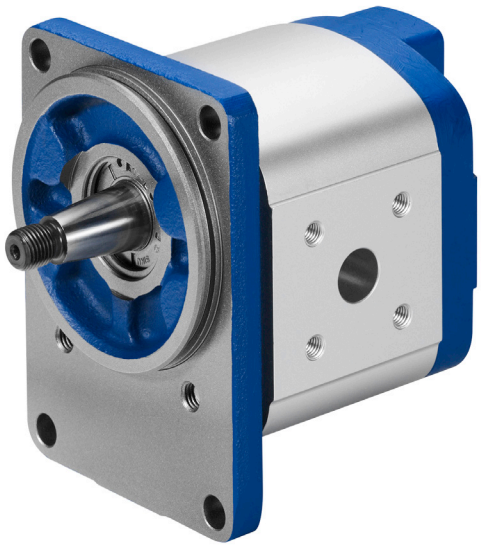
RE 10098/2023-03-15
Replaces: 12.2017

rexroth
A Bosch Company

External gear pump SILENCE AZPU



Notice: Product photo deviates from delivery condition

- Platform G
- Fixed displacement
- Nominal size 22 to 63
- Continuous pressure up to 250 bar
- Intermittent pressure up to 280 bar

Features

- Optimized pressure pulsation, reduces noise emissions and oscillations in the system
- Consistently high quality due to high-volume series production
- Long service life
- Slide bearings for high loading
- Drive shafts conforming to ISO or SAE and customer-specific solutions
- Port connections: Connection flanges or screw-in threads
- Combinations of several pumps possible

Contents

Product description

General information

It is the central task of external gear pumps to convert mechanical energy (torque and speed) into hydraulic energy (flow and pressure). To reduce heat losses, Rexroth's external gear units offer very high efficiencies. They are realized by pressure-dependent gap sealing and highly precise production technology.
Rexroth external gear pumps are built in four frame sizes: Platform 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. Further configuration variants are given by different flanges, ports, shafts, valve arrangements and multiple pump combinations.
Moreover, in the low-noise SILENCE pumps, the dual-flank principle helps to reduce flow pulsation by up to 75 %.

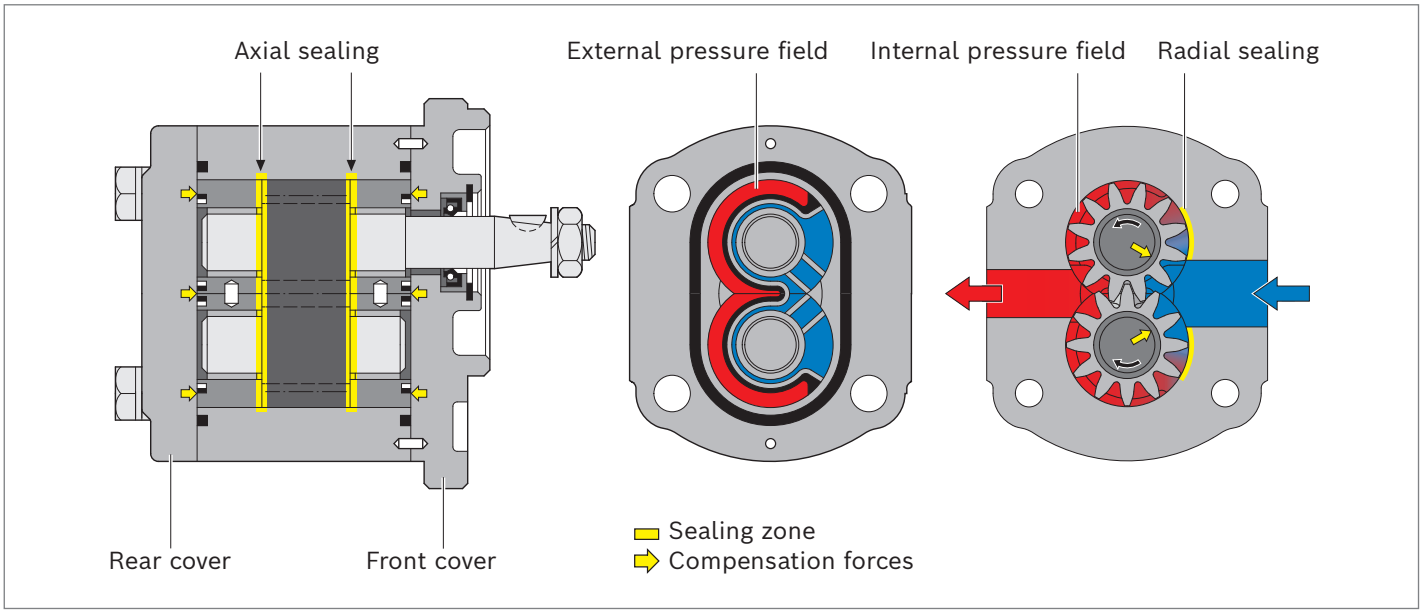
Pumping principle

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 next page. 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.

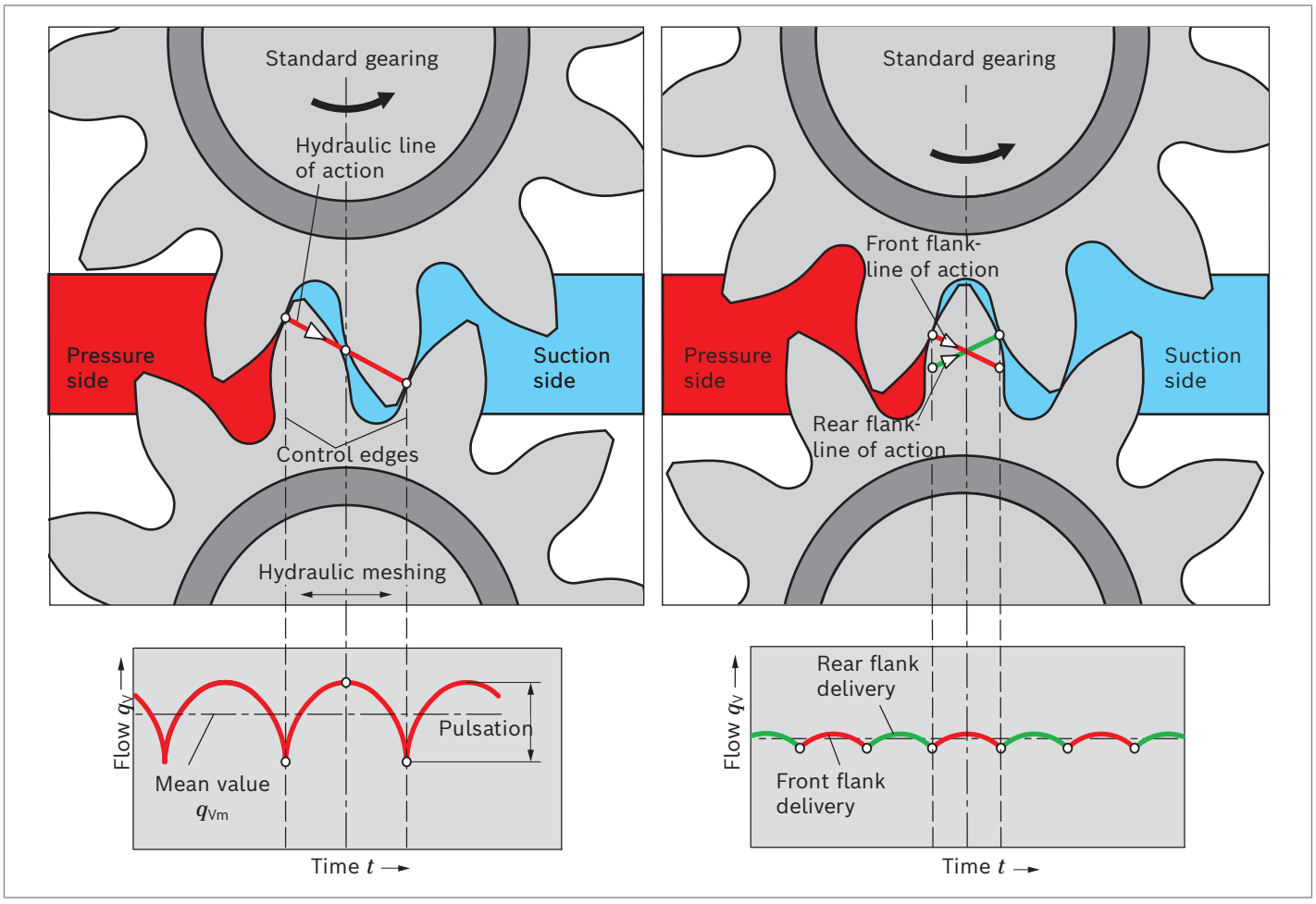
Construction

The external gear pump consists essentially of a pair of gear wheels supported in bearing bushings and the housing with a front cover and a rear 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 gears and seal them up. The pressurized compression areas are limited by special seals.
The seal in the area between the gear teeth and the housing is ensured by the smallest of gaps that are set depending on the pressure between the gear teeth and housing.

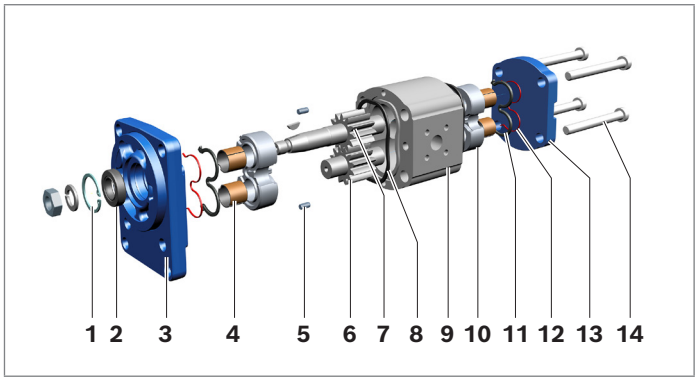
▼ **Axial and radial sealing of gear chambers**



▼ Pumping principle of High Performance and SILENCE pump



▼ Principle design of external gear pump



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**	Rear cover
7	Drive shaft	**14**	Torx screws

Type code

Type code single pump

01	02	03		04	05		06	07	08	09	10	11	12		13
AZ	**P**	**U**	**–**	**2**	**2**	**–**								**–**	

Product

01	External gear unit	**AZ**

Function

02	Pump	**P**

Model

03	SILENCE, platform G (22.5 ... 63 cm³/rev)	**U**

Series

04	Bearing diameter 26 mm	**2**

Version

05	Zinc plated, high precision cover fixation[1)]	**2**

Nominal size (NG)

06	Geometric displacement V_g [cm³/rev], see „Technical data“	**022**	**025**	**028**	**032**	**036**	**040**	**045**	**050**	**056**	**063**

Direction of rotation

07	Viewed on drive shaft	clockwise	**R**
		counter-clockwise	**L**

Drive shaft			**Typical front cover**	
08	Tapered keyed shaft	1 : 5	B	**C**
		1 : 8	O	**H**
	Splined shaft	SAE J744 22-4 13T	C	**D**
		SAE J744 25-4 15T	C	**E**
	Parallel keyed shaft	SAE J744 16-1	C	**Q**

Front cover

09	Rectangular flange	spigot dia. 105 mm		**B**
		spigot dia. 50.78 mm		**O**
	2-bolt flange	spigot dia. 101.6 mm	SAE J744 101-2 (B)	**C**

Port connection

10	SAE flange connection acc. to ISO 6162-1 with metric thread	**07**
	SAE flange connection acc. to ISO 6162-1 with UNC thread	**15**
	Square flange (German version)	**20**
	Square flange (Italian version)	**30**
	UN-thread acc. to ISO 11926-1 / ASME B 1.1, O-ring	**12**

Sealing material

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

Rear cover

12	Axial pressure and suction port	**A**
	Standard (cast iron)	**B**

1) Corrosion-protected version, details see “Technical data“

01	02	03		04	05		06	07	08	09	10	11	12		13
AZ	**P**	**U**	**–**	**2**	**2**	**–**								**–**	

Non standard version

13	Special version[1] (characteristics not covered by type code)	**SXXXX**

Notice

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

1) For more information about special version, please contact us.

