

RE 10088/01.2019
 Replaces: 09.2013

rexroth
 A Bosch Company

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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2 AZPB | External gear pump Product description

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.

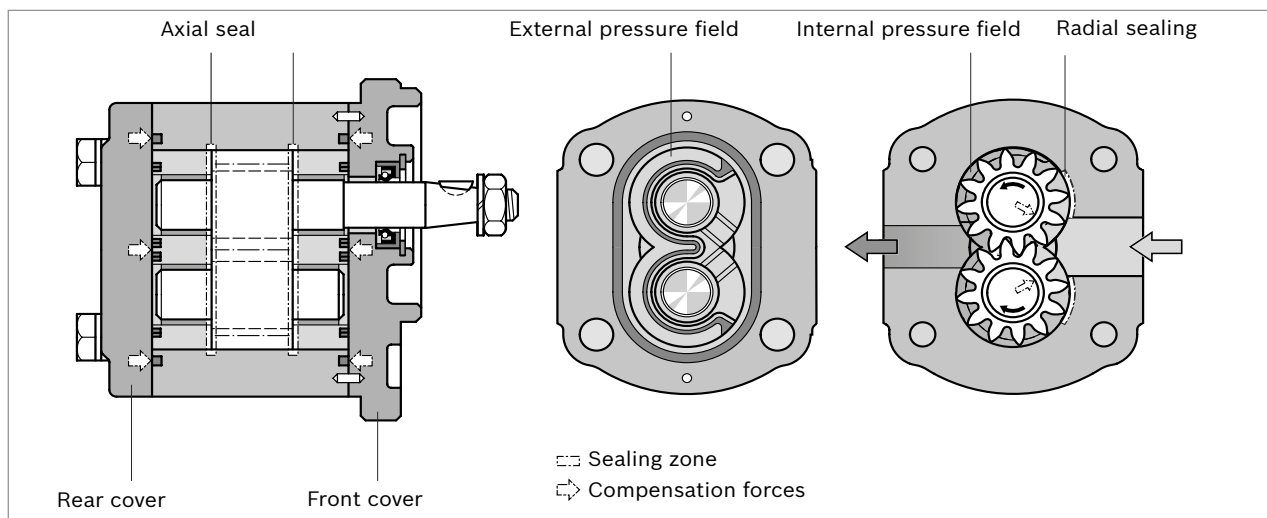
Construction

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.

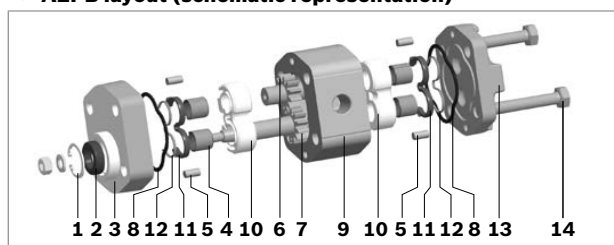
The drive shaft protrudes from the front cover where it is usually sealed by the shaft seal. The bearing forces are absorbed by slide bearings. These were designed for high pressures and have excellent emergency running properties, especially at low rotational speeds.

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)



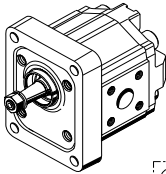
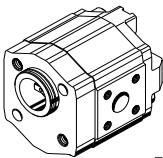
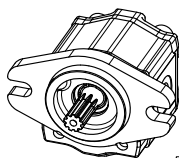
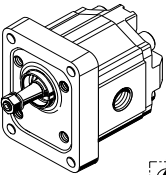
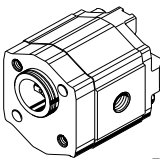
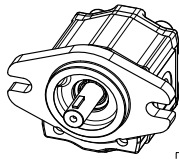
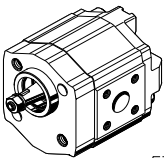
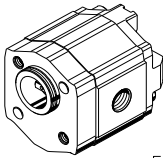
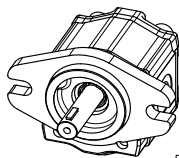
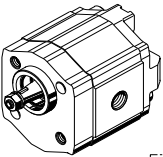
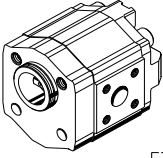
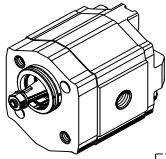
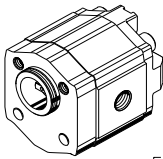
- | | |
|------------------|-----------------------|
| 1 Retaining ring | 8 Housing seal ring |
| 2 Shaft seal | 9 Pump housing |
| 3 Front cover | 10 Bearing bushing |
| 4 Slide bearings | 11 Axial field seal |
| 5 Centering pin | 12 Supporting element |
| 6 Gear wheel | 13 Rear cover |
| 7 Drive shaft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

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AZPB preferred types product overview

Version	Page	Version	Page	Version	Page
	19		24		29
	20		25		30
	21		26		31
	22		27		
	23		28		

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

Single-pump type codes¹⁾

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

External gear unit

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

Series

02	1 cm ³ /rev ... 7.1 cm ³ /rev, Standard Performance, Platform B	B
----	---	----------

Series

03	Bearing journal Ø12 mm, installation identical to Series 1	3
----	--	----------

Version

04	Corrosion-resistant, pinned	2
----	-----------------------------	----------

Size

05	For geometric displacement V_g [cm ³], see "Table of values"	1.0	2.0	2.5	3.1	4.0	4.5	5.0	6.3	7.1
----	--	------------	------------	------------	------------	------------	------------	------------	------------	------------

Direction of rotation

06	As viewed on drive shaft	Clockwise	R
		Counterclockwise	L

Drive shaft

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

Front cover

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

Line connection

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

Sealing material

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

Rear cover

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

Special version

12	Serial number, e.g., S0001	SXXXX
----	----------------------------	--------------

- ¹⁾ – Some type code combinations are not possible. – Further options are available on request.
– Please select the desired pump with the help of the selection table (preferred types) or after consultation with Bosch Rexroth.

External gear pump | **AZPB** 5
Multi-pump type codes

Multi-pump type codes¹⁾

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

External gear unit

01	External gear pump	AZP
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Series²⁾

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

Series (relates to first pump stage)

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

Version (relates to first pump stage)

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

Size³⁾

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

Direction of rotation

06	As viewed on drive shaft	Clockwise	R
		Counterclockwise	L

Drive shaft (relates to first pump stage)

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

Front cover (relates to first pump stage)

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

Line connection (per pump stage)⁴⁾

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

Sealing material

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

Rear cover (relates to last pump stage)

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

Special version

12	Serial number, e.g., S0001	SXXXX
----	----------------------------	--------------

Sample 2-pump combination:

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

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

6 AZPB | External gear pump Technical data

Technical data

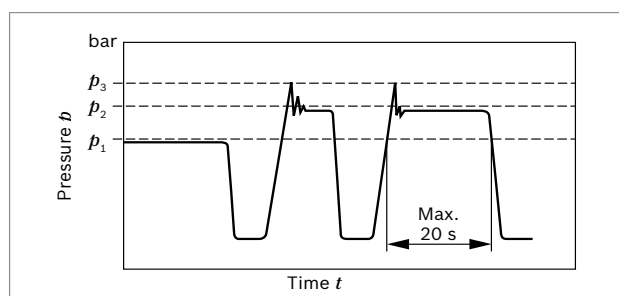
▼ Table of values

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 ³	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 ¹⁾	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	bar	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

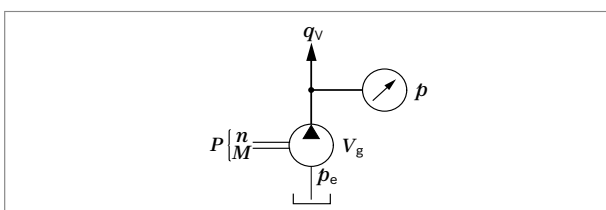
Flow	$q_v = \frac{V_g \times n \times \eta_v}{1000}$	[L/min]
Torque	$M = \frac{V_g \times \Delta p}{20 \times \pi \times \eta_{hm}}$	[Nm]
Power	$P = \frac{2 \pi \times M \times n}{60000} = \frac{q_v \times \Delta p}{600 \times \eta_t}$	[kW]

Key

- V_g Displacement per revolution [cm³]
 Δp Differential pressure [bar] ($\Delta p = p - p_e$)
 n Rotational speed [rpm]
 η_v Volumetric efficiency¹⁾
 η_{hm} Hydraulic-mechanical efficiency²⁾
 η_t Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)²⁾

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

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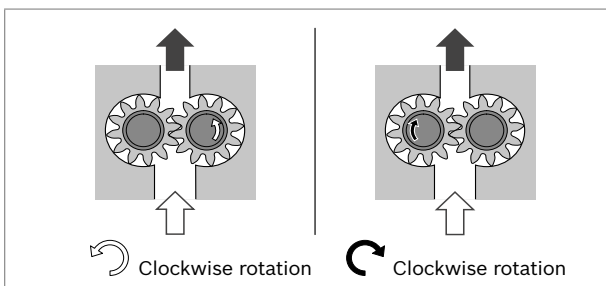


Notice

- 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.¹⁾

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

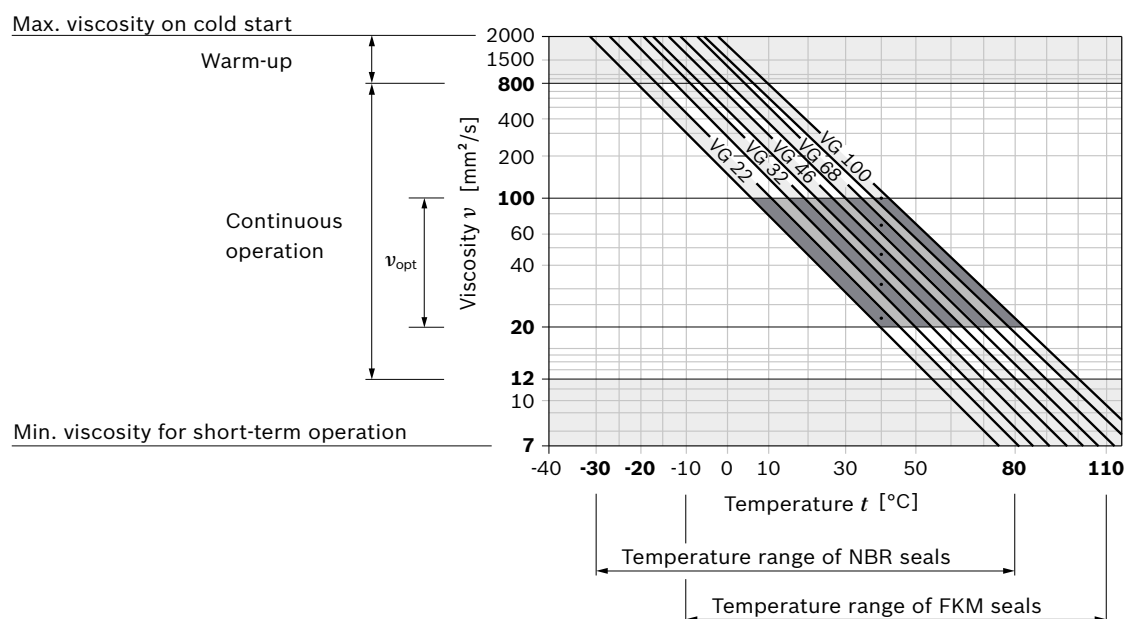
Viscosity range

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



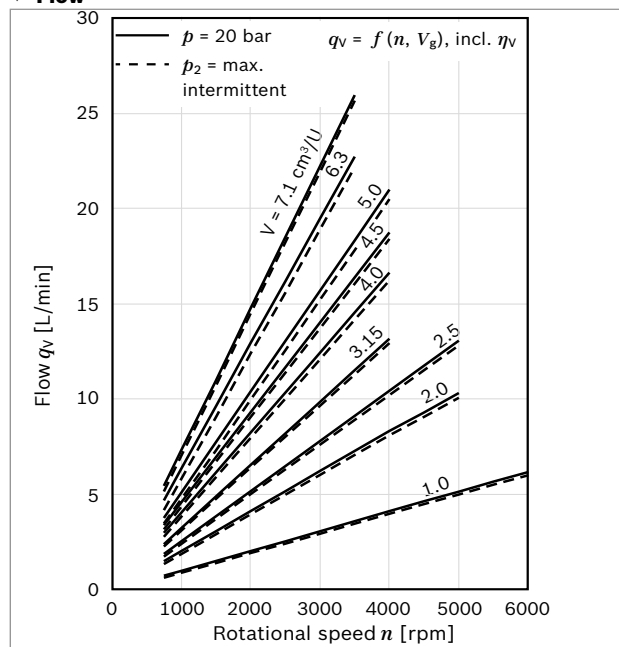
¹⁾ Other hydraulic fluids on request.

