

External Gear Pumps Model F

RE 10 089/08.04
Replaces: Model F
1 987 760 100/01.98

AZPF- ...



Fixed displacement pumps
 $V = 4.0 \dots 28 \text{ cm}^3$

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Page Features

2	- Nominal pressure 280 bar
3	- Plain bearings for heavy duty applications
4	- Drive shafts to ISO or SAE
5	- Combination of several pumps possible
6	- Port connections:
7	flange or screw thread
9	- Consistent high quality due to large-scale production
10	- Large number of different versions available

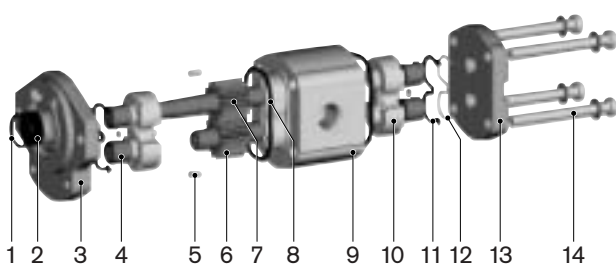
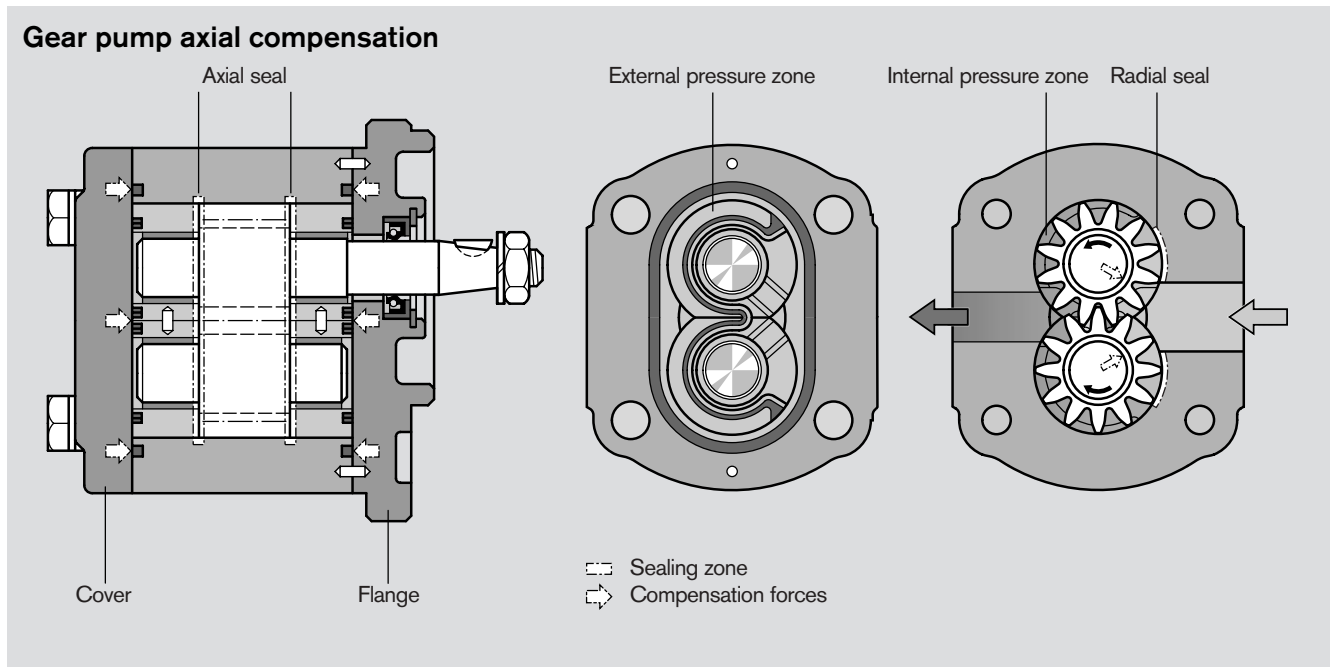
General

Rexroth external gear pumps are available as standard gear pumps in 4 versions: B, F, N and G, and as Silence gear pumps. Different displacements are obtained by using gears of different widths. Further different versions are achieved through the use of different flanges, shafts, valves and multiple pump combinations.

Construction

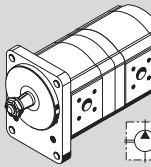
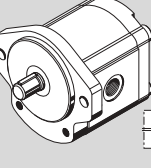
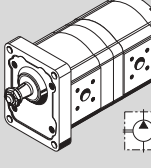
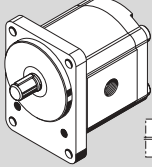
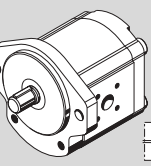
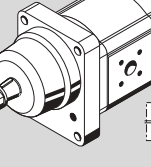
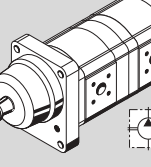
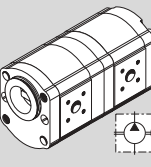
The external gear machine consists essentially of a pair of gears supported in bearings and the housing with a front and a rear cover. The drive shaft protrudes from the front cover where it is sealed by the shaft seal. The bearing forces are absorbed by special bearing bushings with sufficient elasticity to produce surface contact instead of line contact. They also ensure excellent resistance to galling – especially at low speed. The gears have 12 teeth. This keeps both flow pulsation and noise emission to a minimum.

The internal sealing is achieved by forces which are proportional to delivery pressure. This ensures optimum efficiency. The bearings provide the seal at the ends of the gaps between the teeth which carry the pressurized oil. The sealing zone between the gear teeth and the bearings is controlled by the admission of operating pressure to the rear of the bearings. Special seals form the boundary of the zone. The radial clearance at the tips of the gear teeth is sealed by internal forces pushing them against the housing.



- | | |
|---------------------|---------------------|
| 1 Retaining ring | 8 Housing seal |
| 2 Shaft seal | 9 Pump housing |
| 3 Front cover | 10 Bearing |
| 4 Plain bearing | 11 Axial zone seal |
| 5 Centring pin | 12 Support |
| 6 Gear | 13 End cover |
| 7 Gear (frictional) | 14 Fastening screws |

Product overview "Model F" preferential range

























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	19		28		38/ 39		51
	20		29		40/ 41		52
	21		30		42/ 43		53
	22		31		44/ 45		54
	23		32		46		55
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	25		34		48		
	26		35		49		

Ordering code

External Gear Pumps, Single Pumps Standard




























A Z	P	F	-	x x	-	016	R	C	B	20	M	B	18009	S xxxx																																				
<table border="1"> <tr> <td>Function</td> <td rowspan="2">Special design *)</td> </tr> <tr> <td>P = Pump</td> </tr> <tr> <td>Series</td> <td></td> </tr> <tr> <td>1x = Standard bearing</td> <td></td> </tr> <tr> <td>2x = reinforces bearing</td> <td></td> </tr> <tr> <td>Size (S)</td> <td></td> </tr> <tr> <td>4.0 cm³/rev = 004</td> <td></td> </tr> <tr> <td>5.5 cm³/rev = 005</td> <td></td> </tr> <tr> <td>8.0 cm³/rev = 008</td> <td></td> </tr> <tr> <td>11.0 cm³/rev = 011</td> <td></td> </tr> <tr> <td>14.0 cm³/rev = 014</td> <td></td> </tr> <tr> <td>16.0 cm³/rev = 016</td> <td></td> </tr> <tr> <td>19.0 cm³/rev = 019</td> <td></td> </tr> <tr> <td>22.5 cm³/rev = 022</td> <td></td> </tr> <tr> <td>25.0 cm³/rev = 025</td> <td></td> </tr> <tr> <td>28.0 cm³/rev = 028</td> <td></td> </tr> <tr> <td>Direction of rotation</td> <td></td> </tr> <tr> <td>Right = R</td> <td></td> </tr> <tr> <td>Left = L</td> <td></td> </tr> </table>														Function	Special design *)	P = Pump	Series		1x = Standard bearing		2x = reinforces bearing		Size (S)		4.0 cm ³ /rev = 004		5.5 cm ³ /rev = 005		8.0 cm ³ /rev = 008		11.0 cm ³ /rev = 011		14.0 cm ³ /rev = 014		16.0 cm ³ /rev = 016		19.0 cm ³ /rev = 019		22.5 cm ³ /rev = 022		25.0 cm ³ /rev = 025		28.0 cm ³ /rev = 028		Direction of rotation		Right = R		Left = L	
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*) The special equipments partly contained on the pages 18–55, are not considered in the representation of the ordering code.

Drive shafts	Front cover	Port connections
<p>C Tapered keyed shaft 1 : 5  B P suitable front cover</p>	<p>B Square flange Centring Ø 80 mm </p>	<p>20 Rectangular flange DIN 8901/8902 </p>
<p>H Tapered keyed shaft 1 : 8  O</p>	<p>R SAE J 744 82-2 A 2-bolt flange Ø 82.55 mm </p>	<p>12 Thread (UN-2B) SAE O-ring BOSS </p>
<p>N Tang drive  M</p>	<p>P 2-bolt mounting Centring Ø 50 mm </p>	<p>30 Rectangular flange </p>
<p>Q Straight keyed shaft SAE J 744 16-1  R</p>	<p>O Square flange Centring Ø 36.47 mm </p>	<p>01 Pipe thread ISO 228/1 </p>
<p>R Spline shaft SAE J 744 16-4 9T  R C</p>	<p>C SAE J 744 101-2 B 2-bolt flange Ø 101.6 mm </p>	<p>03 Metric thread ISO 6149 with O-ring </p>
<p>P Spline shaft SAE J 744 19-4 11T  R C</p>	<p>M 2-bolt mounting Centring Ø 52 mm with O-ring </p>	
<p>F Spline shaft DIN 5482 B 17 x 14  B P</p>	<p>A Outboard bearing Ø 80 mm, Type 1 </p>	
<p>S Tapered keyed shaft 1 : 5 for flange A  A</p>	<p>N 2-bolt mounting Centring Ø 50 mm </p>	
<p>A Straight keyed ISO Ø 18 mm  B</p>	<p>T 4-bolt mounting Ø 52 mm with O-ring </p>	
	<p>G Outboard bearing Ø 80 mm, Type 2 </p>	

Ordering code

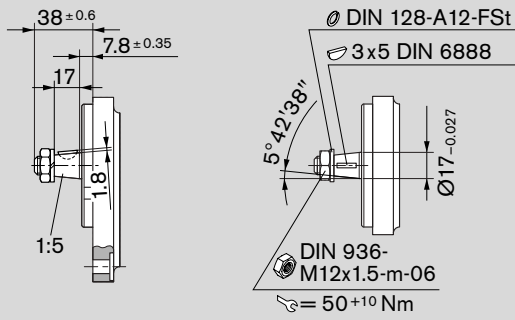
External Gear Pumps, Multiple Pumps Standard

AZ	P	GGFF	-	xx	-	032 / 022 / 016 / 005	R	C	B	20	20	20	20	K	B
Function P = Pump Model B = 1.0 ... 4.0 cm ³ /rev S = 4.0 ... 22.5 cm ³ /rev F = 4.0 ... 22.5 cm ³ /rev N = 20.0 ... 36.0 cm ³ /rev G = 22.5 ... 56.0 cm ³ /rev Series 1x = Standard bearing 2x = reinforced bearing Size correspondingly of separate model Direction of rotation Right = R Left = L						Rear cover refers on the last pumps part Model B Standard = B Model S Standard = B Model F Standard = B Model N Standard = B Model G Standard = B Seals NBR = M FPM = P NBR, shaft seal in FPM = K shaft seal relate to pump section 1									
Drive shafts relates to pump part 1							Front cover relates to pump part 1				Port connections every pump parts				
Model B: Suitable front cover											02 Thread metric DIN 3852 T1 				
Model S: C Tapered keyed shaft 1 : 5  B H Tapered keyed shaft 1 : 8  O R Spline shaft SAE J 744 16-4 9T  R							B Square flange Centering Ø 80 mm  O Square flange Centering Ø 36.47 mm  R SAE J 744 82-2 A 2-bolt flange Ø 82.55 mm 				20 Rectangular flange 				
Model F: C Tapered keyed shaft 1 : 5  B H Tapered keyed shaft 1 : 8  O R Spline shaft SAE J 744 16-4 9T  R							B Square flange Centering Ø 80 mm  O Square flange Centering Ø 36.47 mm  R SAE J 744 82-2 A 2-bolt flange Ø 82.55 mm 				20 Rectangular flange 				
Model N: C Tapered keyed shaft 1 : 5  B D Spline shaft SAE J 744 22-4 13T  C							B Square flange Centering Ø 100 mm  C SAE J 744 101-2 B 2-bolt flange Centering Ø 101.6 mm 				20 Rectangular flange 				
Model G: C Tapered keyed shaft 1 : 5  B D Spline shaft SAE J 744 22-4 13T  C H Tapered keyed shaft 1 : 8  O							B Square flange Centering Ø 105 mm  C SAE J 744 101-2 B 2-bolt flange Centering Ø 101.6 mm  O Square flange Centering Ø 50.78 mm 				20 Rectangular flange 				

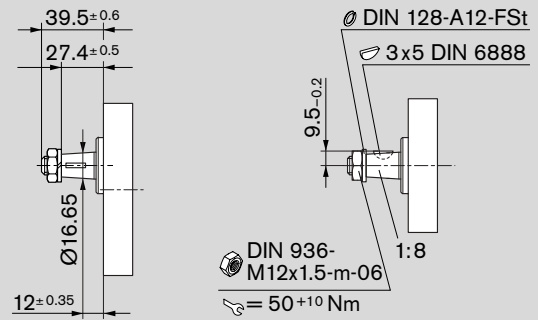
The representation shows only an excerpt from our entire program.