Type code multiple pump

01	02	03		04	05		06	07	08	09	10	11	12	13
AZ	**P**		**–**			**–**								

Product

01	External gear unit	**AZ**

Function

02	Pump	**P**

Model[1)]

03	Standard-Performance	4.0 ... 25 cm^3/rev	Data sheet 10090	**W**
	High-Performance	1.0 ... 7.1 cm^3/rev	Data sheet 10088	**B**
		4.0 ... 28 cm^3/rev	Data sheet 10089	**F**
		22.5 ... 100 cm^3/rev	Data sheet 10093	**G**
	SILENCE	4.0 ... 28 cm^3/rev	Data sheet 10095	**S**
		22.5 ... 100 cm^3/rev	Data sheet 10098	**U**
	SILENCE PLUS	12.0 ... 28 cm^3/rev	Data sheet 10094	**J**

Series (according to data sheet of pump stage 1)

04	Standard bearing	**1**
	Reinforced bearing	**2**

Version (according to data sheet of pump stage 1)

05	Corrosion-protected, pinned	**2**

Nominal size (NG)[2)]

06	In accordance with data sheet for the individual series	

Direction of rotation

07	Viewed on drive shaft	clockwise	**R**
		counter-clockwise	**L**

Drive shaft (according to pump stage1)

08	In accordance with data sheet of pump stage 1	

Front cover (according to pump stage1)

09	In accordance with data sheet of pump stage 1	

Port connection (per pump stage)[3)]

10	In accordance with data sheet for the individual series	

Sealing material

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

Rear cover (according to last pump stage)

12	In accordance with data sheet of the last pump stage	

Non standard version

13	Special version (characteristics not covered by type code)	**SXXXX**

1) A letter is to be selected for each pump stage, e.g. triple pump AZPJ + AZPJ + AZPB: AZP**JJB**
2) A numerical value is to be selected for each pump stage, e.g. triple pump **028/016/2.0**
3) A numerical value is to be selected for each pump stage, e.g. triple 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 table (preferred types) or after consultation with Bosch Rexroth.
- Special options are available on request.

Example triple pump:

AZPU...050... + AZPS...022...+ AZPS...016...

01	02	03		04	05		06	07	08	09	10	11	12
AZ	**P**	**USS**	**–**	**2**	**2**	**–**	**050/022/16**	**R**	**E**	**C**	**072020**	**P**	**B**

Technical data

Operating conditions

Nominal size					22	25	28	32	36
Series					Series 2x				
Displacement geometric, per revolution			V_g	cm^3	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	250	250
Maximum intermittent pressure[2]			p_2	bar	280	280	280	280	280
Maximum pressure peaks			p_3	bar	300	300	300	300	300
Minimum rotational speed at	ν = 12 mm^2/s	$p \leq$ 100 bar	n_{min}	rpm	500	500	500	500	500
		p = 100 ... 180 bar	n_{min}	rpm	1200	1200	1000	1000	1000
		p = 180 bar ... p_2	n_{min}	rpm	1400	1400	1400	1400	1200
	ν = 25 mm^2/s	at p_2	n_{min}	rpm	600	600	500	500	500
Maximum rotational speed		at p_2	n_{max}	rpm	3000	3000	3000	2800	2800

Nominal size					40	45	50	56	63
Series					Series 2x				
Displacement geometric, per revolution			V_g	cm^3	40	45	50	56	63
Pressure at suction port S[1]		absolute	p_e	bar	0.7 ... 3				
Maximum continuous pressure			p_1	bar	250	250	220	195	170
Maximum intermittent pressure[2]			p_2	bar	280	280	250	225	200
Maximum pressure peaks			p_3	bar	300	300	280	250	230
Minimum rotational speed at	ν = 12 mm^2/s	$p \leq$ 100 bar	n_{min}	rpm	500	500	500	500	500
		p = 100 ... 180 bar	n_{min}	rpm	800	800	800	800	800
		p = 180 bar ... p_2	n_{min}	rpm	1200	1000	1000	1000	1000
	ν = 25 mm^2/s	at p_2	n_{min}	rpm	500	500	500	500	500
Maximum rotational speed		at p_2	n_{max}	rpm	2800	2600	2600	2300	2300

Rotary stiffness of drive shaft

Drive shaft			C	H	D	E	Q
Rotary stiffness	c	Nm/rad	1005	902	899	1186	917

General technical data

Weight	m	kg	See chapter “Dimensions”
Installation position			No restrictions
Mounting type			Flange or through-bolting with spigot
Port connections			See chapter “Port connections” on page 21
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 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

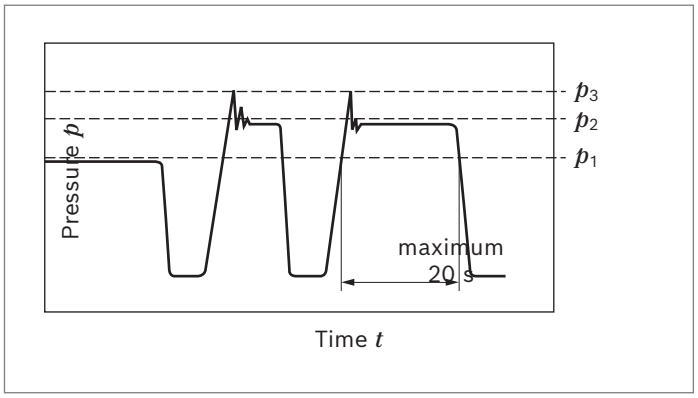
1) In the case of tandem pumps, the suction-side pressure difference between the individual pump stages must not exceed 0.5 bar.

2) Limited service life with threaded ports (applicable for applications with p_2 > 210 bar)

Notice

- Safety requirements pertaining to the whole systems are to be observed.
- Please contact us for applications with frequent load changes.

▼ **Pressure definition**

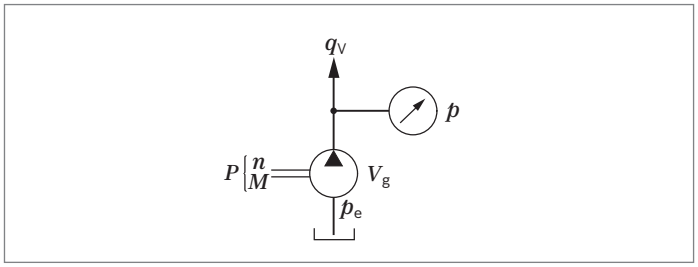


p_1: Maximum continuous pressure
p_2: Maximum intermittent pressure
p_3: Maximum pressure peaks

Determining the operating 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] ($\Delta p = p - p_e$)
n	Rotational speed [rpm]
η_v	Volumetric efficiency
η_{hm}	Hydraulic-mechanical efficiency
η_t	Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)



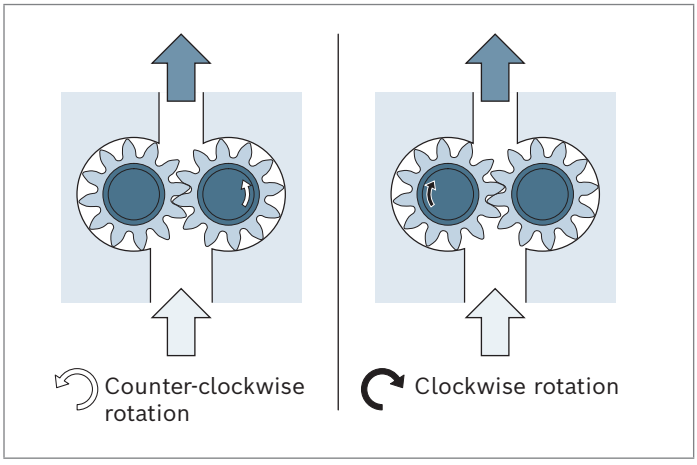
Notice

You can find diagrams for a rough calculation in chapter „Diagrams / Characteristic curves“.

Direction of rotation

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

▼ **Direction of rotation, viewed on drive shaft**



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 provided in the following technical data sheet:

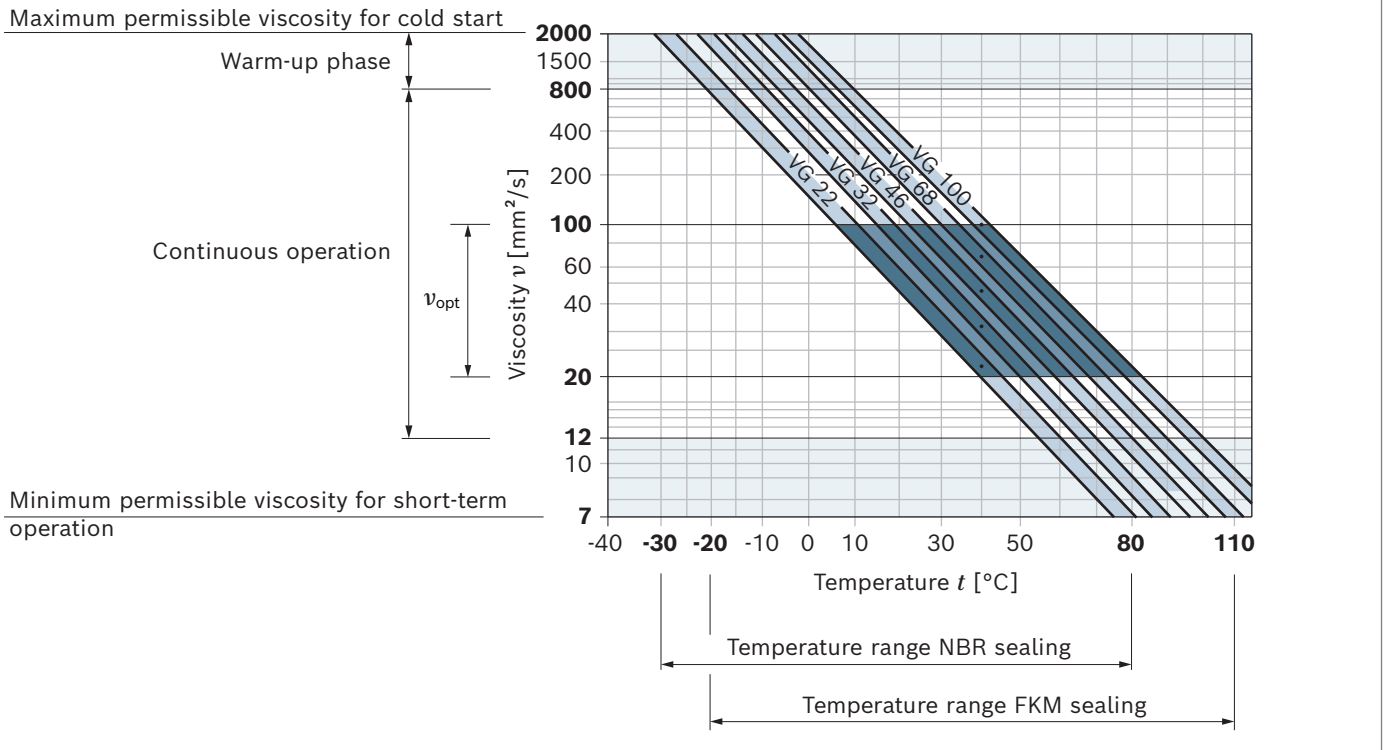
- 90245: Bosch Rexroth Fluid Rating List for Rexroth hydraulic components (pumps and motors)

Selection of hydraulic fluid shall make sure that the operating viscosity in the operating temperature range is within the optimum range (ν_{opt} see “Selection diagram”)

Viscosity and temperature of hydraulic fluids

Viscosity range	
Permissible in continuous operation	ν = 12 ... 800 mm²/s
Recommended in continuous operation	ν_{opt} = 20 ... 100 mm²/s
Permissible for cold start	ν_{max} ≤ 2000 mm²/s
Temperature range	
With NBR seals (NBR = nitrile rubber)	t = -30 °C ... +80 °C
With FKM seals (FKM = fluorocarbon rubber)	t = -20 °C ... +110 °C

▼ **Selection diagram**

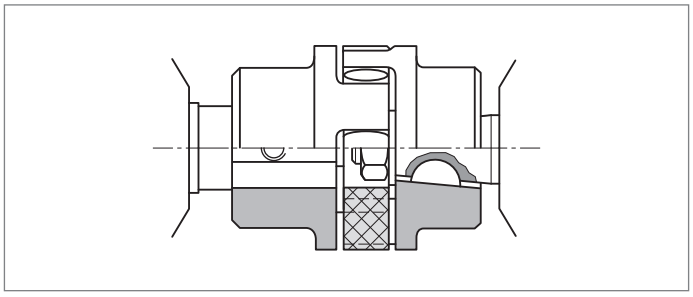


Observe the instructions for the filtration of the hydraulic fluid (see chapter “Project planning information”).