8 AZPB | External gear pump Graphs/curves

Graphs/curves

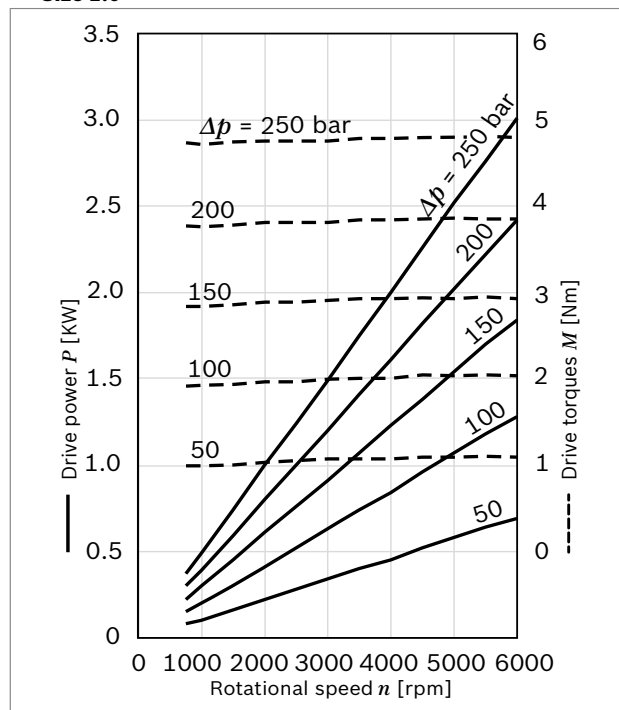
Flow curves

▼ Flow

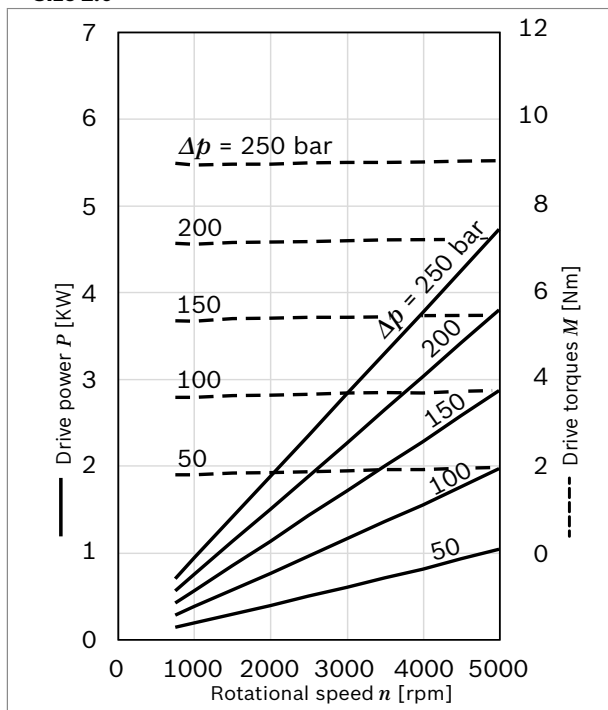


Performance graphs

▼ Size 1.0



▼ Size 2.0

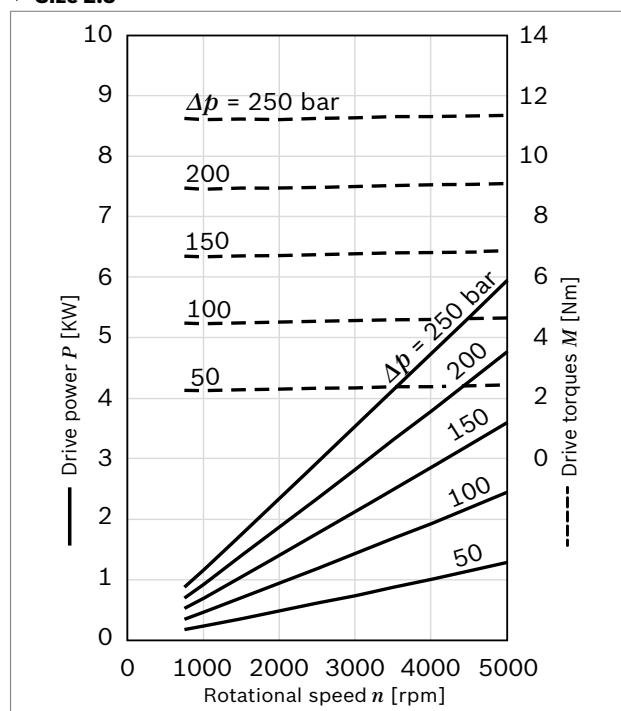


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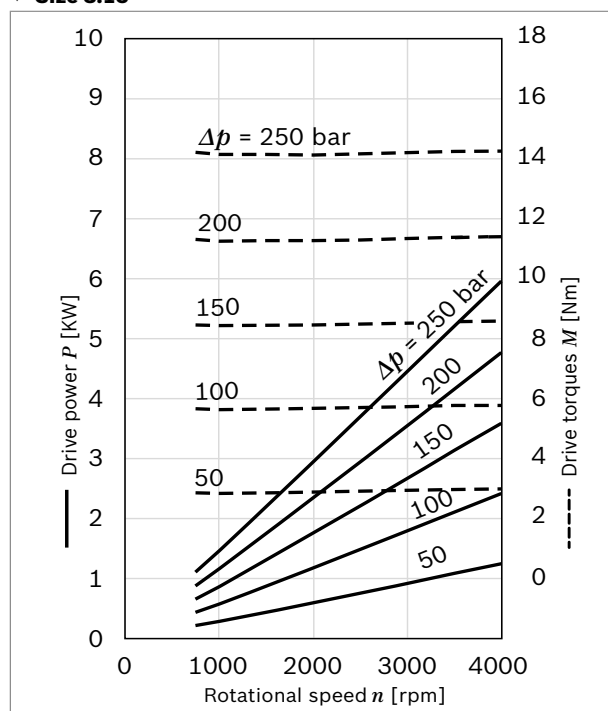
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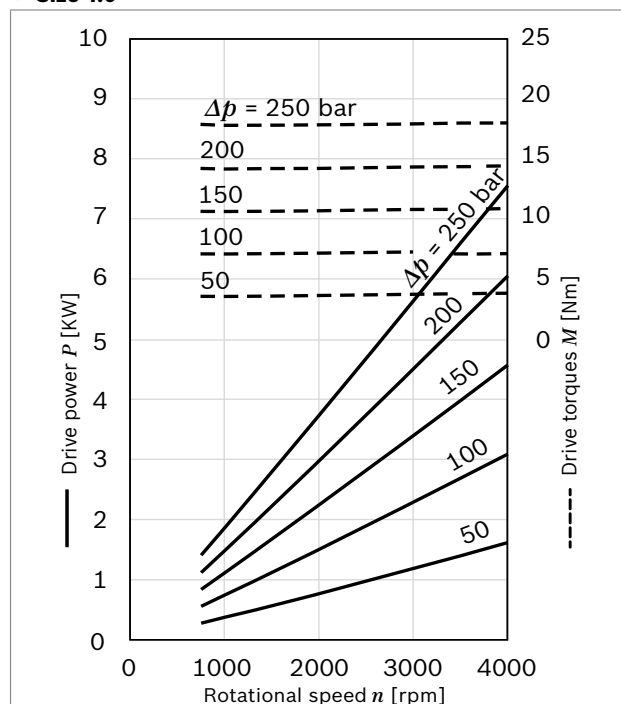
▼ **Size 2.5**



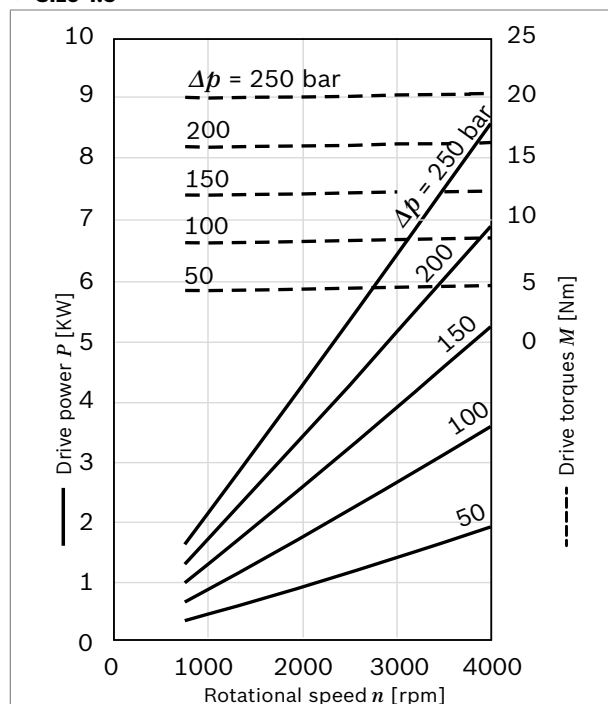
▼ **Size 3.15**



▼ **Size 4.0**

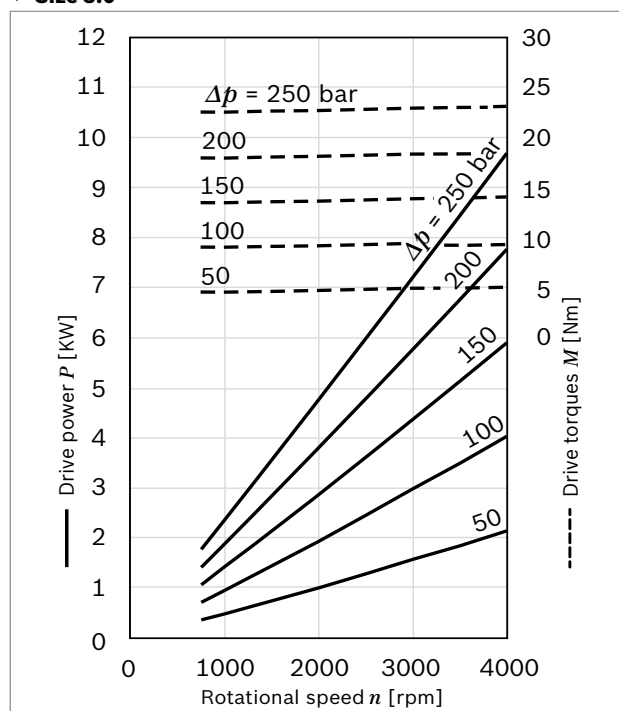


▼ **Size 4.5**

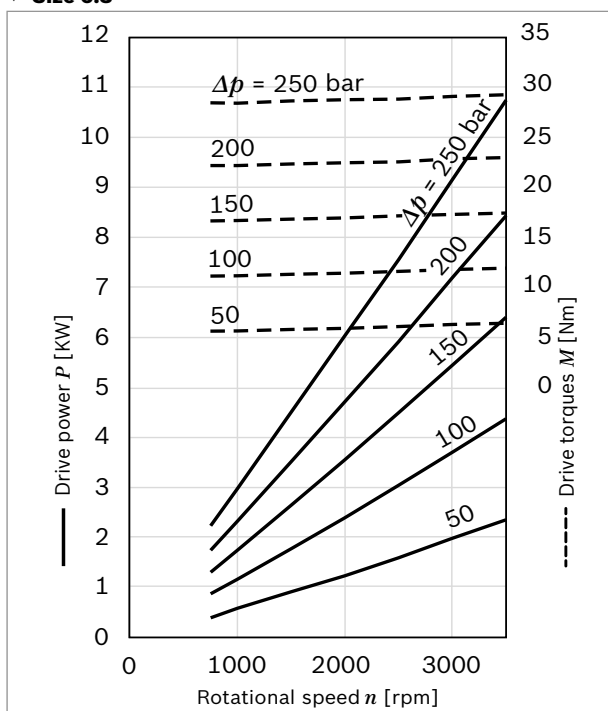


10 AZPB | External gear pump Graphs/curves

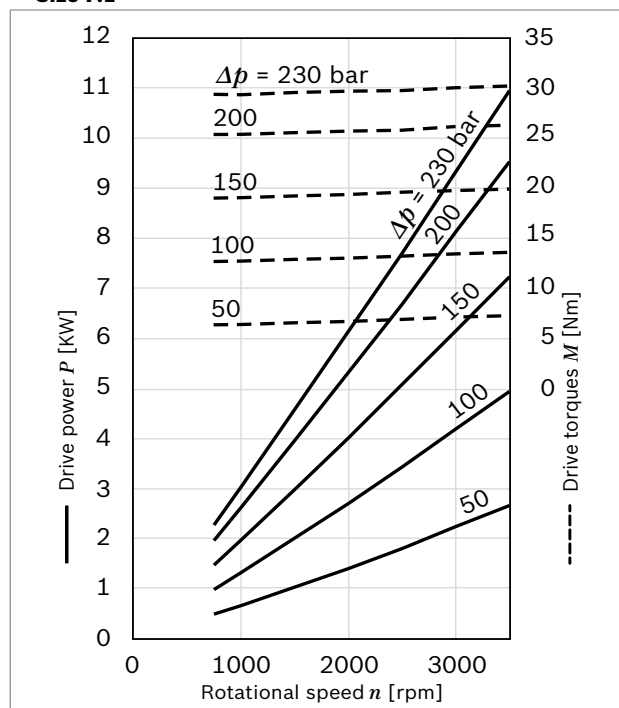
▼ Size 5.0



▼ Size 6.3



▼ Size 7.1



Notice

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

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Noise curves

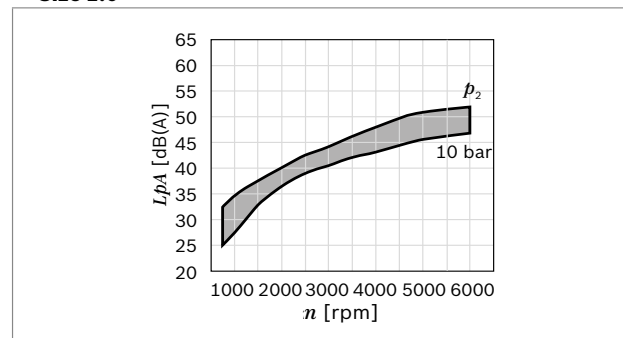
Noise levels based on rotational speed, pressure range between 10 bar and pressure value p_2 (see chapter "Technical data").