Drive shafts

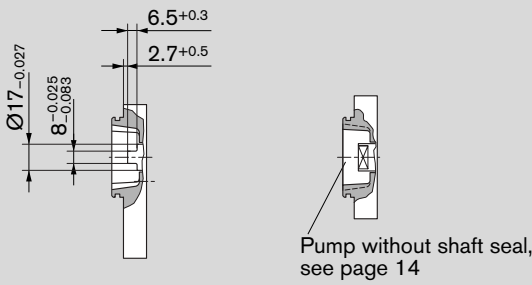
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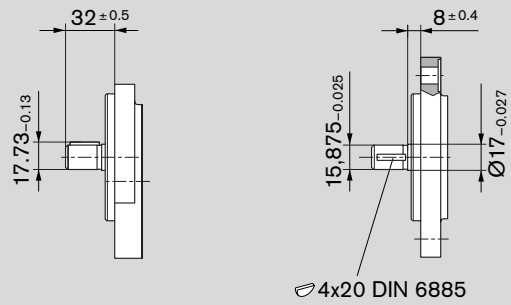
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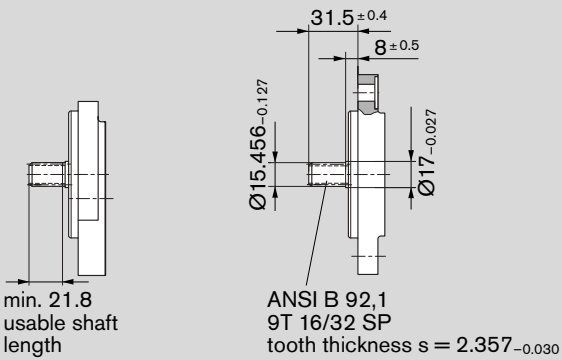
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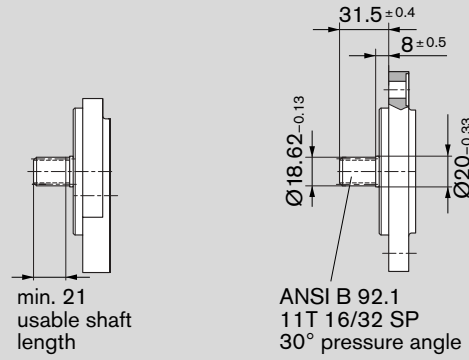
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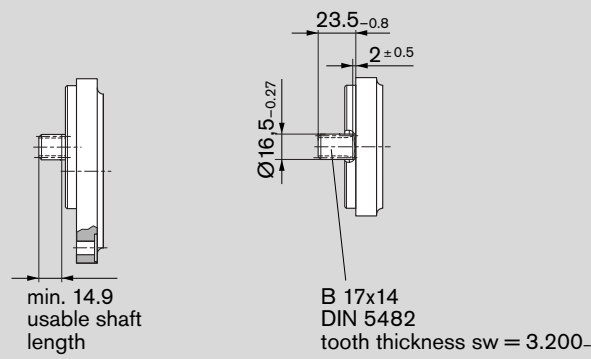
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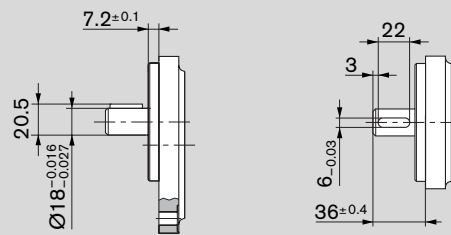
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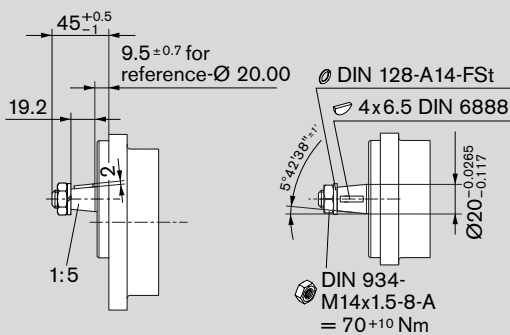
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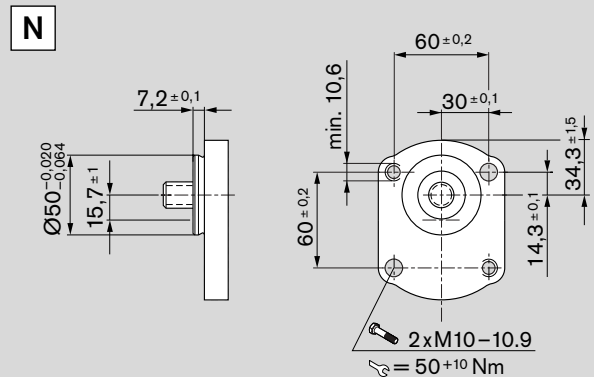
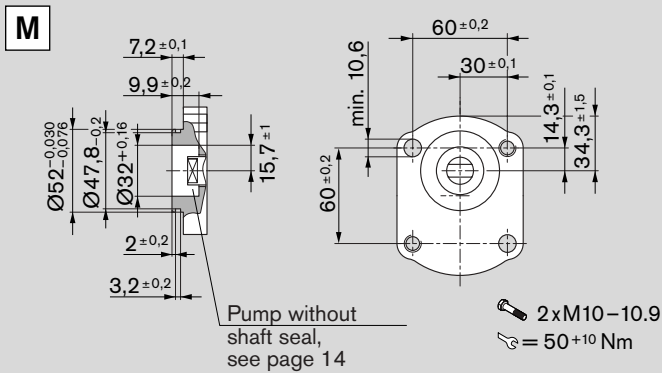
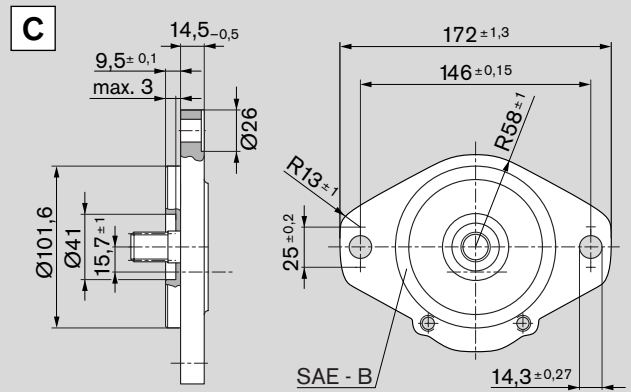
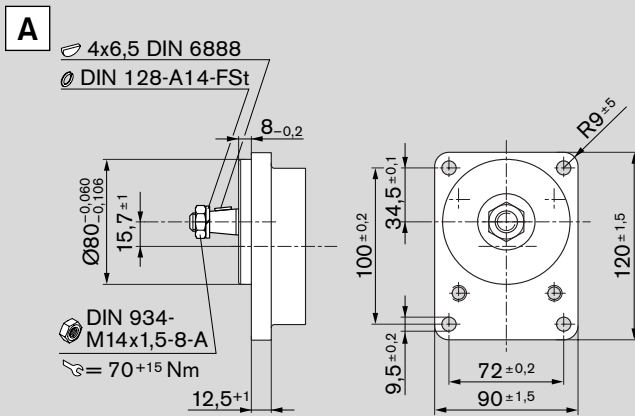
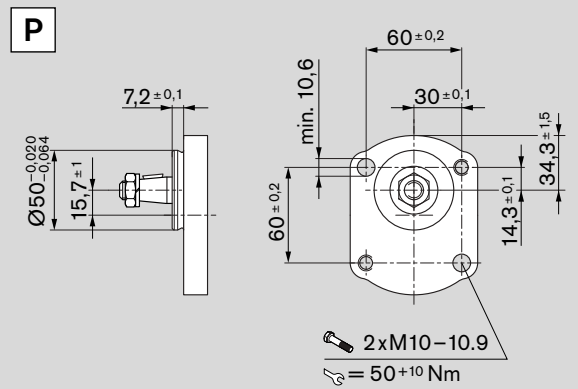
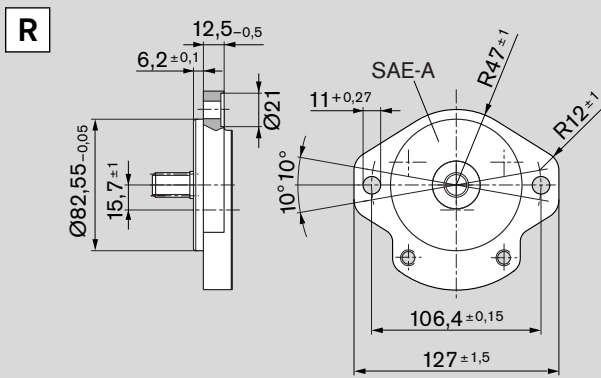
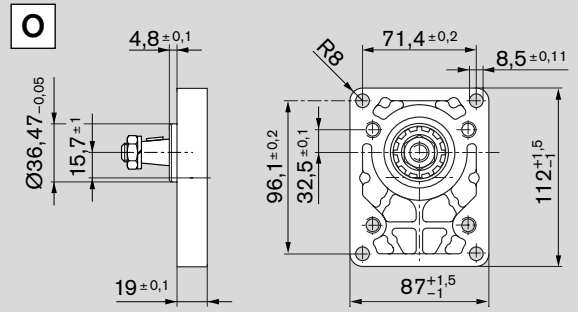
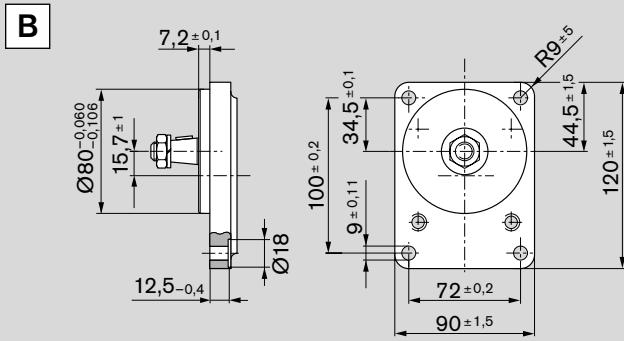
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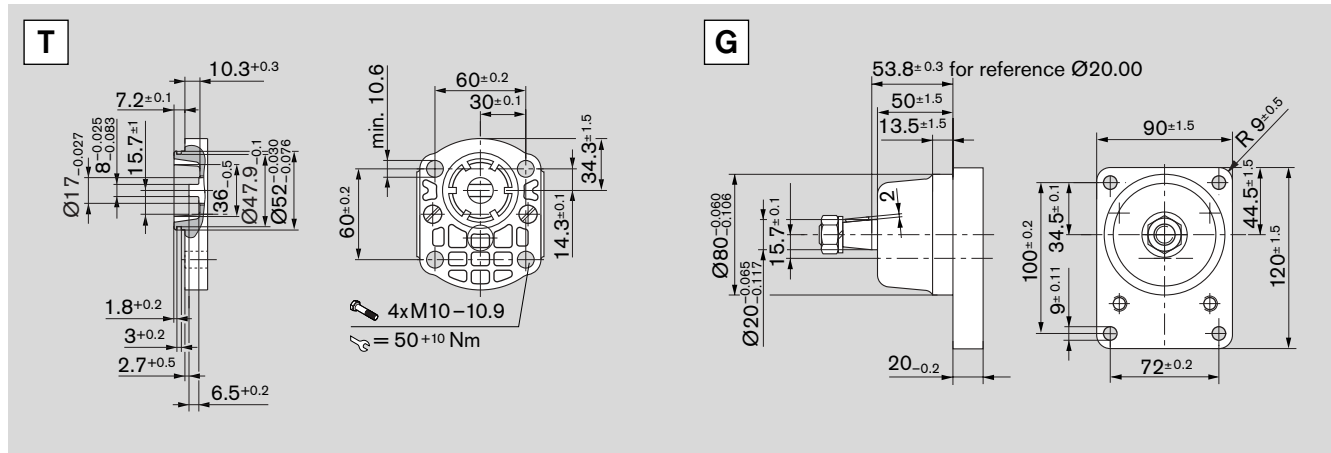
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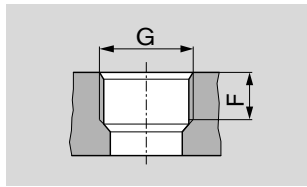
Front cover



Front cover (continuation)



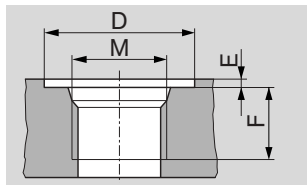
Port connections



01 Pipe thread
ISO 228/1

when pressure $p_2 > 210$ bar
limited fatigue strength

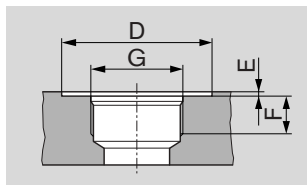
Synopsis of Types	Size	Pressure port		Suction port	
		G	F	G	F
01	4 ... 16 cm ³	G 1/2	16	G 3/4	16
	19 ... 28 cm ³	G 3/4		G1	