Drive

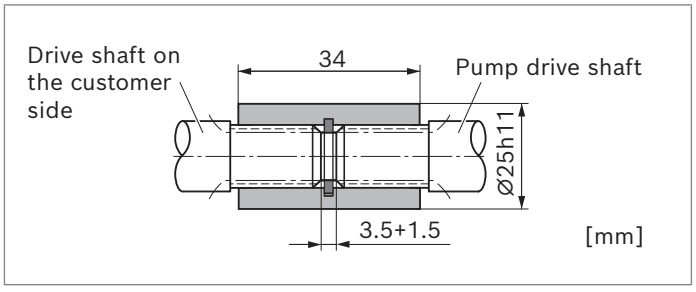
1. Elastic couplings

- The coupling must not transfer any radial and axial forces onto the pump.
- The radial runout deviation from the shaft to the spigot should not exceed 0.2 mm.
- Admissible shaft shifting see installation information of the coupling manufacturers.



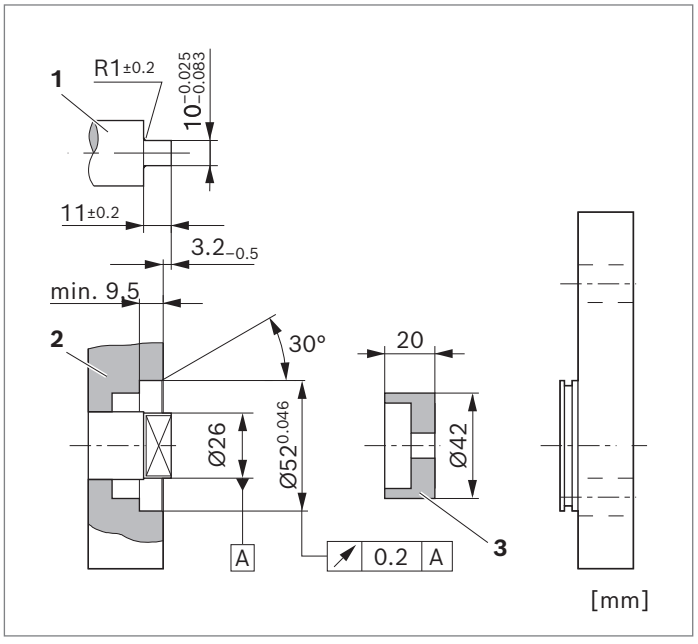
2. Coupling sleeve

- To be used on splined shaft profile according to DIN and SAE.
- Attention: No radial or axial forces are permitted on the pump drive 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 3.5+1.5 mm.
- Reserve installation space for the retaining ring.
- Oil-bath or oil-mist lubrication is required.



3. Tang drive coupling

- For attaching the pump directly to an electric motor or combustion engine, gearbox, etc.
- Pump drive shaft with special tang drive coupling 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-hardened steel DIN EN 10084, e.g. 20MnCrS5 case-hardened 1.0 deep; HRA 83±2
  - Seal ring contact surface ground without rifling $R_t \leq 4$ µm
- Radial shaft seal ring on the customer side (**2**)
  - Provide with rubber cover (see DIN 3760, type AS, or double-lipped ring)
  - Provide installation edges with 15° chamfer or install shaft seal with protection sleeve



Maximum transferable drive torques

▼ **Tapered keyed shafts**

Drive shaft		M_{max}	Nominal size	$p_{2\ max}$
Code	Designation	Nm		bar
C	1 : 5	290	22 ... 45	280
			50	250
			56	225
			63	200
H	1 : 8	240	22 ... 45	280
			50	250
			56	225
			63	200

▼ **Splined shafts**

Drive shaft		M_{max}	Nominal size	$p_{2\ max}$
Code	Designation	Nm		bar
D	SAE J744 22-4 13T	320	22 ... 45	280
			50	250
			56	225
			63	200
E	SAE J744 25-4 15T	530	22 ... 45	280
			50	250
			56	225
			63	200

▼ **Parallel keyed shaft**

Drive shaft		M_{max}	Nominal size	$p_{2\ max}$
Code	Designation	Nm		bar
Q	SAE J744 22-1	250	22 ... 36	280
			40	250
			45	225
			50	200
			56	180
			63	160

Multiple gear pumps

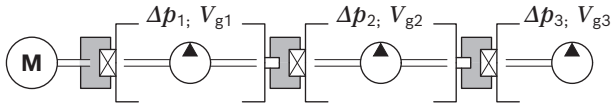
Gear pumps are well-suited to multiple arrangements, whereby the drive shaft of the first pump stage is extended to a second and possibly third pump stage. The shaft of the individual pump sections are normally connected via a driver or via a splined coupling (reinforced through drive). The individual pump stages are usually hydraulically isolated and have separate suction ports. On request a common suction port or separated but hydraulically connected suction ports are available.
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 restricted by the maximum transmissible torques of the drive shaft, the through drive and the driver.

Addition of drive torques

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



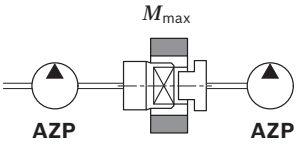
$$\frac{\Delta p_1 \times V_{g1} + \Delta p_2 \times V_{g2} + \Delta p_3 \times V_{g3}}{18 \times \pi} \leq M_{max}\ ^{1)}$$

Δp [bar]
V_g [cm³]

This may result in pressure restrictions for the respective pump stages.

Standard through drive (tang drive coupling)

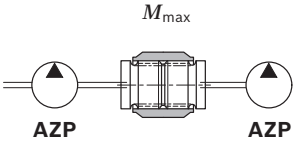
For Platform G (AZPU) pumps, the driver for the next pump stage can support loads up to M_{max} = 130 Nm. This may result in pressure limitations for subsequent pump stages.
Subsequent pumps of a smaller series determine the maximum transmissible torque.



Following pump		M_{max} [Nm]
Platform G	AZPG	130
	AZPU	130
Platform F	AZPW	52
	AZPF-1x	65
	AZPF-2x	85
	AZPS-1x	65
	AZPS-2x	85
	AZPJ	65
Platform B	AZPB-3x	25

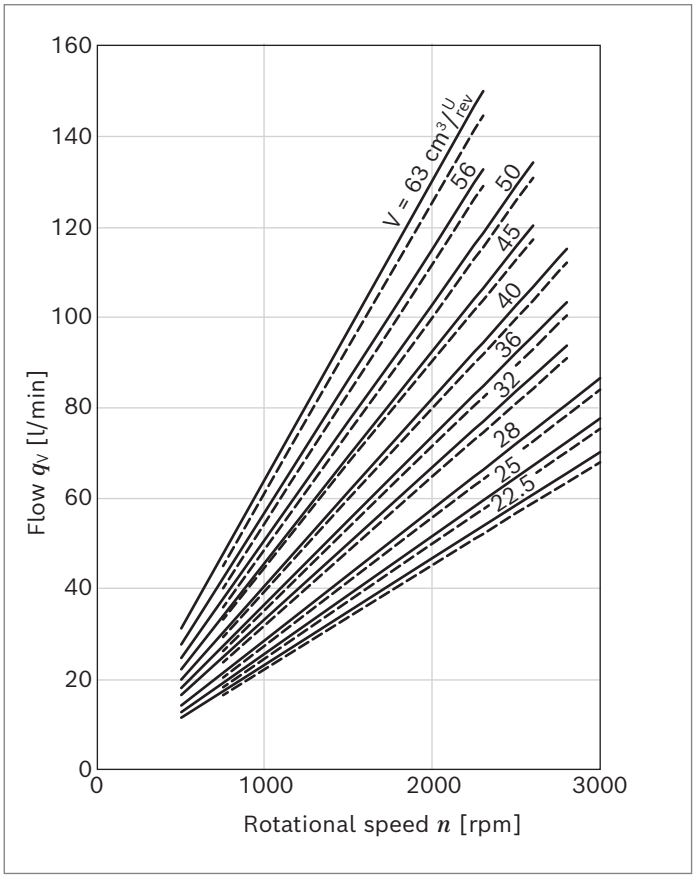
Reinforced through drive

Reinforced through drives (for up to M_{max} = 320 Nm) are available for applications with higher torques/torsional vibrations. Design available on request.



1) M_{max}: see table above “Maximum transferable drive torques”

Flow characteristic curves

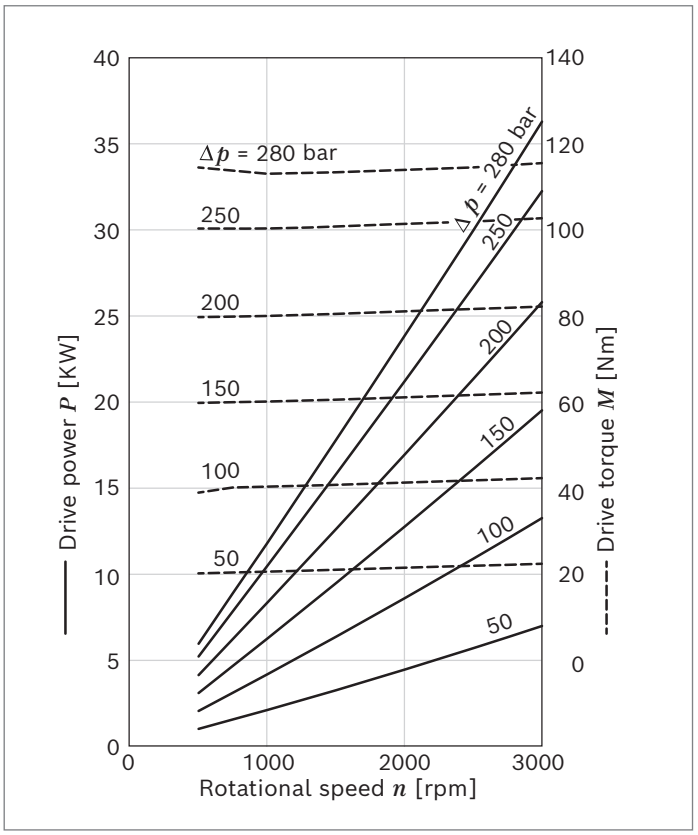


— p = 20 bar
---- p_2 = maximal intermittierend
$q_V = f(n, V_g)$

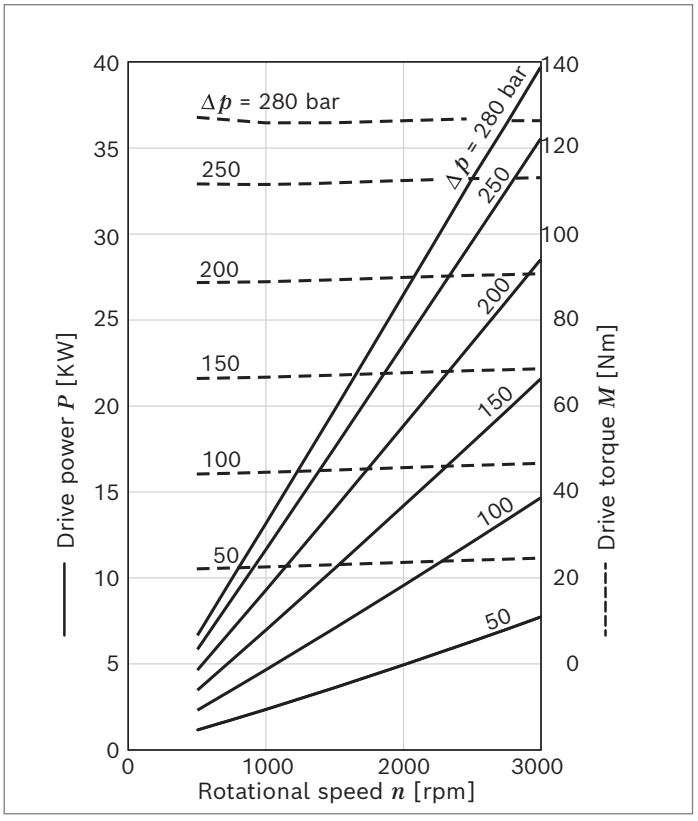
Notice
Characteristic curves measured at ν = 35 mm²/s and t = 50 °C

