rexroth

A Bosch Company

External gear motor AZMG

- ▶ Platform G
- ▶ Fixed displacement
- ▶ Size 22 ... 45
- ▶ Continuous pressure up to 250 bar
- ▶ Maximum start-up pressure up to 280 bar

Features

- ▶ Consistently high quality due to high-volume series production
- ▶ Long service life
- ▶ Wide speed range
- ▶ Slide bearings for high loading
- ▶ Numerous configuration variants available
- ▶ Output shafts according to ISO or SAE and customer-specific solutions
- ▶ Line connection: Connection flanges
- ▶ High pressures though small installation space and low weight
- ▶ Wide viscosity and temperature range

## Contents

Functional description

General

The key task of external gear motors is to convert hydraulic energy (flow and pressure) into mechanical energy (torque and rotational speed). To reduce heat loss, Rexroth external gear motors are designed to be extremely efficient. This efficiency is achieved through pressure-dependent gap sealing and high-precision manufacturing technology. Rexroth external gear motors are available in four platforms: Platforms B, F, N and G, with different gear wheel widths within a platform for different displacements. Additional versions with different flanges, shafts and valve attachments are also available.

At external gear motors, you distinguish between motors for one direction of rotation and reversible motors.
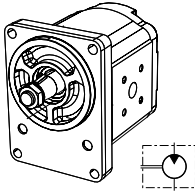
Gear motor for one direction of rotation

These gear motors are designed asymmetrically, i.e., fixed high-pressure and low-pressure sides. This means reversing operation is not possible. Motors require a special start-up sequence to ensure good efficiency. Any leakage oil is drained internally. The shaft seal limits drainage pressure.

▼ **Gear motor for one direction of rotation**
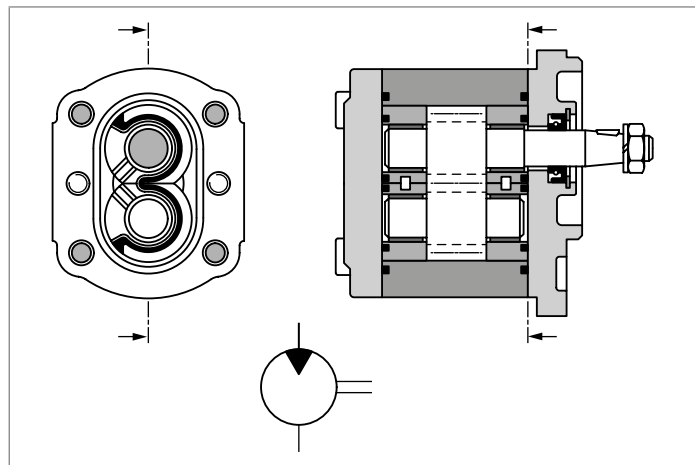
Product overview AZMG preferred types

Version	Page
	9

Type code

01	02		03	04		05	06	07	08	09	10	11	12		13
AZM	G	–			–									–	

External gear unit

01	External gear motor	**AZM**

Series

02	22.5 cm³/rev to 45 cm³/rev, high performance, platform G	**G**

Series

03	Bearing pin Ø26 mm	**2**

Version

04	Corrosion-resistant, pinned	**2**

Size (NG)

