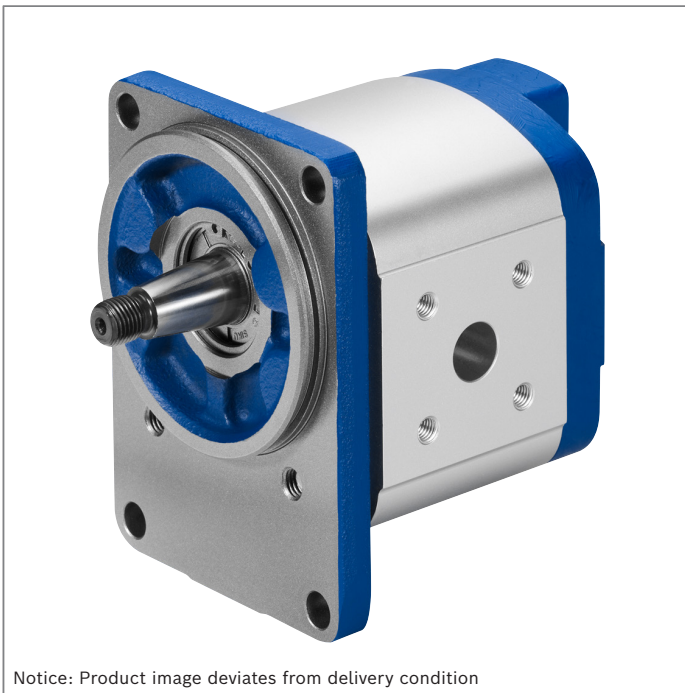


High-Performance external gear pump AZPN



Notice: Product image deviates from delivery condition

- ▶ Platform N
- ▶ Fixed displacement
- ▶ Sizes 20 ... 36
- ▶ Continuous pressure up to 250 bar
- ▶ Intermittent pressure up to 280 bar

Features

- ▶ Consistently high quality based on large-volume production
- ▶ Long service life
- ▶ Slide bearings for high loading
- ▶ Drive shafts according to ISO or SAE and customer-specific solutions
- ▶ Line connections: Connection flanges or screw-in threads
- ▶ Combinations of several pumps possible

Contents

Product description	2
Type code	4
Technical data	8
Diagrams/characteristic curves	15
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Project planning information	30
Information	31
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Product description

General

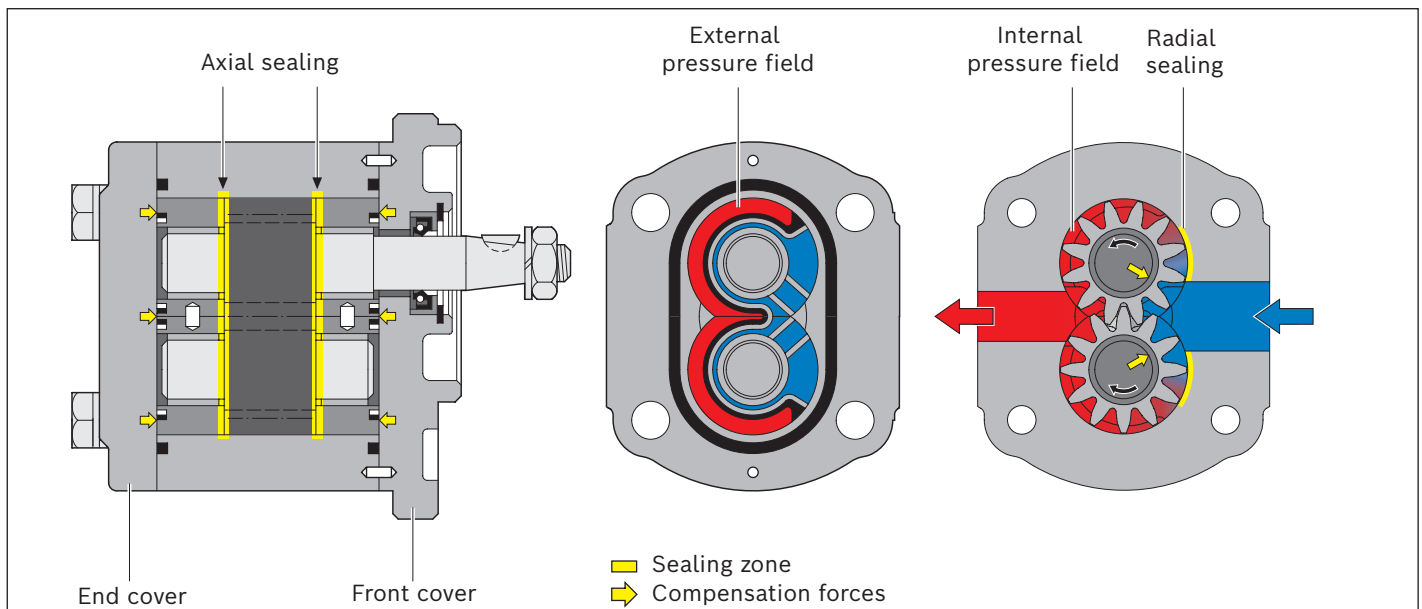
It is the central task of external gear pumps is to convert mechanical energy (torque and rotational speed) into hydraulic energy (flow and pressure). To reduce heat losses, Rexroth external gear units are designed to be extremely efficient. They are realized by pressure-dependent gap sealing and highly precise production technology.

Rexroth external gear pumps are built in four frame sizes: Platforms B, F, N and G, Within each platform different sizes can be realized by different gear widths. The pumps are available in the versions Standard, High-Performance, SILENCE und SILENCE PLUS. Additional configuration variants with different flanges, shafts, valve attachments and multiple pump combinations are also available.

Pumping principle

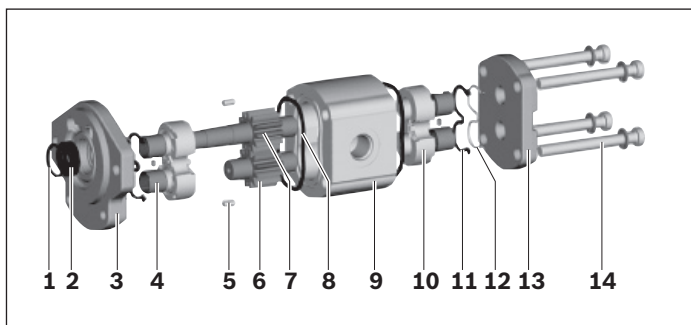
Due to the teeth moving apart during the rotation from the tooth mesh, the gear chambers become clear. The resulting negative pressure as well as the atmospheric pressure on the hydraulic fluid level in the reservoir cause hydraulic fluid to flow from the reservoir to the pump. This hydraulic fluid fills the gear chambers and is transported in them in the direction of the arrow (see sectional drawing) along the housing from the suction side to the pressure side. The teeth mesh again then, force the hydraulic fluid out of the gear chambers and prevent it from flowing back to the suction chamber.

External gear pump layout



Design

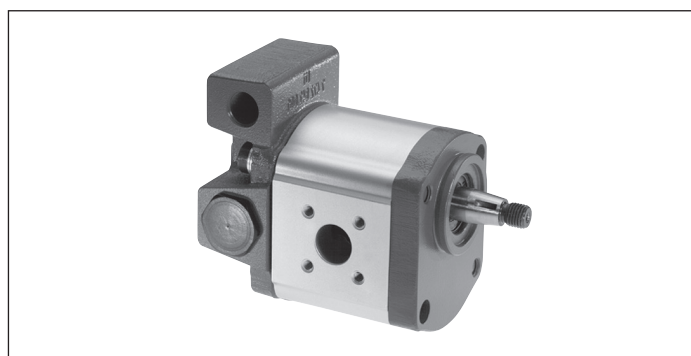
The external gear pump consists essentially of a pair of gear wheels supported in bearing bushings and the housing with a front cover and an end cover. The drive shaft protrudes from the front cover, where it is usually sealed by the shaft seal. The bearing forces are absorbed by slide bearings. These bearings were designed for high pressures and have excellent emergency running properties, especially at low rotational speeds. The gear wheels have 12 teeth. This keeps both flow pulsation and noise emission to a minimum. The sealing of the pressure chambers is achieved by forces depending on the working pressure. This ensures optimum efficiency. The working pressure generated in the gear chambers is transferred to the outside of the bearing bushings in specifically designed pressure fields in such a way that they are pressed against the gear wheels and seal them up. The pressurized compression areas are limited by special seals. The seal in the area between the gear wheels and the housing is ensured by the smallest of gaps that are set depending on the pressure between the gear wheels and housing.



- | | | | |
|---|----------------|----|--------------------|
| 1 | Retaining ring | 8 | Housing seal ring |
| 2 | Shaft seal | 9 | Pump housing |
| 3 | Front cover | 10 | Bearing bushing |
| 4 | Slide bearings | 11 | Axial field seal |
| 5 | Centering pin | 12 | Supporting element |
| 6 | Gear wheel | 13 | End cover |
| 7 | Drive shaft | 14 | Torx screws |

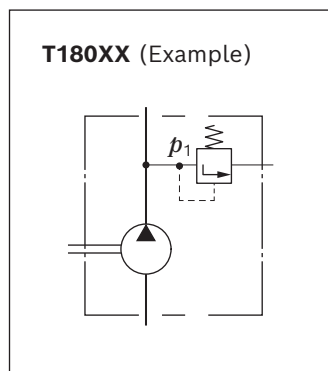
Gear pumps with integrated valves

In order to reduce piping complexity, a flow control valve or pressure relief valve can be integrated in the cover of the gear pump. Such solutions are used, for instance, for the hydraulic oil supply of power steering systems. The pump delivers a constant flow or maximum pressure irrespective of the rotational speed. The residual flow is either returned internally to the suction port or distributed externally to other consumers.



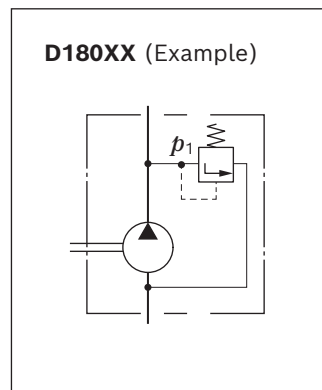
Pressure relief valve, external pressure discharge

$p_1 = 5$ to 250 bar



Pressure relief valve, pressure discharge into suction line

$p_1 = 5$ to 250 bar



Type code

Single pump type code

01	02	03	04	05	06	07	08	09	10	11	12	13	14
AZP	N	-			-								-

External gear unit

01	External gear pump	AZP
----	--------------------	------------

Series

02	High Performance, Platform N	N
----	------------------------------	----------

Unit version

03	Housing width 92 mm	1
	Housing width 110 mm	2

Version

04	Phosphated, pinned	1
	Corrosion-resistant, pinned ¹⁾	2

Size (NG)

05	Geometric displacement V_g [cm ³], see "Technical data"	020	022	025	028	032	036
----	---	------------	------------	------------	------------	------------	------------

Direction of rotation

06	Viewed on drive shaft	clockwise	R
		counter-clockwise	L

Drive shaft

Suitable front cover




07	Tapered shaft	1 : 5	B	C
	Tang drive		M	N
	Splined shaft	SAE J744 22-4 13T	C	D
		SAE J744 19-4 11T	C	P

Front cover

08	Rectangular flange	Ø100 mm		B
	2-hole flange	Ø82.2 mm	SAE J744 82-2 A	R
		Ø101.6 mm	SAE J744 101-2 B	C
	2-hole mounting	Ø52 mm	with O-ring	M

Line connection

020 022 025 028 032 036

09	SAE rectangular flange, metric thread		●	●	●	●	●	●	07
	SAE rectangular flange, UNC thread		-	-	●	●	●	●	15
	Square flange		●	●	●	●	●	●	20

Sealing material

10	NBR (nitrile rubber), shaft seal in FKM (fluorocarbon rubber)	K
	NBR (nitrile rubber)	M
	FKM (fluorocarbon rubber)	P

¹⁾ Corrosion-protected version, for details, see "Technical data"

01	02	03	04	05	06	07	08	09	10	11	12	13	14
AZP	N	-			-								-

End cover

11	Without valve (standard)	B	
	With pressure relief valve Pressure relief external	T	
		internal	D

Valve setting pressure relief valve (parameter only required for end cover with pressure relief valve)

12	Without pressure relief valve	XXX
	Cracking pressure in bar, 3-digit, e.g. 180 bar	180

Valve setting flow control valve (parameter only required for end cover with flow control valve)

13	Without flow control valve	XX
	Flow in l/min, 2-digit, e.g. 9 l/min	09

Special version

14	Special version ¹⁾	SXXXX
----	-------------------------------	--------------

● = Available - = Not available

Notice

- ▶ Not all of the variants according to the type code are possible.
- ▶ Please select the desired pump with the help of the selection tables (preferred types) or after consultation with Bosch Rexroth.
- ▶ Special options are available on request.

