

# High-Performance external gear pump AZPB



- ▶ Platform B
- ▶ Fixed displacement
- ▶ Sizes 1 ... 7.1
- ▶ Continuous pressure up to 220 bar
- ▶ Intermittent pressure up to 250 bar (up to size 6,3)

## Features

- ▶ Consistently high quality due to high-volume series production
- ▶ Long service life
- ▶ Slide bearings for high loads
- ▶ Drive shafts conform to ISO or SAE and custom solutions
- ▶ Line connections: Connection flange or screw-in thread
- ▶ Combinations of several pumps possible

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## Product description

### General

The key task of external gear pumps is to convert mechanical energy (torque and rotational speed) into hydraulic energy (flow and pressure). To reduce heat loss, Rexroth external gear units are designed to be extremely efficient. This efficiency is achieved through pressure-based gap sealing and high-precision manufacturing technology.

Rexroth external gear pumps are available in four platforms: B, F, N and G, with different gear widths within a platform for different displacements. The pumps come in Standard, High-Performance, SILENCE and SILENCE PLUS versions. Different flanges, shafts, valve arrangements and multiple pump combinations produce additional variants for each version.

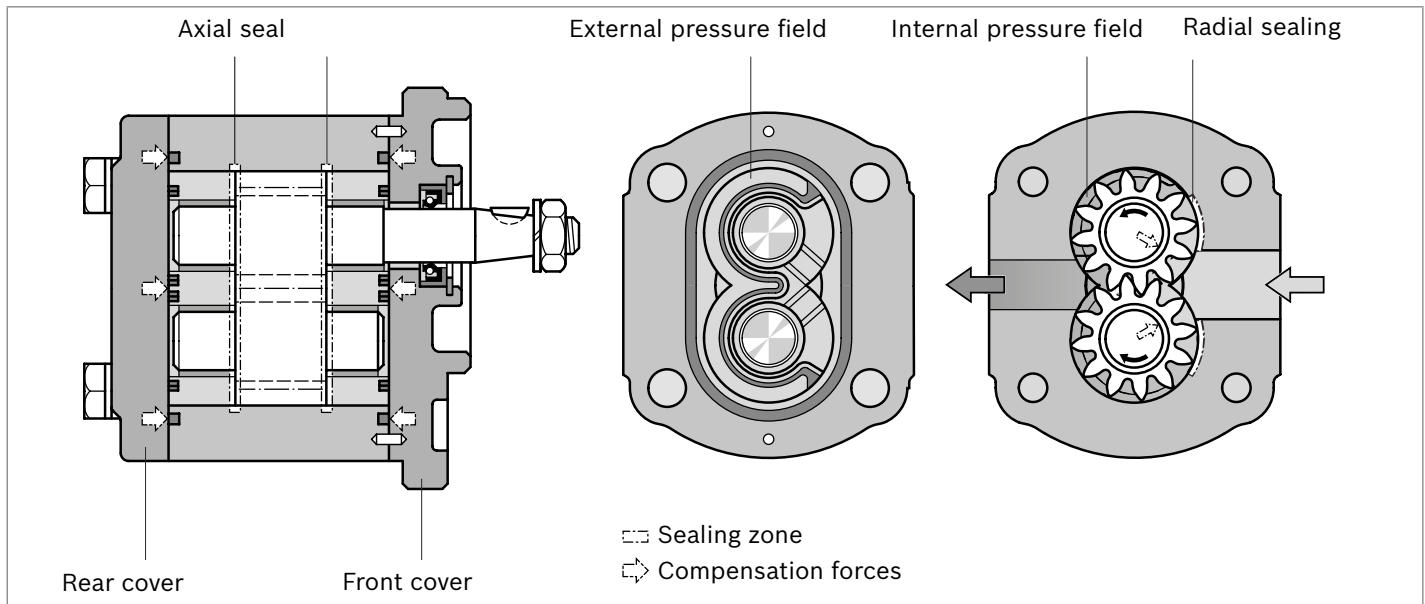
### Construction

The external gear pump consists essentially of a pair of gear wheels supported in bearing bushes and the housing with a front and a rear cover.

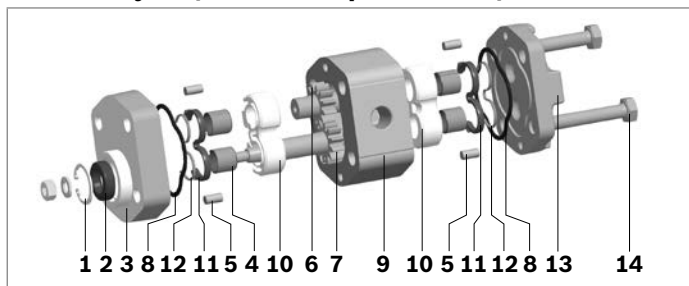
The drive shaft protrudes from the front cover where it is usually sealed by the shaft seal. The bearing forces are absorbed by slide bearings. These were designed for high pressures and have excellent emergency running properties, especially at low rotational speeds.

The gear wheels have 12 teeth. This keeps both flow pulsation and noise emission to a minimum. The internal sealing of the pressure chambers is achieved by delivery pressure-dependent forces. This ensures optimum efficiency. On the rear side, the movable bearing bushes are pressurized with working pressure and pressed as seals against the gear wheels. The pressurized compression springs are limited by special seals. The seal on the area between the gear teeth and the housing is ensured by the smallest of gaps that adjust depending on the pressure between the gear teeth and housing.

### ▼ External gear pump layout



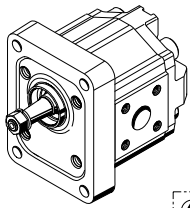
### ▼ AZPB layout (schematic representation)



- |                  |                       |
|------------------|-----------------------|
| 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 Hex screw          |

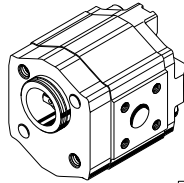
**AZPB preferred types product overview**

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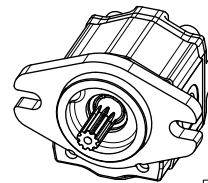
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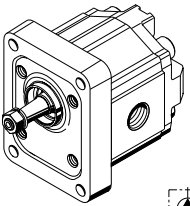
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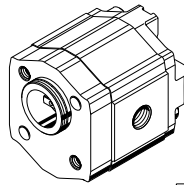


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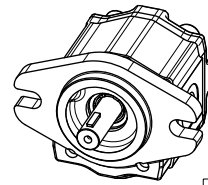
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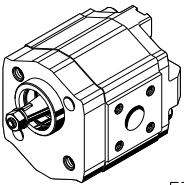
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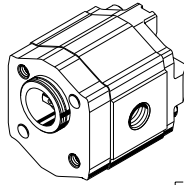
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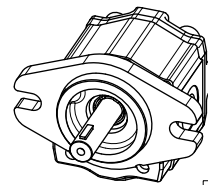
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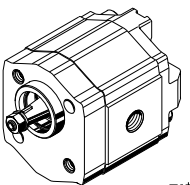
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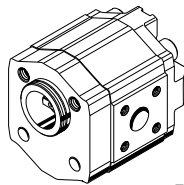
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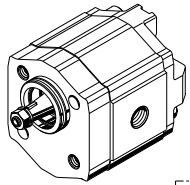
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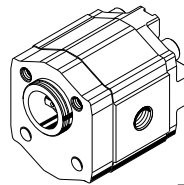
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4 **AZPB** | External gear pump  
Single-pump type codes

**Single-pump type codes<sup>1)</sup>**

01	02	03	04	05	06	07	08	09	10	11	12	
<b>AZP</b>	<b>B</b>	-	<b>3</b>	<b>2</b>	-						-	

**External gear unit**

01	External gear pump	<b>AZP</b>
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**Series**

02	1 cm <sup>3</sup> /rev ... 7.1 cm <sup>3</sup> /rev, Standard Performance, Platform B	<b>B</b>
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**Series**

03	Bearing journal Ø12 mm, installation identical to Series 1	<b>3</b>
----	--	----------

**Version**

04	Corrosion-resistant, pinned	<b>2</b>
----	-----------------------------	----------

**Size**

05	For geometric displacement $V_g$ [cm <sup>3</sup> ], see "Table of values"	<b>1.0</b>	<b>2.0</b>	<b>2.5</b>	<b>3.1</b>	<b>4.0</b>	<b>4.5</b>	<b>5.0</b>	<b>6.3</b>	<b>7.1</b>
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**Direction of rotation**

06	As viewed on drive shaft	Clockwise	<b>R</b>
		Counterclockwise	<b>L</b>

**Drive shaft**

		Suitable front cover		
07	Tapered shaft	1 : 5	P	<b>C</b>
		1 : 8	O	<b>H</b>
	Tang drive	M, Y	<b>N</b>	
	SAE J744 13-1 cylindrical	R	<b>Q</b>	
	SAE J744 13-4 (A-A) splined shaft	R	<b>R</b>	

**Front cover**

08	2-hole flange	Ø32 mm	<b>P</b>
		Ø32 mm with O-Ring	<b>M</b>
		Ø32 mm with O-ring, for attachment to Series F	<b>Y</b>
		SAE J744 50-2 (A-A)	<b>R</b>
	Rectangular flange	Ø25.38 mm	<b>O</b>

**Line connection**

09	ISO 228/1 pipe thread	<b>01</b>
	DIN 3852-T1 metric thread	<b>02</b>
	SAE J1926-1 thread O-ring Boss	<b>12</b>
	Square flange	<b>20</b>

**Sealing material**

10	NBR (nitrile rubber)	<b>M</b>
	NBR, FKM (fluoroelastomer) shaft seal	<b>K</b>
	FKM (fluoroelastomer)	<b>P</b>

**Rear cover**

11	Without valve (standard)	<b>B</b>
	Axial pressure/suction port	<b>A</b>

**Special version**

12	Serial number, e.g., S0001	<b>SXXXX</b>
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1) – Some type code combinations are not possible.  
– Please select the desired pump with the help of the selection table (preferred types) or after consultation with Bosch Rexroth.

– Further options are available on request.

## Multi-pump type codes<sup>1)</sup>

01	02		03	04		05	06	07	08	09	10	11
<b>AZP</b>		-			-							

### External gear unit

01	External gear pump	<b>AZP</b>
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### Series<sup>2)</sup>

02	High-Performance	1.0 ... 7.1 cm <sup>3</sup> /rev	<b>B</b>
		4.0 ... 28 cm <sup>3</sup> /rev	<b>F</b>
		20.0 ... 36 cm <sup>3</sup> /rev	<b>N</b>
		22.5 ... 100 cm <sup>3</sup> /rev	<b>G</b>
	SILENCE	4.0 ... 28 cm <sup>3</sup> /rev	<b>S</b>
		20.0 ... 36 cm <sup>3</sup> /rev	<b>T</b>
		22.5 ... 63 cm <sup>3</sup> /rev	<b>U</b>
	SILENCE PLUS	12.0 ... 28 cm <sup>3</sup> /rev	<b>J</b>

### Series (relates to first pump stage)

03	Bearing journal Ø12 mm	
----	------------------------	--

### Version (relates to first pump stage)

04	Corrosion-resistant, pinned	
----	-----------------------------	--

### Size<sup>3)</sup>

05	In accordance with data sheet for the individual series	
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### Direction of rotation

06	As viewed on drive shaft	Clockwise	<b>R</b>
		Counterclockwise	<b>L</b>

### Drive shaft (relates to first pump stage)

07	In accordance with data sheet for first pump stage	
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### Front cover (relates to first pump stage)

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

### Line connection (per pump stage)<sup>4)</sup>

09	In accordance with data sheet for the individual series 1	
----	---	--

### Sealing material

10	NBR (nitrile rubber)	<b>M</b>
	NBR, FKM (fluoroelastomer) shaft seal	<b>K</b>
	FKM (fluoroelastomer)	<b>P</b>

### Rear cover (relates to last pump stage)

11	In accordance with data sheet for last pump stage	<b>B</b>
----	---	----------

### Special version

12	Serial number, e.g., S0001	<b>SXXXX</b>
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### Sample 2-pump combination:

AZPB ... 6.3 ... + AZPB ... 2.0 ...

01	02		03	04		05	06	07	08	09	10	11
<b>AZP</b>	<b>BB</b>	-	<b>3</b>	<b>2</b>	-	<b>6.3/2.0</b>	<b>L</b>	<b>H</b>	<b>O</b>	<b>0101</b>	<b>M</b>	<b>B</b>

- 1) - Some type code combinations are not possible.  
 - Please select the desired pump with the help of the selection table (preferred types) or after consultation with Bosch Rexroth.  
 - Further options are available on request.
- 2) Select a letter for each pump stage, e.g., AZPB+AZPB: BB.  
 3) Select a numerical value for each pump stage, e.g., 6.3/2.0.  
 4) Select a numerical value for each pump stage, e.g., 0101.

## Technical data

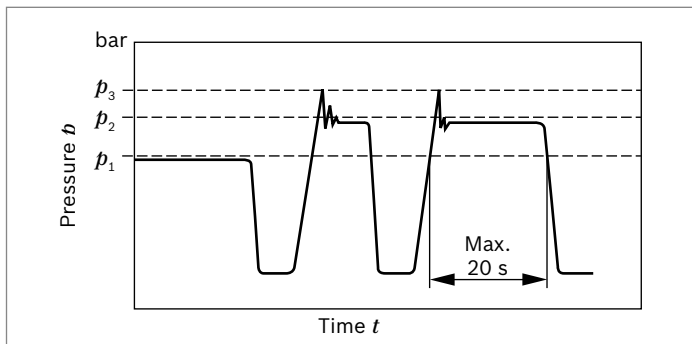
### ▼ Table of values

Size			1.0	2.0	2.5	3.1	4.0	4.5	5.0	6.3	7.1
Series							Series 3x				
Geometric displacement per revolution	$V_g$	cm <sup>3</sup>	1.0	2.0	2.5	3.15	4.0	4.5	5.0	6.3	7.1
Max. continuous pressure	$p_1$	bar	220	220	220	220	220	220	220	220	200
Max. intermittent pressure <sup>1)</sup>	$p_2$	bar	250	250	250	250	250	250	250	250	230
Max. pressure peak	$p_3$	bar	270	270	270	270	270	270	270	270	250
Pressure in suction port	Absolute	$p_e$	0.7 ... 3								
Min. rotational speed at $p_2$	$n_{min}$	rpm	750	750	750	750	750	750	750	750	750
Max. rotational speed at $p_2$	$n_{max}$	rpm	6000	5000	5000	4000	4000	4000	4000	3500	3500

### General data

Installation position	No restrictions
Type of mounting	See offer drawing
Line connections	See chapter "Dimensions – line connection"
Direction of rotation as viewed on drive shaft	Clockwise or counterclockwise; only operate the pump in the direction indicated

### ▼ Pressure definition



- $p_1$  Max. continuous pressure
- $p_2$  Max. intermittent pressure
- $p_3$  Max. pressure peak

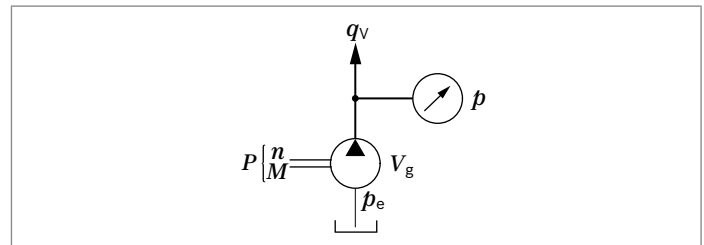
### Determining characteristics

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 [cm<sup>3</sup>]
- $\Delta p$  Differential pressure [bar] ( $\Delta p = p - p_e$ )
- $n$  Rotational speed [rpm]
- $\eta_v$  Volumetric efficiency<sup>1)</sup>
- $\eta_{hm}$  Hydraulic-mechanical efficiency<sup>2)</sup>
- $\eta_t$  Total efficiency ( $\eta_t = \eta_v \times \eta_{hm}$ )<sup>2)</sup>

- 1) Up to 280 bar possible with consultation
- 2) Parameter as a decimal, e.g., 0.9

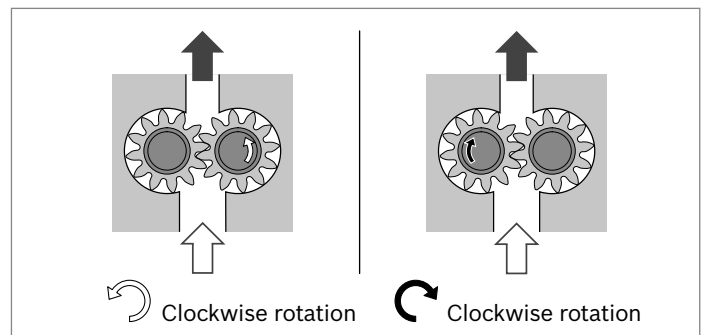


### Notice

- ▶ The chapters "Curves" and "Graphs" contain graphs for a rough calculation.
- ▶ Observe the safety requirements for the overall system.
- ▶ Please contact us regarding applications with frequent load cycles.

### ▼ Direction of rotation as viewed on drive shaft

The dimensional drawings in the chapter "Dimensions" show pumps for clockwise rotation. For counterclockwise rotation, the location of the drive shaft/suction and pressure port is different.