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

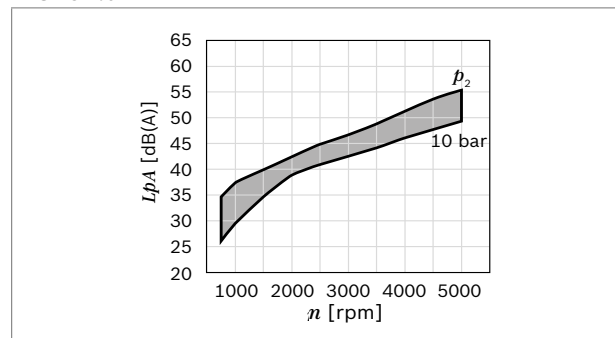
Ambient factors (installation site, piping, other system components) were not included.

The values refer to a single pump.

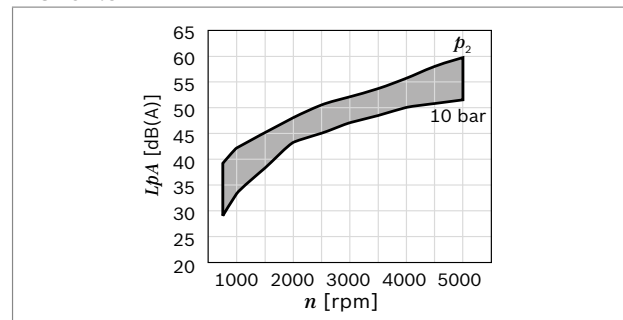
▼ Size 1.0



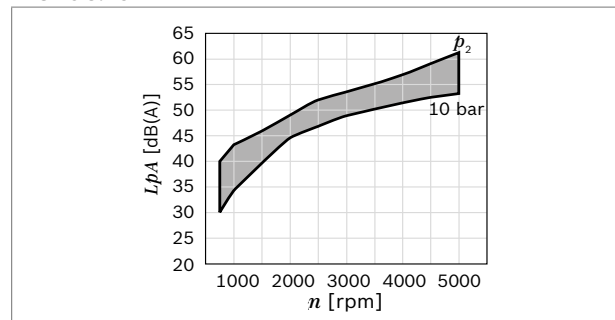
▼ Size 2.0



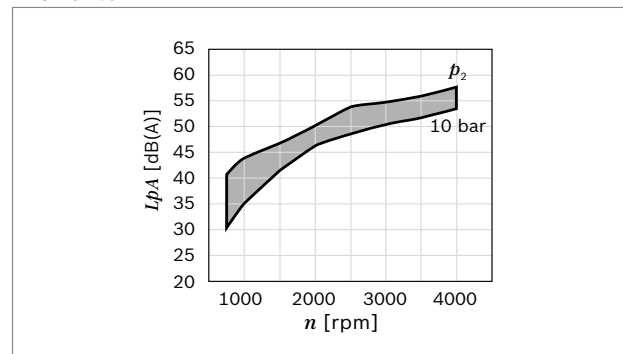
▼ Size 2.5



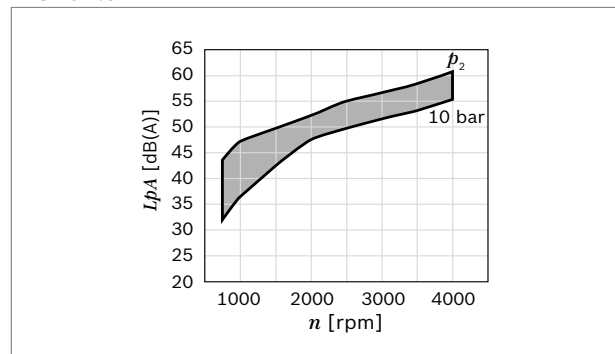
▼ Size 3.15



▼ Size 4.0

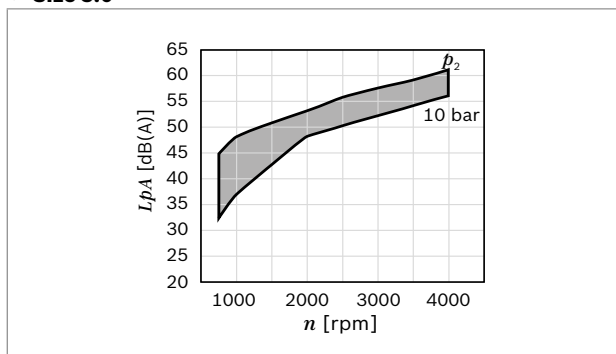


▼ Size 4.5

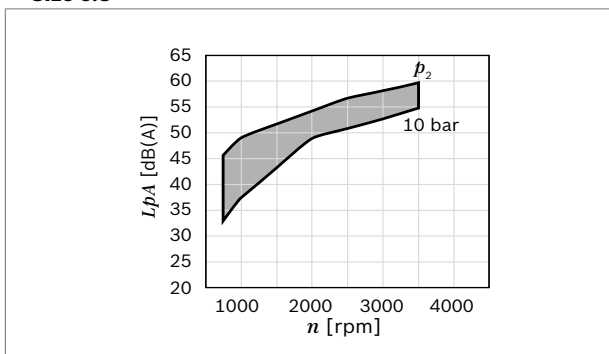


12 **AZPB** | External gear pump Graphs/curves

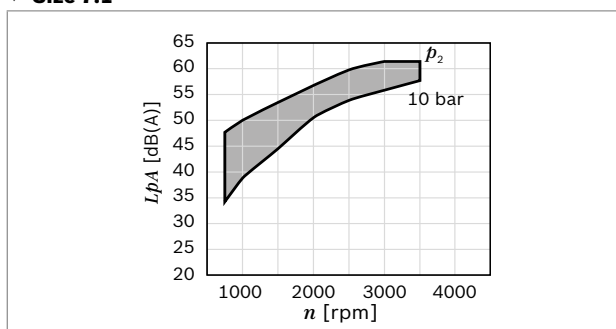
▼ Size 5.0



▼ 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.

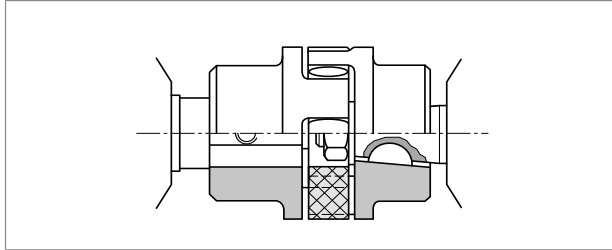
Dimensions [mm]

External gear pump | **AZPB** 13
Drive

Drive

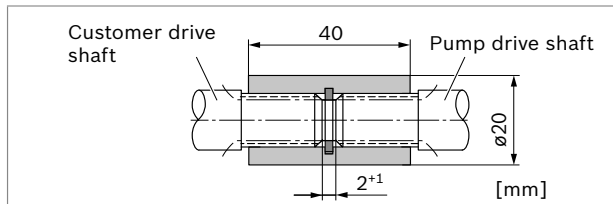
1. Elastic clutch

- ▶ 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



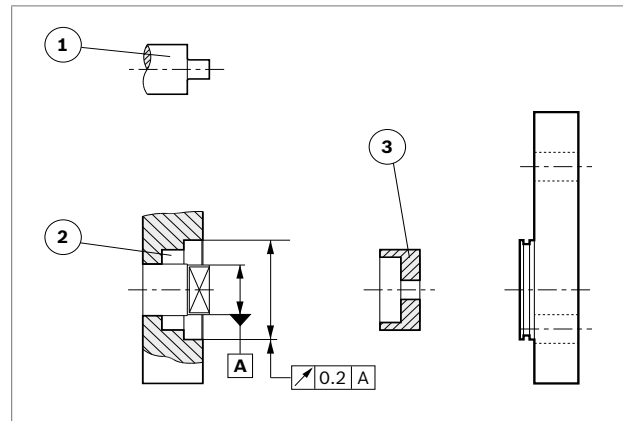
3. Tang drive coupling

- ▶ 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 ± 2
 - Seal ring running surface ground without rifling $R_{\max} \leq 4 \mu\text{m}$

¹⁾ Values in parentheses refer to counterclockwise rotation.

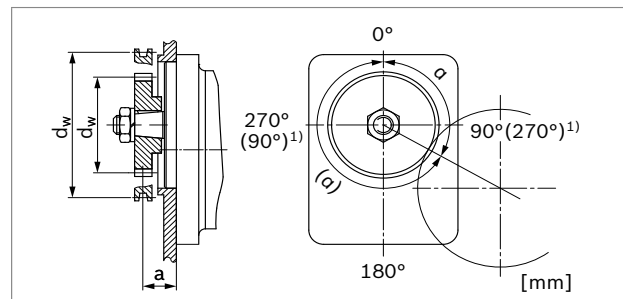
▶ Customer radial shaft seal ring (2)

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



4. V-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 α). For helical gear drives, helix angle β is also required.



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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

Bosch Rexroth AG, RE 10088/01.2019

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Multiple gear pumps

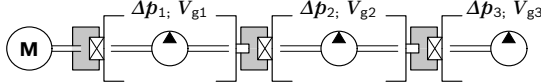
Gear pumps are well-suited to multiple arrangements, with the drive shaft of the first pump stage is extended to a second and possibly third pump stage. The shafts for each pump section are typically connected via a driver. The individual pump stages are usually hydraulically isolated and have separate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

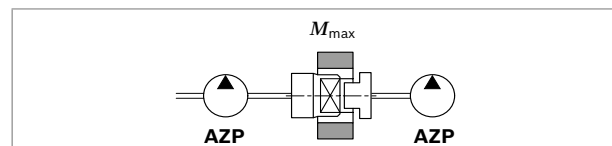


$$\frac{\Delta p_1 \times V_{g1} + \Delta p_2 \times V_{g2} + \Delta p_3 \times V_{g3}}{18 \times \pi} \leq M_{\max}^{1)} \quad \begin{matrix} \Delta p \text{ [bar]} \\ V_g \text{ [cm}^3\text{]} \end{matrix}$$

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 $M_{\max} = 25 \text{ Nm}$. This may result in pressure limitations for subsequent pump stages. Subsequent pumps of a smaller series determine the max. transmissible torque.



Subsequent pump		$M_{\max} \text{ [Nm]}^{1)}$
Platform B	AZPB	25

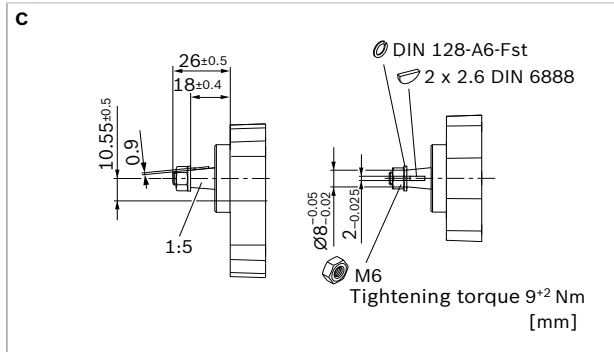
¹⁾ For $M_{\max}$, see chapter "Max. transmissible drive torques".

16 **AZPB** | External gear pump
Dimensions – drive shaft

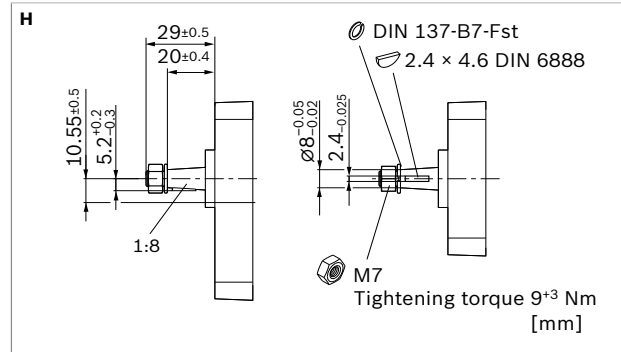
Dimensions [mm]

Dimensions – drive shaft¹⁾

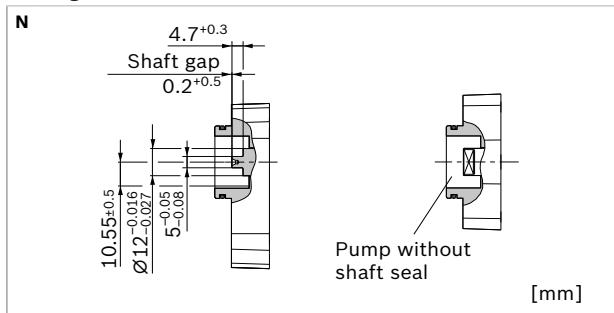
▼ **1:5 tapered shaft**



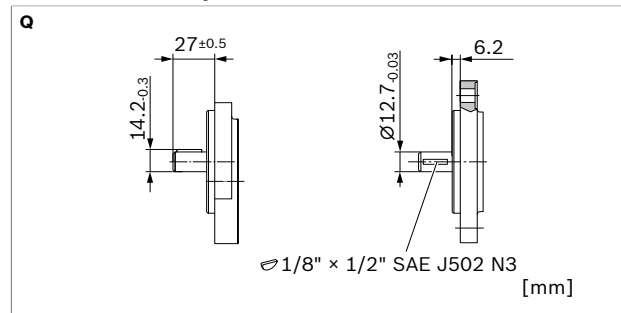
▼ **1:8 tapered shaft**



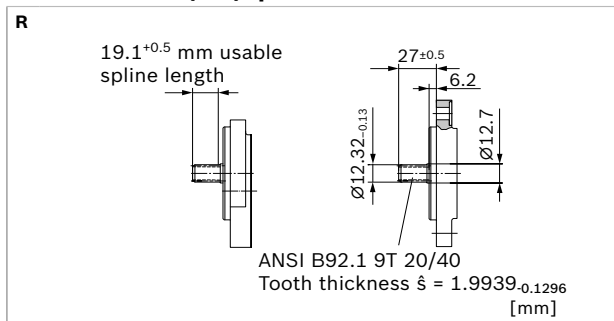
▼ **Tang drive**



▼ **SAE J744 13-1 cylindrical**



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



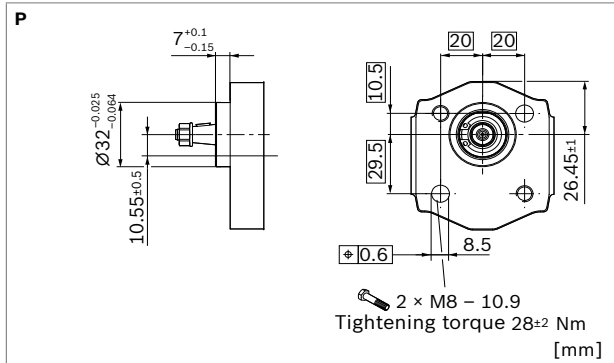
1) For other version, see offer drawing.