Power diagrams

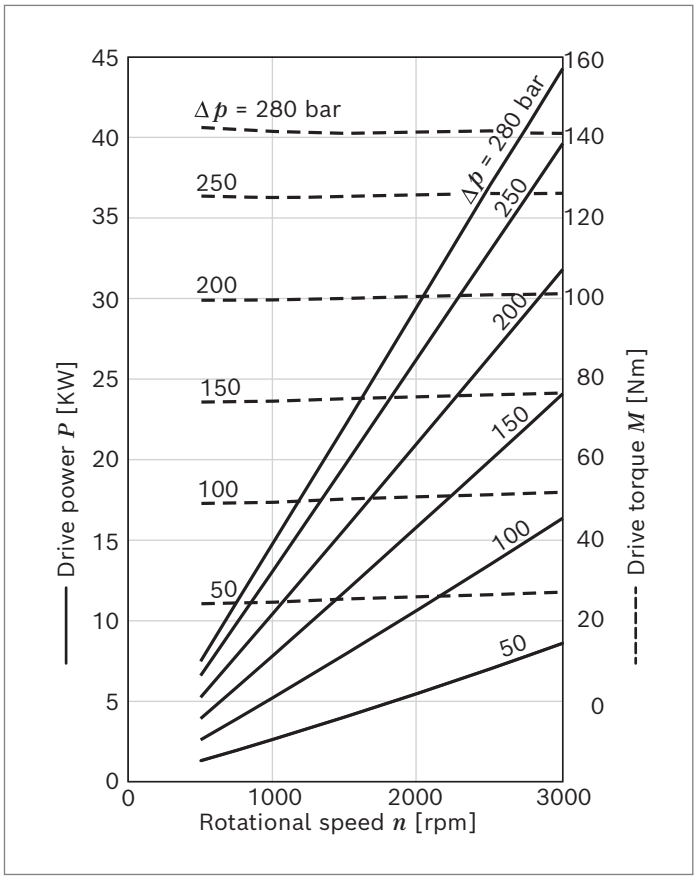
▼ **Nominal size 22**



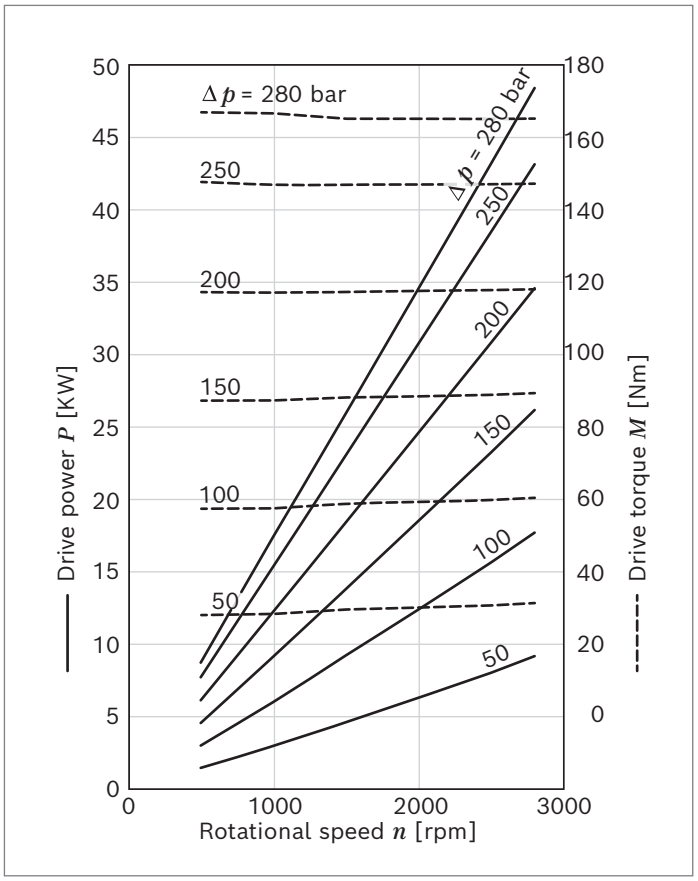
▼ **Nominal size 25**



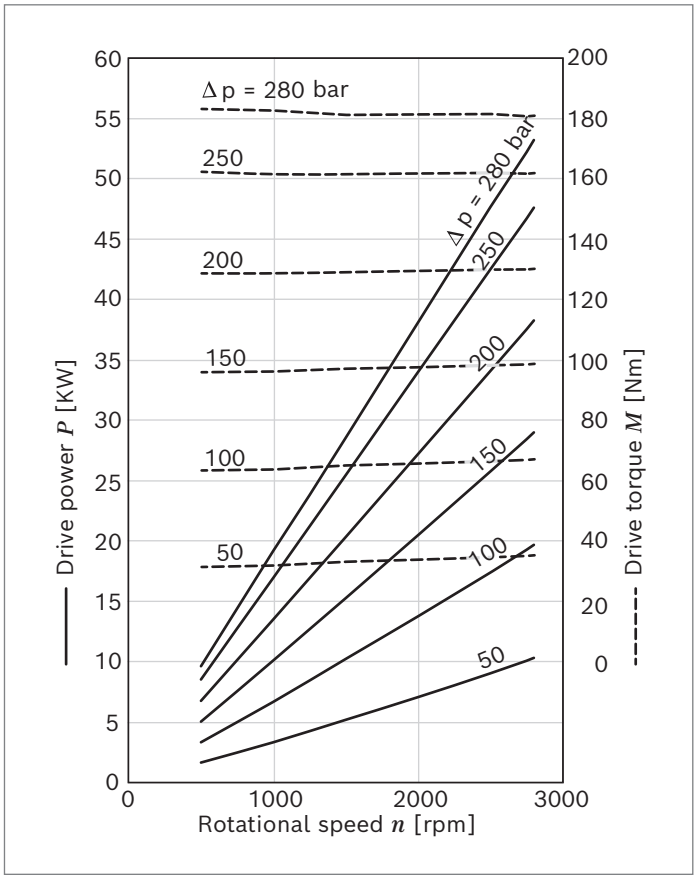
▼ **Nominal size 28**



▼ **Nominal size 32**



▼ **Nominal size 36**



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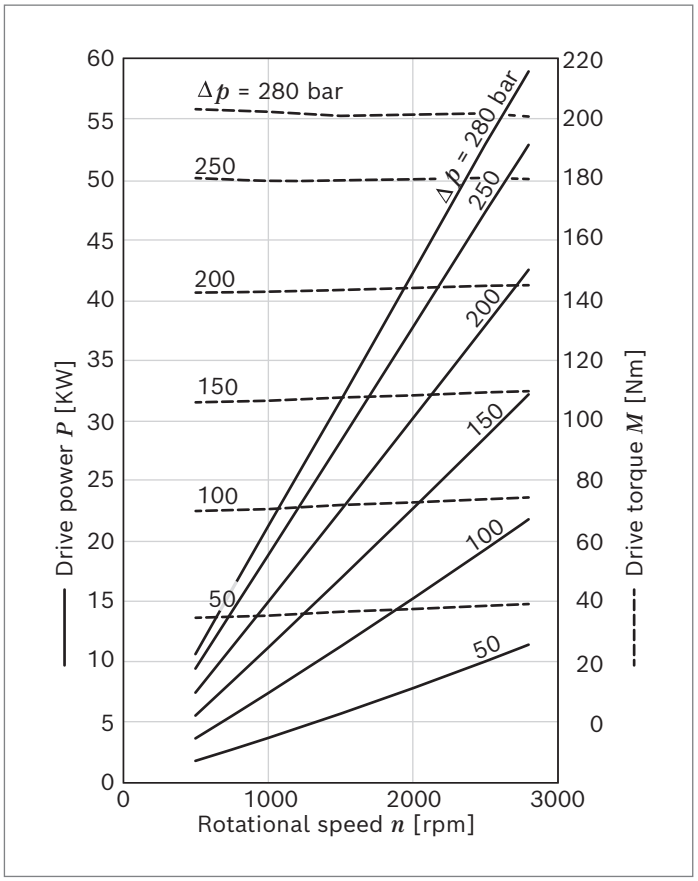

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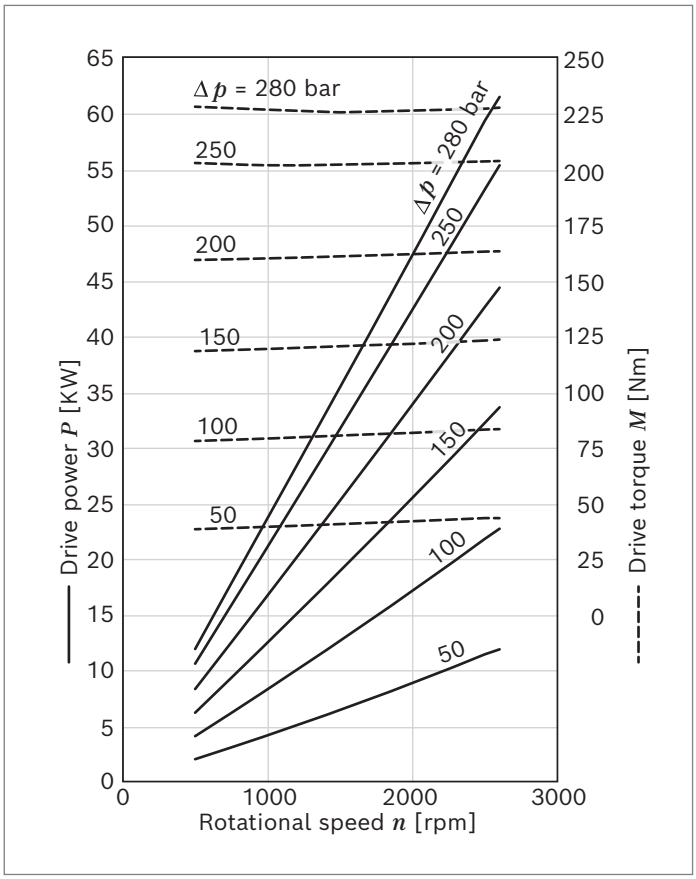

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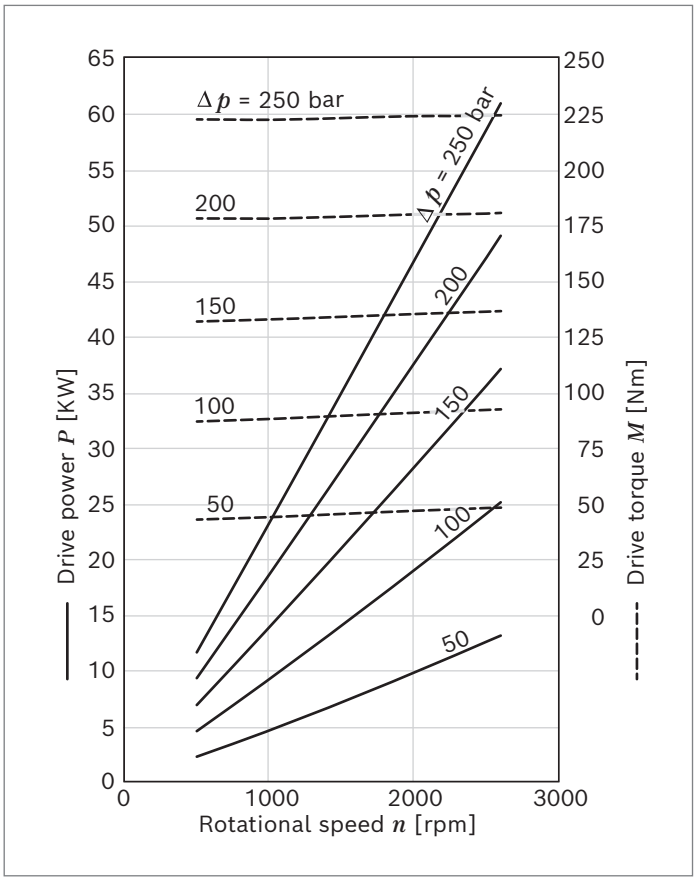

