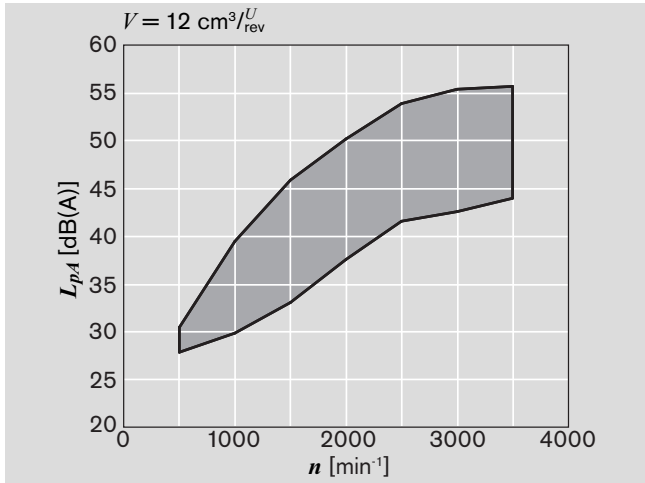
Spacing between measuring sensor – pump: 1 m.

These are typical characteristic values for the respective model. They describe the airborne sound emitted solely by the pump.

Environmental influences (installation site, piping, further system components) are not taken into consideration.

Each value applies for a single pump.

Apart from the low levels, the much lower frequency also contributes to the substantial noise benefits of the SILENCE PLUS compared to other pump designs.



Specification

General	
Construction	External gear pump
Mounting	Flange or through-bolting with spigot
Line ports	Flange
Direction of rotation (looking on shaft)	Clockwise or counter-clockwise, the pump may only be driven in the direction indicated
Installation position	Any
Load on shaft	Radial and axial forces after consulting
Ambient temperature range	-30°C...+80°C with NBR seals -20°C...+110°C with FKM seals
Hydraulic fluid	- Mineral oil compliant with DIN 51 524, 1-3, however under higher load at least HLP compliant with DIN 51 524 Part 2 recommended. - Comply with RE 90220 - Further operating fluids possible after consultation
Viscosity	12...800 mm ² /s permitted range 20...100 mm ² /s recommended range ...2000 mm ² /s range permitted for starting
Hydraulic fluid temperature range	max. +80°C with NBR seals*) max. +110°C with FKM seals**)
Filtration ***)	At least cleanliness level 20/18/15 compliant with ISO 4406 (1999)

*) NBR = Perbunan®
 **) FKM = Viton®
 ***) During the application of control systems or devices with critical counter-reaction, such as steering and brake valves, the type of filtration selected must be adapted to the sensitivity of these devices/systems.

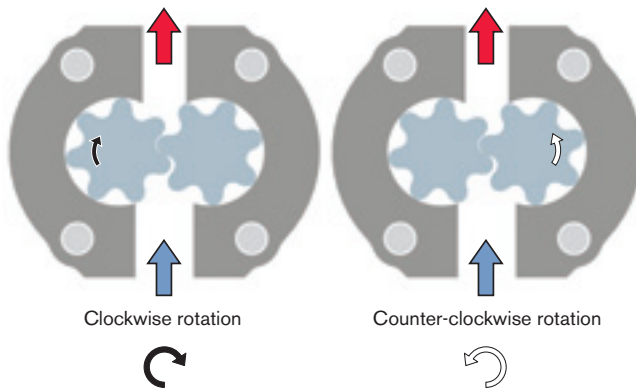
Safety requirements pertaining to the whole systems are to be observed.

In the case of applications with high numbers of load cycles please consulting.

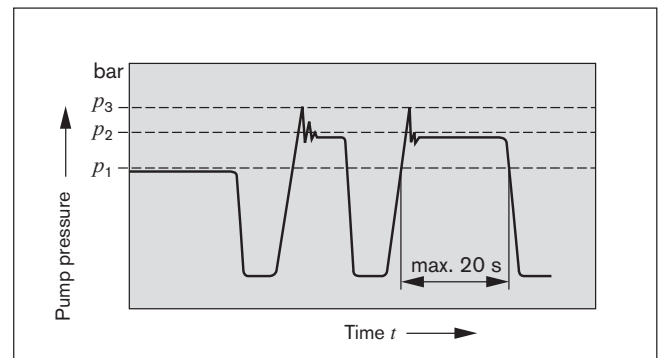
Definition of direction of rotation

Always look on the drive shaft.

Caution: At counter-clockwise-rotation pumps the position of the drive shaft and the suction and pressure ports are different to clockwise-rotation pumps.



Definitions of pressures



p_1 max. continuous pressure
 p_2 max. intermittent pressure
 p_3 max. peak pressure

Series AZPJ-2x

Displacement	V	cm ³ /rev	12	14	16	
Suction pressure	p_e	bar	0.7...3 (absolute), with tandem pumps: $p_e (p_2) = \max. 0.5 > p_e (p_1)$			
Max. continuous pressure	p_1		250			
Max. intermittent pressure	p_2		280			
Max. peak pressure	p_3		300			
Min. rotational speed at bar	< 100	min ⁻¹	500	500	500	
	12 mm ² /s		100...180	1000	800	800
	25 mm ² /s		p_2	1200	1000	1000
Max. rotational speed at	p_2		600	500	500	
			3500	3000	3000	

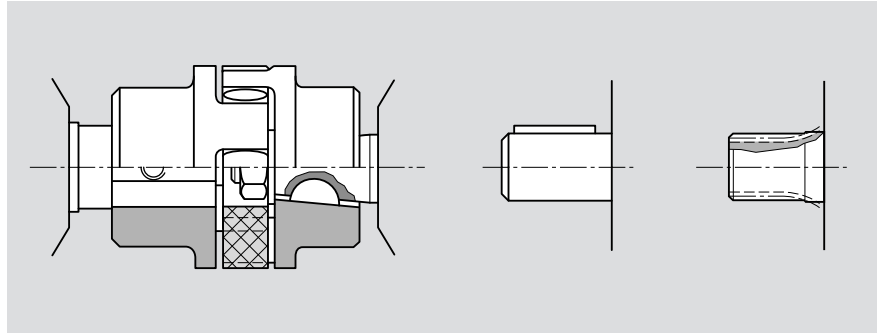
Drive arrangement

1. Flexible couplings

The coupling must not transfer any radial or axial forces to the pump.

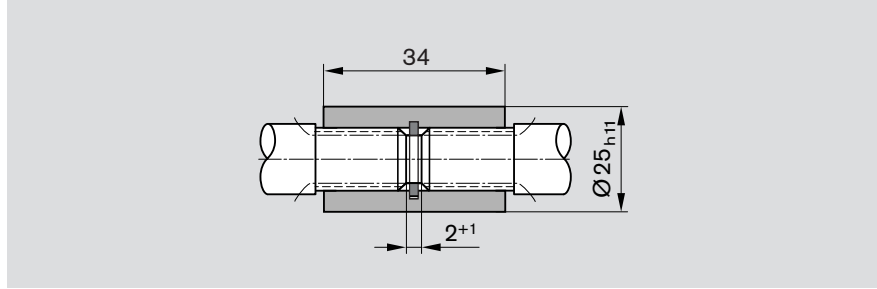
The maximum radial runout of shaft pigot is 0.2 mm.