Dimensions [mm]

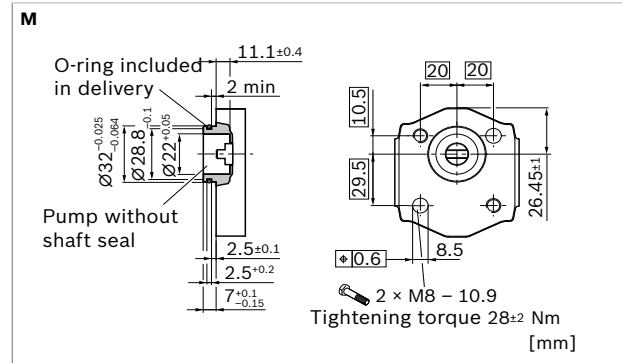
External gear pump | **AZPB** 17
Dimensions – front cover

Dimensions – front cover¹⁾

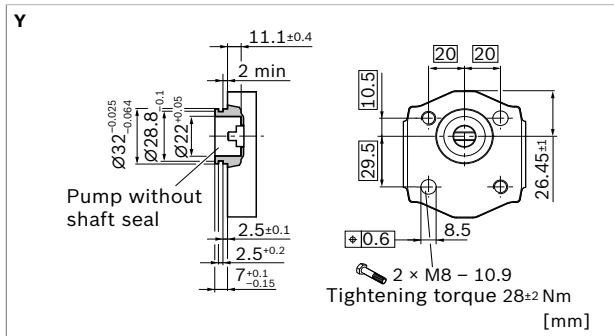
▼ 2-hole mounting Ø32 mm



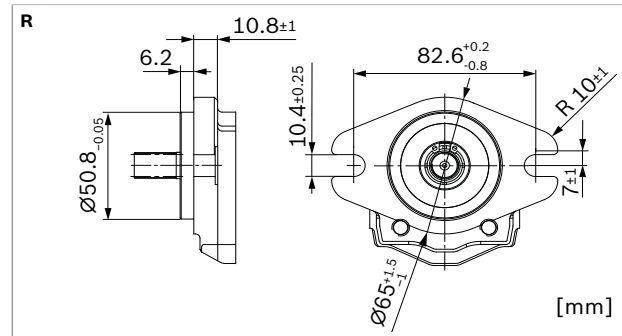
▼ 2-hole mounting Ø32 mm with O-ring



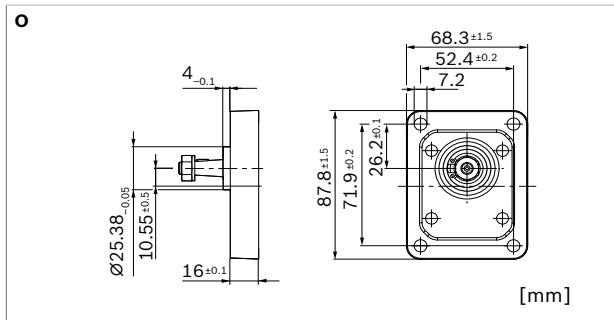
▼ 2-hole mounting Ø32 mm with O-ring, for attachment to Series F



▼ SAE J744 50-2 (A-A)



▼ Rectangular flange Ø25.38 mm



¹⁾ For other version, see offer drawing.

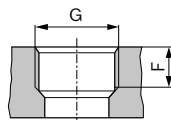
18 **AZPB** | External gear pump
Dimensions – line connection

Dimensions [mm]

Dimensions – line connection

▼ ISO 228/1 pipe thread

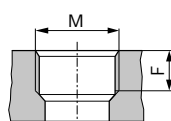
01



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

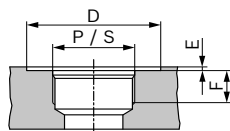
02



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

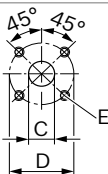
12



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

20



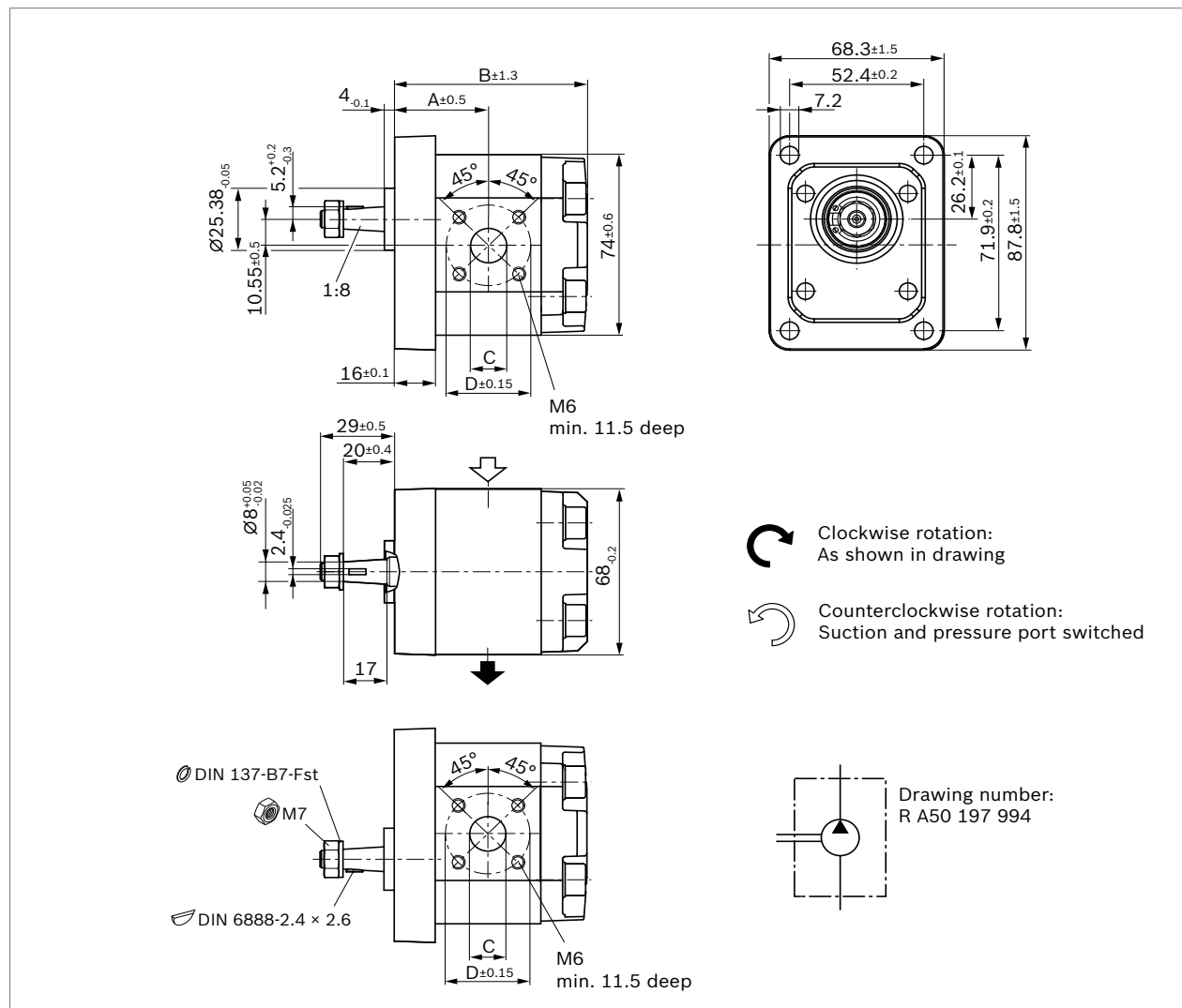
Size	Pressure side			Suction side		
	C mm	D mm	E	C mm	D mm	E
2.0 ... 2.5	12	30	M6; 11.5 deep	12	30	M6; 11.5 deep
3.1 ... 7.1	15	35		15	35	

Dimensions [mm]

External gear pump | **AZPB** 19
Dimensions – preferred series

Dimensions – preferred series

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



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

RE 10088/01.2019, Bosch Rexroth AG

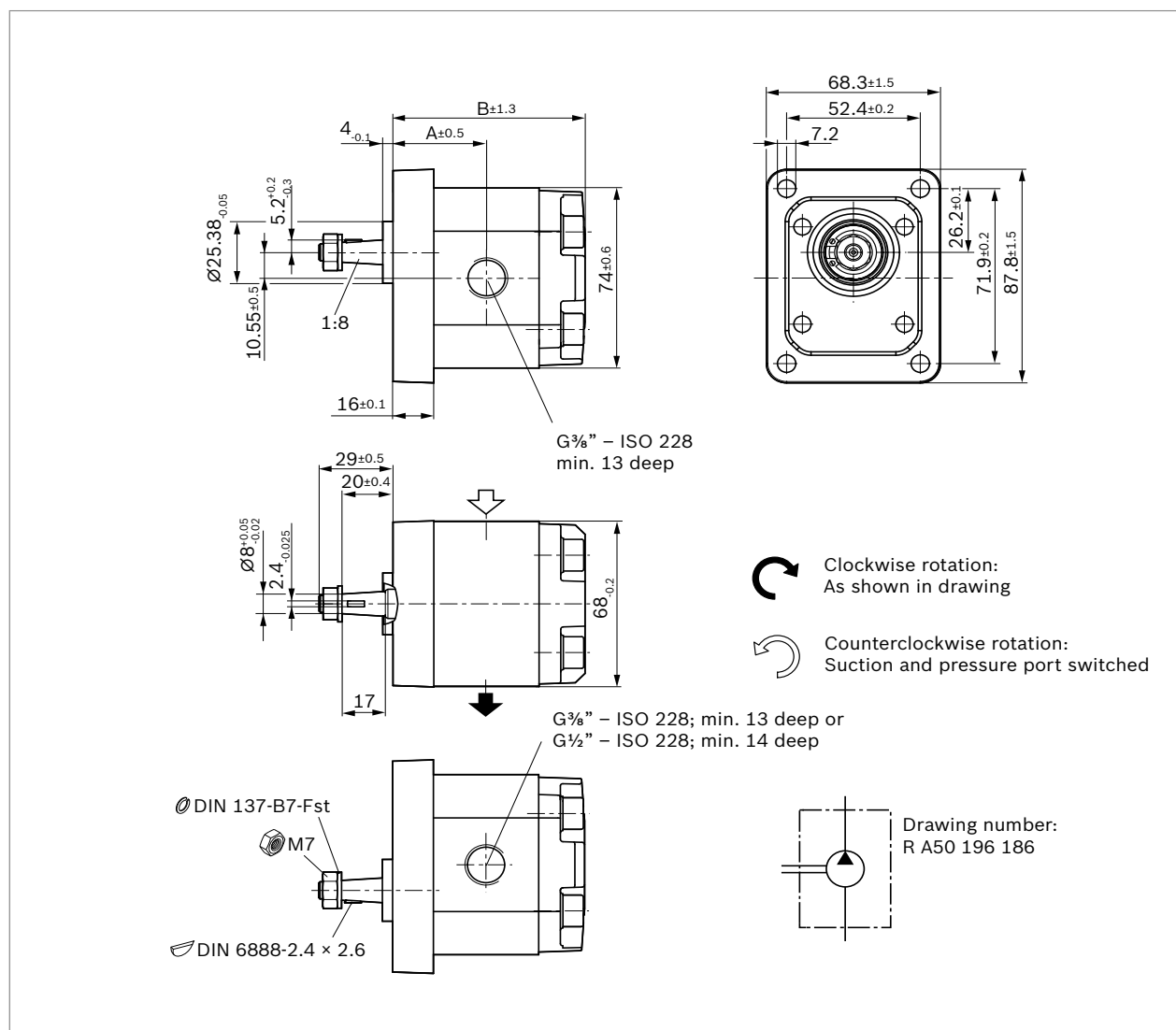
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20 **AZPB** | External gear pump
Dimensions – preferred series

