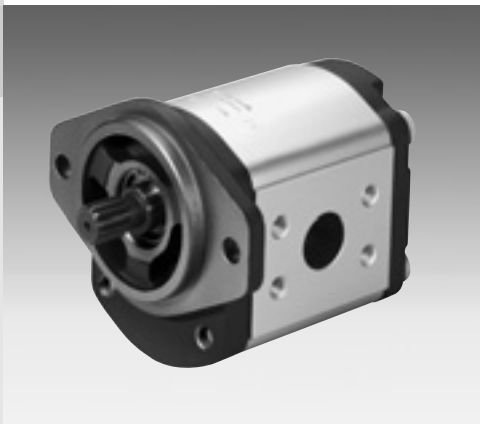
Rexroth
Bosch Group

External gear pump
Series U

RE 10 098/02.12
Replaces
RE 10 098/08.07

AZPU-...



Fixed pumps
$V = 22.5...63$ cm^3/rev

SILENCE

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Features

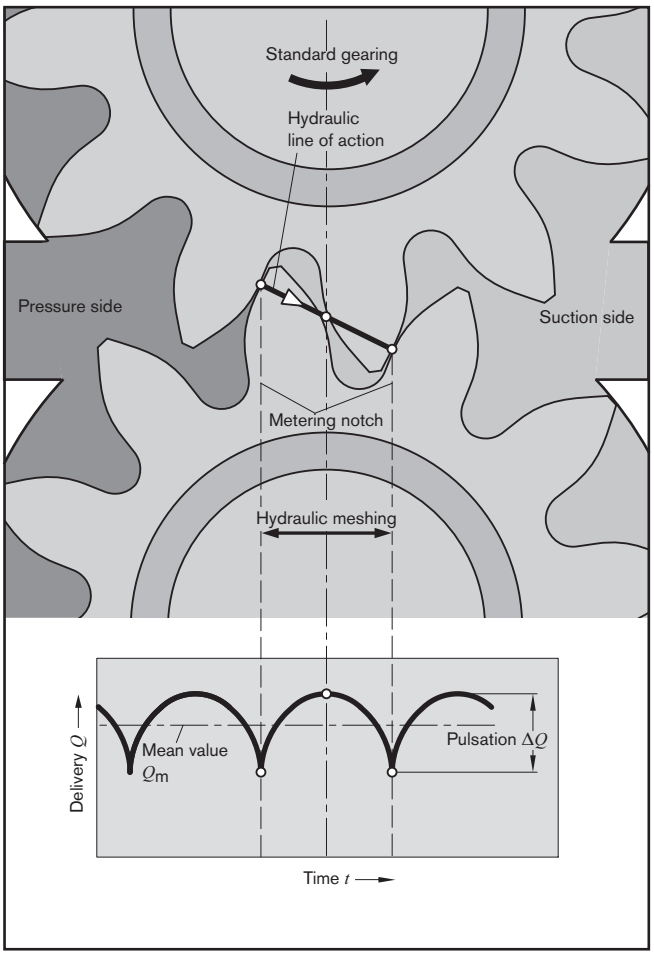
- Nominal pressure 280 bar
- Slide bearings for heavy duty applications
- Drive shafts to ISO or SAE
- Combination of several pumps possible
- Line ports: connection flanges
- Optimized pressure pulsation, which reduces noise emissions and vibration input in system
- Long service life thru reinforced design of shafts and case
- Consistent high quality thru mass production
- Numerous configuration variants available

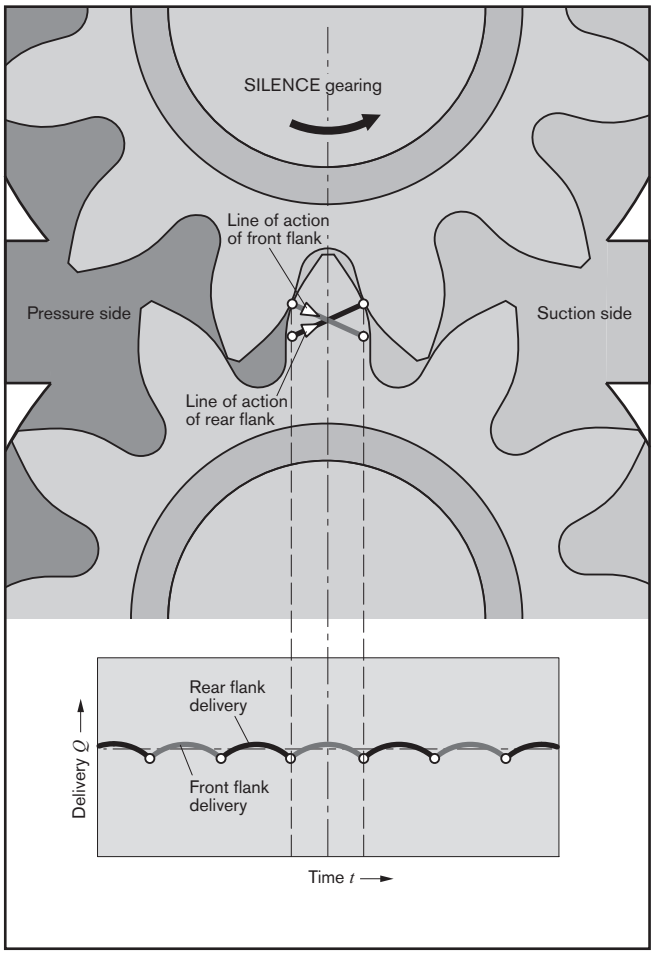
General

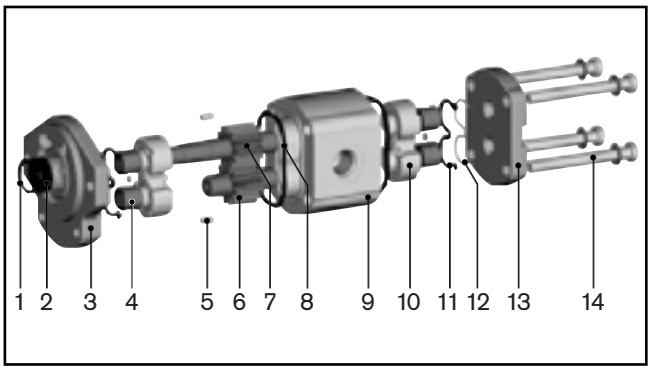
The key task of external gear units is to convert mechanical energy (torque and rotational speed) into hydraulic energy (flow and pressure). In external gear motors this is the other way round. These machines are required to be highly efficient in order to avoid unnecessary heat. This efficiency is achieved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

Moreover, in the low-noise SILENCE pumps, the dual-flank principle helps to reduce flow pulsation by up to 75 %.

The displacement method







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

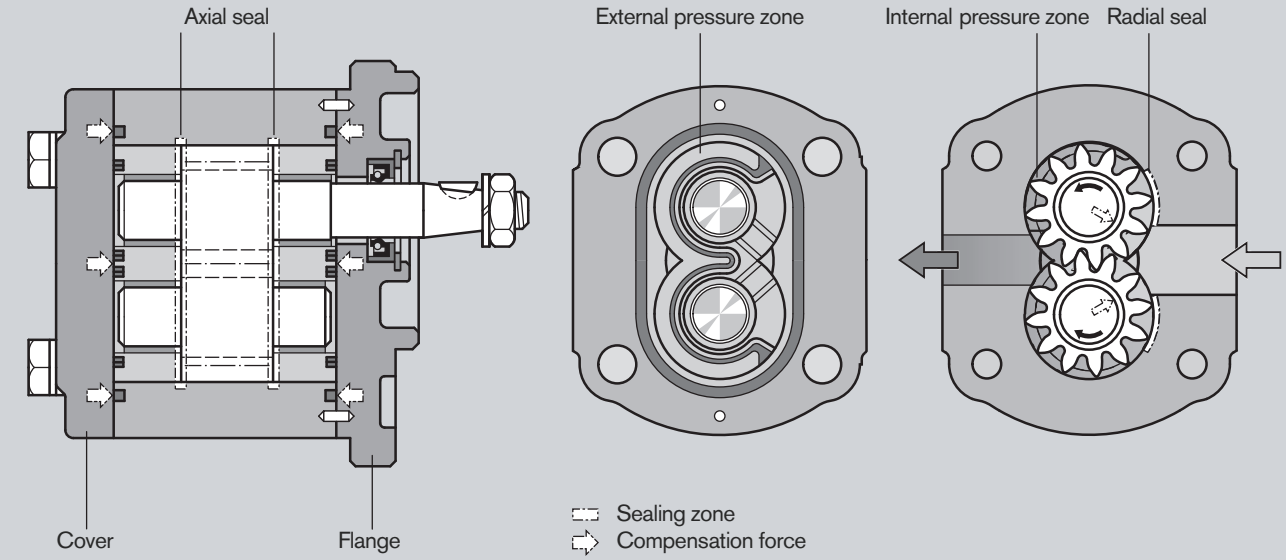
The geometry of the displacement gearing, matched in form by the rotation of the drive shaft, results in the parabolic flow characteristic shown here on the left. In a standard pump, this characteristic is repeated each time a gear tooth meshes. With their dual-flank system, the flow pulsation of SILENCE pumps is reduced by 75 % – with correspondingly lower excitation of downstream system components – at double the fundamental frequency. During this process, the gear pair exhibits an extremely reduced rear flank backlash, so that hydraulic sealing is provided not just by the front flank of the driven gear, but also by the rear flanks. In this way, the front and rear flanks alternately contribute to flow displacement. And by adapting the shape of the metering notches, the expansion of the hydraulic line of action is half that of the standard pump.

Construction

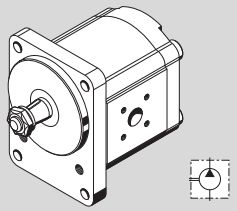
The external gear pump consists essentially of a pair of gears supported in bearing bushings or bearing, dependent on the series, and the case with a front and rear cover. The drive shaft protrudes from the front cover where it is sealed by the shaft seal ring. The bearing forces are absorbed by special slide bearings 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 12 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 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.

Axial and radial compensation for gear pump



Overview of “Series U” standard types

Version	Page
	18

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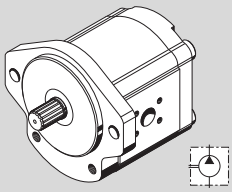
	19 20 21

Ordering code

External gear units Single pumps “SILENCE”

AZ	P	U	–	2	2	–	063	R	C	B	20	M	D	18009	S xxxx

Function
P = Pump

Series
2 = 2nd generation

Version
2 = corrosion-resistant, pinned

Size G
022 = 22.5 cm^3/rev
025 = 25.0 cm^3/rev
028 = 28.0 cm^3/rev
032 = 32.0 cm^3/rev
036 = 36.0 cm^3/rev
040 = 40.0 cm^3/rev
045 = 45.0 cm^3/rev
050 = 50.0 cm^3/rev
056 = 56.0 cm^3/rev
063 = 63.0 cm^3/rev

Direction of rotation
R = Clockwise
L = Counterclockwise

Special design *)

Valve adjustment
200 xx = PRV 200 bar
xxx 11 = FCV 11 l/min
18009 = PRV + FCV 180 bar, 9 l/min

Rear cover
B = Standard
D = PRV residual flow internal
E = FCV residual flow external
S = FCV residual flow internal
V = PRV + FCV

Seals
M = NBR
K = NBR, SSR in FKM

*) Some of the special designs shown on pages 18–21 are not covered in the illustration of the ordering code.