05	Geometric displacement V_g [cm³], see chapter "Technical data"	**022**	**032**	**045**

Direction of rotation

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

Drive shaft   **Suitable front cover**

07	Tapered shaft	1 : 5	B	**C**

Front cover

08	Rectangular flange	Ø 105 mm	**B**

Line connection

09	Square flange		**20**

Sealing material

10	NBR (nitrile rubber)	**M**

End cover

11	Without valve (standard)	**B**

Technical data

▼ **Table of values**

Size					**22**	**32**	**45**
Series						Series 2x	
Displacement			V_g	cm^3	22.5	32	45
Motor inlet pressure		maximum continuous pressure	p_1	bar	250	250	250
		maximum start-up pressure	p_2	bar	280	280	280
		maximum pressure peak	p_3	bar	300	300	300
		minimum inlet pressure abs.[1]	p_{min}	bar	0.7	0.7	0.7
Motor output pressure		abs.	p_A	bar	3	3	3
		upon start-up	p_A	bar	10	10	10
Rotational speed minimum with	v = 12 mm^2/s	p < 100 bar	n_{min}	rpm	500	500	500
		p = 100 ... 180 bar	n_{min}	rpm	1200	1000	800
		p = 180 bar ... p_2	n_{min}	rpm	1400	1400	1000
	v = 25 mm^2/s	at p_2	n_{min}	rpm	600	500	500
Rotational speed maximum		at p_1	n_{max}	rpm	3000	2800	2600

General data	
Installation position	No restrictions
Type of mounting	See offer drawing
Line connections	See chapter "Dimensions – line connection"
Direction of rotation viewed on drive shaft	One direction of rotation (motor rotation is only admissible in the indicated direction)
Drive shaft loading	Axial and radial forces on request only

▼ **Pressure definition**
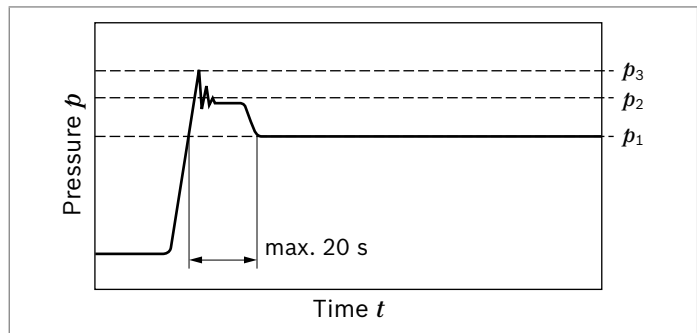
p_1 Maximum continuous pressure
p_2 Maximum start-up pressure
p_3 Maximum pressure peak

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[1] To avoid low inlet pressures with fast reduction of the inlet amount and large flywheel mass of the consumer, an anti-cavitation valve with correspondingly low pressure drop is to be provided.

Determining characteristics

|			
Inlet flow	q_v	$= \dfrac{V_g \times n}{1000 \times \eta_v}$	[l/min]
Rotational speed	n	$= \dfrac{q_V \times 1000 \times \eta_V}{V_g}$	[rpm]
Torque	M	$= \dfrac{V_g \times \Delta p \times \eta_{hm}}{20 \times \pi}$	[Nm]
Power	P	$= \dfrac{2\,\pi \times M \times n}{60000} = \dfrac{q_v \times \Delta p \times \eta_t}{600}$	[kW]

Key

V_g Displacement per revolution [cm³]
Δp Differential pressure [bar] ($\Delta p = p_1 - p_A$)
n Rotational speed [rpm]
q_v Inlet flow [l/min]
M Torque [Nm]
P Power [kW]
η_v Volumetric efficiency[1]
η_{hm} Hydraulic-mechanical efficiency[1]
η_t Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)[1]
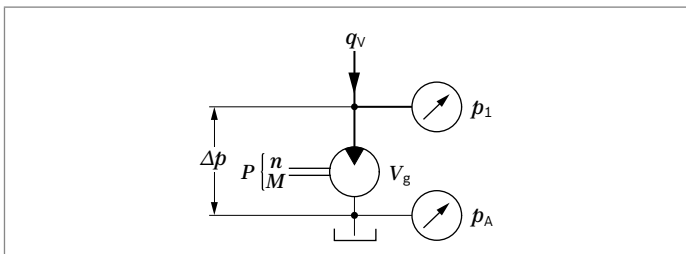
Notice

▶ Please observe the safety requirements for the overall system.
▶ Please contact us regarding applications with frequent load cycles.
▶ In the "Diagrams/characteristic curves" chapter, you can find diagrams for a rough calculation.