Dimensions [mm]

▼ **1:8 tapered shaft with rectangular flange**
AZPB-32- ... H001MB



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

Bosch Rexroth AG, RE 10088/01.2019

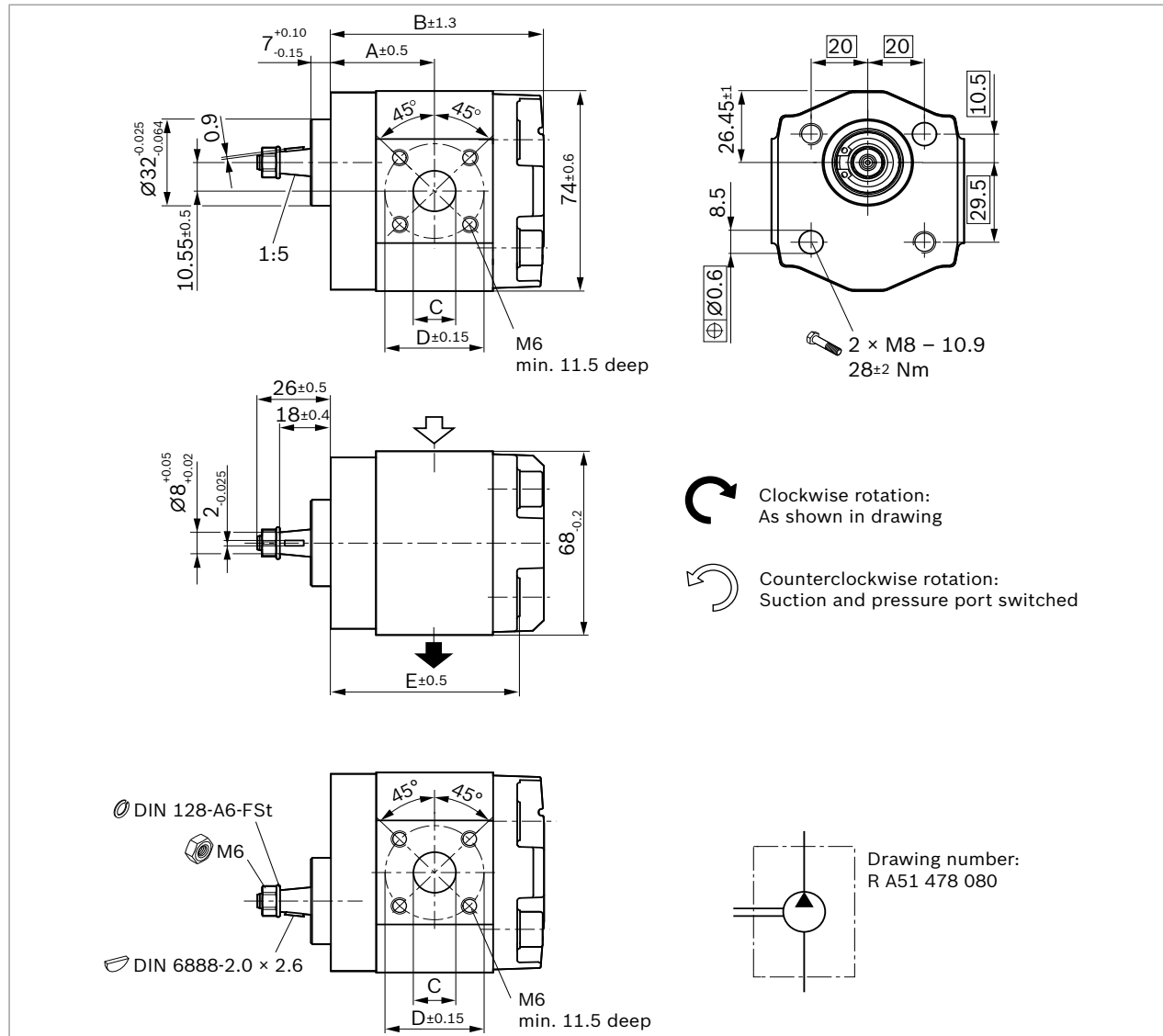
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Dimensions [mm]

External gear pump | **AZPB** 21
Dimensions – preferred series

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



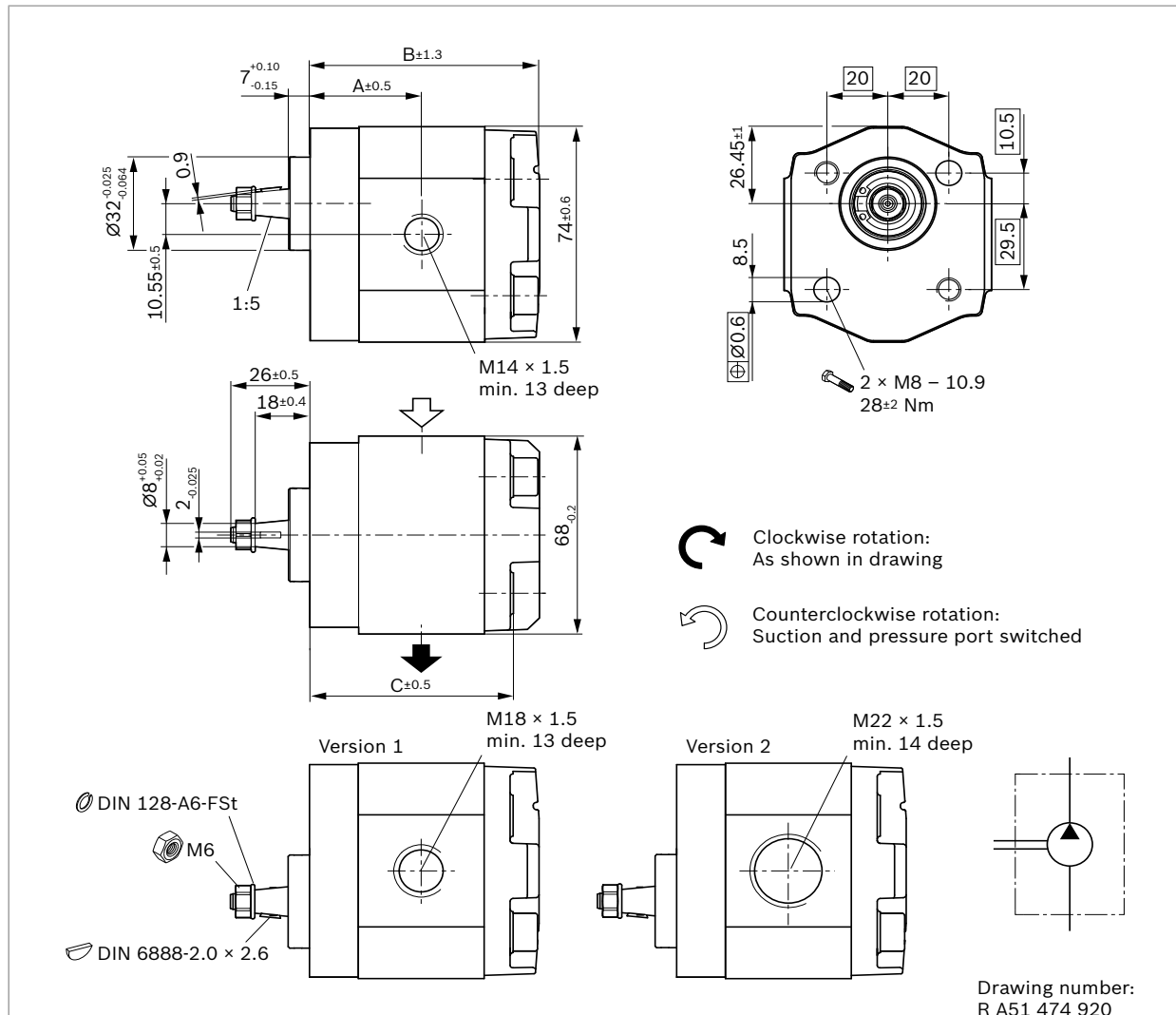
Size	Order number		Max. intermittent pressure p_2 [bar]	Max. rotational speed [rpm]	Dimensions				
	Direction of rotation	Counterclockwise			A	B	C	D	E
2.0	0510110332	0510110025	250	5000	32.8	67.9	12	30	59.0
2.5	0510110333	0510110026	250	5000	33.8	69.8	12	30	60.9
3.15	0510112325	0510112019	250	4000	35.0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

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▼ **1:5 tapered shaft with 2-hole mounting and metric thread**
AZPB-32- ... CP02MB/CP02KB¹⁾



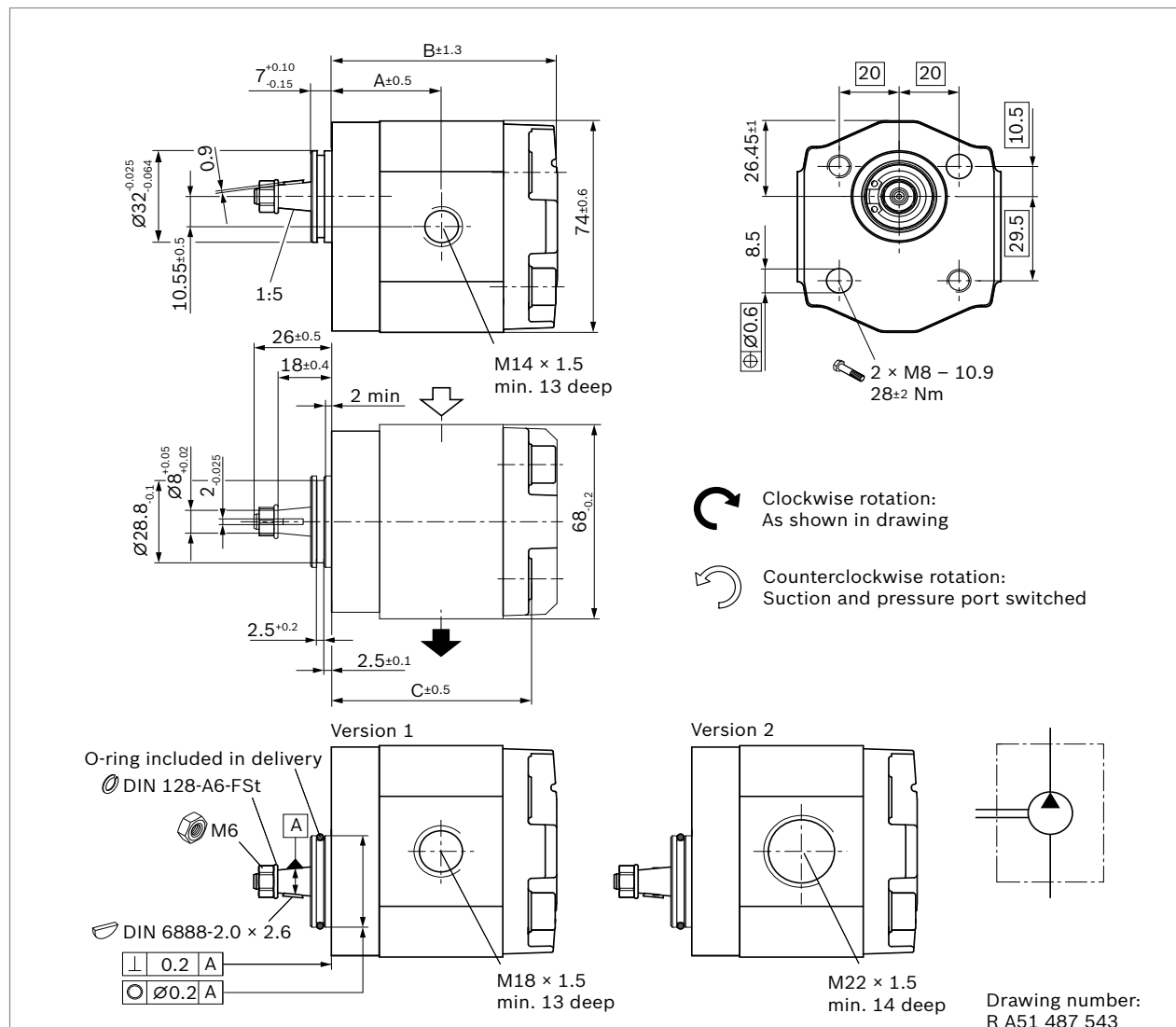
Size	Order number	Max. intermittent pressure p_2 [bar]	Max. rotational speed [rpm]	Dimensions			Version	
	Direction of rotation			A	B	C		
	Counterclockwise	Clockwise						
1.0	0510010313	0510010008	250	6000	30.9	64.1	55.2	1
2.0	0510110324	0510110017	250	5000	32.8	67.9	59.0	1
2.5	0510110325	0510110018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

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

Dimensions [mm]