Refer to the fitting instructions provided by the coupling manufacturer for details of the maximum permitted shaft misalignment.



2. Coupling sleeve

Used on shafts with DIN or SAE splining. Caution: There must be no radial or axial forces exerted on the pump shaft or coupling sleeve. The coupling sleeve must be free to move axially. The distance between the pump shaft and drive shaft must be 2^{+1} . Provide installation space for circlip. Oil-bath or oil-mist lubrications is necessary.



Drive shaft	Splined shaft	M_{max} [Nm]	V [cm ³ /rev]	p_{max} [bar]
F	DIN	100	12...16	280
R	SAE 9z	110		
P	SAE 11z	180		

3. Drive shaft with tang

For the close-coupling of the pumps to electric motor or internal-combustion engine, gear, etc. The pump shaft has a special tang and driver ③ (not included in supply). There is no shaft sealing.

There is no shaft sealing.

The recommended arrangements and dimensions for the drive end and sealing are as follows.

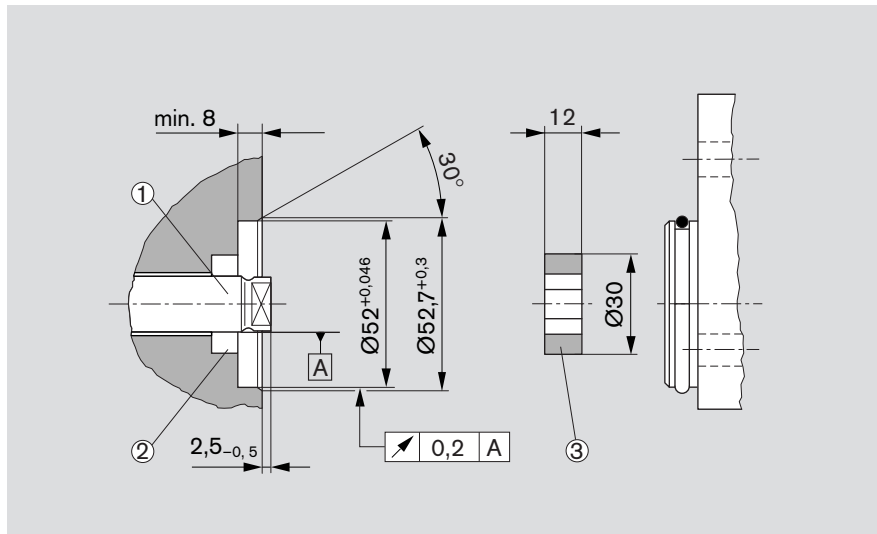
① Drive shaft

Case-hardening steel DIN 17 210
e.g. 20 MnCrS 5
case-hardened 0.6 deep; HRC 60 \pm 3
Surface for sealing ring
ground without rifling $R_{max} \leq 4\mu\text{m}$

The maximal transmissible torque of 85 Nm is considered with a claw height of 19 mm. With lower claw heights e.g. 17 mm the transmissible torque decreases on 65 Nm.

② Radial shaft seal ring

Rubber-covered seal (see DIN 3760, Type AS, or double-lipped ring). Cut 15° chamfer or fit shaft seal ring with protection sleeve.



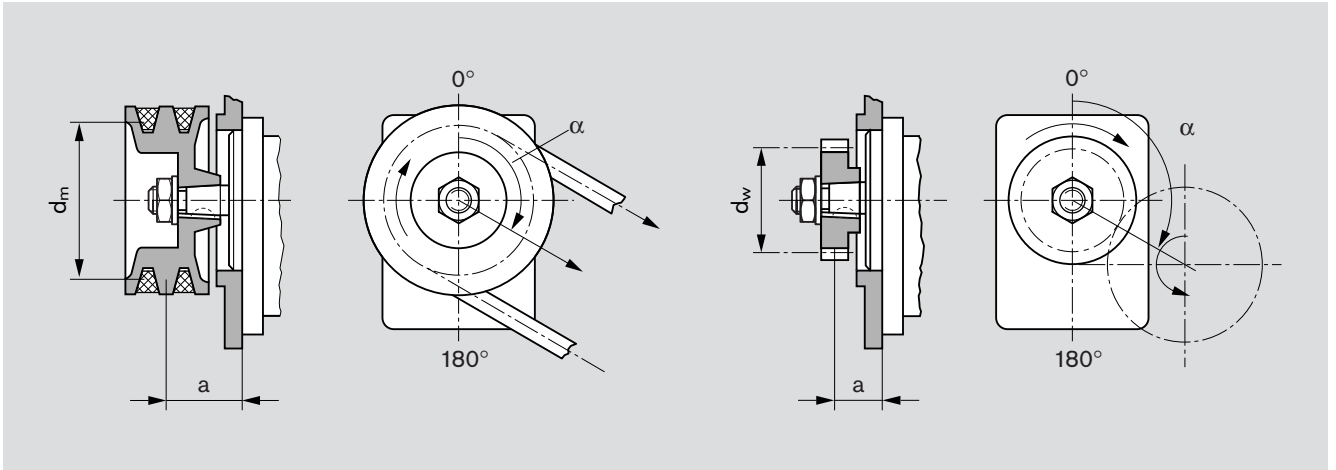
Drive with tang

M_{max} [Nm]	V [cm ³ /rev]	p_{max} [bar]
65	12	280
	14	
85	16	

4. V-belts and straight gearwheels or helical toothed gear drives without outboard bearing

When proposing to use V-belt or gear drive, please submit details of the application for our comments (especially dimensions a , d_m , d_w and angle α).