¹⁾ For further information on special versions, please contact us.

Multiple pump type code

01	02	03	04	05	06	07	08	09	10	11	12
AZP		-			-						

External gear unit

01	External gear pump	AZP
----	--------------------	------------

Series¹⁾

02	High-Performance	1.0 ... 7.1 cm ³ /U	Data sheet 10088	B
		4.0 ... 28 cm ³ /U	Data sheet 10089	F
		20.0 ... 36 cm ³ /U	Data sheet 10091	N
		22.5 ... 100 cm ³ /U	Data sheet 10093	G
	SILENCE	4.0 ... 28 cm ³ /U	Data sheet 10095	S
		20.0 ... 36 cm ³ /U	Data sheet 10092	T
		22.5 ... 63 cm ³ /U	Data sheet 10098	U
	SILENCE PLUS	12.0 ... 28 cm ³ /U	Data sheet 10094	J

Unit version (in accordance with data sheet for pump stage 1)

03	Standard bearings	1
	Reinforced bearings	2

Version (in accordance with data sheet for pump stage 1)

04	Phosphated, pinned	1
	Corrosion-resistant, pinned	2

Size (NG)²⁾

05	In accordance with data sheet for the individual series	
----	---	--

Direction of rotation

06	Viewed on drive shaft	clockwise	R
		counter-clockwise	L

Drive shaft (relates to pump stage 1)

07	In accordance with data sheet for pump stage 1	
----	--	--

Front cover (relates to pump stage 1)

08	In accordance with data sheet for pump stage 1	
----	--	--

Line connection (per pump stage)³⁾

09	In accordance with data sheet for the individual series	
----	---	--

Sealing material

10	NBR (nitrile rubber)	M
	FKM (fluorocarbon rubber)	P
	NBR (nitrile rubber), shaft seal in FKM (fluorocarbon rubber)	K

End cover (relates to last pump stage)

11	In accordance with data sheet for last pump stage	
----	---	--

Special version

12	Special version	SXXXX
----	-----------------	--------------

1) A letter is to be selected for each pump stage, e.g. 3-fold pump AZPJ + AZPJ + AZPB: **JJB**

2) A numerical value is to be selected for each pump stage, e.g. 3-fold pump **028/016/2.0**

3) A numerical value is to be selected for each pump stage, e.g. 3-fold pump **202020**

Notice

- ▶ Not all of the variants according to the type code are possible.
- ▶ Please select the desired pump with the help of the selection tables (preferred types) or after consultation with Bosch Rexroth.
- ▶ Special options are available on request.

Example for 3-fold pump:

AZPN...020... + AZPN...025... + AZPF...016...

01	02		03	04		05	06	07	08	09	10	11
AZP	NNF	-	1	2	-	020/025/016	R	D	C	20202020	K	B

Technical data

Table of values

Size		20	22	25	28	32	36	
Unit version		Series 1x						
Displacement geometric, per revolution	V_g cm ³	20	22.5	25	28	32	36	
Pressure at suction port S ¹⁾	absolute p_e bar	0.7 ... 3						
Maximum continuous pressure	p_1 bar	230	230	230	210	180	160	
Maximum intermittent pressure	p_2 bar	250	250	250	230	200	180	
Maximum pressure peak	p_3 bar	270	270	270	250	220	200	
Minimum rotational speed at	$\nu = 12$ mm ² /s	$p < 100$ bar	n_{min} rmp	500	500	500	500	500
		$p = 100 \dots 180$ bar	n_{min} rmp	600	600	600	600	600
		$p = 180$ bar ... p_2	n_{min} rmp	800	800	800	800	800
	$\nu = 25$ mm ² /s	at p_2	n_{min} rmp	500	500	500	500	500
Maximum rotational speed	at p_2	n_{max} rmp	3000	3000	3000	2800	2800	2800

Size		20	22	25	28	32	36	
Series		Series 2x						
Displacement geometric, per revolution	V_g cm ³	20	22.5	25	28	32	36	
Pressure at suction port S ¹⁾	absolute p_e bar	0.7 ... 3						
Maximum continuous pressure	p_1 bar	250	250	250	230	210	180	
Maximum intermittent pressure	p_2 bar	280	280	280	260	240	210	
Maximum pressure peak	p_3 bar	300	300	300	280	260	230	
Minimum rotational speed at	$\nu = 12$ mm ² /s	$p < 100$ bar	n_{min} rmp	500	500	500	500	500
		$p = 100 \dots 180$ bar	n_{min} rmp	600	600	600	600	600
		$p = 180$ bar ... p_2	n_{min} rmp	800	800	800	800	800
	$\nu = 25$ mm ² /s	at p_2	n_{min} rmp	500	500	500	500	500
Maximum rotational speed	at p_2	n_{max} rmp	3000	3000	3000	2800	2800	2800

General technical data

Weight	m	kg	See chapter "Dimensions"
Installation position			No restrictions
Mounting type			Flange or through-bolting with spigot
Line connections			See chapter "Dimensions"
Direction of rotation, viewed on drive shaft			Clockwise or counter-clockwise, the pump may only be driven in the direction indicated
Drive shaft loading			Axial and radial forces only after consultation
Ambient temperature range	t	°C	-30 ... +80 with NBR seals (NBR = nitrile rubber)
			-20 ... +110 with FKM seals (FKM = fluorocarbon rubber)

Corrosion protection

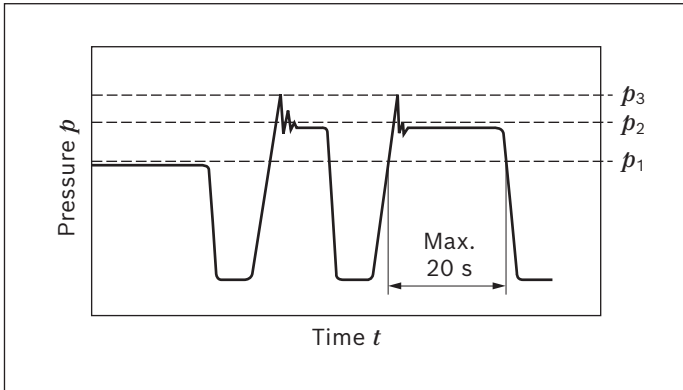
Version 1 (phosphated): Unit with low corrosion protection	The surface serves for protection against flash rust during transport or as priming for painting.
Version 2 (galvanized, passivated): Unit with corrosion protection	Degree of corrosion and rust according to DIN EN ISO 9227 Test duration 96 h: no red rust

Notice

- ▶ Please observe the safety requirements for the overall system.
- ▶ Please contact us for applications with frequent load cycles.

1) In the case of tandem pumps, the suction-side pressure difference between the individual pump stages must not exceed 0.5 bar.

Pressure definition

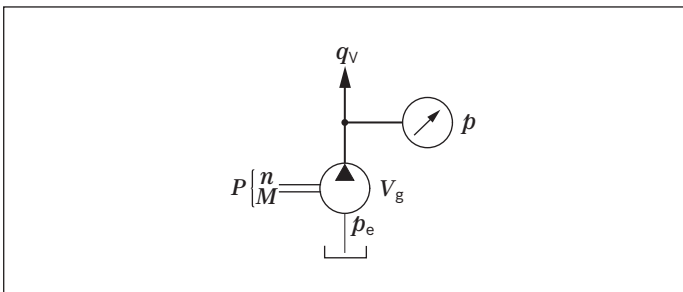


- p_1 : Maximum continuous pressure
- p_2 : Maximum intermittent pressure
- p_3 : Maximum pressure peak

Determination of the characteristics		
Flow	$q_v = \frac{V_g \times n \times \eta_v}{1000}$	[l/min]
Torque	$M = \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{hm}}$	[Nm]
Power	$P = \frac{2 \pi \times M \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$	[kW]

Key

- V_g Displacement per revolution [cm³]
- Δp Differential pressure [bar]
- n Rotational speed [rpm]
- η_v Volumetric efficiency
- η_{hm} Hydraulic-mechanical efficiency
- η_t Total efficiency ($\eta_t = \eta_v \cdot \eta_{hm}$)



Notice

- You can find diagrams for a rough calculation in the "Diagrams/characteristic curves" chapter.

Hydraulic fluid

The external gear unit is designed for operation with HLP mineral oil according to DIN 51524 1-3. Under higher load, however, Bosch Rexroth recommends at least HLP compliant with DIN 51524 Part 2.

See the following data sheet for application instructions and requirements for selecting hydraulic fluid, behavior during operation as well as disposal and environmental protection before you begin project planning:

- ▶ 90220: Hydraulic fluids based on mineral oils and related hydrocarbons

Other hydraulic fluids on request.

Selection of hydraulic fluid

Bosch Rexroth evaluates hydraulic fluids on the basis of the Fluid Rating according to the technical data sheet 90235.

Hydraulic fluids with positive evaluation in the Fluid Rating are listed in the following technical data sheet:

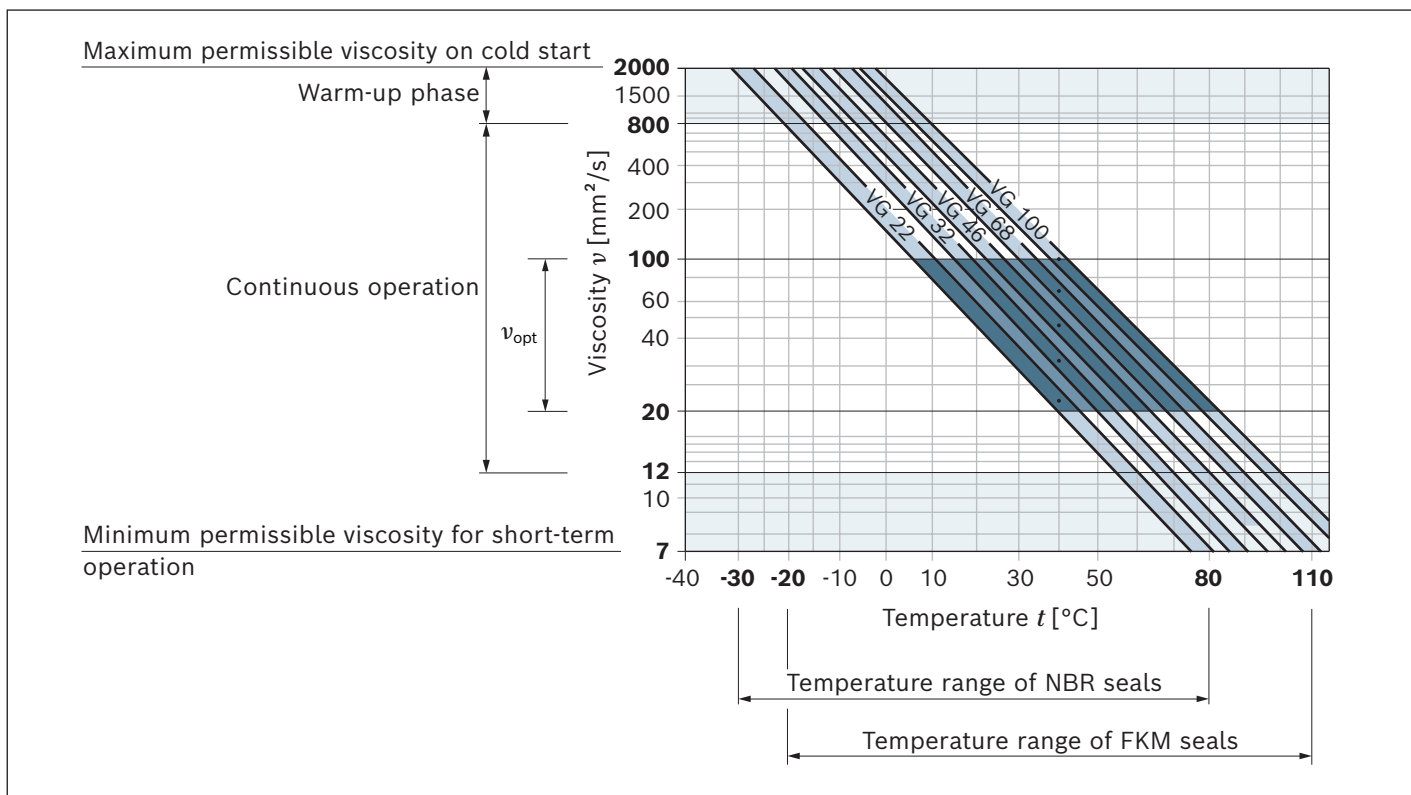
- ▶ 90245: Bosch Rexroth Fluid Rating List for Rexroth hydraulic components (pumps and motors)

The hydraulic fluid should be selected so that the operating viscosity in the operating temperature range is within the optimum range (v_{opt} ; see selection diagram).