External gear pump | **AZPB** 23
Dimensions – preferred series

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



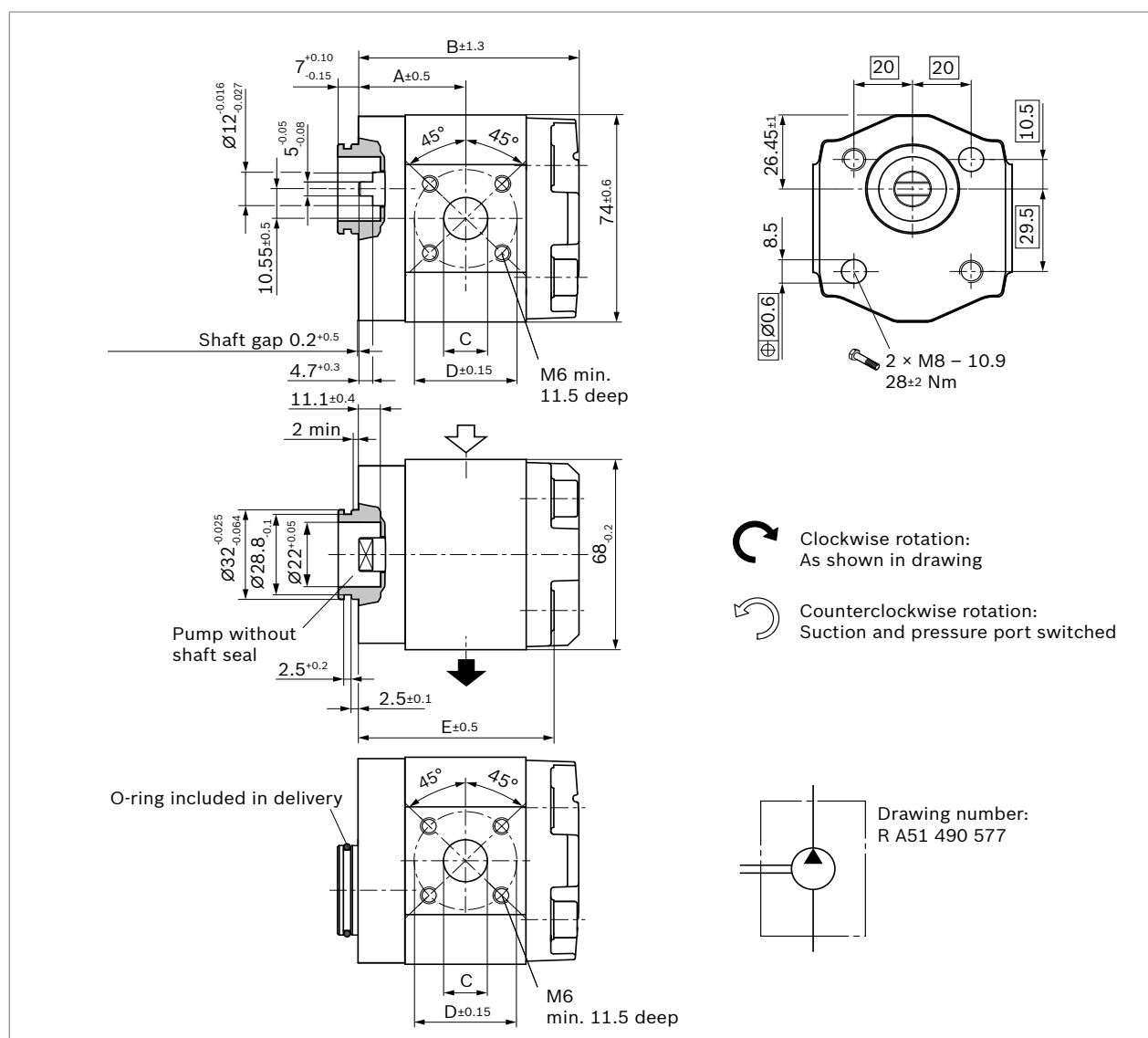
Size	Order number		Max. intermittent pressure p_2 [bar]	Max. rotational speed [rpm]	Dimensions			Version
	Direction of rotation				A	B	C	
	Counterclockwise	Clockwise						
1.0	0510010315	0510010010	250	6000	30.9	64.1	55.2	1
2.0	0510110328	0510010022	250	5000	32.8	67.9	59.0	1
2.5	0510110329	0510010023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

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24 **AZPB** | External gear pump
Dimensions – preferred series

Dimensions [mm]

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



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

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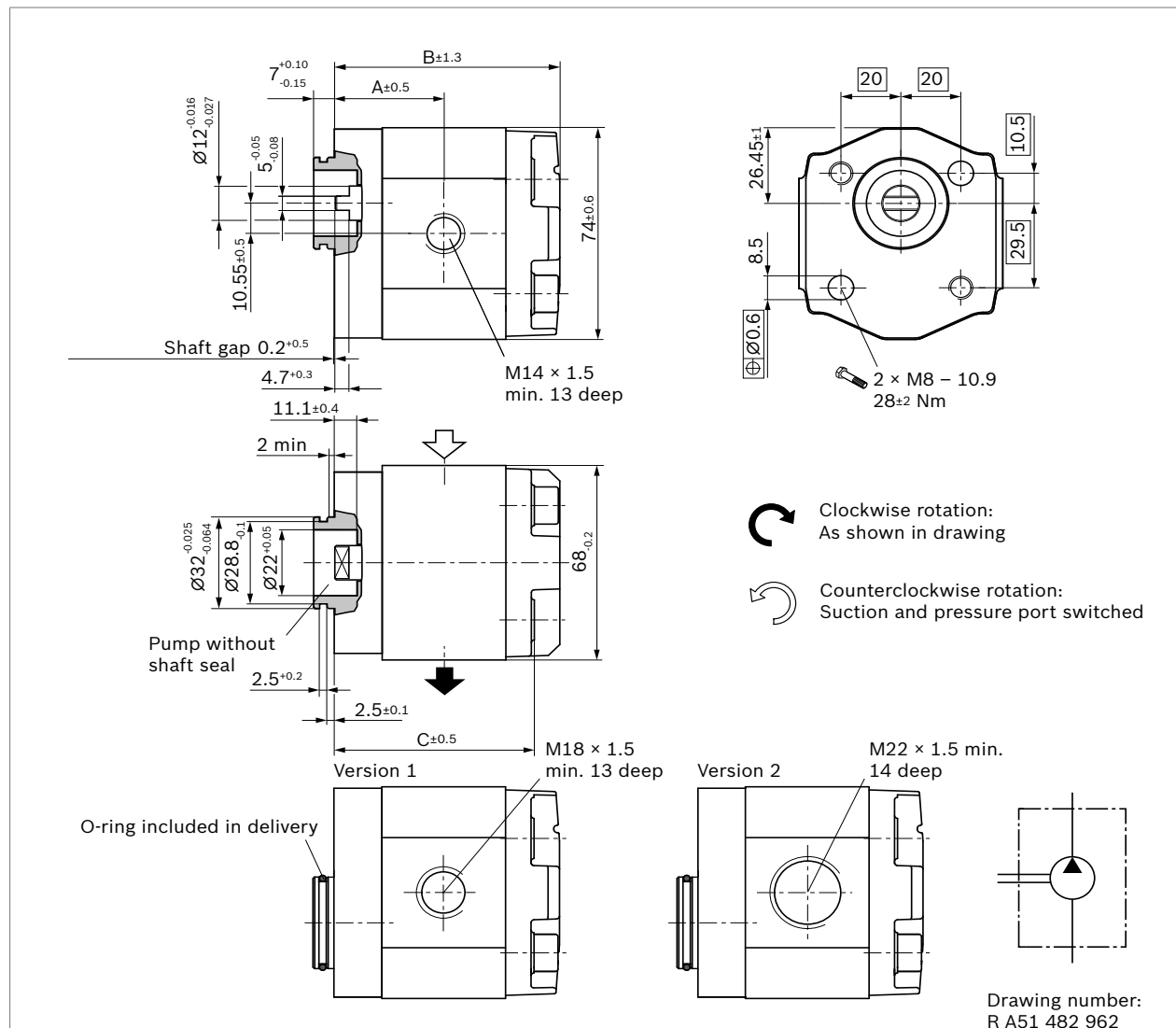
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Dimensions [mm]

External gear pump | **AZPB** 25
 Dimensions – preferred series

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



Size	Order number		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

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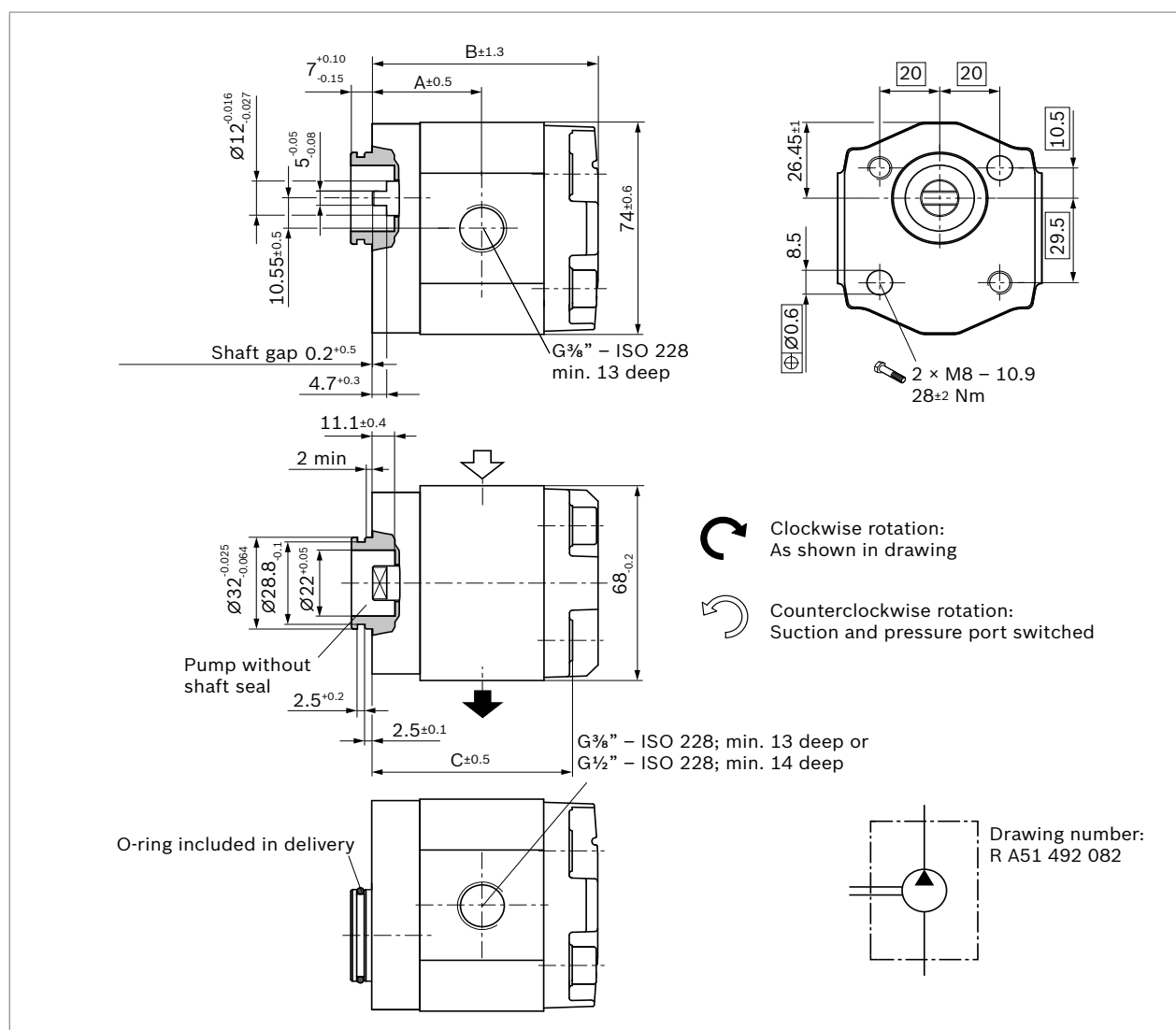
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26 **AZPB** | External gear pump
Dimensions – preferred series

Dimensions [mm]

▼ **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			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