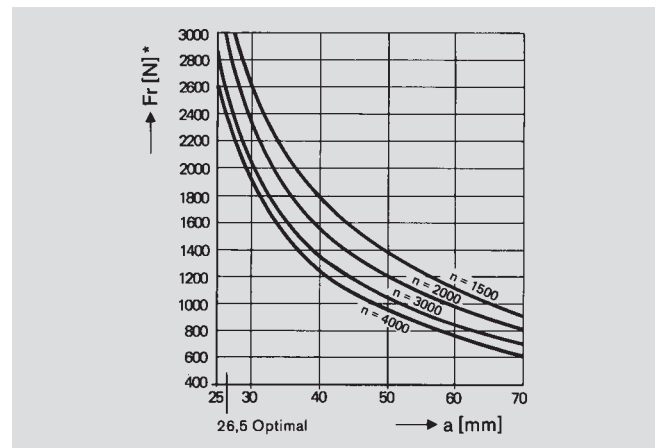
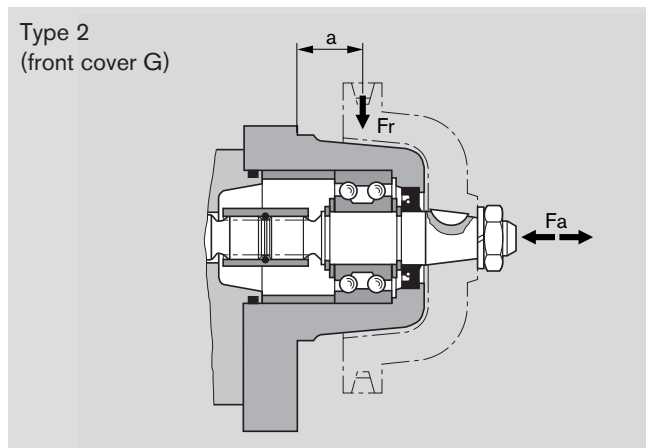
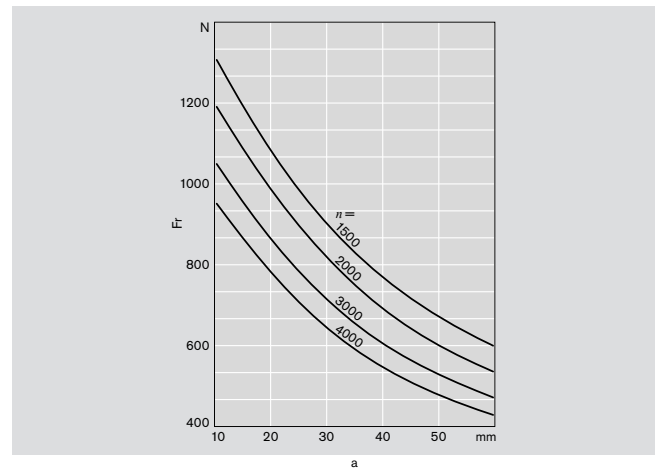
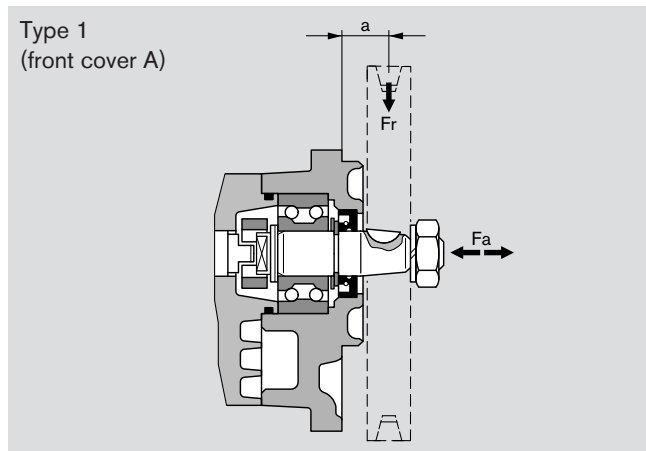
For helical toothed gear drives, details of the helix angle β are also required.



5. Outboard bearing

Outboard bearing eliminate possible problems when the pumps are driven by V-belts or gearwheels. The diagrams below show the maximum radial and axial loads that can be tolerated based on a bearing life of $L_H = 1,000$ hours.

Kind of the bearing	M_{max} [Nm]	V [cm ³ /rev]	p_{max} [bar]
Type 1	65	12...14	280
		16	230
Type 2	85	12...16	280



Multiple gear pumps

Gear pumps are well-suited to tandem combinations of pumps in which the drive shaft of the first pump is extended to drive a second pump and sometimes a third pump in the same manner. A coupling is fitted between each pair of pumps. In most cases each pump is isolated from its neighbor, i.e. the suction ports are separate from one another.

Caution: Basically, the specifications for the single pumps apply, but with certain restrictions:

Max. speed: This is determined by the highest rated pump speed in use.

Pressures: These are restricted by the strength of the drive shaft, the through drives and the drivers. Appropriate data is given in the dimensional drawings.

Pressure restrictions during standard through drive

In the case of series J, the driver for the second pumping stage can carry a load of up to $S_{max.} = 65 \text{ Nm}$, i.e. there is a pressure restriction for the second stage and any further stages.

Drive shaft		Max. transferrable drive torque * [Nm]
C	1:5	155
H	Tapered key shaft 1:8	160
F	DIN 5482	100
N	Claw	65 (12 cc, 14 cc) 85 (16 cc)
R	SAE 9T	110
P	SAE 11T	180
Q	Straight keyed shaft SAE	55
A	Straight keyed shaft ISO Ø 18	75

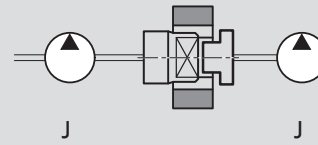
* These values only apply when the conditions described above are complied with. Bosch Rexroth is to be consulted if the stated values are exceeded.

If the first stage is driven through a tang (driver) or outboard bearing type 1, pressure restrictions apply as indicated in the formula below.

Reinforced through drives are available for applications with higher transfer torques and/or rotational vibrations. Customized designs available on request.

Standard through drive

$$M_{max.} = 65 \text{ Nm}$$



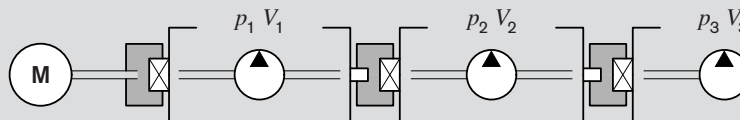
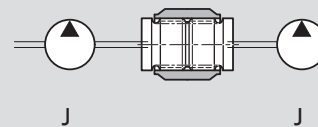
Combinations (drive with tang)

Series pump 1	$M_{max.}$ [Nm]	Series pump 2
J	65	J
J	65	F
F	65	J
J	25	B - 2x

For configuration of multiple pumps we recommend the pump is positioned with the largest displacement on the drive side.