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

Counter-clockwise rotation   Counter-clockwise rotation

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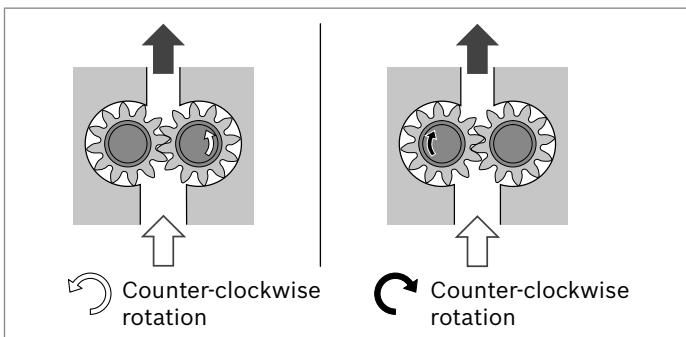
1) Parameter as a decimal, e.g. 0.9

Hydraulic fluid

The external gear unit is designed for operation with
HLP mineral oil according to DIN 51524 1–3. For higher
loading, Bosch Rexroth recommends HLP according
to DIN 51524 Part 2 as a 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 project planning:
▶ 90220: Hydraulic fluids based on mineral oils and
    related hydrocarbons

**Explanation regarding the selection of hydraulic fluid**
Selection of hydraulic fluid shall make sure that
the operating viscosity in the operating temperature range
is within the optimal range (ν_{opt}; see selection diagram).

Viscosity and temperature of hydraulic fluids

Viscosity range

Permissible in continuous operation	ν = 12 ... 800 mm²/s
Recommended in continuous operation	ν_{opt} = 20 ... 100 mm²/s
Permissible for cold start	ν_{max} ≤ 2000 mm²/s

Temperature range

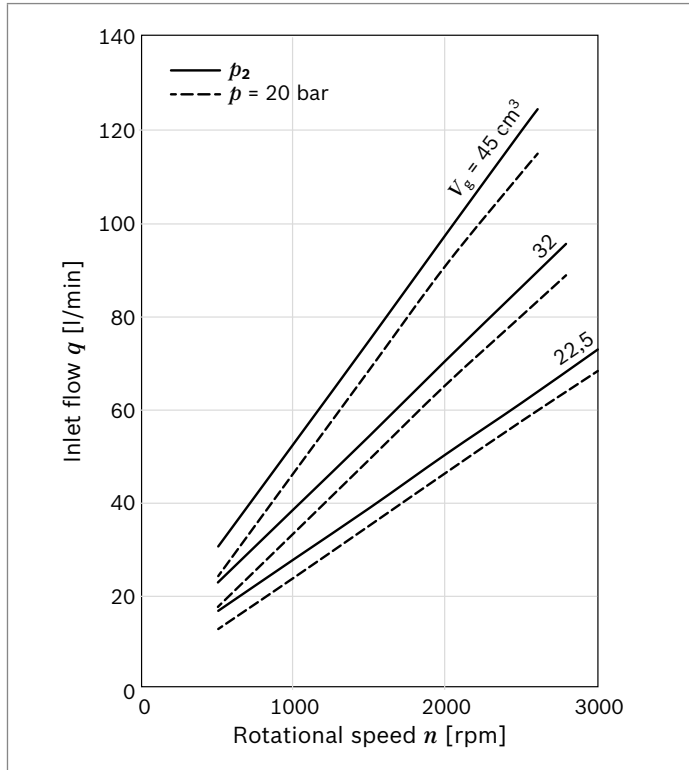|	
With NBR seals (NBR = nitrile rubber)	t = -30 °C ... +80 °C
With FKM seals (FKM = fluoroelastomer)	t = -20 °C ... +110 °C