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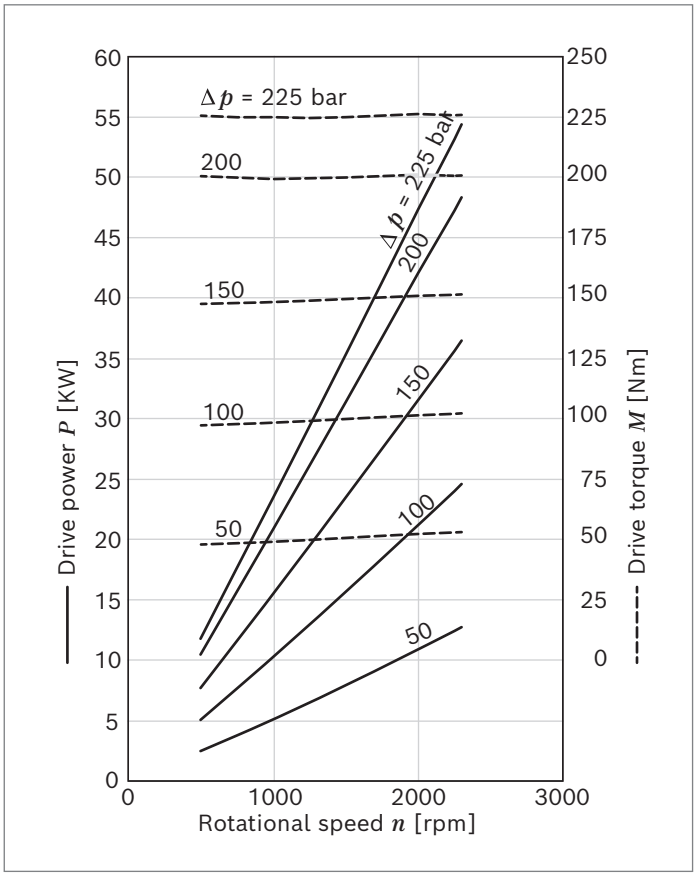

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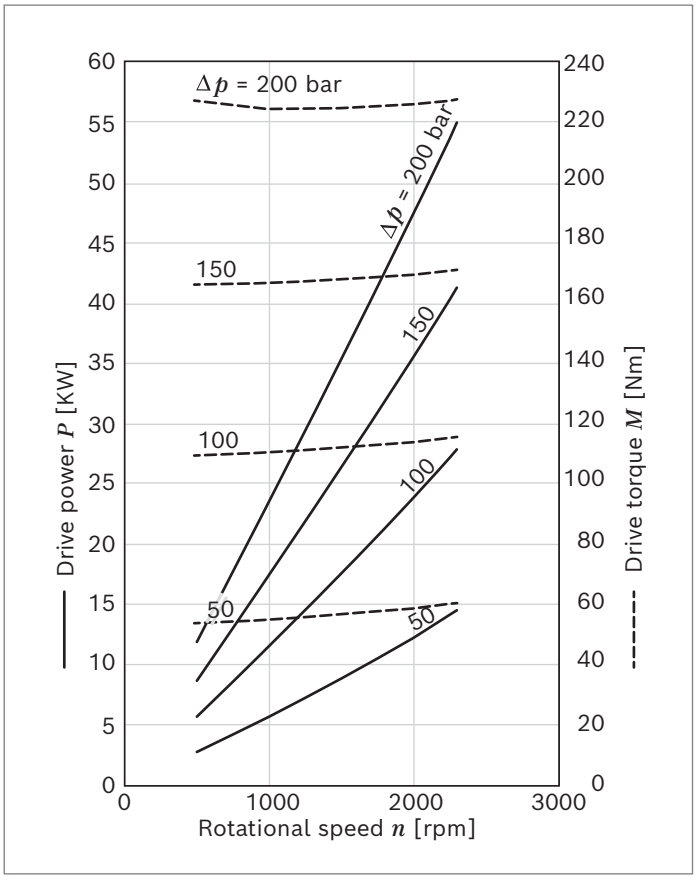


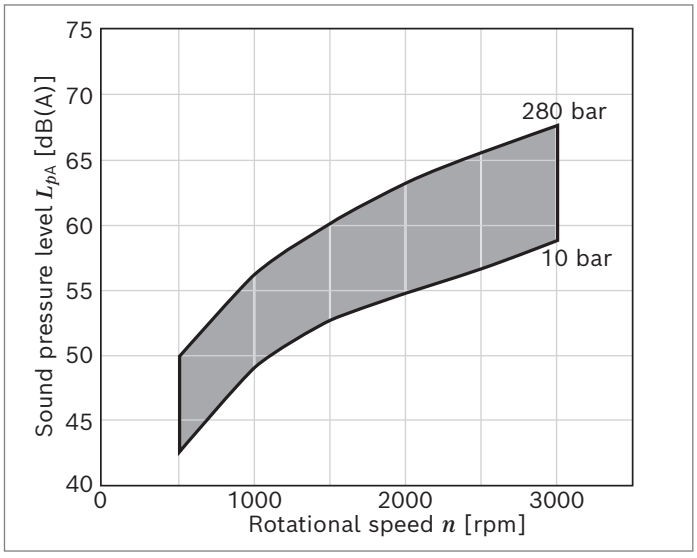
Noise charts

Noise levels dependent on the 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 taken into account.
The values refer to one individual pump.

Notice

- Characteristic curves measured at ν = 32 mm²/s and t = 50 °C.
- Sound pressure level calculated from noise measurements made in the low reflection measuring room according to DIN 45635, Part 26.
- Distance from measuring sensor to pump: 1 m.

▼ **Nominal size 22**



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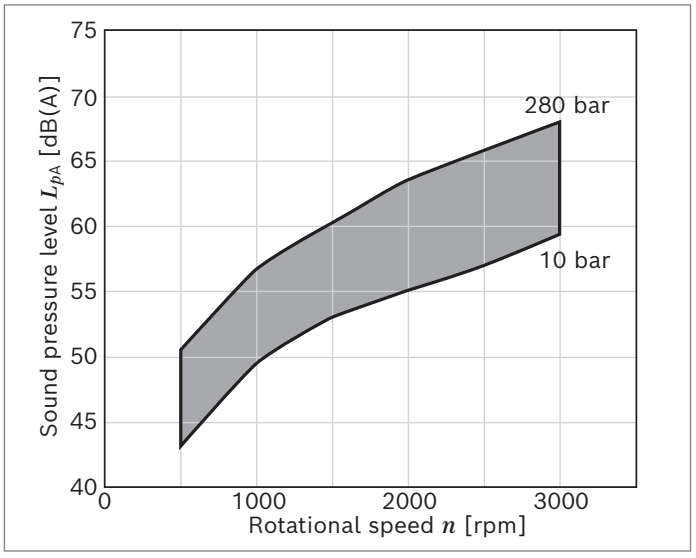

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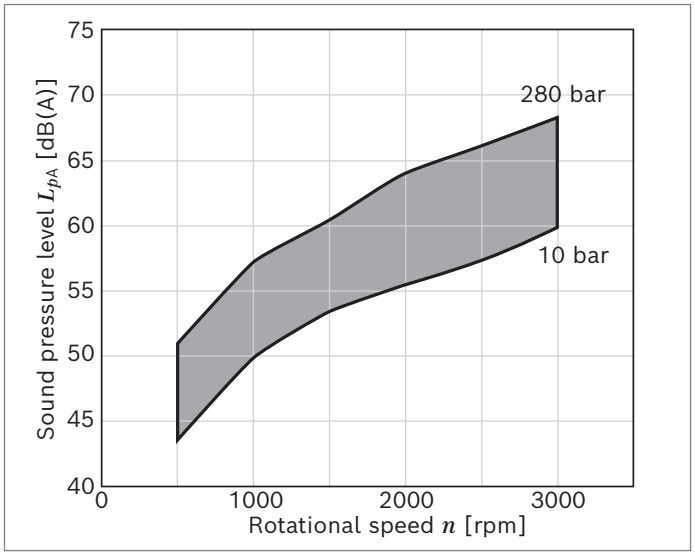
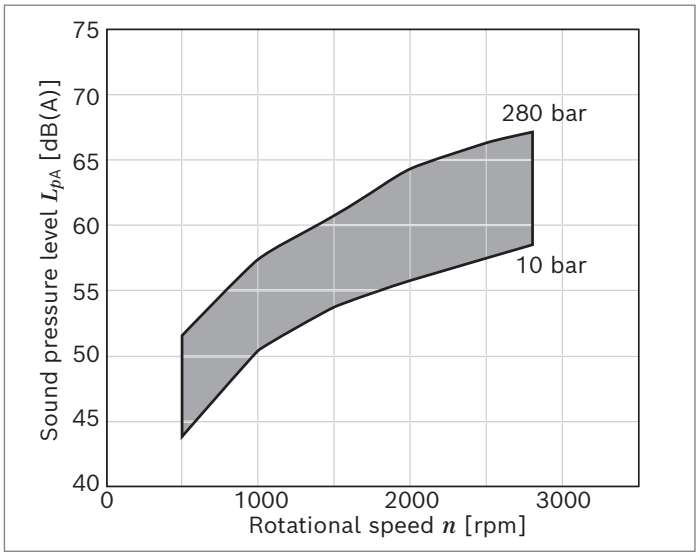


▼ **Nominal size 32**



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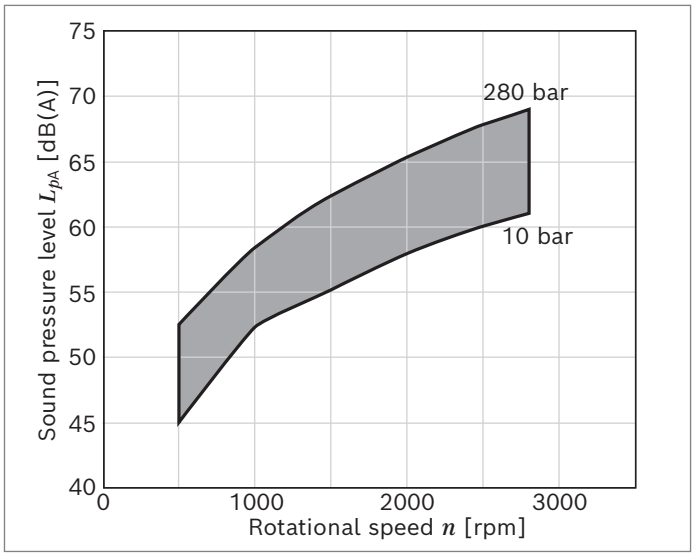

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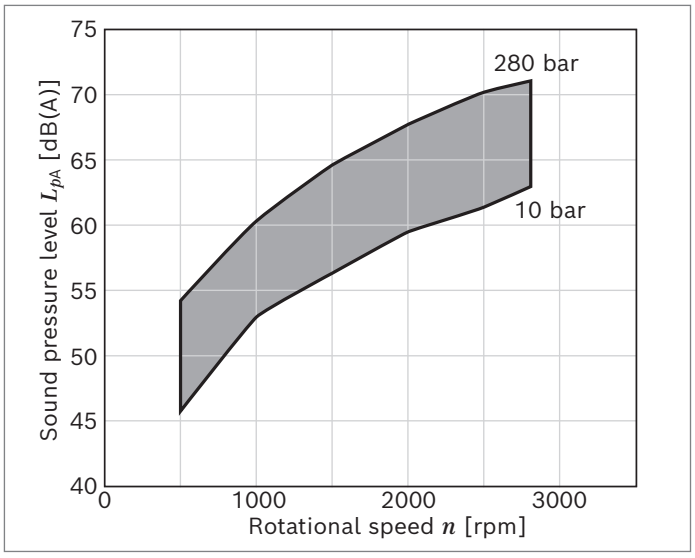