Reinforced through drive

$$M_{max.} = 160 \text{ Nm}$$

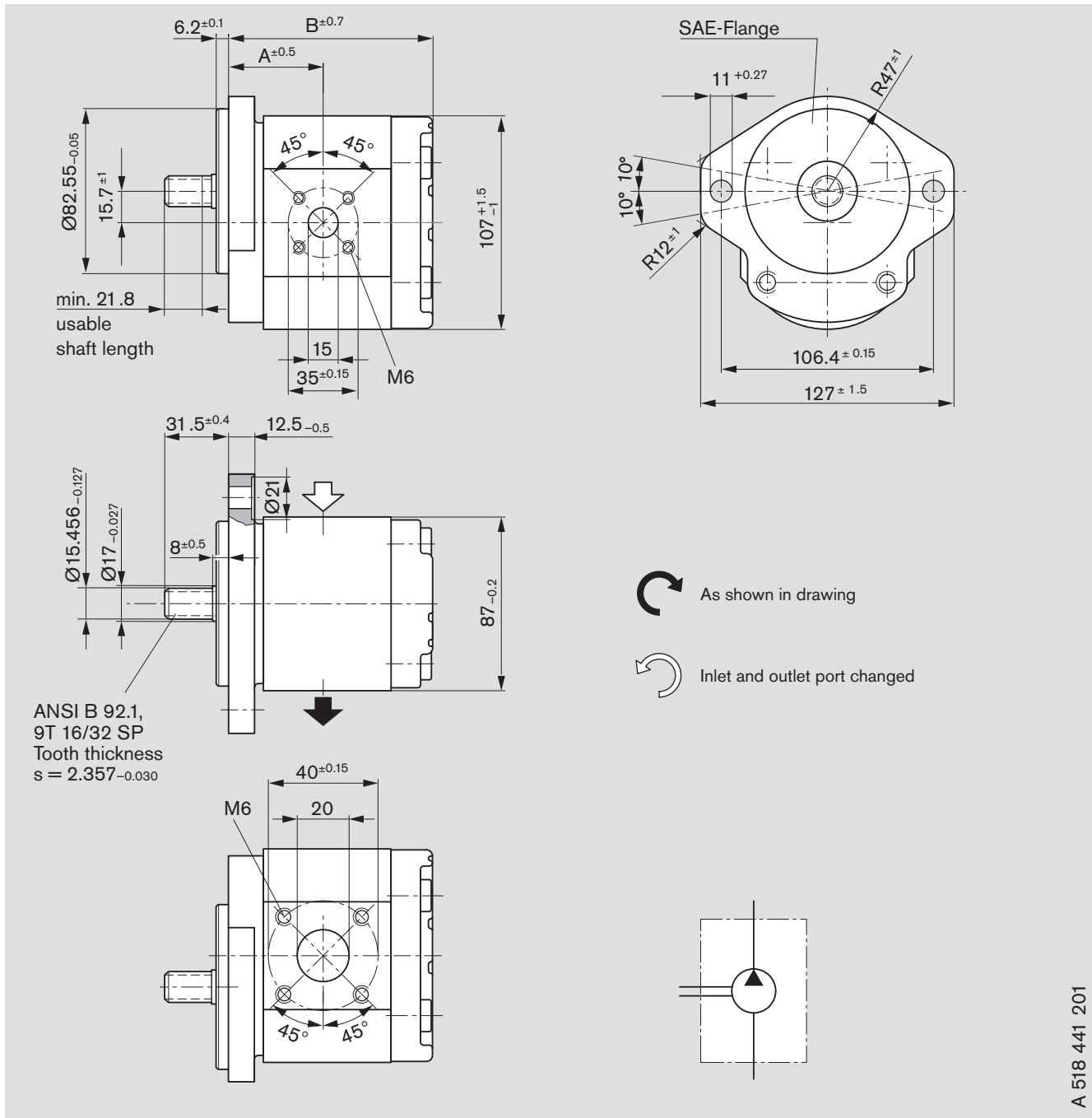


$$M_{max.} \cong \Delta p_1 \cdot V_1 \cdot 0,0177 + \Delta p_2 \cdot V_2 \cdot 0,0177 + \Delta p_3 \cdot V_3 \cdot 0,0177$$

Δp [bar] V [cm³/rev]

Dimensions

Standard range



A 518 441 201

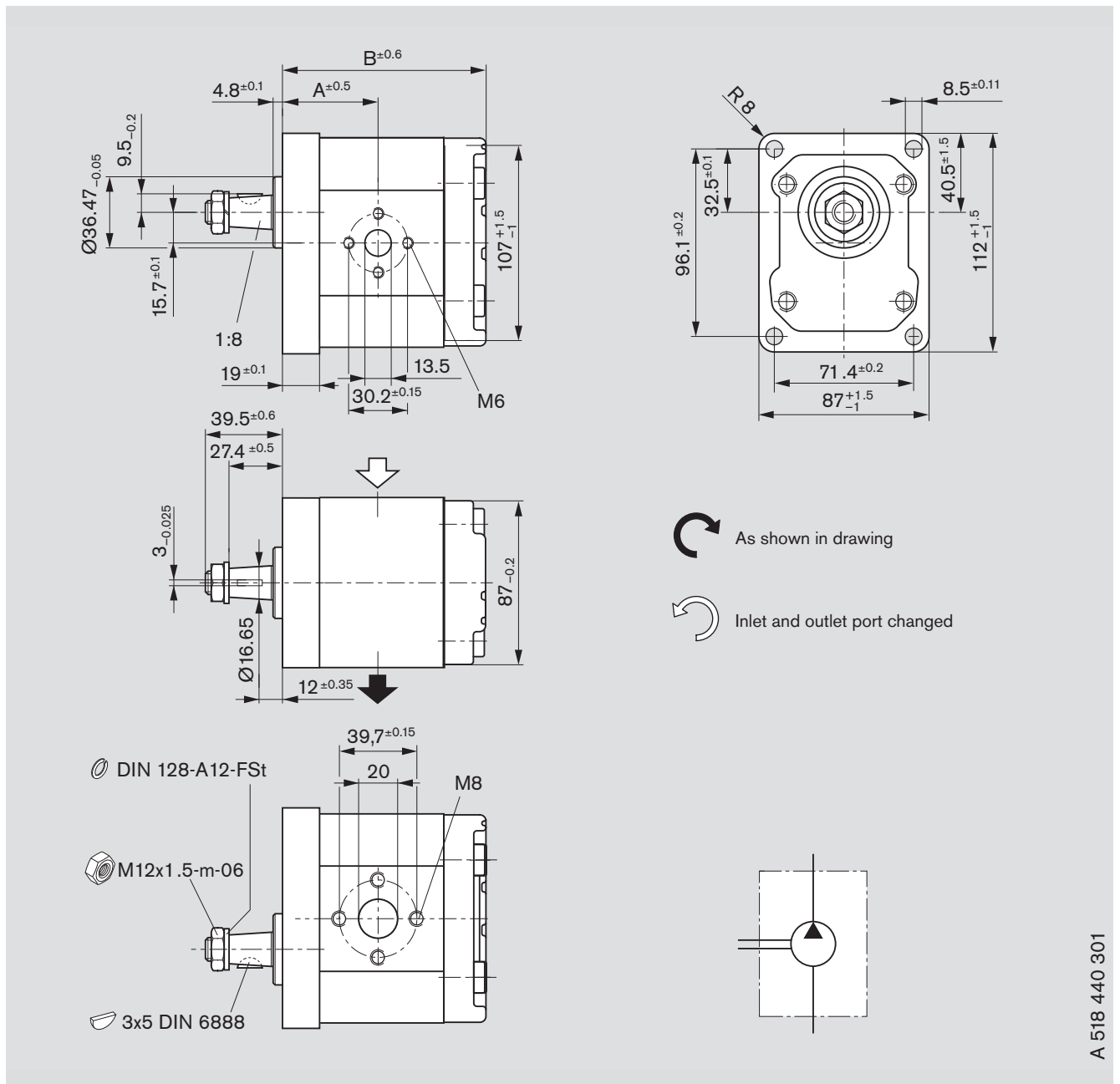
Ordering code:

AZPJ - 22 - R R 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Mass kg	Dimension	
	L	R				[mm]	[mm]
12	0 518 525 306	0 518 525 005	280	3500	3.8	46.5	96.3
14	0 518 525 307	0 518 525 006	280	3000	3.9	47.5	99.5
16	0 518 625 303	0 518 625 003	280	3000	4.0	47.5	102.9