03 Thread metric
ISO 6149
with O-ring

when pressure $p_2 > 210$ bar
limited fatigue strength

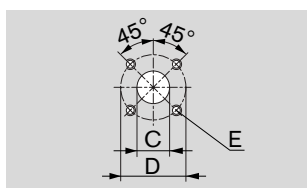
Synopsis of Types	Size	Pressure port				Suction port			
		M	D	E	F	M	D	E	F
03	4 ... 5.5 cm ³	M 18 x 1.5	29	0.5	14.5	M 18 x 1.5	29	0.5	14.5
	8 ... 16 cm ³				18				M 27 x 1.5
	19 ... 28 cm ³	M 22 x 1.5	34		M 33 x 2	46	22		



12 Thread
(UN-2B) SAE
O-ring BOSS

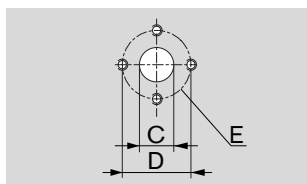
when pressure $p_2 > 210$ bar
limited fatigue strength

Synopsis of Types	Size	Pressure port				Suction port			
		G	D	E	F	G	D	E	F
12	4 ... 5.5 cm ³	9/16-18 UNF-2B	25	0.5	13	9/16-18 UNF-2B	25	0.5	13
	8 cm ³								
	11 ... 28 cm ³	11/16-12 UNF-2B	45		11/16-12 UNF-2B	45	19		



20 Rectangular flange
DIN 8901/8902

Synopsis of Type	Size	Pressure port			Suction port		
		C	D	E	C	D	E
20	4 ... 5.5 cm ³	15	35	M 6 depth 13	15	40	M 6 depth 13
	8 ... 16 cm ³				20		
	19 ... 28 cm ³	26	55		M 8 depth 13		



30 Rectangular flange

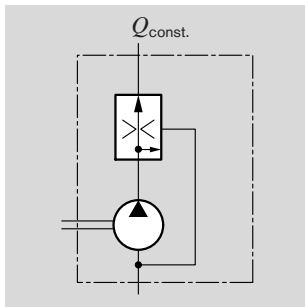
Synopsis of Type	Size	Pressure port			Suction port		
		C	D	E	C	D	E
30	4 ... 8 cm ³	13.5	30.2	M 6 depth 13	13.5	30.2	M 6 depth 13
	11 ... 28 cm ³				20.0		

Gear pumps with integral valves

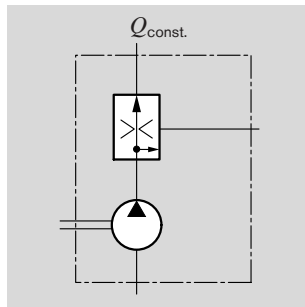
In order to reduce external pipework it is possible to incorporate a flow control valve or pressure relief valve in the rear cover of the pump. A typical application of this is in power-assisted steering systems. The pump delivers a constant flow irrespective of the speed at which it is driven. The excess flow is either returned internally to the suction or distributed externally to other items of equipment.



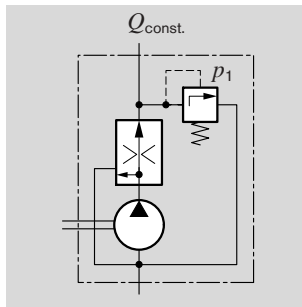
on request



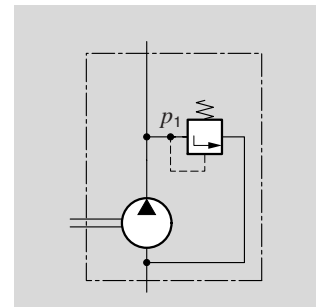
3-way flow control valve.
Excess flow returned to suction
 $Q_{const.} = 2...27 \text{ l/min}$



3-way flow control valve.
Excess flow distributed externally; loadable
 $Q_{const.} = 2...27 \text{ l/min}$



3-way flow control valve with pressure relief valve. Excess flow returned to suction
 $Q_{const.} = 2...27 \text{ l/min}$
 $p_1 = 100...180 \text{ bar}$



Pressure relief valve.
Discharge returned to suction
 $p_1 = 5...250 \text{ bar}$

Ordering code

S xxx17

E xxx12

V 21011

D 180xx

Design calculations for pumps

The design calculations for pumps are based on the following parameters:

- V [cm³/rev] Displacement
- Q [l/min] Delivery
- p [bar] Pressure
- M [Nm] Drive torque
- n [rev/min] Drive speed
- P [kW] Drive power

It is also necessary to allow for different efficiencies such as:

- η_v Volumetric efficiency
- η_{hm} Hydraulic-mechanical efficiency
- η_t Overall efficiency

The following formulas describe the various relationships. They include correction factors for adapting the parameters to the usual units encountered in practice.

Note: Diagrams providing approximate selection data will be found on subsequent pages.

$$Q = V \cdot n \cdot \eta_v \cdot 10^{-5}$$

$$V = \frac{Q}{n \cdot \eta_v} \cdot 10^5$$

$$p = \frac{M \cdot \eta_{hm}}{1,59 \cdot V}$$

$$V = \frac{M \cdot \eta_{hm}}{1,59 \cdot p}$$

$$P = \frac{p \cdot Q}{6 \cdot \eta_t}$$

$$Q = \frac{6 \cdot P \cdot \eta_t}{p}$$

$$n = \frac{Q}{V \cdot \eta_v} \cdot 10^5$$

$$M = \frac{1,59 \cdot V \cdot p}{\eta_{hm}}$$

$$p = \frac{6 \cdot P \cdot \eta_t}{Q}$$

[%]

n — η_v — Q

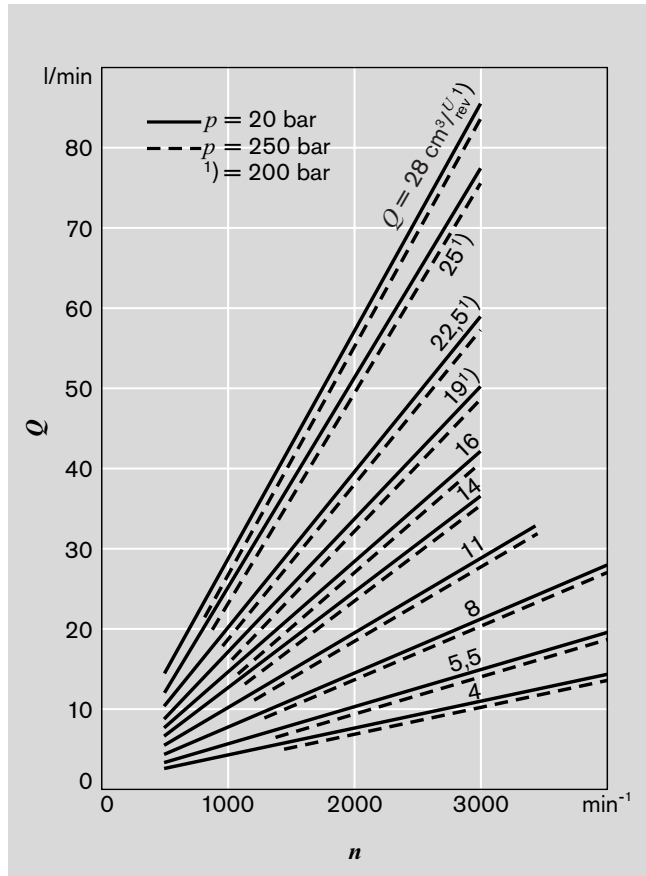
M — η_{hm} — p

P — η_t — $p \cdot Q$

V [cm³/rev] Q [l/min] p [bar] **Note:** η [%] e.g. 95 [%]

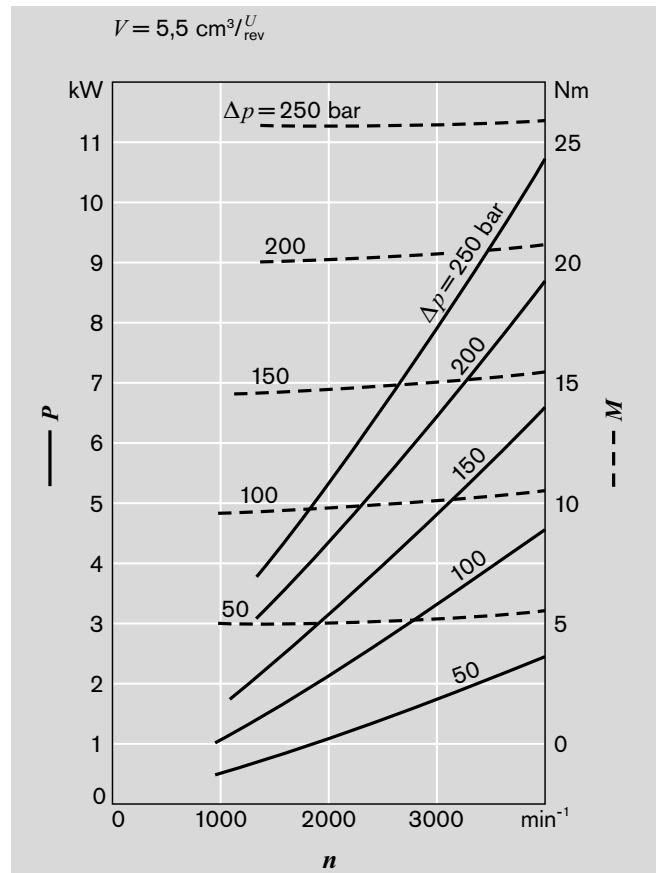
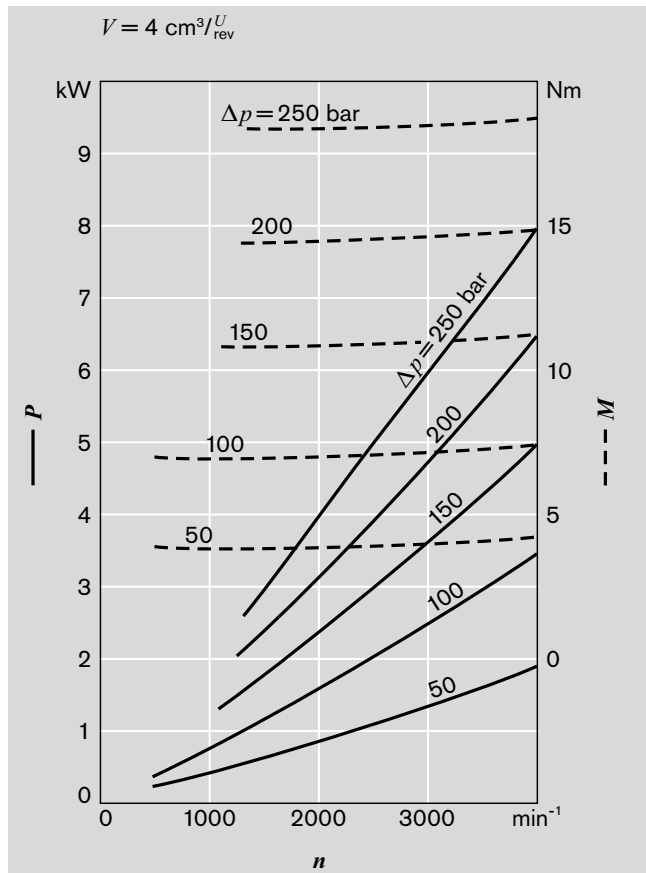
n [rev/min] P [kW] M [Nm]

