

External gear motor AZMF



- ▶ Platform F
- ▶ Fixed displacement
- ▶ Size 8 ... 28
- ▶ 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
- ▶ Optional reversible version for 2- and 4-quadrant operation
- ▶ Numerous configuration variants available
- ▶ Output shafts according to ISO or SAE and customer-specific solutions
- ▶ Line connections: Connection flanges or screw-in threads
- ▶ High pressures though small installation space and low weight
- ▶ Wide viscosity and temperature range

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Functional description

General

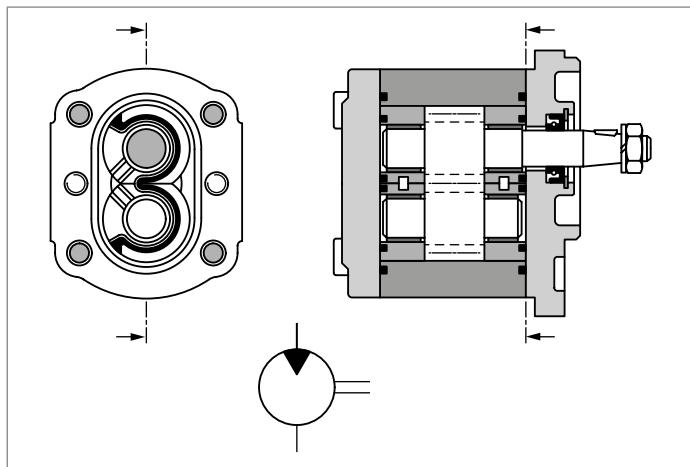
The key task of external gear motors is to convert hydraulic energy (flow and pressure) into mechanical energy (torque and rotational speed). To reduce heat loss, Rexroth external gear motors are designed to be extremely efficient. This efficiency is achieved through pressure-dependent gap sealing and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

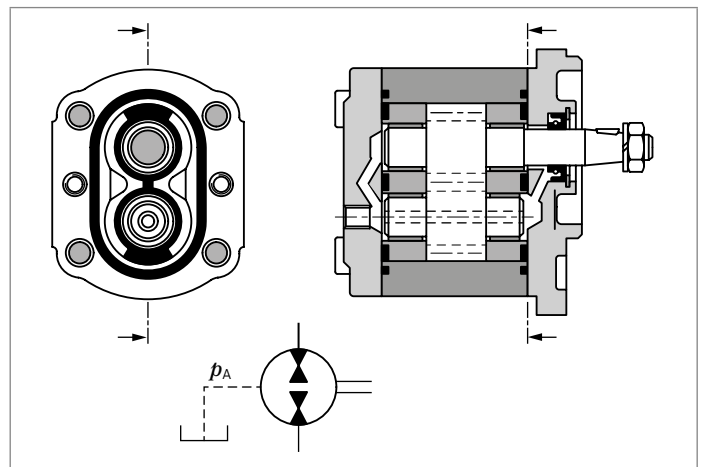
▼ Gear motor for one direction of rotation



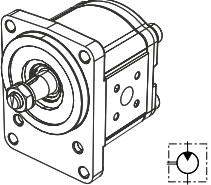
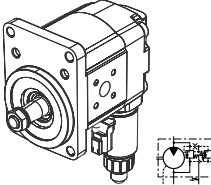
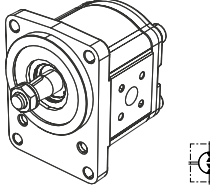
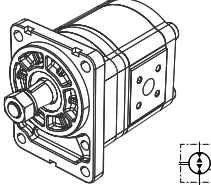
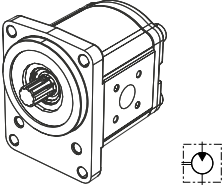
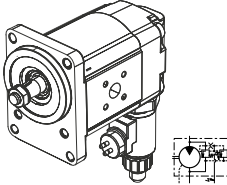
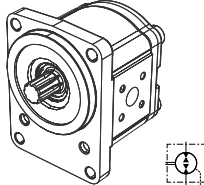
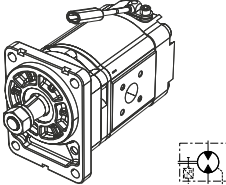
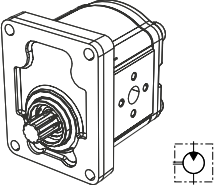
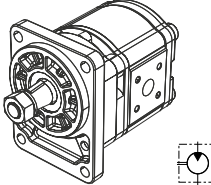
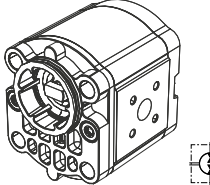
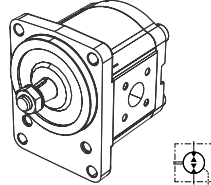
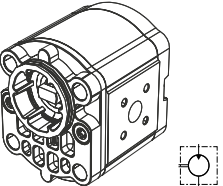
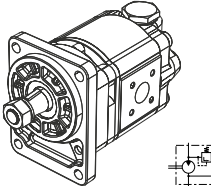
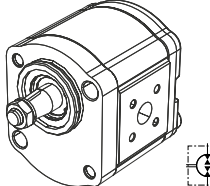
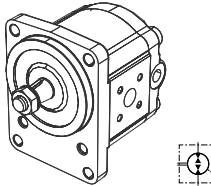
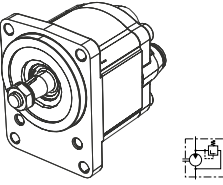
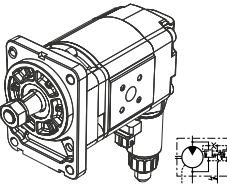
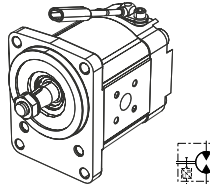
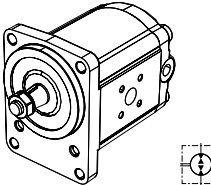
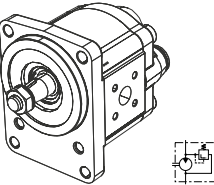
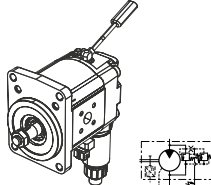
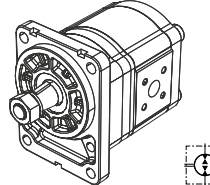
Gear motor, reversible

Due to their symmetrical layout, the high-pressure and low-pressure chambers are separate from the bearing and shaft seal chambers. Any leakage oil is drained through a separate drain port in the housing cover. This drainage allows the motor to run in reverse, making series connections possible. Standard motors and pumps can only withstand up to approx. 3 bar abs. due to the connection between the shaft seal and the low-pressure side. The figure shows a reversible motor for 4-quadrant operation, i.e., output drive torque and drive torque in both directions (motor functions as a pump when the load is reversed).

▼ Gear motor, reversible



AZMF preferred types product overview

Version	Page	Version	Page	Version	Page	Version	Page
	16		22		32		38
	17		24		33		39
	18		26		34		40
	19		27		35		41
	20		28		36		42
	21		30		37		

Type code

01	02	03	04	05	06	07	08	09	10	11	12	13
AZM	F	-			-							-

External gear unit

01	External gear motor	AZM
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Series

02	8 cm³/rev to 28 cm³/rev, high performance, platform F (5 cm³, upon request)	F
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Series

03	Bearing pin Ø18 mm	1
	Bearing pin Ø20 mm	2

Version

04	Phosphated	0
	Phosphated, pinned	1
	Corrosion-resistant, pinned	2
	with proportional valve	3

Size (NG)

05	Geometric displacement V_g [cm³], see chapter "Technical data"	005 ¹⁾	008	011	014	016	019	022	025	028
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Direction of rotation

06	Viewed on drive shaft	clockwise	R
		counter-clockwise	L
		reversible	U

Drive shaft

Suitable front cover

07	Tapered shaft	1 : 5	B, N	C
		1 : 5	A	S
	Tang drive		T	N
	Splined shaft	DIN 5482 B17 × 14	B, O	F

Front cover

08	Outrigger bearing	Ø 80 mm	Type 1	A
	Rectangular flange	Ø 80 mm		B
		Ø 36.47 mm		O
	2-bolt mounting	Ø 50 mm		N
	4-bolt mounting	Ø 52 mm	with O-ring	T

Line connection

09	Square flange		20
	Square flange		30

Sealing material

10	NBR (nitrile rubber)	M
	FKM (fluoroelastomer)	P

1) On request

01	02	03	04	05	06	07	08	09	10	11	12	13
AZM	F	-			-							-

End cover

11	Without valve (standard)	B
	Pressure relief valve with residual flow internal	D
	Proportional pressure relief valve	G
	Drain port (axial)	L

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

12	Pressure relief valve e.g. 200 bar	200XX
	Proportional pressure relief valve e.g. 180 bar	180XX

Special version

13	Connection in end cover "D"	S0076
	Tang drive with coupling	S0184
	Proportional pressure relief valve with an internal resistor of 11.5 Ω	S0458
	Dust protection cover for shaft seal	S0540
	Dust protection cover for shaft seal, radial drain port in the end cover	S0570
	Proportional pressure relief valve KBVS.3	S0689
	Fan motor with speed sensor, pulse encoder wheel with 9 teeth	S0747

Technical data

▼ Table of values

Size				8	11	14	16	19	22	
Series				Series 1x						
Displacement			V_g	cm ³	8	11	14	16	19	22.5
Motor inlet pressure		maximum continuous pressure	p_1	bar	250	250	250	250	210	180
		maximum start-up pressure	p_2	bar	280	280	280	280	230	210
		maximum pressure peak	p_3	bar	300	300	300	300	250	230
		minimum inlet pressure abs. ²⁾	$p_{\min}$	bar	0.7	0.7	0.7	0.7	0.7	0.7
Motor output pressure for	reversible motors		p_A	bar	≤ continuous pressure					
	non-reversible motors	abs.	p_A	bar	3	3	3	3	3	3
		upon start-up	p_A	bar	10	10	10	10	10	10
		Motors with proportional pressure relief valve	max.	p_A	bar	40	40	40	40	40
Pressure in the drain port maximum ¹⁾		abs.	p_L	bar	3	3	3	3	3	3
		upon start-up	p_L	bar	10	10	10	10	10	10
Rotational speed minimum with	$v = 12 \text{ mm}^2/\text{s}$	$p < 100 \text{ bar}$	$n_{\min}$	rpm	500	500	500	500	500	500
		$p = 100 \dots 180 \text{ bar}$	$n_{\min}$	rpm	1000	1000	800	800	800	800
		$p = 180 \text{ bar} \dots p_2$	$n_{\min}$	rpm	1400	1200	1000	1000	1000	1000
	$v = 25 \text{ mm}^2/\text{s}$	at p_2	$n_{\min}$	rpm	700	600	500	500	500	500
Rotational speed maximum		at p_2	$n_{\max}$	rpm	4000	3500	3000	3000	3000	2500
Rotational speed maximum		at p_2 and 50% duty cycle	$n_{\max}$	rpm	4500	4000	3500	3500	3500	3000

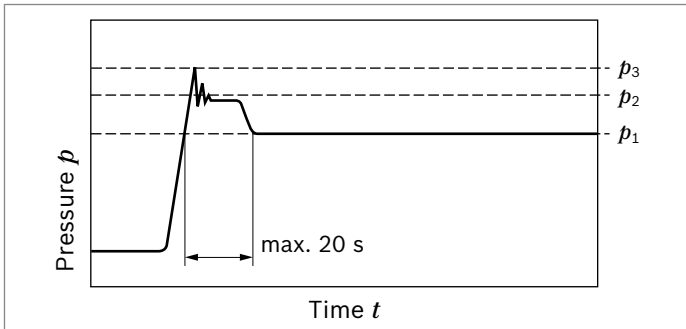
Size				19	22	
Series				Series 2x		
Displacement		V_g	cm ³	19	22.5	
Motor inlet pressure	maximum continuous pressure	p_1	bar	250	220	
	maximum start-up pressure	p_2	bar	280	250	
	maximum pressure peak	p_3	bar	300	280	
	minimum inlet pressure abs. ²⁾	$p_{\min}$	bar	0.7	0.7	
Motor output pressure for	reversible motors	p_A	bar	≤ continuous pressure		
	non-reversible motors	abs.	p_A	bar	3	3
		upon start-up	p_A	bar	10	10
	Motors with proportional pressure relief valve	max.	p_A	bar	40	40
Pressure in the drain port maximum ¹⁾		abs.	p_L	bar	3	3
		upon start-up	p_L	bar	10	10
Rotational speed minimum with	v 12 mm ² /s	p < 100 bar	$n_{\min}$	rpm	500	500
		p = 100 ... 180 bar	$n_{\min}$	rpm	800	800
		p = 180 bar ... p_2	$n_{\min}$	rpm	1000	1000
	v = 25 mm ² /s	at p_2	$n_{\min}$	rpm	800	800
Rotational speed maximum		at p_2	$n_{\max}$	rpm	3500	3500
Rotational speed maximum		at p_2 and 50% duty cycle	$n_{\max}$	rpm	4000	4000

1) For reversible motors

2) 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.

General data	
Installation position	No restrictions ¹⁾
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) or reversible.
Drive shaft loading	Axial and radial forces on request only

▼ Pressure definition



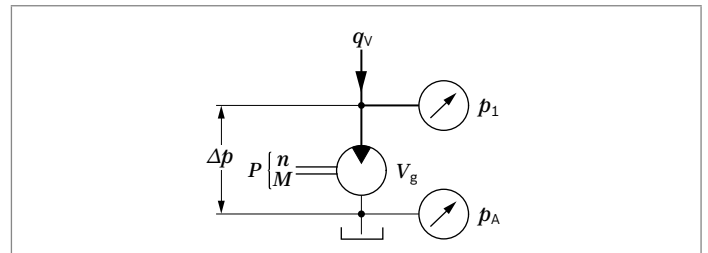
- p_1 Maximum continuous pressure
 p_2 Maximum start-up pressure
 p_3 Maximum pressure peak

Determining characteristics

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

Key

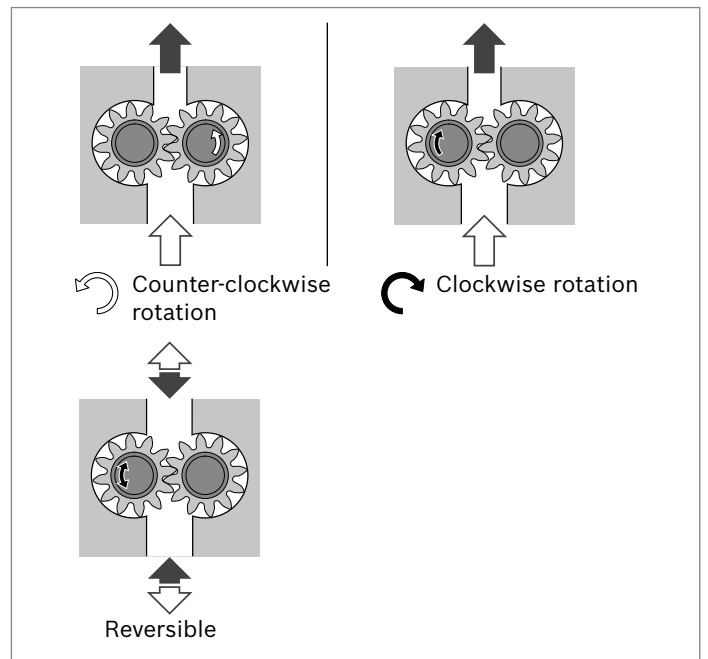
- V_g Displacement per revolution [cm³]
 Δp Differential pressure [bar] ($\Delta p = p_1 - p_A$)
 n Rotational speed [rpm]
 q_v Inlet flow [l/min]
 M Torque [Nm]
 P Power [kW]
 η_v Volumetric efficiency²⁾
 η_{hm} Hydraulic-mechanical efficiency²⁾
 η_t Total efficiency ($\eta_t = \eta_v \times \eta_{hm}$)²⁾



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



¹⁾ For motors with proportional pressure relief valve, the installation position of the coil is $\pm 45^\circ$ downwards.

²⁾ 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

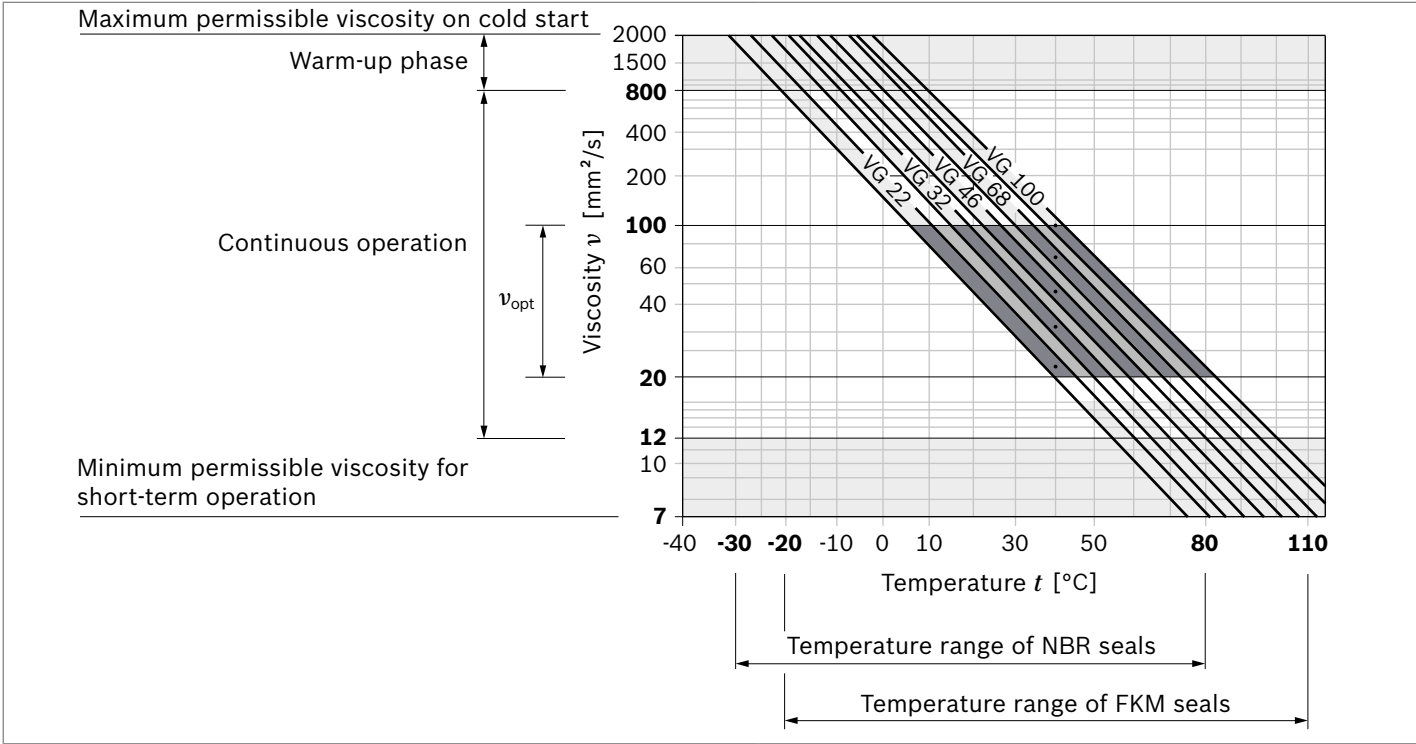
Selection of hydraulic fluid shall make sure that the operating viscosity in the operating temperature range is within the optimal range (v_{opt} ; see selection diagram).