Viscosity and temperature of hydraulic fluids

Viscosity range	
Permissible in continuous operation	$v = 12 \dots 800 \text{ mm}^2/\text{s}$
Recommended in continuous operation	$v_{opt} = 20 \dots 100 \text{ mm}^2/\text{s}$
Permissible for cold start	$v_{max} \leq 2000 \text{ mm}^2/\text{s}$
Temperature range	
With NBR seals (NBR = nitrile rubber)	$t = -30 \text{ °C} \dots +80 \text{ °C}$
With FKM seals (FKM = fluorocarbon rubber)	$t = -20 \text{ °C} \dots +110 \text{ °C}$

Selection diagram

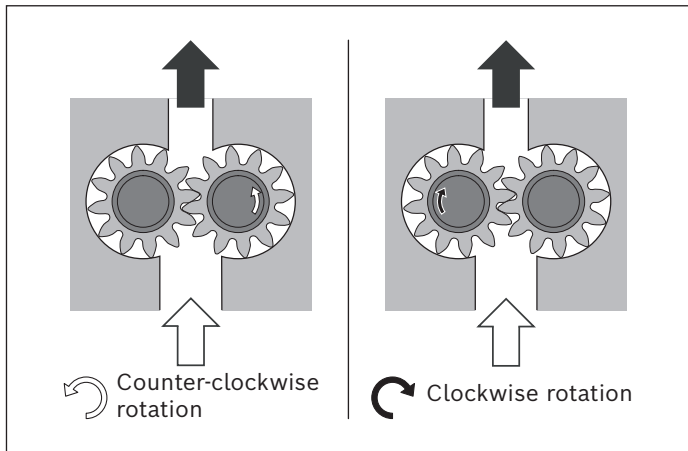


Please observe the information on the filtration of hydraulic fluid (see chapter "Project planning information").

Direction of rotation

The dimensional drawings in the chapter "Dimensions" represent pumps for clockwise rotation. The position of the drive shaft or the position of suction and pressure port changes for counter-clockwise rotation.

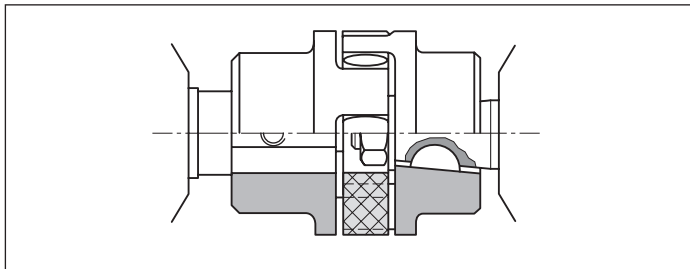
Direction of rotation, viewed on drive shaft



Drives

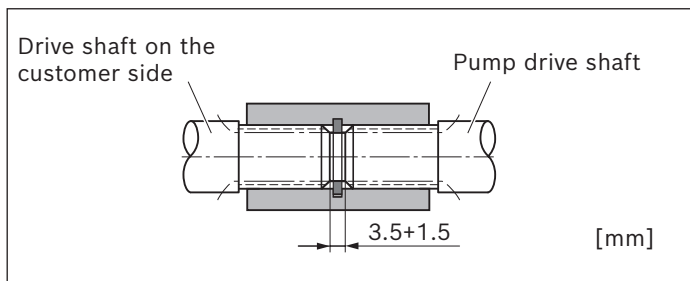
1. Elastic couplings

- ▶ The coupling must not transfer any radial or axial forces to the pump.
- ▶ The maximum admissible radial run-out deviation from the shaft to the fitting slot is 0.2 mm.
- ▶ Admissible shaft shifting see installation information of the coupling manufacturers.



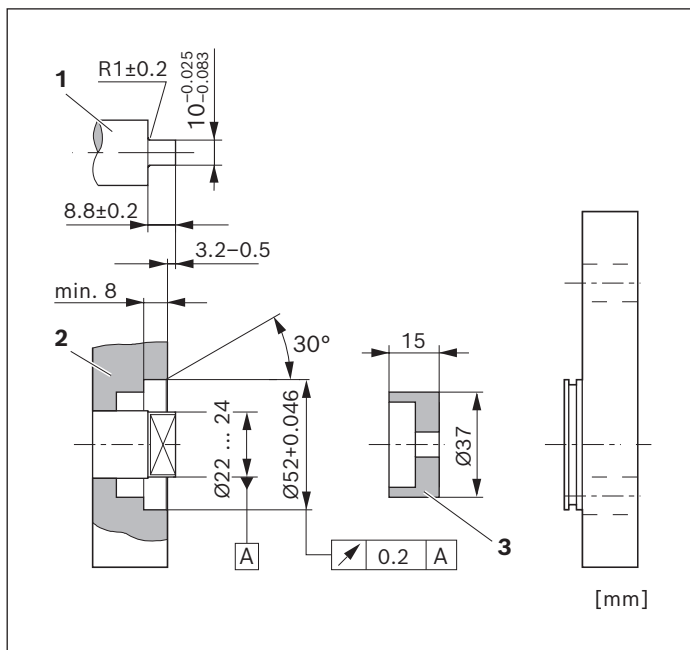
2. Coupling sleeve

- ▶ To be used for splined shaft profile according to DIN and SAE
- ▶ Attention: No radial or axial forces are permitted on the pump shaft or coupling sleeve. The coupling sleeve must be free to move axially.
- ▶ The distance between the pump drive shaft and drive shaft on the customer side must be $3.5+1.5$ mm.
- ▶ Reserve installation space for the retaining ring.
- ▶ Oil-bath or oil-mist lubrication required



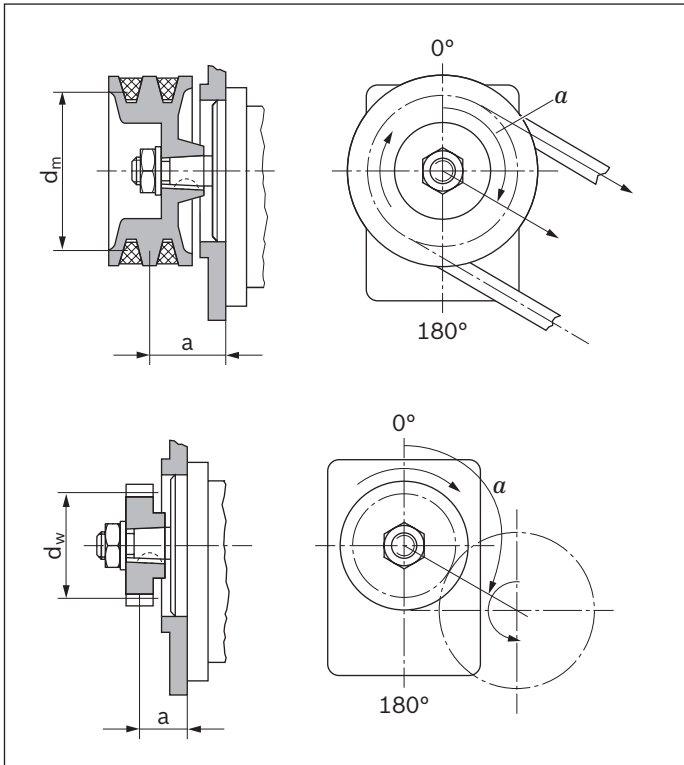
3. Tang drive coupling

- ▶ For attaching the pump directly to an electric motor or combustion engine, gear, etc.
- ▶ Pump drive shaft with special tang drive and driver **(3)** (scope of delivery, see offer drawing)
- ▶ No shaft seal
- ▶ Drive-side installation and sealing according to the following recommendations and dimensions
- ▶ Drive shaft on the customer side **(1)**
 - Case-hardening steel DIN EN 10084, e.g. 20MnCrS5 case-hardened 1.0 mm deep; HRA 83±2
 - Seal ring contact surface ground without rifling $R_t \leq 4 \mu\text{m}$
- ▶ Radial shaft seal ring on the customer side **(2)**
 - Provide with rubber cover (see DIN 3760, type AS, or double-lipped ring)
 - Provide installation edge with 15° slant or install shaft seal with protection sleeve



4. V-belt and straight gear wheel or helical toothed gear drives without outrigger bearing

For V-belt or gear wheel drives, please contact us specifying the application and mounting conditions (dimensions a , d_m , d_w and angle α). For helical toothed gear drives, details of the helix angle β are also required.



Maximum transmissible drive torques

Splined shafts

Drive shaft		M_{max}	Size	$p_{2 max}$ Series 1x	$p_{2 max}$ Series 2x
Code	Designation	Nm		bar	bar
P	SAE J744 19-4 11T	180	20 ... 25	250	280
			28	230	260
			32	200	240
			36	180	210
D	SAE J744 22-4 13T	320	20 ... 25	250	280
			28	230	260
			32	200	240
			36	180	210

Tapered shafts

Drive shaft		M_{max}	Size	$p_{2 max}$ Series 1x	$p_{2 max}$ Series 2x
Code	Type	Nm		bar	bar
C	1 : 5	200	20 ... 25	250	280
			28	230	260
			32	200	240
			36	180	210

Tang drive

Drive shaft		M_{max}	Size	$p_{2 max}$ Series 1x	$p_{2 max}$ Series 2x
Code	Designation	Nm		bar	bar
N	Tang drive	95	20	250	270
			22	240	240
			25	220	220
			28	190	190
			32	170	170
			36	150	150

Multiple gear pumps

Gear pumps are well-suited to multiple arrangements, whereby the drive shaft of the first pump stage extended to a second and possibly third pump stage. The shaft of the individual pump sections are normally connected via a driver or via a splined coupling (reinforced through drive). The individual pump stages are usually hydraulically isolated and have separate suction ports. A common suction port or separate suction ports that are hydraulically connected is available on request. For the configuration of multiple pumps, Bosch Rexroth recommends arranging the pump stage with the largest displacement on the drive side.

Notice

Basically, the parameters of the single pumps apply,; however, certain restrictions need to be observed:

► **Maximum rotational speed:**

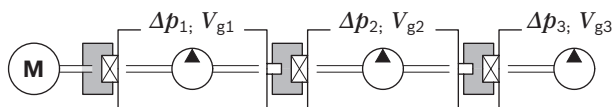
This is determined by the largest pump stage used.

► **Pressures:**

These are limited by the maximum transmissible torques from drive shaft, through drive and driver.