Diagrams

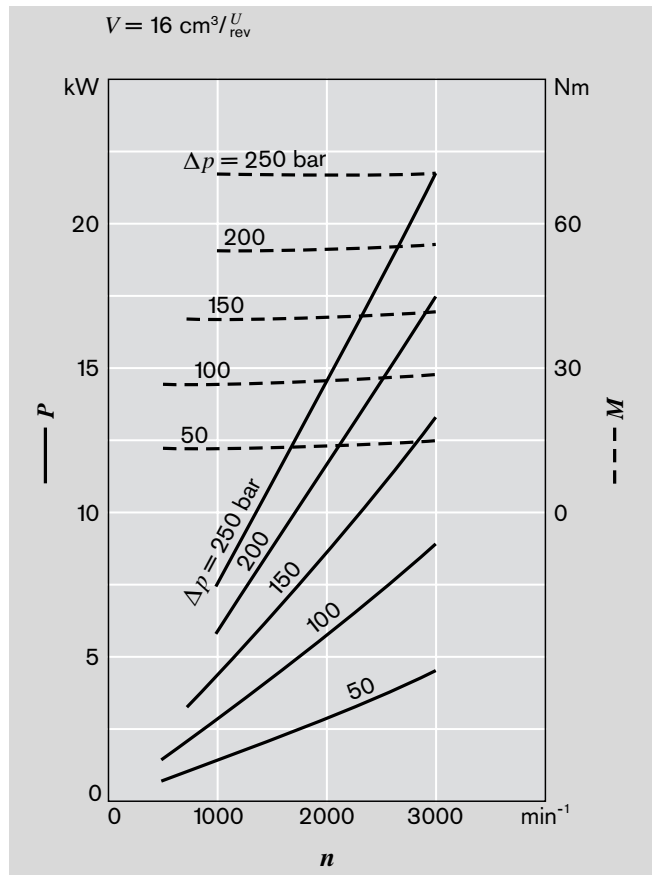
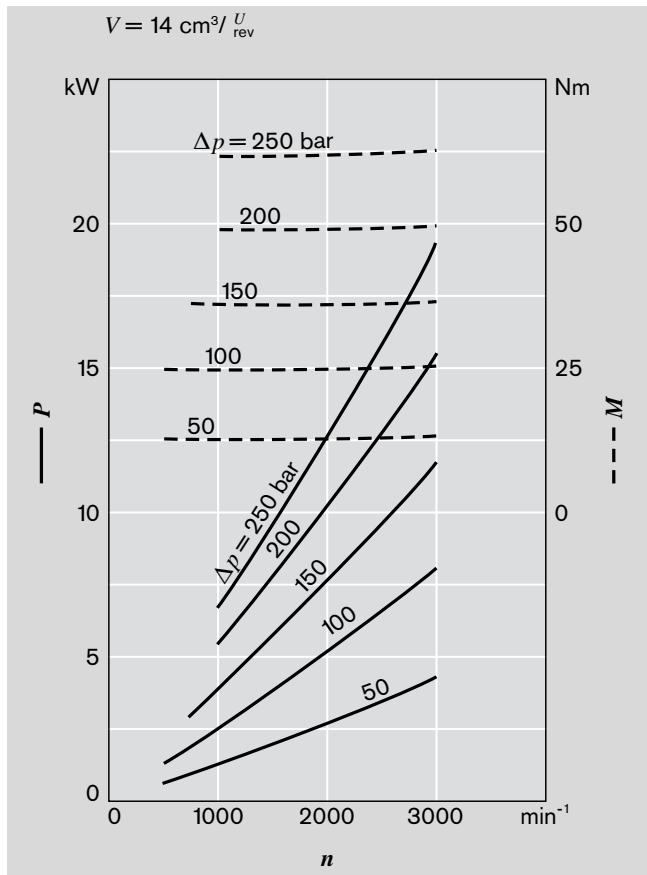
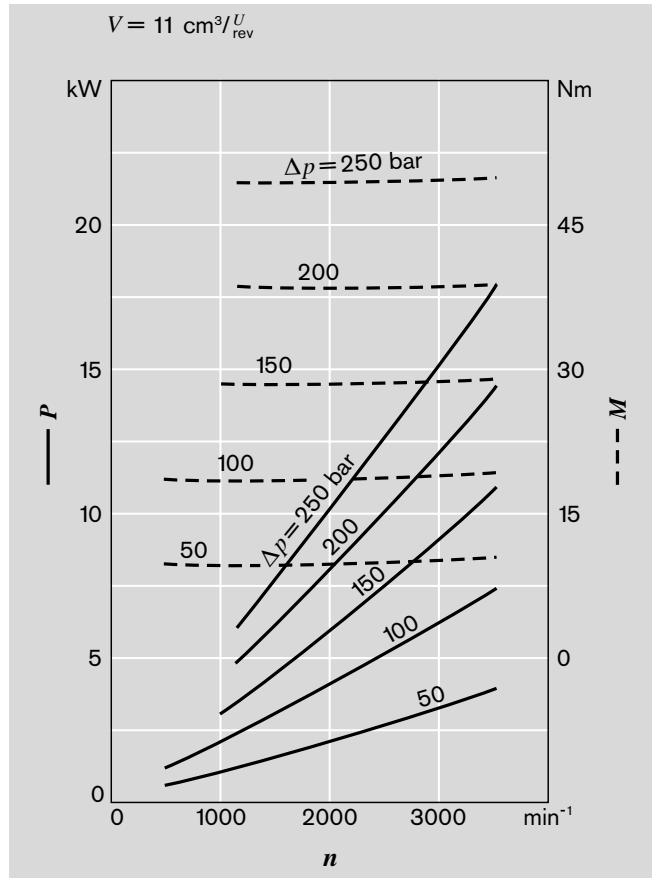
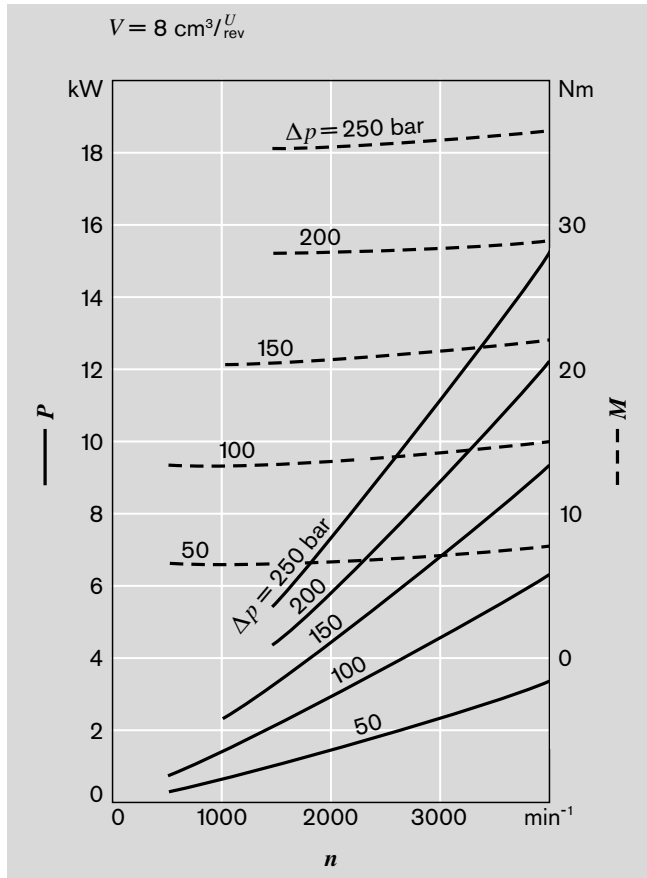


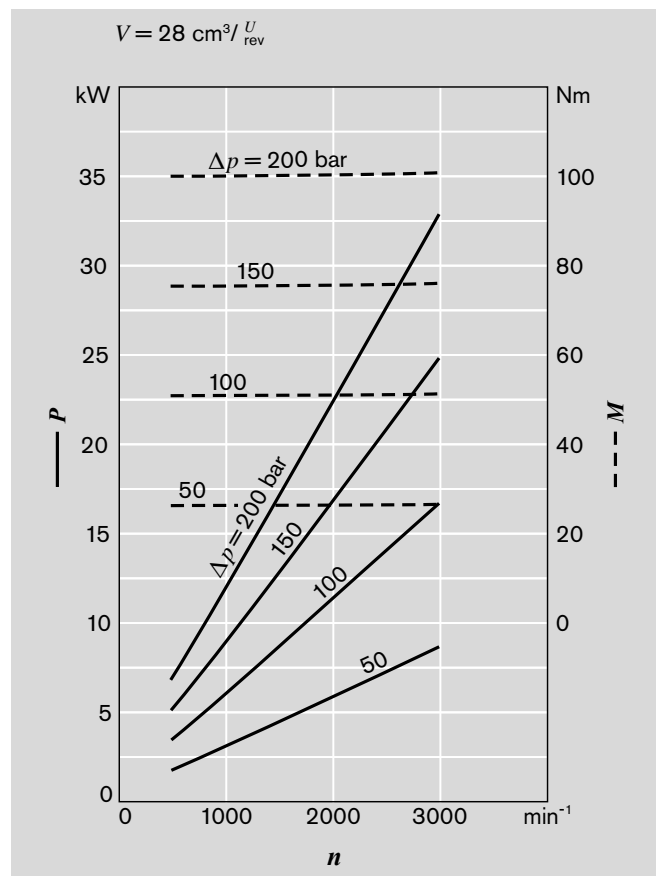
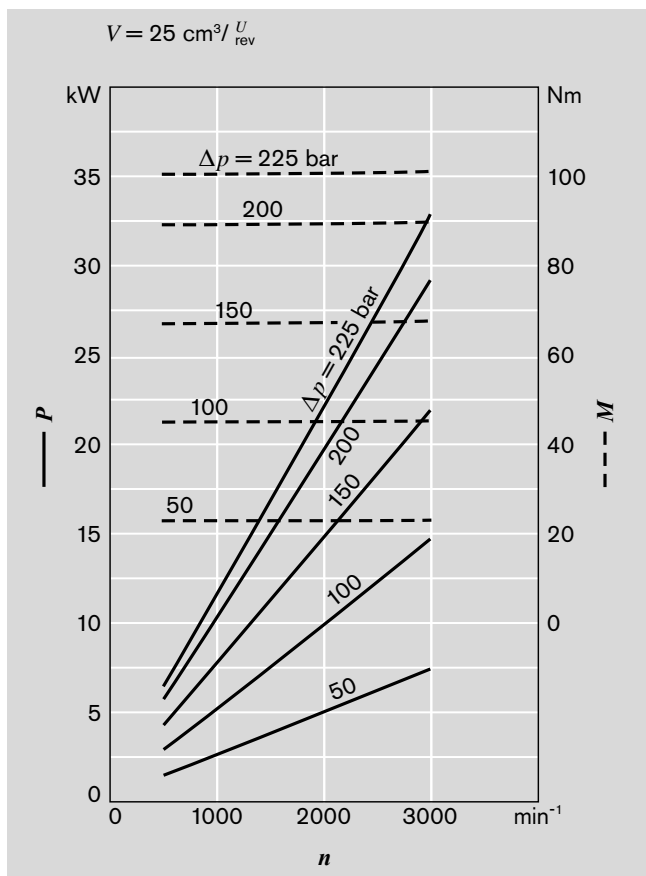
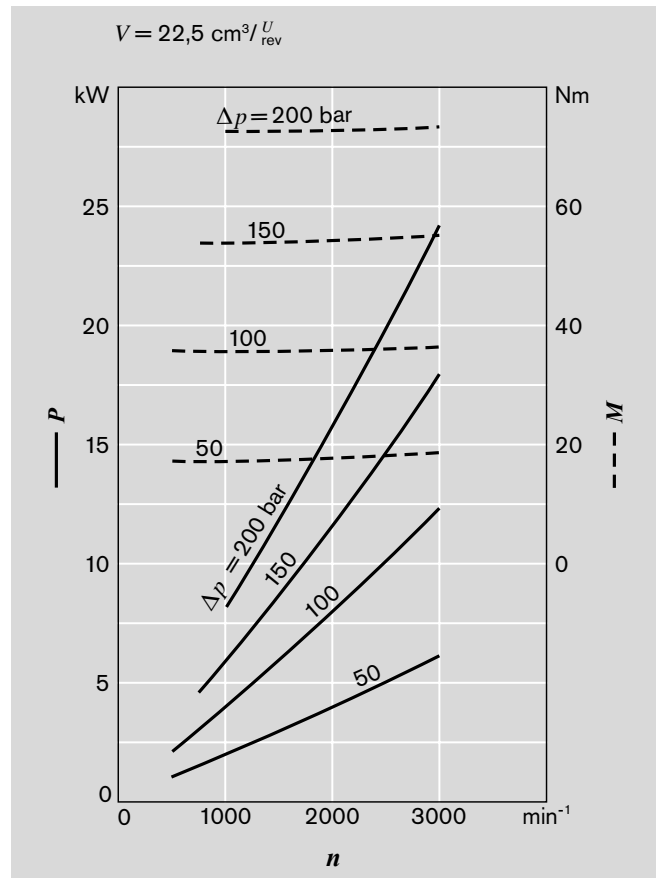
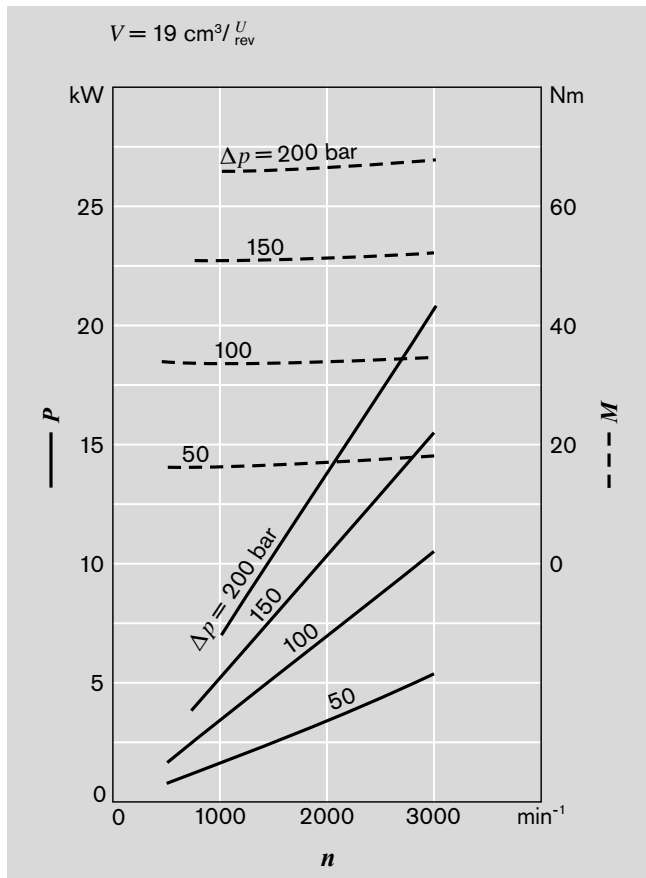
$v = 35 \text{ mm}^2/\text{s}, T = 50 \text{ }^\circ\text{C}$

$Q = f(n, V)$ incl. η_v
 $P = f(n, p)$ ——— incl. η_t
 $M = f(n, p)$ - - - incl. η_{hm}



Diagrams (continuation)





Specification

General	
Construction	external gear pump
Mounting	Flange or through-bolting with spigot
Port connections	screw, flange
Direction of rotation (looking on shaft)	clockwise or anti-clockwise, the pump may only be driven in the direction indicated
Mounting position	any
Load on shaft	radial and axial forces after consulting
Ambient temperature range	-30 °C...+80 °C
Fluide	mineral oil-based hydraulic fluids to DIN/ISO, other fluids to order
Viscosity	12...800 mm ² /s permitted range 20...100 mm ² /s recommended range ...2000 mm ² /s permitted for starting
Fluid temperature range	-30 °C...+80 °C -20 °C...+110 °C with FPM seals
Filter *)	contamination at least class 19/16 to ISO 4406 obtained with filter β ₂₀ = 75. For higher lifespan demands we a correspondingly higher filter class recommended.