Bosch Rexroth AG, RE 10088/01.2019

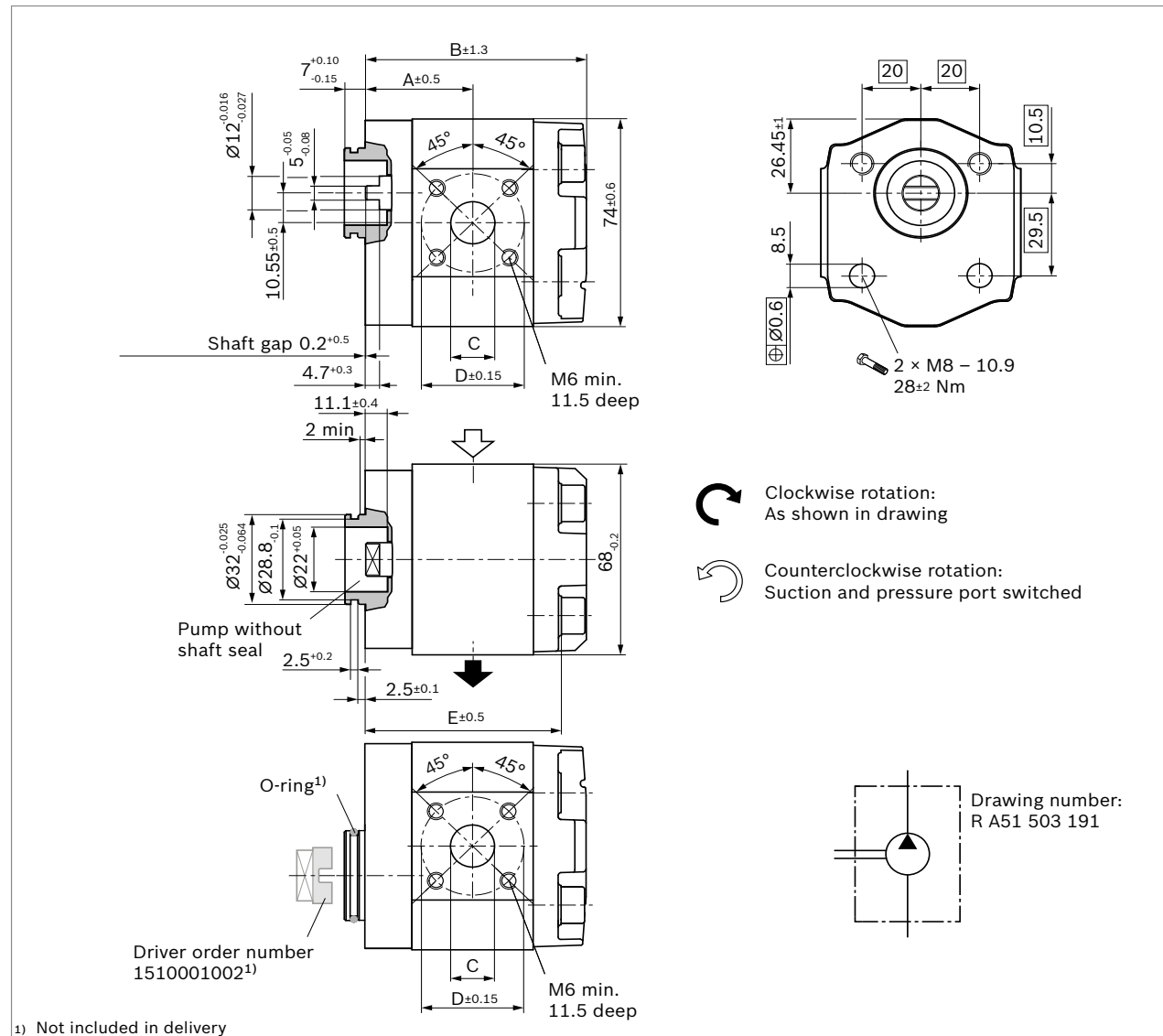
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Dimensions [mm]

External gear pump | **AZPB** 27
Dimensions – preferred series

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



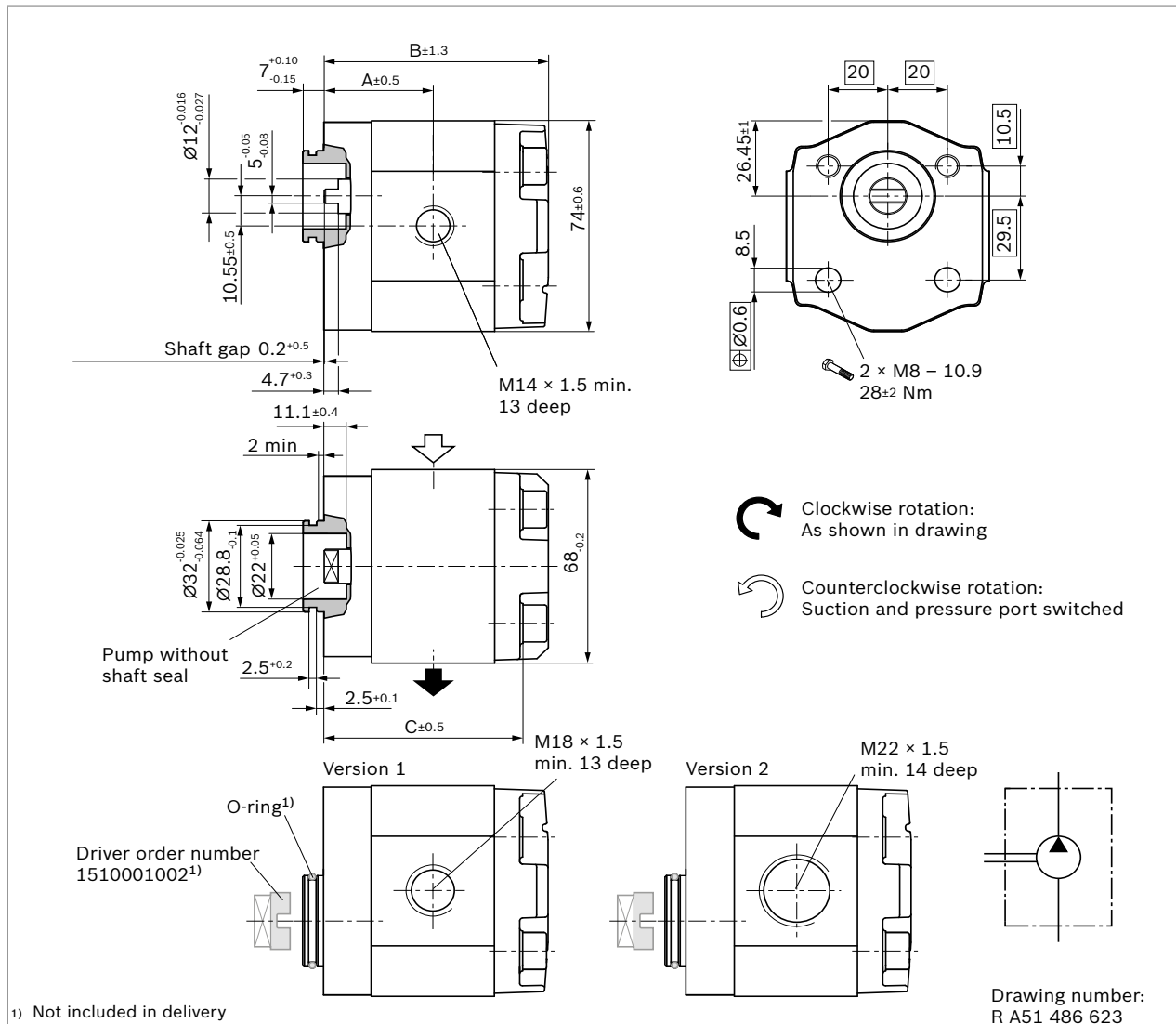
Size	Order number		Max. intermittent pressure p_2 [bar]	Max. rotational speed [rpm]	Dimensions				
	Direction of rotation				A	B	C	D	E
	Counterclockwise	Clockwise							
2.0	1519222469	1519222468	250	5000	32.8	67.9	12	30	59.0
2.5	1519222471	1519222470	250	5000	33.8	69.8	12	30	60.9
3.15	1519222473	1519222472	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

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28 **AZPB** | External gear pump
 Dimensions – preferred series

Dimensions [mm]

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



Size	Order number		Max. intermittent pressure p_2 [bar]	Max. rotational speed [rpm]	Dimensions			Version
	Direction of rotation	Counterclockwise			A	B	C	
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

Bosch Rexroth AG, RE 10088/01.2019

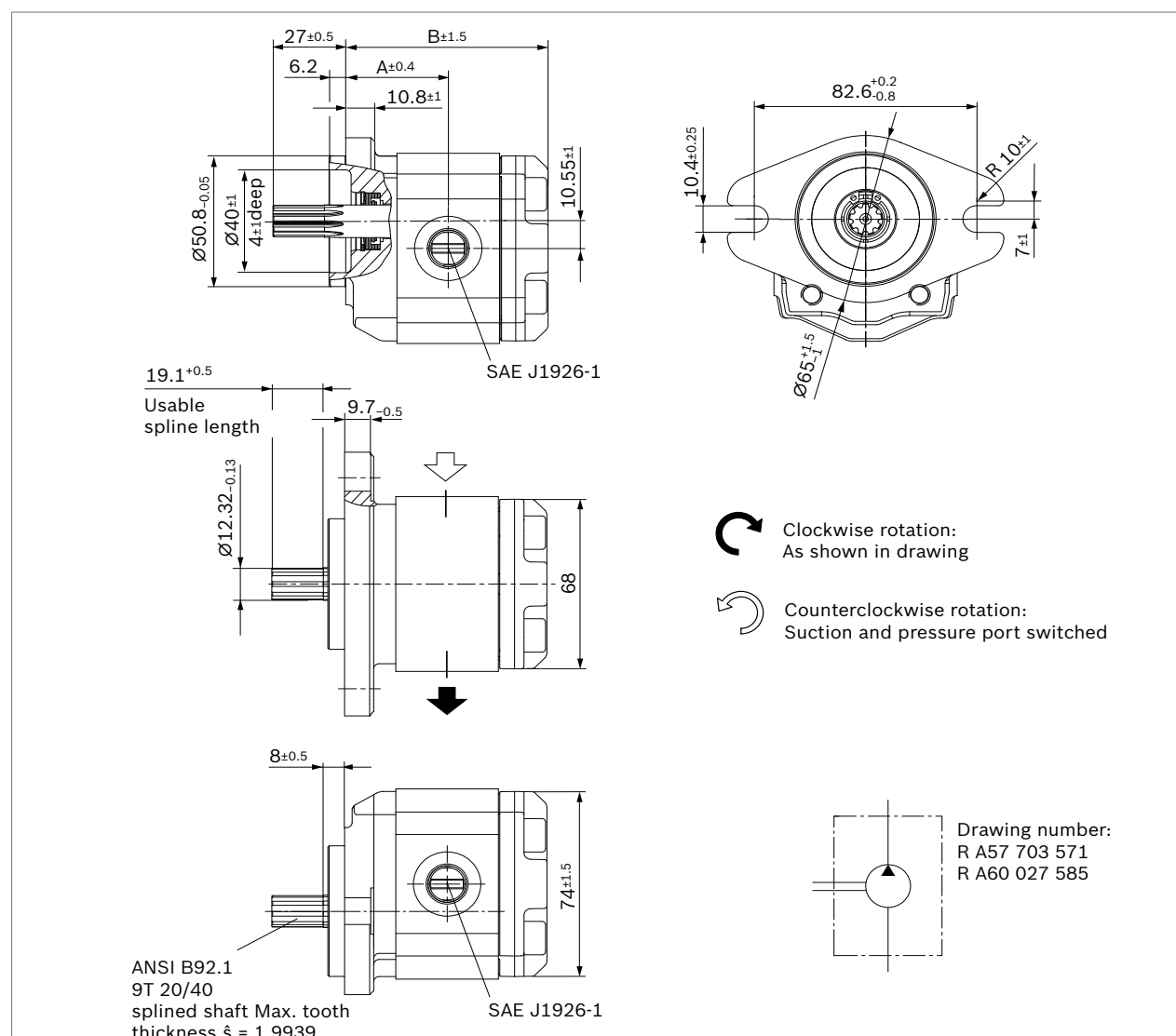
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Dimensions [mm]

External gear pump | **AZPB** 29
Dimensions – preferred series

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



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

RE 10088/01.2019, Bosch Rexroth AG

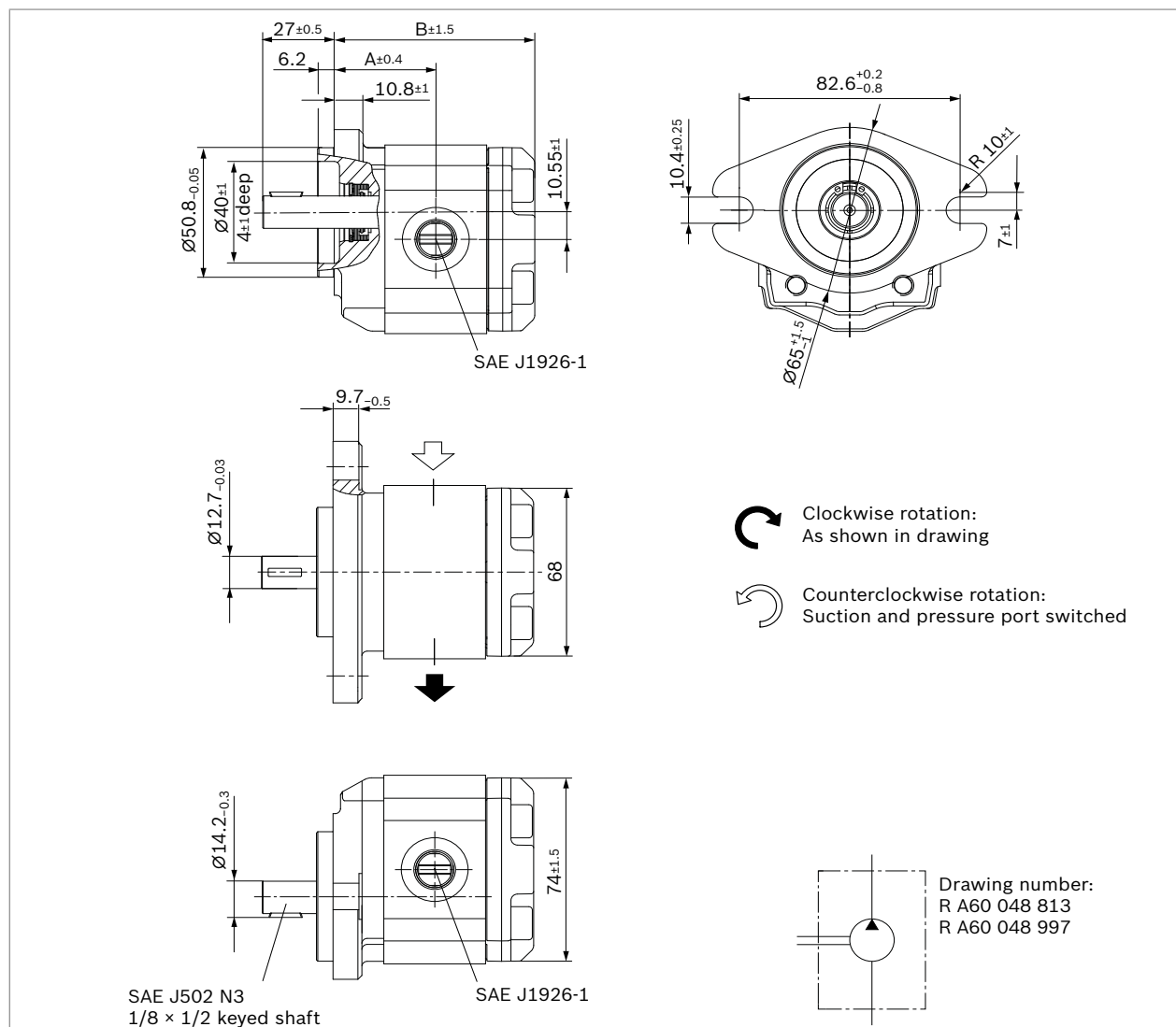
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30 **AZPB** | External gear pump
 Dimensions – preferred series