▼ **Selection diagram**
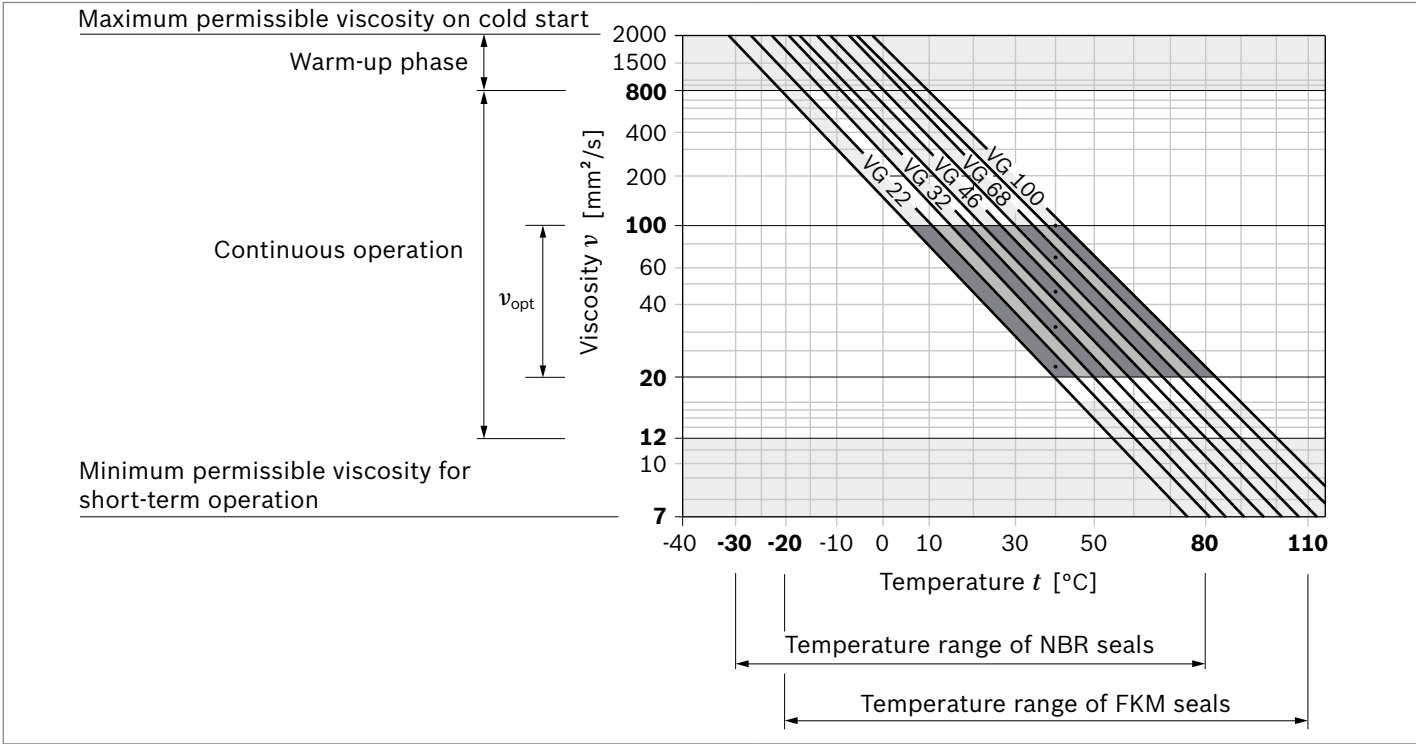
1) Other hydraulic fluids on request.