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)	$t = -30 \text{ }^{\circ}\text{C} \dots +80 \text{ }^{\circ}\text{C}$
With FKM seals (FKM = fluoroelastomer)	$t = -20 \text{ }^{\circ}\text{C} \dots +110 \text{ }^{\circ}\text{C}$

▼ Selection diagram

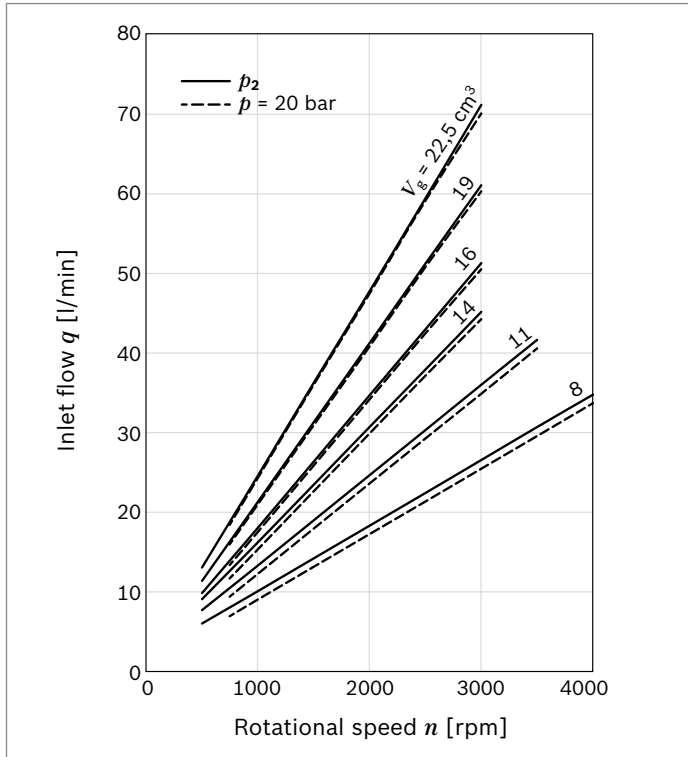


1) Other hydraulic fluids on request.

Diagrams/characteristic curves

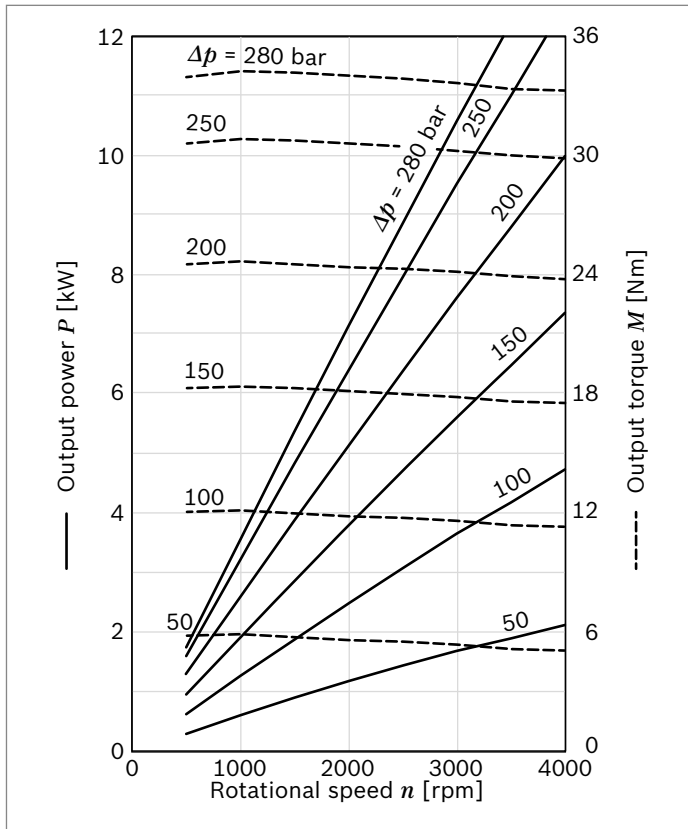
Inlet flow characteristic curve

▼ Inlet flow

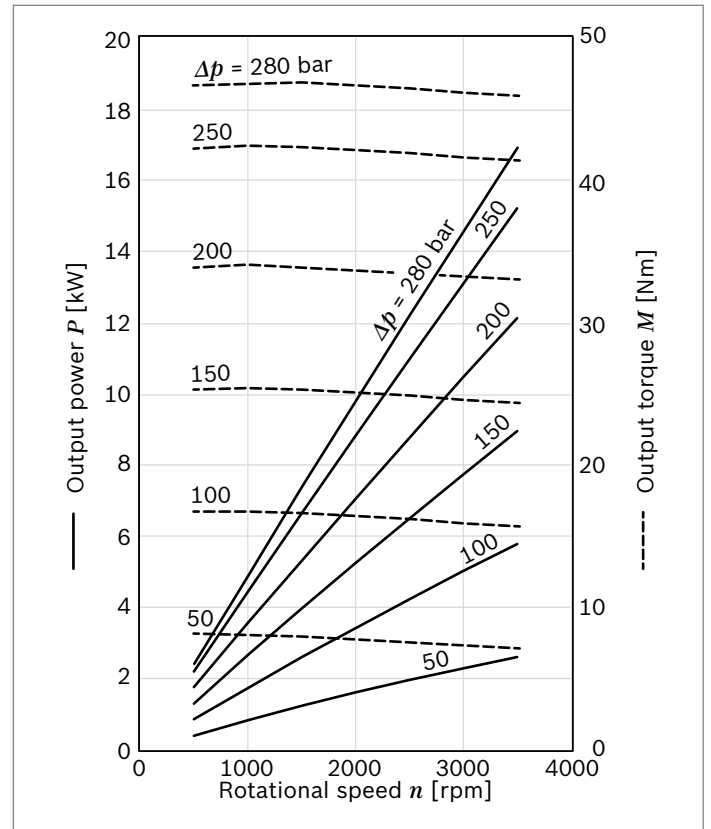


Performance charts

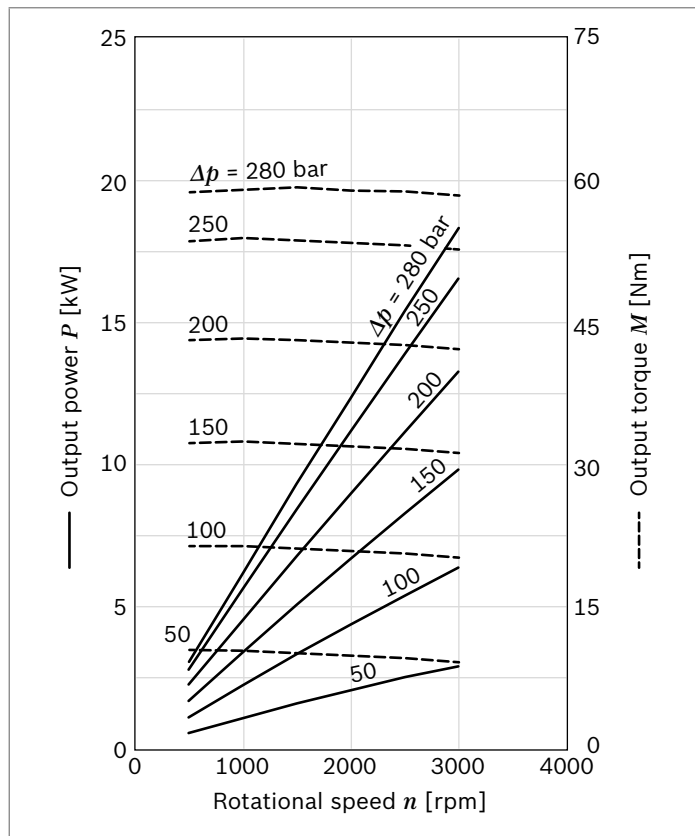
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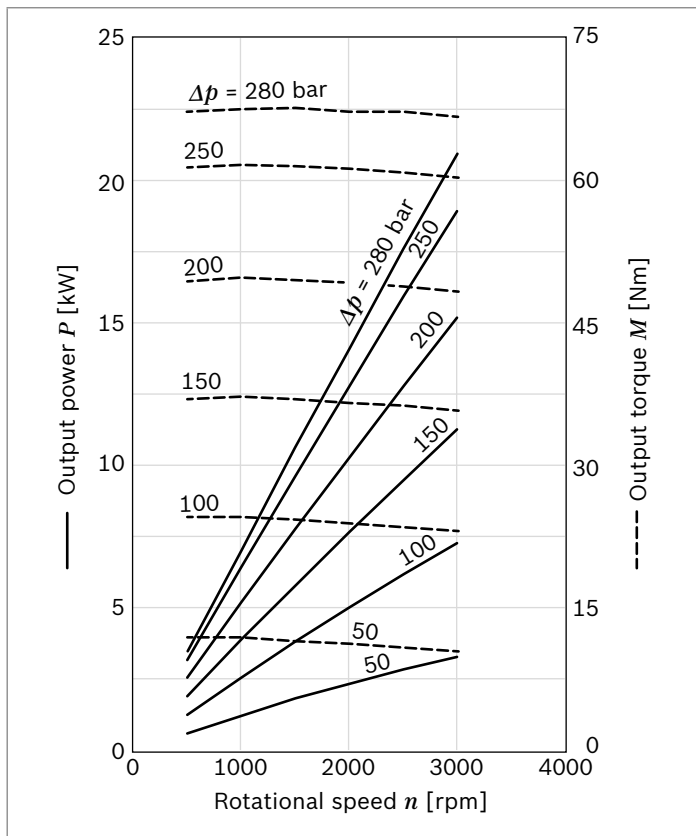
▼ Size 11



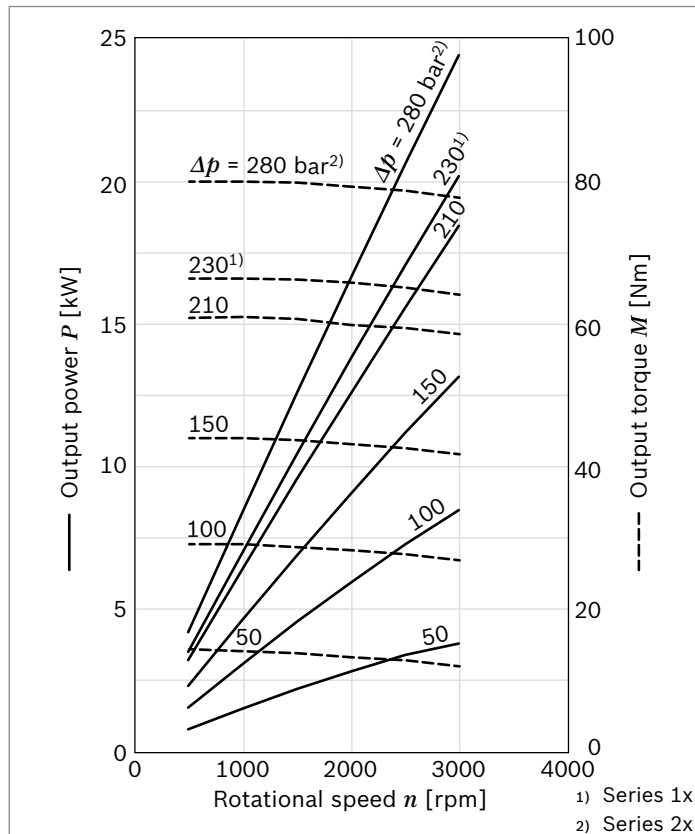
▼ **Size 14**



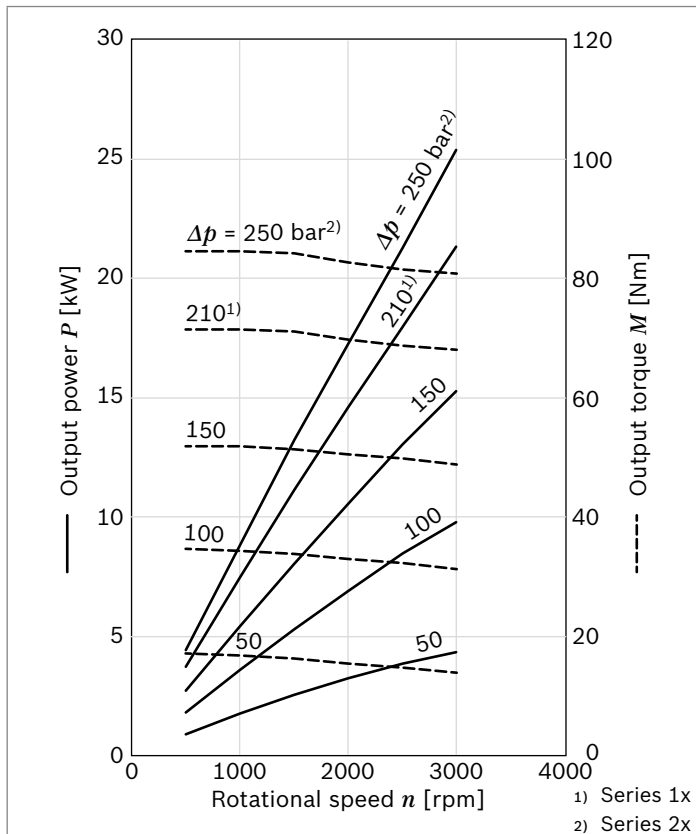
▼ **Size 16**



▼ **Size 19**



▼ **Size 22**



Notice

Characteristic curves measured at $v = 32 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$.

$P = f(n, p)$ incl. η_t

$M = f(n, p)$ incl. η_{hm}

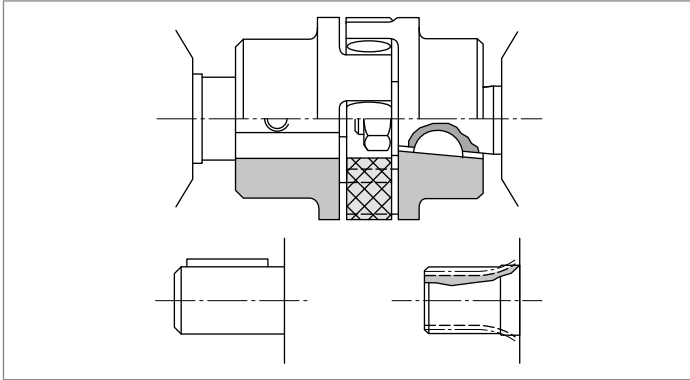
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Output drives

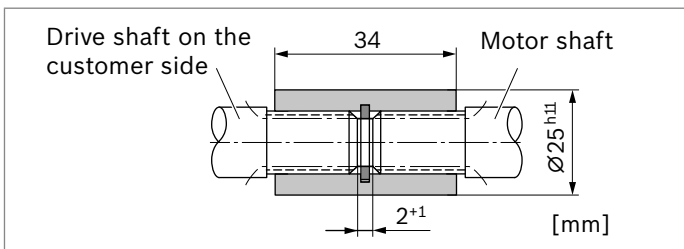
1. Elastic couplings

- ▶ 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.