## Hydraulic fluid

The external gear unit is designed for operation with HLP mineral oil complying with DIN 51524 1–3. For higher loads, Bosch Rexroth recommends HLP complying with DIN 51524 Part 2 at minimum.<sup>1)</sup>

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

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

### Explanation regarding the selection of hydraulic fluid

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

### Viscosity and temperature of hydraulic fluids

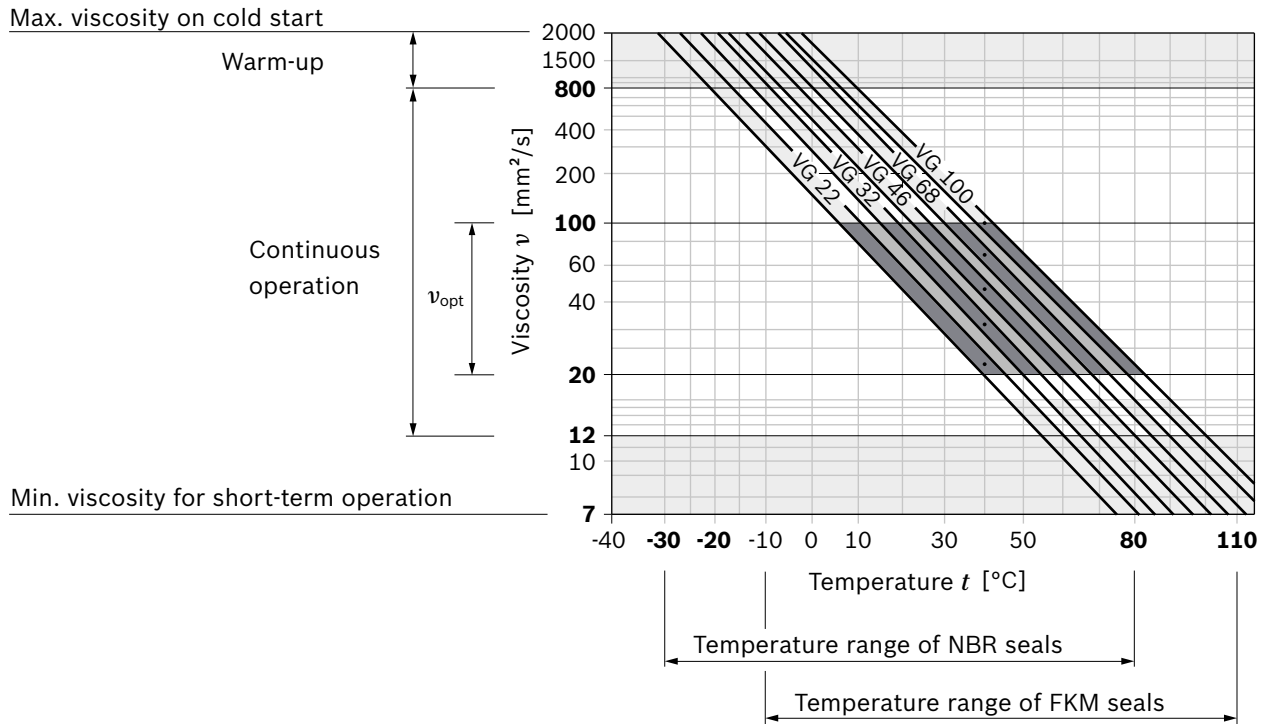
#### Viscosity range

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 = fluoroelastomer)	$t = -10 \text{ °C} \dots +110 \text{ °C}$

#### ▼ Selection diagram

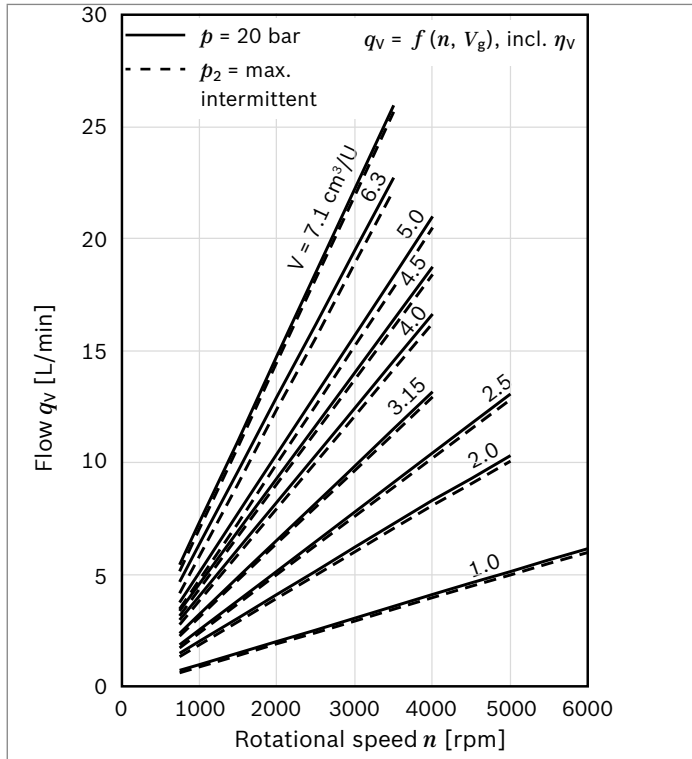


1) Other hydraulic fluids on request.