Dimensions

Standard range



A 518 440 301

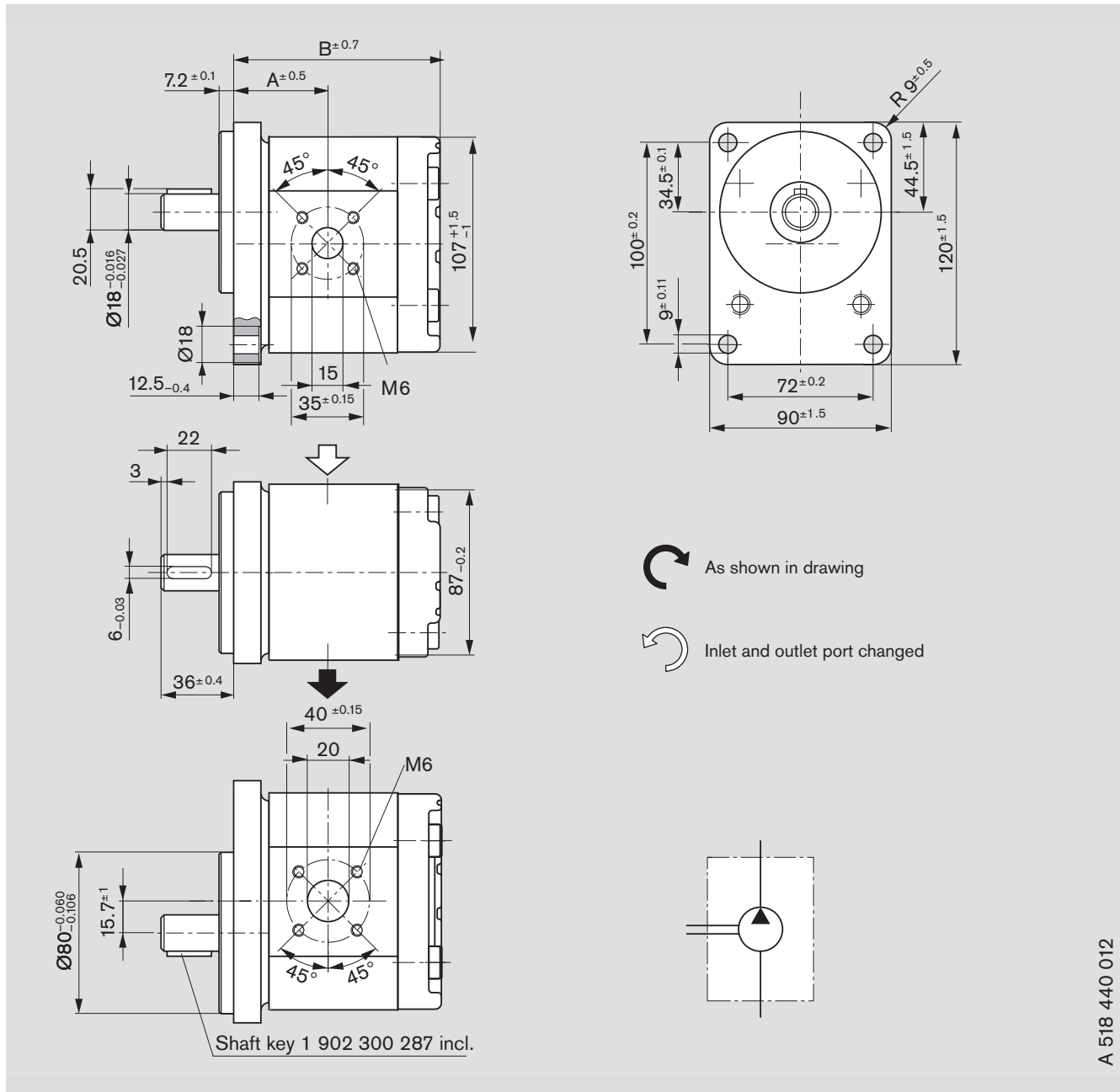
Ordering code:

AZPJ - 22 - H O 30 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Mass kg	Dimension	
	L	R				[mm]	[mm]
12	0 518 525 308	0 518 525 007	280	3500	3.7	48.0	97.8
14	0 518 525 309	0 518 525 008	280	3000	2.8	49.0	101.0
16	0 518 625 304	0 518 625 004	280	3000	3.9	49.0	104.4

Dimensions

Standard range



A 518 440 012

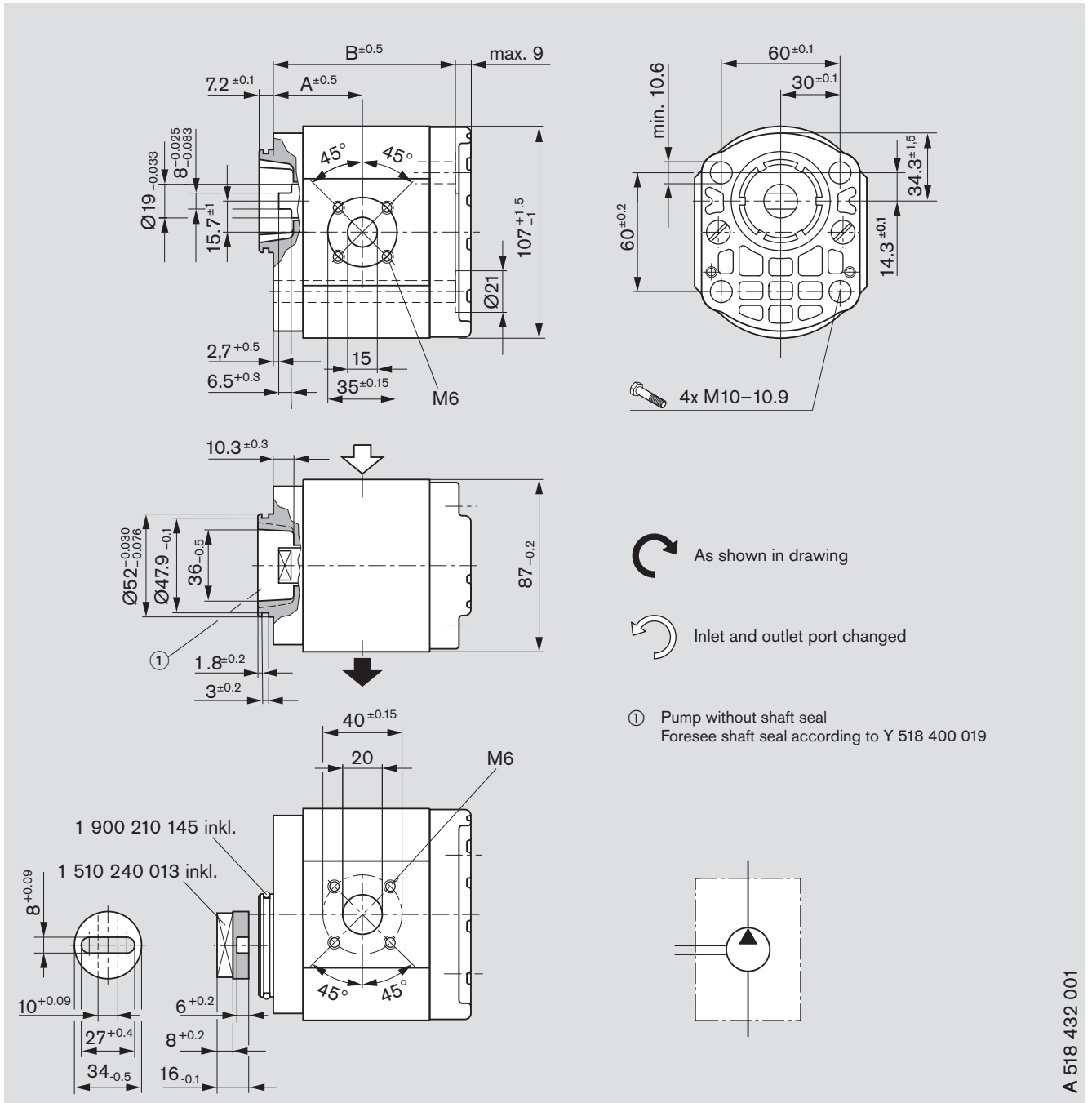
Ordering code:

AZPJ - 22 - A B 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Mass kg	Dimension	
	L	R				[mm]	[mm]
12	0 518 525 304	0 518 525 003	280	3500	3.9	46.5	96.3
14	0 518 525 305	0 518 525 004	280	3000	4.0	47.5	99.5
16	0 518 625 302	0 518 625 002	270	3000	4.1	47.5	102.9

Dimensions

Standard range



A 518 432 001

Ordering code:

AZPJ - 22 - NT 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Mass kg	Dimension	
	L	R				[mm]	[mm]
12 *)	0 518 515 301	0 518 515 001	280	3500	2.5	44.0	87.1
14 *)	0 518 515 302	0 518 515 002	280	3000	2.6	45.0	90.3
16 **)	0 518 615 301	0 518 615 001	280	3000	2.7	45.0	93.7

*) Drive shaft Ø 17 mm, driver 1 510 240 011 included in the scope of supply

***) Drive shaft Ø 19 mm, driver 1 510 240 013 included in the scope of supply

Notes for commissioning

Filter recommendation

The major share of premature failures in external gear pumps is caused by contaminated hydraulic fluid.

As a warranty cannot be issued for dirt-specific wear, we recommend filtration compliant with cleanliness level 20/18/15 ISO 4406, which reduces the degree of contamination to a permissible dimension in terms of the size and concentration of dirt particles:

Operating pressure [bar]	>160	<160
Contamination class ISO 4406	18/15	19/16
To be reached with $\beta_x = 75$	20	25

We recommend that a full-flow filter always be used. Basic contamination of the hydraulic fluid used may not exceed class 20/18/15 according to ISO 4406. Experience has shown that new fluid quite often lies above this value. In such instances a filling device with special filter should be used.

General

- The pumps supplied by us have been checked for function and performance. No modifications of any kind may be made to the pumps; any such changes will render the warranty null and void!
- Pump may only be operated in compliance with permitted data (see pages 13–16).

Project planning notes

Comprehensive notes and suggestions are available in Hydraulics Trainer, Volume 3 RE 00 281, "Project planning notes and design of hydraulic systems". Where external gear pumps are used we recommend that the following note be adhered to.

Technical data

All stated technical data is dependent on production tolerances and is valid for specific marginal conditions.

Note that, as a consequence, scattering is possible, and at certain marginal conditions (e.g. viscosity) **the technical data may change.**

Characteristics

When designing the external gear pump, note the maximum possible service data based on the characteristics displayed on pages 10 to 11.

Additional information on the proper handling of hydraulic products from Bosch Rexroth is available in our document: "General product information for hydraulic products" RE 07 008.

Contained in delivery

Deliveries contains the component as per drawing on pages 17–21.

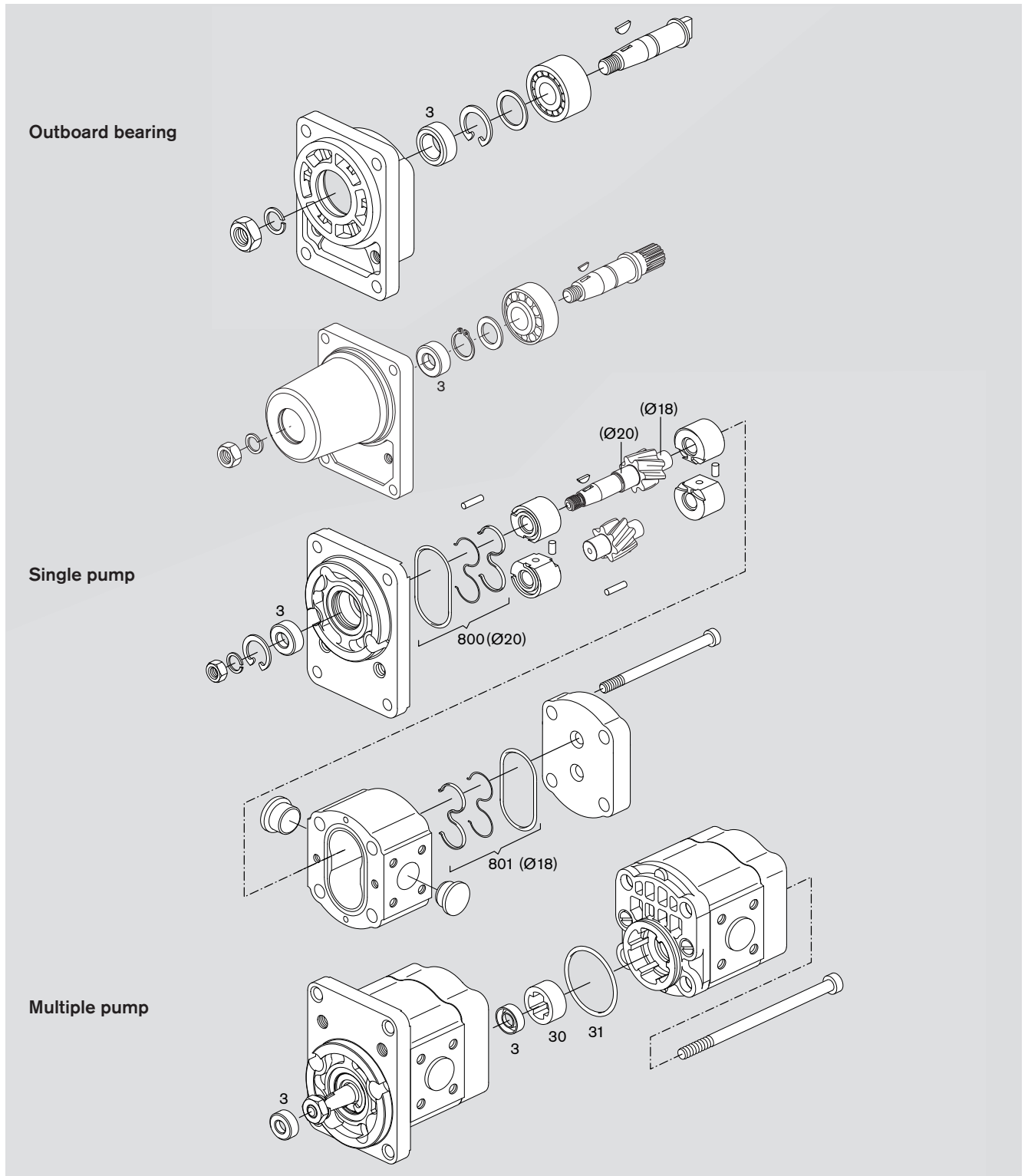
You can find further information in our publication:

"General Operating Instructions for External Gear Units"
RE 07 012-B1.