Addition of drive torques

Please note, that in multiple pump arrangements the drive torques of the single pumps stages will add up according to the following formula:



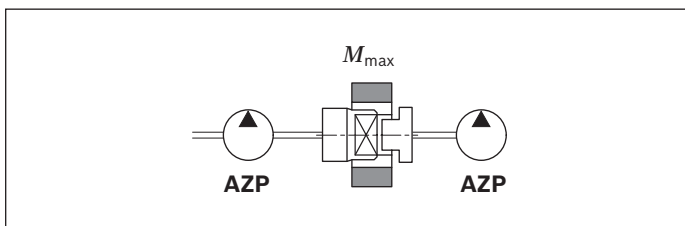
$$\frac{\Delta p_1 \times V_{g1} + \Delta p_2 \times V_{g2} + \Delta p_3 \times V_{g3}}{18 \times \pi} \leq M_{\max} \quad 1) \quad \begin{matrix} \Delta p \text{ [bar]} \\ V_g \text{ [cm}^3\text{]} \end{matrix}$$

This may result in pressure limitations for the respective pump stage.

Standard through drive (coupling dog)

For platform N (AZPN, AZPT) the driver for the next pump stage can support loads of up to $M_{\max} = 95$ Nm. This may result in pressure limitations for subsequent pump stages.

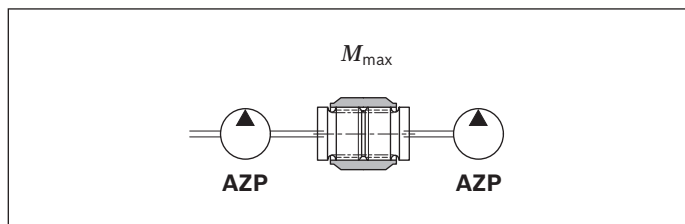
For the following pumps in a smaller series, these determine the maximum transferable torque.



Following pump	M_{\max} [Nm]	
Platform N	AZPN	95
	AZPT	95
Platform F	AZPF-1x	65
	AZPF-2x	85
	AZPS-1x	65
	AZPS-2x	85
	AZPJ	65
Platform B	AZPB-3x	25

Reinforced through drive

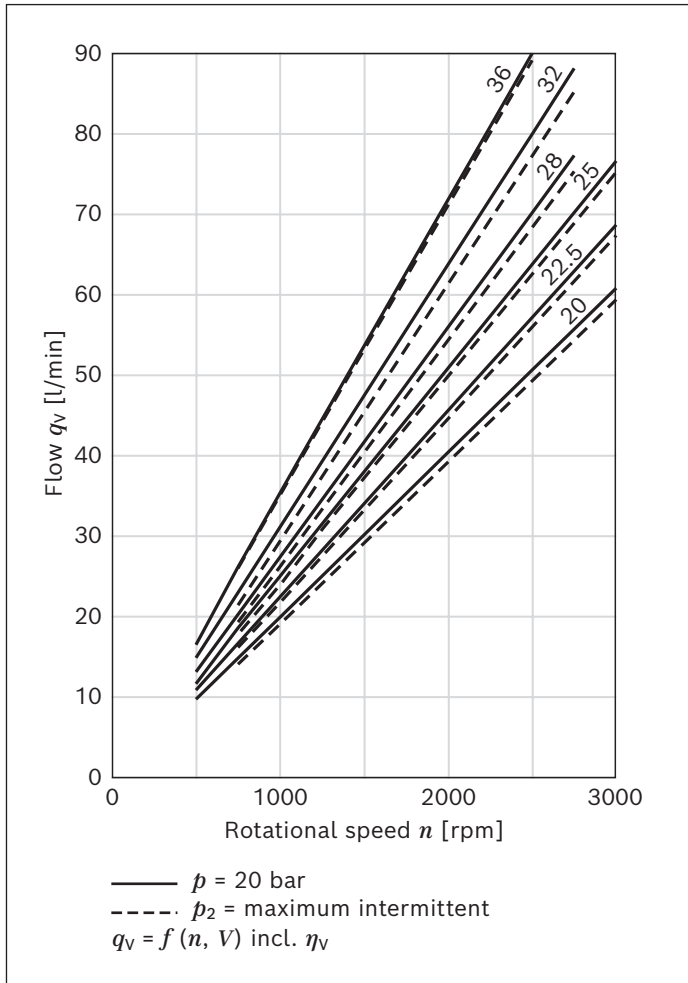
Reinforced through drives (for up to $M_{\max} = 160$ Nm) are available for applications with higher torques/torsional vibrations. Design available on request.



1) For M_{\max} , see table "Maximum transmissible drive torques" above

Diagrams/characteristic curves

Flow characteristic curves

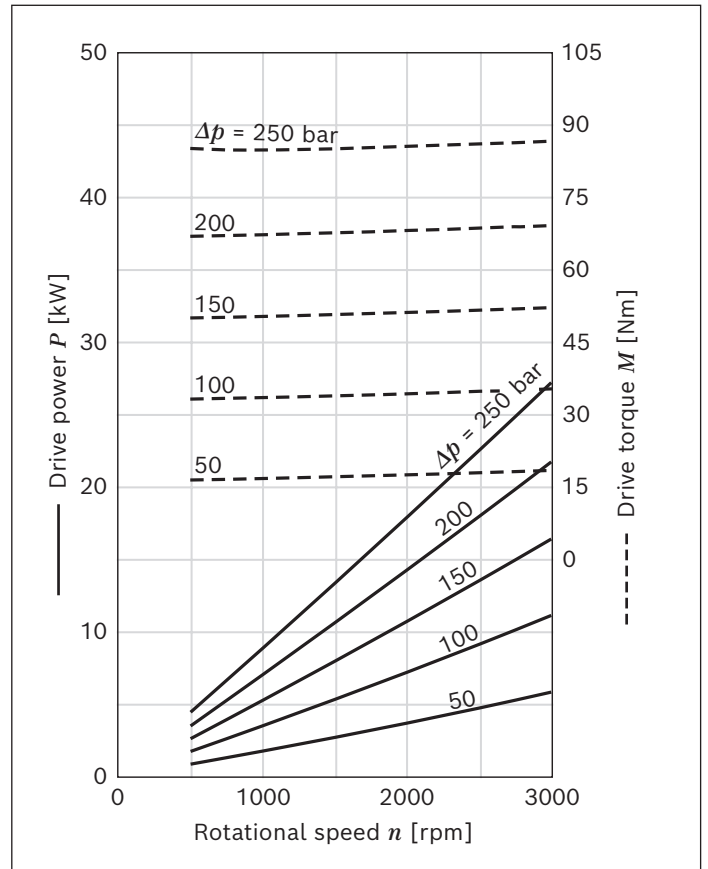


Notice

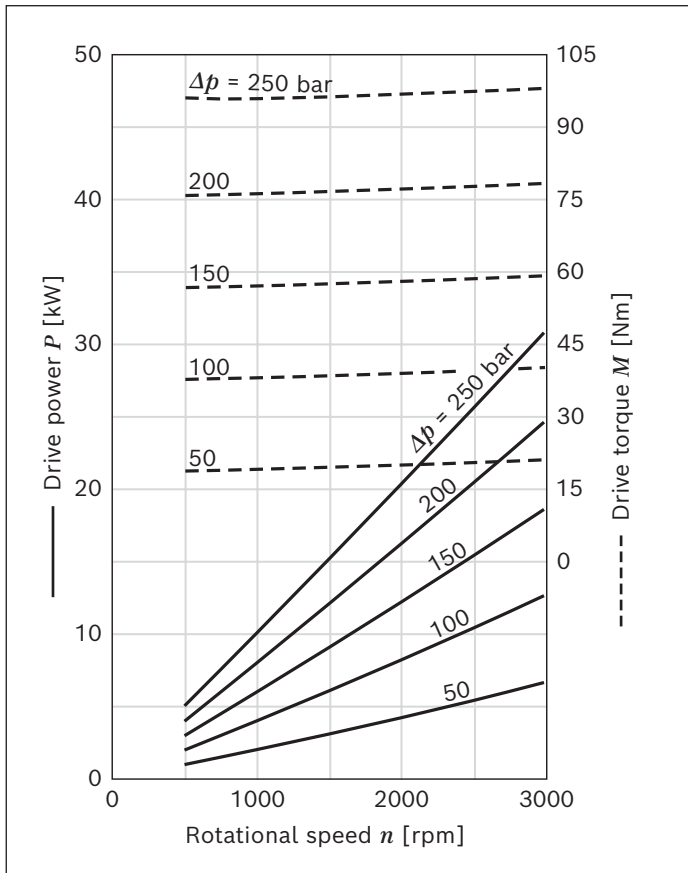
- Characteristic curves measured at $v = 32$ mm²/s and $t = 50$ °C.