Drive shafts

		Suitable front cover
C	Tapered key shaft 1 : 5	**B**
D	Splined shaft SAE J 744 22-4 13T	**C**
H	Tapered key shaft 1 : 8	**O**

Front cover

B	Rectangular flange Centering Ø 105 mm	
C	SAE J 744 101-2 B 2-hole flange Ø 101.6 mm	
O	Rectangular flange Centering Ø 50.78 mm	

Line ports

20	Rectangular flange	
07	Square flange SAE thread, metric	
30	Rectangular flange	

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 “SILENCE”

AZ	P	UUSS	–	x	x	–	032/022/016/005	R	C	B	20 20 20 20	K	B

Function
P = Pump

Series
B = 1.0...7.1 cm³/rev
S = 4.0...28 cm³/rev
F = 4.0...28 cm³/rev
T = 20.0...36 cm³/rev
N = 20.0...36 cm³/rev
U = 22.5...63 cm³/rev
G = 22.5...63 cm³/rev

Series, relates to pump section 1
2 = 2nd generation

Version, relates to pump section 1
2 = corrosion-resistant, pinned

Size
as per individual Series

Direction of rotation
R = Clockwise
L = Counterclockwise

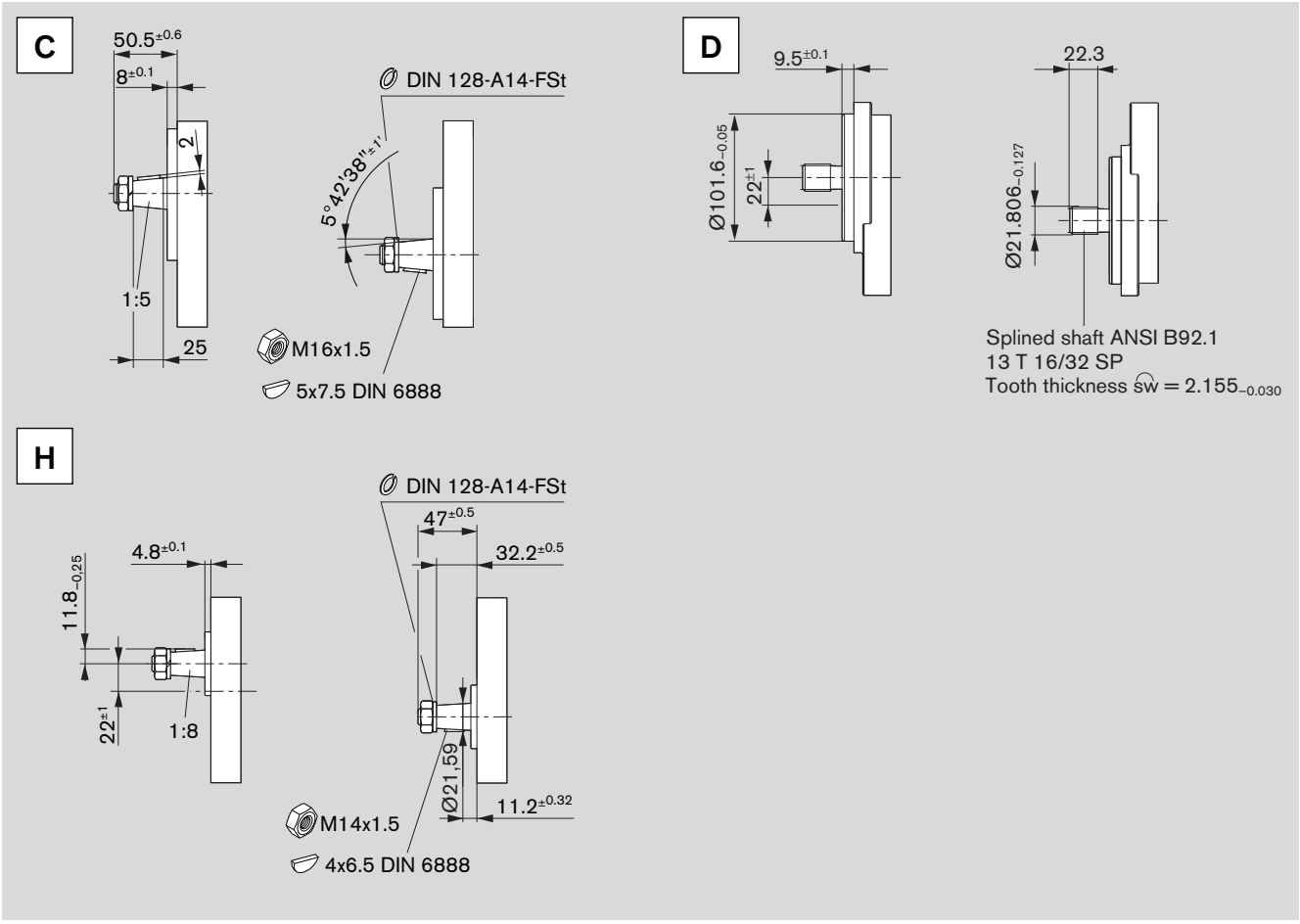
Rear cover
relates to last pump part
B = Standard

Seals
M = NBR
P = FKM
K = NBR, WDR in FKM
WDR relates to pump part 1

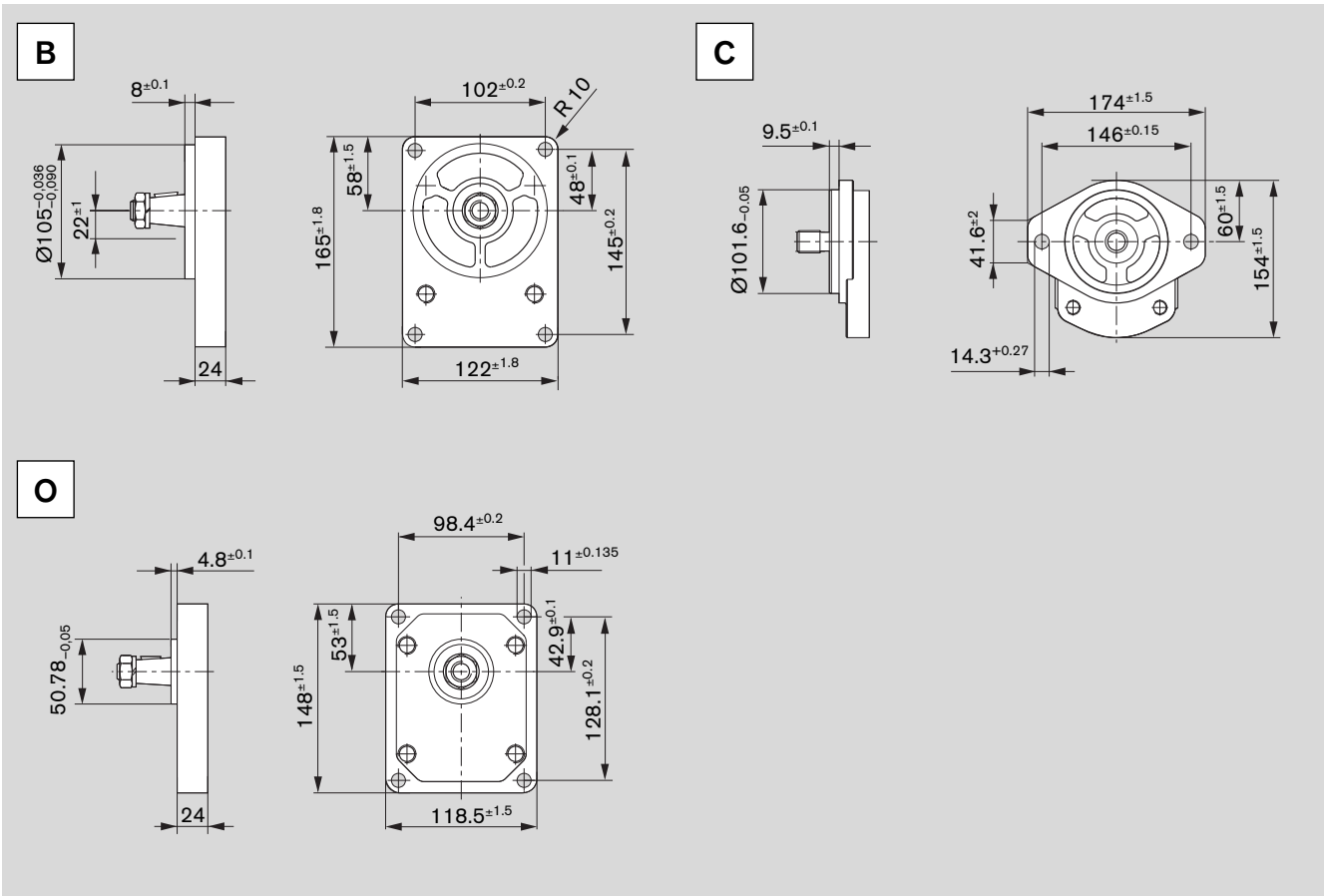
Drive shafts relates to pump part 1	Front cover relates to pump part 1	Line ports every pump parts
Series B: **H** Tapered key shaft 1 : 5 — Suitable front cover **O**	**O** Square flange Centering Ø 25.38 mm	**01** Pipe thread ISO 228/1 **20** Rectangular flange
Series F, S: **C** Tapered key shaft 1 : 5 — **B** **H** Tapered key shaft 1 : 8 — **O** **R** Splined shaft SAE J 744 16-4 9T — **R**	**B** Square flange Centering Ø 80 mm **O** Square flange Centering Ø 36.47 mm **R** SAE J 744 82-2 A 2-bolt flange Ø 82.55 mm	**20** Rectangular flange **30** Rectangular flange
Series N, T: **C** Tapered key shaft 1 : 5 — **B** **D** Splined shaft SAE J 744 22-4 13T — **C**	**B** Square flange Centering Ø 100 mm **C** SAE J 744 101-2 B 2-bolt flange Centering Ø 101.6 mm	**07** Square flange SAE Thread, metric **20** Rectangular flange
Series G, U: **C** Tapered key shaft 1 : 5 — **B** **D** Splined shaft SAE J 744 22-4 13T — **C** **H** Tapered key shaft 1 : 8 — **O**	**B** Square flange Centering Ø 105 mm **C** SAE J 744 101-2 B B 2-bolt flange Centering Ø 101.6 mm **O** Square flange Centering Ø 50.78 mm	**07** Square flange SAE Thread, metric **20** Rectangular flange **30** Rectangular flange

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.

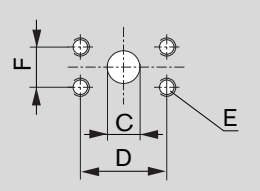
Drive shafts



Front cover

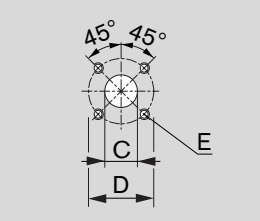


Line ports



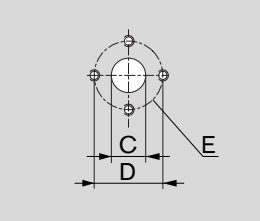
07 **Square flange SAE, thread, metric**

Ordering code	Size	Pressure side C	D	E	F	Suction side C	D	E	F
07	22.5...28 cm³	18	47.6	M10 depth 18	22.2	25	52.4	M10 depth 14	26.2
	32.0...50 cm³	25	52.4		26.2	32	58.7		30.2
	56.0...63 cm³	32	58.7		30.2	38	69.8		35.8



20 **Rectangular flange**

Ordering code	Size	Pressure side C	D	E	Suction side C	D	E
20	22.5...63 cm³	18	55	M8 depth 13	26	55	M8 depth 13

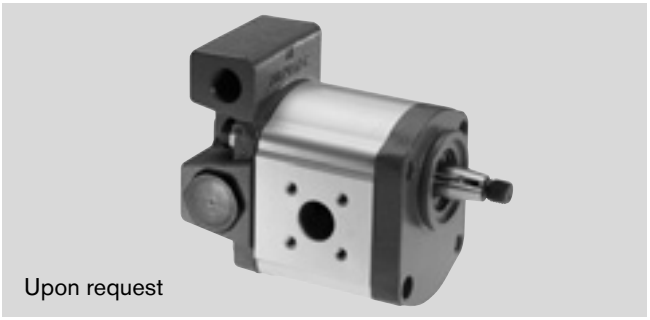


30 **Rectangular flange**

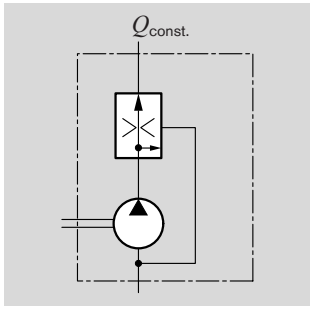
Ordering code	Size	Pressure side C	D	E	Suction side C	D	E
30		18	39.7	M8 depth 13	26	50.8	M10 depth 13

Gear pumps with integral valves

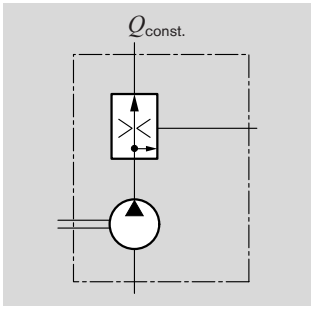
In order to reduce external pipework it is possible to incorporate a flow-control valve or pressure-relief valve in the cover of the gear pump. Such solutions are used, for example for supplying hydraulic oil to power steering systems. The pump delivers a constant flow irrespective of the speed at which it is driven. The excess flow is either returned internally to the suction port or distributed externally to other items of equipment.