*) During the application of control systems or devices with critical counter-reaction, such as steering and brake valves, the type of filtration selected must be adapted to the sensitivity of these devices/systems.

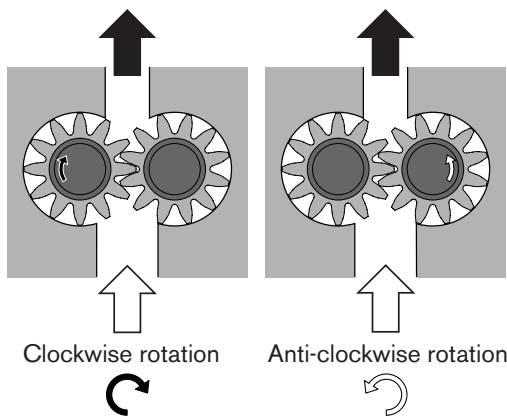
Safety requirements pertaining to the whole systems are to be observed.

In the case of applications with high numbers of load cycles please consulting.

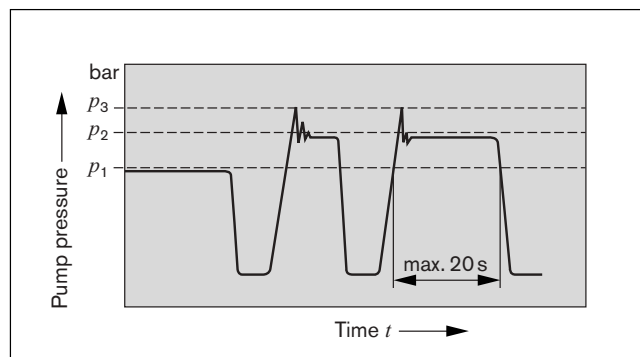
Definition of direction of rotation

Always look on the drive shaft.

Note: Dimensions drawings always show clockwise-rotation pumps. On anti-clockwise-rotation pumps the positions of the drive shaft and the suction and pressure ports are different.



Definitions of pressures



p_1 max. continuous pressure
 p_2 max. intermittent pressure
 p_3 max. peak pressure

Model AZPF

Displacement	cm ³ /rev	4	5.5	8	11	14	16	19	22.5	25	28	
Inlet pressure	bar	min. 0.7 bar max. 3 bar absolute										
Intermittent pressure p_2		280	280	280	280	280	280	280	250	225	200	
Peak pressure p_3		300	300	300	300	300	300	300	290	265	240	
Continuous pressure p_1		250	250	250	250	250	250	250	220	195	170	
Max. rotational speed at p_2	[min ⁻¹]	4000	4000	4000	3500	3000	3000	3500	3500	3000	3000	
Min. rotational speed at p_2 *)		600	500	400	350	300	300	300	300	300	300	

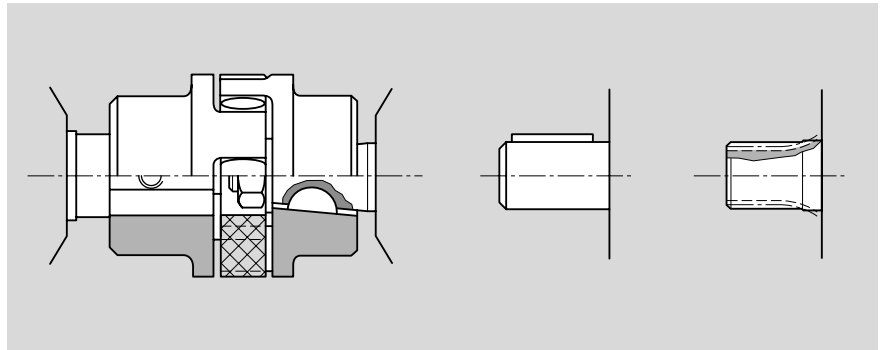
*) Valid for oil viscosity of 25 mm²/s and an oil temperature of 55 °C with HLP 46

Drive arrangement

1. Flexible couplings

The coupling must not transfer any radial or axial forces to the pump.

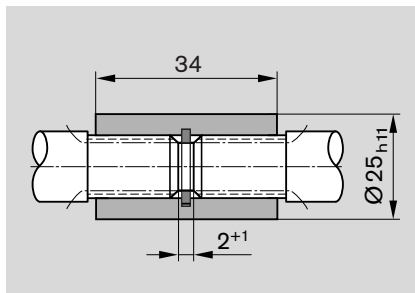
The maximum radial runout of shaft spigot is 0.2 mm. Refer to the fitting instructions provided by the coupling manufacturer for details of the maximum permitted shaft misalignment.



2. Sleeve couplings

Used on shafts with DIN or SAE splining.

Note: There must be no radial or axial forces exerted on the pump or sleeve coupling.
The sleeve must be free to move axially.
The distance between the pump shaft and drive shaft must be 2^{+1} .
Oil-bath or oil-mist lubrications is necessary.

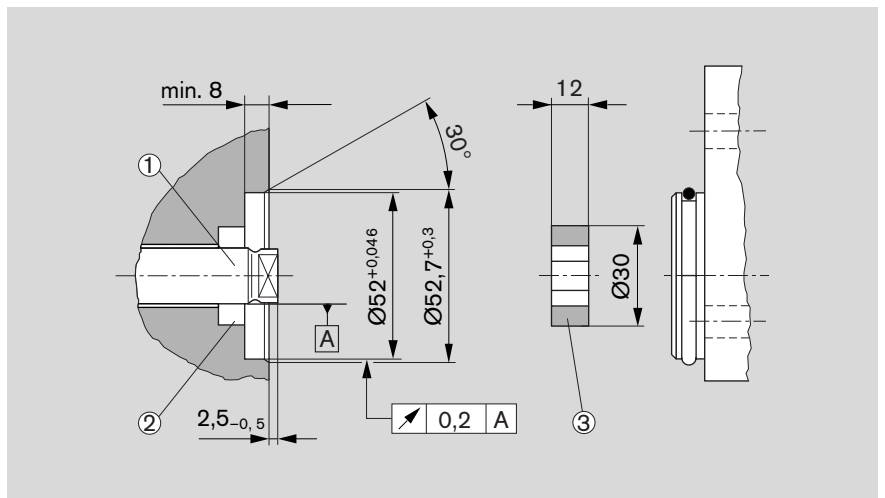


Spline shaft	$M_{max.}$ [Nm]	V [cm ³ /rev]	$p_{max.}$ [bar]
DIN	190	4...28	$p_{max.}$
SAE	130		

3. Drive shaft with tang

For the close-coupling of the pumps to electric motor or engines, gearboxes, etc. The pump shaft has a special tang drive which combines with a centre coupling ③ (not included with the pumps). There is no shaft seal.

The recommended arrangements and dimensions for the drive end and sealing are as follows.



① Drive shaft

Case-hardening steel DIN 17 210
e.g. 20 MnCrS 5
case-hardened 0.6 deep; HRc 60 ±3.
Surface for sealing ring
ground without rifling $R_{max.} \leq 4 \mu m$

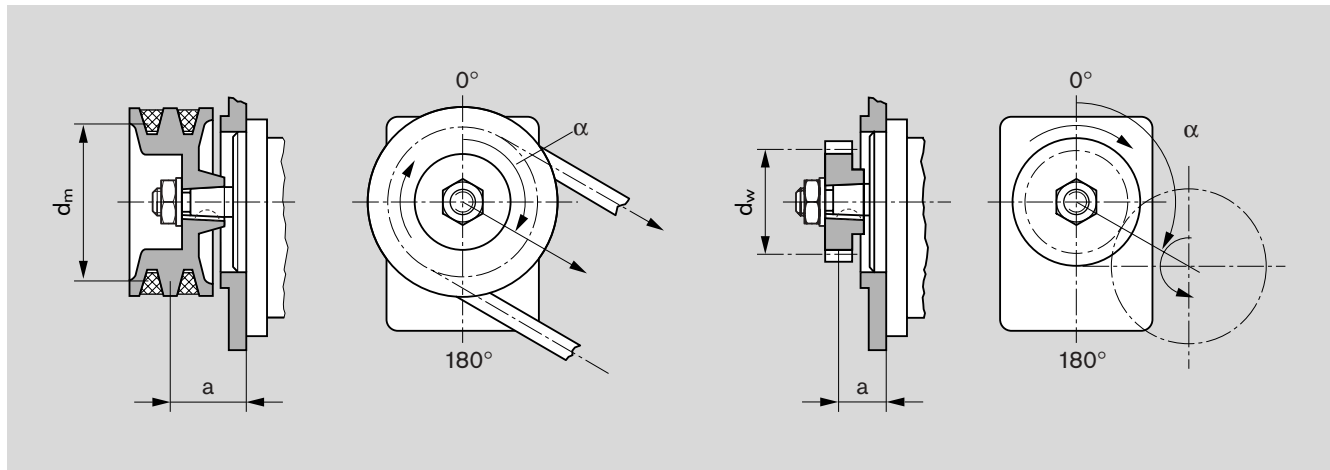
② Radial shaft seal

Rubber-covered seal (see DIN 3760, Type AS or double-lipped ring).
Cut 15° chamfer or fit shaft seal with protective sleeve.

$M_{max.}$ [Nm]	V [cm ³ /rev]	$p_{max.}$ [bar]
65	4...14	280
	16	230
	19	195
	22.5	165
	25	150
	28	130

4. V-belts and gearwheels without outboard bearing

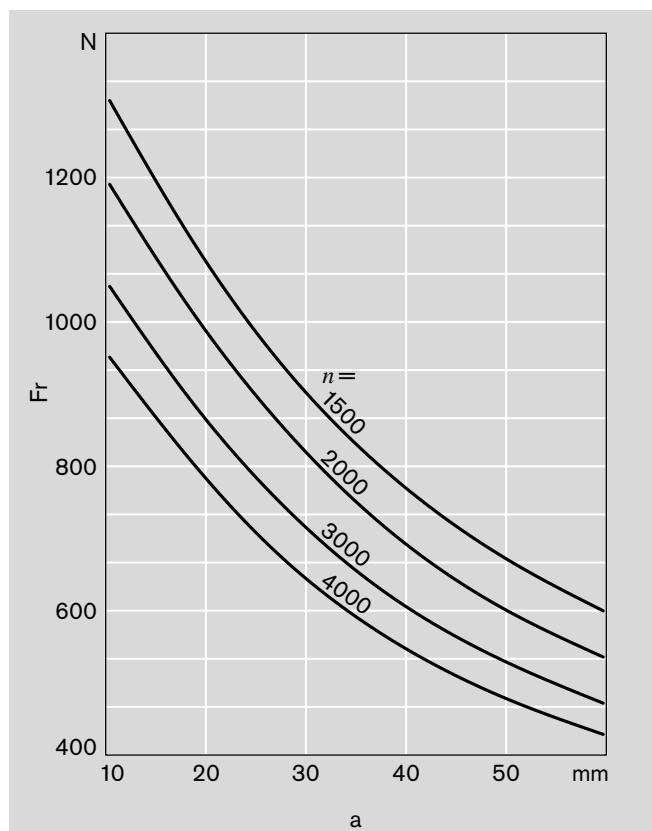
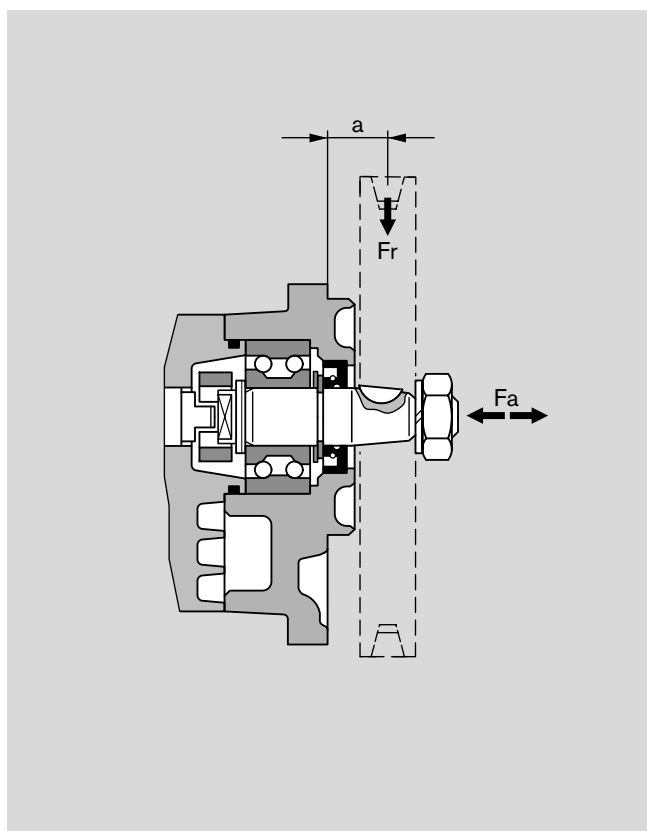
When proposing to use V-belt or gear-wheel drive, please submit details of the application for our comments (especially dimensions a , d_m , d_w and angle α).



5. Outboard bearing

Outboard bearing eliminate possible problems when the pumps are driven by V-belts or gearwheels. The diagrams below show the maximum overhung and thrust loads that can be tolerated referred to a bearing life of $L_H = 1,000$ hours.