2. Coupling sleeve

- ▶ To be used for splined shaft profile according to DIN and SAE
- ▶ Attention: Make sure no radial and axial forces act on the motor shaft and coupling sleeve. The coupling sleeve should freely move in the axial direction.
- ▶ Distance motor shaft – drive shaft on the customer side 2^{+1} mm
- ▶ Reserve installation space for the retaining ring.
- ▶ Oil-bath or oil-mist lubrication required

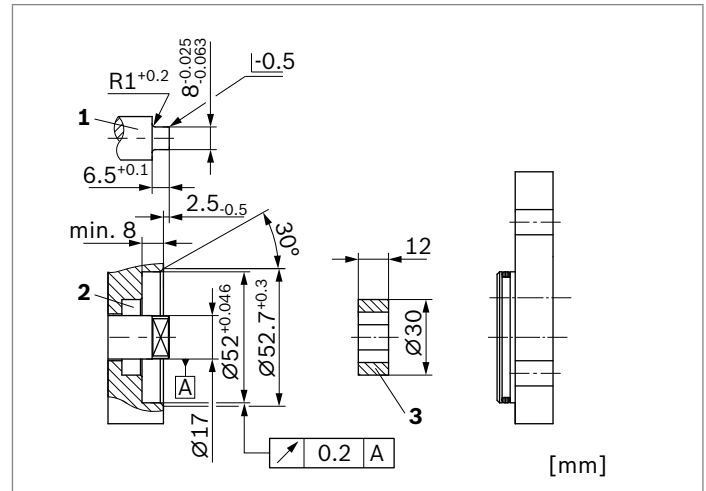


3. Tang drive coupling

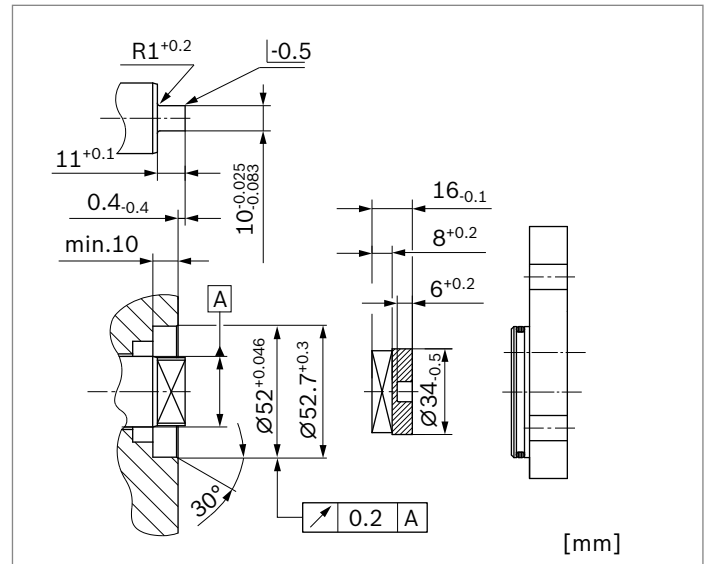
- ▶ For attaching the motor directly to consumers
- ▶ Motor drive shaft with special tang drive and driver (3)
- ▶ No shaft seal
- ▶ Output side installation and sealing according to following recommendations and dimensions
- ▶ Output shaft on the customer side (1)
 - Case hardening steel DIN EN ISO683-3, e.g. 20 MnCrS 5 case-hardened 0.6 deep; HRC 60±3
 - Seal ring contact surface ground without rifling $R_{\max} \leq 4 \mu\text{m}$

- The maximum transmissible torque of 85 Nm applies to a claw height of 19 mm. With lower claw heights, e.g. 17 mm, the maximum transmissible torque decreases to 65 Nm.
- ▶ Radial shaft seal ring on the customer side (2)
 - Provide with rubber cover (see DIN 3760, type AS, or double-lipped ring)
 - Provide installation edges with 15° slant and/or shaft seal with protection sleeve

▼ AZMF-1x

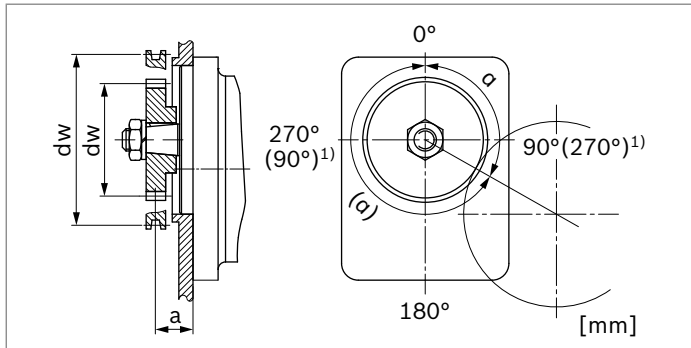


▼ AZMF-2x



4. V-belt and gear wheel without outrigger bearing

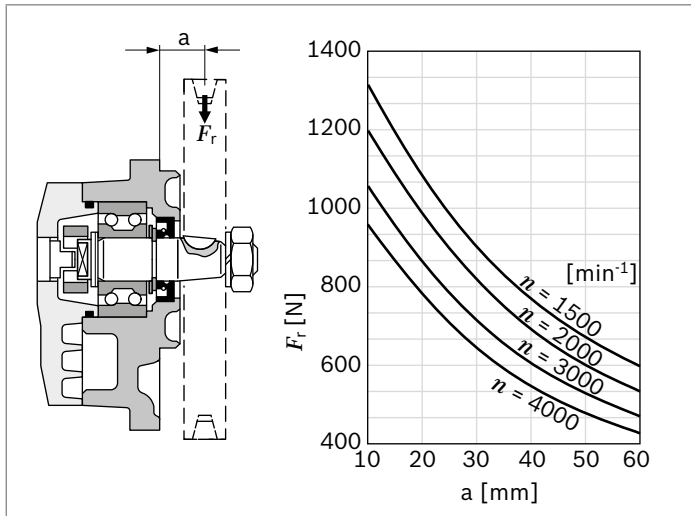
For V-belt or gear wheel output drives, please contact us and indicate the application and mounting conditions (dimensions a, dw and angle α).



5. Outrigger bearing

Motors with outrigger bearing are offered to eliminate possible problems with V-belt or gear wheel output drives. The diagrams show the radial load capacity in relation to a bearing service life of $L_H = 1000$ h

▼ Front cover A (type 1, with claw)



Max. transmissible output torques

Tapered shaft series 1x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
C	1 : 5	B	155	8 ... 16	280
				19	230
				22	210
S	1 : 5 for front cover A	A	65	8 ... 14	280
				16	230
				19	190
				22	160

Tapered shaft series 2x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
C	1 : 5	B	155	19	280
				22	250
S	1 : 5 for front cover A	A	65	19	190
				22	160

Tang drive 1x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
N		T	65	8 ... 14	280
				16	230
				19	190

Tang drive 2x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
N		T	85	19	250
				22	210

Splined shaft 1x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
F	DIN 5482 B 17 × 14	B, O	100	8 ... 16	280
				19	230
				22	210

Splined shaft 2x

Drive shaft		Front cover	$M_{\max}$	Size	$p_{2 \max}$
Code	Designation	Code	Nm		bar
F	DIN 5482 B 17 × 14	B, O	100	19	280
				22	250

1) Values in parentheses refer to counter-clockwise rotation.

Gear motors with integrated valves; sensors

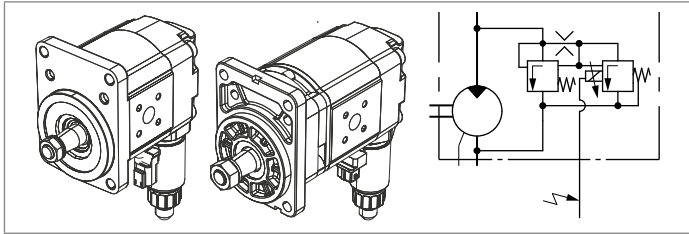
Gear motor with integrated pilot operated proportional pressure relief valve

Gear motor with integrated pilot operated proportional pressure relief valve and shaft seal unloading thanks to three-chamber principle.

Gear motors without shaft seal unloading are not recommended due to the loading from the oil return, particularly with cold oil.

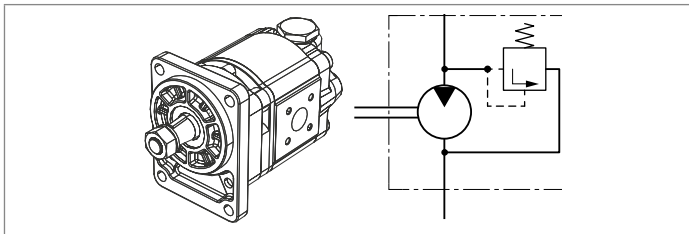
The basis of this drive unit is a motor of the "F" series. A proportional pressure relief valve is integrated in the end cover. This unit offers the following advantages:

- ▶ No piping necessary for the proportional pressure relief valve function
- ▶ Integrated pressure limitation
- ▶ Fail-safe behavior in case of power failure
- ▶ Drag speed almost zero
- ▶ Motor speed proportionally controllable
- ▶ Insensitive to pressure loads from the outlet.



Gear motor with pressure relief valve

Return flow pressure ≤ 3 bar (10 bar during start-up)

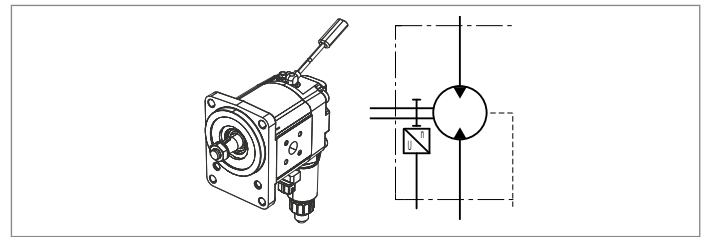


Gear motor with integrated speed sensor

The Hall effect-based DSM1-10 speed sensor has been specially developed for use under harsh conditions in mobile working machines. The sensor detects the rotational speed signal of ferromagnetic gear wheels. As an active sensor, he delivers a signal with a constant amplitude that is independent of the rotational speed.

Due to its compact and robust design, the external gear motor with integrated speed sensor is particularly suitable for:

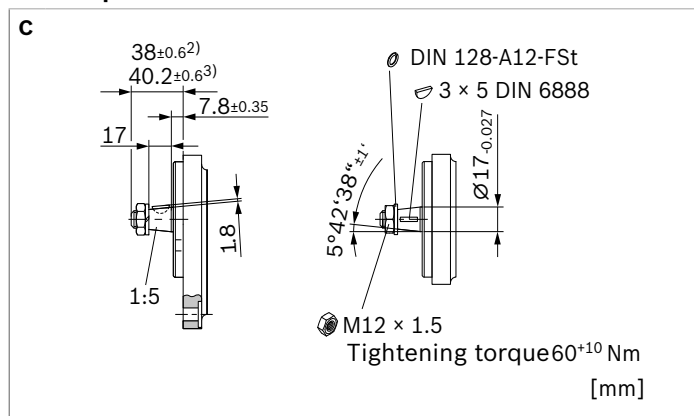
- ▶ Fan drives in buses, trucks and construction machinery from 7 to 20 kW
- ▶ As vibration drive for road rollers and pavers.



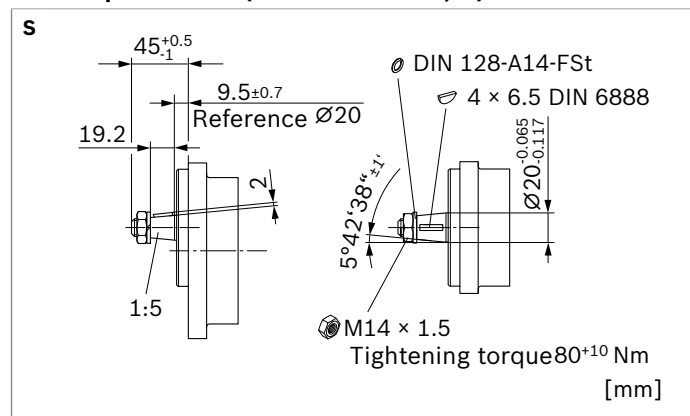
For further information see:
Speed sensor data sheet 95132.

Dimensions – drive shaft¹⁾

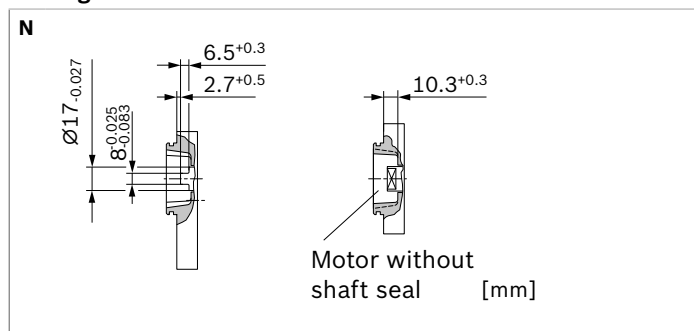
▼ 1:5 tapered shaft



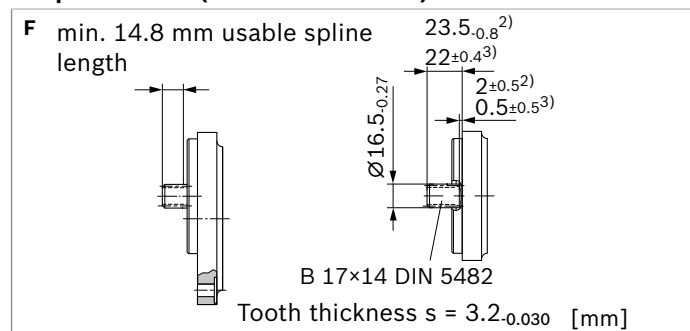
▼ 1:5 tapered shaft (for front cover A, G)



▼ Tang drive

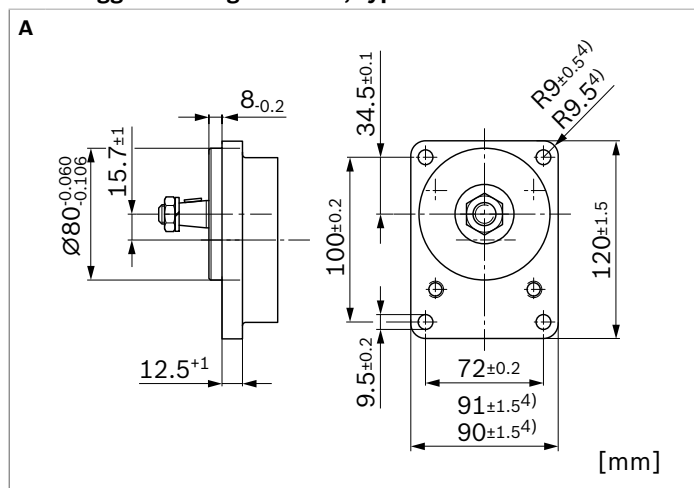


▼ Splined shaft (DIN 5482 B17 x 14)

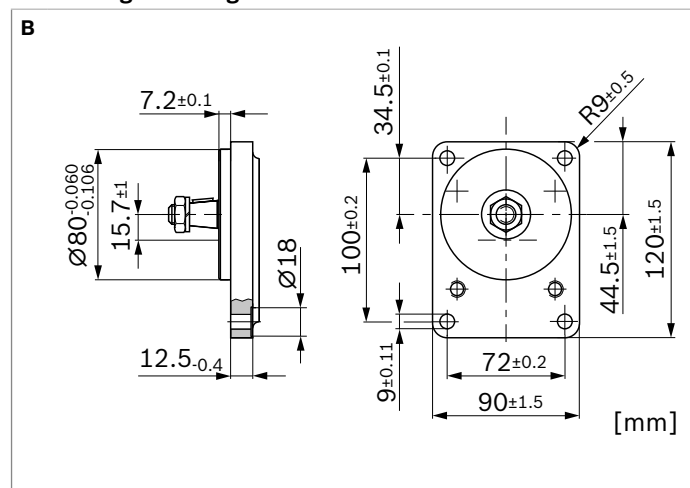


Dimensions – front cover¹⁾

▼ Outrigger bearing $\varnothing 80$ mm, type 1



▼ Rectangular flange $\varnothing 80$ mm

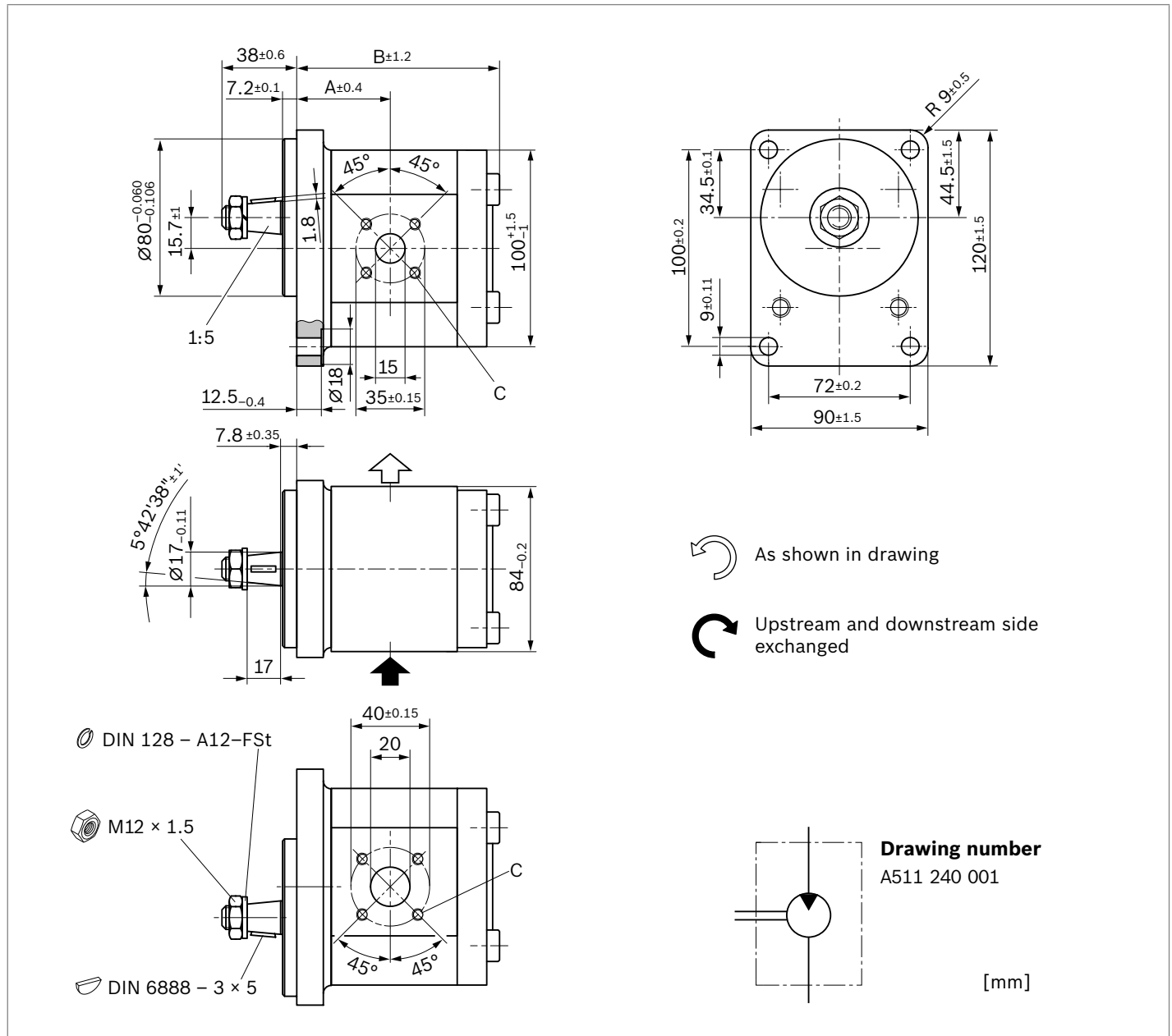


1) For other version, see offer drawing
2) In combination with front cover B

3) In combination with front cover O
4) Depending on the outrigger bearing

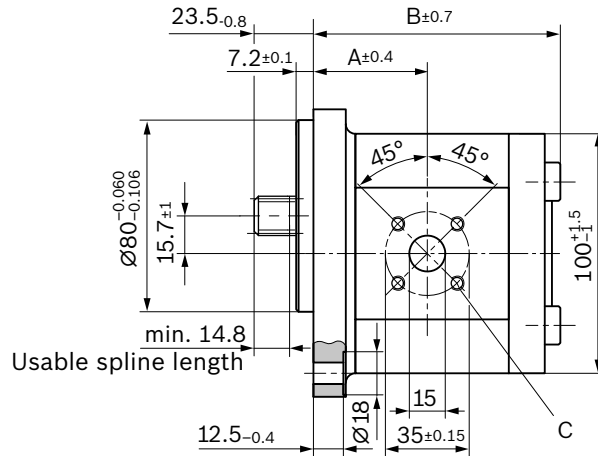
Dimensions – preferred series

▼ 1:5 tapered shaft with rectangular flange Ø80 mm AZMF-...-xCB20MB

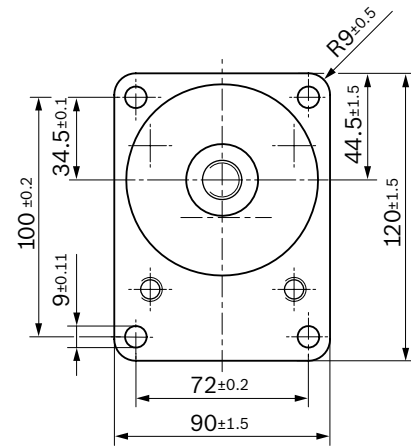
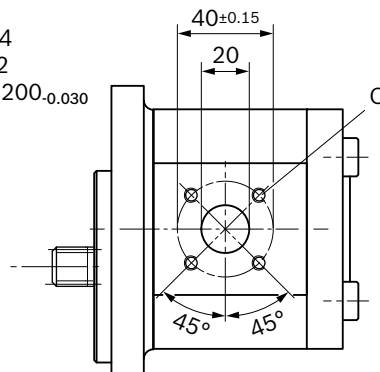