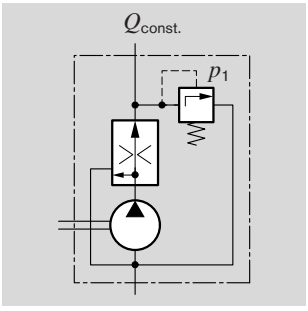
Upon request



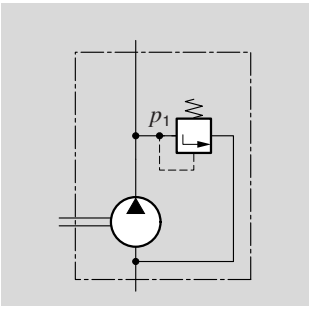
3-way flow-control valve.
Excess flow returned to suction line
$Q_{const.}$ = 2...30 l/min



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



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



Pressure-relief valve.
Discharge returned to suction line
p_1 = 5...250 bar

Ordering code

S	**xxx17**

E	**xxx12**

V	**15011**

D	**180xx**

Design calculations for pumps

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

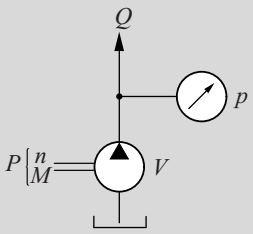
V	[cm³/rev]	Displacement
Q	[l/min]	Delivery
p	[bar]	Pressure
M	[Nm]	Drive torque
n	[rev/min]	Drive speed
P	[kW]	Drive power

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.



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

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

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

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

$$V = \frac{M \cdot \eta_{hm}}{159 \cdot p}$$

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

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

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

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

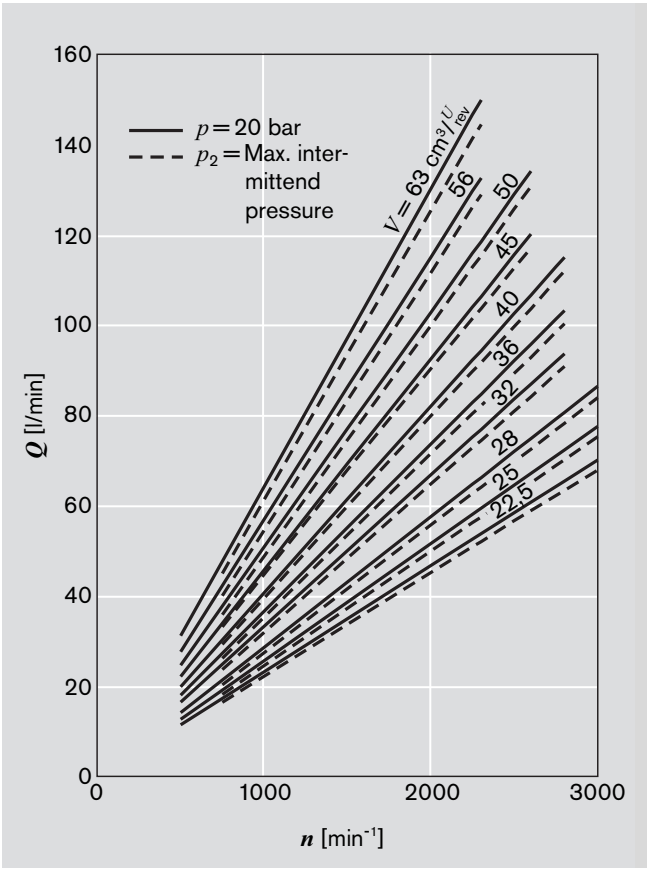
[%]

n —— η_v ⟶ Q
M —— η_{hm} ⟶ p
P —— η_t ⟶ $p \cdot Q$

V [cm³/rev] Q [l/min] p [bar]
n [rev/min] P [kW] M [Nm]

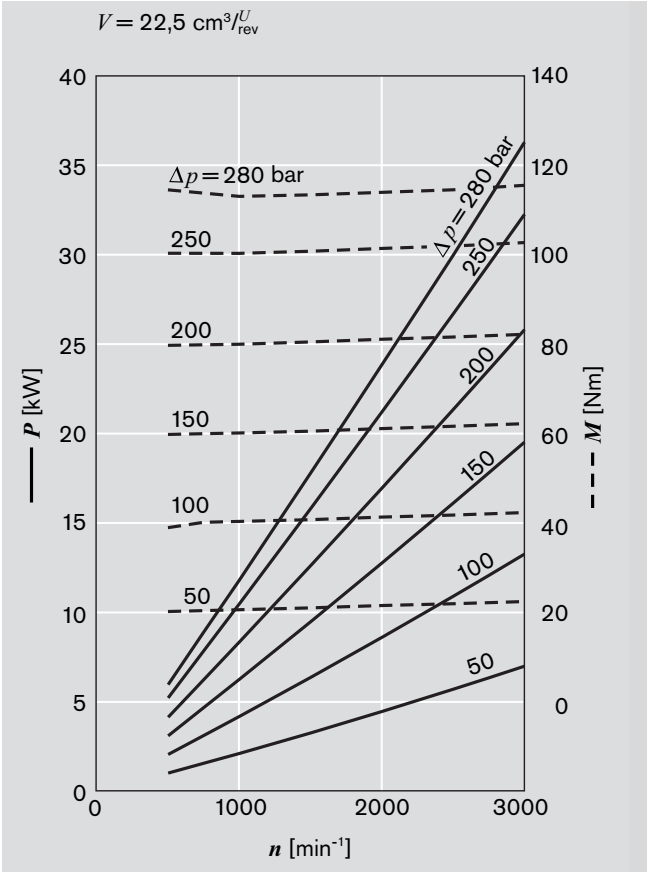
Caution: η [%] e.g. 95 [%]

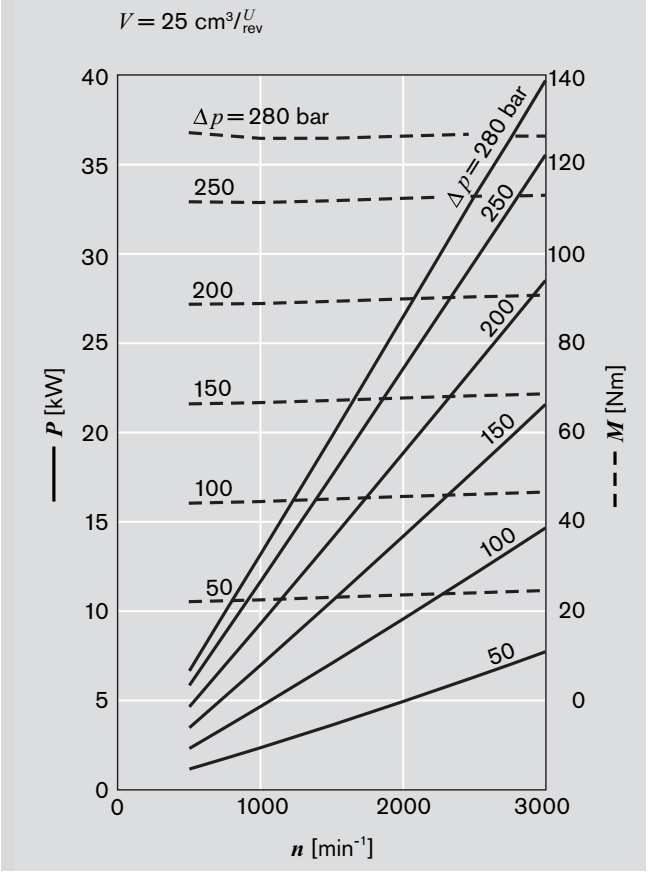
Performance charts



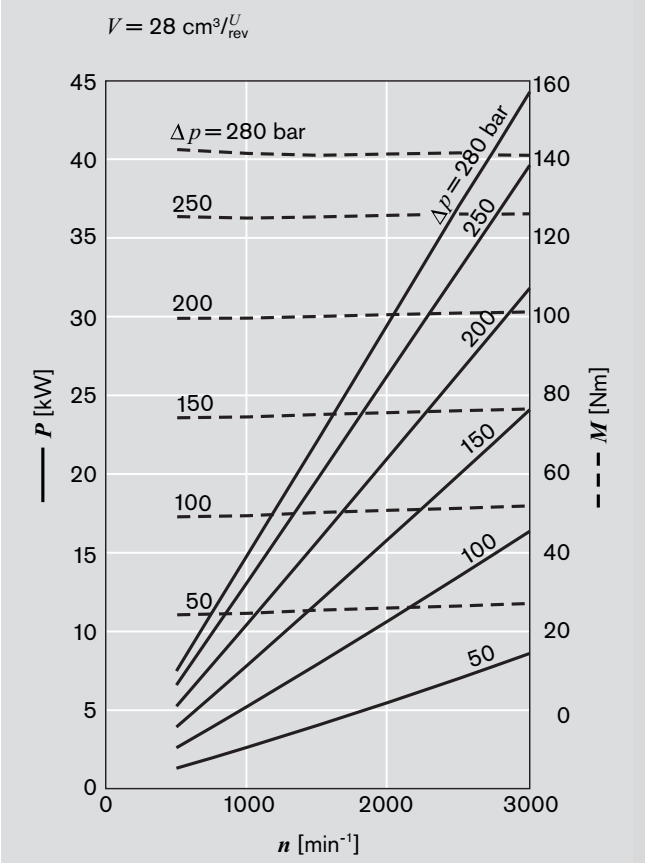
$\nu = 35\ mm^2/s$, $\vartheta = 50\,°C$

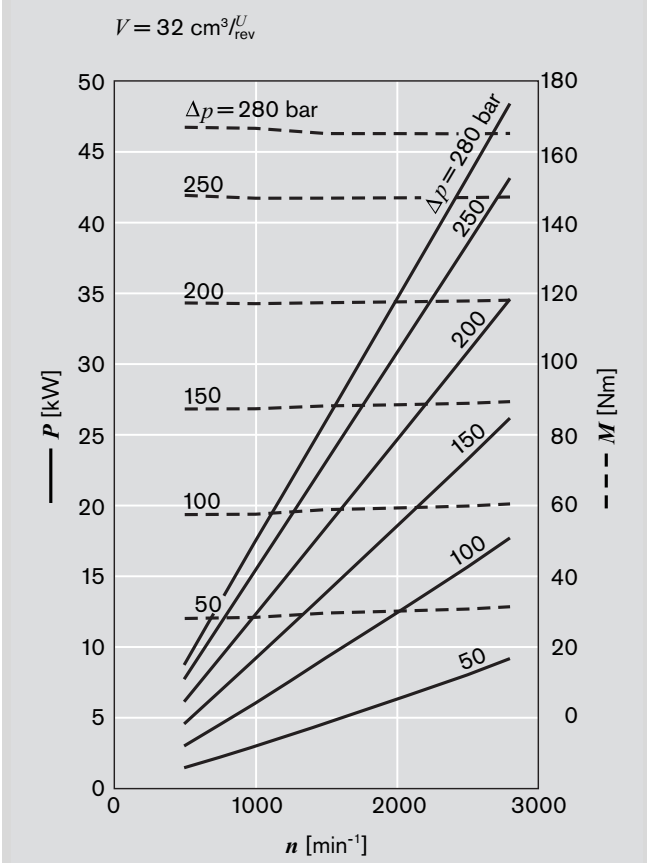
$Q = f(n,V)$ incl. η_v
$P = f(n,p)$ —— incl. η_t
$M = f(n,p)$ - - - incl. η_{hm}