Service parts

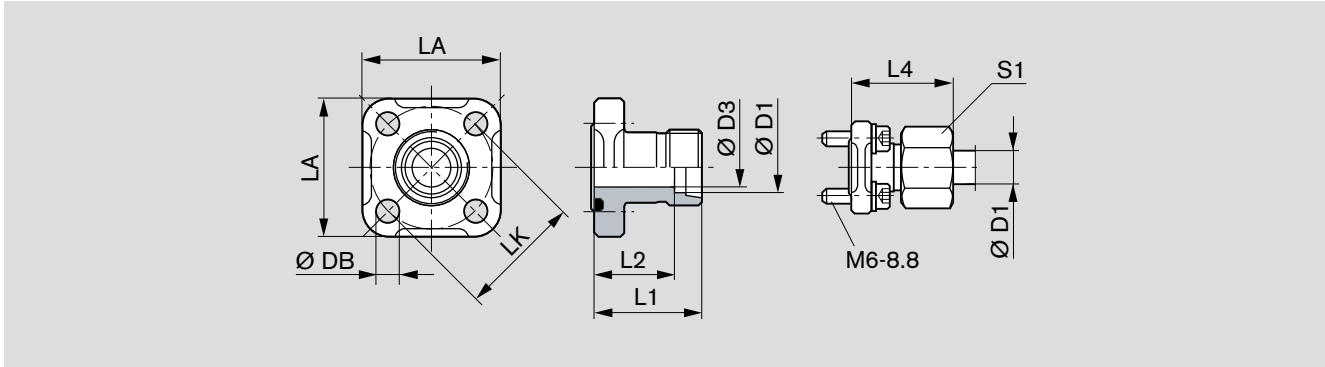
Page	Ordering code	Seal kit Pos. 800 1 517 010...	Seal kit Pos. 801 1 517 010...	Shaft seal ring Pos. 3 1 510 283...	Dimension	Seal ring Pos. 31 1 900 210...	Material	Dimension	Driver Pos. 30 1 510 240...
17	AZPJ - 22 - □□□ □ C B 20 M B	212	247	035 NBR	17x30x7/8	-	-	-	-
18	AZPJ - 22 - □□□ □ R R 20 M B	212	247	035 NBR	17x30x7/8	-	-	-	-
19	AZPJ - 22 - □□□ □ H O 30 M B	212	247	035 NBR	17x30x7/8	-	-	-	-
20	AZPJ - 22 - □□□ □ A B 20 M B	212	247	035 NBR	17x30x7/8	-	-	-	-
21	AZPJ - 22 - □□□ □ N T 20 M B	212	247	-		145	NBR	45x2.5	013

NBR = Perbunan® FKM = Viton®



Fittings

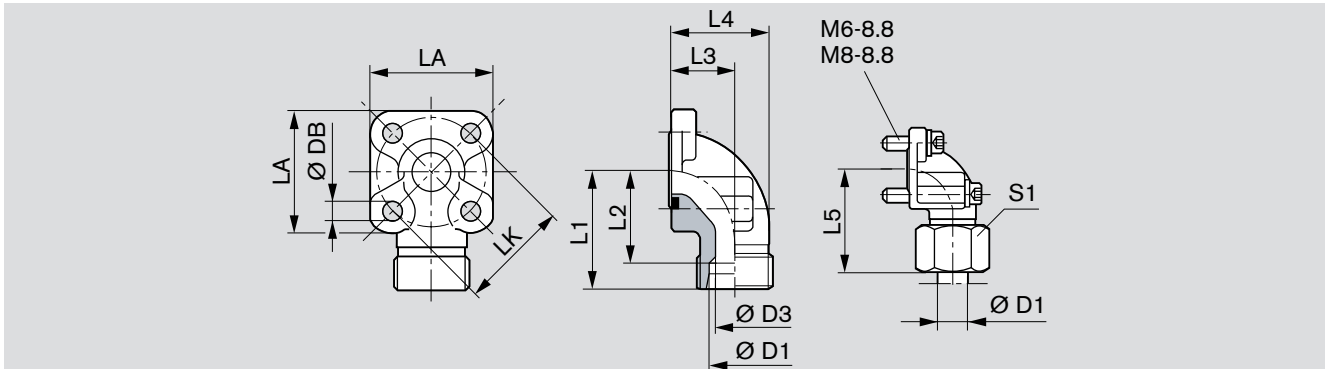
Gear pump flange, straight, for rectangular flange **20** see page 8



LK	D1	D3	L1	L2	L4	LA	S1	DB	Screws 4x	Seal ring NBR *)	Mass [kg]	Part number	p [bar]
35	10L	8	30	23.0	39.0	40	19	6.4	M 6x22	20x2.5	0.09	1 515 702 064	315
35	12L	10	30	23.0	39.0	40	22	6.4	M 6x22	20x2.5	0.10	1 515 702 065	315
35	15L	12	30	23.0	38.0	40	27	6.4	M 6x22	20x2.5	0.10	1 515 702 066	250
40	15L	12	35	28.0	43.0	42	27	6.4	M 6x22	24x2.5	0.12	1 515 702 067	100
40	18L	15	35	27.5	44.0	42	32	6.4	M 6x22	24x2.5	0.13	1 515 702 068	100
40	22L	19	35	27.5	44.5	42	36	6.4	M 6x22	24x2.5	0.12	1 515 702 069	100
40	28L	24	42	27.5	34.5	42	41	6.4	M 6x22	24x2.5	0.15	1 515 702 008	100