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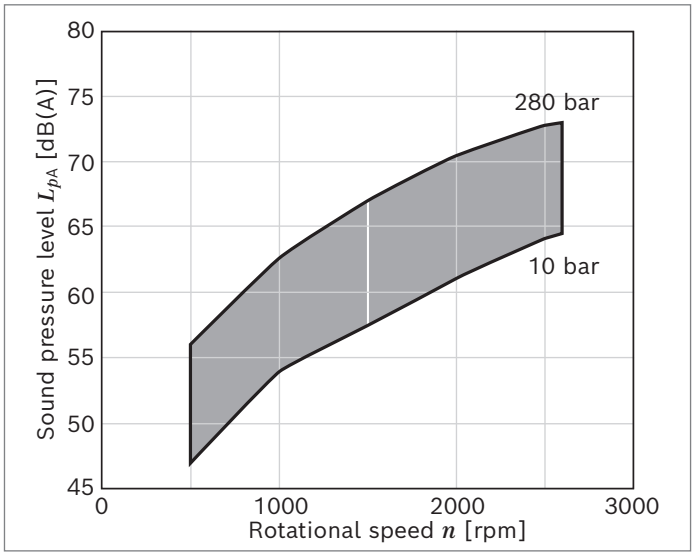
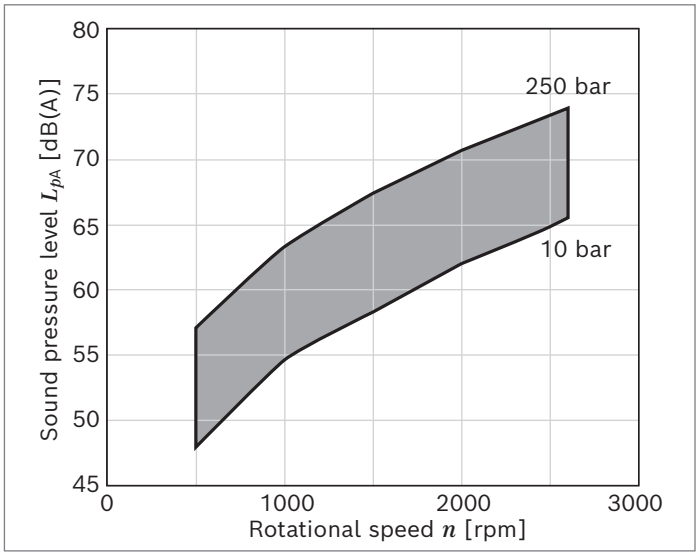
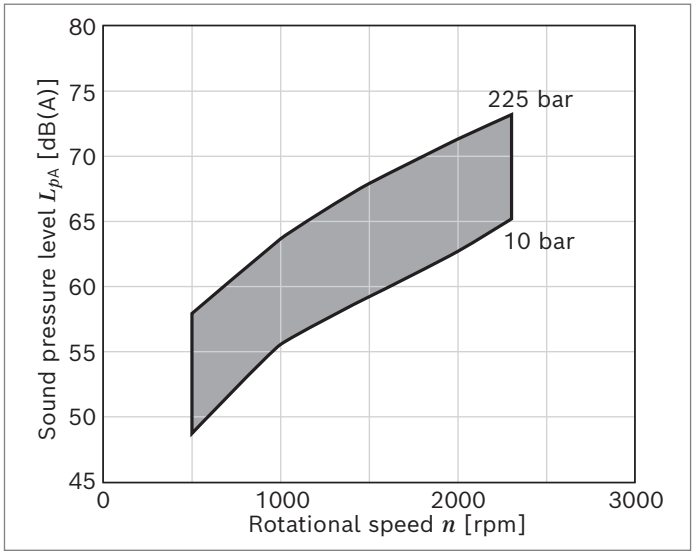


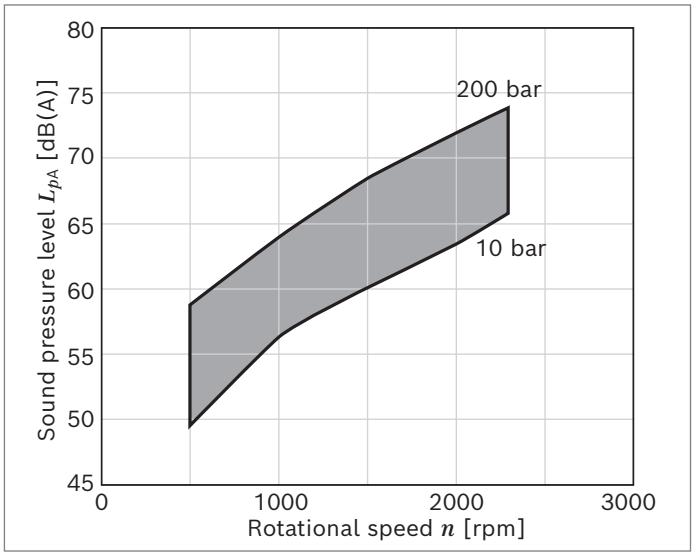
▼ **Nominal size 50**



▼ **Nominal size 56**



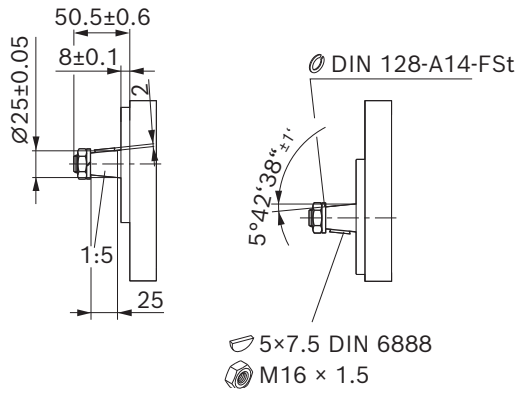
▼ **Nominal size 63**



Drive shafts

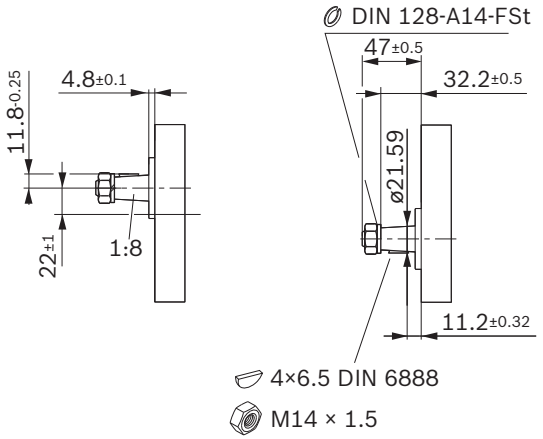
▼ **Tapered keyed shaft 1:5**

C



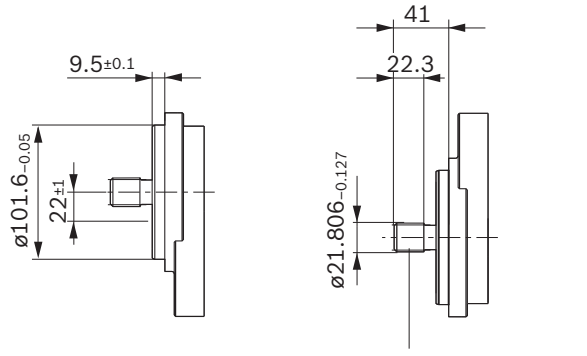
▼ **Tapered keyed shaft 1:8**

H



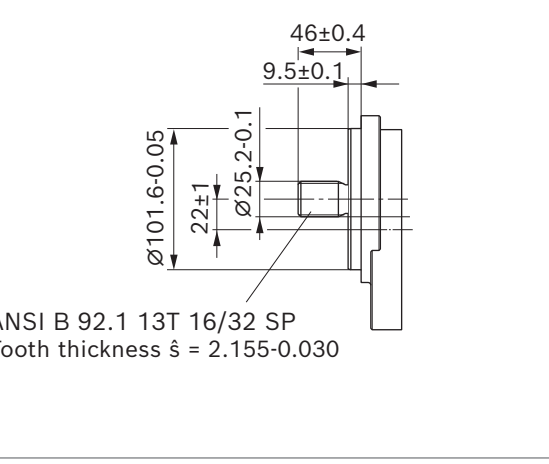
▼ **Splined shaft SAE J744 22-4 13T**

D



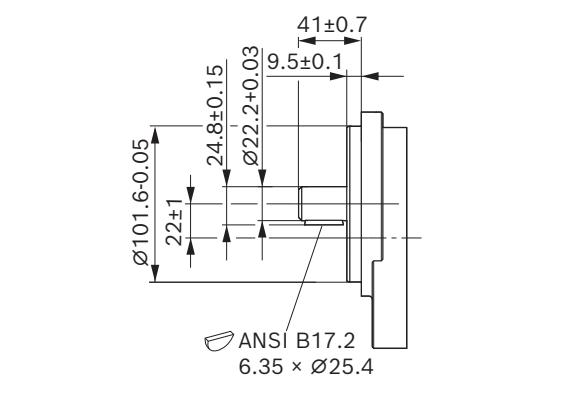
▼ **Splined shaft SAE J744 25-4 15T**

E



▼ **Parallel keyed shaft SAE J744 16-1**

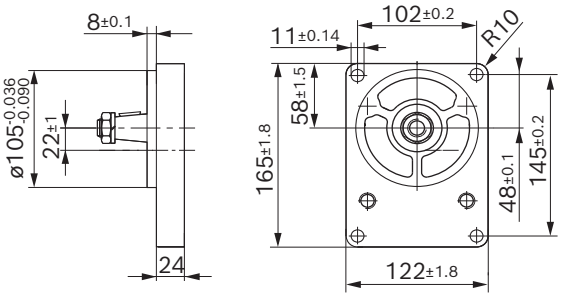
Q



Front covers

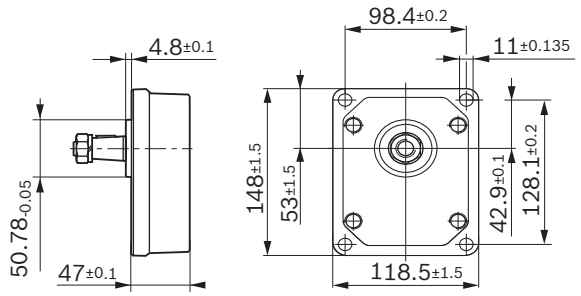
▼ **Rectangular flange spigot dia. 105 mm**

B



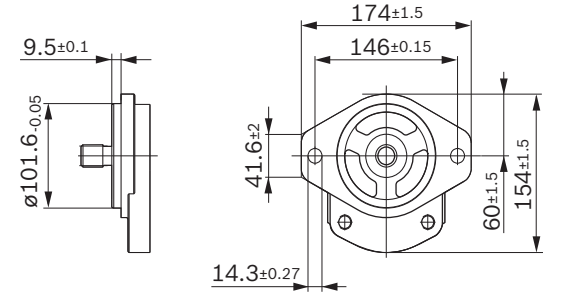
▼ **Rectangular flange spigot dia. 50.78 mm**

O



▼ **2-bolt flange SAE J744 101-2 (B) spigot dia. 101.6 mm**

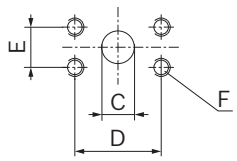
C



Port connections

▼ SAE flange connection acc. to ISO 6162-1 with metric thread

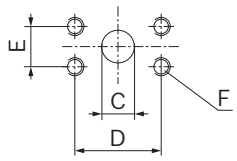
07



Nominal size	Pressure side				Suction side			
	C	D	E	F	C	D	E	F
	mm	mm	mm		mm	mm	mm	
22 ... 36	18	47.6	22.2	M10; 18 mm deep	25	52.4	26.2	M10; 18 mm deep
40 ... 50	25	52.4	26.2		32	58.7	30.2	
56 ... 63	32	58.7	30.2		38	69.8	35.8	M12; 23 mm deep

▼ SAE flange connection acc. to ISO 6162-1 with UNC thread

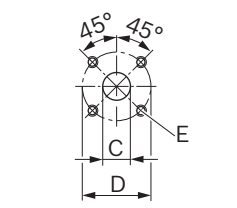
15



Nominal size	Pressure side				Suction side			
	C	D	E	F	C	D	E	F
	mm	mm	mm		mm	mm	mm	
22 ... 36	19	47.6	22.2	3/8-16 UNC-2B; 18 mm deep	25	52.4	26.2	3/8-16 UNC-2B; 18 mm deep
40 ... 50	25	52.4	26.2		32	58.7	30.2	7/16-14 UNC-2B; 18 mm deep
56 ... 63	32	58.7	30.2	7/16-14 UNC-2B; 18 mm deep	38	69.8	35.8	1/2-13 UNC-2B 18 mm deep