## Graphs/curves

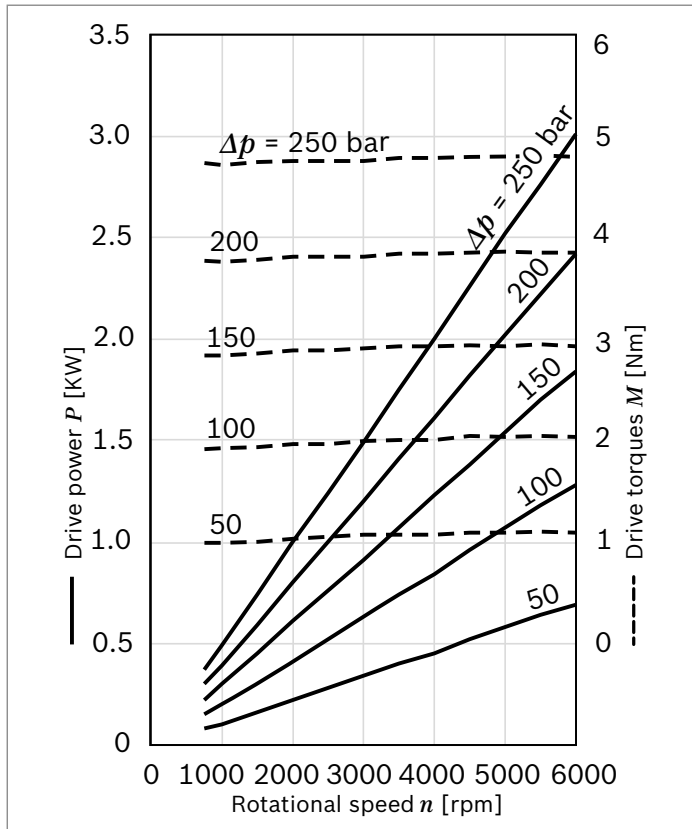
### Flow curves

#### ▼ Flow

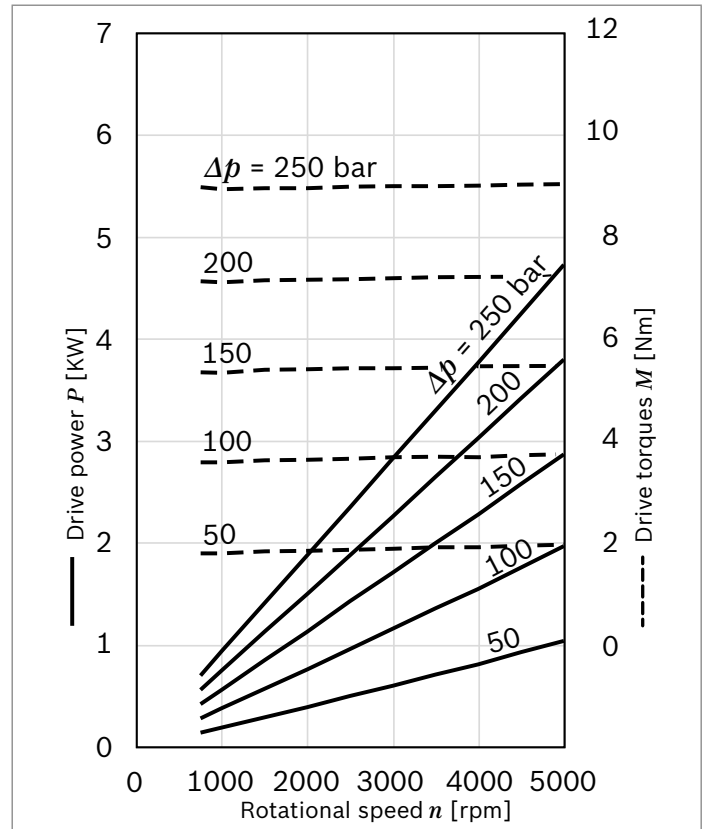


### Performance graphs

#### ▼ Size 1.0

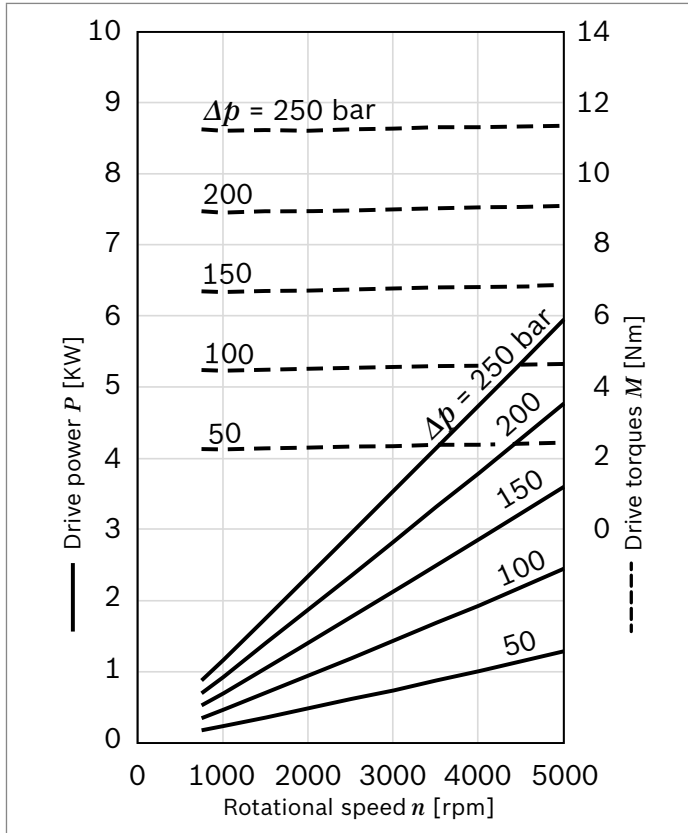


#### ▼ Size 2.0

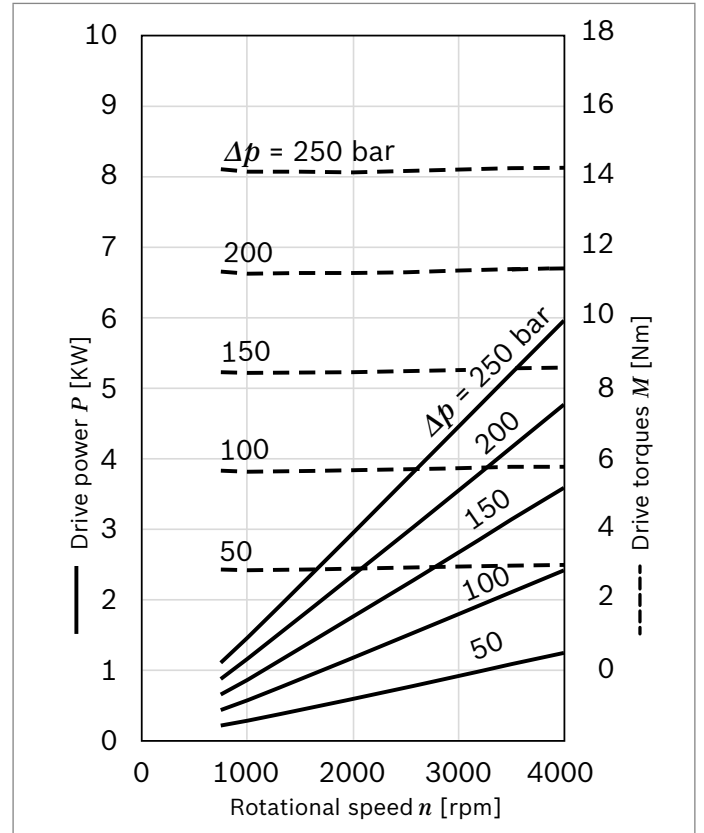




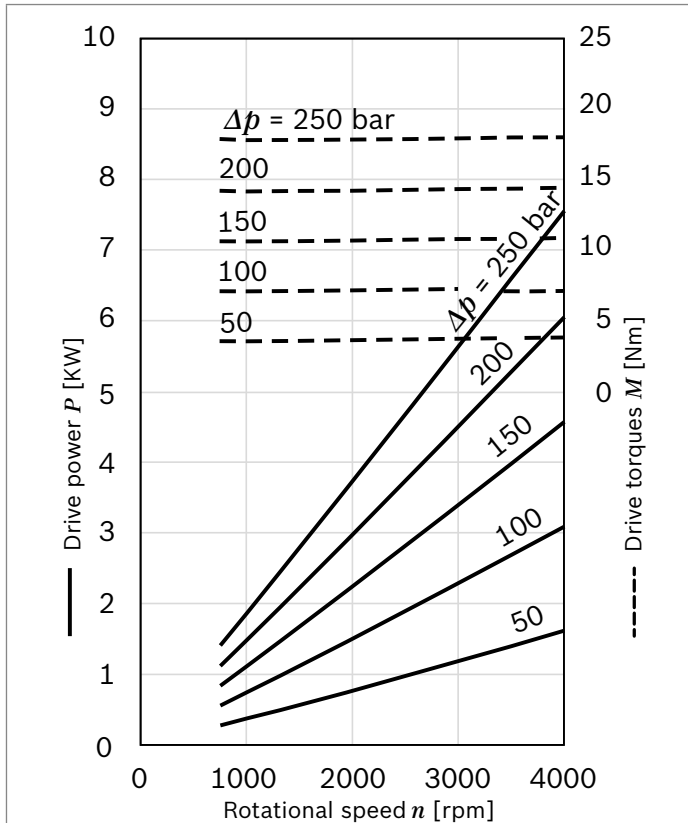
▼ **Size 2.5**



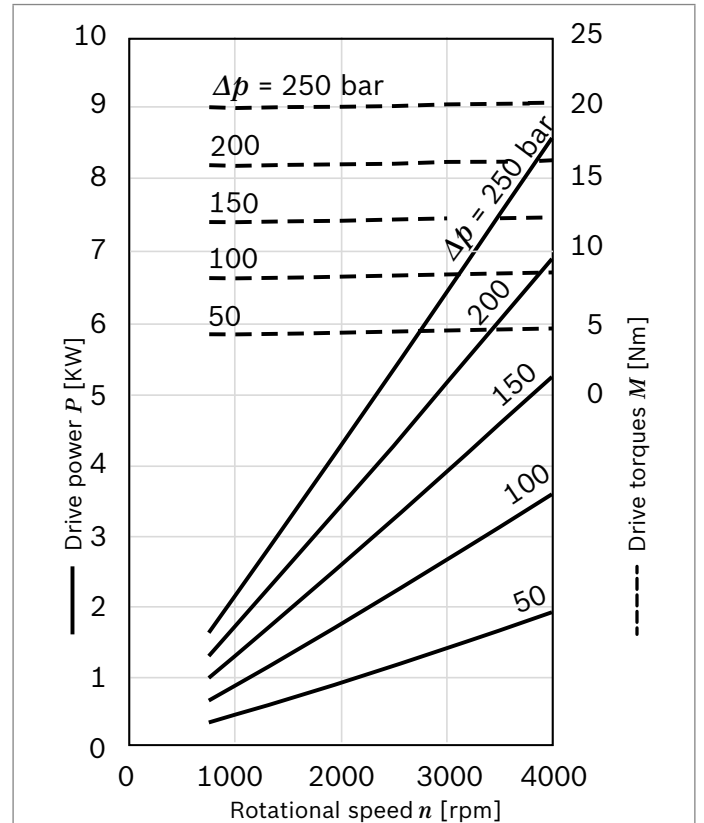
▼ **Size 3.15**



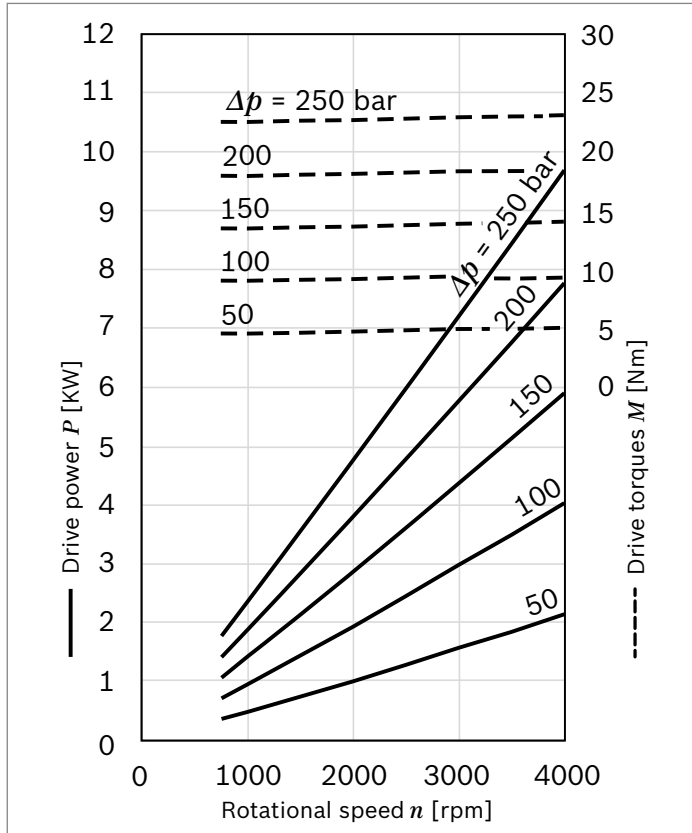
▼ **Size 4.0**



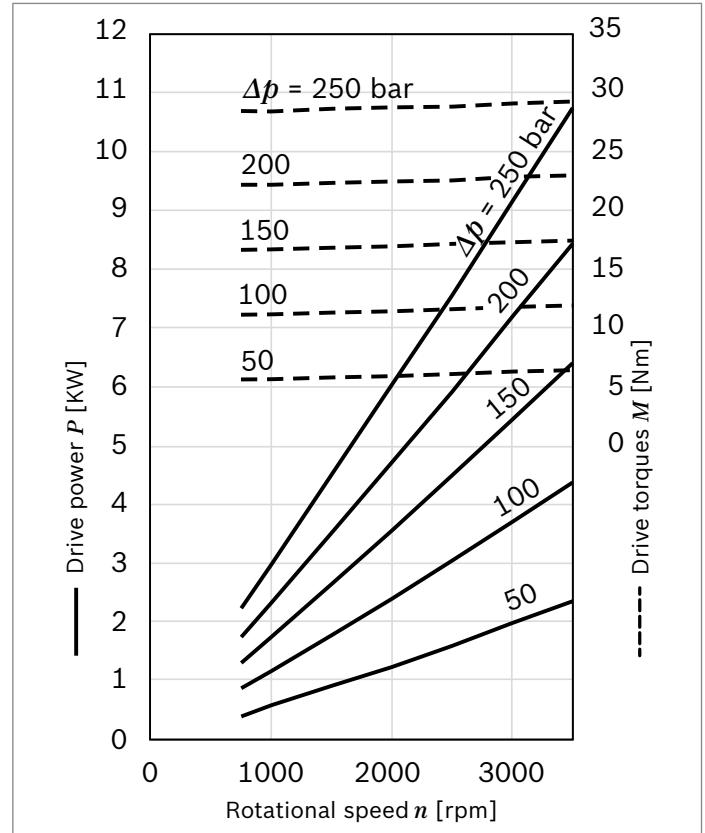
▼ **Size 4.5**



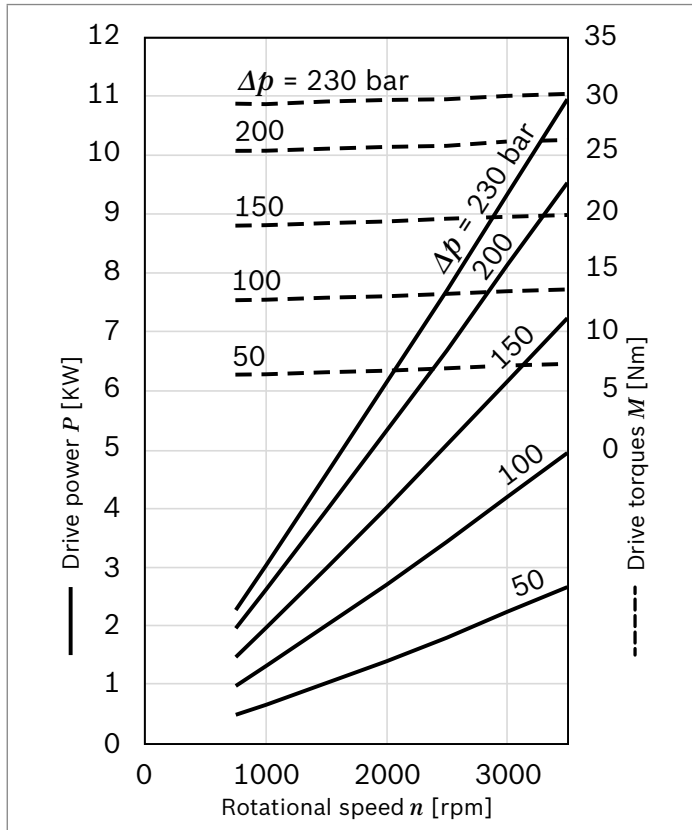
▼ **Size 5.0**



▼ **Size 6.3**



▼ **Size 7.1**



**Notice**

Curves measured at  $\nu = 32 \text{ mm}^2/\text{s}$ ,  $t = 50 \text{ }^\circ\text{C}$ .

**Noise curves**

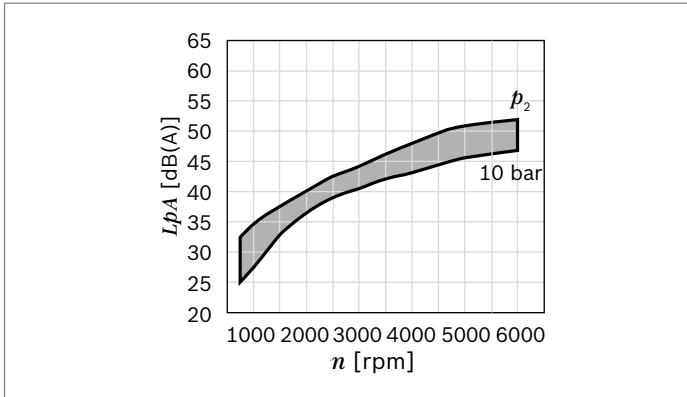
Noise levels based on rotational speed, pressure range between 10 bar and pressure value  $p_2$  (see chapter “Technical data”).

These are typical characteristics for each size. They describe the airborne sound emitted solely by the pump.

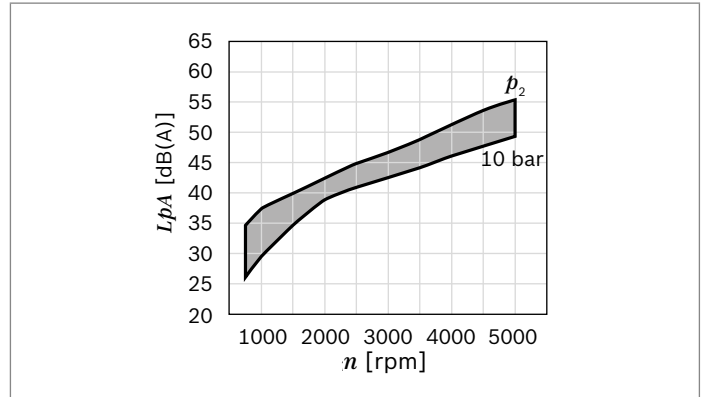
Ambient factors (installation site, piping, other system components) were not included.

The values refer to a single pump.

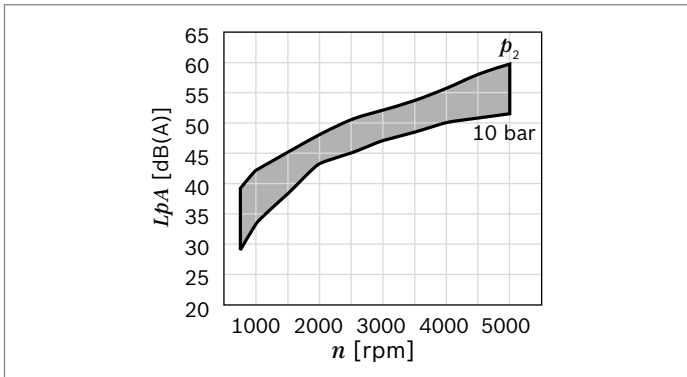
▼ **Size 1.0**



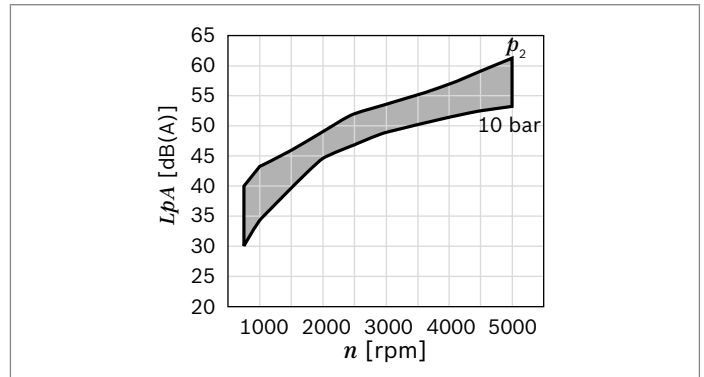
▼ **Size 2.0**



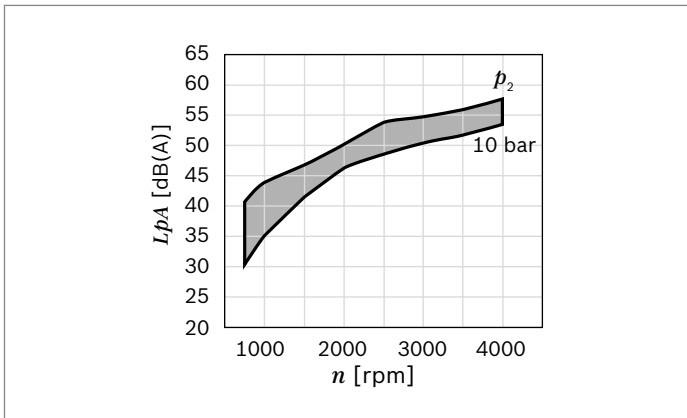
▼ **Size 2.5**



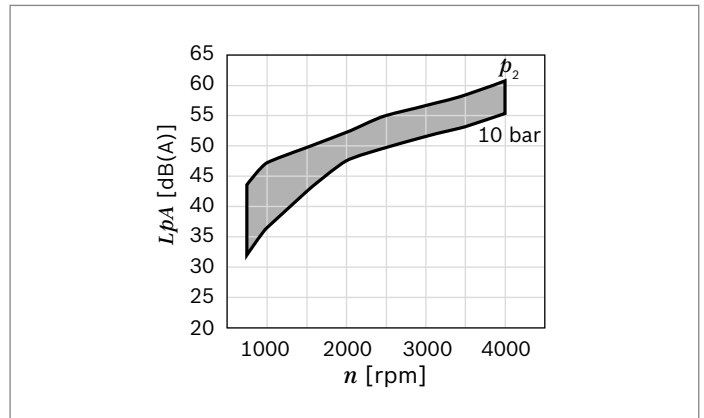
▼ **Size 3.15**



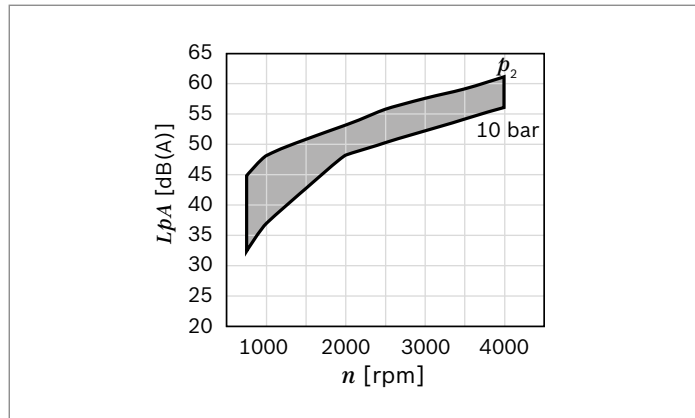
▼ **Size 4.0**



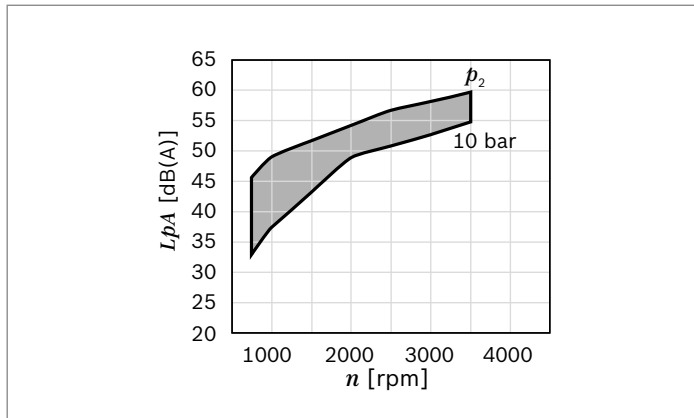
▼ **Size 4.5**



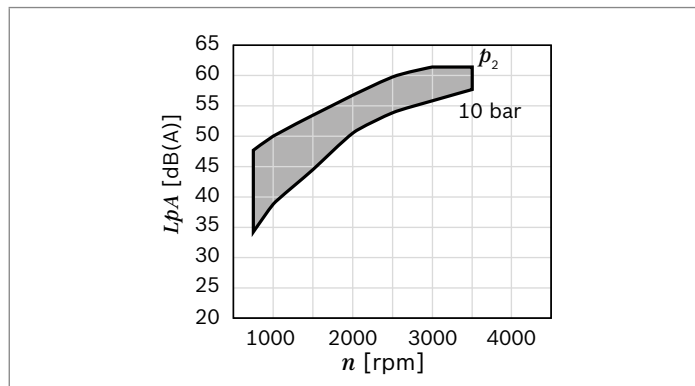
▼ **Size 5.0**



▼ **Size 6.3**



▼ **Size 7.1**



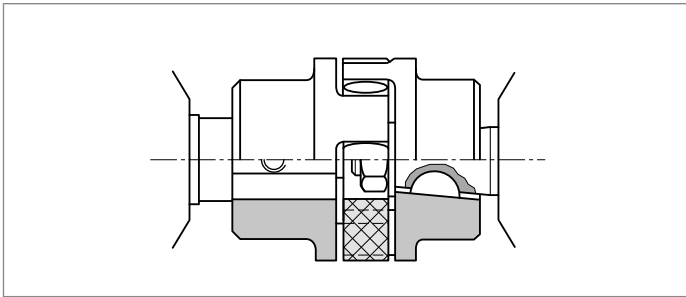
**Notice**

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

## Drive

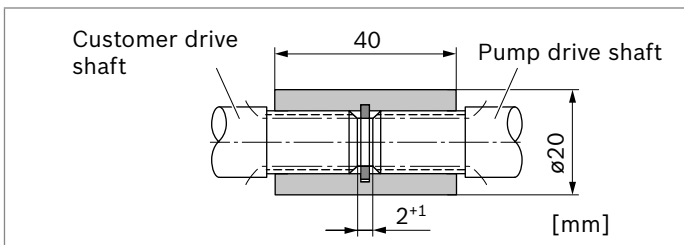
### 1. Elastic clutch

- ▶ The clutch should not transfer any radial or axial forces to the pump.
- ▶ The radial runout deviation from the shaft to the spigot should not exceed 0.2 mm.
- ▶ See the clutch manufacturer's assembly instructions for shaft misalignment tolerances.



### 2. Clutch sleeve

- ▶ To be used on SAE splined shaft profile
- ▶ Attention: Make sure no radial or axial forces act on the pump drive shaft or clutch sleeve. The clutch sleeve should freely move in the axial direction.
- ▶ The distance between the pump drive shaft and customer drive shaft should be  $2^{+1}$  mm.
- ▶ Reserve installation space for the snap ring.
- ▶ Oil-bath or oil-mist lubrication required

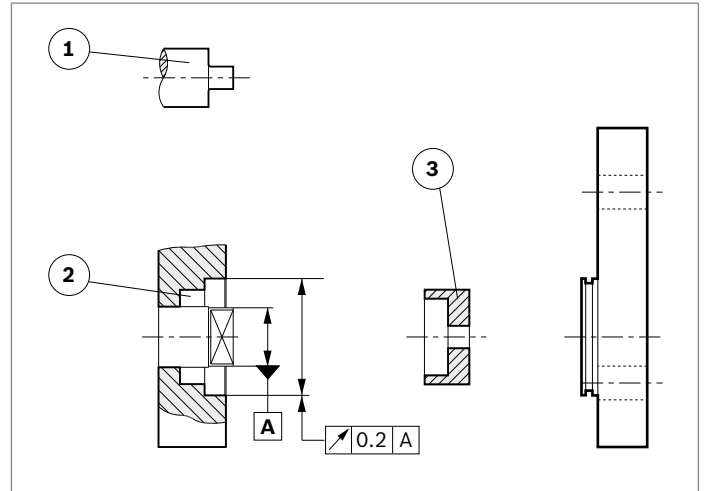


### 3. Tang drive coupling

- ▶ For attaching the pump directly to an electric motor or combustion engine, gearbox, etc.
- ▶ Pump shaft with special tang drive coupling and driver (3)
- ▶ No shaft seal
- ▶ Drive-side installation and sealing according to the following recommendations and dimensions
- ▶ Customer drive shaft (1)
  - DIN 17210 case-hardened steel, e.g., 20 MnCrS 5 case-hardened 1.0 deep; HRA  $83 \pm 2$
  - Seal ring running surface ground without rifling $R_{\max} \leq 4 \mu\text{m}$

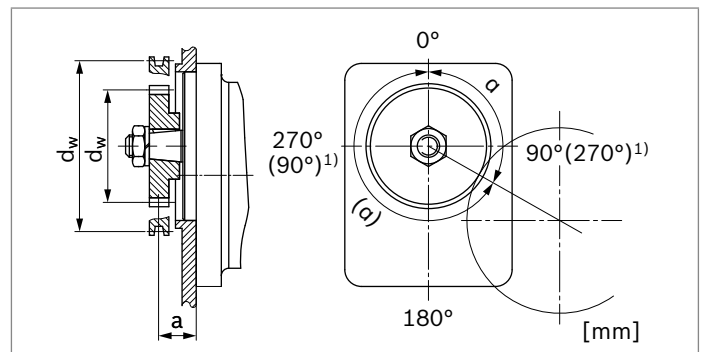
### ▶ Customer radial shaft seal ring (2)

- Provide with rubber cover (see DIN 3760, type AS, or double-lipped ring)
- Provide installation edge with  $15^\circ$  slant or install shaft seal with protection sleeve



### 4. V-belts and straight gear wheels or helical gear drives without outboard bearing

For V-belt or gear wheel drives, please contact us with the application and mounting conditions (dimensions  $a$ ,  $d_m$ ,  $d_w$  and angle  $\alpha$ ). For helical gear drives, helix angle  $\beta$  is also required.