Power diagrams

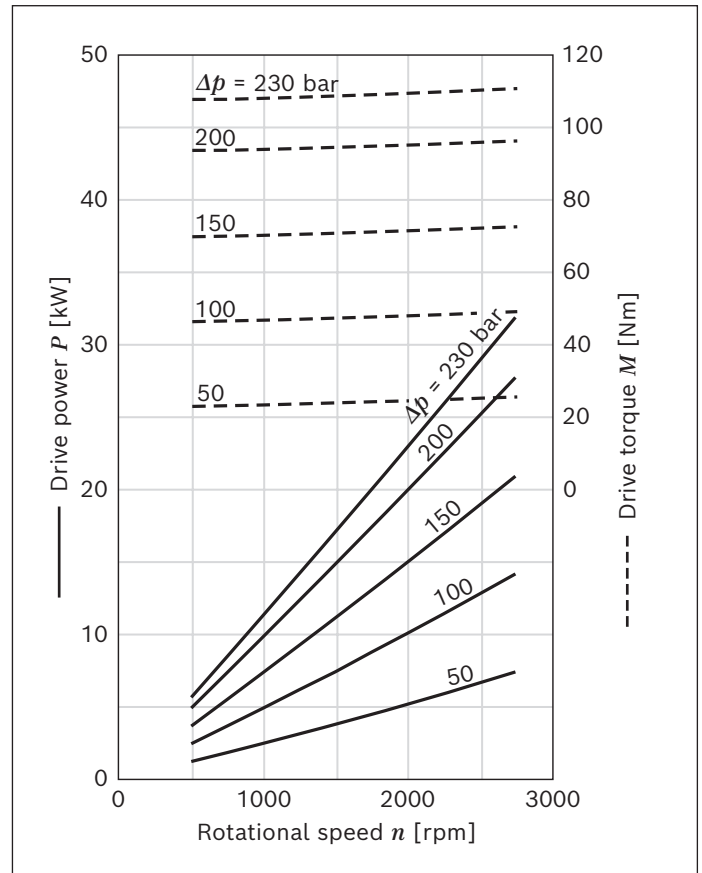
Size 20



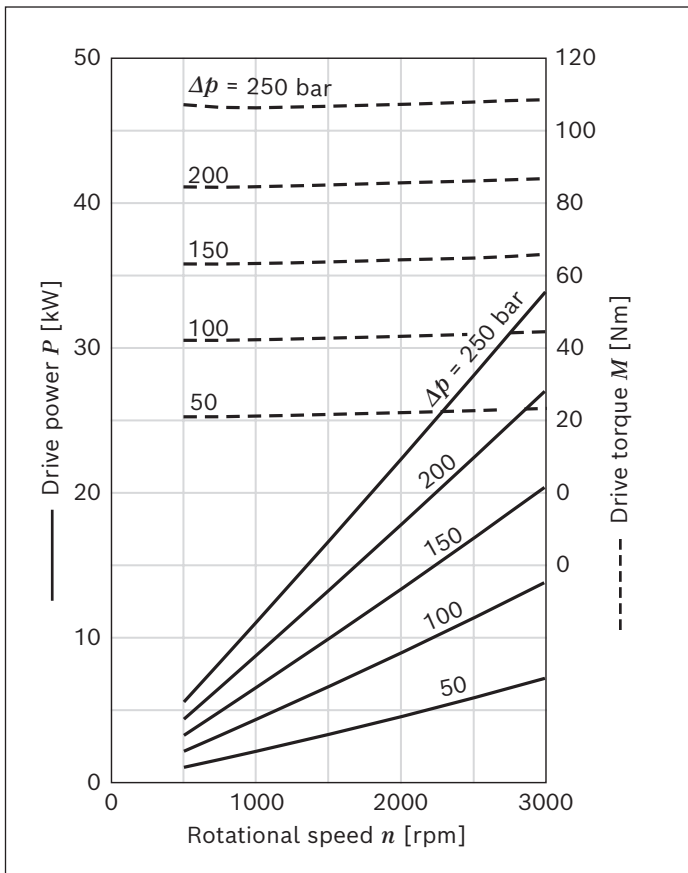
Size 22



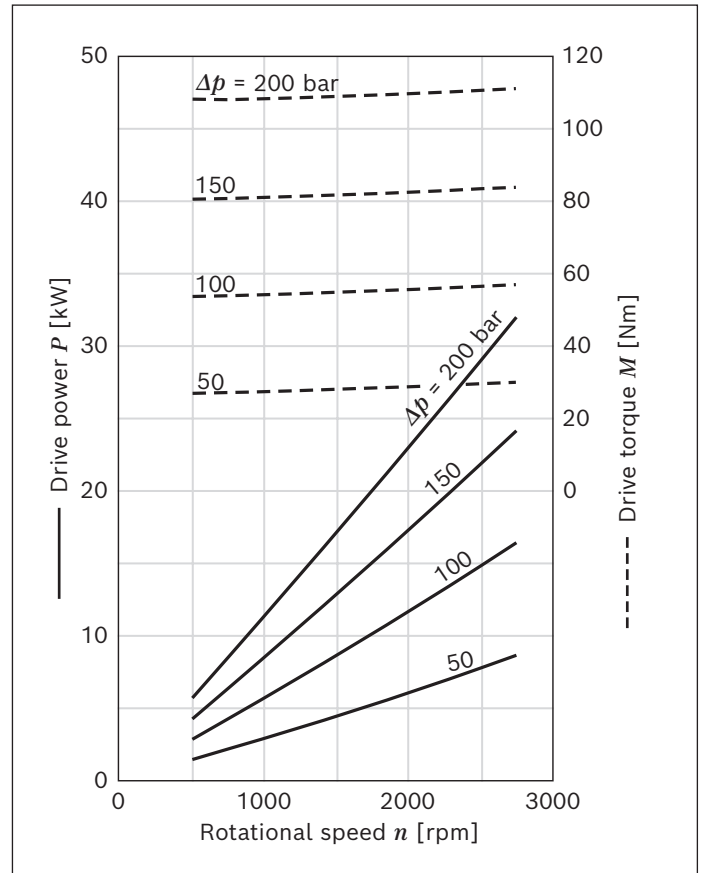
Size 28



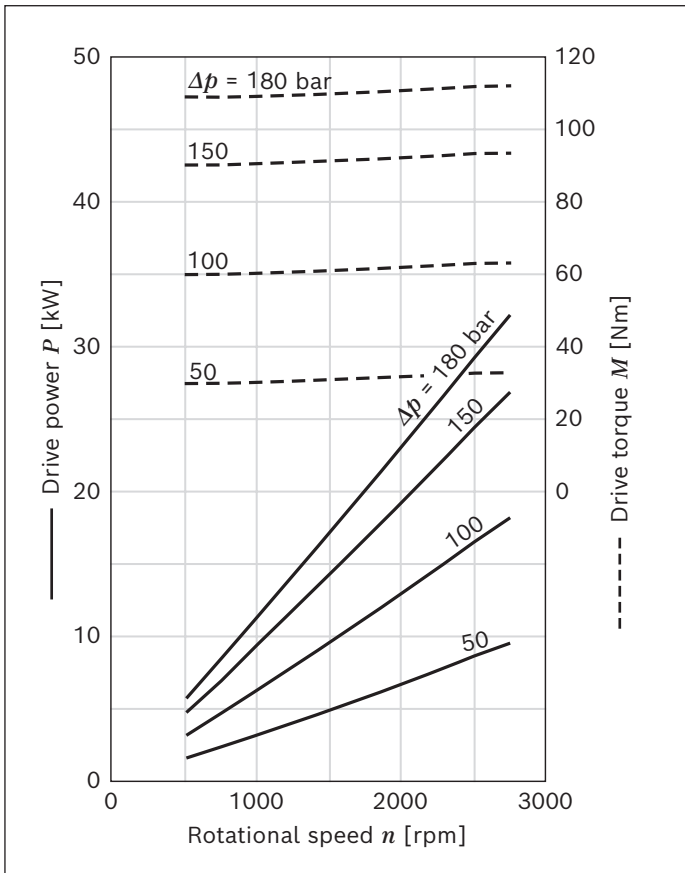
Size 25



Size 32



Size 36



Noise charts

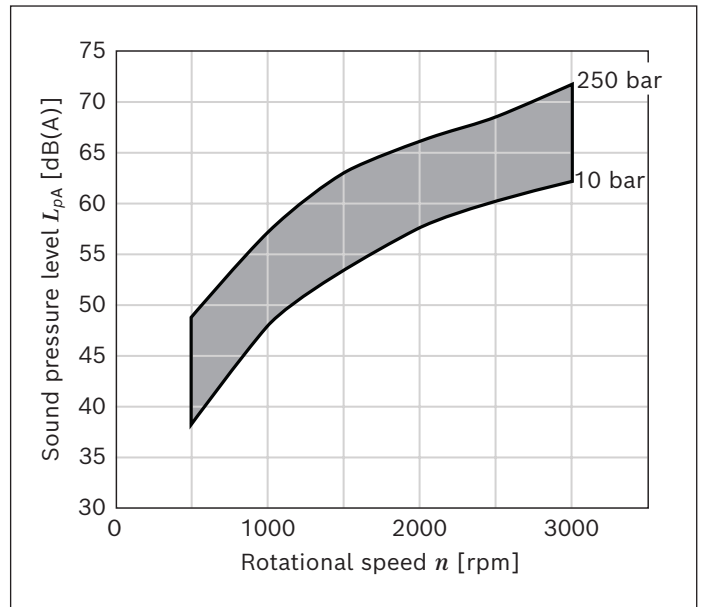
Noise levels based on rotational speed, pressure range between 10 bar and pressure value p_2 (see chapter "Technical data").

These are typical characteristic values for the respective size. They describe the airborne sound emitted solely by the pump. Ambient influences (installation site, piping, other system components) were not included. The values refer to a single pump.

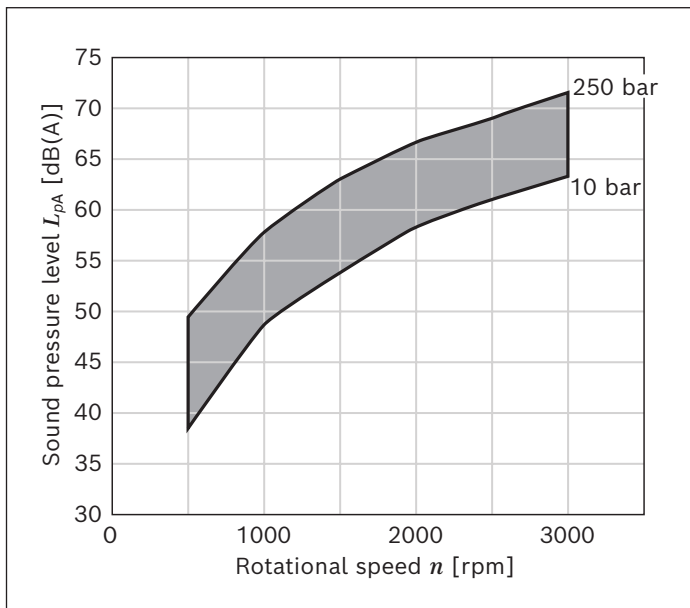
Notice

- ▶ Characteristic curves measured at $\nu = 32 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$.
- ▶ Sound pressure level calculated from noise measurements made in a low reflection measuring room according to DIN 45635 Part 26.
- ▶ Distance from measuring sensor to pump: 1 m.