$M_{max.}$ [Nm]	V [cm ³ /rev]	$p_{max.}$ [bar]
65	4...14	280
	16	230



Multiple gear pumps

Gear pumps are well-suited to tandem combinations of pumps in which the drive shaft of the first pump is extended to drive a second pump and sometimes a third pump in the same manner. A coupling is fitted between each pair of pumps. In most cases each pump is isolated from its neighbour, i.e. the suction ports are separate from one another. A common suction port is also possible as an option.

Note: Basically, the specifications for the individual pumps apply, but with certain restrictions:

Max. speed: This is determined by the highest rated pump speed in use.

Pressures: These are restricted by the strength of the drive shaft, the transmissions and the couplings. Appropriate data is given in the dimensional drawings and the graph see page 15.

Pressure restrictions during standard transmission

In the case of Size F the centre coupling for the second pump can carry a load of up to $M_{max.} = 65 \text{ Nm}$, i.e. the pressure restriction for the second pump and any further pumps.

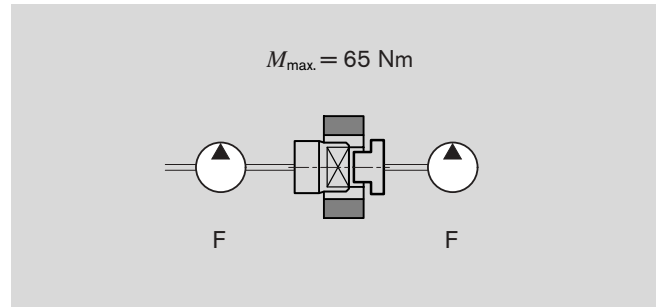
$M_{max.}$ [Nm]	V [cm ³ /rev]	$p_{max.}$ [bar]
65	16	230
	19	190
	22.5	160
	25	140
	28	130

In the first pump is driven through a tang and centre coupling or Type 1 outboard bearing, the pressure restrictions for both pumps are as indicated in the formula below.

In the case of applications with high numbers of load cycles please consulting.

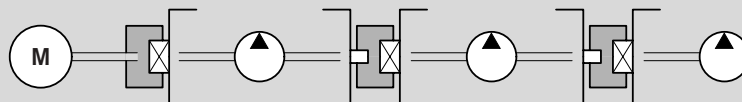
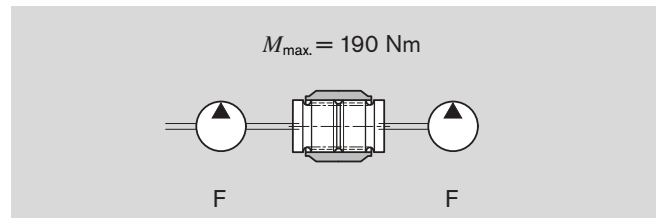
Reinforced transmissions are available for applications with higher transfer torques and/or torsional vibrations. Customized designs available on request.

Standard transmission



Combinations

Model Pump 1	$M_{max.}$ [Nm]	Model Pump 2
F	65	F
F	65	S
F	12	B

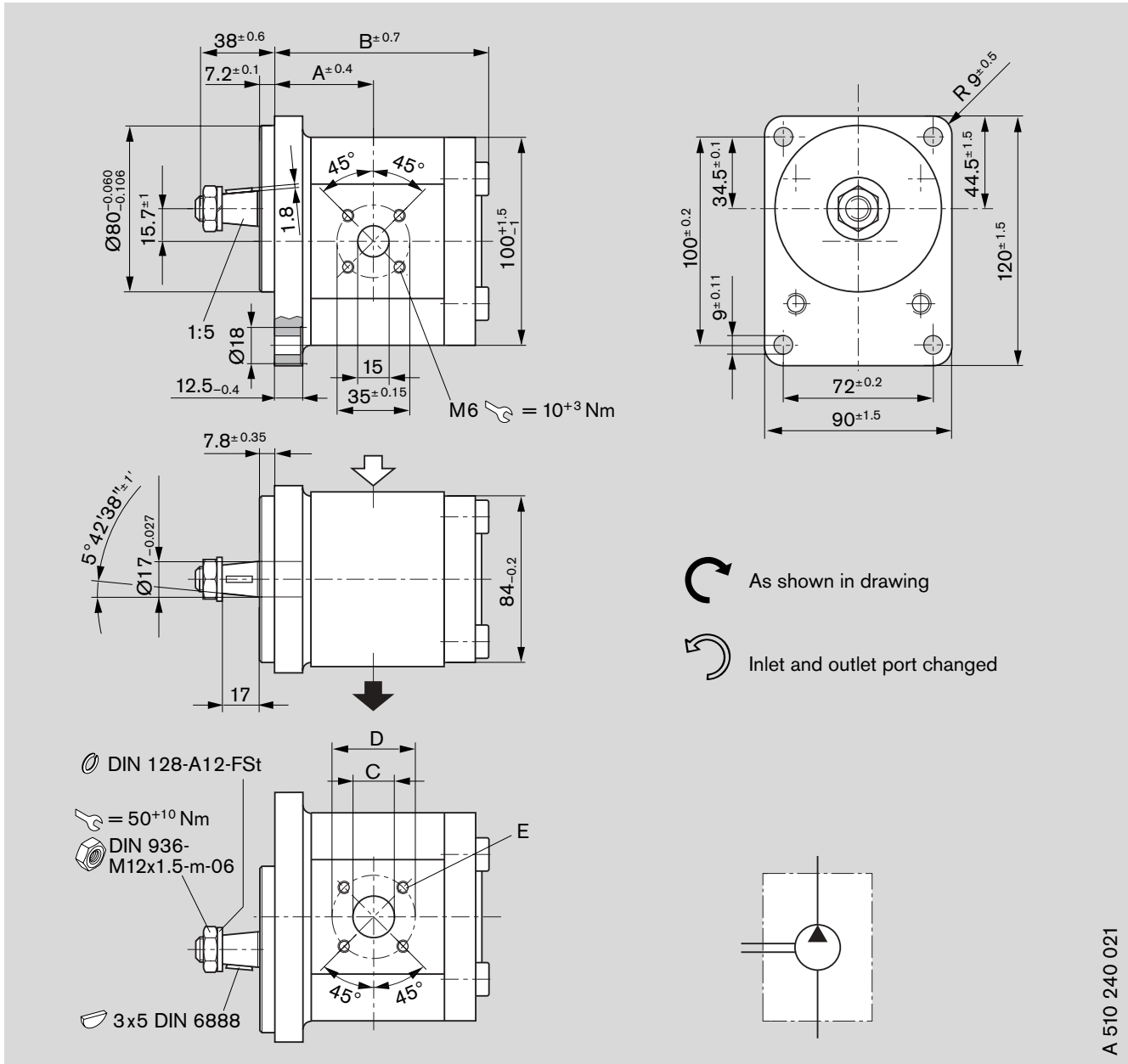


$$T = \Delta p_1 \cdot V_1 \cdot 0.0173 + \Delta p_2 \cdot V_2 \cdot 0.0173 + \Delta p_3 \cdot V_3 \cdot 0.0173$$

$$\Delta p \text{ [bar]} \quad V \text{ [cm}^3\text{/rev]} \quad \eta_{hm} = 92 \%$$

Dimensions in mm

Preferential range



A 510 240 021

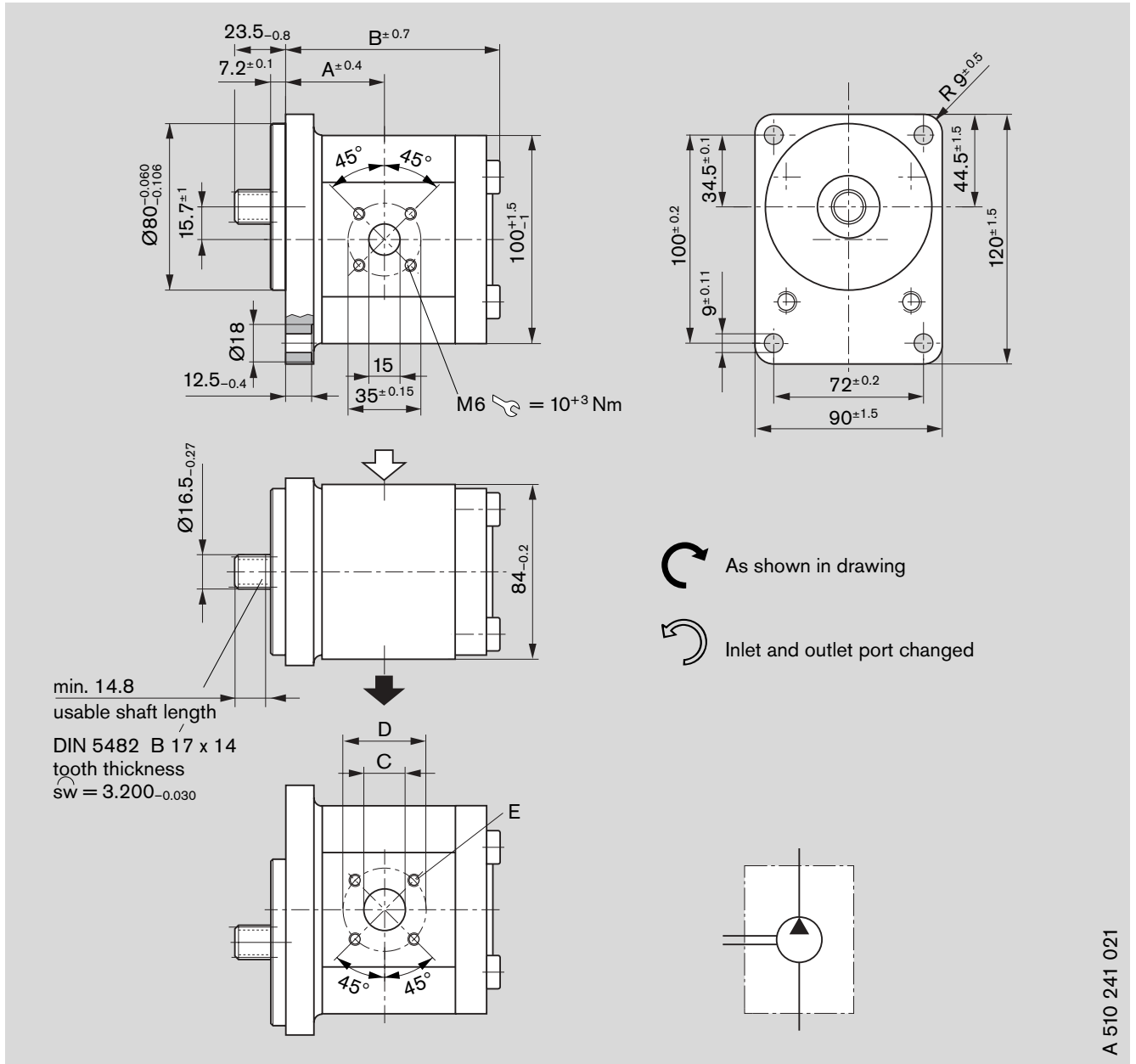
Ordering code

AZPF - 10 - C B 20 M B
 AZPF - 11 - C B 20 M B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	0 510 225 306	0 510 225 006	280	4000	39.9	85.0	15	40	M6 13 depth torque $= 10^{+3}$ Nm
5.5	0 510 325 306	0 510 325 006	280	4000	41.1	87.5	15	40	
8	0 510 425 307	0 510 425 009	280	4000	43.2	91.6	20	40	
11	0 510 525 311	0 510 525 009	280	3500	47.0	96.6	20	40	
14	0 510 525 319	0 510 525 018	280	3000	47.5	101.6	20	40	
16	0 510 625 315	0 510 625 022	280	3000	47.5	105.0	20	40	
19	0 510 625 314	0 510 625 013	230	3500	47.5	110.0	20	40	
22.5	0 510 725 330*	0 510 725 030	210	2500	55.1	115.4	20	40	