NG	Order number		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation Counter-clockwise	Clockwise			A	B	C
8	0511425300	0511425001	210	4000	43.2	90.7	M6; min. 13 deep
11	0511525300	0511525001	210	3500	47.0	95.9	
	0511525311		210	3500	47.0	94.1	
14	0511525304		210	3000	47.5	100.9	
16		0511625005	210	3000	47.5	104.4	
19	0511625308	0511625009	180	3000	47.5	109.4	
		0511625003	180	3000	47.5	109.4	
22	0511725304	0511725005	210	3000	61.1	125.0	

▼ **Splined shaft (DIN5482 B17 × 14) with rectangular flange Ø80 mm**
AZMF-...-x FB20MB



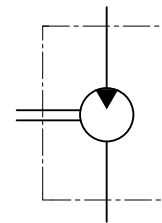
Splined shaft B17 x 14
according to DIN 5482
Tooth thickness $\hat{s} = 3,200_{-0.030}$



As shown in drawing



Upstream and downstream side
exchanged



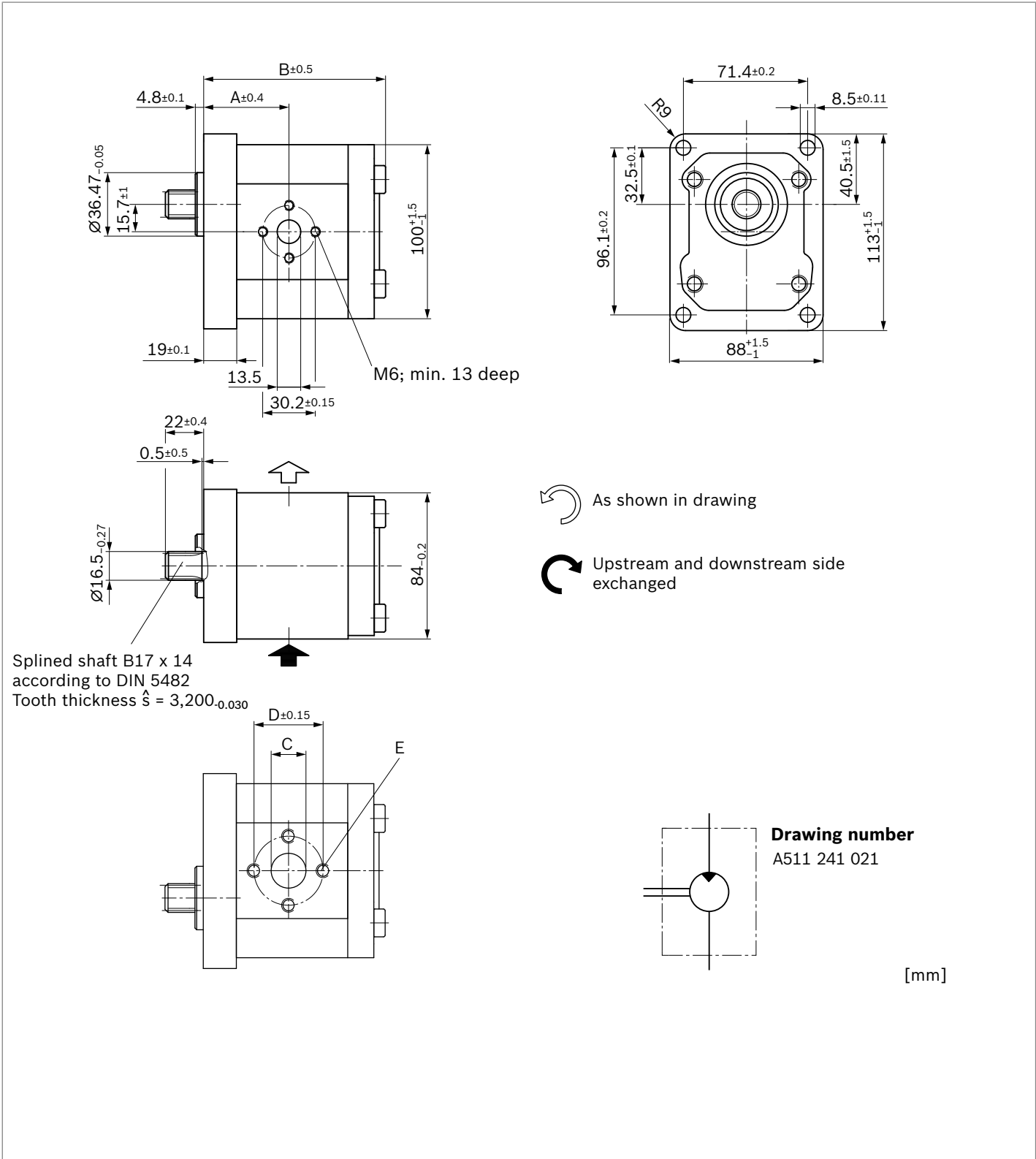
Drawing number

A511 241 001

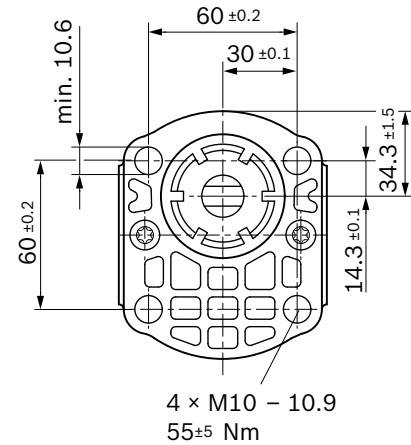
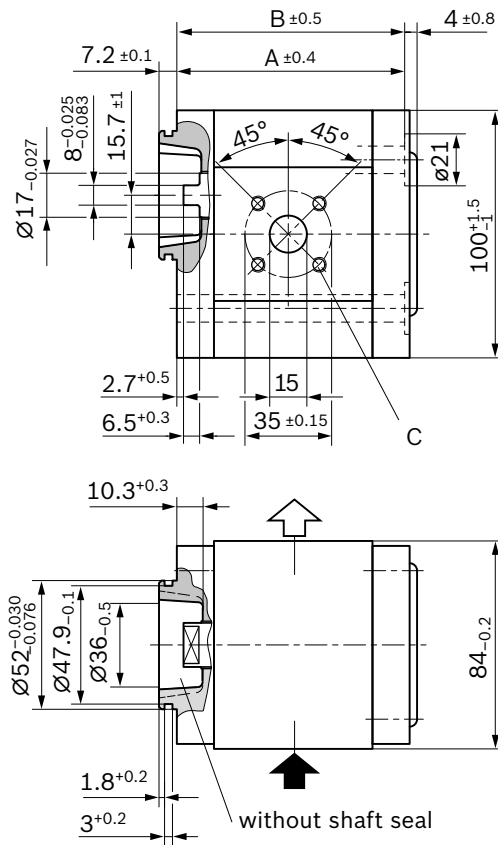
[mm]

NG	Order number		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation Counter-clockwise	Clockwise			A	B	C
8	0511425301	0511425002	210	4000	43.2	91.0	M6; min. 13 deep
11	0511525301		210	3500	47.0	96.0	
16	0511625301	0511625001	210	3000	47.5	104.4	
19	0511625300	0511625002	180	3000	47.5	109.4	
22	0511725303	0511725004	180	3000	61.1	126.8	

▼ **Splined shaft (DIN5482 B17 × 14) with rectangular flange Ø36.47 mm**
AZMF-...-xFO30MB

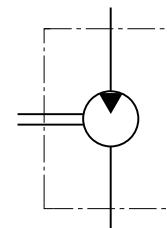
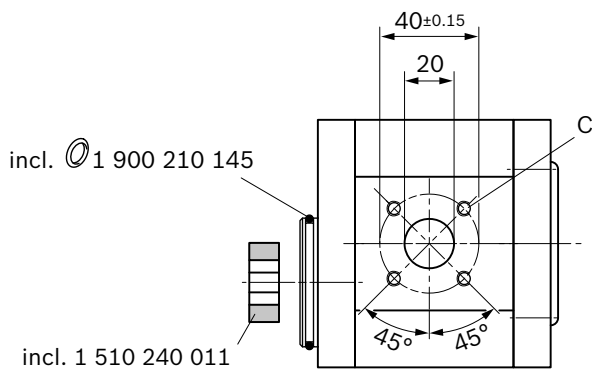


NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions				
				A	B	C	D	E
8	0511425003	210	4000	44.9	90.7	13.5	30.2	M6; min. 13 deep

▼ Dihedral claw with 4-bolt mounting Ø52 mm with coupling
AZMF-...-xNT20MB-S0184

As shown in drawing

Upstream and downstream side exchanged

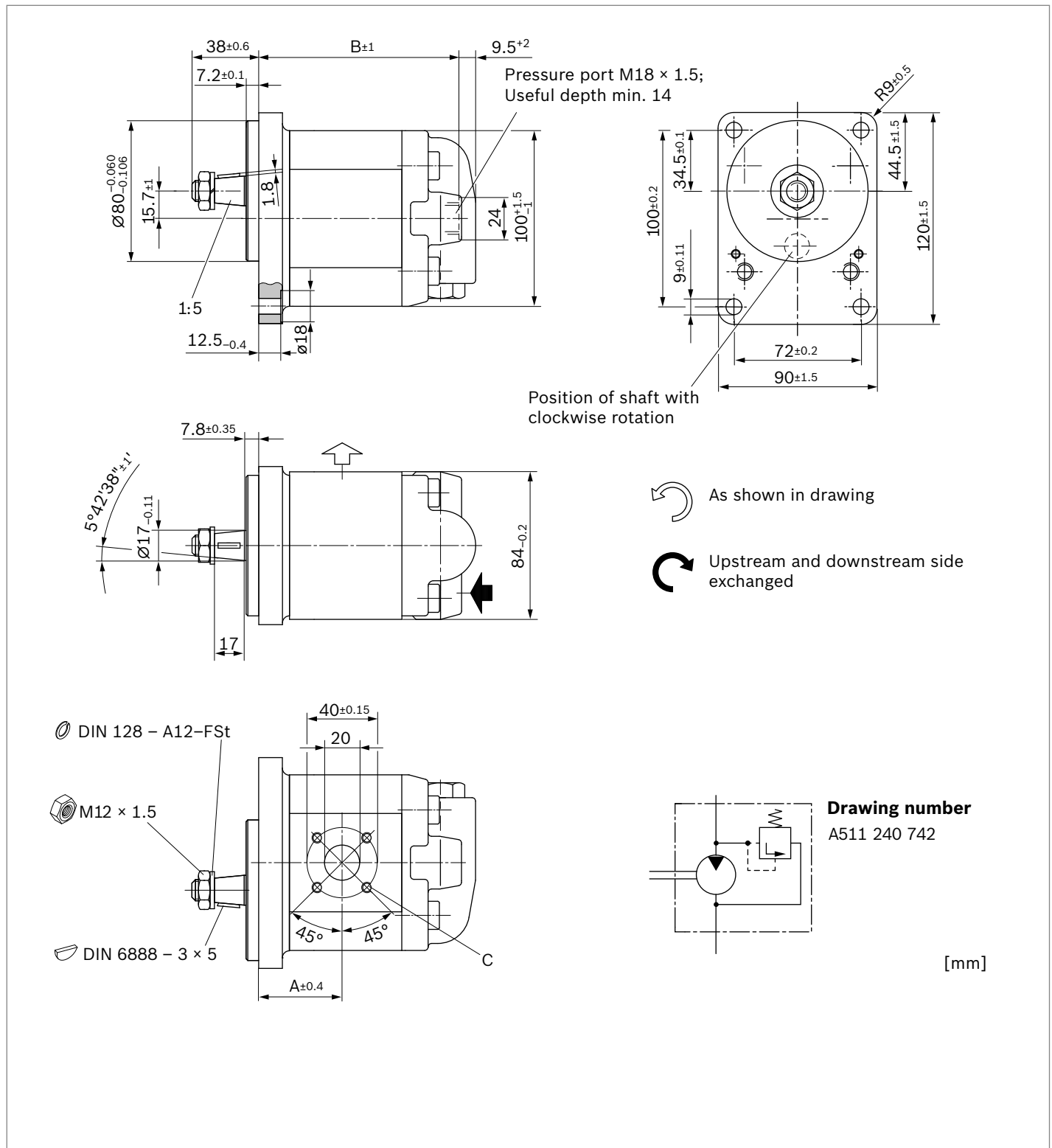


Drawing number
A511 232 001

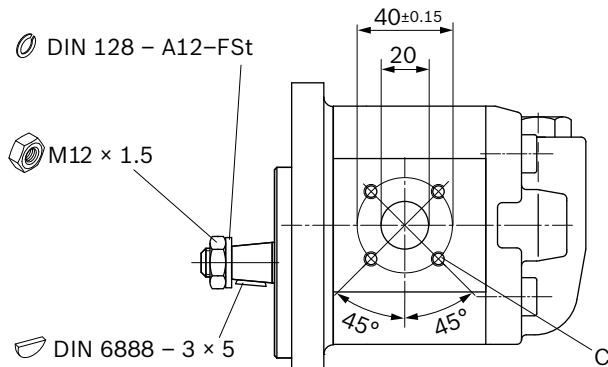
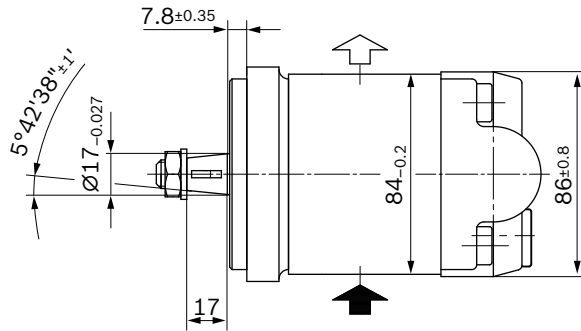
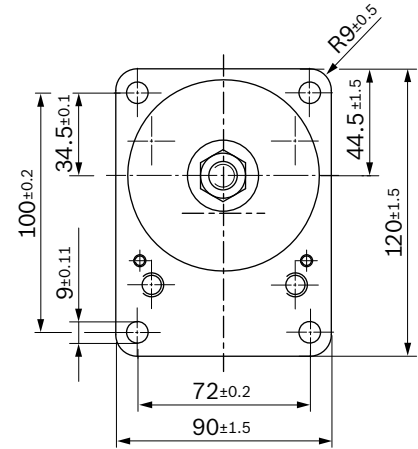
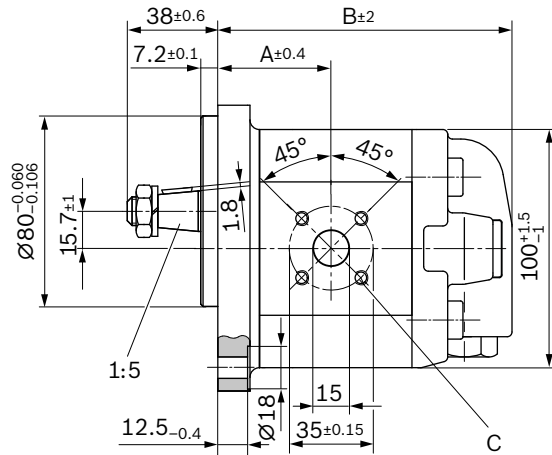
[mm]

NG	Order number		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation				A	B	C
	Counter-clockwise	Clockwise					
8	0511415300	0511415001	250	4000	40.7	80.3	M6; min. 13 deep
11	0511515300	0511515001	250	3500	44.5	85.3	
16	0511615301	0511615002	220	3000	45.0	93.7	
19	0511615300	0511615001	190	3000	45.0	98.7	
22	0511715300	0511715001	160	3000	52.6	104.1	

▼ **1:5 tapered shaft with rectangular flange Ø80 mm, pressure relief valve with residual flow and suction port in the end cover**
AZMF-...-xCBxxxD150XX

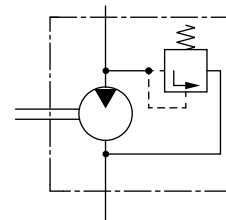


NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation			A	B	C
	Clockwise					
8	0511425008	150	4000	43.2	101.8	M6; min. 13 deep

▼ 1:5 tapered shaft with rectangular flange Ø80 mm, pressure relief valve with residual flow
AZMF-...-xCB20MD