▼ Square flange (German version)

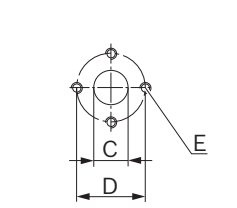
20



Nominal size	Pressure side			Suction side		
	C	D	E	C	D	E
	mm	mm		mm	mm	
22 ... 63	18	55	M8; 13 mm deep	26	55	M8; 13 mm deep

▼ Square flange (Italian version)

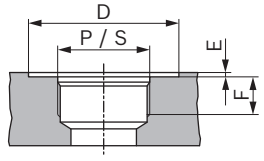
30



Nominal size	Pressure side			Suction side		
	C	D	E	C	D	E
	mm	mm		mm	mm	
22 ... 56	18	39.7	M8; 13 mm deep	26	50.8	M10; 13 mm deep
63	26	50.8	M10; 13 mm deep	36	62	

▼ UN-thread acc. to ISO 11926-1/ASME B 1.1, O-ring[1)]

12



Nominal size	Pressure side				Suction side			
	P	D	E	F	S	D	E	F
		mm	mm	mm		mm	mm	mm
22 ... 25	1 1/16-12 UN-2B	45	0.5	19	1 5/16-12 UN-2B	50	0.5	19
28 ... 40					1 5/8-12 UN-2B	58		
45 ... 63					1 7/8-12 UN-2B	68		

Port connections in rear cover

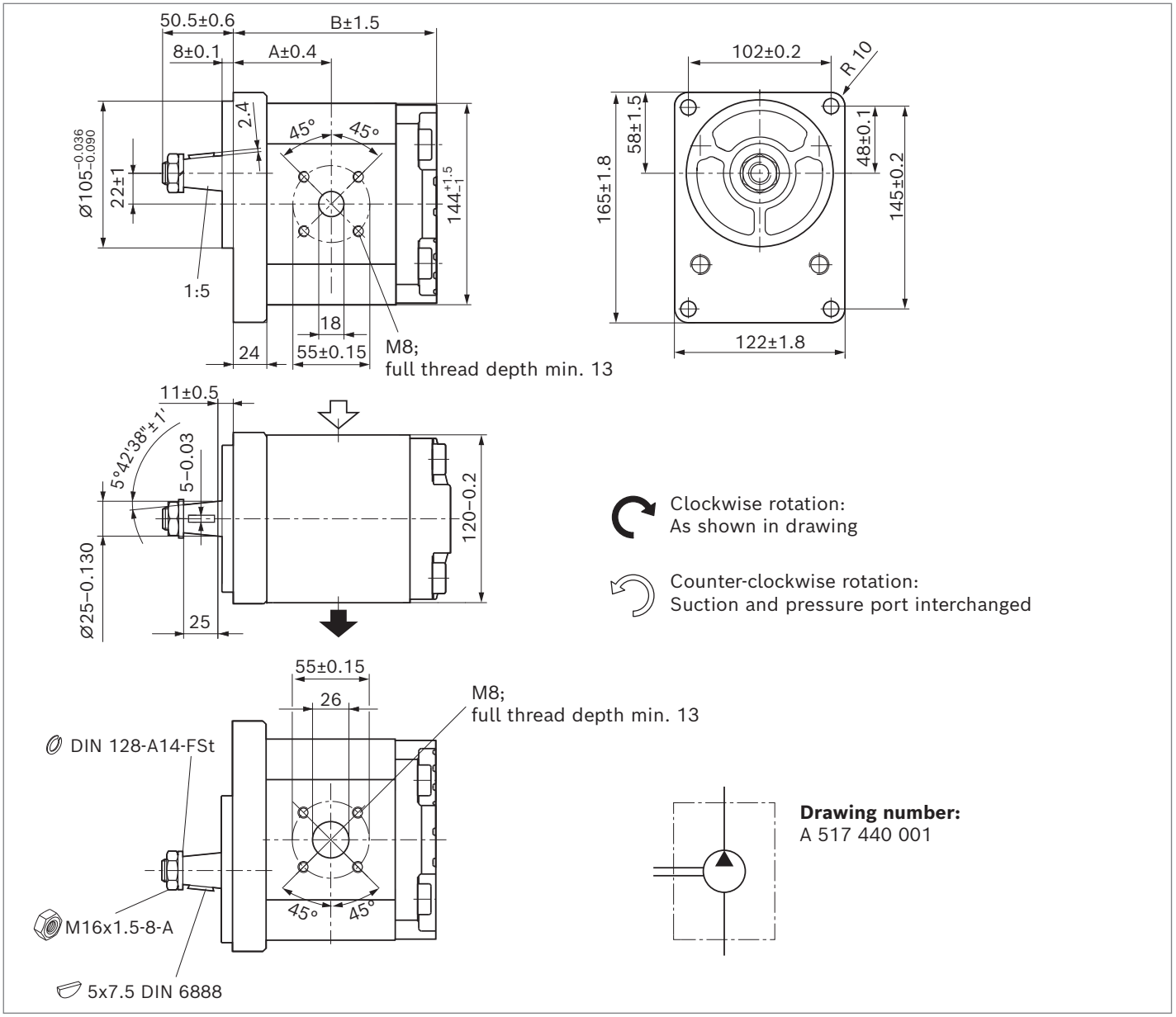
Nominal size	Pressure side			Suction side		
	P	E	F	S	E	F
		mm	mm		mm	mm
22 ... 28	1 1/16-12 UN-2B	1	19	1 5/16-12 UN-2B	1	19
32 ... 63	1 5/16-12 UN-2B			1 5/8-12 UN-2B		

1) Limited service life with threaded ports (applicable for applications with p_2 > 210 bar)

Dimensions – Preferred program

Tapered keyed shaft 1:5 with rectangular flange spigot dia. 105 mm

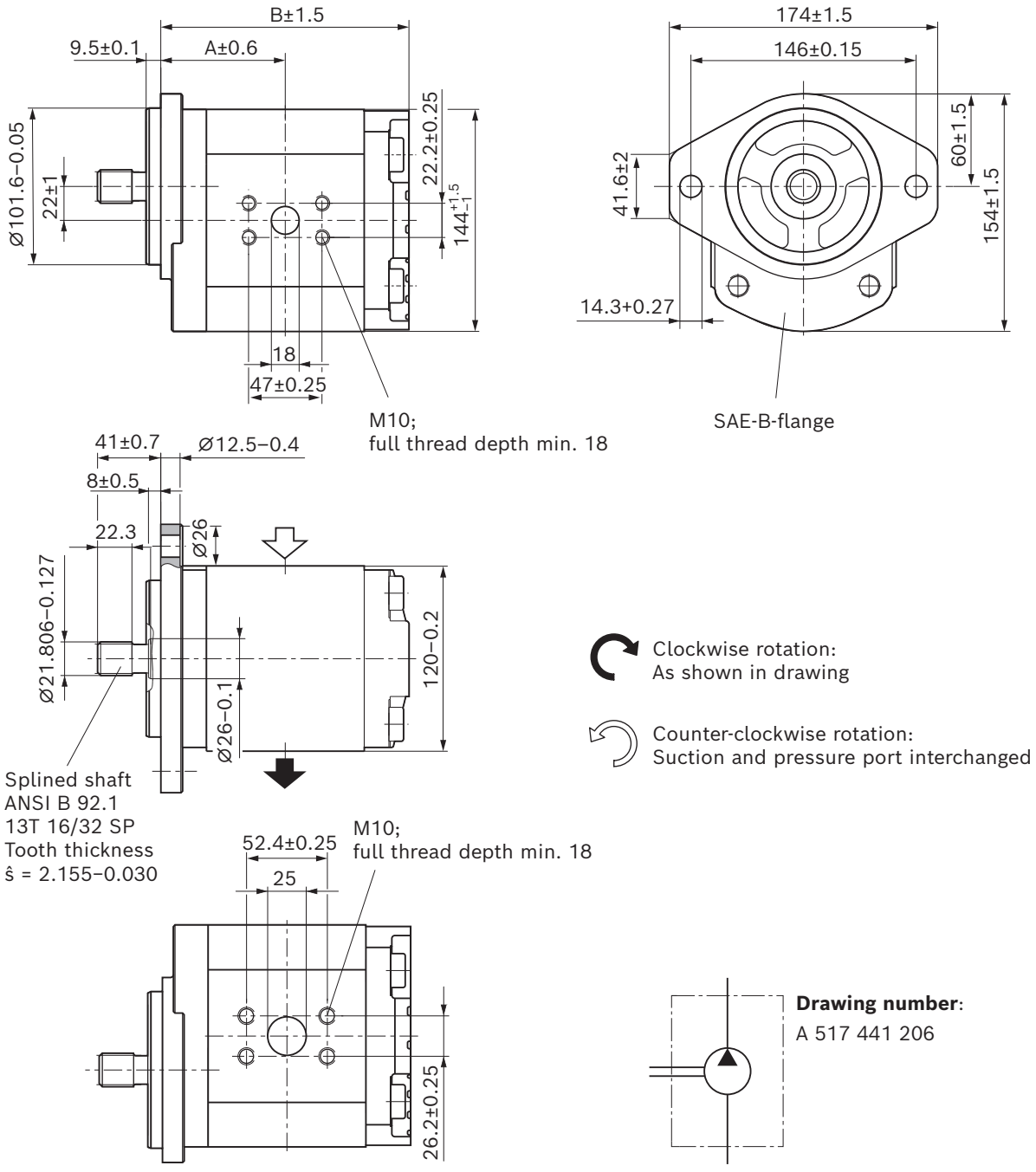
AZPU–22– ... **CB20**MB



NG	Material number Direction of rotation counter-clockwise	Material number Direction of rotation clockwise	Maximum intermittent pressure p_2 bar	Maximum rotational speed n_{max} rpm	Weight m kg	Dimensions A mm	Dimensions B mm
22	0 517 725 322	0 517 725 026	280	3000	10.3	60.9	124.6
25	0 517 725 323	0 517 725 027	280	3000	10.4	61.9	126.6
28	0 517 725 324	0 517 725 028	280	3000	10.5	63.2	129.1
32	0 517 725 325	0 517 725 029	280	2800	10.7	64.8	132.4
36	0 517 725 326	0 517 725 030	280	2800	10.9	66.4	135.7
40	0 517 725 327	0 517 725 031	280	2800	11.0	68.1	139.0
45	0 517 725 328	0 517 725 032	280	2600	11.2	70.1	143.1
50	0 517 825 301	0 517 825 001	250	2600	11.4	72.2	147.2
56	0 517 825 302	0 517 825 002	225	2300	11.7	74.7	152.2
63	0 517 825 303	0 517 825 003	200	2300	12.0	77.6	158.0

Splined shaft SAE J744 22-4 13T with 2-bolt flange SAE J744 101-2 (B) spigot dia. 101.6 mm