Dimensions in mm

Preferential range



A 510 241 021

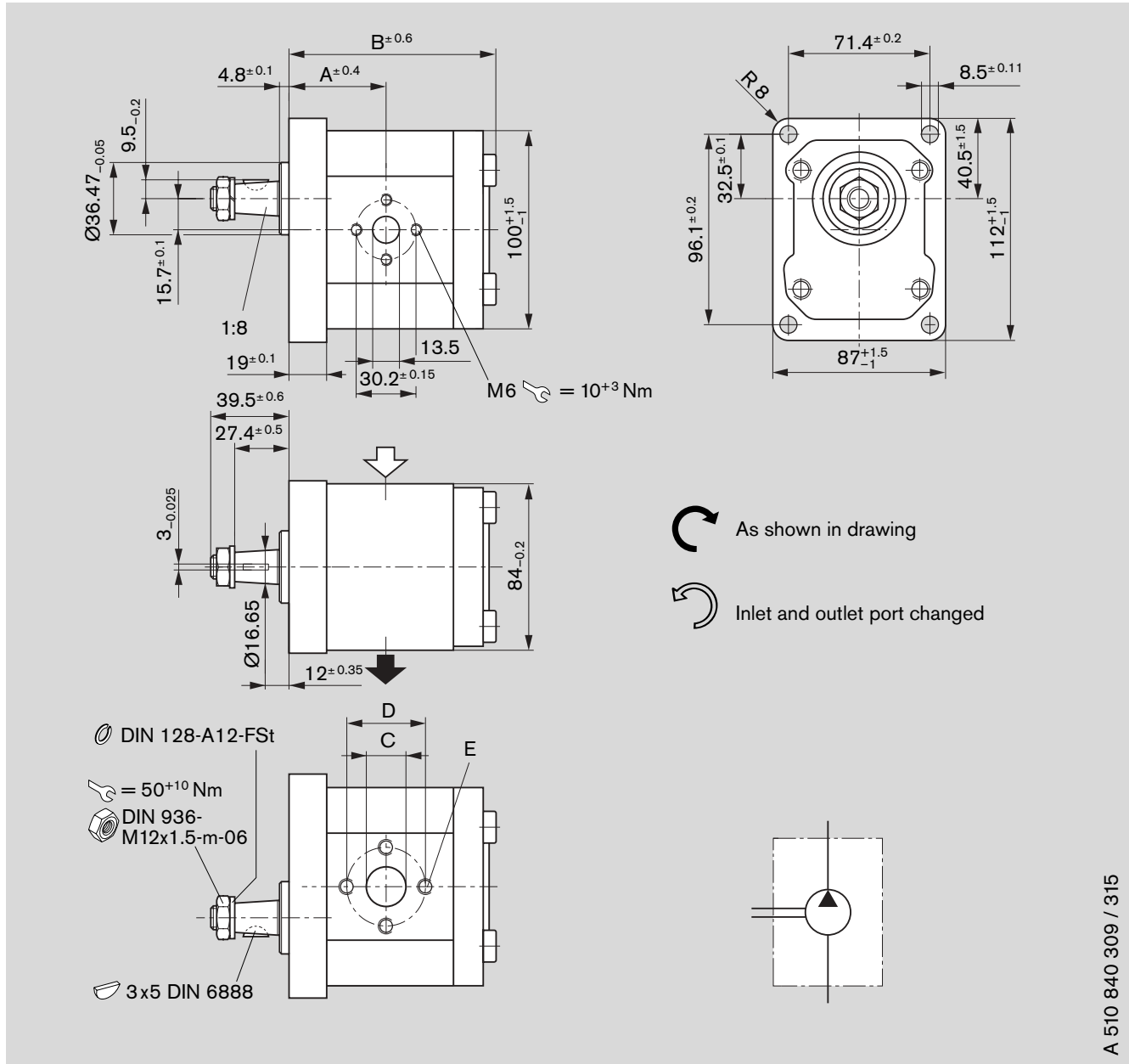
Ordering code

AZPF - 10 - F B 20 M B
 AZPF - 11 - F B 20 M B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	\curvearrowleft L	\curvearrowright R			A	B	C	D	E
4	0 510 225 307	0 510 225 007	280	4000	39.9	85.0	15	40	M6 13 depth $\curvearrowright = 10^{+3} \text{ Nm}$
5.5	0 510 325 307	0 510 325 007	280	4000	41.1	87.5	15	40	
8	0 510 425 308	0 510 425 010	280	4000	43.2	91.6	20	40	
9	0 510 425 336*	-	280	4000	43.7	92.4	20	40	
11	0 510 525 312	0 510 525 010	280	3500	47.0	96.6	20	40	
14	0 510 525 328	0 510 525 030	280	3000	47.5	101.6	20	40	
16	0 510 625 317	0 510 625 015	280	3000	47.5	105.0	20	40	
19	0 510 625 316	0 510 625 014	230	3000	47.5	110.0	20	40	
22.5	0 510 725 349	-	230	3000	61.1	127.4	20	40	
22.5	-	0 510 725 062	210	2500	55.1	115.4	20	40	

Dimensions in mm

Preferential range



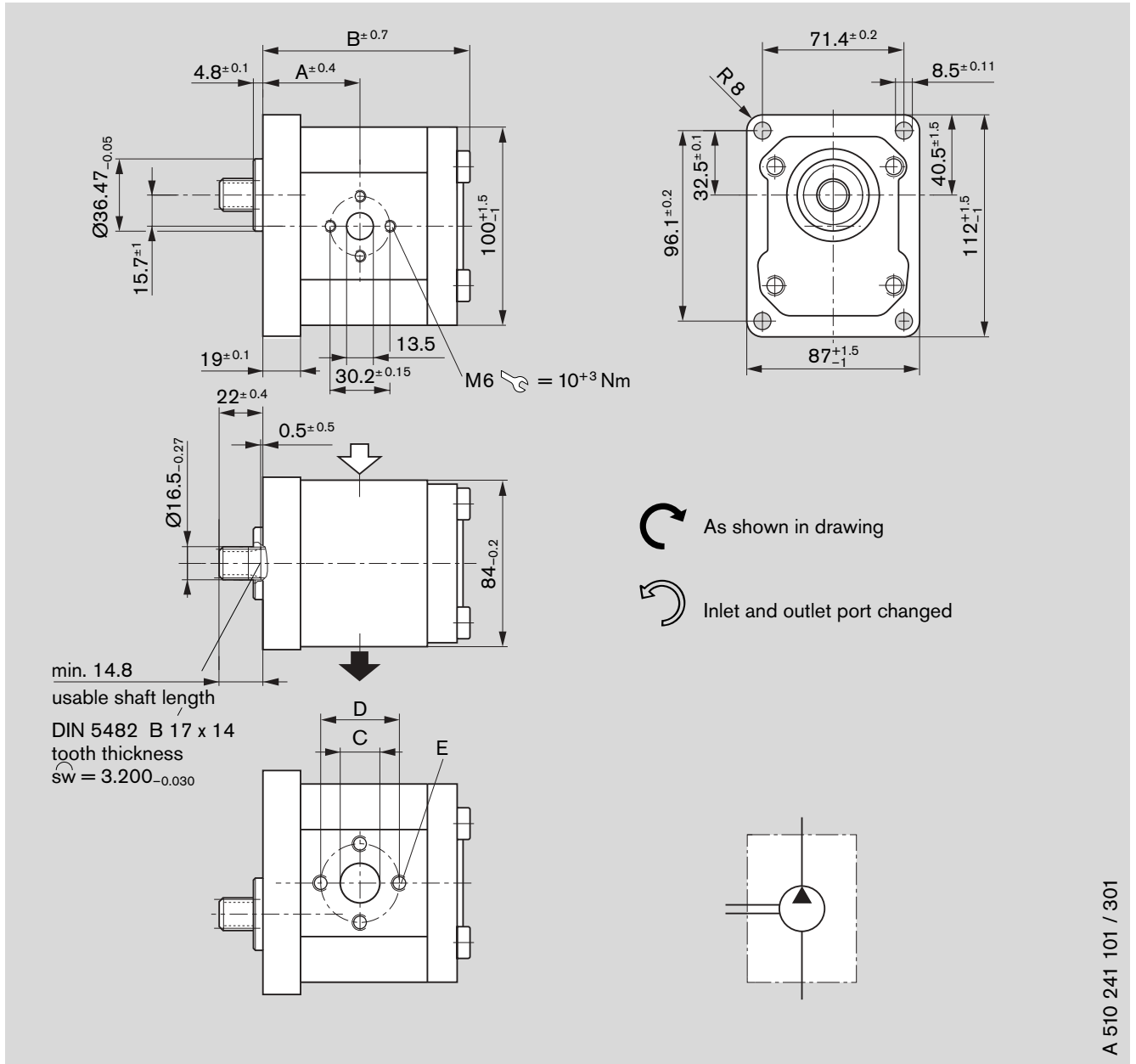
Ordering code

AZPF - 12 - H O 30 K B
 AZPF - 22 - H O 30 K B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	\curvearrowleft L	\curvearrowright R			A	B	C	D	E
4	0 510 225 317	0 510 225 022	280	4000	41.4	84.1	13.5	30.2	M6
5.5	0 510 325 320	0 510 325 025	280	4000	42.6	86.6	13.5	30.2	13 depth $\hookrightarrow = 25^{+5}$ Nm
8	0 510 425 334	0 510 425 043	280	4000	44.7	92.5	13.5	30.2	
11	0 510 525 374	0 510 525 074	280	3500	48.5	97.5	13.5	30.2	M8
14	0 510 525 375	0 510 525 075	280	3000	49.0	102.5	13.5	30.2	13 depth $\hookrightarrow = 25^{+5}$ Nm
16	0 510 625 381	0 510 625 075	280	3000	49.0	105.9	13.5	30.2	
19	0 510 625 076*	0 510 625 386*	280	3500	59.9	121.1	20.0	39.7	
22.5	0 510 725 410*	0 510 725 112*	250	3500	62.6	126.5	20.0	39.7	
25	0 510 725 411*	0 510 725 113*	225	3000	64.7	132.5	20.0	39.7	
28	0 510 725 412*	0 510 725 114*	200	3000	67.1	137.3	20.0	39.7	

Dimensions in mm

Preferential range



A 510 241 101 / 301

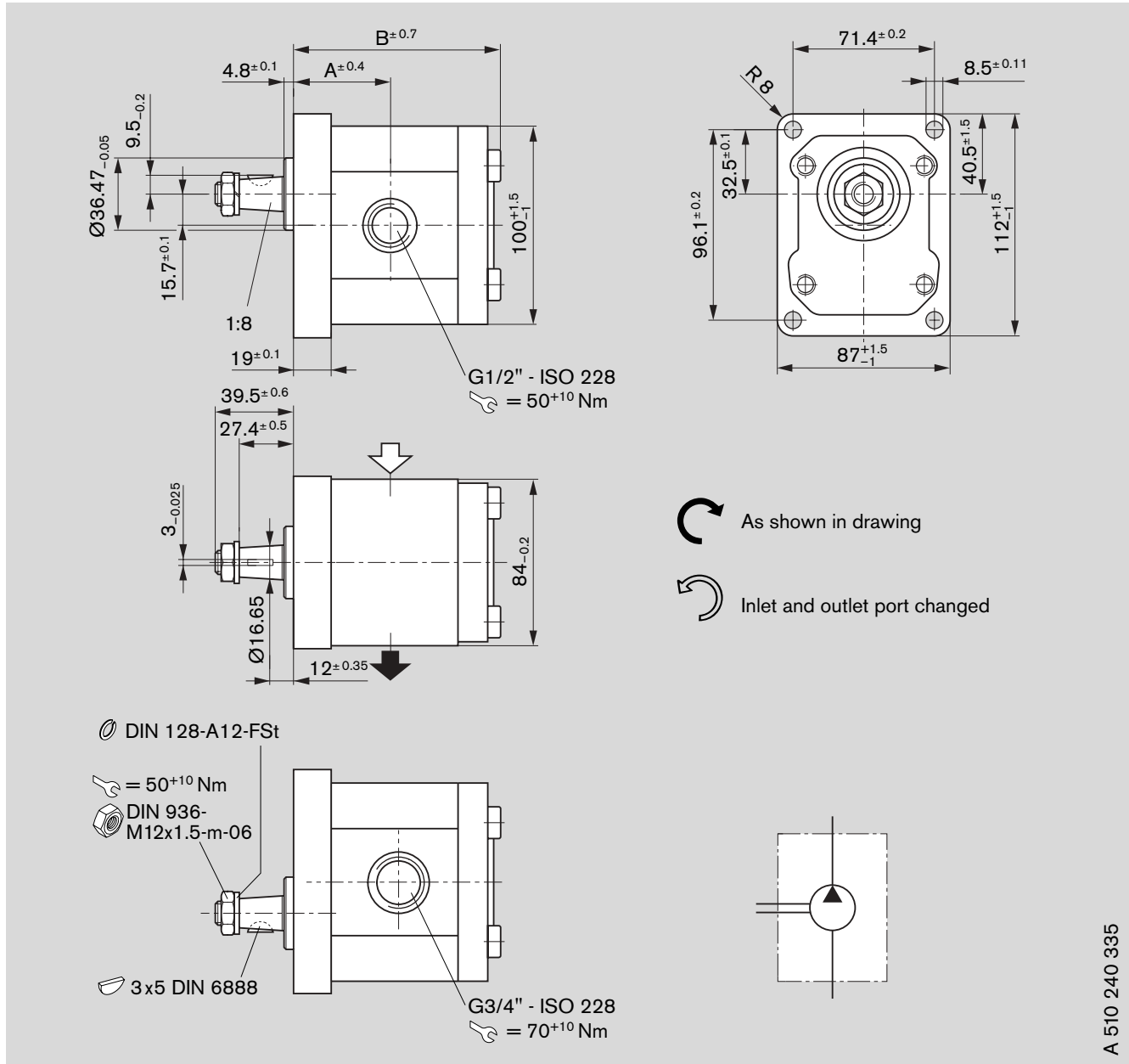
Ordering code

AZPF - 10 - F O 30 M B
 AZPF - 10 - F O 30 P B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
8	0 510 425 315	0 510 425 021	280	4000	44.7	93.1	13.5	30.2	M6 13 depth
11	0 510 525 323	0 510 525 024	280	3500	48.5	98.1	20.0	39.7	M8 13 depth
11	0 510 525 331*	-	210	3500	48.5	98.1	20.0	39.7	
14	-	0 510 525 034*	210	3000	49.0	103.1	20.0	39.7	
16	0 510 625 327*	0 510 625 039*	210	3000	49.0	106.5	20.0	39.7	
19	-	0 510 625 049*	210	3000	49.0	111.5	20.0	39.7	
19	0 510 625 332*	-	210	3000	59.9	123.5	20.0	39.7	
22.5	0 510 725 348*	0 510 725 076*	210	3000	62.6	127.8	20.0	39.7	