1) Values in parentheses refer to counterclockwise rotation.

- 14 **AZPB** | External gear pump  
Max. transmissible drive torques

## Max. transmissible drive torques

### Tapered shaft

Drive shaft		Front cover	$M_{\max}$	Size	$p_{\max}$
Code	Designation	Code	Nm		bar
C	1:5	P	26	1 ... 5	250
				6.3	190
				7.1	170
H	1:8	O	30	1 ... 5	250
				6.3	190
				7.1	170

### Tang drive

Drive shaft		Front cover	$M_{\max}$	Size	$p_{\max}$
Code	Designation	Code	Nm		bar
N		M, Y	25	1 ... 5	250
				6.3	190
				7.1	170

### Parallel keyed shafts

Drive shaft		Front cover	$M_{\max}$	Size	$p_{\max}$
Code	Designation	Code	Nm		bar
Q	SAE J744 13-1	R	35	1 ... 5	250
				6.3	190
				7.1	170

### Splined shafts

Drive shaft		Front cover	$M_{\max}$	Size	$p_{\max}$
Code	Designation	Code	Nm		bar
R	SAE J744 13-4 (A-A)	R	55	1 ... 5	250
				6.3	190
				7.1	170

## Multiple gear pumps

Gear pumps are well-suited to multiple arrangements, with the drive shaft of the first pump stage is extended to a second and possibly third pump stage. The shafts for each pump section are typically connected via a driver.

The individual pump stages are usually hydraulically isolated and have separate suction ports. A joint suction port or separate suction ports that are hydraulically connected is available on request.

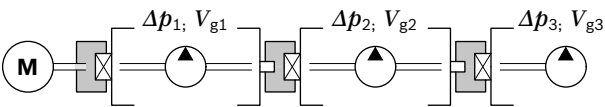
For the configuration of multiple pumps, Bosch Rexroth recommends arranging the pump stage with the largest displacement on the drive side.

### Notice

- ▶ Attention: The parameters of each pump generally apply, however certain restrictions need to be observed:
- ▶ Max. rotational speed: This is determined by the largest pump stage used.
- ▶ Pressures: These are limited by the max. transmissible torques from drive shaft, through drive and driver.

### Compounding of drive torques

With multiple pumps, note that the drive torques of the subsequent stages compound according to the following formula:



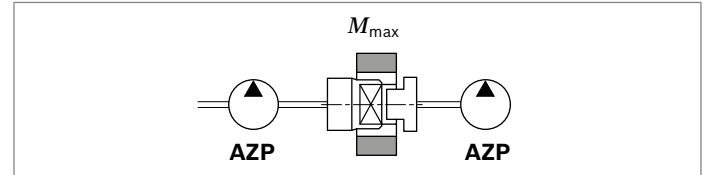
$$\frac{\Delta p_1 \times V_{g1} + \Delta p_2 \times V_{g2} + \Delta p_3 \times V_{g3}}{18 \times \pi} \leq M_{\max}^{1)}$$

$\Delta p$  [bar]  
 $V_g$  [cm<sup>3</sup>]

This may result in pressure limitations in each pump stage.

### Standard through drive (tang drive coupling)

For Platform B pumps, the driver for the next pump stage can support loads up to  $M_{\max} = 25$  Nm. This may result in pressure limitations for subsequent pump stages. Subsequent pumps of a smaller series determine the max. transmissible torque.

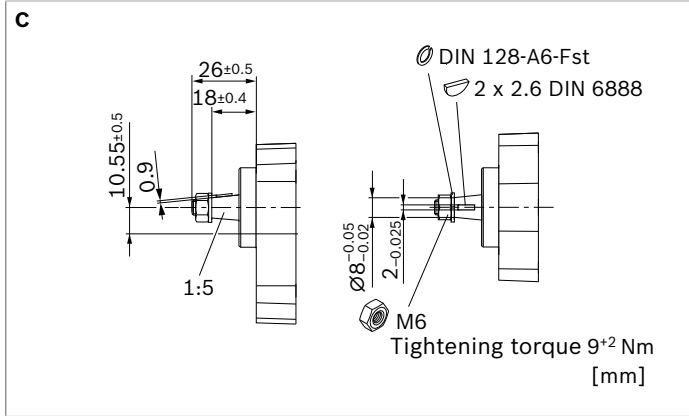


Subsequent pump		$M_{\max}$ [Nm] <sup>1)</sup>
Platform B	AZPB	25

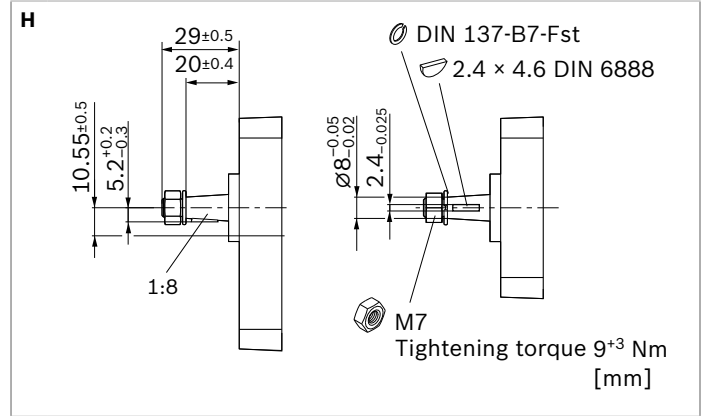
1) For  $M_{\max}$ , see chapter "Max. transmissible drive torques".

**Dimensions – drive shaft**<sup>1)</sup>

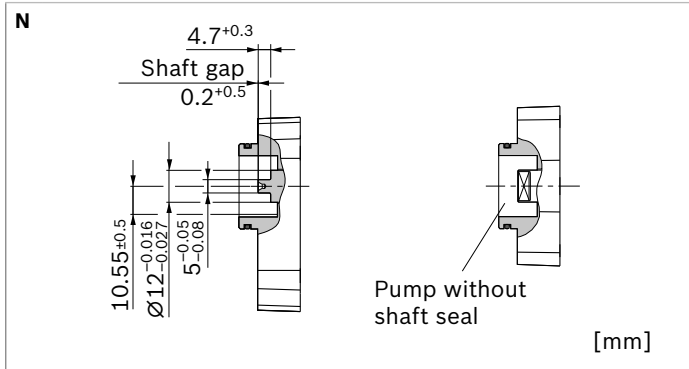
▼ **1:5 tapered shaft**



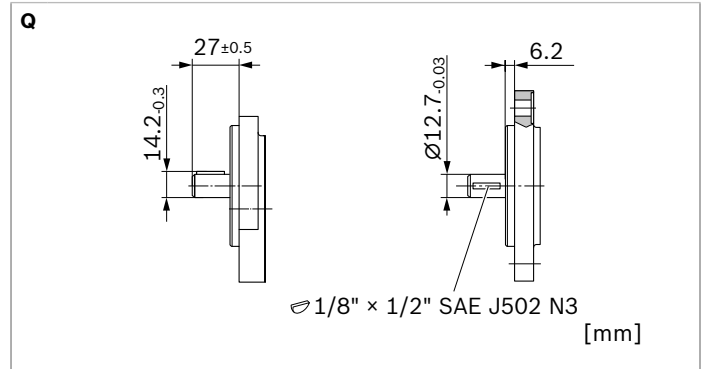
▼ **1:8 tapered shaft**



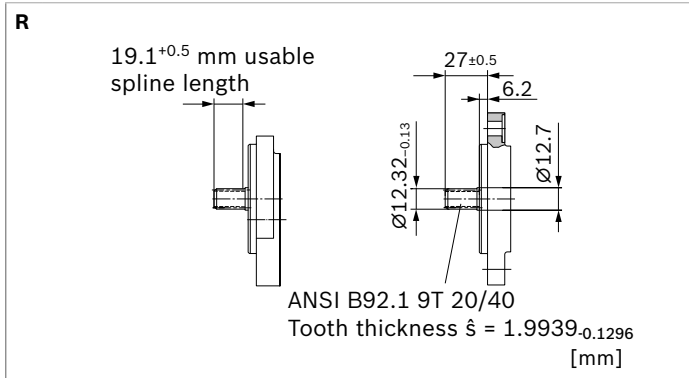
▼ **Tang drive**



▼ **SAE J744 13-1 cylindrical**



▼ **SAE J744 13-4 (A-A) splined shaft**

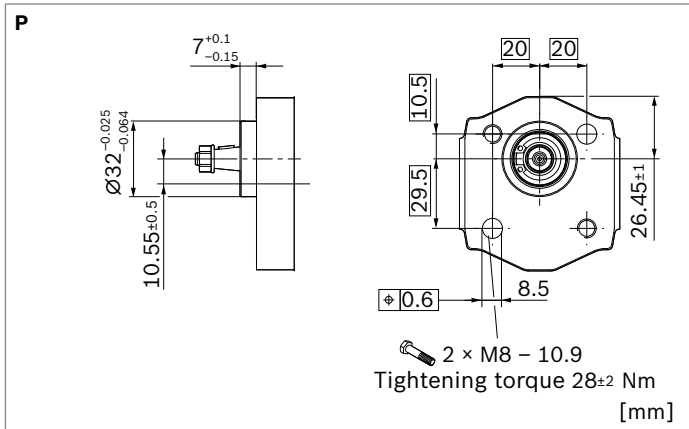


1) For other version, see offer drawing.

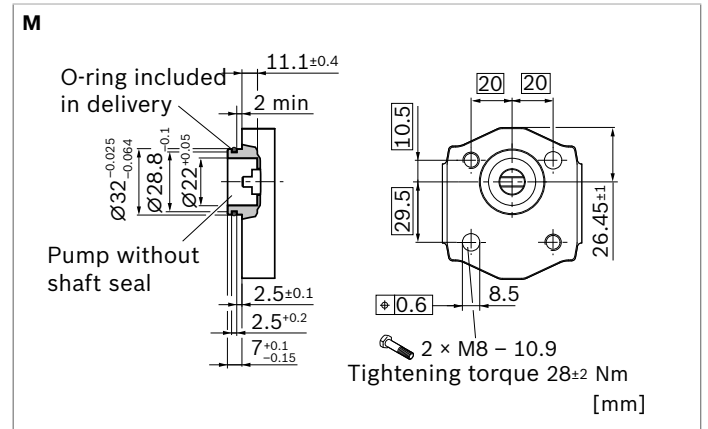


**Dimensions – front cover**<sup>1)</sup>

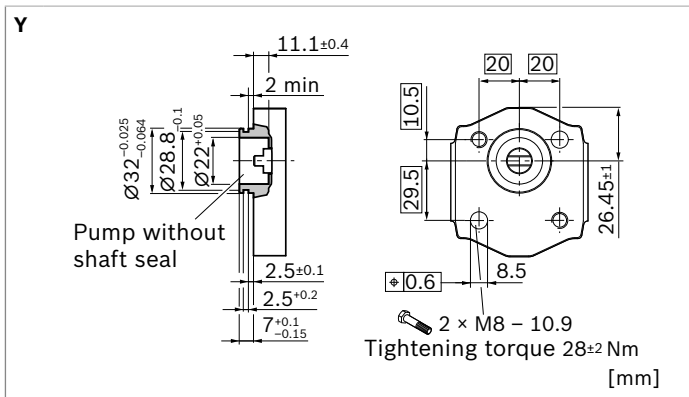
▼ **2-hole mounting  $\varnothing 32$  mm**



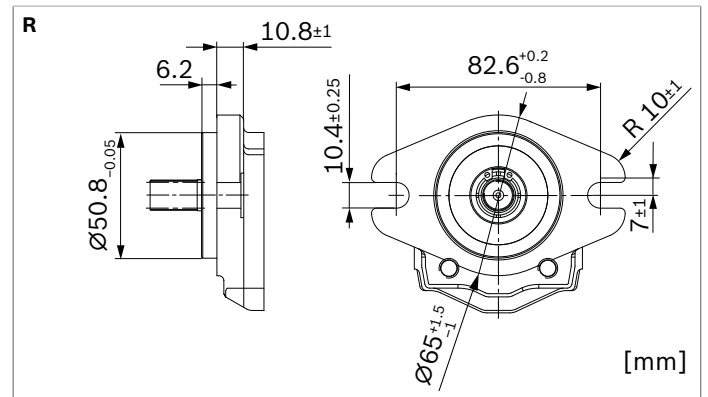
▼ **2-hole mounting  $\varnothing 32$  mm with O-ring**



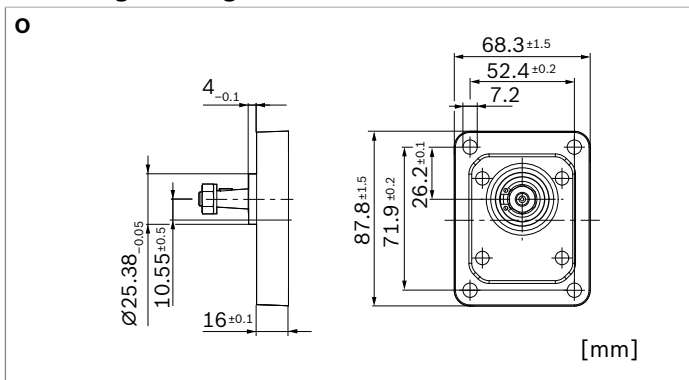
▼ **2-hole mounting  $\varnothing 32$  mm with O-ring, for attachment to Series F**



▼ **SAE J744 50-2 (A-A)**



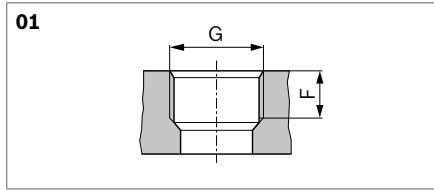
▼ **Rectangular flange  $\varnothing 25.38$  mm**



1) For other version, see offer drawing.