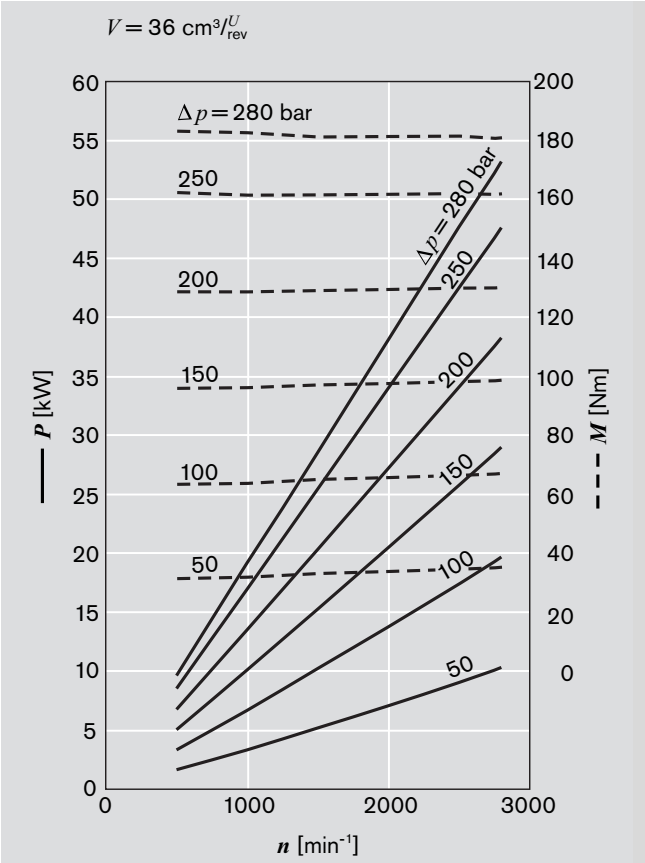


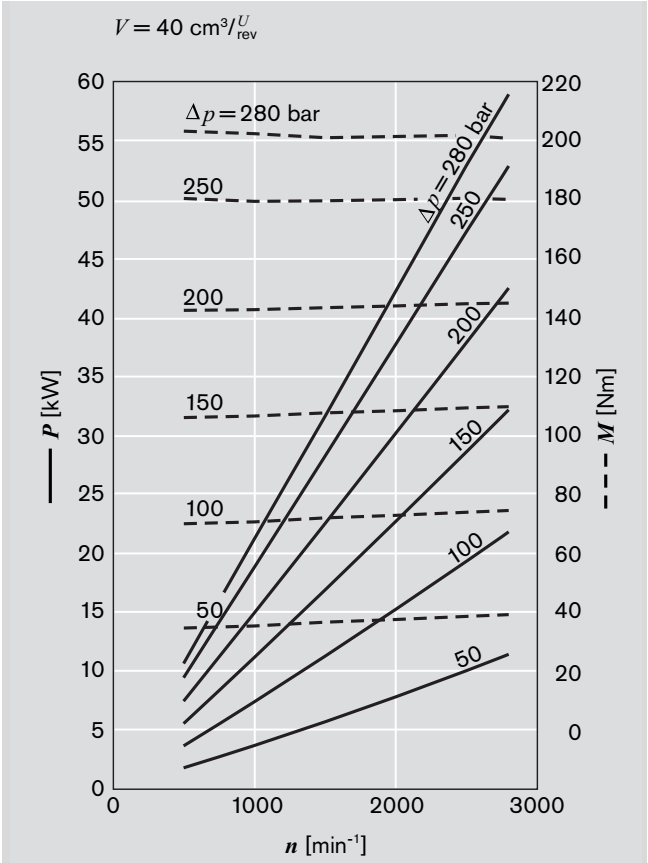


Performance charts (continued)

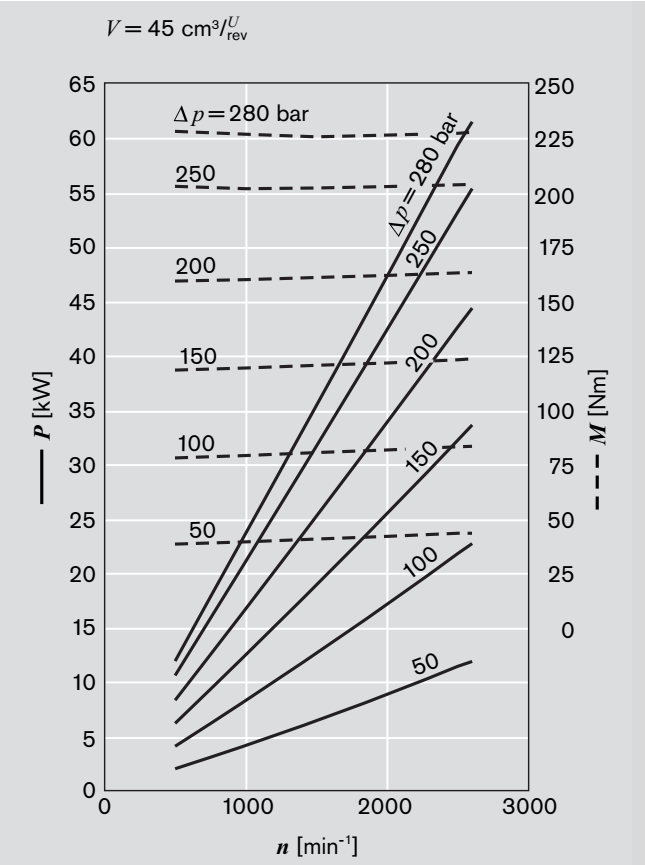


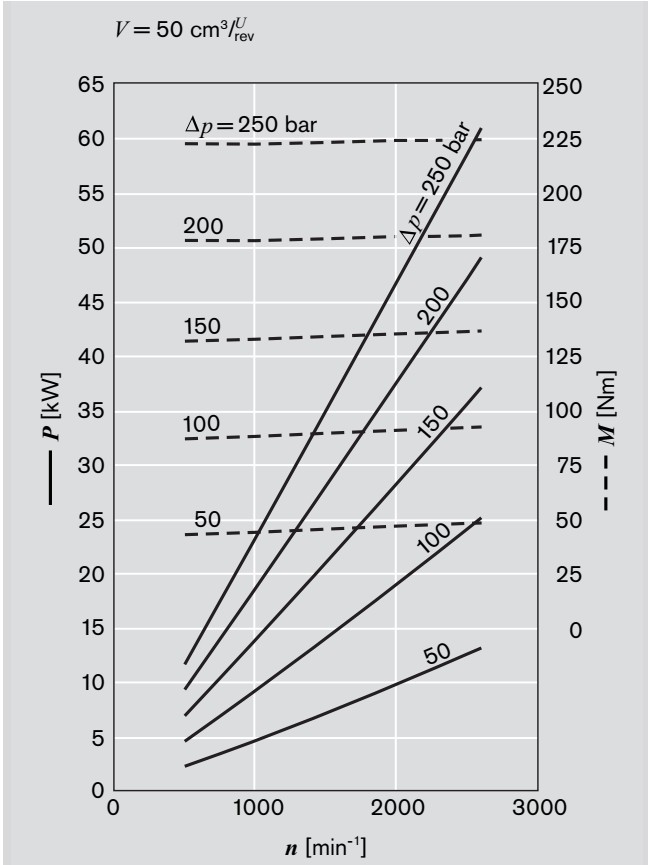


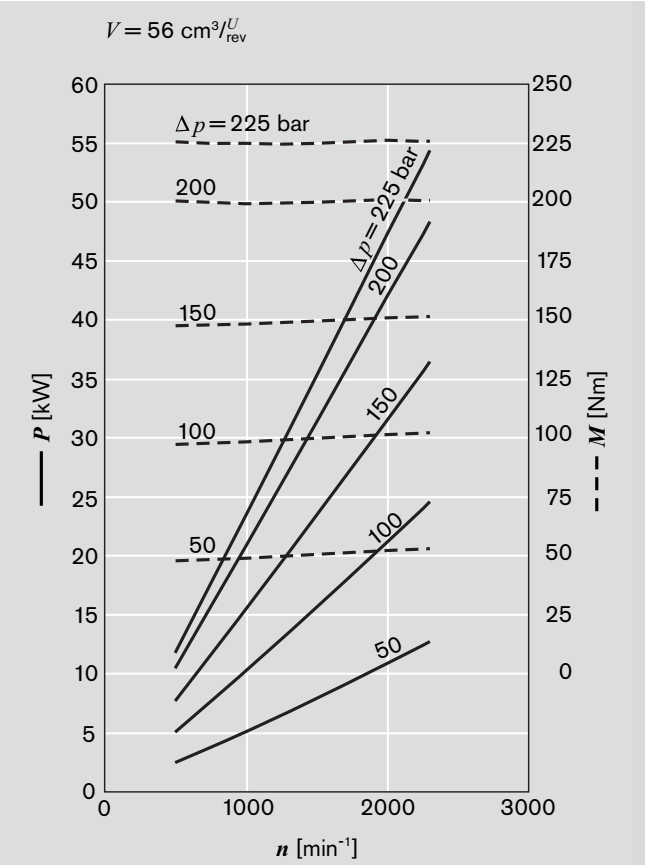


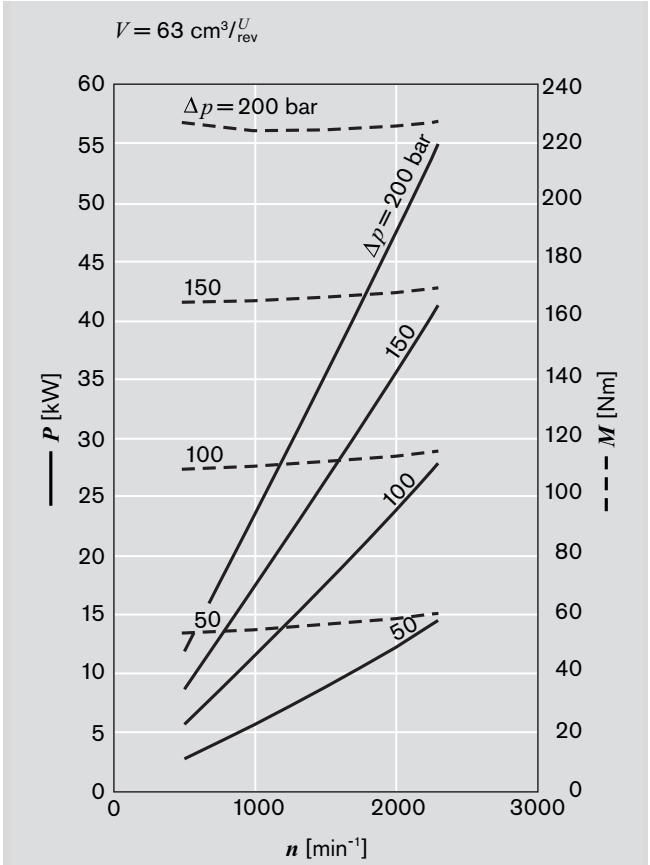


Performance charts (continued)