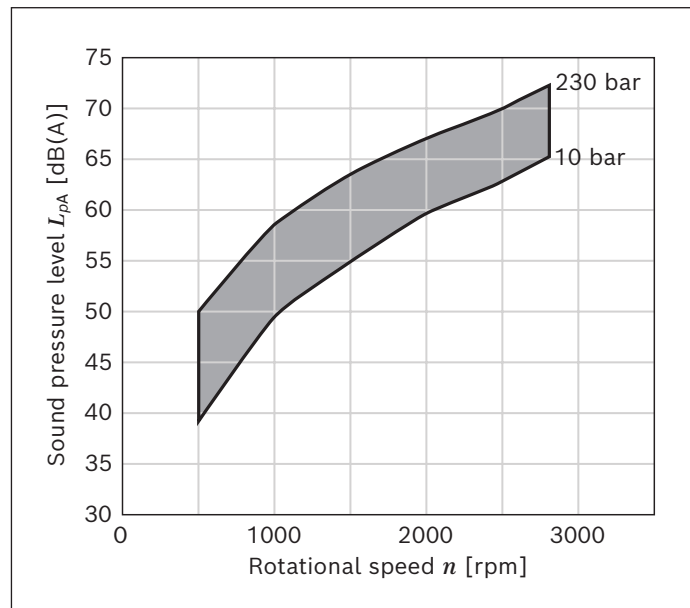
Size 20



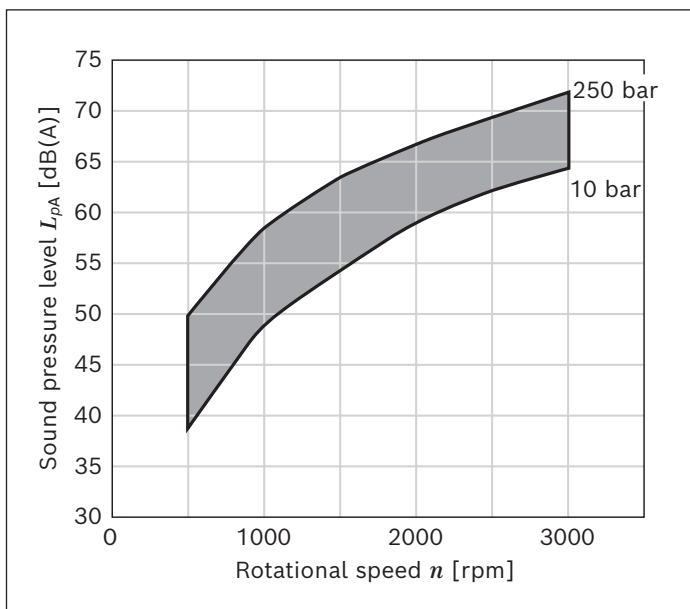
Size 22



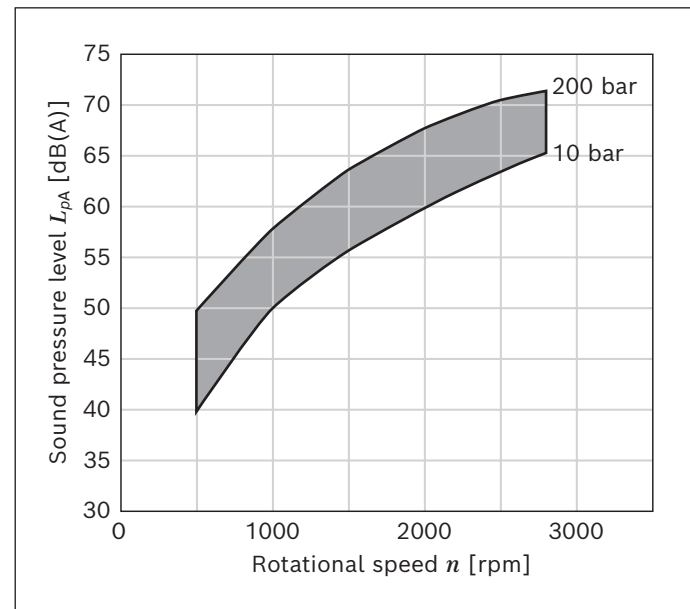
Size 28



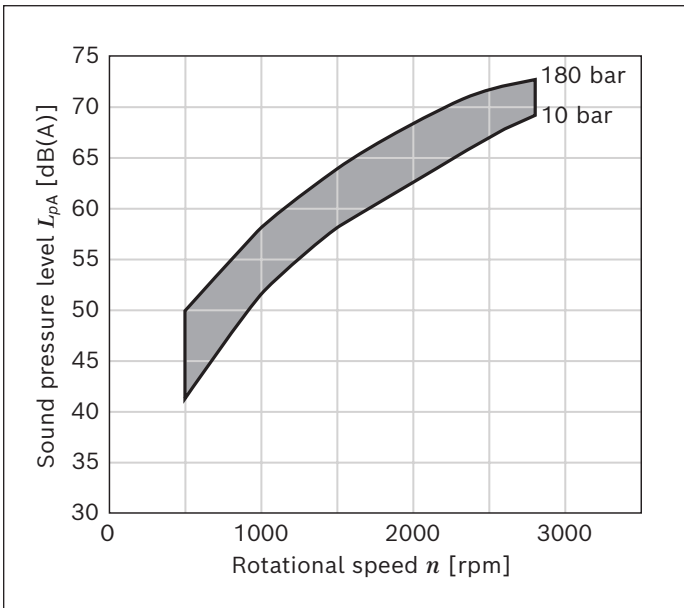
Size 25



Size 32



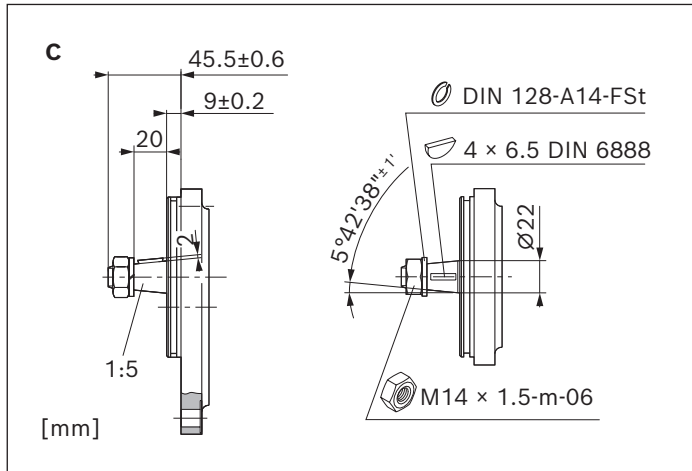
Size 36



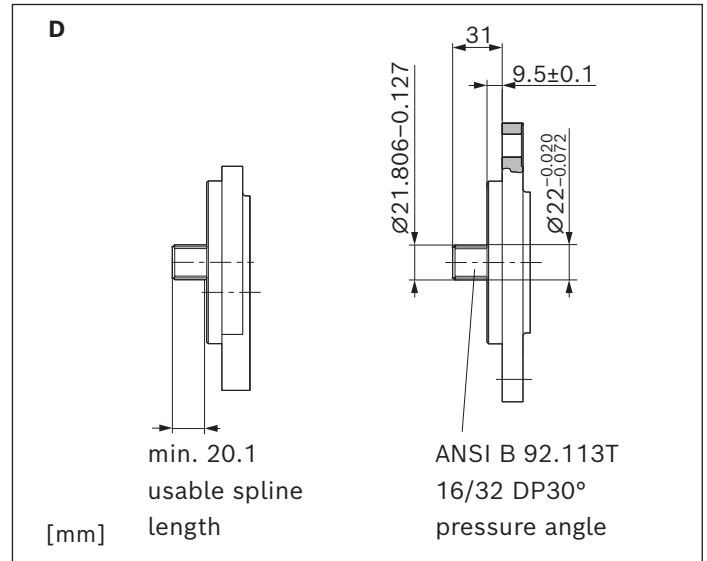
Dimensions

Drive shafts

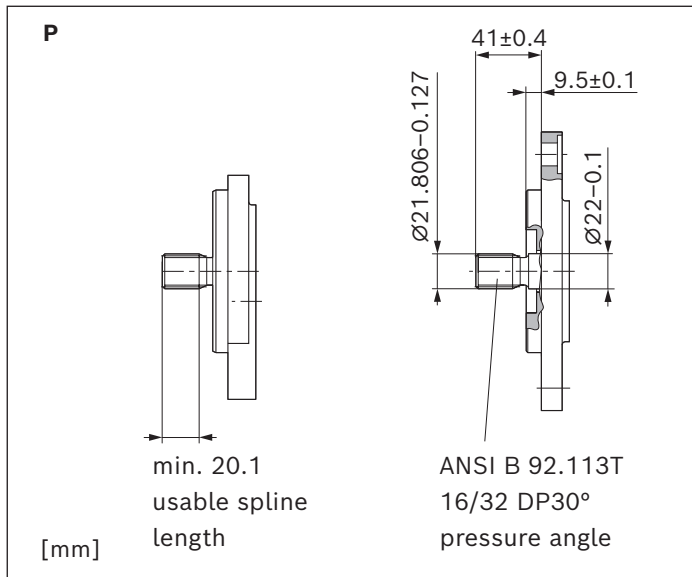
Tapered shaft 1:5¹⁾



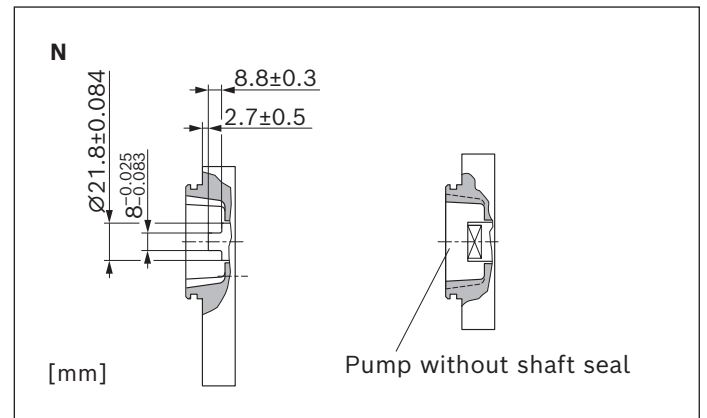
Splined shaft (SAE J744 22-4 13T)



Splined shaft (SAE J744 19-4 11T)



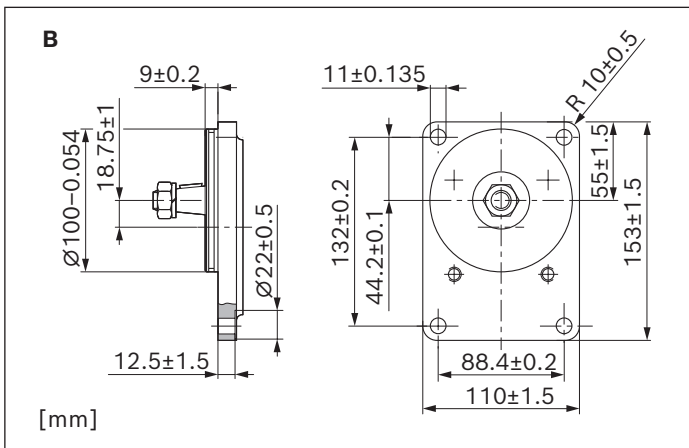
Tang drive



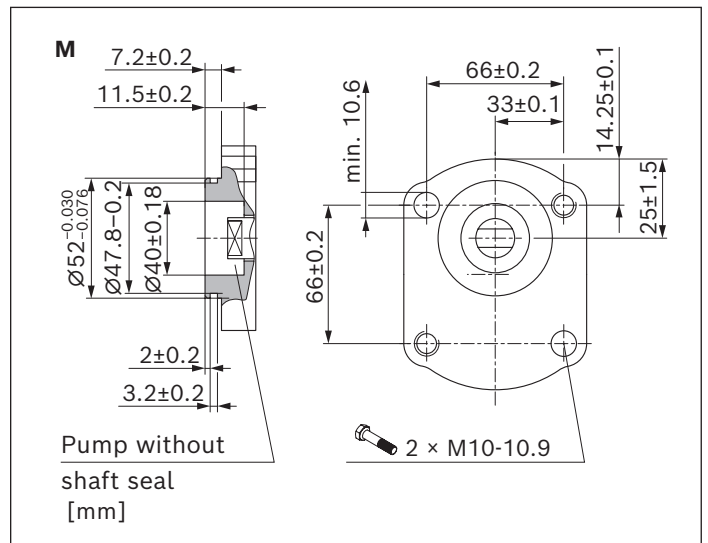
1) Depending on the version, the woodruff key may sit loosely in the groove

Front cover

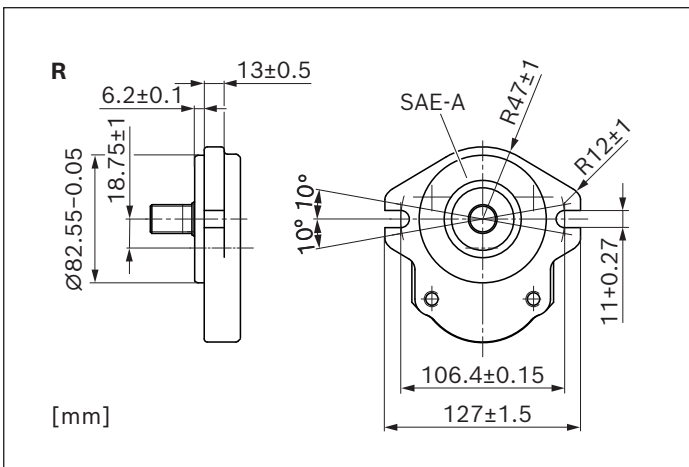
Rectangular flange $\varnothing 100$ mm



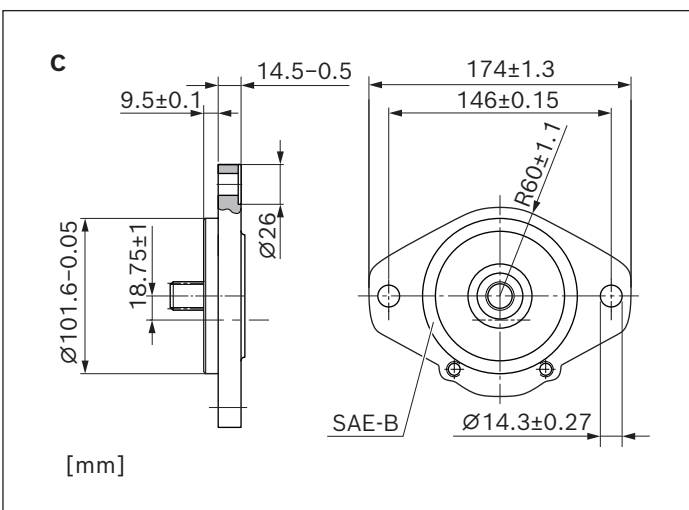
2-hole mounting $\varnothing 52$ mm, with O-ring



2-hole flange $\varnothing 82.55$ mm, SAE J744 82-2 (A)

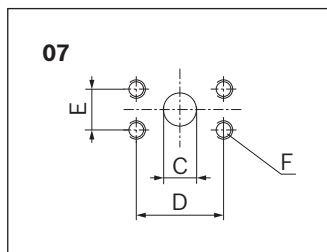


2-hole flange $\varnothing 101.6$ mm, SAE J744 101-2 (B)



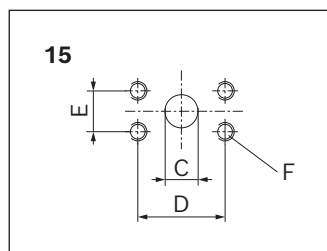
Line connections

SAE rectangular flange, metric thread



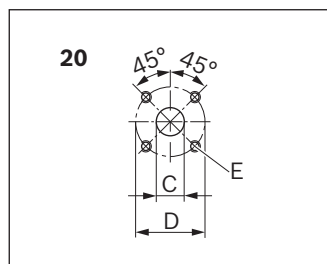
Series	Size	Pressure side				Suction side			
		C mm	D mm	E mm	F ¹⁾	C mm	D mm	E mm	F ¹⁾
1x and 2x	20	18	47.6	22.2	M10; 14 mm deep	25	47.6	22.2	M10; 14 mm deep
	22 ... 36					25	52.4	26.2	