As shown in drawing

Upstream and downstream side exchanged

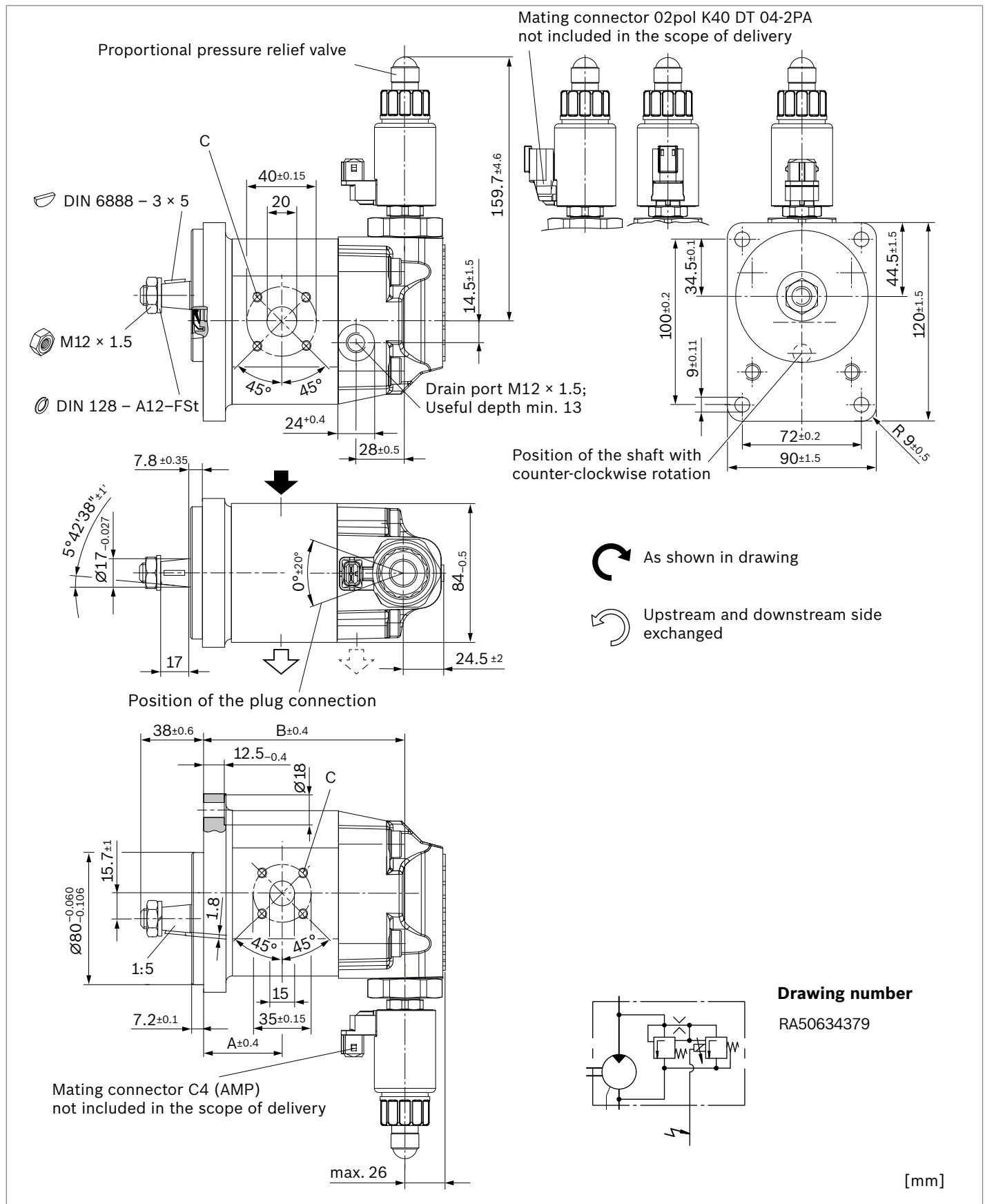


Drawing number
A511 840 710

[mm]

NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation			A	B	C
	Counter-clockwise					
8	0511425304	150	3500	43.2	110.8	M6; min. 13 deep

▼ **1:5 tapered shaft with rectangular flange Ø80 mm and proportional pressure relief valve**
AZMF-...-xCB20PG

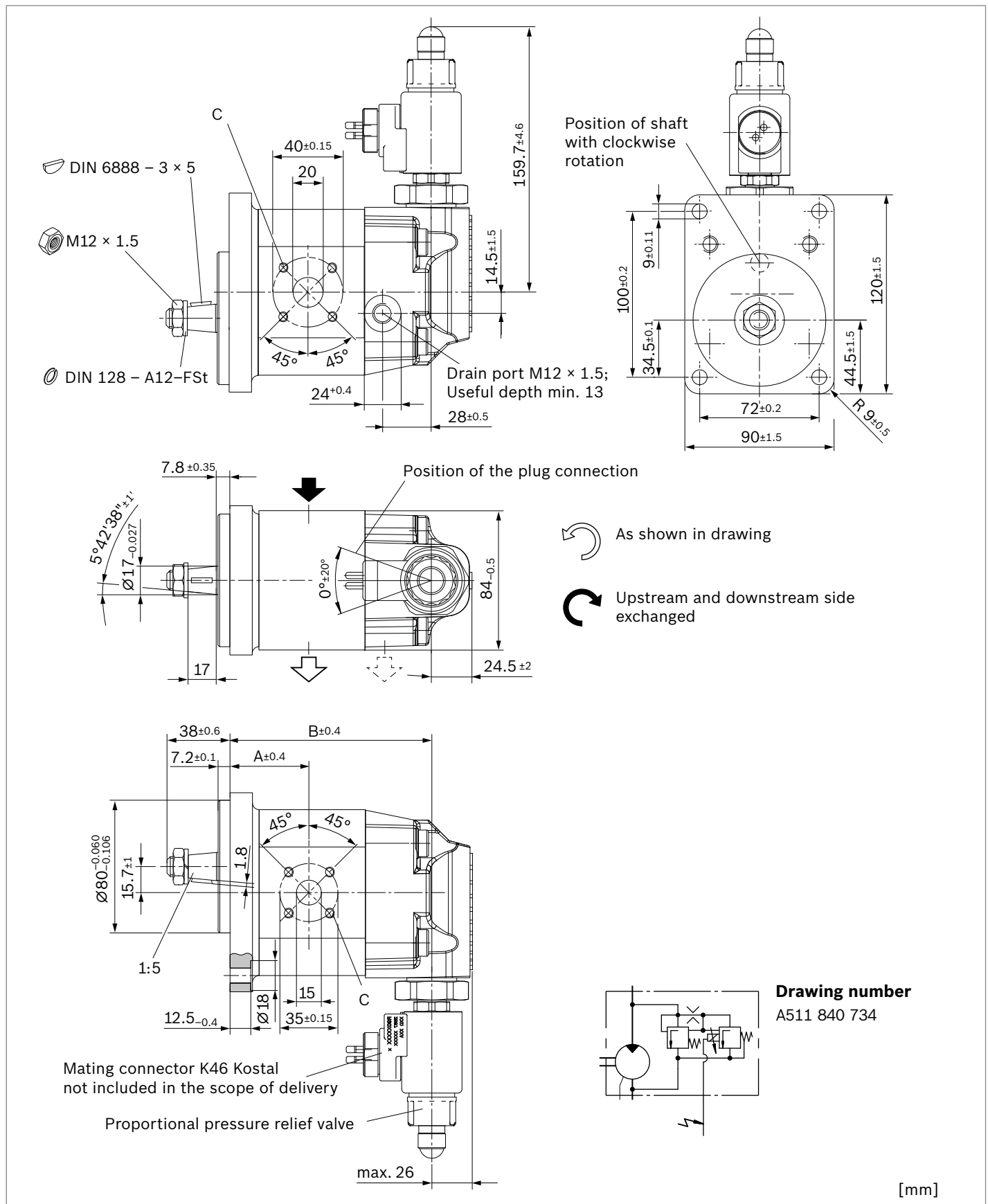


▼ 1:5 tapered shaft with rectangular flange Ø80 mm and proportional pressure relief valve
AZMF-...-xCB20PG

NG	Order number		Maximum pressure at the pressure relief valve [bar]	Maximum rotational speed [rpm]	Dimensions			Valve		Connector	
	Direction of rotation				A	B	C	Order number	Voltage [V]		
	Counter-clockwise	Clockwise									
8		0511425018	185	3000	43.2	109.0	M6; min. 13 deep	901070391	24	C4 (2pol.)	
		0511425017	110	3000	43.2	109.0		901104239	24	C4 (2pol.)	
11	0511525314		185	3000	42.0	114.0		901122391	24	C4 (2pol.)	
		0511525025	220 ¹⁾	3000	42.0	114.0		901122151	24	K40 (2pol.)	
		0511525024	220 ¹⁾	3000	42.0	114.0		901122405	24	C4 (2pol.)	
	0511525315	0511525019	130	3000	42.0	114.0		901122416	24	C4 (2pol.)	
14		0511525020	220 ¹⁾	3000	42.0	119.0		901070405	24	C4 (2pol.)	
		0511525015	220 ¹⁾	3000	42.0	119.0		901070386	12	C4 (2pol.)	
		0511525016	185	3000	42.0	119.0		901070387	12	C4 (2pol.)	
		0511525017	155	3000	42.0	119.0		901070407	12	C4 (2pol.)	
		0511525026	110	3000	42.0	119.0		901070756	12	K40 (2pol.)	
16	0511625315		155	3000	42.0	122.4		907047407	12	C4 (2pol.)	
		0511625034	110	3000	42.0	122.4		901070756	12	K40 (2pol.)	
		0511625033	250	3000	42.0	122.4		901250625	24	K40 (2pol.)	
		0511625317	0511625029	220 ¹⁾	3000	42.0	122.4		901070736	12	K40 (2pol.)
		0511625313	220 ¹⁾	3000	42.0	122.4		901070386	12	C4 (2pol.)	
		0511625030	220 ¹⁾	3000	42.0	122.4		907047405	24	C4 (2pol.)	
		0511625024	220 ¹⁾	3000	42.0	122.4		901070386	12	C4 (2pol.)	
19	0511625311		185	3000	47.5	127.4		901122391	24	C4 (2pol.)	
	0511625312		220 ¹⁾	3000	47.5	127.4		901122151	24	K40 (2pol.)	
		0511625026	220 ¹⁾	3000	47.5	127.4		901070736	12	K40 (2pol.)	
		0511625027	220 ¹⁾	3000	47.5	127.4		901122405	24	C4 (2pol.)	
		0511625023	150 ¹⁾	3000	47.5	127.4		901122386	12	C4 (2pol.)	
22		0511725029	220 ¹⁾	3000	55.1	132.8		901070405	24	C4 (2pol.)	
		0511725031	220 ¹⁾	3000	55.1	132.8		901070736	12	K40 (2pol.)	
		0511725035	220 ¹⁾	3000	55.1	132.8		901236512	24	C4 (2pol.)	
		0511725028	220 ¹⁾	3000	55.1	132.8		901070386	12	C4 (2pol.)	

1) Short-term

▼ **1:5 tapered shaft with rectangular flange Ø80 mm and proportional pressure relief valve with an internal resistor of 11.5 Ω**
AZMF-13-xCB20PG-S0458

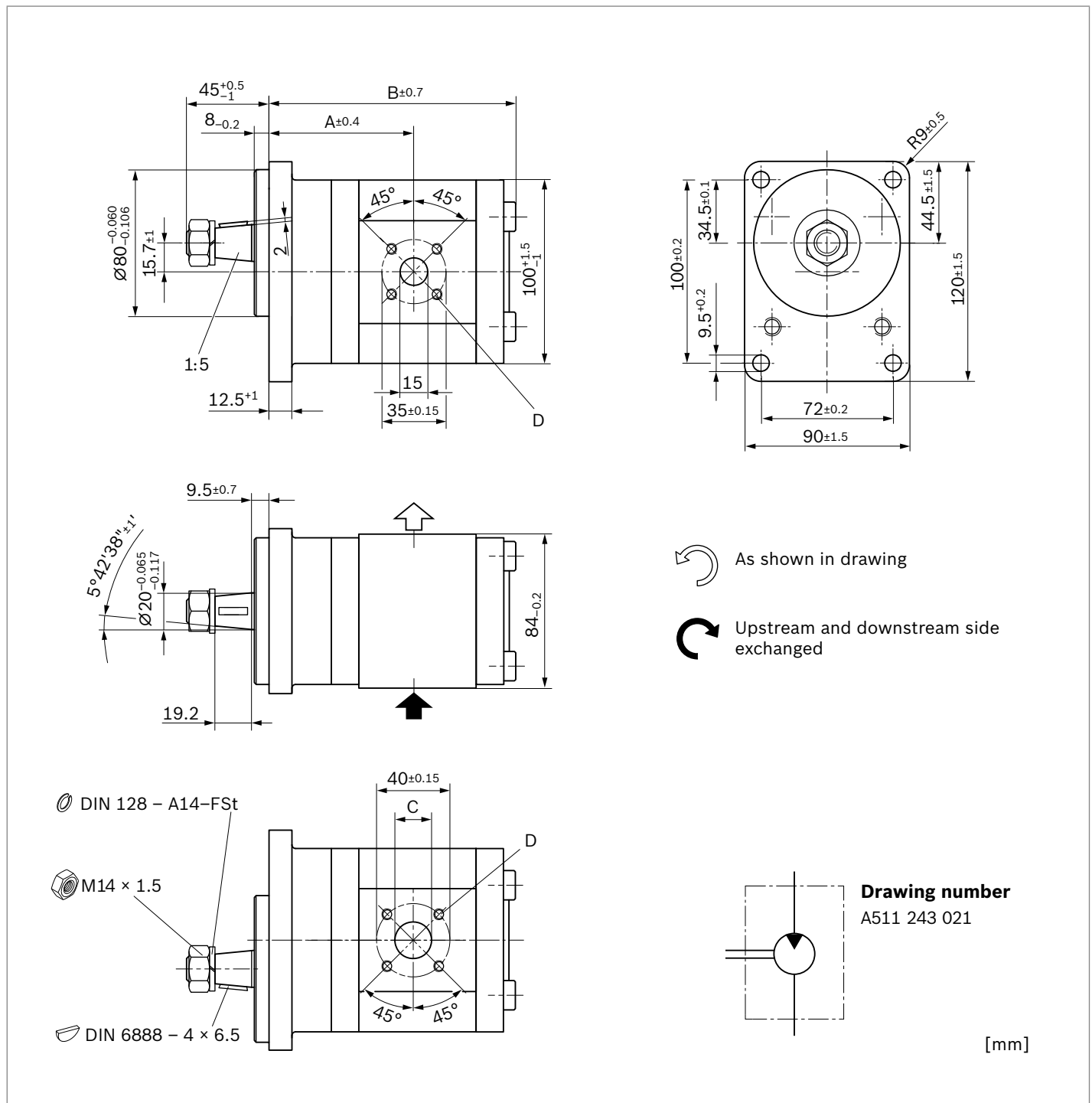


▼ **1:5 tapered shaft with rectangular flange Ø80 mm and proportional relief valve with an internal resistor of 11.5 Ω**
AZMF-13-xCB20PG-S0458

NG	Order number		Maximum pressure at the pressure relief valve [bar]	Maximum rotational speed [rpm]	Dimensions			Valve		Connector
	Direction of rotation				A	B	C	Order number	Voltage [V]	
	Counter-clockwise	Clockwise								
11	0511525313		185	3500	42.0	114.0	M6; min.	901101014	24	K46 (Kostal)
16	0511625316	0511625025	220 ¹⁾	3000	47.5	122.4	13 deep	901101327	24	K46 (Kostal)
22	0511725314		220 ¹⁾	3000	55.1	132.8		901101327	24	K46 (Kostal)
		0511725040	220 ¹⁾	3000	55.1	132.8		901267110	24	K46 (Kostal)
		0511725039	220 ¹⁾	3000	55.1	132.8		901267111	12	K46 (Kostal)