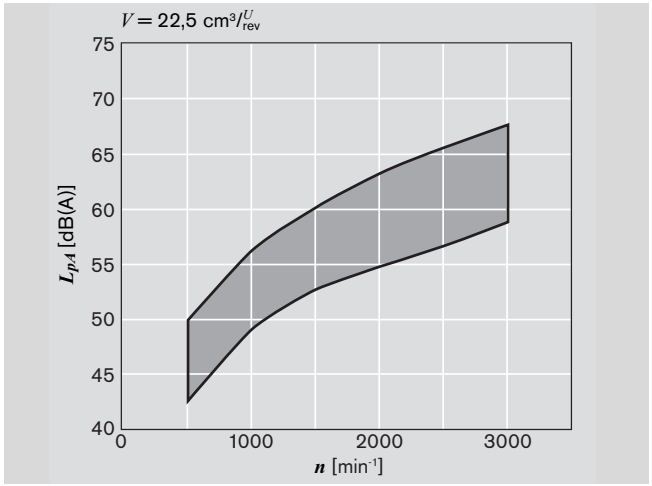


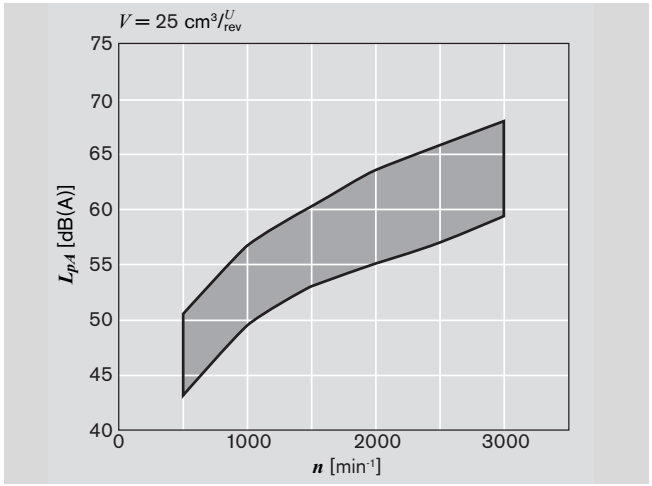


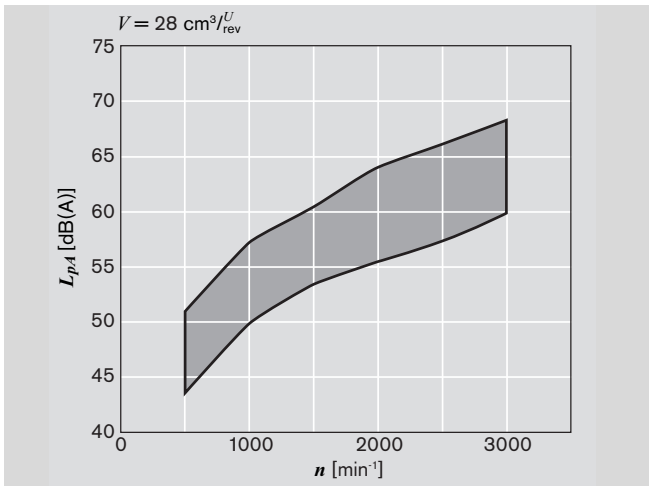
Noise charts

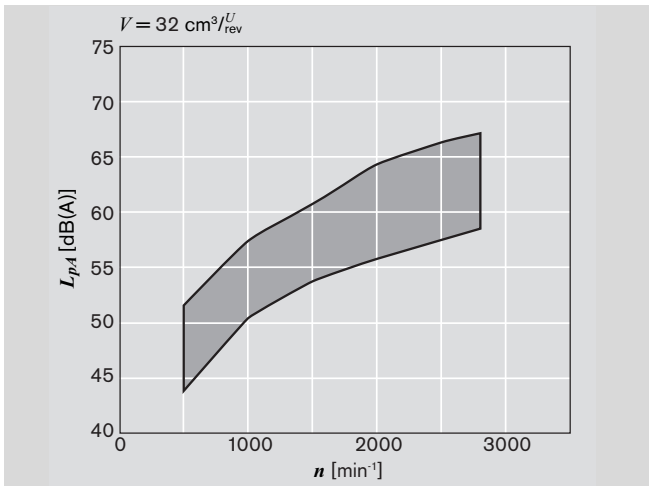
Noise level dependent on rotational speed, pressure range between 10 bar and pressure value p_2 (see page 14 Specifications table).
Oil data: $\nu = 32$ mm²/s, $\vartheta = 50$ °C.
Sound pressure level calculated from noise measurements made in the sound absorbent measuring room compliant with DIN 45 635, Part 26.
Spacing between measuring sensor – pump: 1 m.

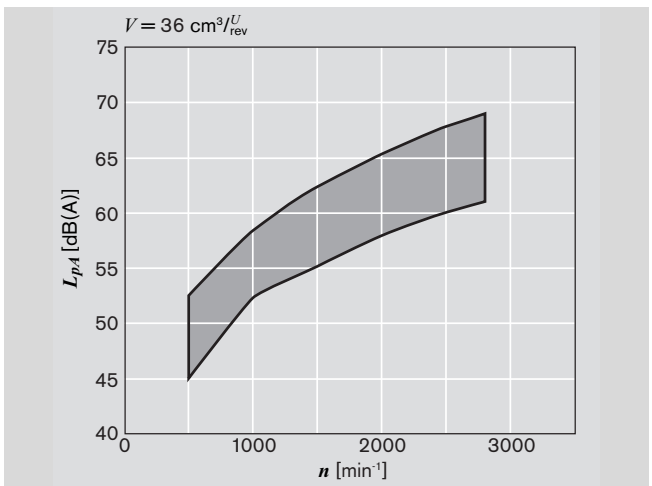
These are typical characteristic values for the respective model. They describe the airborne sound emitted solely by the pump. Environmental influences (installation site, piping, further system components) are not taken into consideration.
Each value applies for a single pump.

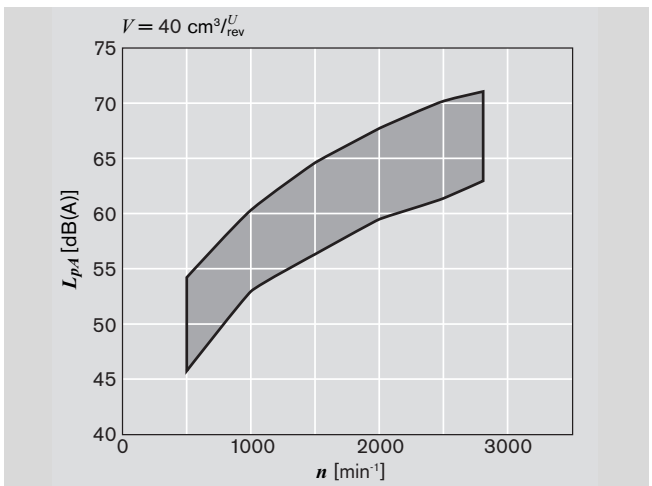




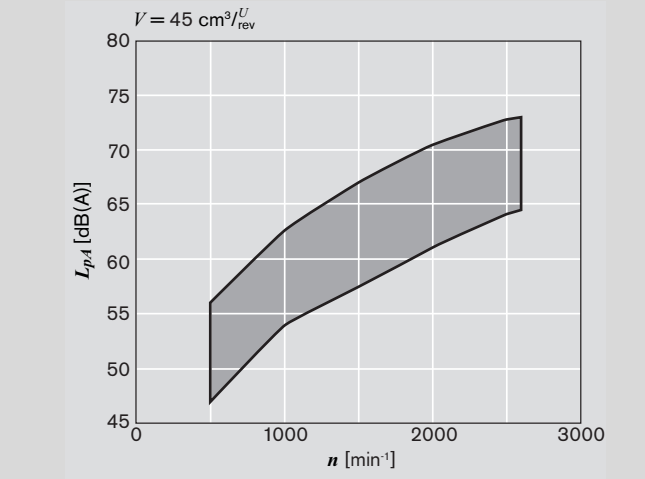


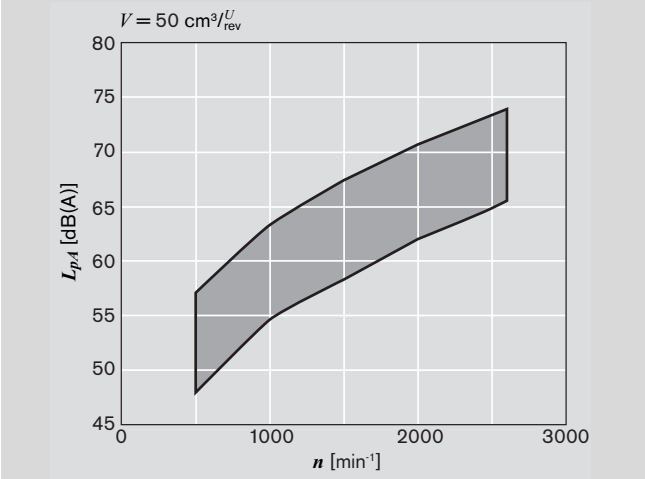


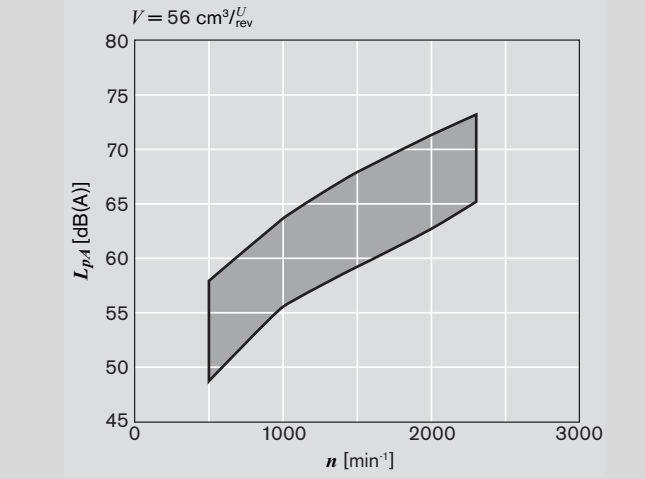


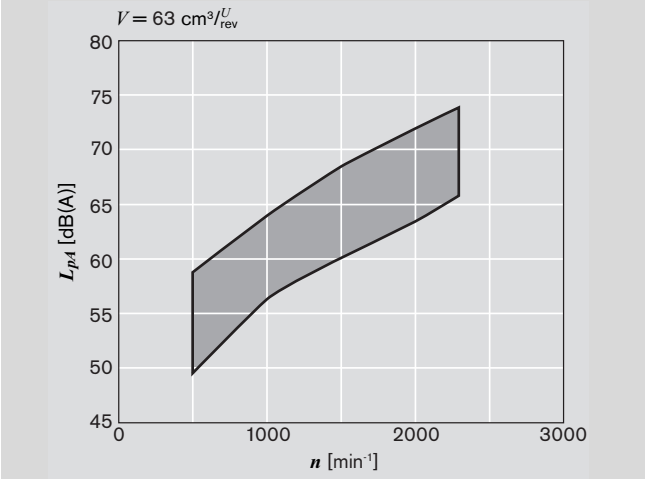


Noise charts (continued)









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 or max. +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®
***) On hydraulic systems or devices with critical counter-reaction, such as steering and counterbalance valves, the type of filtration selected must be adapted to the sensitivity of these devices/systems.

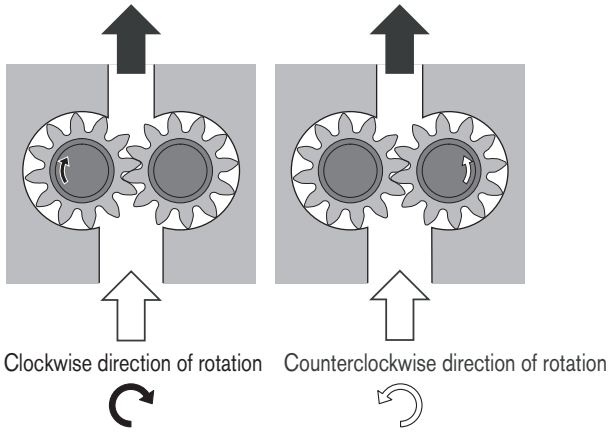
Safety requirements pertaining to the whole systems are to be observed.

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

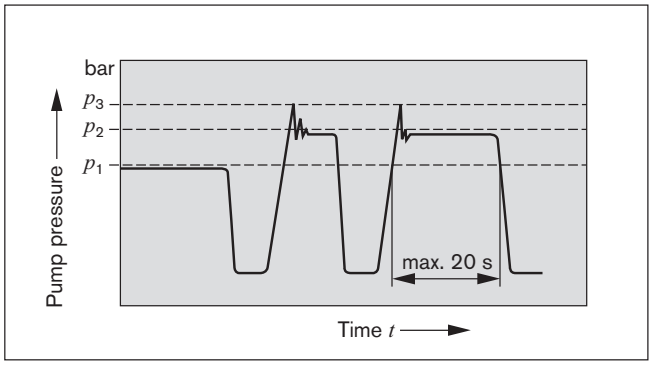
Definition of direction of rotation

Always look on the drive shaft.