Diagrams/characteristic curves

Inlet flow characteristic curves

▼ **Inlet flow**
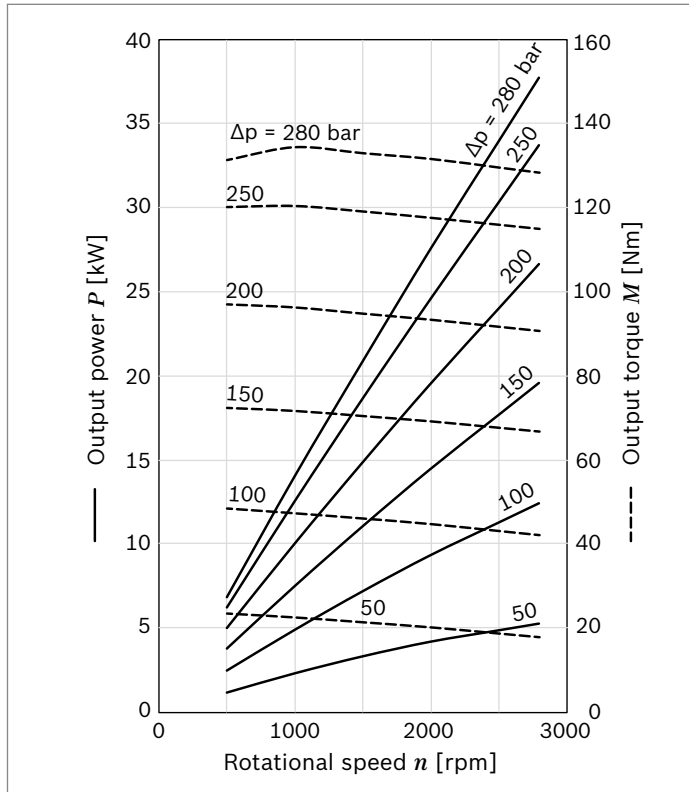

Performance charts
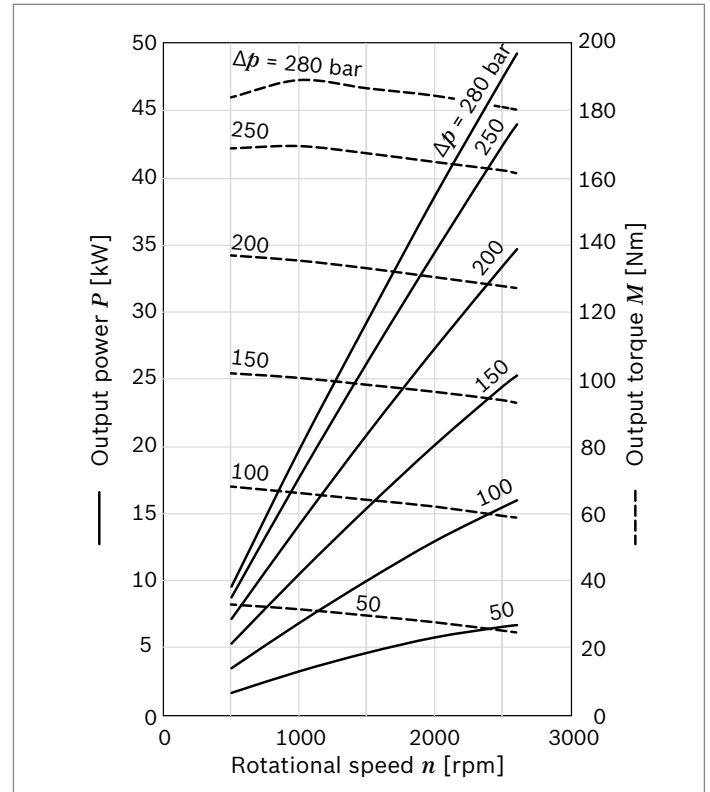
▼ **Size 22**
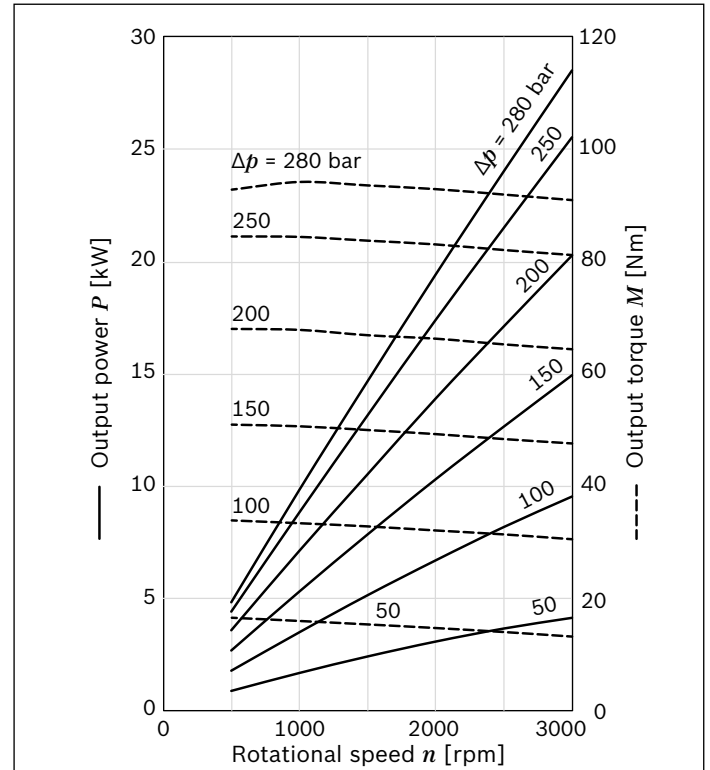
▼ **Size 32**