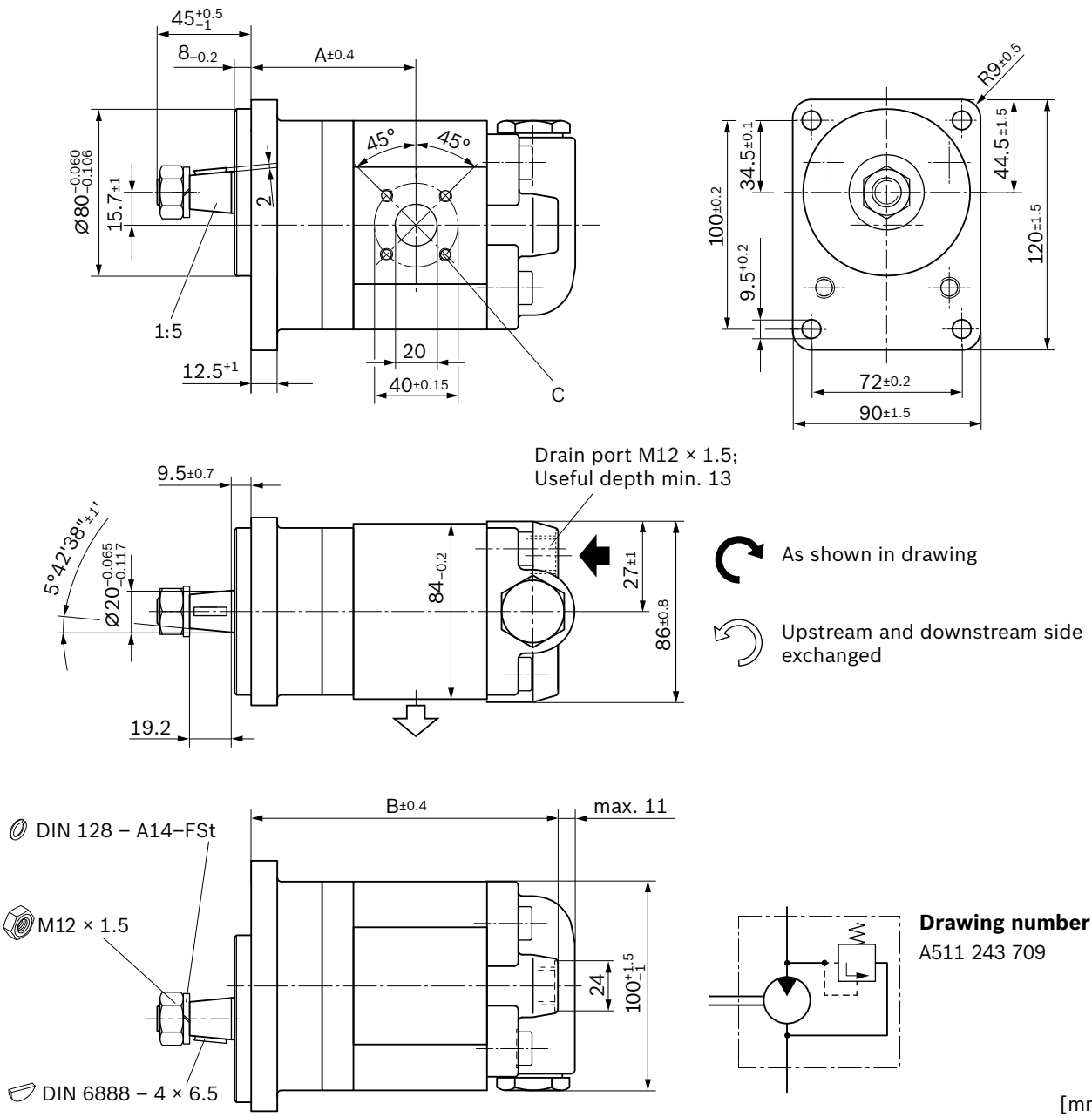
1) Short-term

▼ **1:5 tapered shaft with outboard bearing Ø80 mm**
AZMF-...-xSA20MB



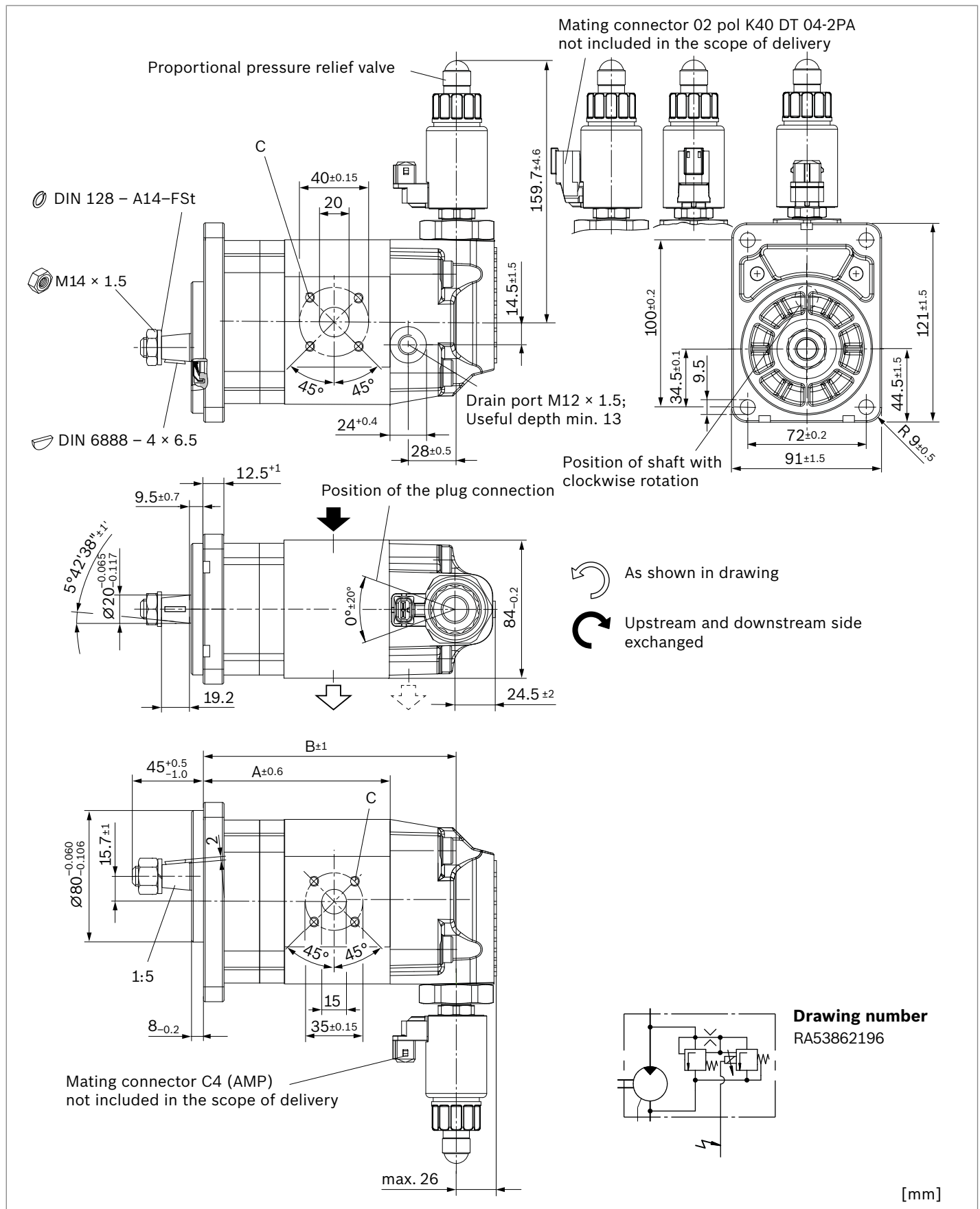
NG	Order number		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation				A	B	C	D
	Counter-clockwise	Clockwise						
8	0511445300	0511445001	280	4000	74.7	120.6	20	M6; min. 13 deep
11	0511545300	0511545001	280	3500	78.5	125.6	20	
16	0511645300	0511645001	230	3000	79.0	134.0	20	
19	0511645302		210	3000	79.0	139.0	20	
22	0511745300	0511745001	190	2500	92.6	156.4	20	

▼ 1:5 tapered shaft with outboard bearing Ø80 mm and port in end cover "D"
AZMF-...-xSA20MDx-S0076



NG	Order number		Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation Counter-clockwise	Clockwise			A	B	C
8		0511445003	200	4000	74.7	133.1	M6; min. 13 deep
11	0511545302	0511545003	150	3500	79.1	138.1	

▼ **1:5 tapered shaft with outboard bearing Ø80 mm and proportional pressure relief valve**
AZMF-...-xSA20PGx

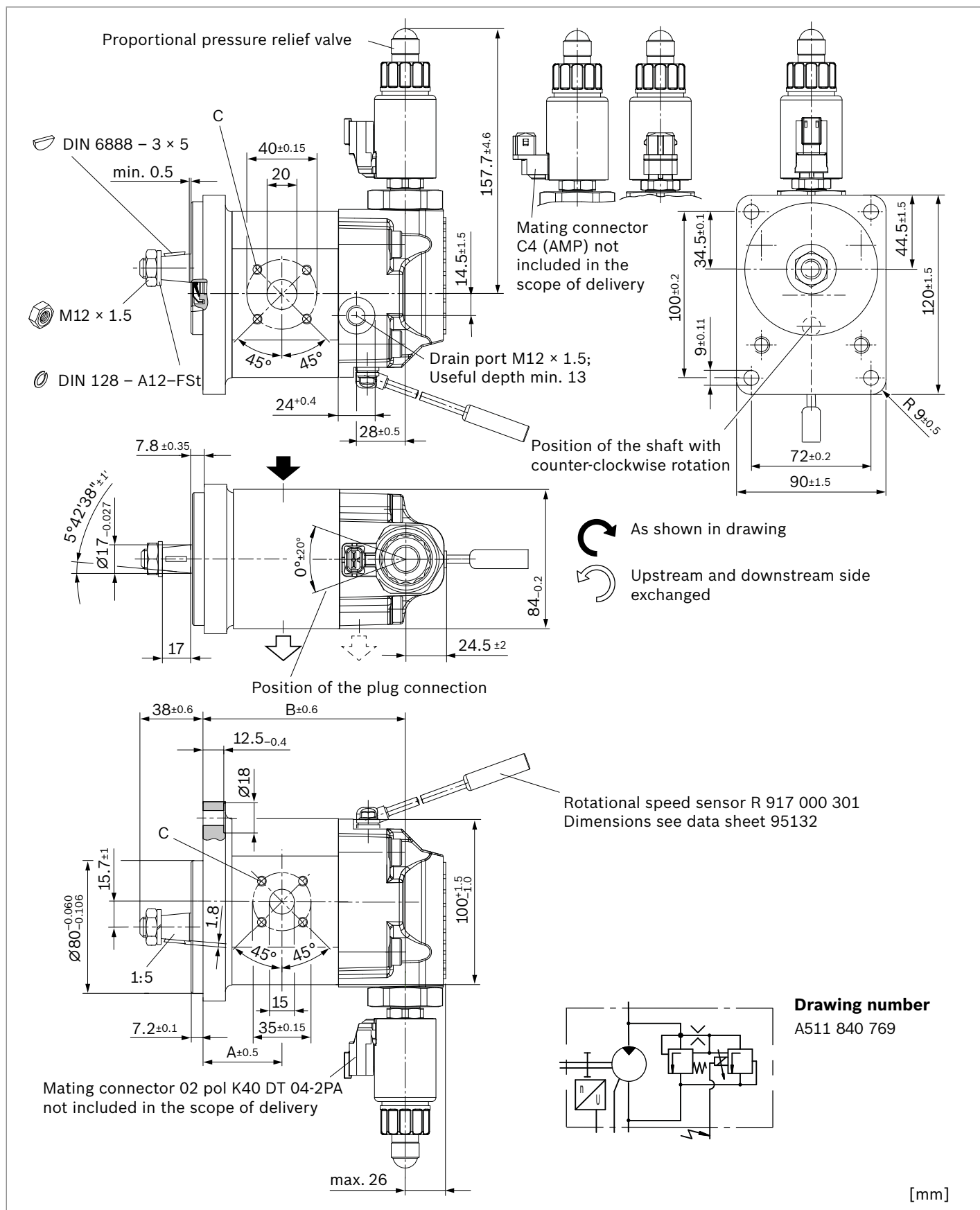


▼ 1:5 tapered shaft with outboard bearing Ø80 mm and proportional pressure relief valve
AZMF-...-xSA20PGx

NG	Order number		Maximum pressure at the pressure relief valve [bar]	Maximum rotational speed [rpm]	Dimensions			Valve		Connector
	Direction of rotation				A	B	C	Order number	Voltage [V]	
	Counter-clockwise	Clockwise								
8	0511445303		170	3000	74.7	140.5	M6; min. 13 deep	901265439	12	K40 (2pol.)
	0511445304		220	3000	74.7	140.5		901070717	24	K40 (2pol.)
16		0511645018	220	3000	78.9	153.8		901036405	24	C4 (2pol.)
		0511645013	220	3000	78.9	153.8		901036386	12	C4 (2pol.)
		0511645014	185	3000	78.9	153.8		901036387	12	C4 (2pol.)
		0511645015	155	3000	78.9	153.8		901036407	12	C4 (2pol.)
		0511645016	130	3000	78.9	153.8		901036402	12	C4 (2pol.)
19	0511645311		220 ¹⁾	3000	78.9	158.8		901070717	24	K40 (2pol.)

1) Short-term

▼ **1:5 tapered shaft with rectangular flange Ø80 mm and proportional pressure relief valve KBVS.3**
AZMF-13-xCB20PX-S0689



▼ 1:5 tapered shaft with rectangular flange Ø80 mm and proportional relief valve from BRI-CC
AZMF-13-xCB20Px-S0689

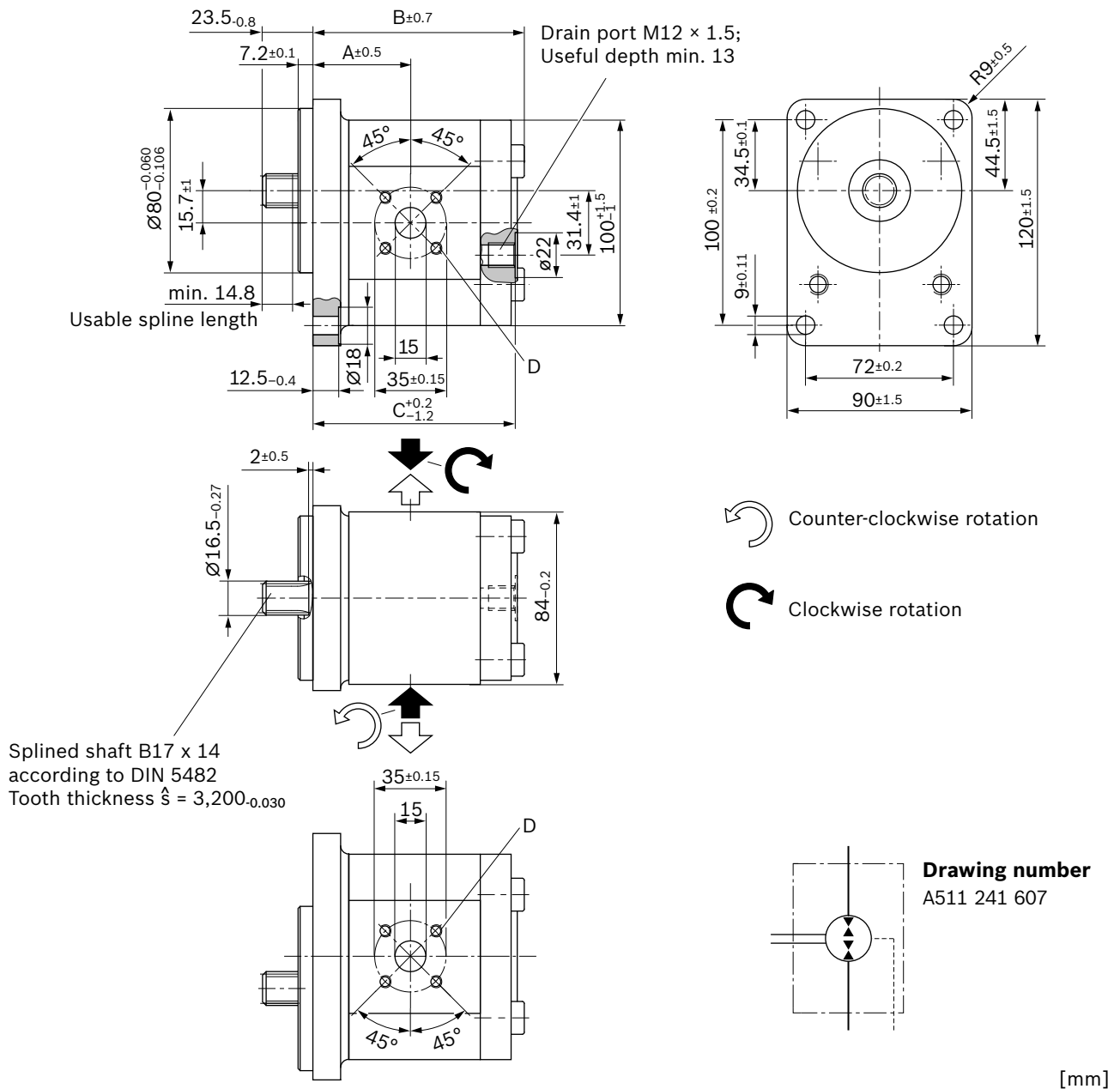
NG	Order number		Maximum pressure at the pressure relief valve [bar]	Maximum rotational speed [rpm]	Dimensions			Valve		Connector
	Counter-clockwise	Clockwise			A	B	C	Order number	Voltage [V]	
16	0511625318		185	3000	47.5	122.4	M6; min. 13 deep	901036387	12	C4 (2pol.)
19		0511625028	220	3000	47.5	127.4		901036386	12	C4 (2pol.)
22		0511725032	220 ¹⁾	2500	55.1	132.8		901036386	12	C4 (2pol.)

1) Short-term

[illegible]

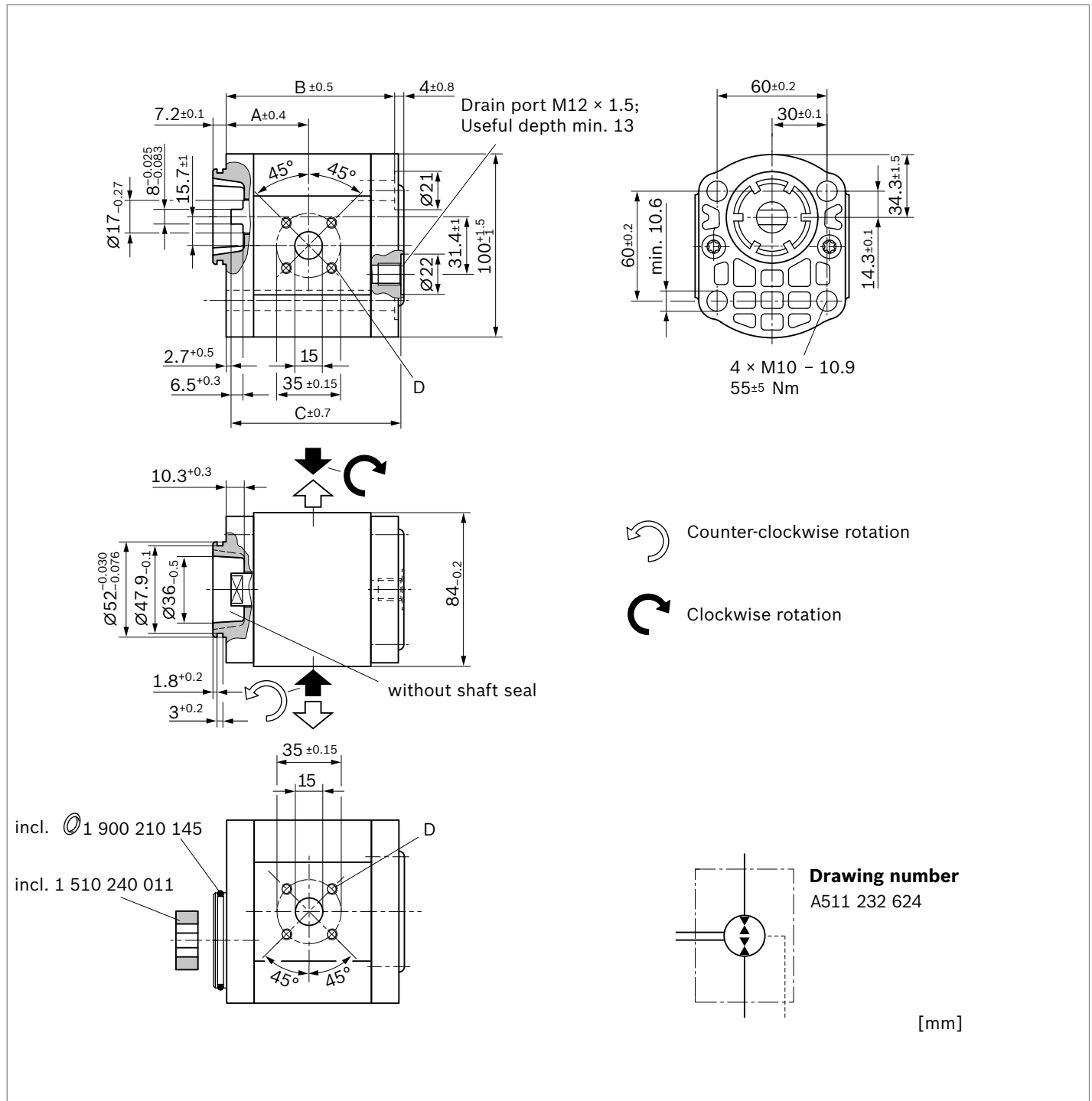
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation Reversible			A	B	C	D
8	0511425601	250	4000	43.2	89.5	85.8	M6; min. 13 deep
11	0511525604	250	3500	47.0	95.9	90.8	
16	0511625602	250	3000	47.5	104.3	99.2	

▼ **Splined shaft (DIN5482 B17 × 14) with rectangular flange Ø80 mm and axial drain port AZMF-...-xUFB20xL**