Caution: Dimensions drawings always show clockwise-rotation pumps. On counterclockwise-rotation pumps the positions of the drive shaft and the suction and pressure ports are different.



Definitions of pressures



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

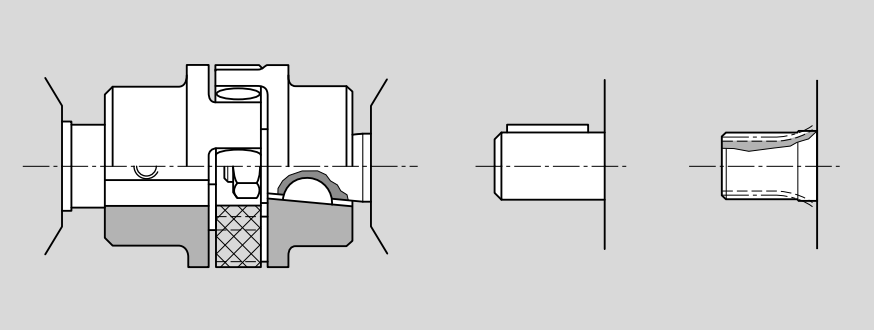
Size AZPU

Displacement	V	cm^3/rev	22.5	25	28	32	36	40	45	50	56	63
Suction pressure	p_e		0,7...3 (absolute), with tandem pumps: p_e (p_2) = max. 0.5 > p_e (p_1)									
max. continuous pressure	p_1	bar	250							220	195	170
max. intermittent pressure	p_2		280							250	225	200
max. peak pressure	p_3		300							280	250	230
min. rpm at bar, 12 mm^2/s	< 100	rpm	500	500	500	500	500	500	500	500	500	500
	100...180		1,200	1,200	1,000	1,000	1,000	800	800	800	800	800
	180... p_2		1,400	1,400	1,400	1,400	1,200	1,200	1,000	1,000	1,000	1,000
25 mm^2/s	p_2		600	600	500	500	500	500	500	500	500	500
max. rotational speed at	p_2		3,000	3,000	3,000	2,800	2,800	2,800	2,600	2,600	2,300	2,300

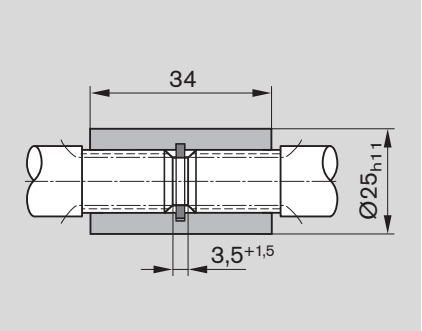
Drive arrangement

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

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 $3.5^{+1.5}$. Oil-bath or oil-mist lubrications is necessary.



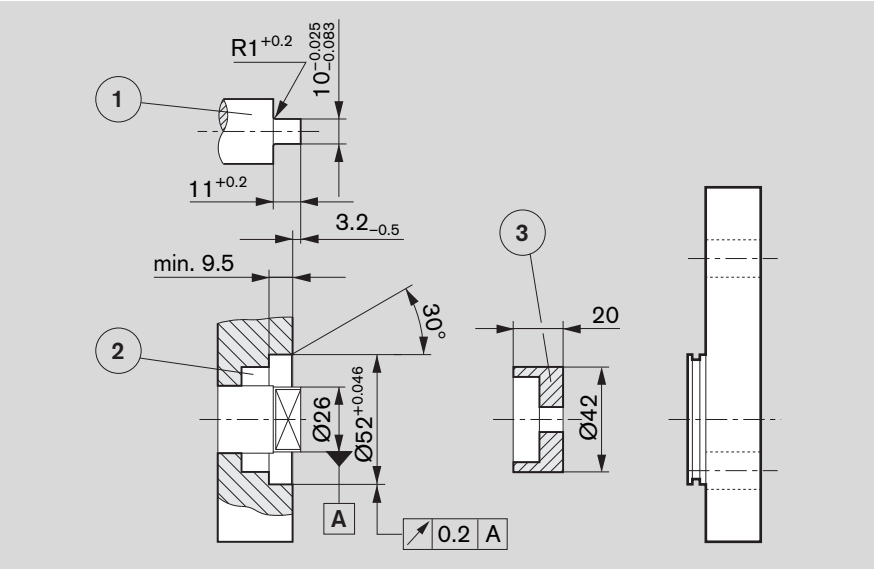
Splined shaft	Ordering code	M_{max} [Nm]
SAE-B 13 teeth	D	300

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.

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 1 .0 deep; HRA $83^{\pm 2}$
Surface for sealing ring
ground without rifling $R_t \leq 4\mu m$

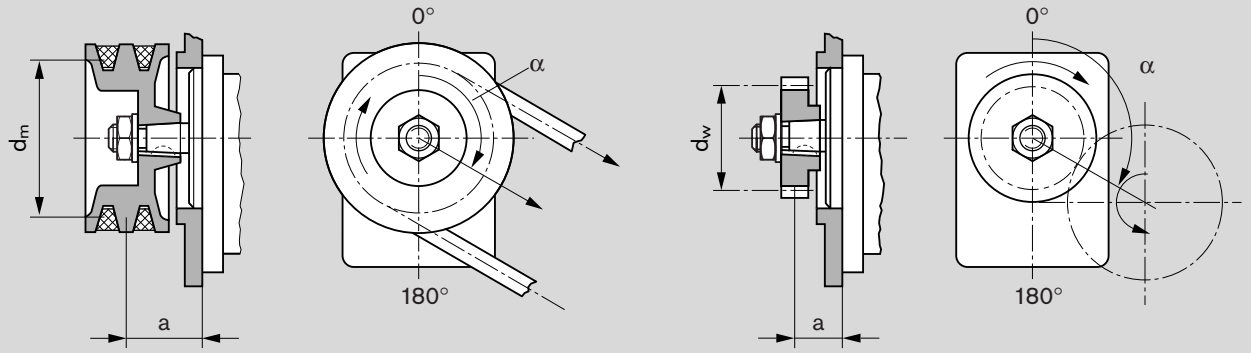
② **Radial shaft seal**
with rubber covered seal
(see DIN 3760, Type AS, or double-lipped ring).
Cut 15° chamfer or fit shaft seal ring with protection sleeve.



M_{max} [Nm]	V [cm³/rev]	p_{max} [bar]
130	28	260
	36	200
	40	180
	45	160
	50	150
	56	130
	63	110
	70	100
	80	90
	100	70

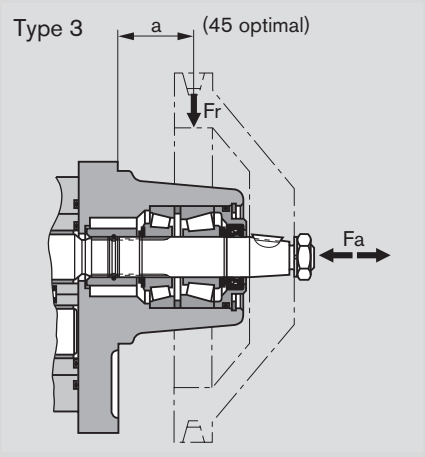
4. V-belts and straight gearwheels or helical toothed gear drives without outboard bearing

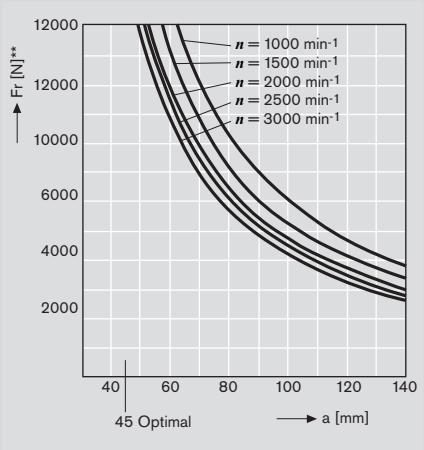
When proposing to use V-belt or gear drive, please submit details of the application for our comments (especially dimensions a, d_m, d_w and angle α).
For helical toothed gear drives, details of the helix angle β are also required.



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 $L_H = 1000$ h.





Multiple gear pumps

Gear pumps are suitable for multiple setups, whereby the drive shaft for the 1st pump is extended to a second and even a 3rd pump. 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. A common suction port is also possible as an option.
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.

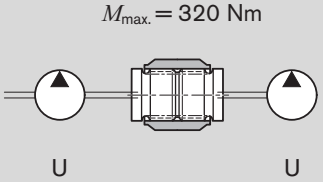
Pressure restrictions during standard through drive
In the case of series U, the driver for the second pumping stage can carry a load of up to $M_{max.}$ = 130 Nm, i.e. there is a pressure restriction for the second stage and any further stages.

$M_{max.}$ [Nm]	V [cm³/rev]	p_{max} [bar]
65 Series F, S	16	230
	19	190
	22.5	160
	25	140
	28	130
130 Series G, U	22.5	280
	25	280
	28	260
	32	230
	36	200
	40	180
	45	160
	50	150
	56	130
	63	110

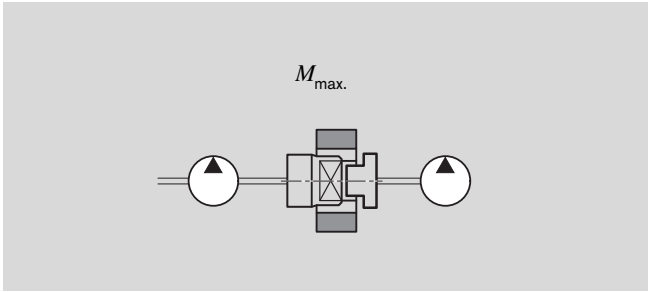
If the 1st stage is driven through a tang (driver) or outboard bearing type 1, pressure restrictions apply as indicated in the formula below.

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

Reinforced through drive



Standard through drive



Combinations

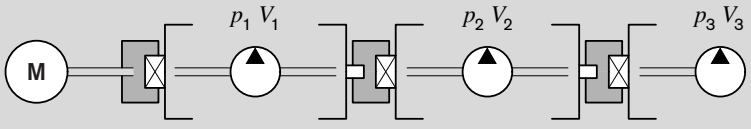
Series Pump 1	$M_{max.}$ [Nm]	Series Pump 2
U U	130 65	G, U F, S

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

Max. transferrable drive torque

Function	Code	Designation	Max. transferrable drive torque * [Nm]
Splined shafts	D	SAE J744 22-4 (13T 16/32 DL)	300
	E	SAE-C 15 teeth	450
Tapered key shaft	C	1:5	290
	H	1:8	240

* These figures are valid providing the conditions defined on pages 15 and 16 are observed. Bosch Rexroth is to be consulted if the stated values are exceeded.