▼ **Size 45**

Notice

Characteristic curves measured at $v = 32$ mm^2/s and $t = 50$ °C.

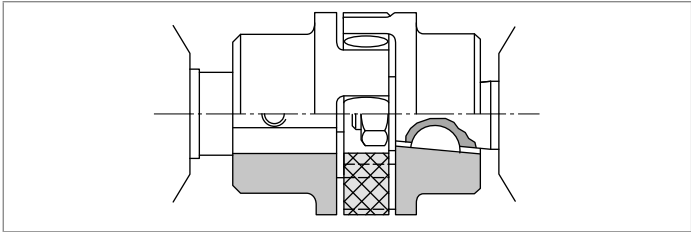$P = f(n, p)$ incl. η_t ⎯⎯⎯

$M = f(n, p)$ incl. η_{hm} ------

Output dri ves

1. Elastic couplings

▸ The coupling should not transfer any radial or axial forces to the motor.

▸ The maximum radial runout deviation from the motor shaft to the spigot should not exceed 0.2 mm.

▸ See the coupling manufacturer's assembly instructions for permissible shaft misalignment tolerances.
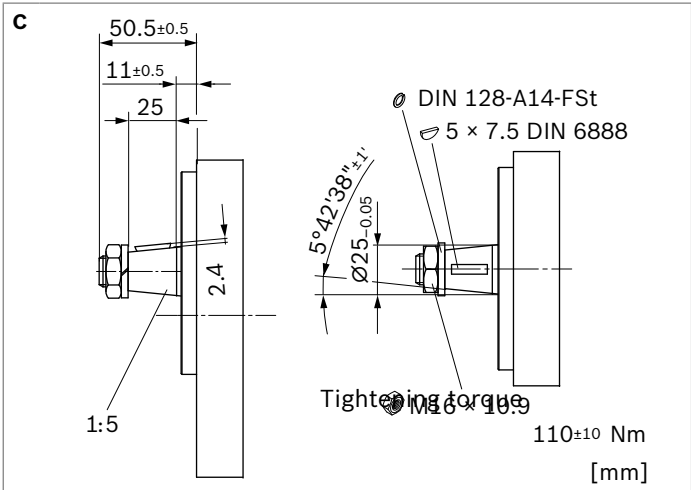

Max. transmissible output torques

Tapered shaft

Drive shaft		Front cover	M_{max}	Size	$p_{2\,max}$
Code	Designation	Code	Nm		bar
C	1 : 5	B	290	22 ... 45	280

1)

Dimensions − drive shaft

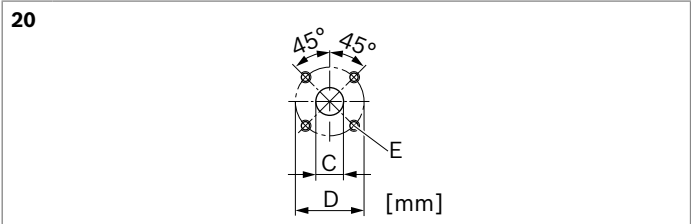▼ **1:5 tapered shaft**

Dimensions − front cover

1)