SAE rectangular flange, UNC thread



Series	Size	Pressure side				Suction side			
		C mm	D mm	E mm	F	C mm	D mm	E mm	F
1x and 2x	25 ... 36	19	47.6	22.2	3/8-16 UNC-2B; 14 mm deep	25	52.4	26.2	3/8-16 UNC-2B; 14 mm deep

Square flange



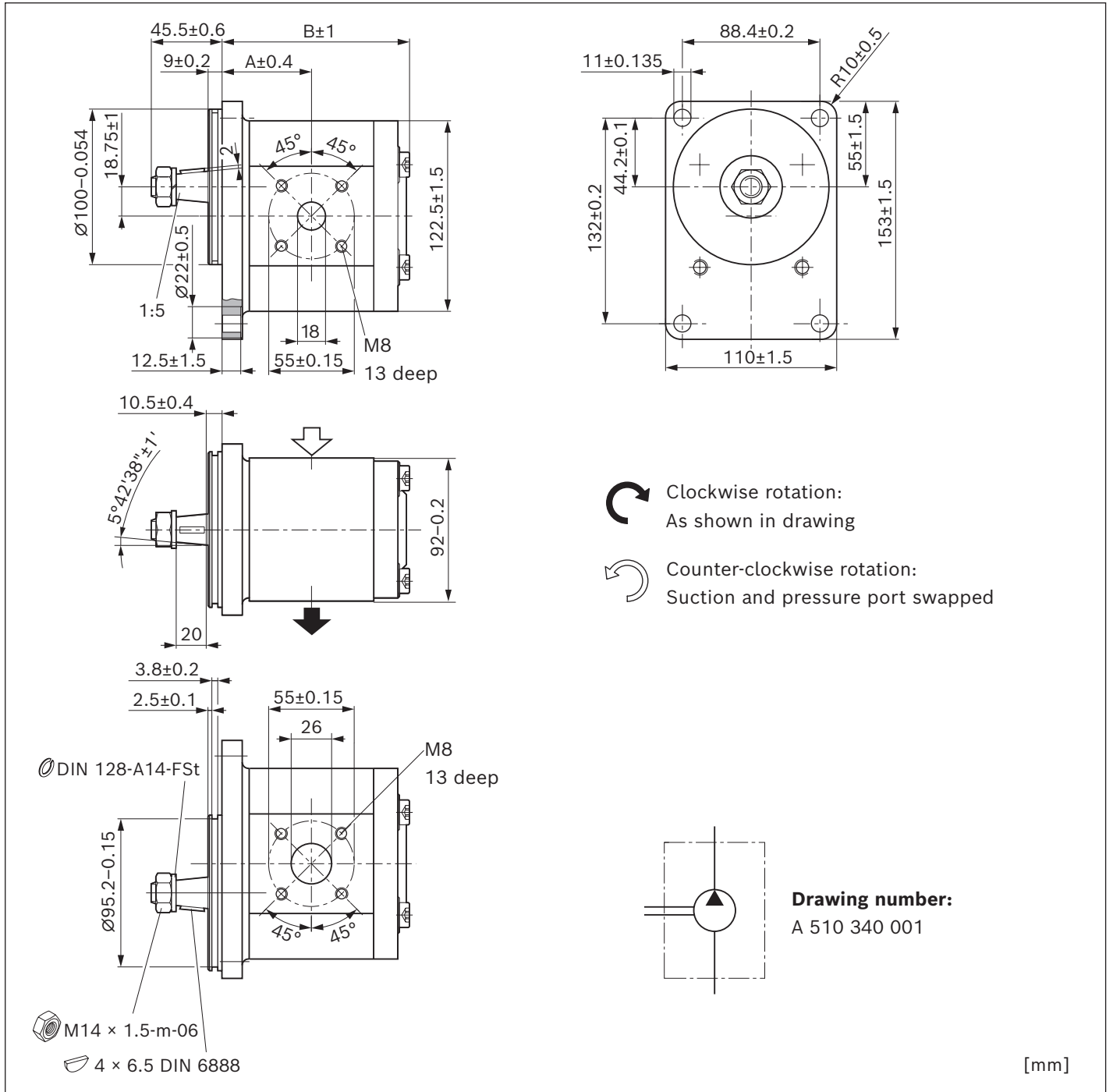
Series	Size	Pressure side			Suction side		
		C mm	D mm	E	C mm	D mm	E
1x and 2x	20 ... 36	18	55	M8; 13 mm deep	26	55	M8; 13 mm deep

1) For the thread depth of series 2, refer to the offer drawing.

Preferred program

Tapered shaft 1:5 with rectangular flange Ø100 mm

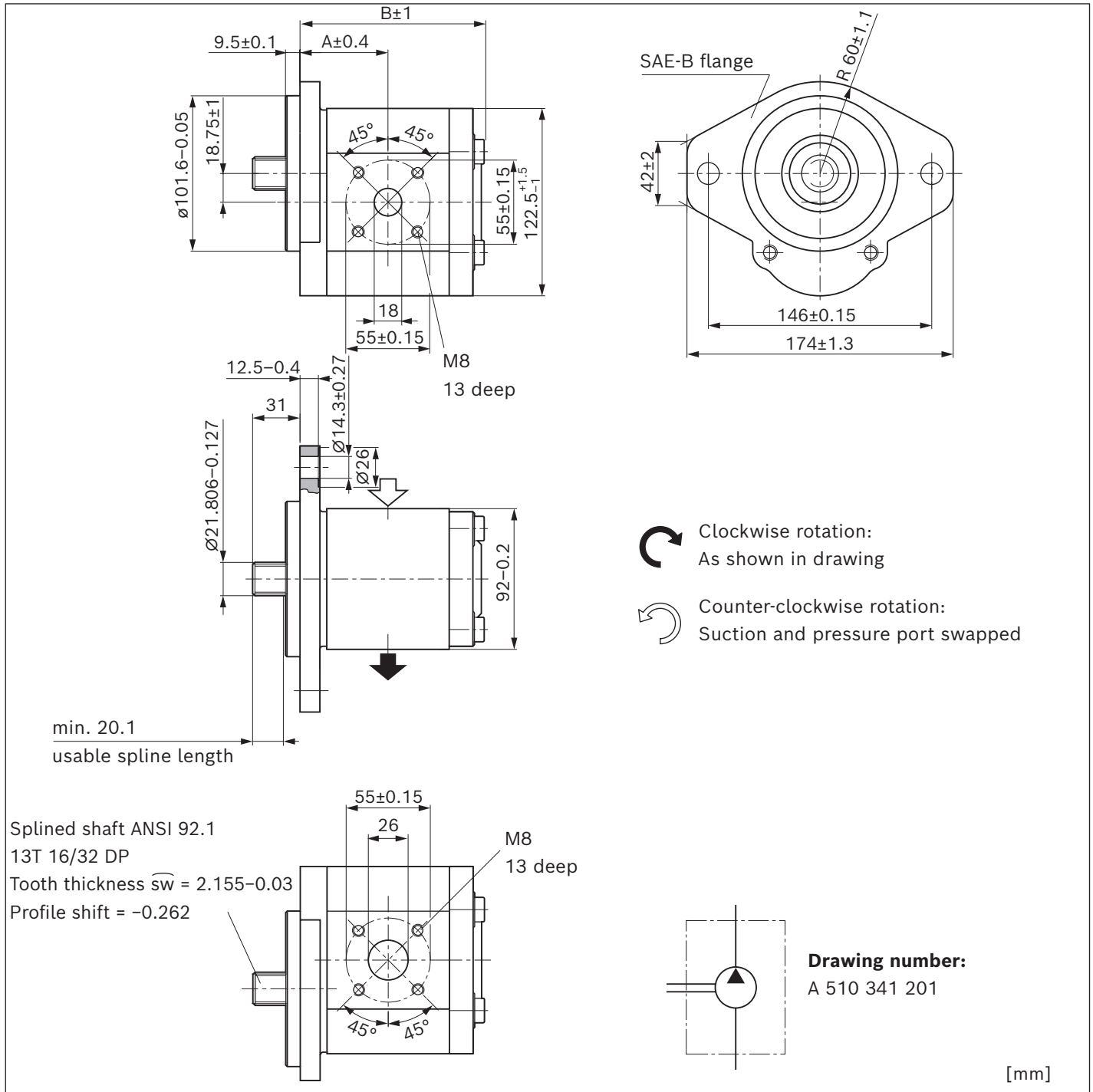
AZPN – 11 – ... **CB20MB**



NG	Material number		Max. intermittent pressure p_2 bar	Max. rotational speed n_{max} rpm	Weight m kg	Dimensions	
	Direction of rotation counter-clockwise	clockwise				A mm	B mm
20	0 510 625 335	0 510 625 035	250	3000	5.4	52	109.8
22			250	3000		53.1	112.8
25	0 510 725 352	0 510 725 047	250	3000	5.6	55	115.8
28	0 510 725 364	0 510 725 055	230	2800	5.7	56.5	118.8
32	0 510 725 353	0 510 725 048	200	2800	5.9	59	123.3

Splined shaft (SAE J744 22-4 13T) with 2-hole flange $\varnothing 101.6$ mm

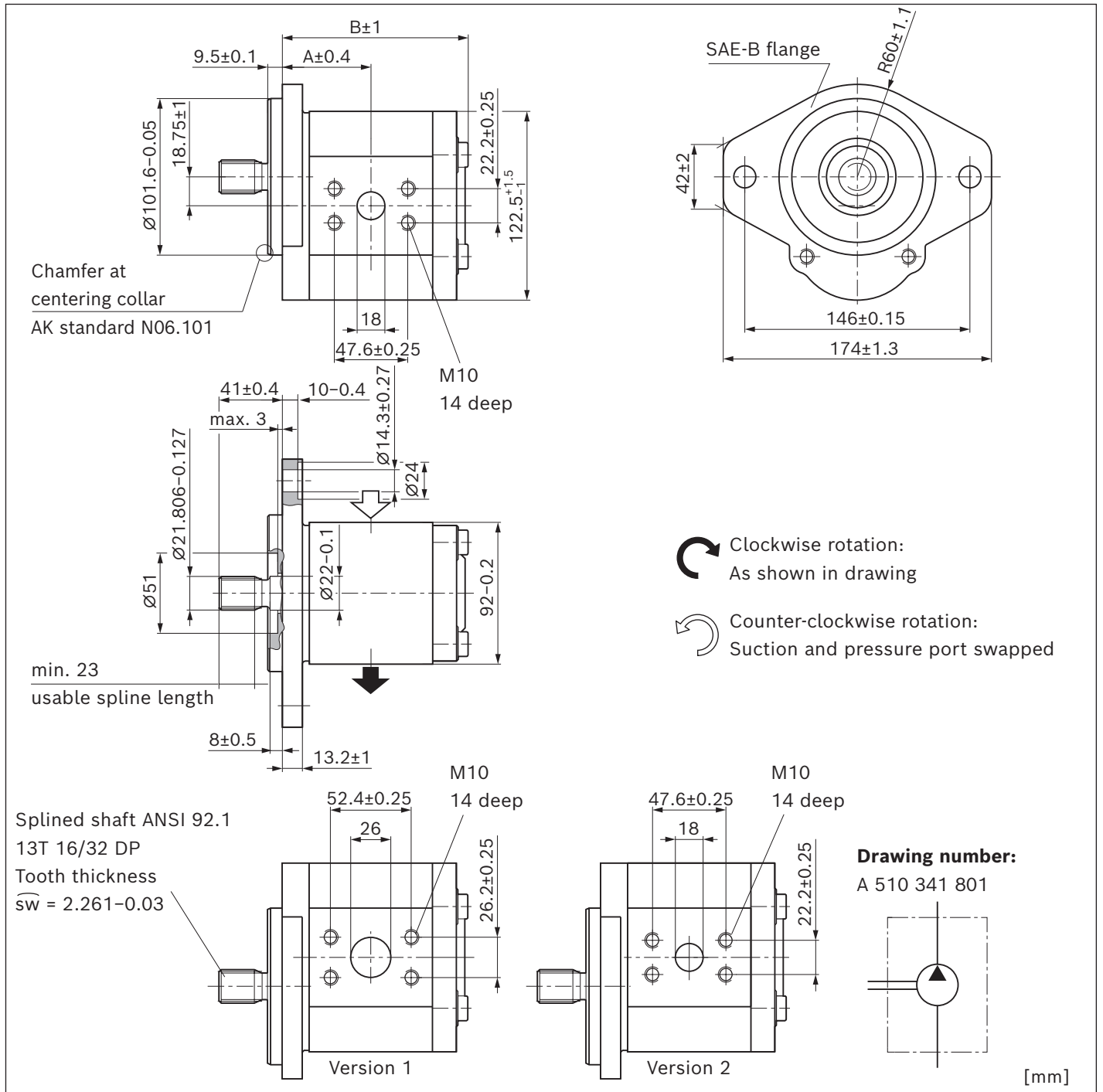
AZPN - 1X - ... **DC20MB** / AZPN - 1X - ... **DC20KB**