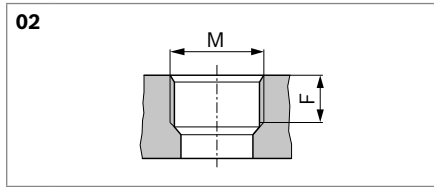
## Dimensions – line connection

### ▼ ISO 228/1 pipe thread



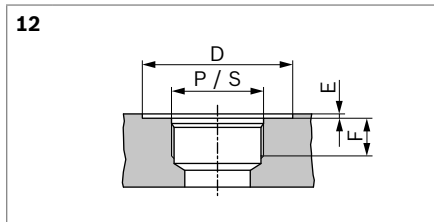
Size	Pressure side		Suction side	
	P	F mm	S	F mm
1.0 ... 3.1	G3/8	13	G3/8	13
4.0 ... 7.1			G1/2	14

### ▼ DIN 3852-T1 metric thread



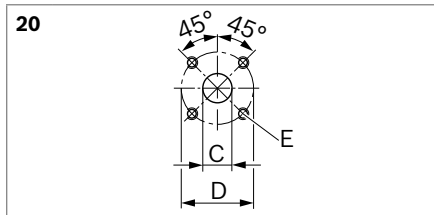
Size	Pressure side		Suction side	
	P	F mm	S	F mm
1.0 ... 3.1	M14 × 1.5	13	M18 × 1.5	13
4.0 ... 7.1			M22 × 1.5	14

### ▼ SAE J1926-1 thread O-ring Boss



Size	Pressure side			Suction side				
	P	D mm	E mm	F mm	S	D mm	E mm	F mm
1.0	9/16-18 UNF-2B	25	0.5	13	9/16-18 UNF-2B	25	0.5	13
2.0 ... 5.0					3/4-16 UNF-2B	30	0.5	15
6.3 ... 7.1	3/4-16 UNF-2B	30	0.5	15	7/8-14 UN-2B	34	0.5	17

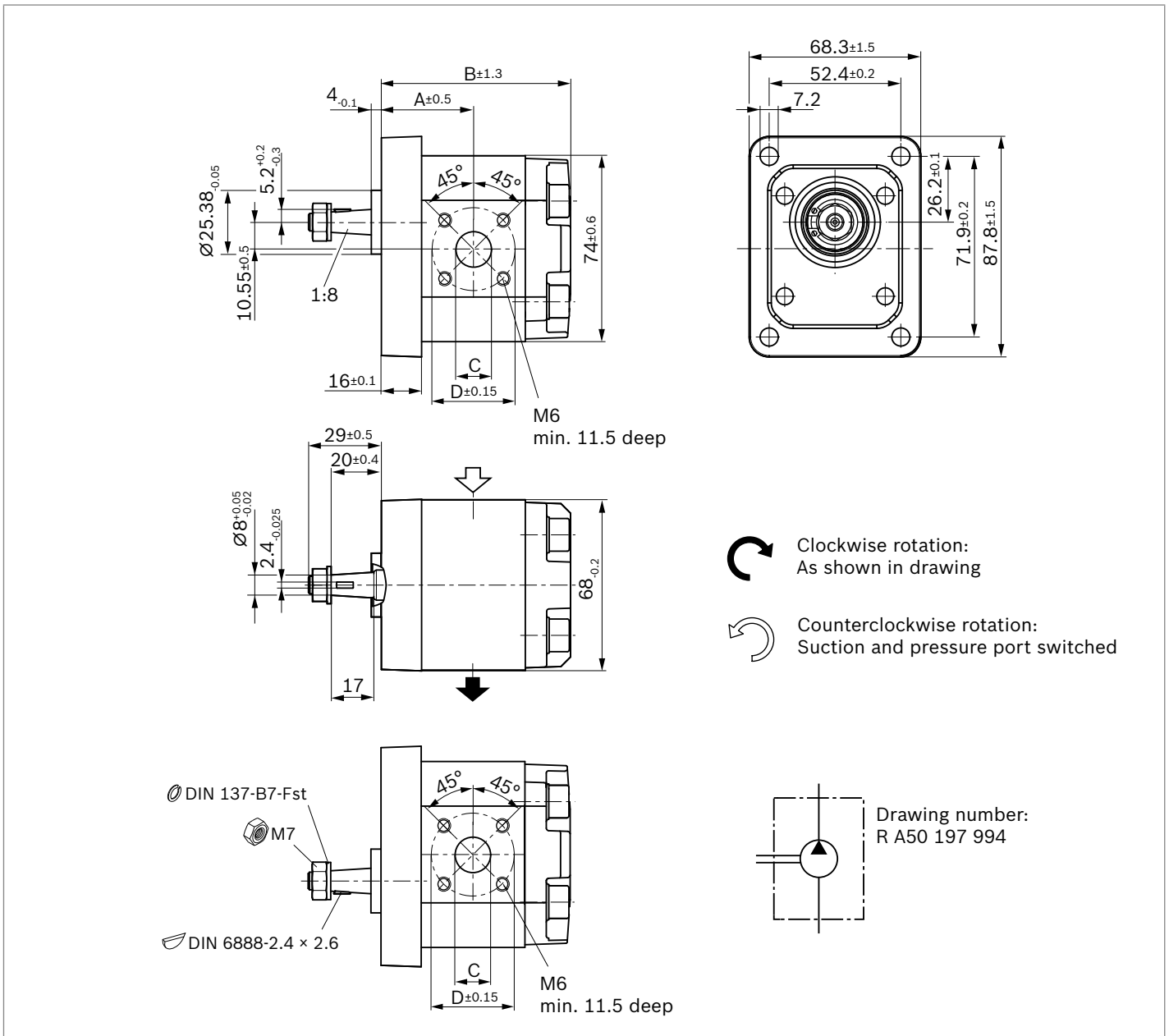
### ▼ Square flange



Size	Pressure side			Suction side		
	C mm	D mm	E	C mm	D mm	E
2.0 ... 2.5	12	30	M6; 11.5 deep	12	30	M6; 11.5 deep
3.1 ... 7.1	15	35		15	35	

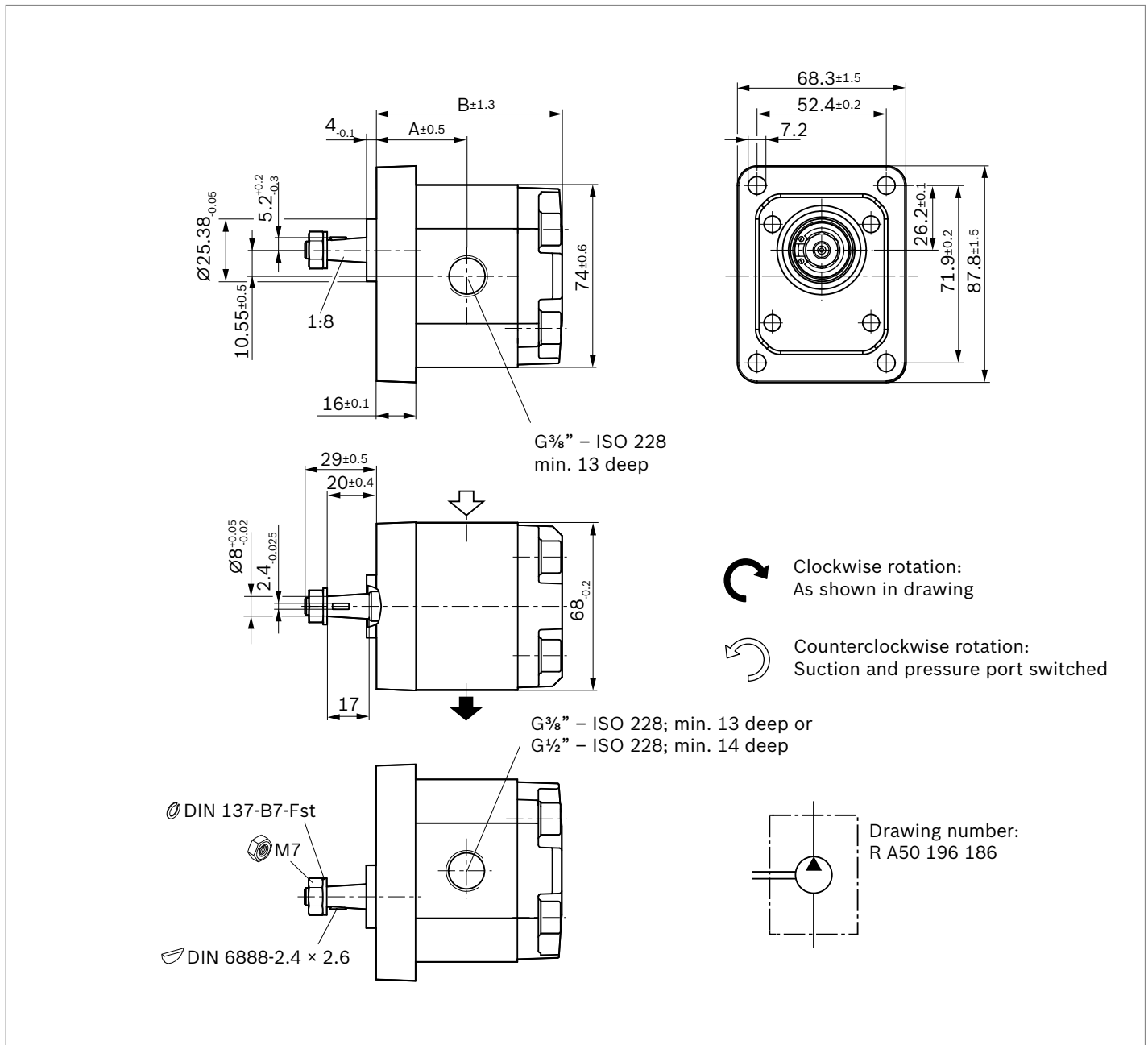
### Dimensions – preferred series

▼ **1:8 tapered shaft with square flange**  
**AZPB-32- ... HO20MB**



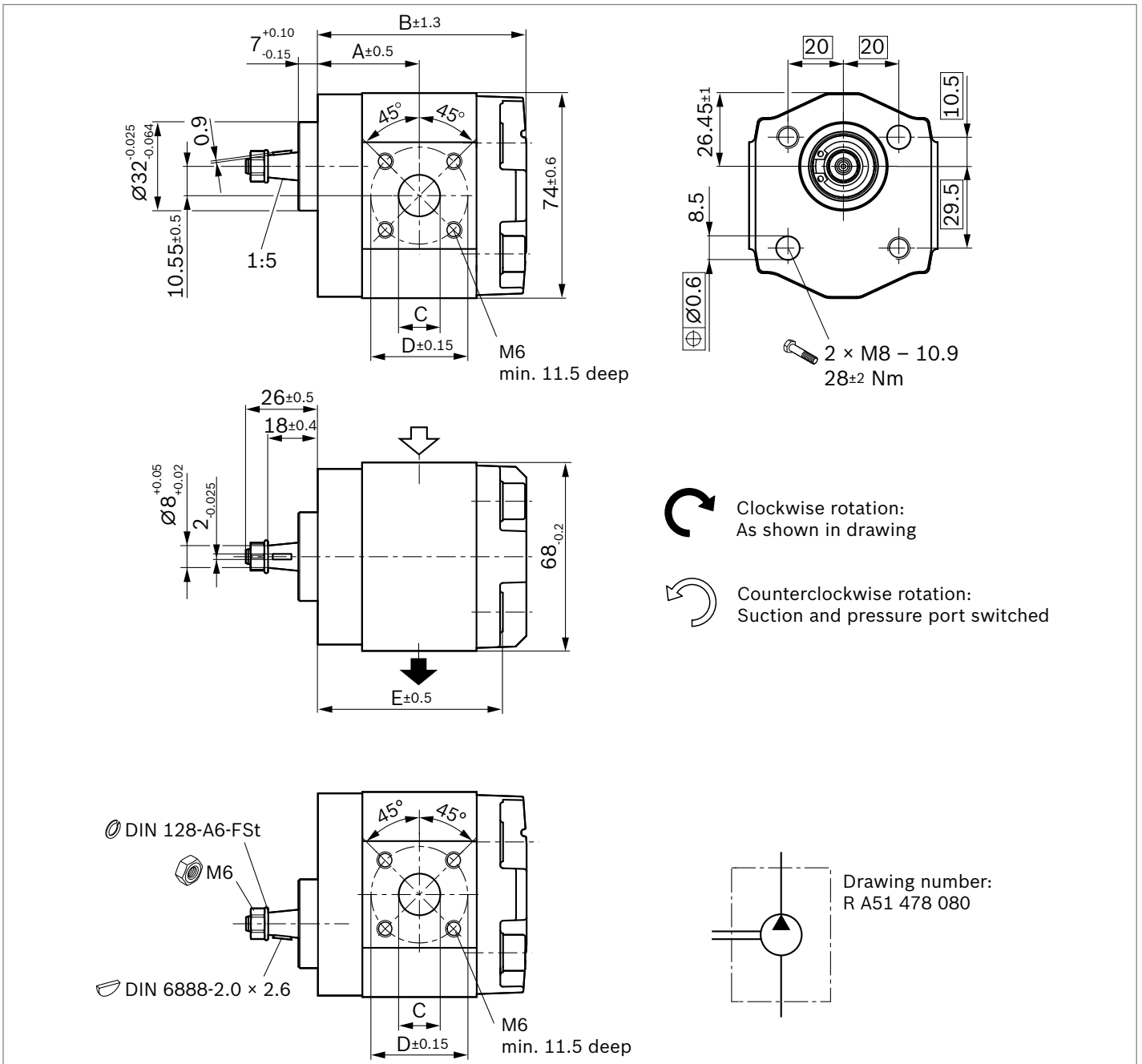
Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			
		Counterclockwise	Clockwise			A	B	C	D
2.0	0510120326	0510120028	0510120028	250	5000	32.8	67.9	12	30
2.5	0510120327	0510120029	0510120029	250	5000	33.8	69.8	12	30
3.15	0510120328	0510120030	0510120030	250	4000	35.0	72.3	15	35
4.0	0510120329	0510120031	0510120031	250	4000	36.6	75.5	15	35
4.5	0510120330	0510120032	0510120032	250	4000	37.6	77.4	15	35
5.0	0510120331	0510120033	0510120033	250	4000	38.6	79.5	15	35
6.3	0510120332	0510120034	0510120034	250	3500	41.0	84.2	15	35
7.1	0510120333	0510120035	0510120035	230	3500	42.5	87.3	15	35

▼ **1:8 tapered shaft with rectangular flange**  
**AZPB-32- ... HO01MB**



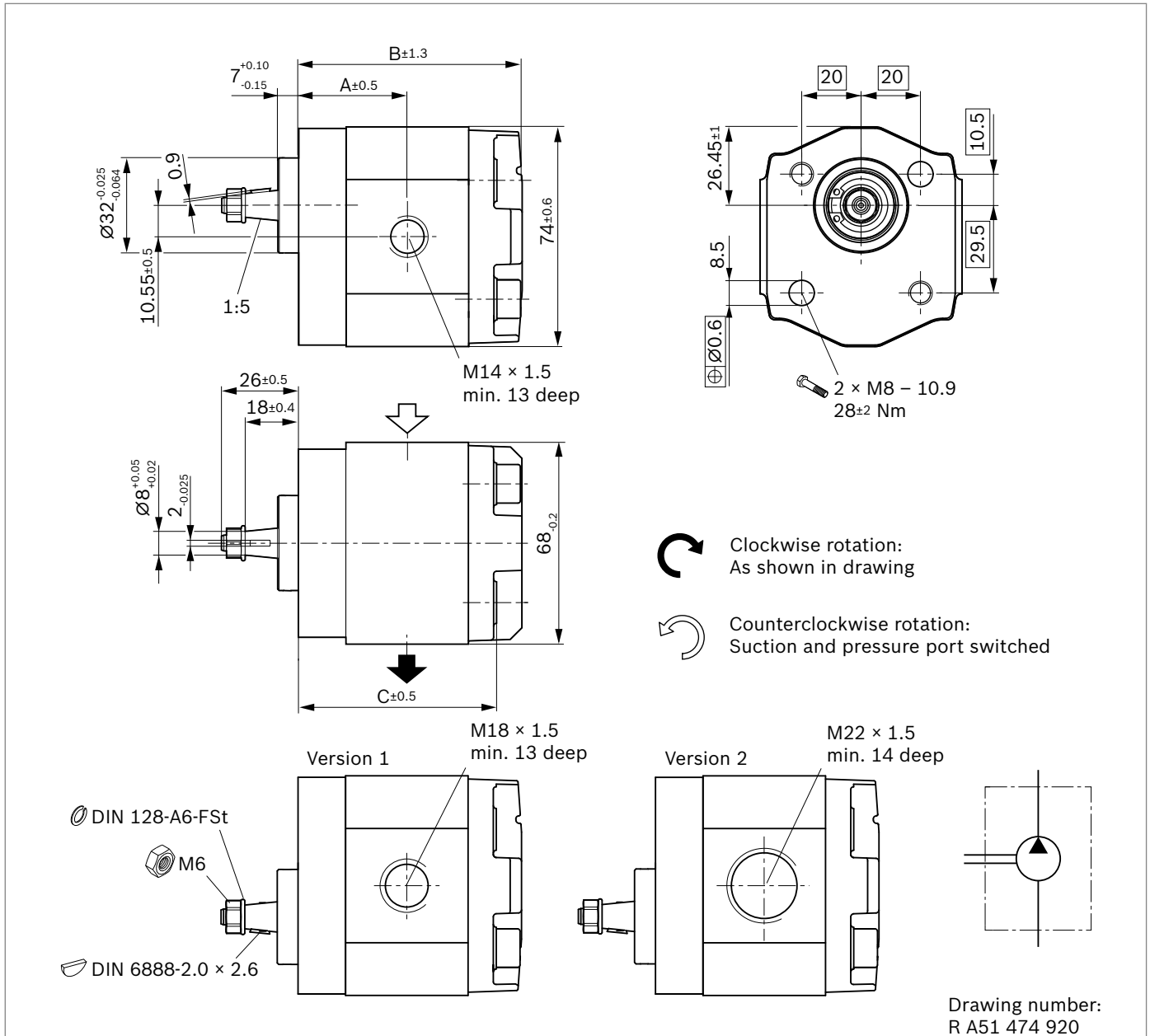
Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions		Version
		Counterclockwise	Clockwise			A	B	
1.0	0510020303	0510020003	0510020003	250	6000	30.9	64.1	3/8
2.0	0510120318	0510120020	0510120020	250	5000	32.8	67.9	3/8
2.5	0510120319	0510120021	0510120021	250	5000	33.8	69.8	3/8
3.15	0510120320	0510120022	0510120022	250	4000	35.0	72.3	3/8
4.0	0510120321	0510120023	0510120023	250	4000	36.6	75.5	1/2
4.5	0510120322	0510120024	0510120024	250	4000	37.6	77.4	1/2
5.0	0510120323	0510120025	0510120025	250	4000	38.6	79.5	1/2
6.3	0510120324	0510120026	0510120026	250	3500	41.0	84.2	1/2
7.1	0510120325	0510120027	0510120027	230	3500	42.5	87.3	1/2

▼ **1:5 tapered shaft with 2-hole mounting and square flange**  
**AZPB-32- ... CP20MB**



Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions				
		Counterclockwise	Clockwise			A	B	C	D	E
2.0	0510110332	0510110025	0510110025	250	5000	32.8	67.9	12	30	59.0
2.5	0510110333	0510110026	0510110026	250	5000	33.8	69.8	12	30	60.9
3.15	0510112325	0510112019	0510112019	250	4000	35.0	72.3	15	35	63.4
4.0	0510114336	0510114030	0510114030	250	4000	36.6	75.5	15	35	66.6
4.5	0510114337	0510114031	0510114031	250	4000	37.6	77.4	15	35	68.5
5.0	0510114338	0510114032	0510114032	250	4000	38.6	79.5	15	35	70.6
6.3	0510122324	0510122020	0510122020	250	3500	41.0	84.2	15	35	75.3
7.1	0510122325	0510122021	0510122021	230	3500	42.5	87.3	15	35	78.4