▼ **Rectangular flange ⌀105 mm**
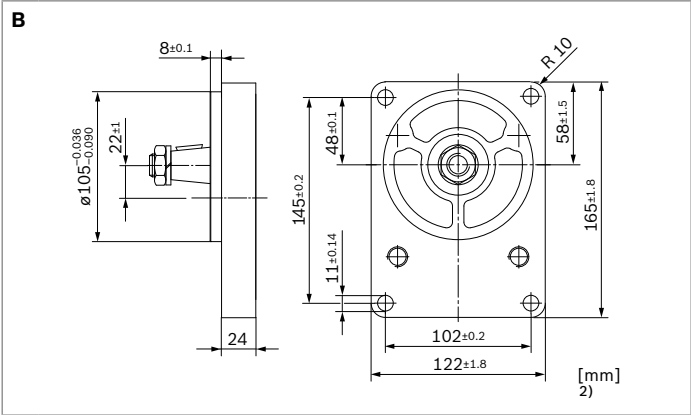
Dimensions − standard line connection

▼ **Square flange**

Direction of rotation	Series	Size	Upstream side			Downstream side		
			C	D	E	C	D	E
right/left	2x	22 ... 45	18	55	M8; 13 deep	26	55	M8; 13 deep

Dimensions – preferred series

▼ **1:5 tapered shaft with rectangular flange ∅105 mm**
  AZMG–...–xCB20MB

As shown in drawing

Upstream and downstream
side exchanged

DIN 128-A14-FSt

M16 × 1.5

DIN 6888 – 5 × 7.5

Drawing number
A511 440 016

[mm]
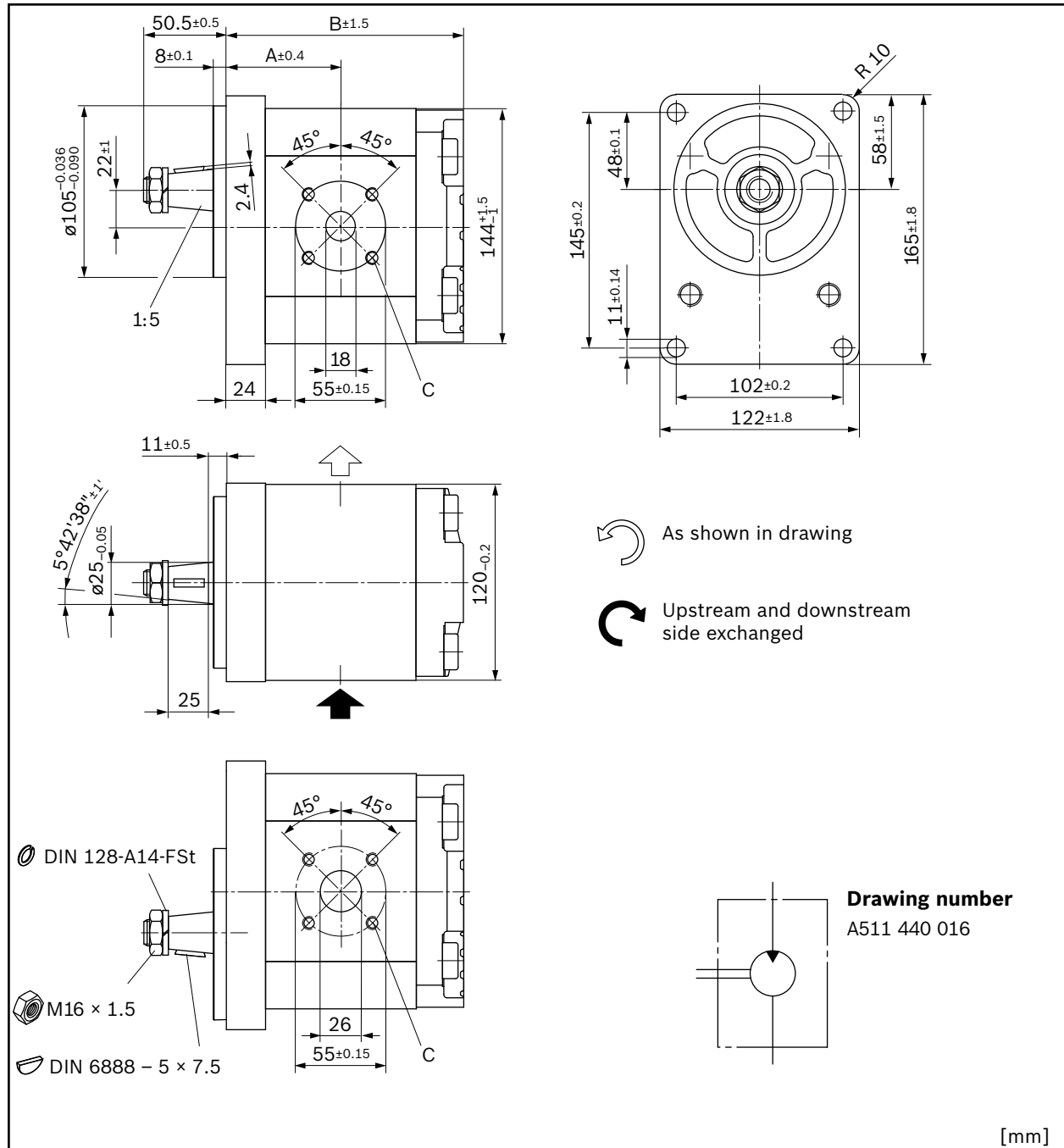
NG	Order number Direction of rotation		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Counter-clockwise	Clockwise			A	B	C
22	0511725317	0511725036	280	3000	60.9	124.6	M8; min. 13 deep
32	0511725318	0511725037	280	2800	64.8	132.4	
45	0511725319	0511725038	280	2600	70.1	143.1	