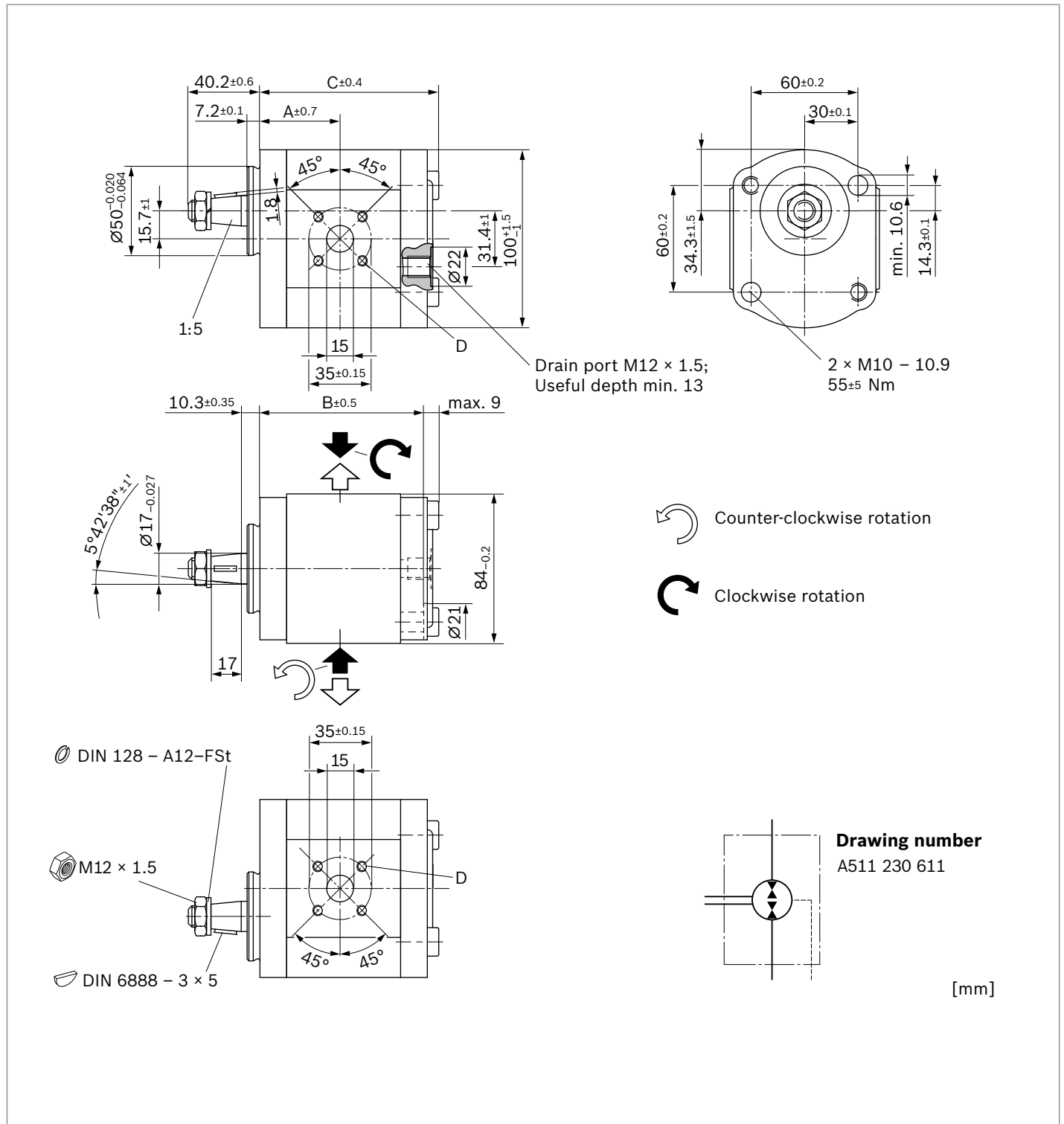
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation Reversible			A	B	C	D
8	0511425603	250	4000	43.2	91.0	85.8	M6; min. 13 deep
11	0511525601	250	3500	47.0	96.0	90.8	
16	0511625603	250	3000	47.5	104.4	99.2	
19	0511625605	210	3000	47.5	109.4	104.2	
22	0511725602	180	2500	55.1	114.8	109.6	

▼ Tang drive with 4-bolt mounting Ø52 mm and axial drain port
AZMF-...-xUNT20ML



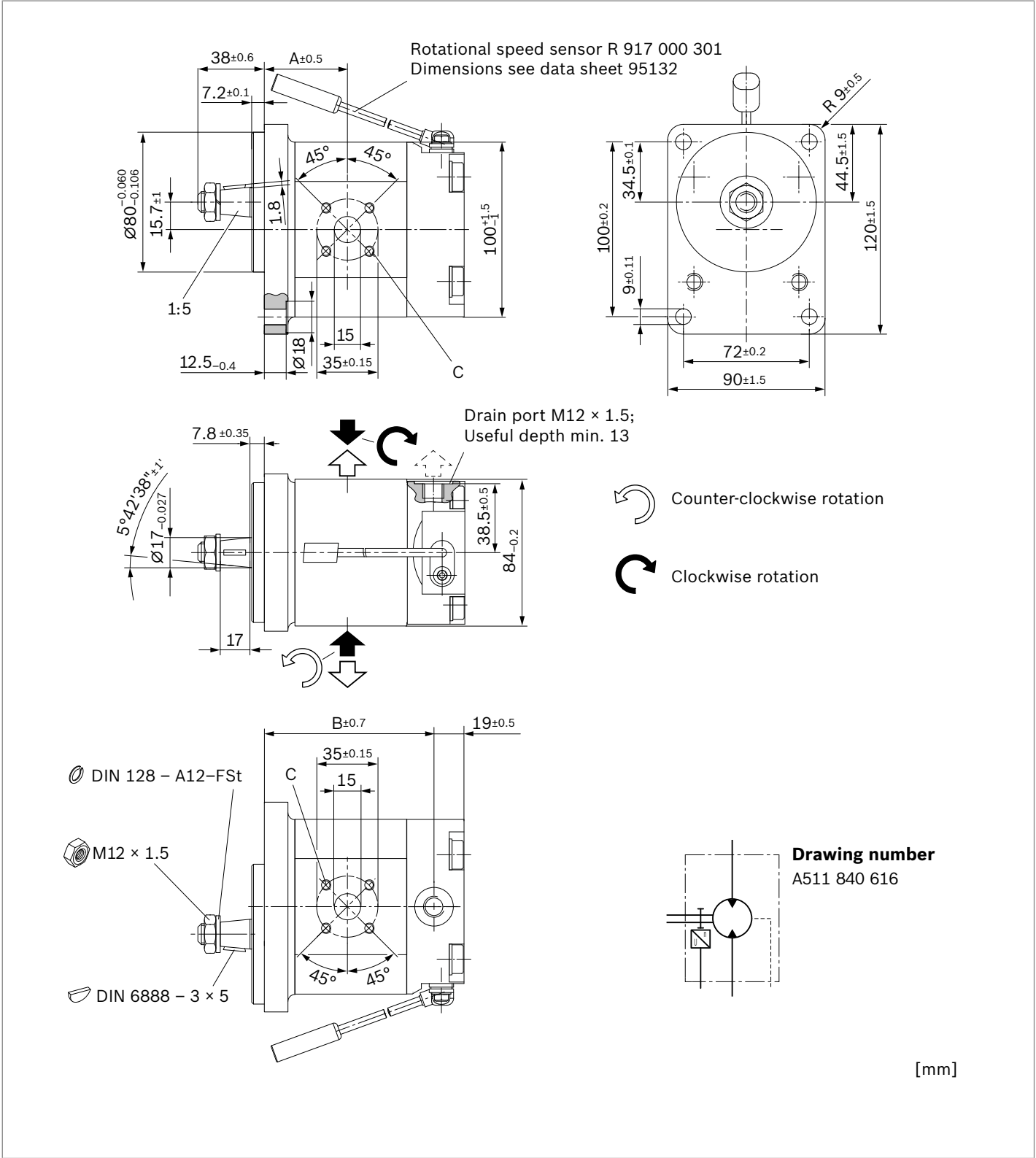
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation			A	B	C	D
	Reversible						
8	0511415605	250	4000	40.7	80.3	82.8	M6; min. 13 deep
11	0511515602	250	3500	44.5	85.3	87.8	
16	0511615607	220	3000	45.0	93.7	96.2	
19	0511615608	190	3000	45.0	98.7	101.2	
22	0511715601	160	3000	52.6	104.1	106.6	

▼ **1:5 tang drive Tapered shaft with rectangular flange Ø80 mm and axial drain port**
AZMF-...-xUCN20ML



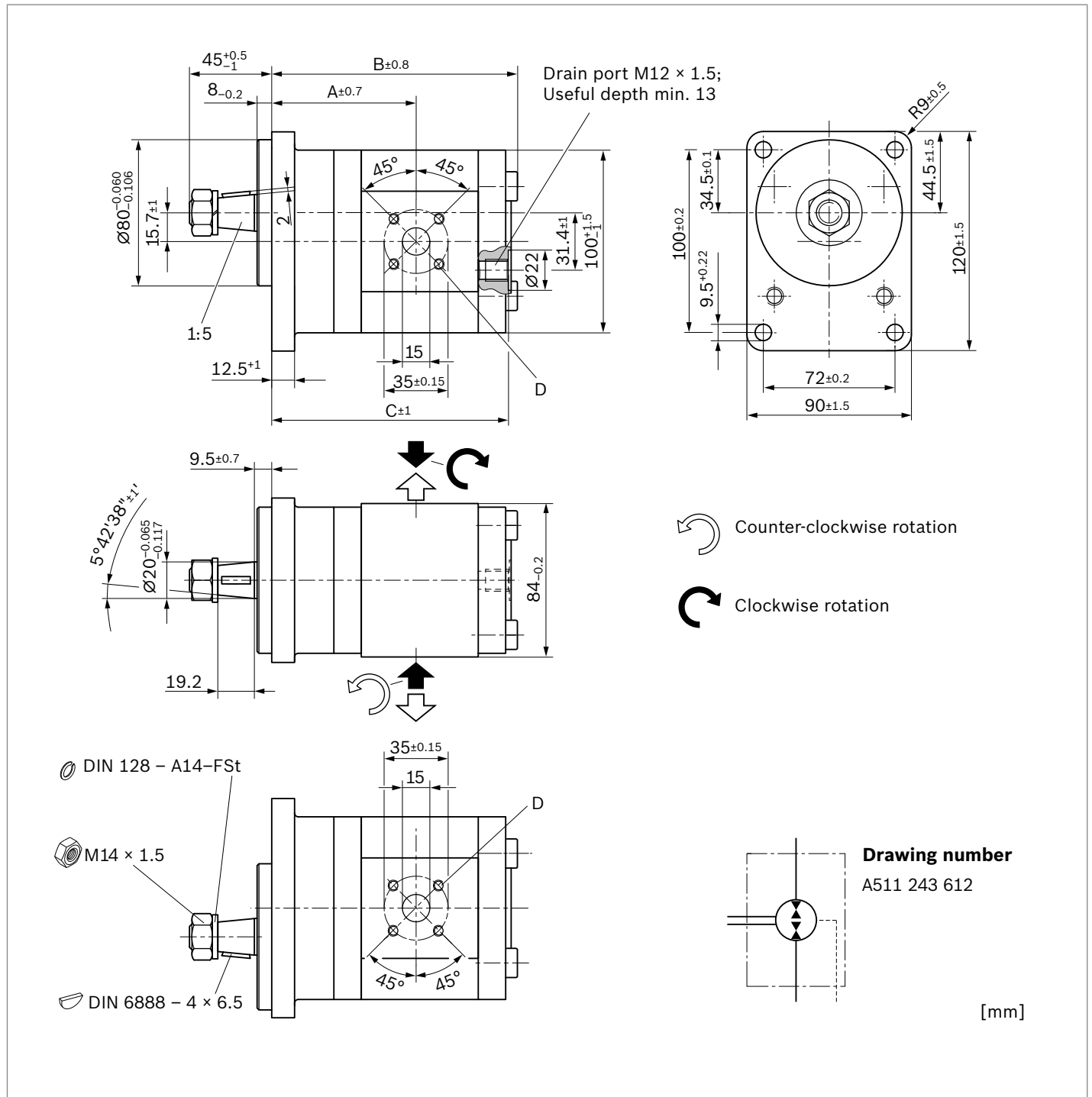
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
				A	B	C	D
8	0511415606	210	4000	40.7	80.3	83.3	M6;
11	0511515607	150	3500	44.5	85.3	88.3	min. 13 deep
	0511515601	210	3500	44.5	85.3	88.3	

▼ **1:5 tapered shaft with rectangular flange Ø80 mm and fan motor with speed sensor, pulse encoder wheel with 9 teeth**
AZMF-11-xUCB20PX-S0747



NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation Reversible			A	B	C
16	0511625627	250	3000	47.5	96.2	M6; min. 13 deep

▼ 1:5 tapered shaft with outrigger bearing Ø80 mm and axial drain port
AZMF-10-xUSA20ML

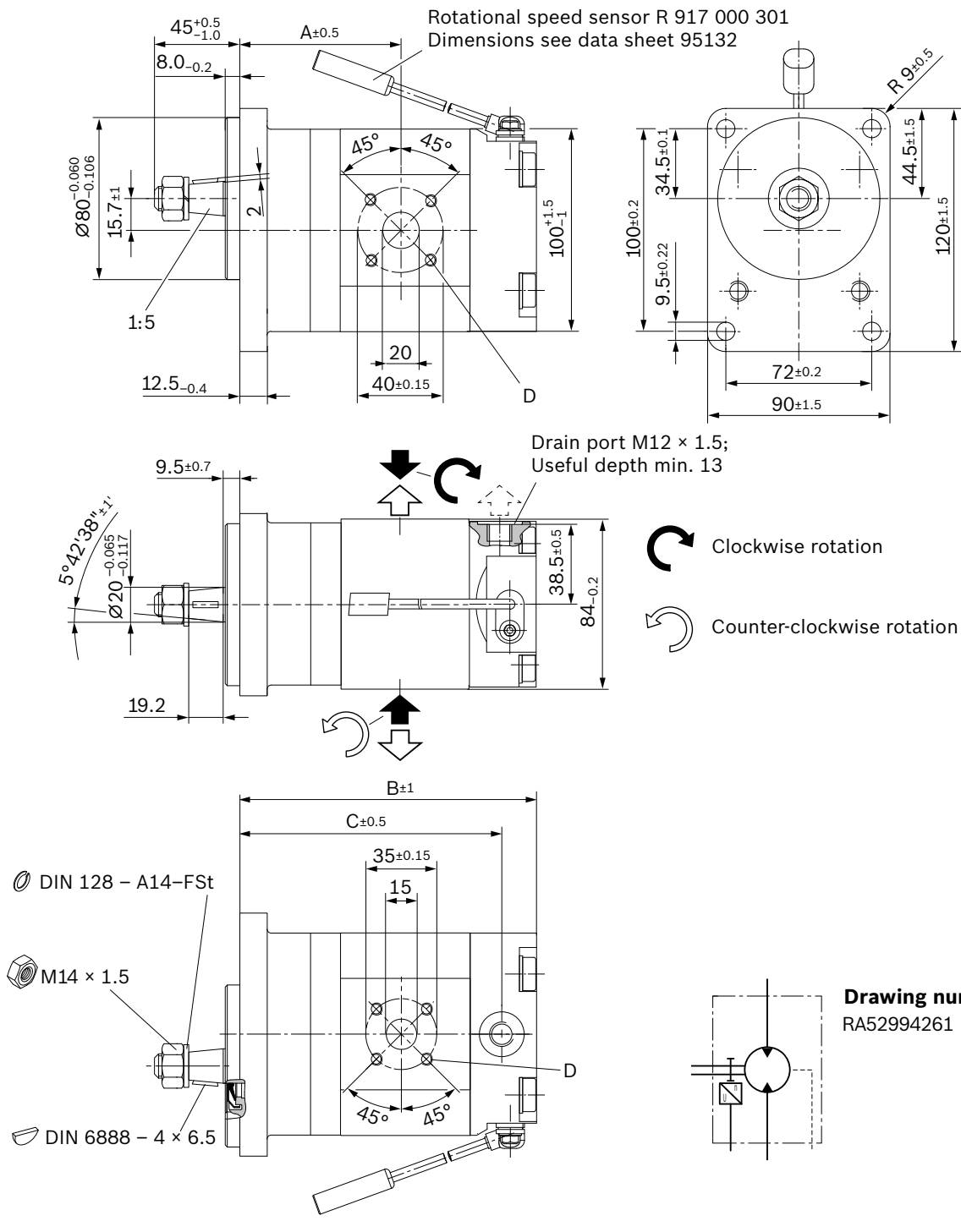


NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation			A	B	C	D
8	Reversible	250	4000	74.8	120.8	116.9	M6; min 13 deep
11		250	3500	78.6	125.8	121.9	
14		250	3000	79.0	130.6	126.8	
16		230	3000	79.1	134.2	130.3	
19		190	3000	79.1	139.2	135.3	

[illegible]