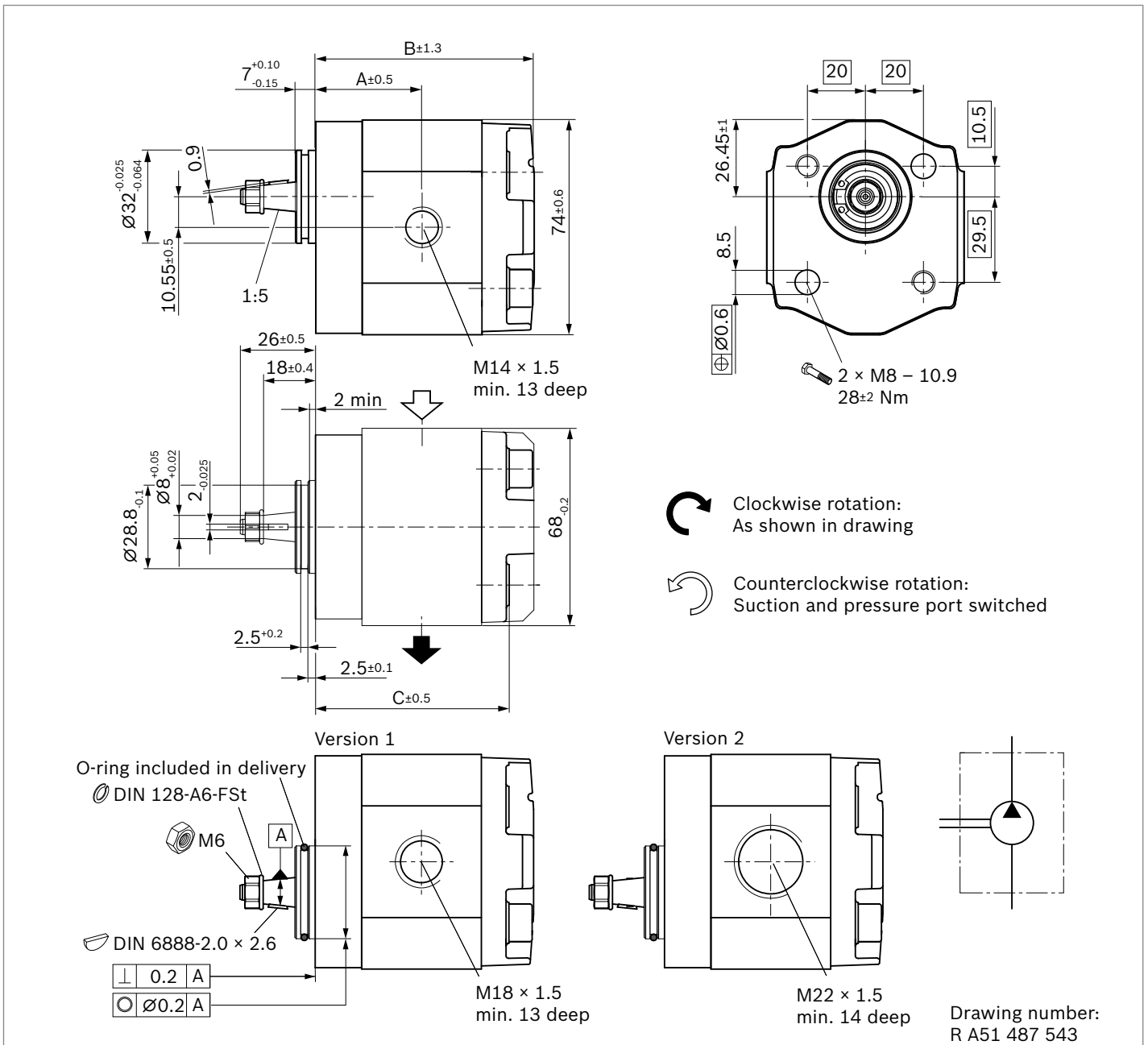
▼ **1:5 tapered shaft with 2-hole mounting and metric thread**  
**AZPB-32- ... CP02MB/CP02KB<sup>1)</sup>**



Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			Version
		Counterclockwise	Clockwise			A	B	C	
1.0	0510010313	0510010008	0510010008	250	6000	30.9	64.1	55.2	1
2.0	0510110324	0510110017	0510110017	250	5000	32.8	67.9	59.0	1
2.5	0510110325	0510110018	0510110018	250	5000	33.8	69.8	60.9	1
3.15		0510112015 <sup>1)</sup>	0510112015 <sup>1)</sup>	250	4000	35.0	72.3	63.4	1
3.15	0510112321	0510112014	0510112014	250	4000	35.0	72.3	63.4	1
4.0	0510114324	0510114018	0510114018	250	4000	36.6	75.5	66.6	2
4.5	0510114325	0510114019	0510114019	250	4000	37.6	77.4	68.5	2
5.0	0510114326	0510114020	0510114020	250	4000	38.6	79.5	70.6	2
6.3	0510122316	0510122012	0510122012	250	3500	41.0	84.2	75.3	2
7.1	0510122317	0510122013	0510122013	230	3500	42.5	87.3	78.4	2

<sup>1)</sup> Version with NBR, FKM shaft seal  
Bosch Rexroth AG, RE 10088/01.2019

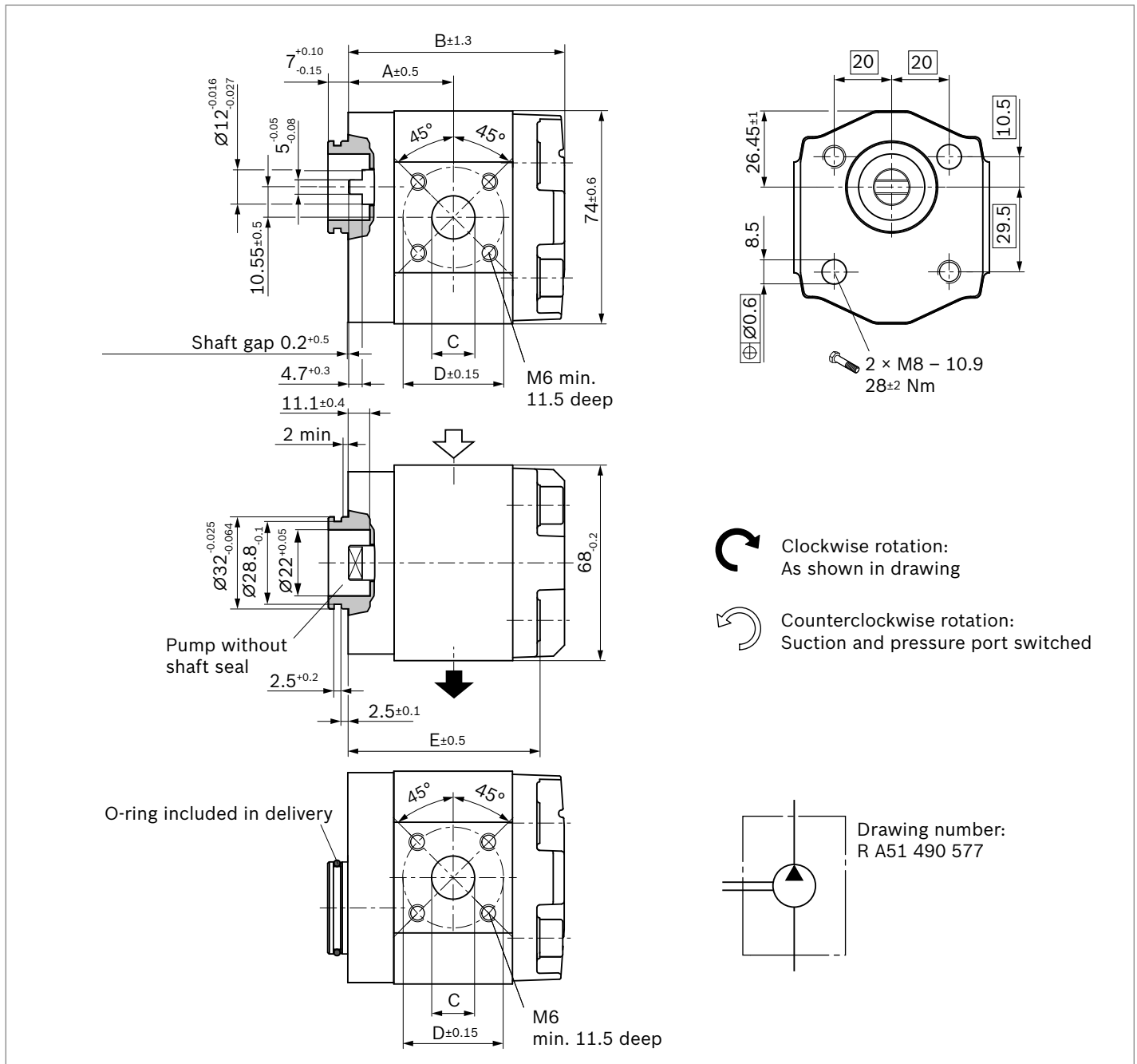
▼ **1:5 tapered shaft with 2-hole mounting, metric thread and O-ring groove**  
**AZPB-32- ... CP02MB-S0177**



Drawing number:  
R A51 487 543

Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			Version
		Counterclockwise	Clockwise			A	B	C	
1.0	0510010315	0510010010	0510010010	250	6000	30.9	64.1	55.2	1
2.0	0510110328	0510010022	0510010022	250	5000	32.8	67.9	59.0	1
2.5	0510110329	0510010023	0510010023	250	5000	33.8	69.8	60.9	1
3.15	0510112323	0510112018	0510112018	250	4000	35.0	72.3	63.4	1
4.0	0510114330	0510114025	0510114025	250	4000	36.6	75.5	66.6	2
4.5	0510114331	0510114026	0510114026	250	4000	37.6	77.4	68.5	2
5.0	0510114332	0510114027	0510114027	250	4000	38.6	79.5	70.6	2
6.3	0510122320	0510122016	0510122016	250	3500	41.0	84.2	75.3	2
7.1	0510122321	0510122017	0510122017	230	3500	42.5	87.3	78.4	2

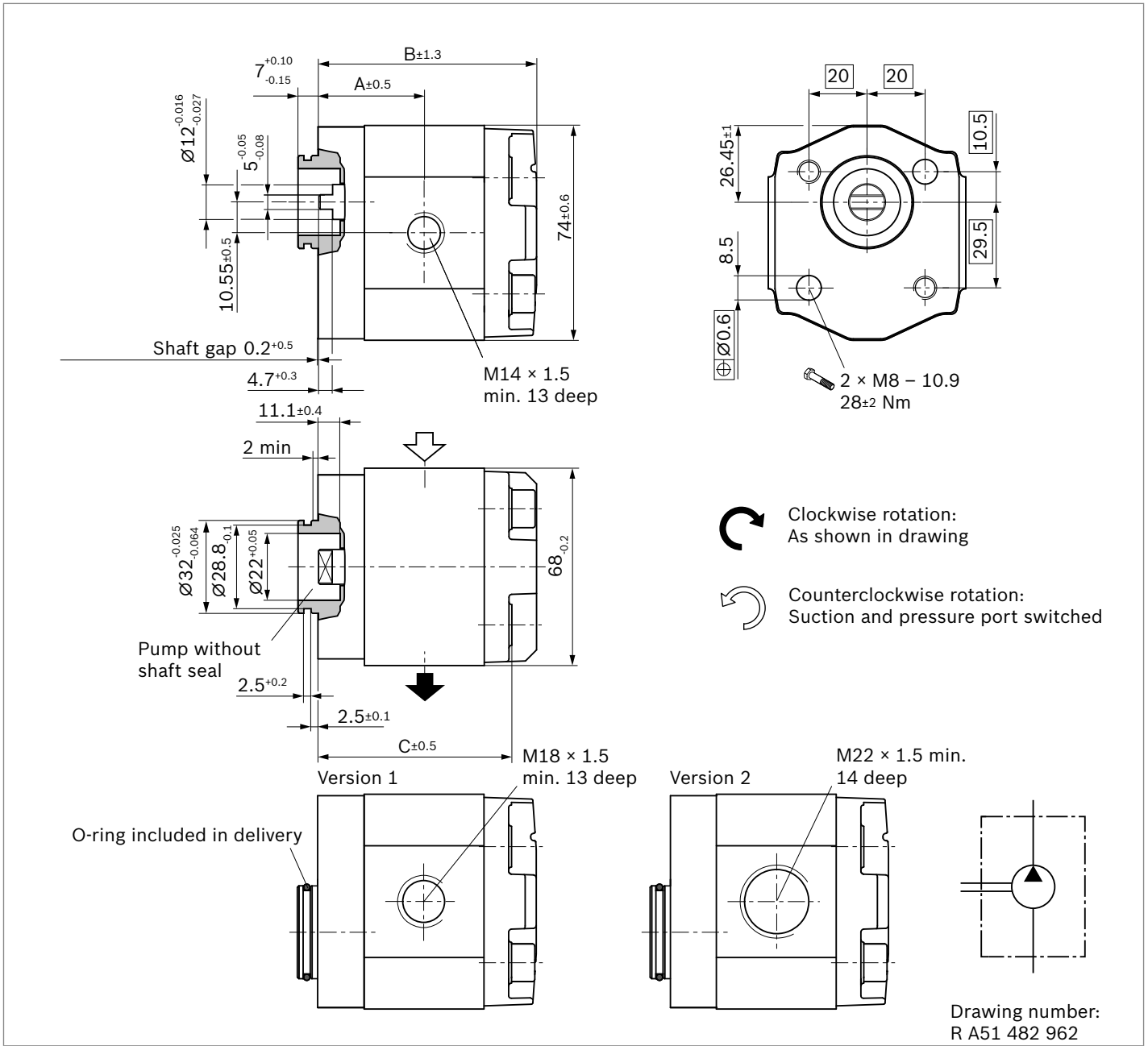
▼ **Tang drive with 2-hole mounting and square flange**  
**AZPB-32- ... NM20MB**



Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions				
		Counterclockwise	Clockwise			A	B	C	D	E
2.0	0510110334	0510110027	0510110027	250	5000	32.8	67.9	12	30	59.0
2.5	0510110335	0510110028	0510110028	250	5000	33.8	69.8	12	30	60.9
3.15	0510112326	0510112020	0510112020	250	4000	35.0	72.3	15	35	63.4
4.0	0510114339	0510114033	0510114033	250	4000	36.6	75.5	15	35	66.6
4.5	0510114340	0510114034	0510114034	250	4000	37.6	77.4	15	35	68.5
5.0	0510114341	0510114035	0510114035	250	4000	38.6	79.5	15	35	70.6
6.3	0510122326	0510122022	0510122022	250	3500	41.0	84.2	15	35	75.3
7.1	0510122327	0510122023	0510122023	230	3500	42.5	87.3	15	35	78.4