Accessories

▼ 90° angle flange, for square flange 20 (see chapter "Line connection")

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

LK	D	Series[1]	Material number	p_{max}	K1	K2	K3	K4	K5	K6	K7	K9	K10	SW	Screws		O-ring	Weight
mm	mm			bar	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	2 ×	2 ×	NBR	kg
55	20	S	1515702004	250	13	18.2	45	34.5	24	38	57.0	8.4	58	36	M8 × 25	M8 × 50	32 × 2.5	0.62
55	30	S	1515702006	250	12	26.5	49	38.5	32	51	63.5	8.4	58	50	M8 × 25	M8 × 50	32 × 2.5	0.63
55	35	L	1515702005	100	12	26.5	49	38.5	32	52	61.0	8.4	58	50	M8 × 25	M8 × 60	32 × 2.5	0.77
55	42	L	1515702019	100	12	26.5	49	38.0	40	64	61.5	8.4	58	60	M8 × 25	M8 × 70	32 × 2.5	1.04

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).
Motors delivered by Bosch Rexroth are tested for function and performance.
The motor should only be operated with the permissible data (see page chapter "Technical data").

Characteristic curves

When dimensioning the gear motor, observe the maximum possible application data based on the characteristic curves.

Filtration of the hydraulic fluid

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

Bosch Rexroth generally recommends full-flow filtration. Basic contamination of the hydraulic fluid used may not exceed level 20/18/15 according to ISO 4406. Experience has shown that even new fluids are often above this value. In this case, a filling device with a special filter should be used.
Bosch Rexroth does not accept any warranty for wear due to contamination.

Further information

Installation drawings and dimensions are valid at date of publication, subject to modifications.
Further information and notes on project planning can be found in the "General instruction manual for external gear units" (07012-B1, Chapter 5.5).

Order number overview

Order number	Type	Page
0511725036	AZMG−22−022RCB20MB	9
0511725317	AZMG−22−022LCB20MB	9
0511725037	AZMG−22−032RCB20MB	9
0511725318	AZMG−22−032LCB20MB	9
0511725038	AZMG−22−045RCB20MB	9
0511725319	AZMG−22−045LCB20MB	9