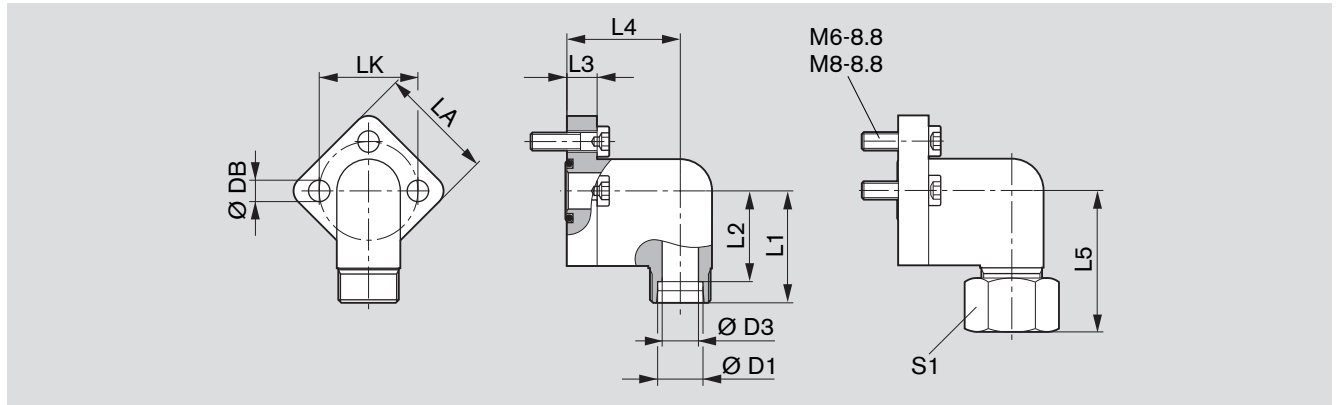
Complete fittings with seal ring, metric screw set, nuts and olive. *) NBR = Perbunan®

Gear pump flange, 90° angle, for rectangular flange **20** see page 8



LK	D1	D3	L1	L2	L3	L4	L5	LA	S1	DB	Screws		Seal ring NBR *)	Mass [kg]	Part number	p (bar)
											2x	2x				
35	10L	8	38	31.0	16.5	26.5	47.0	40	19	6.4	M 6x22	M 6x35	20x2.5	0.16	1 515 702 070	315
35	12L	10	38	31.0	16.5	26.5	47.0	40	22	6.4	M 6x22	M 6x35	20x2.5	0.16	1 515 702 071	315
35	15L	12	38	31.0	16.5	26.5	46.0	40	27	6.4	M 6x22	M 6x35	20x2.5	0.15	1 515 702 072	250
35	16S	12	38	29.5	20.0	31.0	48.0	40	30	6.4	M 6x22	M 6x40	20x2.5	0.18	1 515 702 002	315
35	18L	15	38	29.5	20.0	31.0	47.0	40	32	6.4	M 6x22	M 6x40	20x2.5	0.18	1 545 702 006	250
35	20S	16	45	34.5	25.0	38.0	56.0	40	36	6.4	M 6x22	M 6x45	20x2.5	0.24	1 515 702 017	315
40	15L	12	38	31.0	22.5	36.5	46.0	42	27	6.4	M 6x22	M 6x22	24x2.5	0.15	1 515 702 073	100
40	18L	15	38	30.5	22.5	36.5	47.0	42	32	6.4	M 6x22	M 6x22	24x2.5	0.17	1 515 702 074	100
40	20S	16	40	29.5	22.5	35.5	50.0	42	36	6.4	M 6x22	M 6x45	24x2.5	0.20	1 515 702 011	250
40	22L	19	38	30.5	22.5	36.5	47.5	42	36	6.4	M 6x22	M 6x22	24x2.5	0.17	1 515 702 075	100
40	28L	22	40	32.5	28.0	43.0	49.0	42	41	6.4	M 6x20	M 6x50	24x2.5	0.24	1 515 702 010	100
40	35L	31	41	30.5	34.0	55.0	52.0	42	50	6.4	M 6x22	M 6x60	24x2.5	0.33	1 515 702 018	100

Complete fittings with seal ring, metric screw set, nuts and olive. *) NBR = Perbunan®

Gear pump flange, 3-hole, 90° angle, for rectangular flange 30 see page 8


LK	D1	D3	L1	L2	L3	L4	L5	LA	S1	DB	Screws 3x	Seal ring NBR *)	Mass [kg]	Part number	p [bar]
30	12L	10	37	30.0	10	37.5	46	38	22	6.4	M6x22	16x2.5	0.13	1 515 702 146	250
30	15L	12	37	30.0	10	37.5	47	38	27	6.4	M6x22	16x2.5	0.14	1 515 702 147	250
30	18L	15	37	30.0	10	37.5	47	38	32	6.4	M6x22	16x2.5	0.17	1 515 702 148	160
40	22L	19	43	35.5	14	41.0	53	48	36	8.4	M8x30	24x2.5	0.29	1 515 702 149	160
40	28L	24	43	35.5	14	41.0	53	48	41	8.4	M8x30	24x2.5	0.40	1 515 702 150	160

Complete fittings with seal ring, metric screw set, nuts and olive. *) NBR = Perbunan®

Note

You can find the permissible tightening torques in our publication:
 "General Operating Instructions for External Gear Units"
 RE 07 012-B1.

Ordering-No.

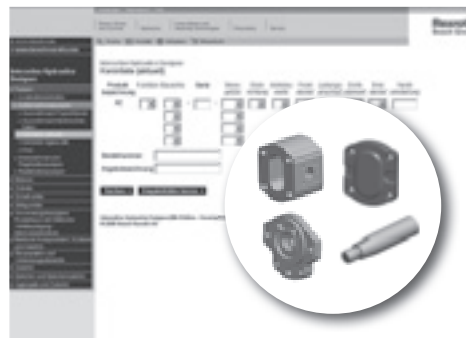
Ordering-No.	Page	Ordering-No.	Page
0 518 515 001	21	0 518 625 003	18
0 518 515 002	21	0 518 625 004	19
0 518 515 301	21	0 518 625 301	17
0 518 515 302	21	0 518 625 302	20
0 518 525 001	17	0 518 625 303	18
0 518 525 002	17	0 518 625 304	19
0 518 525 003	20		
0 518 525 004	20		
0 518 525 005	18		
0 518 525 006	18		
0 518 525 007	19		
0 518 525 008	19		
0 518 525 302	17		
0 518 525 303	17		
0 518 525 304	20		
0 518 525 305	20		
0 518 525 306	18		
0 518 525 307	18		
0 518 525 308	19		
0 518 525 309	19		
0 518 615 001	21		
0 518 615 301	21		
0 518 625 001	17		
0 518 625 002	20		

The AZ configurator at www.boschrexroth.com/azconfigurator

The AZ configurator assists you to configure your individual external gear unit easily and user-friendly. You only need to specify your requirements: From the displacement, direction of rotation, drive shaft, connection flange right up to the required rear cover. You immediately receive a project drawing (PDF format) if a configuration already exists. You receive the price of the configured external gear unit upon request.



The AZ configurator assists you to configure your individual external gear unit easily and user-friendly – all data needed for project planning are acquired thru menu guidance.



Selection is made either on an ordering code or your technical requirements. This means that you can search for external gear units that have already been configured, or you specify the configuration variant of the external gear unit based upon the operating parameters you require.



If the external gear unit you selected has been released you will receive the part number, ordering code and a detailed installation drawing. If your special configuration is not available please send your specification to Rexroth. One of our employees will then contact you.

Notes

Notes

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