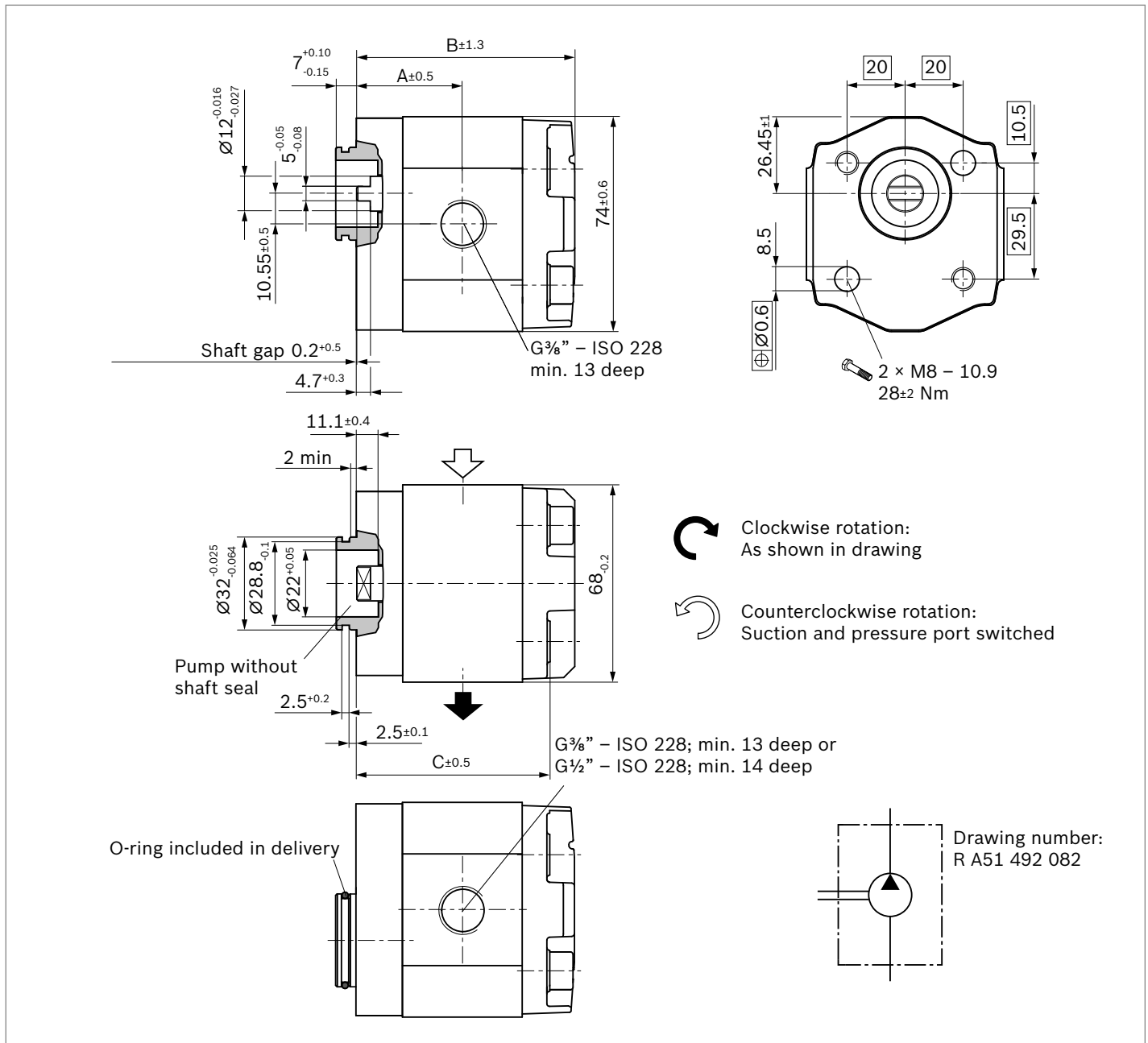


▼ Tang drive with 2-hole mounting and metric thread  
**AZPB-32- ... NM02MB**



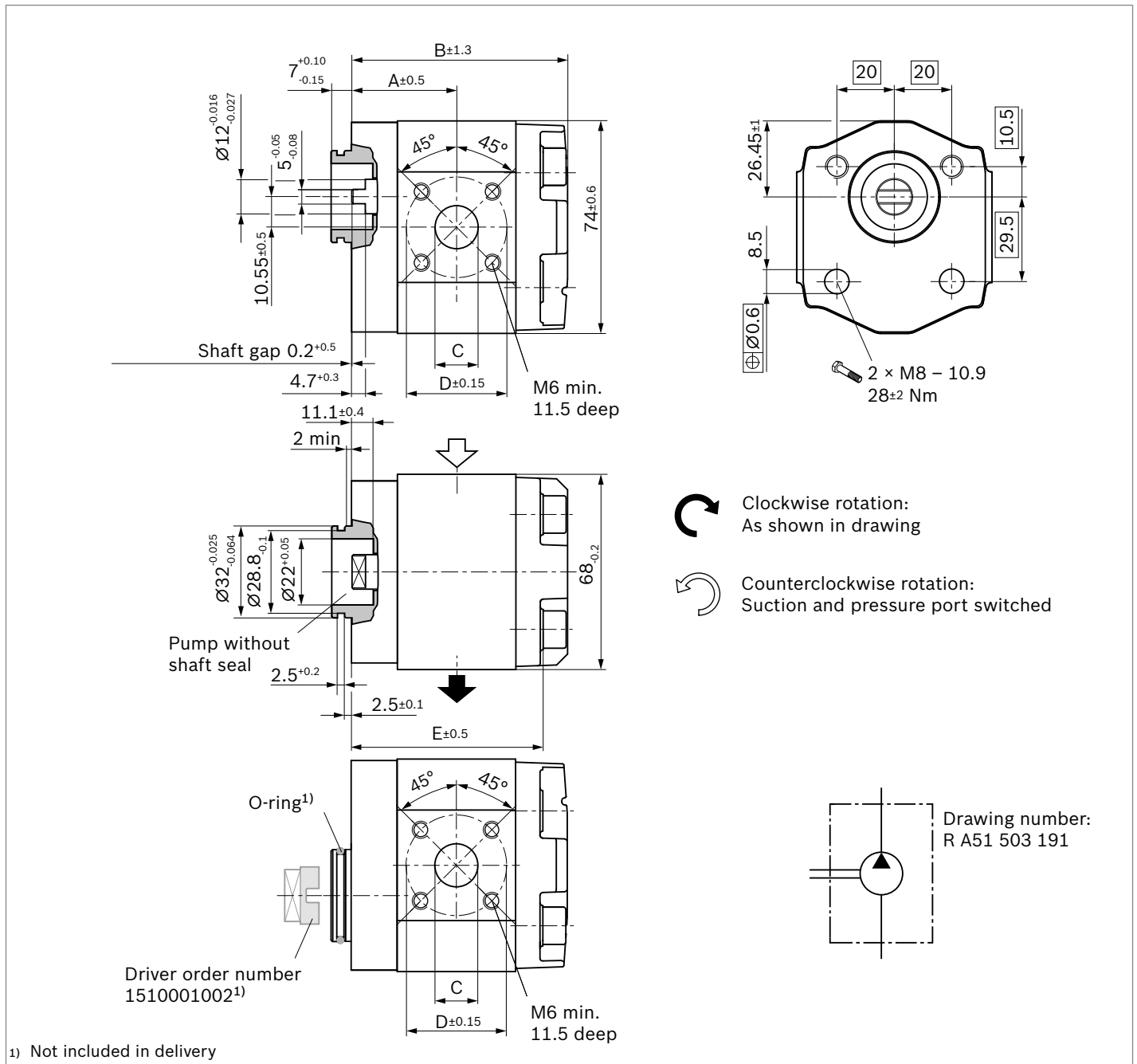
Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			Version
		Counterclockwise	Clockwise			A	B	C	
1.0	0510010314	0510010009	250	6000	30.9	64.1	55.2	1	
2.0	0510110326	0510010019	250	5000	32.8	67.9	59.0	1	
2.5	0510110327	0510010020	250	5000	33.8	69.8	60.9	1	
3.15	0510112322	0510112016	250	4000	35.0	72.3	63.4	1	
4.0	0510114327	0510114021	250	4000	36.6	75.5	66.6	2	
4.5	0510114328	0510114022	250	4000	37.6	77.4	68.5	2	
5.0	0510114329	0510114023	250	4000	38.6	79.5	70.6	2	
6.3	0510122318	0510122014	250	3500	41.0	84.2	75.3	2	
7.1	0510122319	0510122015	230	3500	42.5	87.3	78.4	2	

▼ **Tang drive with 2-hole mounting and pipe thread**  
**AZPB-32- ... NM01MB**



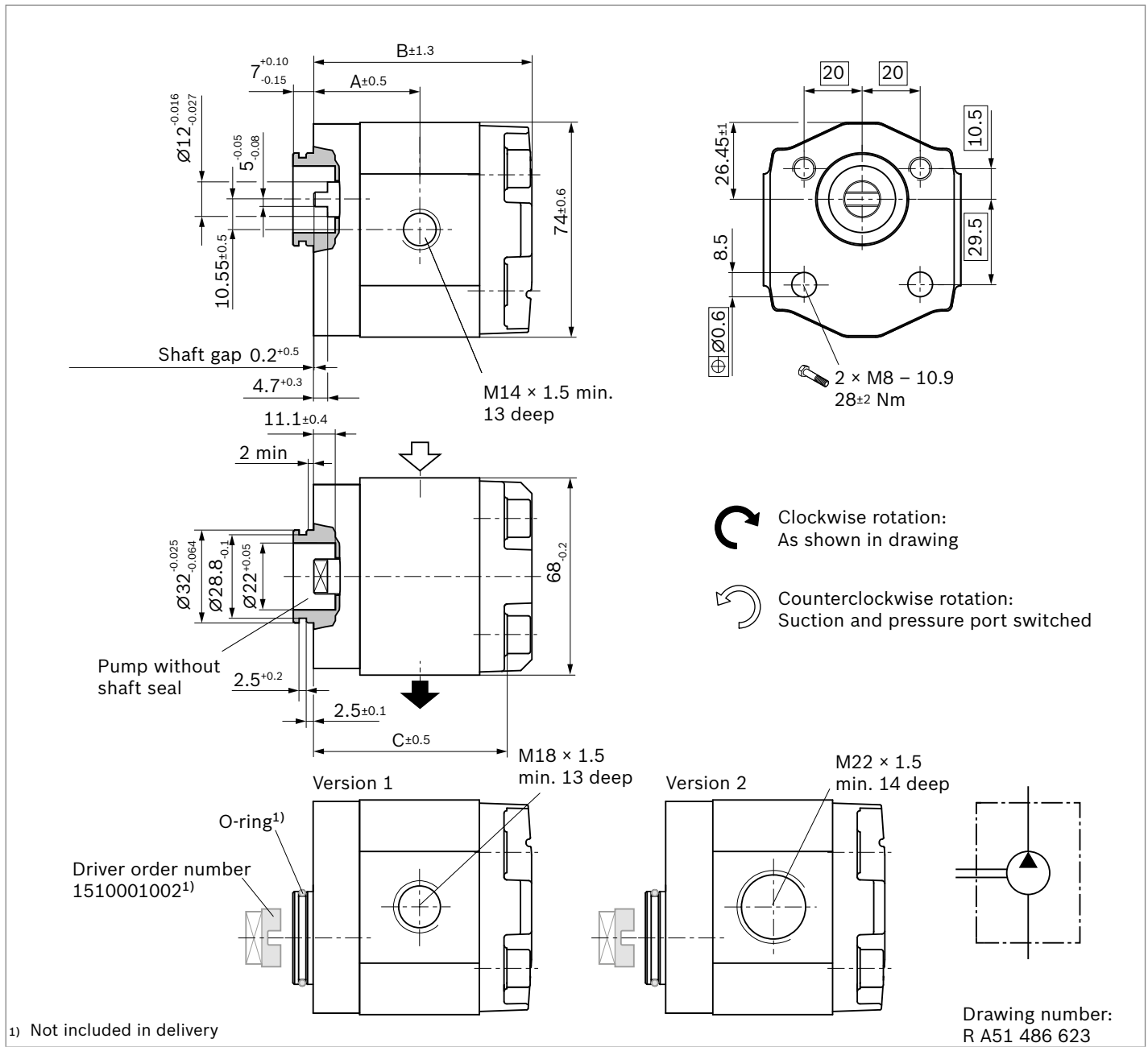
Size	Order number		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			Version
	Direction of rotation Counterclockwise	Direction of rotation Clockwise			A	B	C	
1.0	0510010316	0510010011	250	6000	30.9	64.1	55.2	3/8
2.0	0510110330	0510110021	250	5000	32.8	67.9	59.0	3/8
2.5	0510110331	0510110024	250	5000	33.8	69.8	60.9	3/8
3.15	0510112324	0510112017	250	4000	35.0	72.3	63.4	3/8
4.0	0510114333	0510114028	250	4000	36.6	75.5	66.6	1/2
4.5	0510114334	0510114024	250	4000	37.6	77.4	68.5	1/2
5.0	0510114335	0510114029	250	4000	38.6	79.5	70.6	1/2
6.3	0510122322	0510122018	250	3500	41.0	84.2	75.3	1/2
7.1	0510122323	0510122019	230	3500	42.5	87.3	78.4	1/2

▼ Tang drive with 2-hole mounting and square flange  
AZPB-32- ... NY20MB



Size	Order number		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions				
	Direction of rotation	Direction of rotation			A	B	C	D	E
	Counterclockwise	Clockwise							
2.0	1519222469	1519222468	250	5000	32.8	67.9	12	30	59.0
2.5	1519222471	1519222470	250	5000	33.8	69.8	12	30	60.9
3.15	1519222473	1519222472	250	4000	35.0	72.3	15	35	63.4
4.0	1519222475	1519222474	250	4000	36.6	75.5	15	35	66.6
4.5	1519222477	1519222476	250	4000	37.6	77.4	15	35	68.5
5.0	1519222479	1519222478	250	4000	38.6	79.5	15	35	70.6
6.3	1519222481	1519222480	250	3500	41.0	84.2	15	35	75.3
7.1	1519222483	1519222482	230	3500	42.5	87.3	15	35	78.4

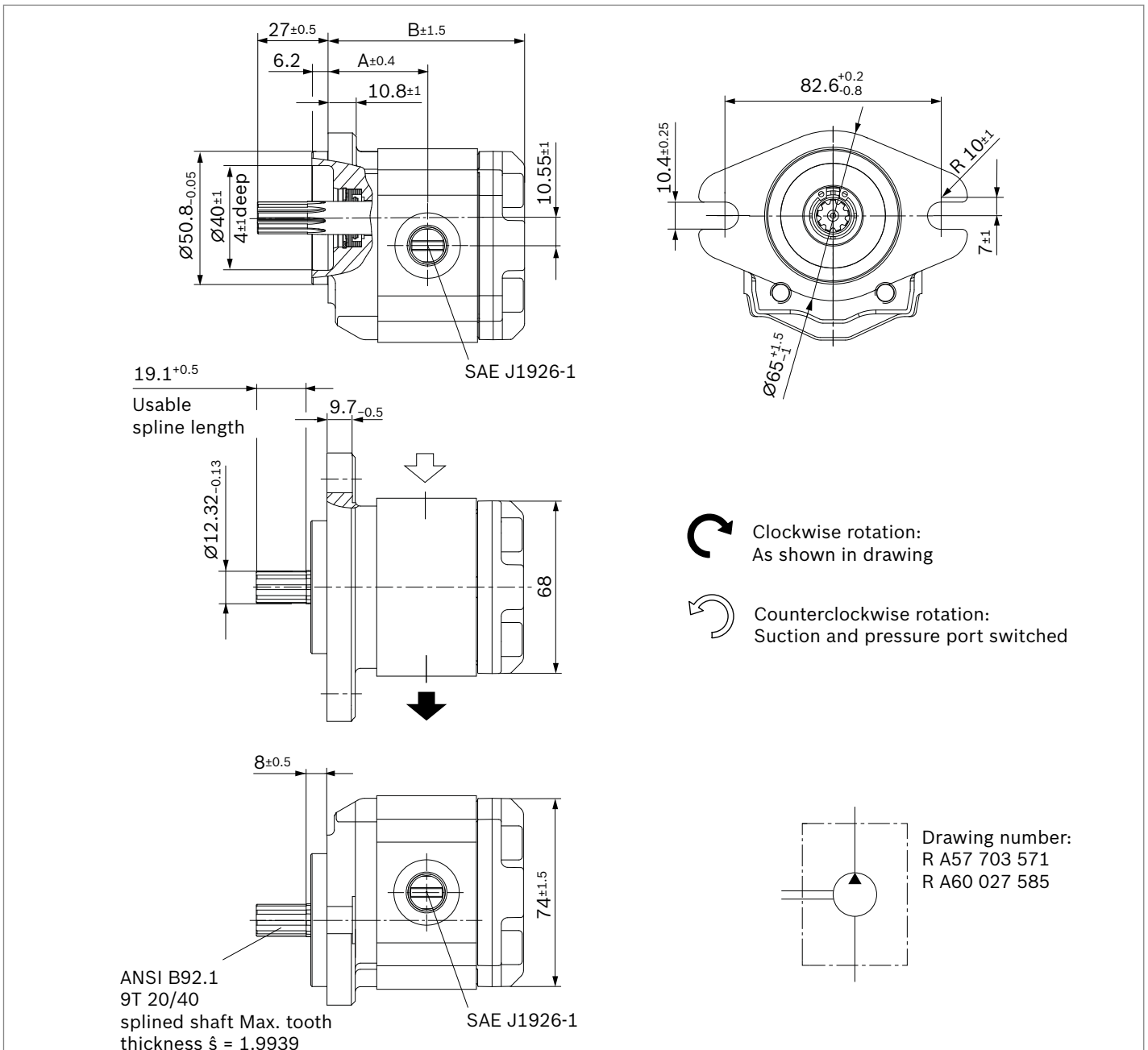
▼ **Tang drive with 2-hole mounting and metric thread**  
**AZPB-32- ... NY02MB**