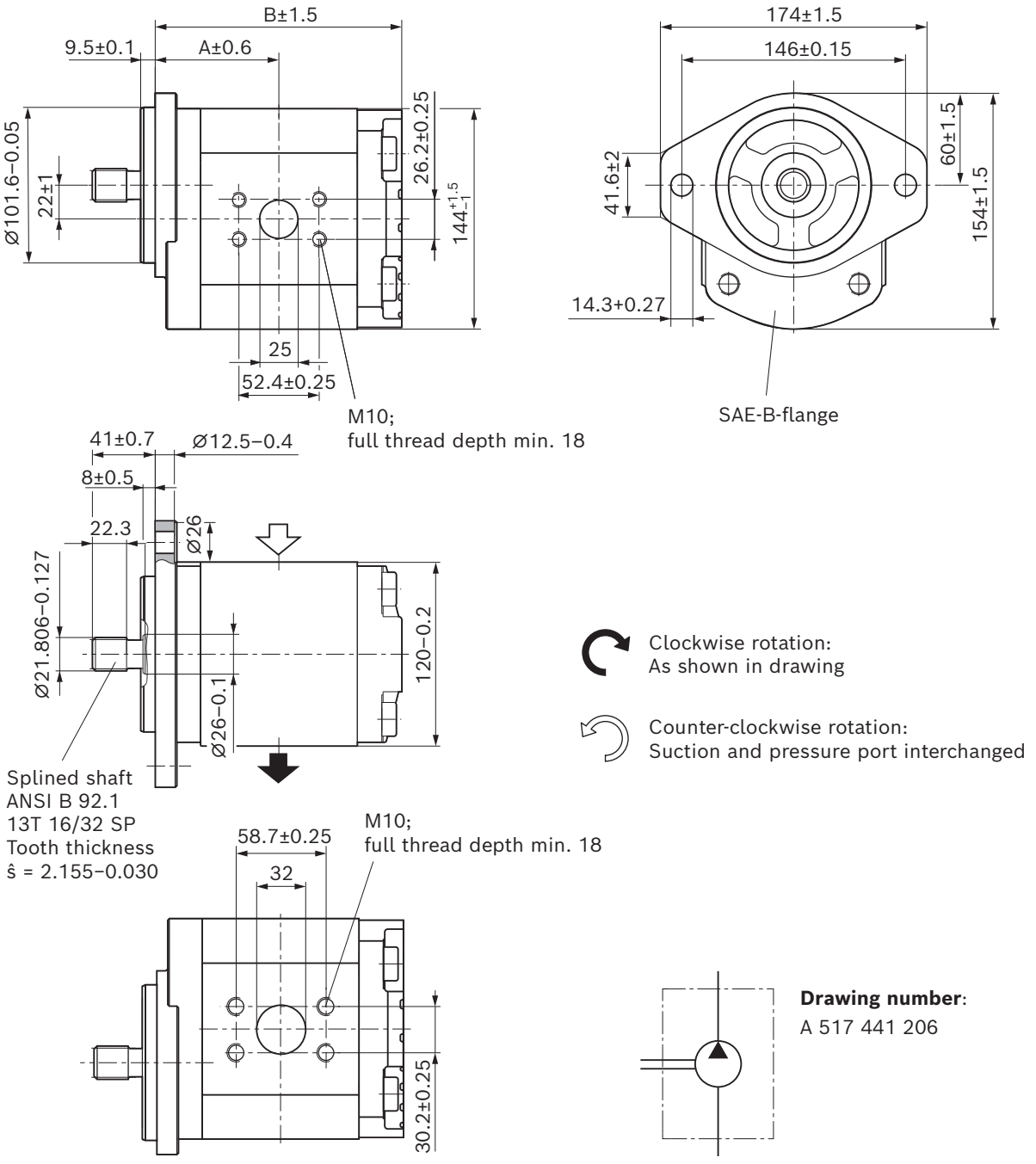
AZPU–22– ... **DC07**KB



NG	Material number Direction of rotation counter-clockwise	 clockwise	Maximum intermittent pressure p_2 bar	Maximum rotational speed n_{max} rpm	Weight m kg	Dimensions A mm	 B mm
22	0 517 725 329	0 517 725 033	280	3000	9.6	66.4	130.1
25	0 517 725 330	0 517 725 034	280	3000	9.7	67.4	132.1
28	0 517 725 331	0 517 725 035	280	3000	9.8	68.7	134.6

Splined shaft SAE J744 22-4 13T with 2-bolt flange SAE J744 101-2 (B) spigot dia. 101.6 mm

AZPU–22– ... **DC07**KB

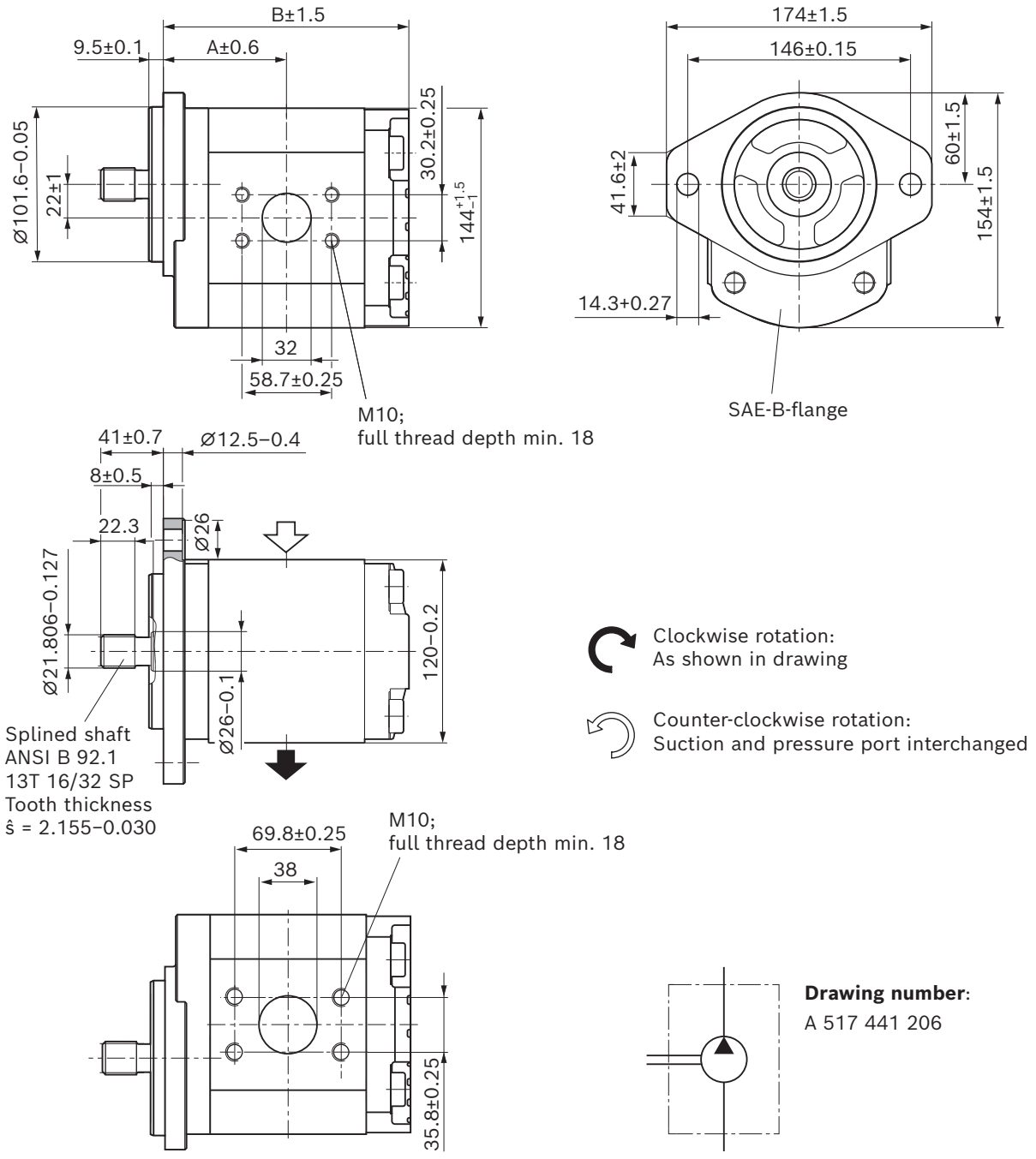


NG	Material number Direction of rotation counter-clockwise	 clockwise	Maximum intermittent pressure p_2 bar	Maximum rotational speed n_{max} rpm	Weight m kg	Dimensions A mm	 B mm
32	0 517 725 332	0 517 725 036	280	2800	10.0	70.3	137.9
36	0 517 725 333	0 517 725 037	280	2800	10.1	71.9	141.2
40	0 517 725 334	0 517 725 038	280	2800	10.3	73.6	144.5
45	0 517 725 335	0 517 725 039	280	2600	10.5	75.6	148.6
50	0 517 825 304	0 517 825 004	250	2600	10.7	77.7	152.7

1) Limited service life with threaded ports (applicable for applications with p_2 > 210 bar)

Splined shaft SAE J744 22-4 13T with 2-bolt flange SAE J744 101-2 (B) spigot dia. 101.6 mm

AZPU–22– ... **DC07**KB



NG	Material number Direction of rotation counter-clockwise	 clockwise	Maximum intermittent pressure p_2 bar	Maximum rotational speed n_{max} rpm	Weight m kg	Dimensions A mm	 B mm
56	0 517 825 305	0 517 825 005	225	2300	11.0	80.2	157.7
63	0 517 825 306	0 517 825 006	200	2300	11.3	83.1	163.5

1) Limited service life with threaded ports (applicable for applications with p_2 > 210 bar)

Project planning information

Technical data

All mentioned technical data are dependent on manufacturing tolerances and are applicable for 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, observe the maximum possible application data on the basis of the characteristic curves shown.

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.

Notice
When used as an auxiliary steering pump, the vehicle manufacturer should make sure that the steering system continues to operate safely, even if the auxiliary steering pump fails (regulation similar to ECE R-79 can be referred).

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 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.
The basic contamination of the hydraulic fluid filled in should not exceed class 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.

Further information

Installation drawings and dimensions are valid at date of publication, subject to modifications.
Further information and notes on project planning can be found in the “General Operating Instructions 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.

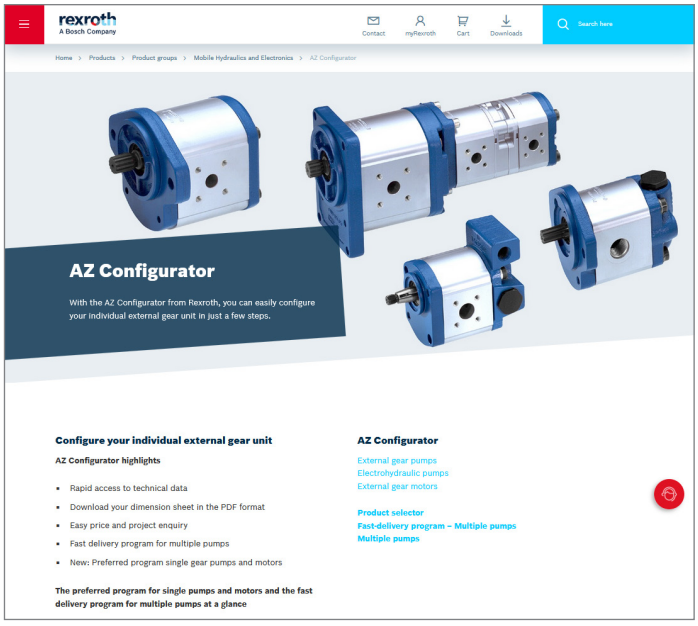
The selector guides you through a selection of features to all of the products available for order. By clicking on the order number, you can view and download the following product information: Data sheet, dimension sheet, operating conditions, and tightening torques.

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 to easily and conveniently configure 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.

For an already existing configuration you receive as a result the order number, the type code, as well as further information. If your configuration does not lead to a product that is available for order, our online tools provide you with the possibility of sending a project request directly to Bosch Rexroth. We will then get in contact with you.

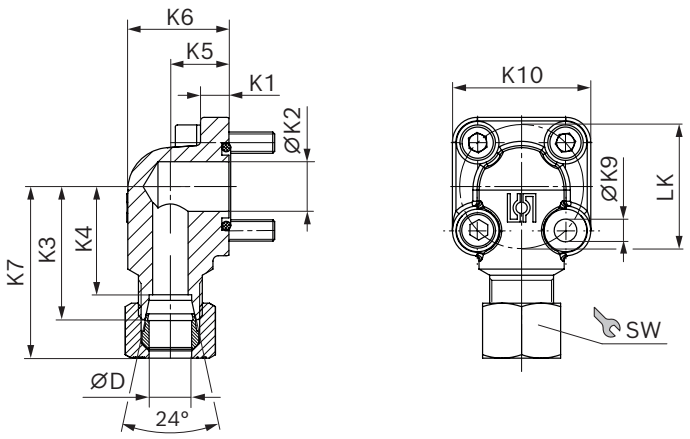
Link: www.boschrexroth.com/az-configurator



Accessories

90° angle flange, for square flange 20 (German version)

Complete screw connections with O-ring, metric screw set, nuts and olive.



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	57.0	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	61.0	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	38.0	40	64	61.5	8.4	58	60	M8 × 25	M8 × 70	32 × 2.5	1.04