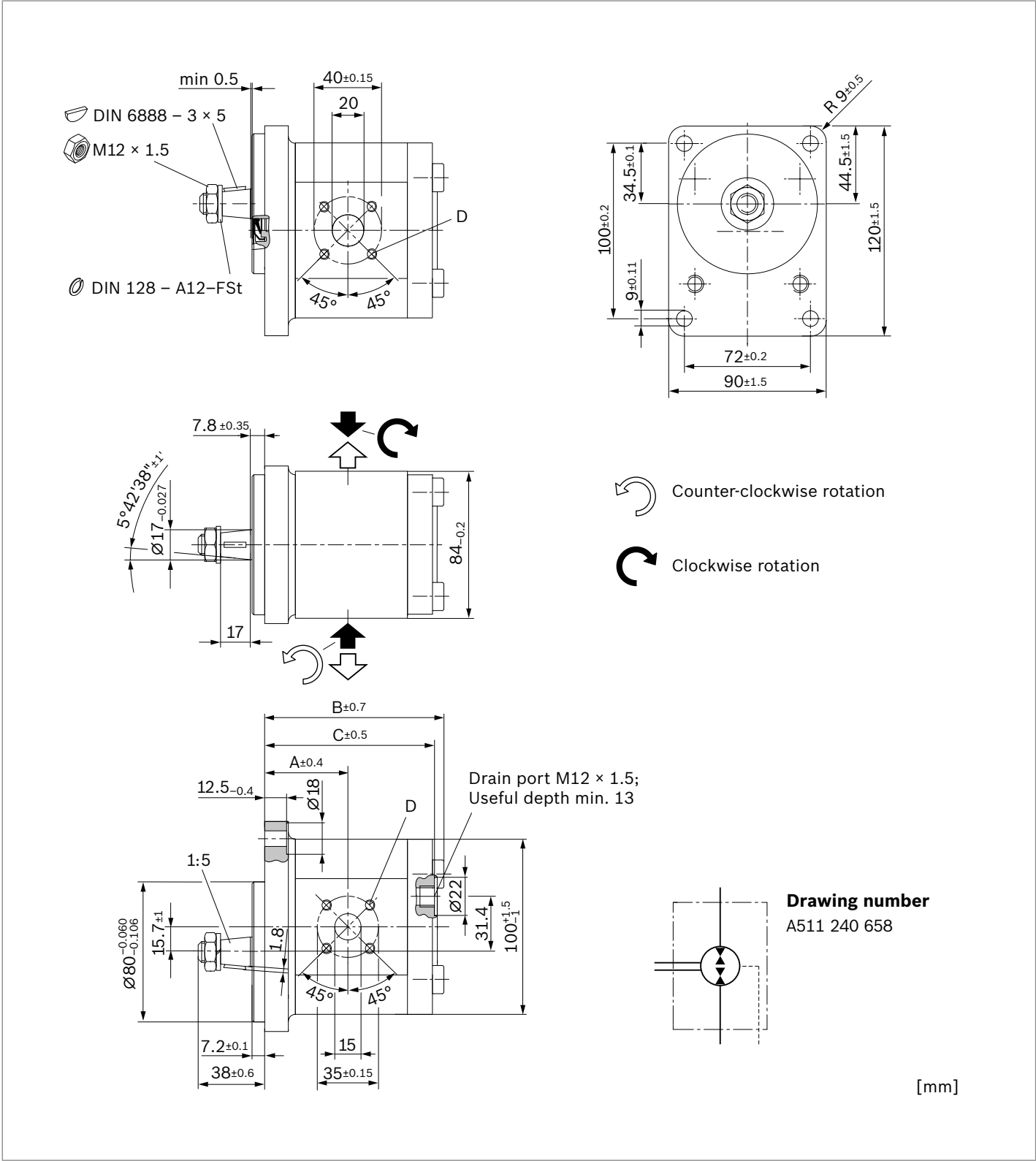
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
				A	B	C	D
8	0511445602	250	4000	74.7	120.8	117.0	M6; min. 13 deep
11	0511545606	250	3500	78.5	125.8	121.8	
14	0511545609	250	3000	79.0	130.6	126.8	
16	0511645608	230	3000	79.1	134.2	130.3	

▼ 1:5 tapered shaft with outrigger bearing $\varnothing 80$ mm and fan motor with speed sensor, pulse encoder wheel with 9 teeth
AZMF-13-xUSA20PL-S0747



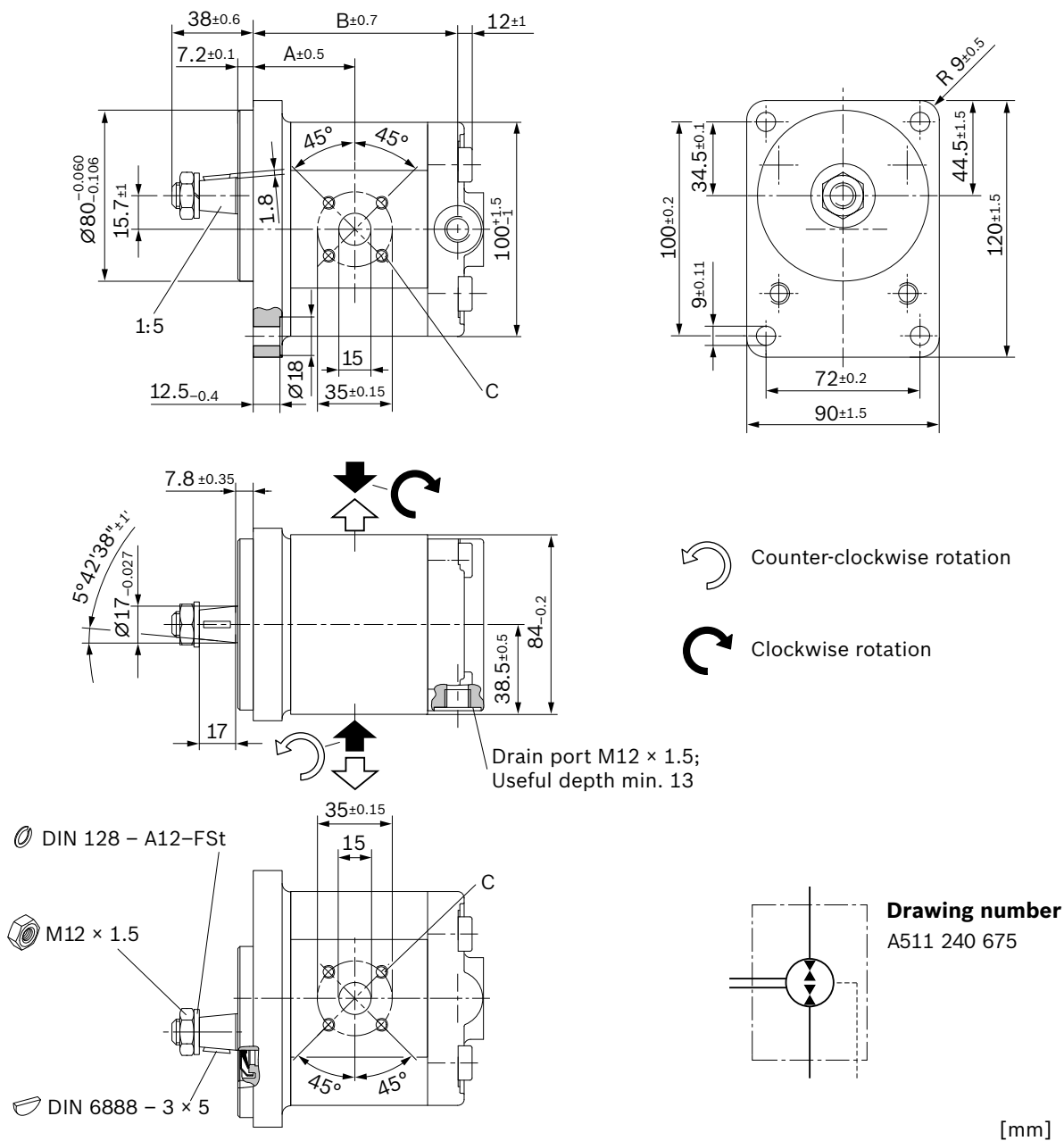
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation			A	B	C	D
	Reversible						
19	0511645610	210	3000	79.0	151.7	132.7	M6; min. 13 deep

▼ 1:5 tapered shaft with rectangular flange Ø80 mm and dust protection cover for shaft seal
AZMF- ...-xUCB20PL-S0540



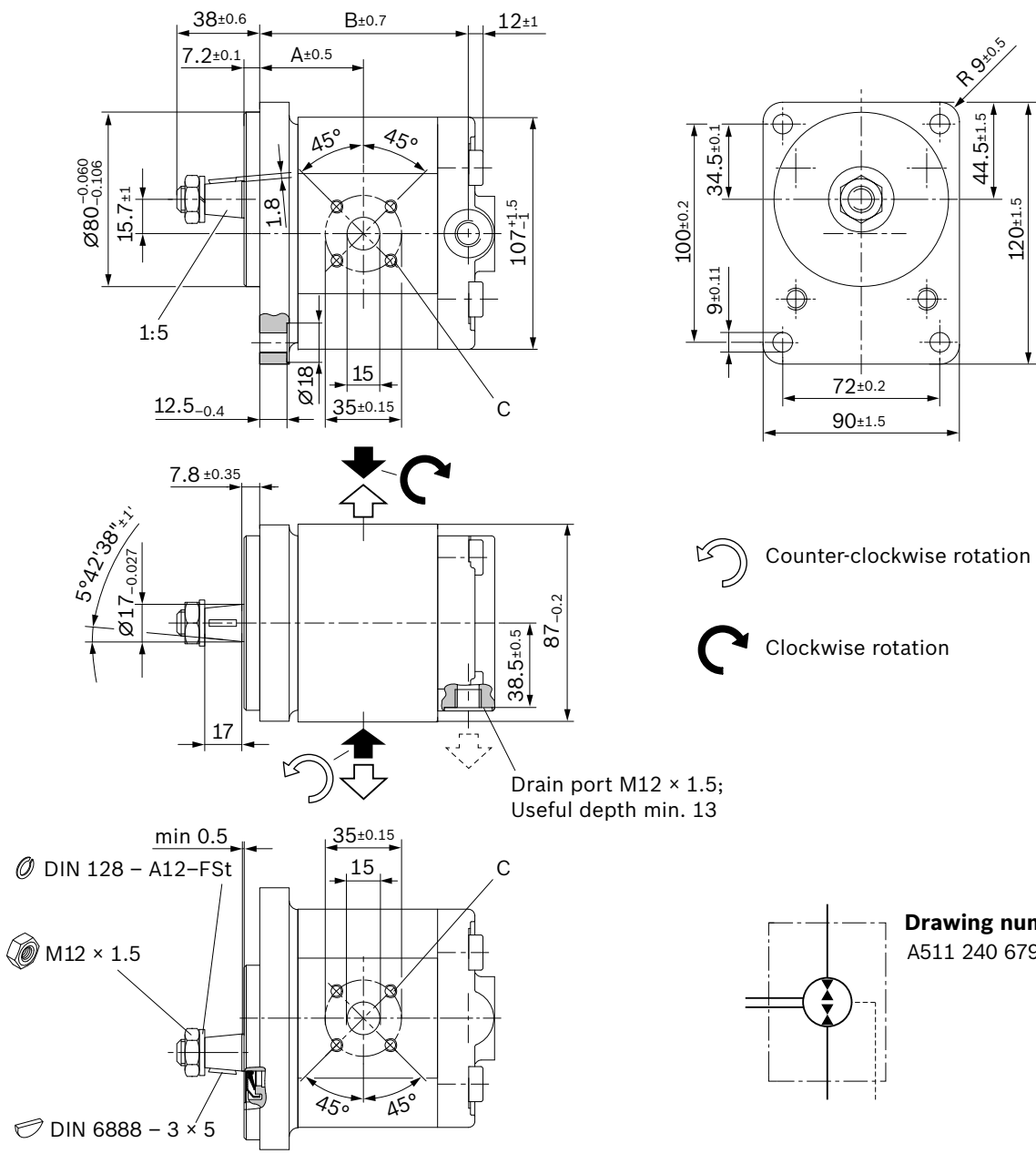
NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions			
	Direction of rotation Clockwise			A	B	C	D
11	0511525609	210	3500	47.0	94.2	90.8	M6; min. 13 deep

▼ 1:5 tapered shaft with rectangular flange Ø80 mm and dust protection cover for shaft seal, radial drain port in the end cover
AZMF-12-xUCB20PL-S0570



NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
				A	B	C
8	0511425608	250	4000	43.2	82.8	M6; min.13 deep
11	0511525613	250	3500	47.0	87.8	
14	0511525614	250	3000	47.5	92.8	
16	0511625620	250	3000	47.8	96.2	

▼ 1:5 tapered shaft with rectangular flange Ø80 mm and dust protection cover for shaft seal, radial drain port in the end cover
AZMF-...-xUCB20PL-S0570

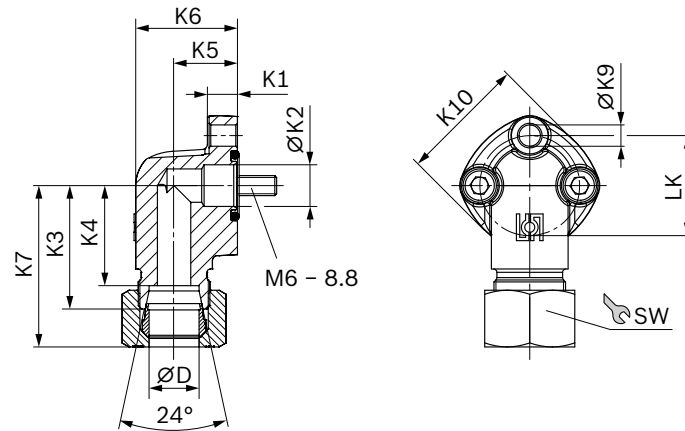


NG	Order number	Maximum start-up pressure p_2 [bar]	Maximum rotational speed [rpm]	Dimensions		
	Direction of rotation Counter-clockwise			A	B	C
19	0511625621	250	3000	58.4	113.2	M6; min. 13 deep
22	0511725617	250	3000	61.1	118.6	

Accessories

▼ 90° angle flange, 3-hole, for square flange 30 (see chapter "Line connection")

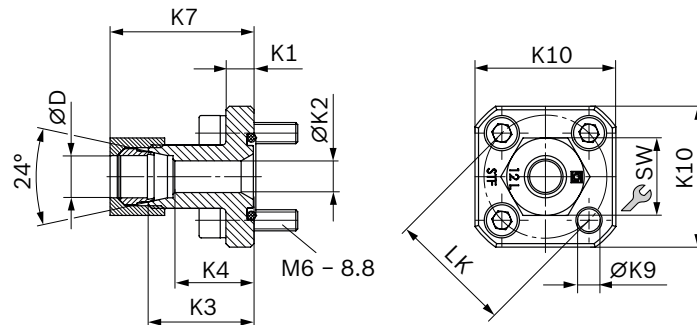
Complete fitting with O-ring, metric screw set, nut and cutting ring.



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	3 ×	NBR	kg
30	12	L	1515702146	250	9	12.5	37	30	19	30.5	46	6.4	38	22	M6 × 25	16 × 2.5	0.18

▼ Straight flange, for square flange 20 (see chapter "Line connection")

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

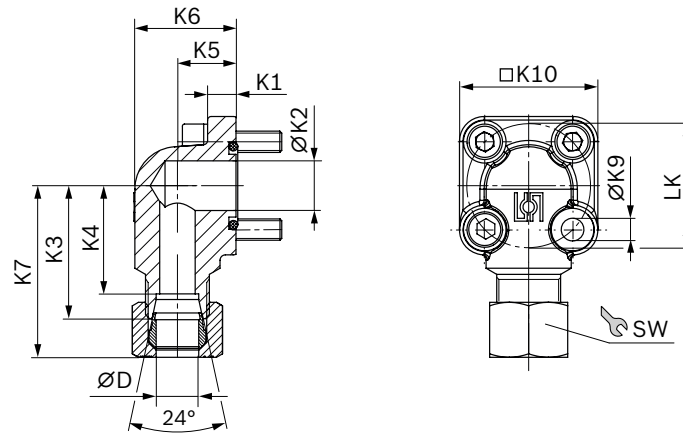


LK	D	Series ¹⁾	Material number	p_{max}	K1	K2	K3	K4	K7	K9	K10	SW	Screws	O-ring	Weight
mm	mm			bar	mm	mm	mm	mm	mm	mm	mm	mm	4 ×	NBR	kg
35	10	L	1515702064	315	8	7	30	23.0	38.0	6.5	40	19	M6 × 22	20 × 2.5	0.13
35	12	L	1515702065	315	8	9	30	23.0	38.5	6.5	40	22	M6 × 22	20 × 2.5	0.14
35	15	L	1515702066	250	8	11	30	23.0	39.0	6.5	40	27	M6 × 22	20 × 2.5	0.15
40	15	L	1515702067	100	8	11	35	28.0	44.0	6.5	40	27	M6 × 22	26 × 2.5	0.16
40	18	L	1515702068	100	8	14	35	27.5	44.0	6.5	40	32	M6 × 22	26 × 2.5	0.17
40	22	L	1515702069	100	8	18	35	27.5	45.0	6.5	40	36	M6 × 22	26 × 2.5	0.16
40	28	L	1515702008	100	8	19	35	27.5	45.0	6.5	40	41	M6 × 22	26 × 2.5	0.18

¹⁾ See DIN EN ISO 8434-1

▼ **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	<i>p</i> _{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
35	10	L	1515702070	315	8	14	37.5	30.5	16.5	28.5	45.0	6.4	39	19	M6 × 22	M6 × 35	20 × 2.5	0.18
35	12	L	1515702071	315	8	14	37.5	30.5	16.5	28.5	46.0	6.4	39	22	M6 × 22	M6 × 35	20 × 2.5	0.19
35	15	L	1515702072	250	8	14	37.5	30.5	16.5	28.5	46.0	6.4	39	27	M6 × 22	M6 × 35	20 × 2.5	0.20
35	16	S	1515702002	315	8	15	38.0	29.5	20.0	33.0	49.0	6.4	39	30	M6 × 22	M6 × 40	20 × 2.5	0.25
35	18	L	1515702006	250	8	15	37.5	30.0	20.0	33.0	47.0	6.4	39	32	M6 × 22	M6 × 40	20 × 2.5	0.22
35	20	S	1515702017	315	8	15	45.0	34.5	25.0	38.0	57.0	6.4	39	36	M6 × 22	M6 × 45	20 × 2.5	0.30
40	15	L	1515702073	100	9	20	38.0	31.0	22.5	38.0	47.0	6.4	42	27	M6 × 22	M6 × 22	26 × 2.5	0.26
40	18	L	1515702074	100	9	20	38.0	30.5	22.5	38.0	47.5	6.4	42	32	M6 × 22	M6 × 22	26 × 2.5	0.27
40	20	S	1515702011	250	9	20	40.0	29.5	22.5	37.0	52.0	6.4	42	36	M6 × 22	M6 × 45	26 × 2.5	0.26
40	22	L	1515702075	100	9	20	38.0	30.5	22.5	38.0	48.0	6.4	42	36	M6 × 22	M6 × 22	26 × 2.5	0.27
40	28	L	1515702010	100	9	20	40.0	32.5	28.0	44.0	50.5	6.4	42	41	M6 × 22	M6 × 50	26 × 2.5	0.37
40	35	L	1515702018	100	9	20	41.0	30.5	34.0	53.0	53.0	6.4	42	50	M6 × 22	M6 × 60	26 × 2.5	0.41

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.

Drain line

For reversible motors and/or motors that can be loaded by the return flow, a drain line is to be connected directly at the reservoir. Ensure adequate dimensioning.

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

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0511625311	AZMF-13-019LCB20PG185xx	23
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0511625023	AZMF-13-019RCB20PG220xx	23
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