NG	Material number		Max. intermittent pressure p_2 bar	Max. rotational speed n_{max} rpm	Weight m kg	Dimensions	
	Direction of rotation counter-clockwise	clockwise				A mm	B mm
20			250	2500		52	110.1
22			250	2500		53.5	112.6
25	0 510 725 377	0 510 725 057	250	2500	5.5	55	115.3
25		0 510 725 094	250	2500	5.5	55	115.3
28	0 510 725 431	0 510 725 058	230	2500	5.7	56.5	118.3
36	0 510 725 363	0 510 725 155	180	2500	6	61	123.3

Splined shaft (SAE J744 22-4 13T) with 2-hole flange Ø101.6 mm

AZPN – 11 – ... **DC07KB** S0081



NG	Material number		Max. intermittent pressure p_2 bar	Max. rotational speed n_{max} rmp	Weight m kg	Dimensions		Version
	Direction of rotation counter-clockwise	clockwise				A mm	B mm	
20	0 510 625 380	0 510 625 073	250	3000	5.3	52	109.8	2
22	0 510 725 404	0 510 725 103	250	3000	5.4	52	112.8	
25	0 510 725 405	0 510 725 104	250	3000	5.5	55	115.8	
28	0 510 725 406	0 510 725 105	230	2800	5.7	56.5	118.8	1
32	0 510 725 407	0 510 725 106	200	2800	5.8	59	123.3	
36			180	2600		61	127.8	

NG	Material number		Max. intermittent pressure		Max. rotational speed	Weight	Dimensions				
	P _I	P _{II}	Direction of rotation counter-clockwise	clockwise	$p_{2 I}$ bar	$p_{2 II}$ bar	n_{max} rmp	m kg	A mm	B mm	C mm
20	20	0 510 665 461	0 510 665 149		250	250	2000	9.9	52	160.7	217.9
22	20	0 510 765 369			250	250	2000	10	53.5	163.6	222.7
22	22	0 510 765 380	0 510 765 086		250	230	3000	10.1	53.5	165.2	225.7
25	20		0 510 765 067		250	250	2000	10.1	55	166.6	225.7
25	22		0 510 765 068		250	230	3000	10.2	55	168.2	228.7
25	25	0 510 766 315	0 510 765 069		250	200	3000	10.3	55	169.7	229.9
32	32	0 510 765 370	0 510 768 034		200	160	2500	10.9	29	181.2	244.9

NG	Material number		Max. intermittent pressure		Max. rotational speed	Weight	Dimensions				
	P _I	P _{II}	Direction of rotation counter-clockwise	clockwise	p_{2I} bar	p_{2II} bar	n_{max} rmp	m kg	A mm	B mm	C mm
20	4		0 510 665 181		250	280	3000		52	141.5	184.2
22	8	0 510 765 387	0 510 765 078		250	280	3000	8.4	53.5	147.9	193.8
22	11	0 510 765 381	0 510 765 062		250	280	3000	8.5	53.5	151.7	200.6
25	4	0 510 766 316			250	280	3000		55	147.6	190.2
25	11	0 510 765 377	0 510 765 079		250	280	3000	8.6	55	154.7	203.6
25	14		0 510 766 014		250	250	3000	8.7	55	155.2	206.8
25	16		0 510 765 080		250	230	3000	8.8	55	155.2	210.2
28	11		0 510 765 092		230	280	2800	8.7	56.5	157.7	206.6
28	16	0 510 765 384	0 510 765 063		230	230	2800	8.9	56.5	158.2	213.2
28	19	0 510 766 314	0 510 767 058		200	200	2800	9	56.5	158.2	219.8
28	22		0 510 767 045		230	200	2100	9.2	56.5	165.8	223.6
28	22	0 510 767 332			230	150	2100	9.3	56.5	165.8	223.6
32	8		0 510 765 064		200	280	2500	8.8	59	158.4	204.3
32	11	0 510 768 320	0 510 765 065		200	280	2500	8.9	59	162.2	211.1
32	14	0 510 765 378			200	250	2500	9	59	162.7	216.1
32	16		0 510 765 066		200	230	2500	9.1	59	162.7	217.7
32	22	0 510 768 318			200	150	2100		59	170.3	229.9

Project planning information

Technical data

All mentioned technical data are dependent on manufacturing tolerances and apply in certain boundary conditions.

Note that certain deviations are therefore possible and that technical data may vary when certain boundary conditions (e.g., viscosity) change.

Pumps delivered by Bosch Rexroth are tested for function and performance.

The pump may only be operated with the permissible data (see chapter "Technical data").

Characteristic curves

When dimensioning the gear pump, please observe the maximum possible application data based on the characteristic curves in this document.

Application information

External gear units are not approved in on-highway vehicles for safety-relevant functions, as well as functions in the drive train, for steering, braking and level regulation.

Classified as on-highway vehicles are e.g. vehicles such as motorbikes, private cars, trucks, vans, freight cars, buses and trailers. The European vehicle classes L (motorbikes), M (private cars), N (vehicles for transporting goods such as trucks and vans) and O (trailers and semi-trailers) serve as reference.

Filtration of the hydraulic fluid

Since the majority of premature failures in gear pumps occur due to contaminated hydraulic fluid, filtration should maintain a cleanliness level of at least 20/18/15 as defined by ISO 4406. Thus contamination can be reduced to an acceptable degree in terms of particle size and concentration.

Bosch Rexroth generally recommends full-flow filtration. Basic contamination of the hydraulic fluid used should not exceed level 20/18/15 as defined by ISO 4406. New fluids are often above this value. In such instances, a filling device with a special filter should be used.

Bosch Rexroth is not liable for wear due to contamination. For hydraulic systems or devices with function-related critical failure effects, such as steering and brake valves, the type of filtration selected must be adapted to the sensitivity of these devices.

Notice

- ▶ When used as an auxiliary steering pump, the vehicle manufacturer must ensure that the steering system continues to operate safely as per ECE R-79 even if the auxiliary steering pump fails.

Further information

Installation drawings and dimensions are valid at date of publication, subject to modifications. Subject to change. Further information and notes on project planning can be found in the "General instruction manual for external gear units" (07012-B, chapter 5.5)

Information

AZ Configurator

With our practical product selector, it will take you next to no time to find the right solution for your applications, no matter whether it is SILENCE PLUS or another external gear unit.

Based on a selection of features, the selector guides you through all of the products available for order. By clicking on the order number, you can view and download the following product information: data sheet, dimension sheet, instruction manual, operating conditions and tightening torques.

You can order your selection directly via our online shop and at the same time benefit from an additional discount of 2%. And if you need something really quickly, simply use our fast delivery and preferred programs (GoTo).

Then the goods will be sent within 10 working days. You also have the possibility of easily and conveniently configuring your individual external gear unit with our AZ Configurator. All the necessary data that you need for the project planning of external gear units is requested by means of the menu navigation.

If your desired configuration already exists, the result is the order number, the type code and further information.

If your configuration does not result in an orderable product, our online tools give you the possibility of sending a project request directly to Bosch Rexroth. We will then get in contact with you.

Link: www.boschrexroth.com/az-configurator

Spare parts

Spare parts can be found online at www.boschrexroth.com/eshop

Select "Spare parts and accessories" and enter the material number of the external gear units into the search field.

Example:

Material number: **0 510 625 335**

Type designation: AZPN-11-020LCB20MB

All available spare parts are listed under "Spare parts" and can be ordered via the shopping basket.

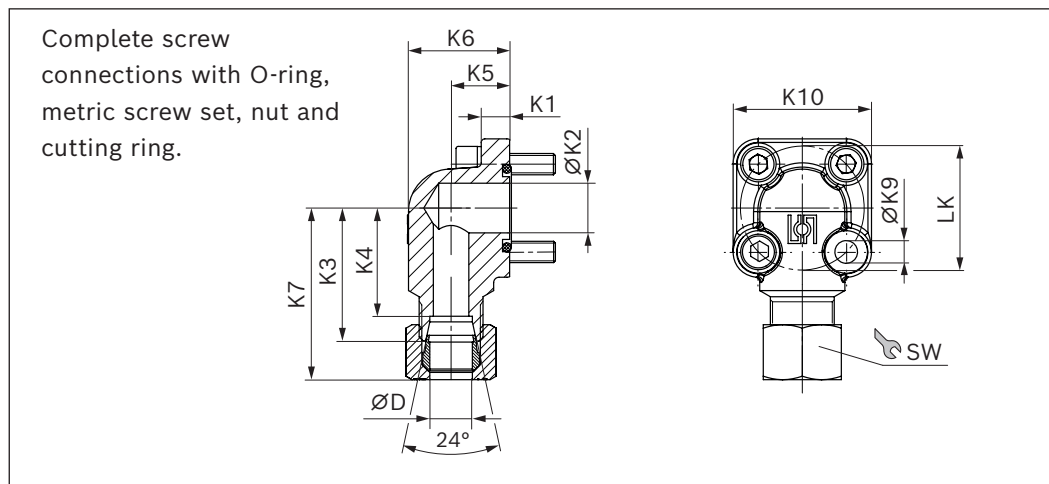
Pos.	Material number	Designation	Quantity	Launch / Discontinuation
1		PUMP HOUSING	1	
2		BEARING COVER	1	
3	1510283023	ROTARY SHAFT LIP SEAL 48V22V7 S1 MRB 77	1	

Other related documents

- ▶ Extensive notes and suggestions can be found in the Hydraulic Trainer, volume 3: "Planning and Design of Hydraulic Power Systems", order number R900018547.

Accessories

90° angled flange, for square flange 20



LK	D	Series ¹⁾	Material number	p_{max}	K1	K2	K3	K4	K5	K6	K7	K9	K10	SW	Screws		O-ring	Weight
mm	mm			bar	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	2 ×	2 ×	NBR	kg
55	20	S	1 515 702 004	250	13	18.2	45	34.5	24	38	57	8.4	58	36	M8 × 25	M8 × 50	32 × 2.5	0.62
55	30	S	1 545 719 006	250	12	26.5	49	38.5	32	51	63.5	8.4	58	50	M8 × 25	M8 × 50	32 × 2.5	0.63
55	35	L	1 515 702 005	100	12	26.5	49	38.5	32	52	61	8.4	58	50	M8 × 25	M8 × 60	32 × 2.5	0.77
55	42	L	1 515 702 019	100	12	26.5	49	38	40	64	61.5	8.4	58	60	M8 × 25	M8 × 70	32 × 2.5	1.04

¹⁾ See DIN EN ISO 8434-1

Notice

- Maximum permissible tightening torques can be found in the "General instruction manual for external gear units" (07012-B).

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