1) Not included in delivery

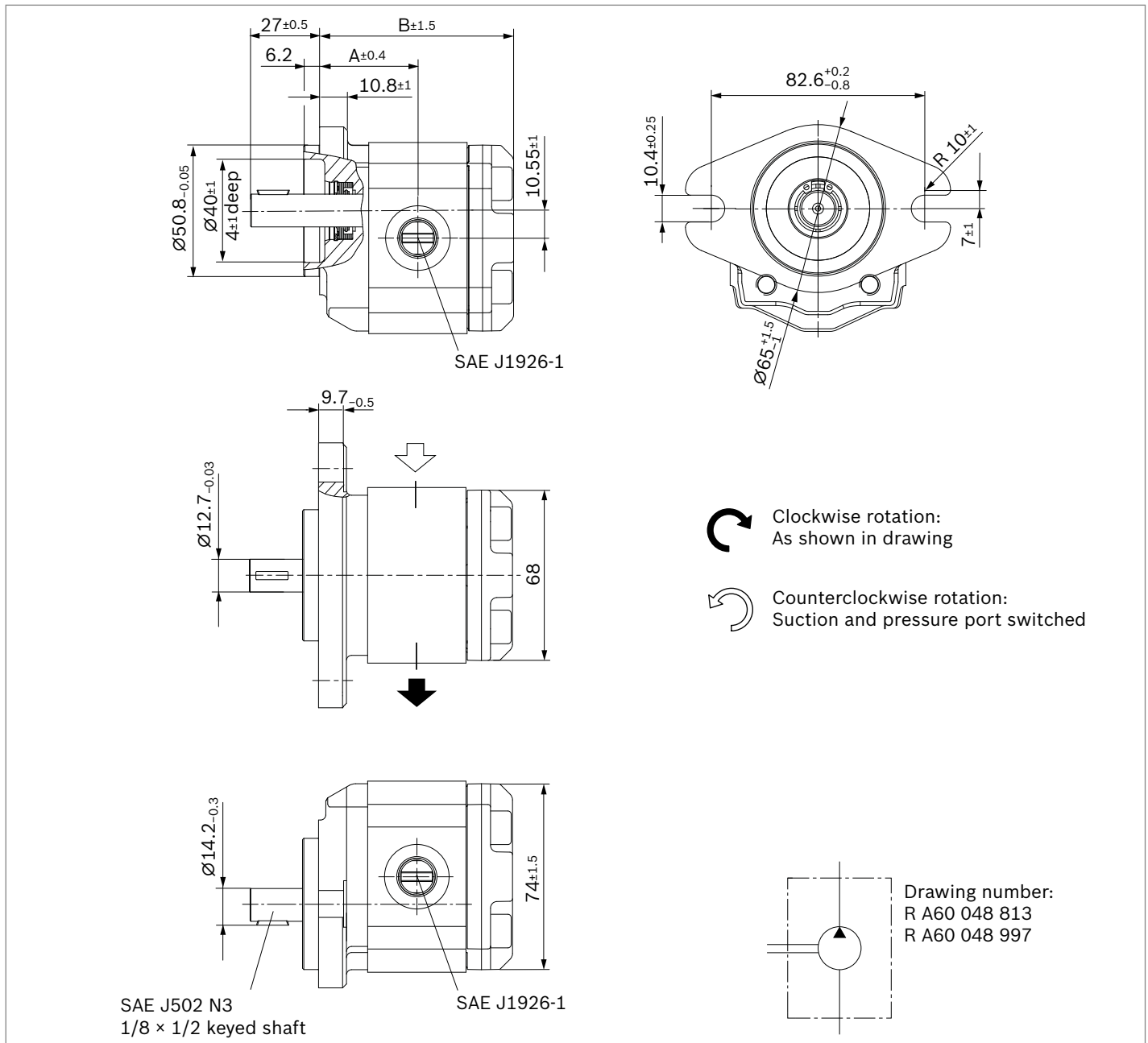
Size	Order number		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions			Version
	Direction of rotation	Direction of rotation			A	B	C	
	Counterclockwise	Clockwise						
1.0	1519222444	1519222443	250	6000	30.9	64.1	55.2	1
2.0	1519222446	1519222445	250	5000	32.8	67.9	59.0	1
2.5	1519222448	1519222447	250	5000	33.8	69.8	60.9	1
3.15	1519222450	1519222449	250	4000	35.0	72.3	63.4	1
4.0	1519222452	1519222451	250	4000	36.6	75.5	66.6	2
4.5	1519222454	1519222453	250	4000	37.6	77.4	68.5	2
5.0	1519222456	1519222455	250	4000	38.6	79.5	70.6	2
6.3	1519222458	1519222457	250	3500	41.0	84.2	75.3	2
7.1	1519222460	1519222459	230	3500	42.5	87.3	78.4	2

▼ **SAE J744 13-4 (A-A) splined shaft with SAE J744 50-2 2-hole flange**  
**AZPB-32- ... RR12KB**



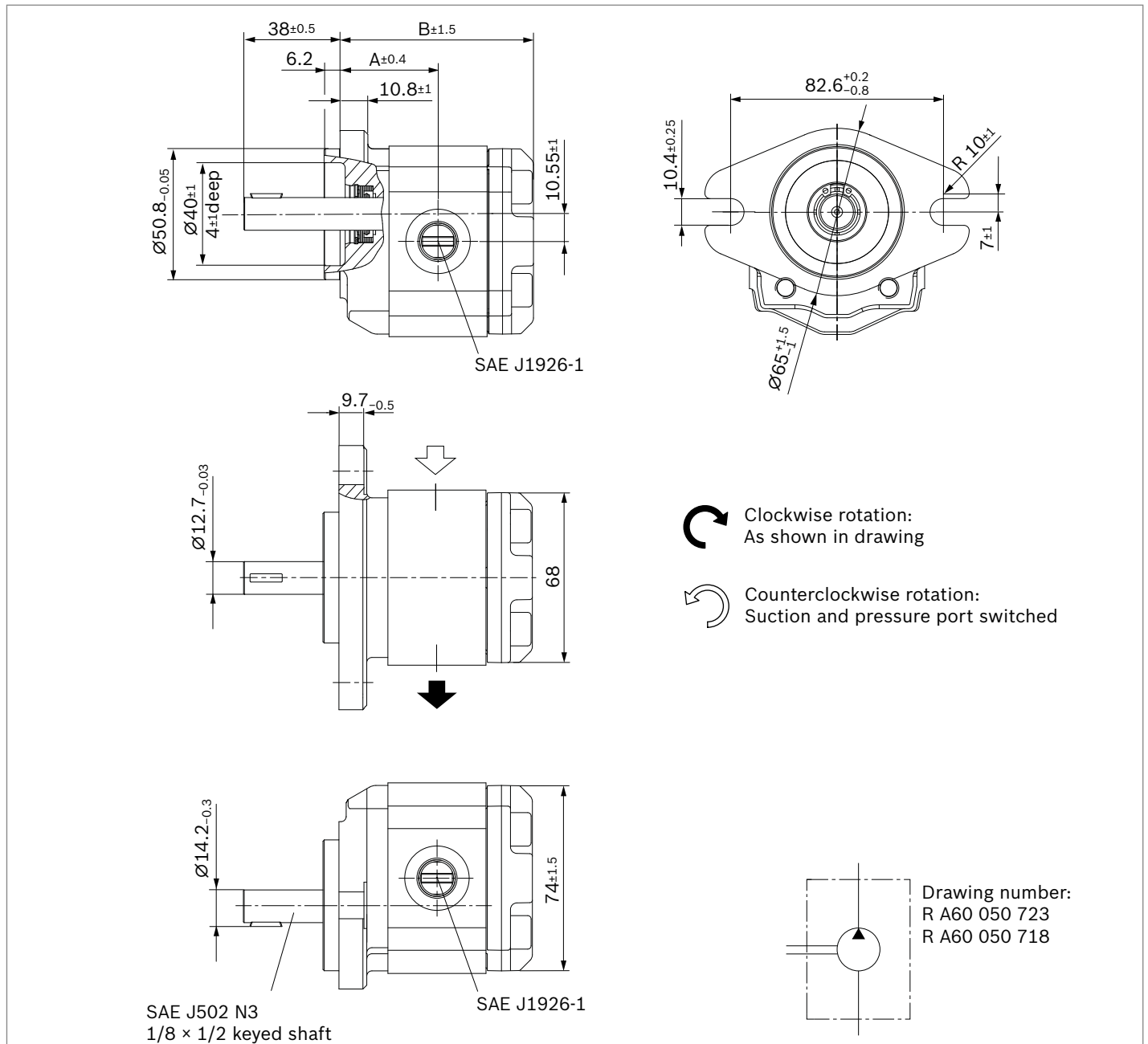
Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions	
		Counterclockwise	Clockwise			A	B
1.0	R979107392	R979107392	R979107365	250	6000	34.0	66.9
2.0	R979107393	R979107393	R979107366	250	5000	35.8	70.7
2.5	R979107394	R979107394	R979107367	250	5000	36.8	72.6
3.15	R979107395	R979107395	R979107368	250	4000	38.0	75.0
4.0	R979107396	R979107396	R979107369	250	4000	39.6	78.3
4.5	R979107397	R979107397	R979107370	250	4000	40.6	80.2
5.0	R979107398	R979107398	R979107371	250	4000	41.6	82.3
6.3	R979107399	R979107399	R979107372	250	3500	44.0	87.0
7.1	R979107400	R979107400	R979107373	230	3500	45.5	90.1

▼ **SAE J744 13-1 cylindrical shaft with SAE J744 50-2 2-hole flange**  
**AZPB-32- ... QR12KB**



Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions	
		Counterclockwise	Clockwise			A	B
1.0	R979107401	R979107374	R979107374	250	6000	34.0	66.9
2.0	R979107402	R979107375	R979107375	250	5000	35.8	70.7
2.5	R979107403	R979107376	R979107376	250	5000	36.8	72.6
3.15	R979107404	R979107377	R979107377	250	4000	38.0	75.0
4.0	R979107405	R979107378	R979107378	250	4000	39.6	78.3
4.5	R979107406	R979107379	R979107379	250	4000	40.6	80.2
5.0	R979107407	R979107380	R979107380	250	4000	41.6	82.3
6.3	R979107408	R979107381	R979107381	250	3500	44.0	87.0
7.1	R979107409	R979107382	R979107382	230	3500	45.5	90.1

▼ SAE J502 N3 cylindrical shaft long with SAE J744 50-2 2-hole flange  
**AZPB-32- ... QR12KB-S0022**

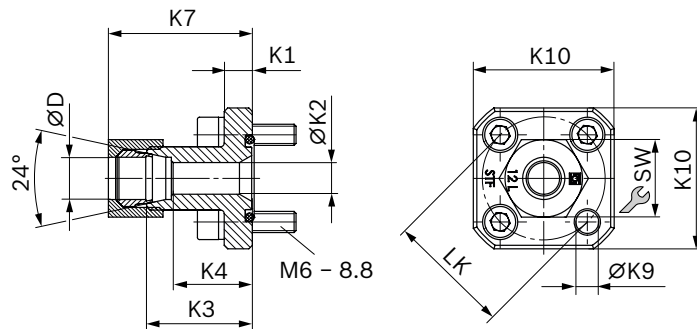


Size	Order number	Direction of rotation		Max. intermittent pressure $p_2$ [bar]	Max. rotational speed [rpm]	Dimensions	
		Counterclockwise	Clockwise			A	B
1.0	R979107410	R979107383	R979107383	250	6000	34.0	66.9
2.0	R979107411	R979107384	R979107384	250	5000	35.8	70.7
2.5	R979107412	R979107385	R979107385	250	5000	36.8	72.6
3.15	R979107413	R979107386	R979107386	250	4000	38.0	75.0
4.0	R979107414	R979107387	R979107387	250	4000	39.6	78.3
4.5	R979107415	R979107388	R979107388	250	4000	40.6	80.2
5.0	R979107416	R979107389	R979107389	250	4000	41.6	82.3
6.3	R979107417	R979107390	R979107390	250	3500	44.0	87.0
7.1	R979107418	R979107391	R979107391	230	3500	45.5	90.1

## Accessories

### Straight gear pump flange for Square Flange 20 (see chapter “Line connection”)

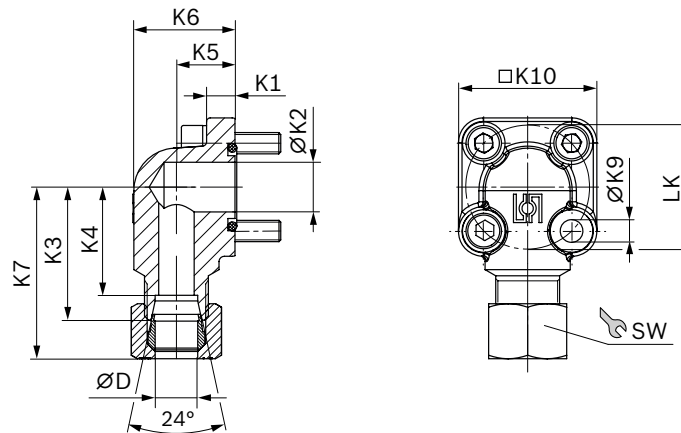
Complete fitting with O-ring, metric screw set, nuts and cutting ring.



LK	D	Series <sup>1)</sup>	Material number	p	K1	K2	K3	K4	K7	K9	K10	AF	Screws	O-ring	Weight
mm	mm			bar	mm	mm	mm	mm	mm	mm	mm	mm	4 ×	NBR	kg
35	10	L	1 515 702 064	315	8	7	30	23	38.0	6.5	40	19	M6 × 22	20 × 2.5	0.13
35	12	L	1 515 702 065	315	8	9	30	23	38.5	6.5	40	22	M6 × 22	20 × 2.5	0.14
35	15	L	1 515 702 066	250	8	11	30	23	39.0	6.5	40	27	M6 × 22	20 × 2.5	0.15

### 90° gear pump flange for Square Flange 20 (see chapter “Line connection”)

Complete fitting with O-ring, metric screw set, nuts and cutting ring.



LK	D	Series <sup>1)</sup>	Material number	p	K1	K2	K3	K4	K5	K6	K7	K9	K10	AF	Screws	O-ring	Weight	
mm	mm			bar	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	2 ×	2 ×	NBR	kg
35	10	L	1 515 702 070	315	8	14	37.5	30.5	16.5	28.5	45	6.4	39	19	M6 × 22	M6 × 35	20 × 2.5	0.18
35	12	L	1 515 702 071	315	8	14	37.5	30.5	16.5	28.5	46	6.4	39	22	M6 × 22	M6 × 35	20 × 2.5	0.19
35	15	L	1 515 702 072	250	8	14	37.5	30.5	16.5	28.5	46	6.4	39	27	M6 × 22	M6 × 35	20 × 2.5	0.20
35	16	S	1 515 702 002	315	8	15	38.0	29.5	20.0	33.0	49	6.4	39	30	M6 × 22	M6 × 40	20 × 2.5	0.25
35	18	L	1 545 702 006	250	8	15	37.5	30.0	20.0	33.0	47	6.4	39	32	M6 × 22	M6 × 40	20 × 2.5	0.22
35	20	S	1 515 702 017	315	8	15	45.0	34.5	25.0	38.0	57	6.4	39	36	M6 × 22	M6 × 45	20 × 2.5	0.30

#### Notice

Max. tightening torques can be found in the “General instruction manual for external gear units” (07012-B).

1) See DIN EN ISO 8434-1.



## Project planning notes

### Technical data

All specified technical data is based on manufacturing tolerances and apply with certain constraints.

Note that this makes certain deviations possible and that technical data may vary with certain constraints (e.g., viscosity).

Pumps by Bosch Rexroth come tested for function and performance.

The pumps should only be operated to tested data (see chapter “Technical data”).

### Curves

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

### Hydraulic fluid filtration

Since the majority of premature failures of gear pumps occur due to contaminated hydraulic fluid, filtration should maintain a cleanliness level of 20/18/15 as defined by ISO 4406.

This can reduce contamination 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 this case, 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 should make sure the steering system continues to operate safely per ECE R-79 even if the auxiliary steering pump fails.

### Further information

Before finalizing your design, please request a binding installation drawing.

Further information and notes on project planning can be found in the “General instruction manual for external gear units” (07012-B1, Chapter 5.5).

## Order number overview

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## 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 Standard Performance or another external gear unit.

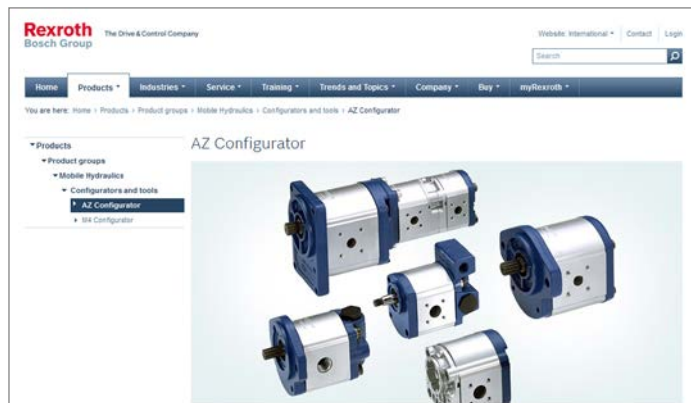
The selector guides you through a selection of features to all of the products available for order. By clicking on the order number, you can view and download the following product information: data sheet, dimension sheet, instruction manual, operating conditions and tightening torques.

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). Your order will then be sent within 10 business days.

You also have the possibility of easily and conveniently configuring your custom external gear unit with our AZ configurator. All the necessary data you need for the project planning of external gear units can be obtained through the menu navigation.

For an existing configuration, 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](http://www.boschrexroth.com/az-configurator)

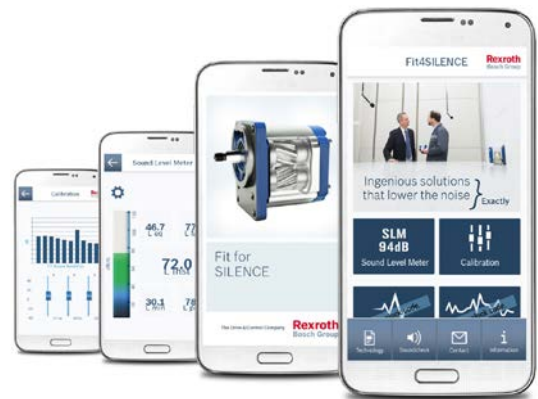


## Fit4SILENCE app

Do you want to quickly determine the noise level of an application but don't have a measuring device at hand? With Fit4SILENCE, this is no longer a problem! Our new noise measurement app for all Android devices can be directly downloaded free. After calibration, you can start using it straight away and conduct fast, accurate noise measurements with different weightings in no time at all. An additional measuring device is no longer necessary because calibrated smartphones using the app can achieve an accuracy that approximates professional measuring devices.

Last but not least, the app contains interesting information about SILENCE PLUS technology, including an audio sample. Link: [www.boschrexroth.com/silence-plus](http://www.boschrexroth.com/silence-plus)

### ▼ Download the Android app:



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