Dimensions [mm]

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



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

Bosch Rexroth AG, RE 10088/01.2019

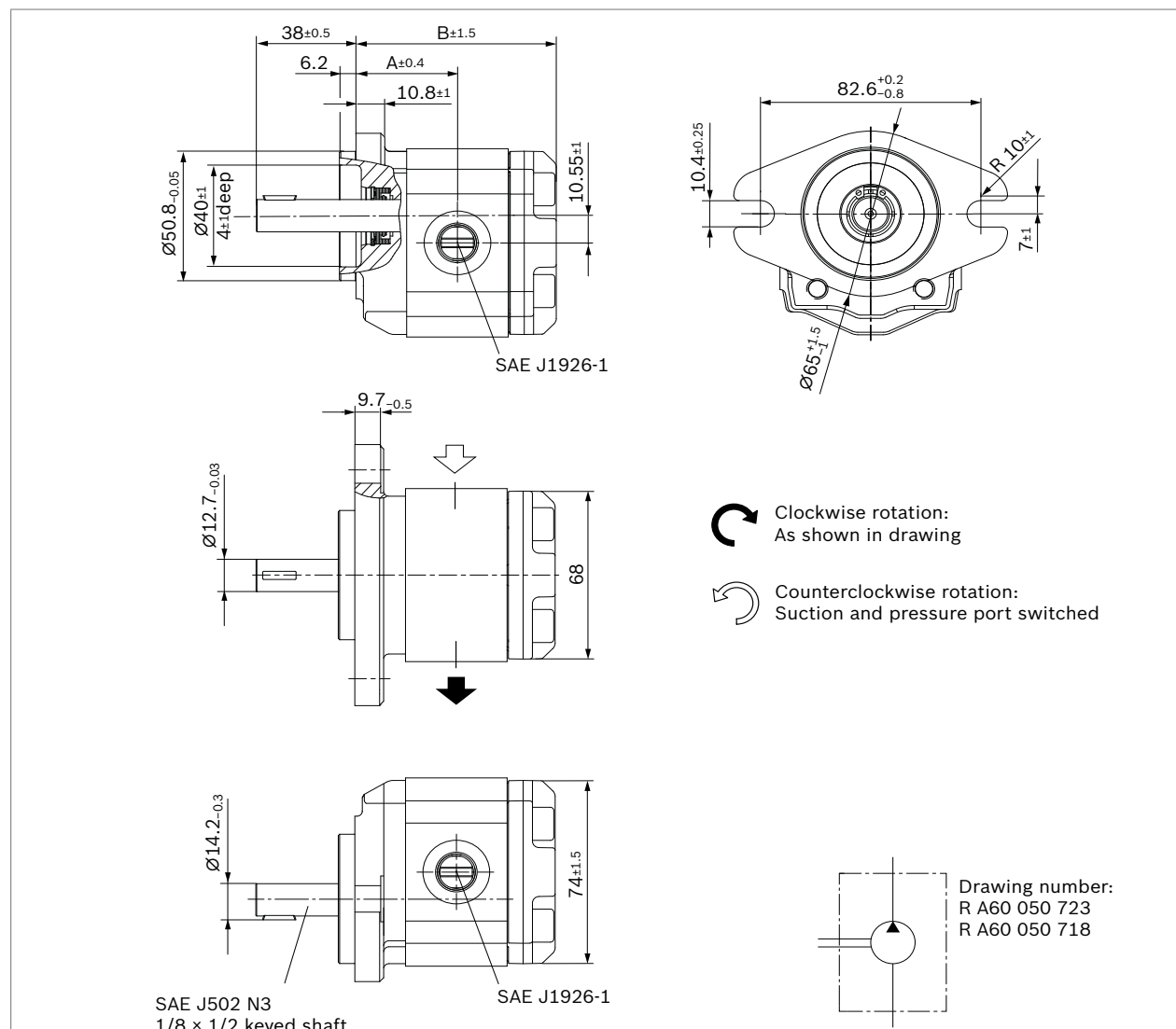
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Dimensions [mm]

External gear pump | **AZPB** 31
Dimensions – preferred series

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



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

RE 10088/01.2019, Bosch Rexroth AG

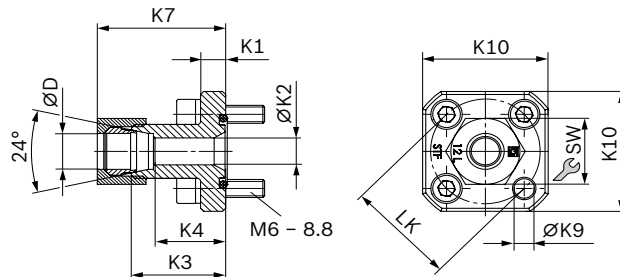
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Accessories

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

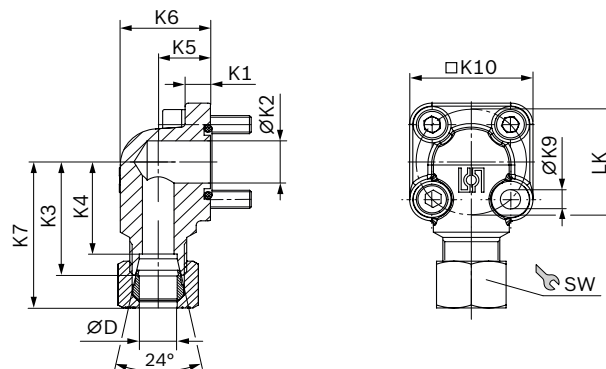
Complete fitting with O-ring, metric screw set, nuts and cutting ring.



LK	D	Series ¹⁾	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 ¹⁾	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).

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Order number overview

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0510120329	AZPB-32-4.0LHO20MB	19
0510120330	AZPB-32-4.5LHO20MB	19
0510120331	AZPB-32-5.0LHO20MB	19
0510120332	AZPB-32-6.3LHO20MB	19
0510120333	AZPB-32-7.1LHO20MB	19
0510120028	AZPB-32-2.0RHO20MB	19
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0510120031	AZPB-32-4.0RHO20MB	19
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0510120033	AZPB-32-5.0RHO20MB	19
0510120034	AZPB-32-6.3RHO20MB	19
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0510020303	AZPB-32-1.0LHO01MB	20
0510120318	AZPB-32-2.0LHO01MB	20
0510120319	AZPB-32-2.5LHO01MB	20
0510120320	AZPB-32-3.1LHO01MB	20
0510120321	AZPB-32-4.0LHO01MB	20
0510120322	AZPB-32-4.5LHO01MB	20
0510120323	AZPB-32-5.0LHO01MB	20
0510120324	AZPB-32-6.3LHO01MB	20
0510120325	AZPB-32-7.1LHO01MB	20
0510020003	AZPB-32-1.0RHO01MB	20
0510120020	AZPB-32-2.0RHO01MB	20
0510120021	AZPB-32-2.5RHO01MB	20
0510120022	AZPB-32-3.1RHO01MB	20
0510120023	AZPB-32-4.0RHO01MB	20
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0510120025	AZPB-32-5.0RHO01MB	20
0510120026	AZPB-32-6.3RHO01MB	20
0510120027	AZPB-32-7.1RHO01MB	20
0510110332	AZPB-32-2.0LCP20MB	21
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0510114338	AZPB-32-5.0LCP20MB	21
0510122324	AZPB-32-6.3LCP20MB	21
0510122325	AZPB-32-7.1LCP20MB	21
0510110025	AZPB-32-2.0RCP20MB	21
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0510010313	AZPB-32-1.0LCP02MB	22
0510110324	AZPB-32-2.0LCP02MB	22
0510110325	AZPB-32-2.5LCP02MB	22
0510112321	AZPB-32-3.1LCP02MB	22
0510114324	AZPB-32-4.0LCP02MB	22
0510114325	AZPB-32-4.5LCP02MB	22
0510114326	AZPB-32-5.0LCP02MB	22
0510122316	AZPB-32-6.3LCP02MB	22
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0510010008	AZPB-32-1.0RCP02MB	22
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0510114020	AZPB-32-5.0RCP02MB	22
0510122012	AZPB-32-6.3RCP02MB	22
0510122013	AZPB-32-7.1RCP02MB	22
0510010315	AZPB-32-1.0LCP02MB-S0177	23
0510110328	AZPB-32-2.0LCP02MB-S0177	23
0510110329	AZPB-32-2.5LCP02MB-S0177	23
0510112323	AZPB-32-3.1LCP02MB-S0177	23
0510114330	AZPB-32-4.0LCP02MB-S0177	23
0510114331	AZPB-32-4.5LCP02MB-S0177	23
0510114332	AZPB-32-5.0LCP02MB-S0177	23
0510122320	AZPB-32-6.3LCP02MB-S0177	23
0510122321	AZPB-32-7.1LCP02MB-S0177	23
0510010010	AZPB-32-1.0RCP02MB-S0177	23
0510010022	AZPB-32-2.0RCP02MB-S0177	23
0510010023	AZPB-32-2.5RCP02MB-S0177	23
0510112018	AZPB-32-3.1RCP02MB-S0177	23
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0510114035	AZPB-32-5.0RNM20MB	24
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0510010314	AZPB-32-1.0LNM02MB	25
0510110326	AZPB-32-2.0LNM02MB	25
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0510112322	AZPB-32-3.1LNM02MB	25
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0510114328	AZPB-32-4.5LNM02MB	25
0510114329	AZPB-32-5.0LNM02MB	25
0510122318	AZPB-32-6.3LNM02MB	25
0510122319	AZPB-32-7.1LNM02MB	25
0510010009	AZPB-32-1.0RNM02MB	25
0510010019	AZPB-32-2.0RNM02MB	25
0510010020	AZPB-32-2.5RNM02MB	25
0510112016	AZPB-32-3.1RNM02MB	25
0510114021	AZPB-32-4.0RNM02MB	25
0510114022	AZPB-32-4.5RNM02MB	25
0510114023	AZPB-32-5.0RNM02MB	25
0510122014	AZPB-32-6.3RNM02MB	25
0510122015	AZPB-32-7.1RNM02MB	25
0510010316	AZPB-32-1.0LNM01MB	26
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0510110331	AZPB-32-2.5LNM01MB	26
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0510114335	AZPB-32-5.0LNM01MB	26
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1519222444	AZPB-32-1.0LNY02MB	28
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R979107406	AZPB-32-4.5LQR12KB	30
R979107407	AZPB-32-5.0LQR12KB	30
R979107408	AZPB-32-6.3LQR12KB	30
R979107409	AZPB-32-7.1LQR12KB	30
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R979107376	AZPB-32-2.5RQR12KB	30
R979107377	AZPB-32-3.1RQR12KB	30
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R979107379	AZPB-32-4.5RQR12KB	30
R979107380	AZPB-32-5.0RQR12KB	30
R979107381	AZPB-32-6.3RQR12KB	30
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R979107388	AZPB-32-4.5RQR12KB-S0022	31
R979107389	AZPB-32-5.0RQR12KB-S0022	31
R979107390	AZPB-32-6.3RQR12KB-S0022	31
R979107391	AZPB-32-7.1RQR12KB-S0022	31

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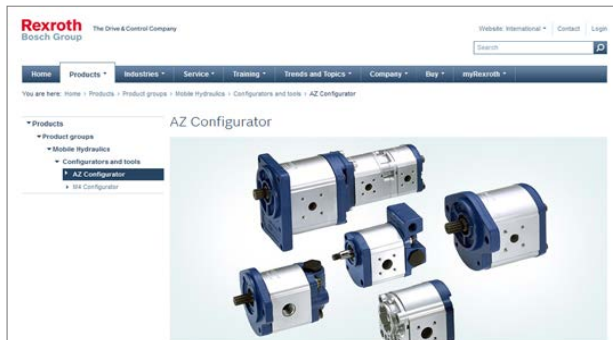
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