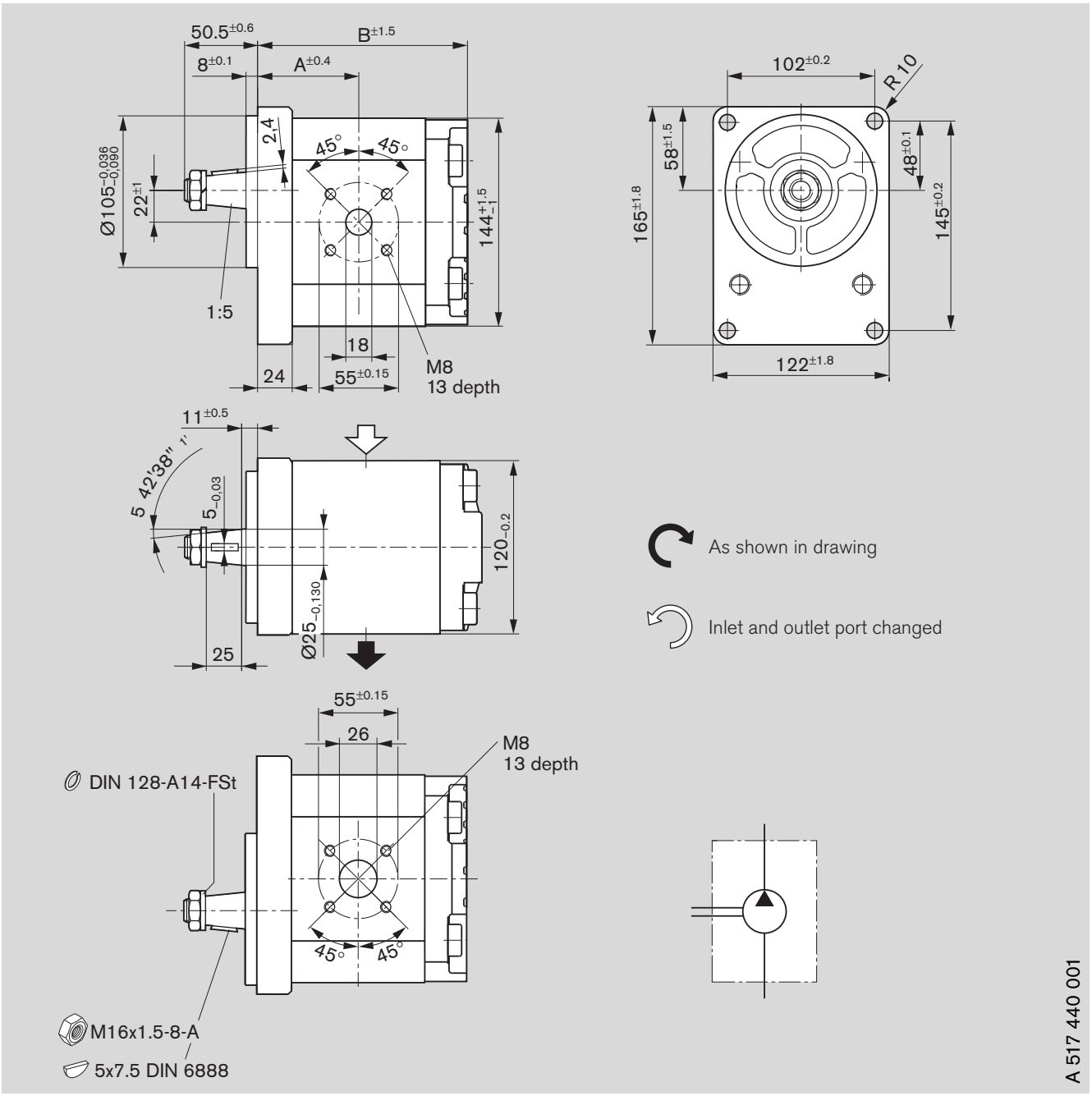


$$M_{max.} \geqq \Delta p_1 \cdot V_1 \cdot 0.0177 + \Delta p_2 \cdot V_2 \cdot 0.0177 + \Delta p_3 \cdot V_3 \cdot 0.0177$$

Δp [bar] V [cm³/rev]

Dimensions

Standard range



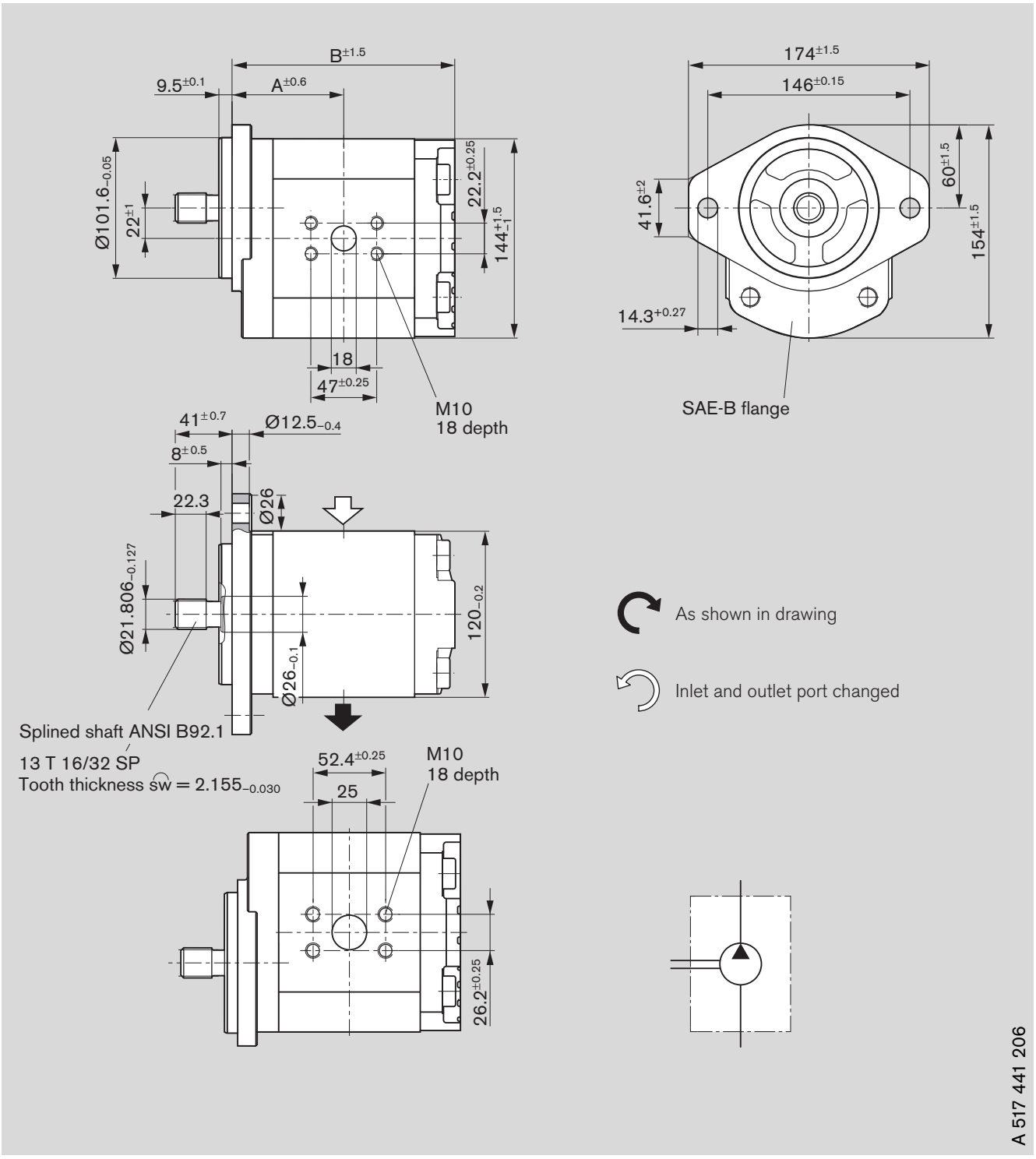
Ordering code:

AZPU – 22 – ☐☐☐ ☐ C B 20 M B

Displacement [cm³/rev]	Ordering-No. L	Ordering-No. R	max. operating pressure [bar]	max. rotation speed [rpm]	Mass [kg]	Dimension [mm] A	Dimension [mm] B
22.5	**0 517 725 322**	**0 517 725 026**	280	3,000	10.3	60.9	124.6
25	**0 517 725 323**	**0 517 725 027**	280	3,000	10.4	61.9	126.6
28	**0 517 725 324**	**0 517 725 028**	280	3,000	10.5	63.2	129.1
32	**0 517 725 325**	**0 517 725 029**	280	2,800	10.7	64.8	132.4
36	**0 517 725 326**	**0 517 725 030**	280	2,800	10.9	66.4	135.7
40	**0 517 725 327**	**0 517 725 031**	280	2,800	11.0	68.1	139.0
45	**0 517 725 328**	**0 517 725 032**	280	2,600	11.2	70.1	143.1
50	**0 517 825 301**	**0 517 825 001**	250	2,600	11.4	72.2	147.2
56	**0 517 825 302**	**0 517 825 002**	225	2,300	11.7	74.7	152.2
63	**0 517 825 303**	**0 517 825 003**	200	2,300	12.0	77.6	158.0

Dimensions

Standard range



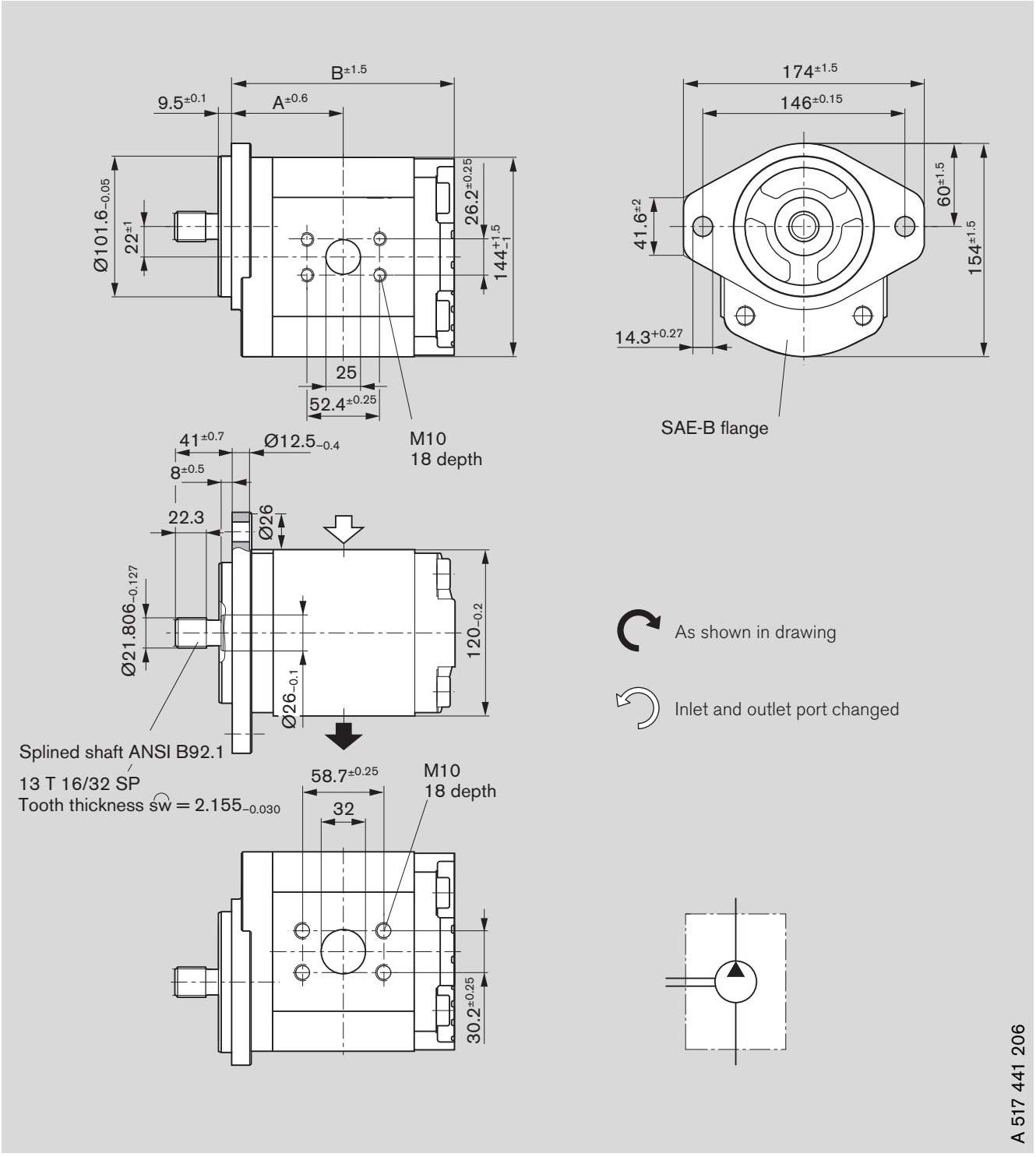
Ordering code:

AZPU – 22 – ☐☐☐ ☐ D C 07 K B

Displacement [cm³/rev]	Ordering-No. L	Ordering-No. R	max. operating pressure [bar]	max. rotation speed [rpm]	Mass [kg]	Dimension [mm] A	Dimension [mm] B
22.5	**0 517 725 329**	**0 517 725 033**	280	3,000	9.6	66.4	130.1
25	**0 517 725 330**	**0 517 725 034**	280	3,000	9.7	67.4	132.1
28	**0 517 725 331**	**0 517 725 035**	280	3,000	9.8	68.7	134.6

Dimensions

Standard range



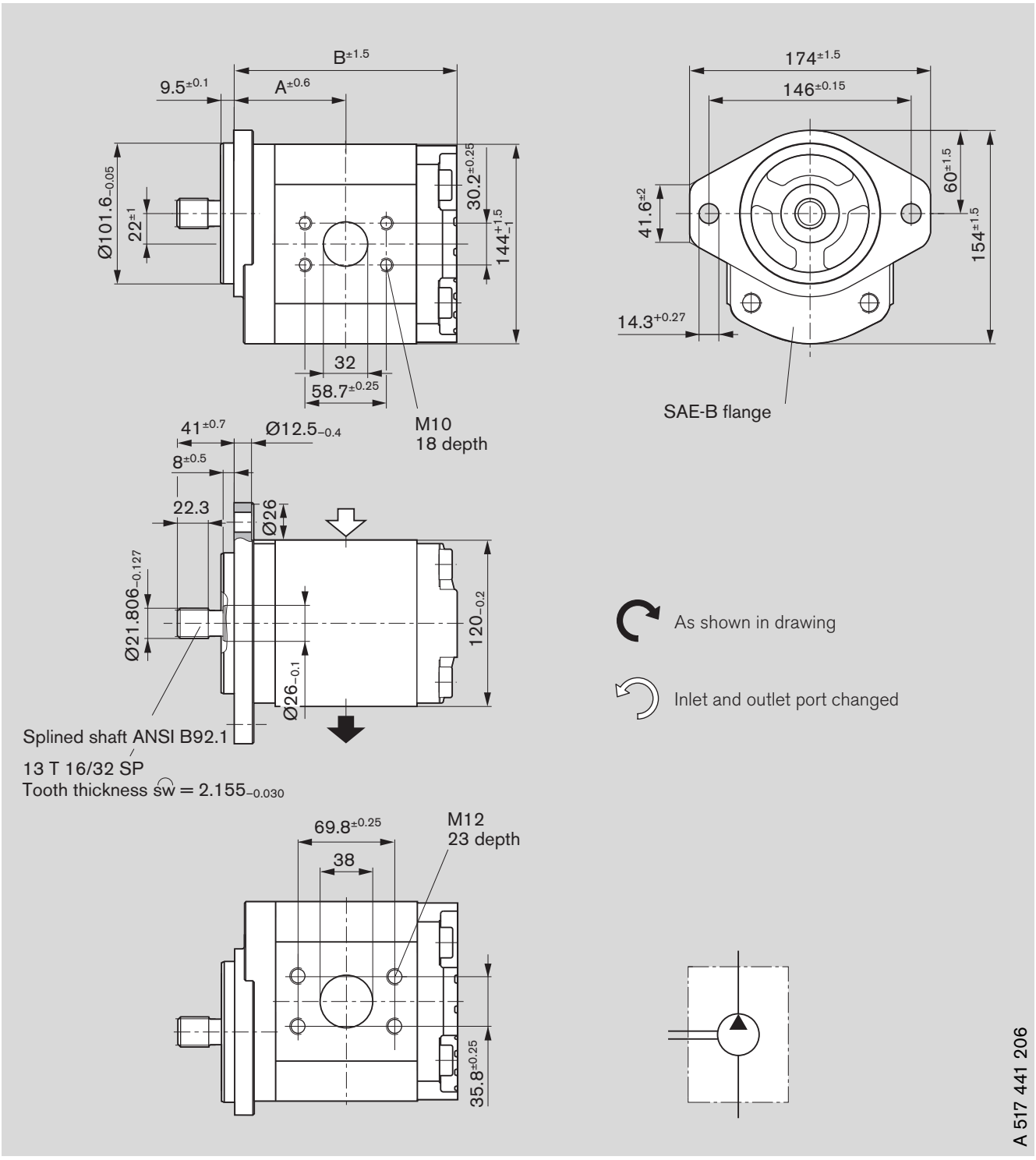
Ordering code:

AZPU – 22 – ☐☐☐ ☐ D C 07 K B

Displacement [cm³/rev]	Ordering-No. L	Ordering-No. R	max. operating pressure [bar]	max. rotation speed [rpm]	Mass [kg]	Dimension [mm] A	Dimension [mm] B
32	**0 517 725 332**	**0 517 725 036**	280	2,800	10.0	70.3	137.9
36	**0 517 725 333**	**0 517 725 037**	280	2,800	10.1	71.9	141.2
40	**0 517 725 334**	**0 517 725 038**	280	2,800	10.3	73.6	144.5
45	**0 517 725 335**	**0 517 725 039**	280	2,600	10.5	75.6	148.6
50	**0 517 825 304**	**0 517 825 004**	250	2,600	10.7	77.7	152.7

Dimensions

Standard range



Ordering code:

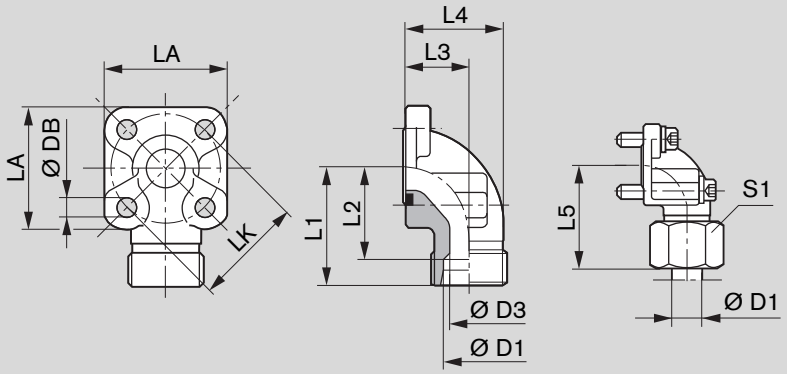
AZPU – 22 – ☐☐☐ ☐ D C 07 K B

Displacement [cm³/rev]	Ordering-No. L	Ordering-No. R	max. operating pressure [bar]	max. rotation speed [rpm]	Mass [kg]	Dimension [mm] A	Dimension [mm] B
56	**0 517 825 305**	**0 517 825 005**	225	2,300	11.0	80.2	157.7
63	**0 517 825 306**	**0 517 825 006**	200	2,300	11.3	83.1	163.5

Fittings

Fittings can be used for rectangular flange 20 see page 7

Gear pump flange, 90° angle



LK	D1	D3	L1	L2	L3	L4	L5	LA	S1	DB	Screws 2 pcs.	2 pcs.	Seal ring	Mass kg	Part number	p (bar)
55	20S	17	45	34.5	24.0	40.0	56.0	58	36	8.4	M8x25	M8x50	33x2.5	0.44	**1 515 702 004**	250
55	30S	26	49	35.5	32.0	50.0	62.0	58	50	8.4	M8x25	M8x50	33x2.5	0.50	**1 515 702 006**	250
55	35L	31	49	38.5	32.0	51.5	62.0	58	50	8.4	M8x25	M8x60	32x2.5	0.47	**1 515 702 005**	100
55	42 L	38	49	38.0	40.0	64.5	61.0	58	60	8.4	M8x25	M8x70	32x2.5	0.60	**1 515 702 019**	100

Complete fittings with seal ring, metric screw set, nuts and olive.

Note
The permissible tightening torques can be found in our publication:
“General operating instructions for external gear units”
RE 07 012-B1.

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 recommended 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 15 – 18).

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 12.

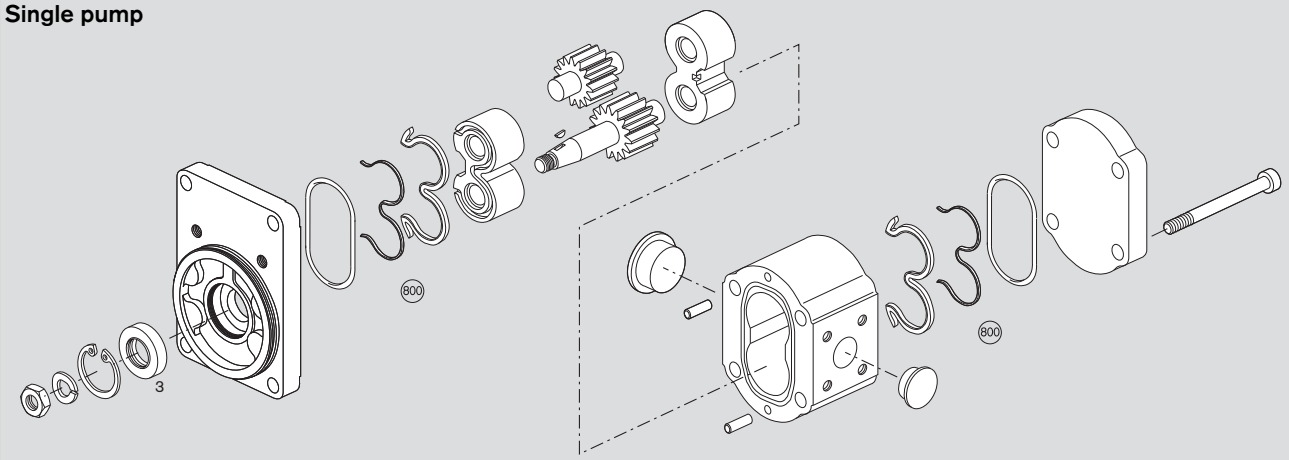
Additional information on the proper handling of hydraulic products from Bosch Rexroth is available in our document: “General product information for hydraulic products” RE 07 008.

Contained in delivery
The components with characteristics as described under ordering code and device measurements, pages 18 – 21, are contained in delivery.

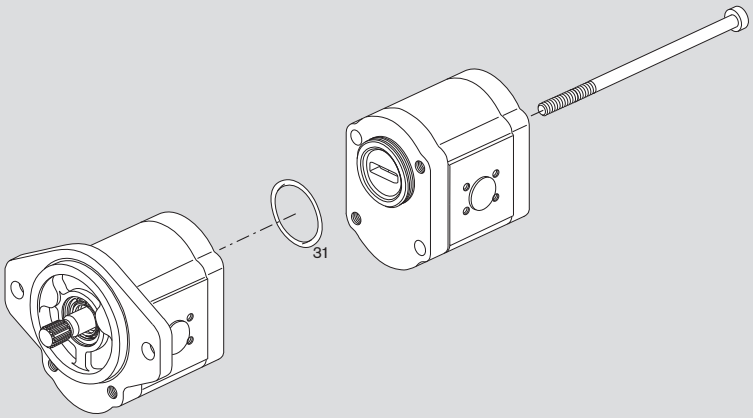
You can find further information in our publication: “General Operating Instructions for External Gear Units” RE 07 012-B1.

Service parts

Single pump



Multiple pump



Page	Ordering code	Seal kit “U” Item 800 NBR	Shaft seal ring Item 3	Dimension	Material
18	AZPU – 22 – ☐☐☐ ☐ C B 20 M B	1 517 010 231	1 510 283 072	42 x 26 x 7	NBR
19, 20, 21	AZPU – 22 – ☐☐☐ ☐ D C 07 K B	1 517 010 231	1 510 283 069	42 x 26 x 7	FKM

NBR = Perbunan® FKM = Viton®

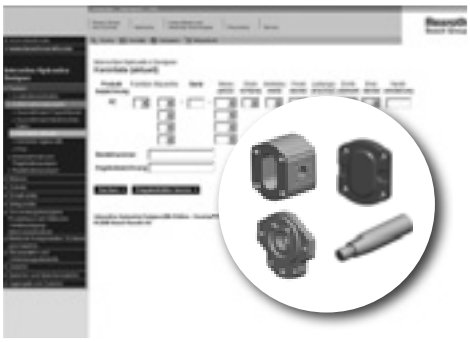
For multiple pumps

Seal ring Item 31 NBR	1 900 210 145

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.

Ordering-No.

Ordering-No.	Page
0 517 725 004	20
0 517 725 026	18
0 517 725 027	18
0 517 725 028	18
0 517 725 029	18
0 517 725 030	18
0 517 725 031	18
0 517 725 032	18
0 517 725 033	19
0 517 725 034	19
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0 517 725 036	20
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0 517 825 005	21
0 517 825 006	21
0 517 825 301	18
0 517 825 302	18
0 517 825 303	18
0 517 825 305	21
0 517 825 306	21

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www.boschrexroth.com/brm