Dimensions in mm

Preferential range



A 510 240 335

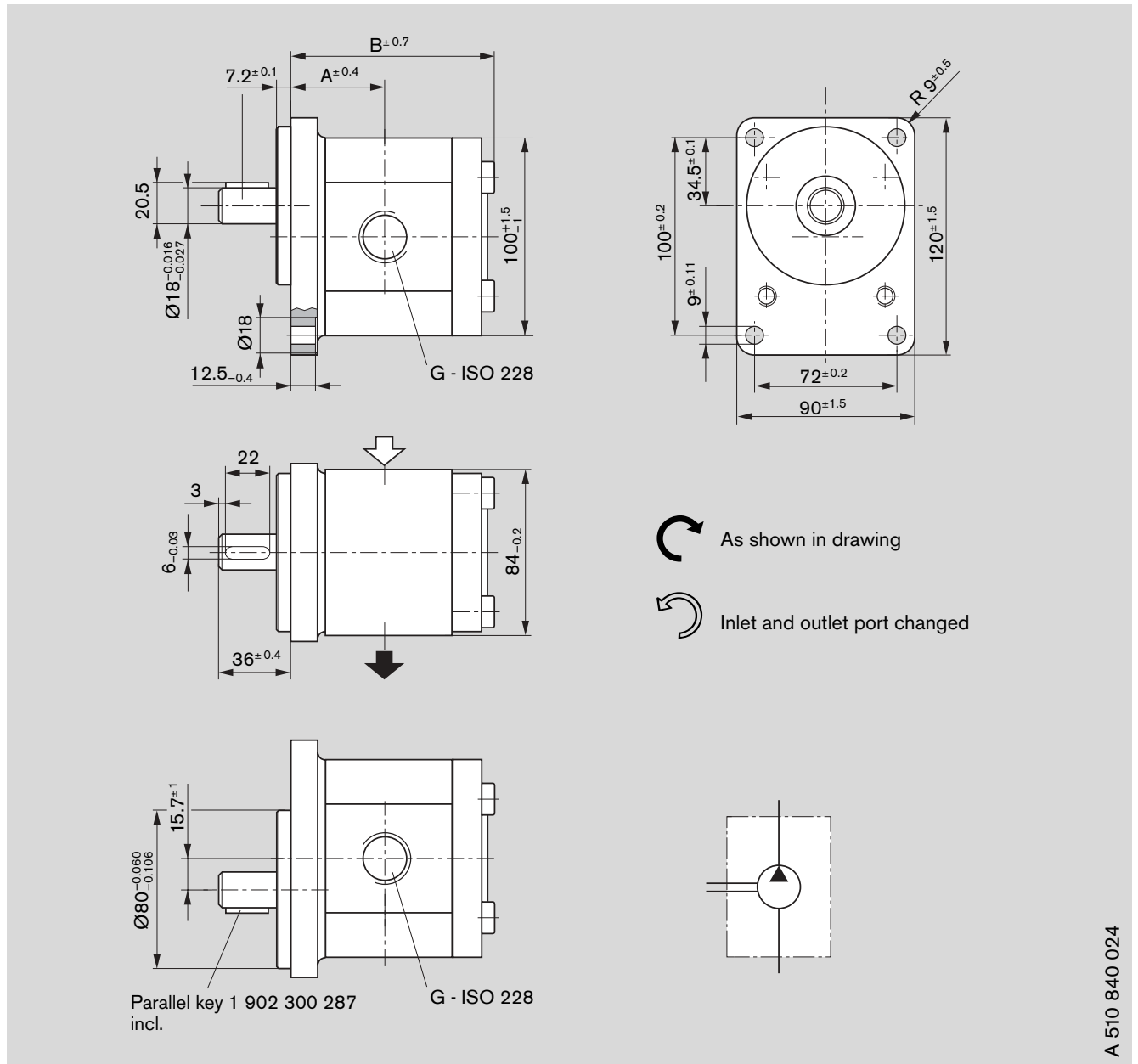
Ordering code

AZPF - 10 - H O 01 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]		
					A	B	G
4	-	-	-	-	-	-	ISO 228 16 depth
5.5	-	0 510 325 018	280	4000	42.6	89.0	
8	-	0 510 425 027	280	4000	44.7	93.1	
11	-	0 510 525 039	280	3500	48.5	98.1	
14	-	0 510 525 040	280	3000	49.0	103.1	
16	-	0 510 625 047	280	3000	49.0	106.5	
19	-	0 510 625 052	230	3000	49.0	111.5	
22.5	-	0 510 725 084	210	2500	56.6	116.4	

Dimensions in mm



Preferential range



A 510 840 024

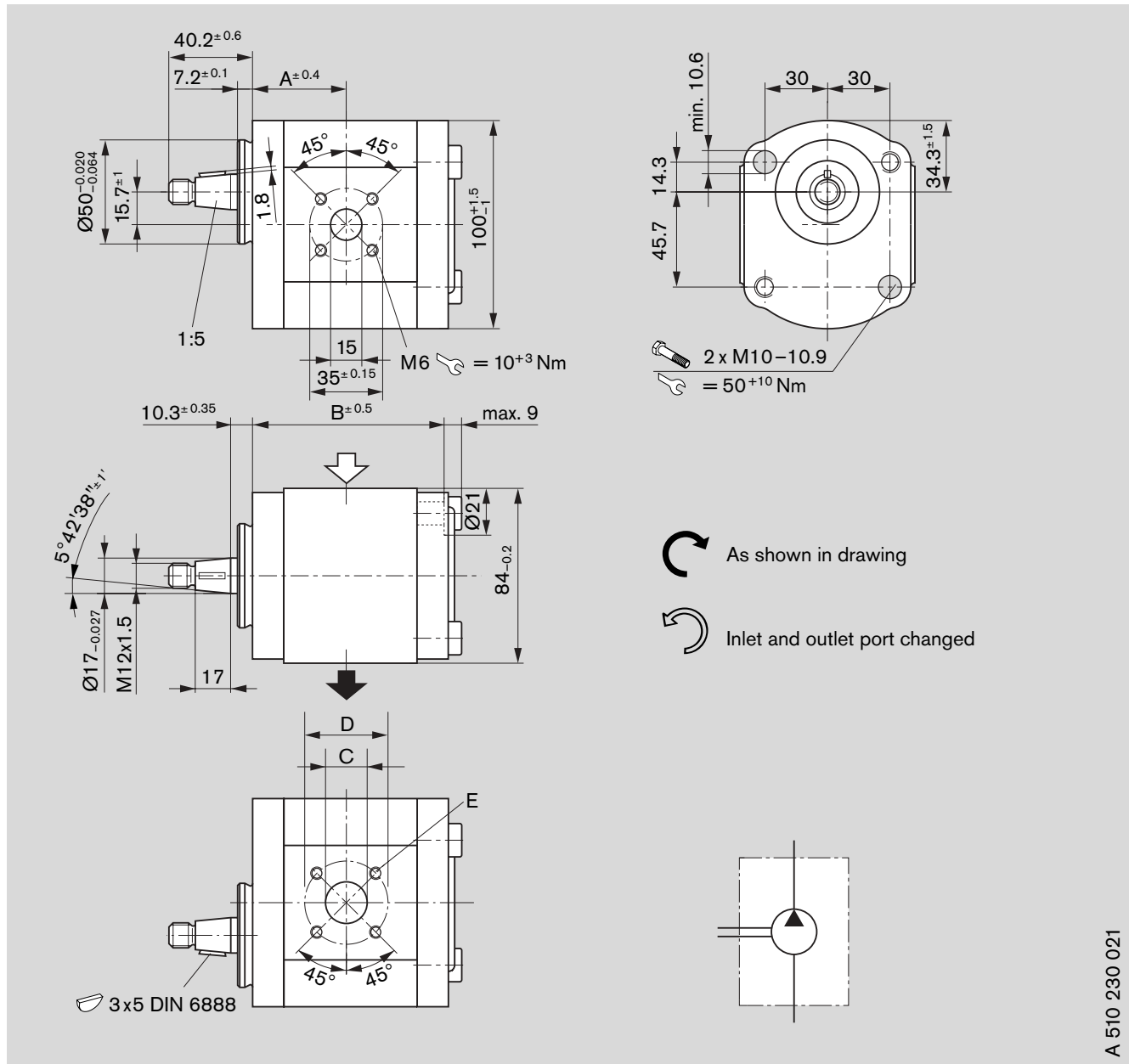
Ordering code

AZPF - 11 - A B 01 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]		
	 L	 R			A	B	G
4	0 510 225 318	0 510 225 023	280	4000	39.9	84.3	G 1/2 - ISO 228
5.5	0 510 325 321	0 510 325 026	280	4000	41.1	85.2	16 depth
8	0 510 425 335	0 510 425 044	280	4000	43.2	89.3	G 3/4 - ISO 228 16 depth
11	0 510 525 376	0 510 525 076	280	3500	45.6	94.3	
14	-	-	-	-	-	-	
16	0 510 625 382	0 510 625 077	250	3000	49.9	102.7	
19	-	-	-	-	-	-	
22.5	0 510 725 418	0 510 725 120	180	2500	55.1	114.7	

Dimensions in mm

Preferential range



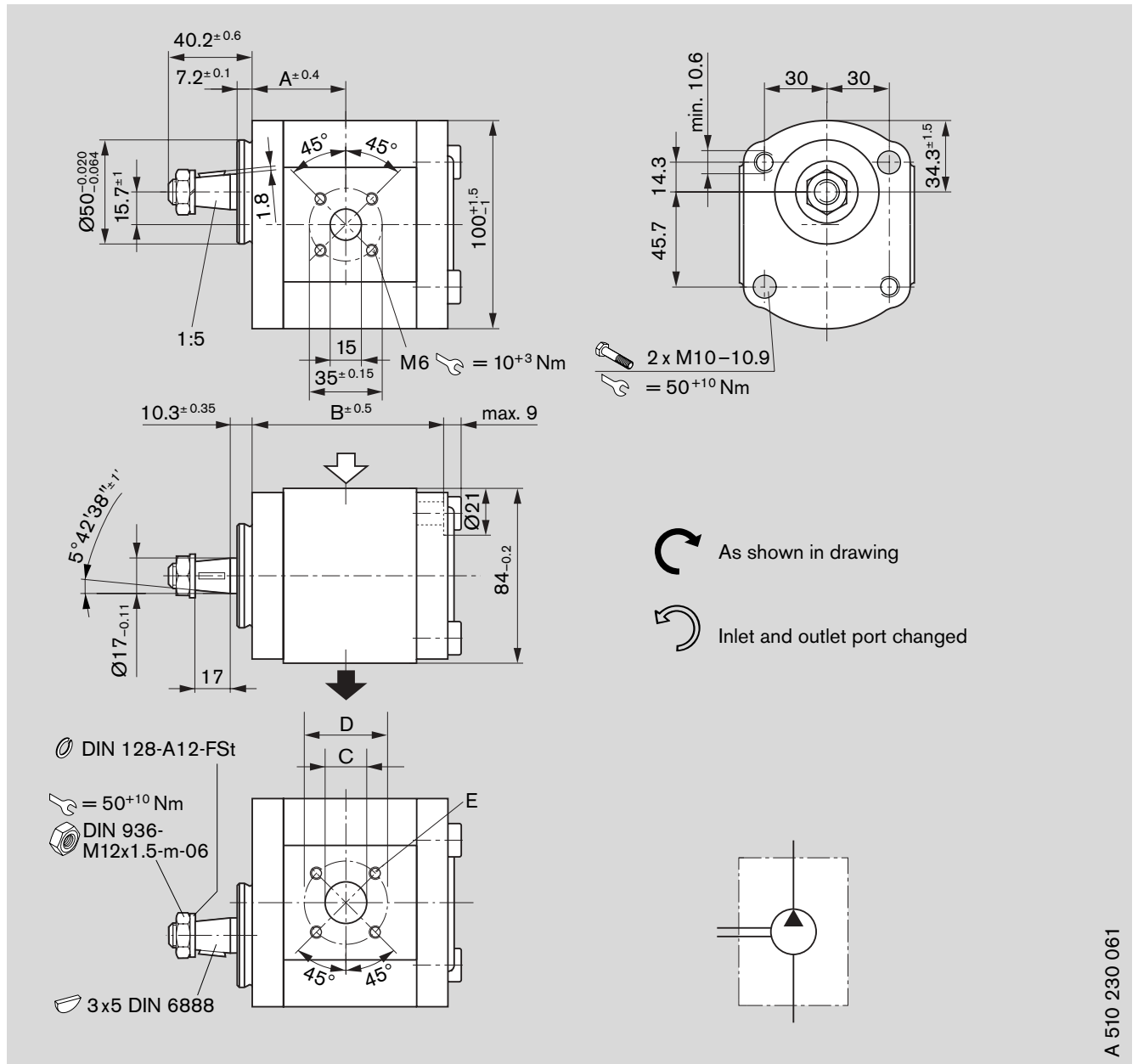
Ordering code

AZPF - 10 - C P 20 M B
 AZPF - 10 - C P 20 K B*
 AZPF - 11 - C P 20 M B**

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	0 510 215 009	0 510 215 309	280	4000	37.7	73.7	15	40	M6 13 depth $\hookrightarrow = 10^{+3} \text{ Nm}$
5.5	0 510 315 307	0 510 315 006	280	4000	38.6	76.2	15	40	
8	0 510 415 316**	-	280	4000	40.6	80.3	20	40	
11	0 510 515 309	0 510 515 007	280	3500	44.5	85.5	20	40	
14	0 510 515 316	0 510 515 018	280	3000	45.0	90.3	20	40	
16	0 510 515 317	0 510 615 010	280	3000	45.0	93.7	20	40	
19	0 510 615 318	0 510 615 005	230	3000	45.0	98.7	20	40	
22.5	0 510 715 306*	-	210	2500	52.5	104.1	20	40	

Dimensions in mm

Preferential range



A 510 230 061

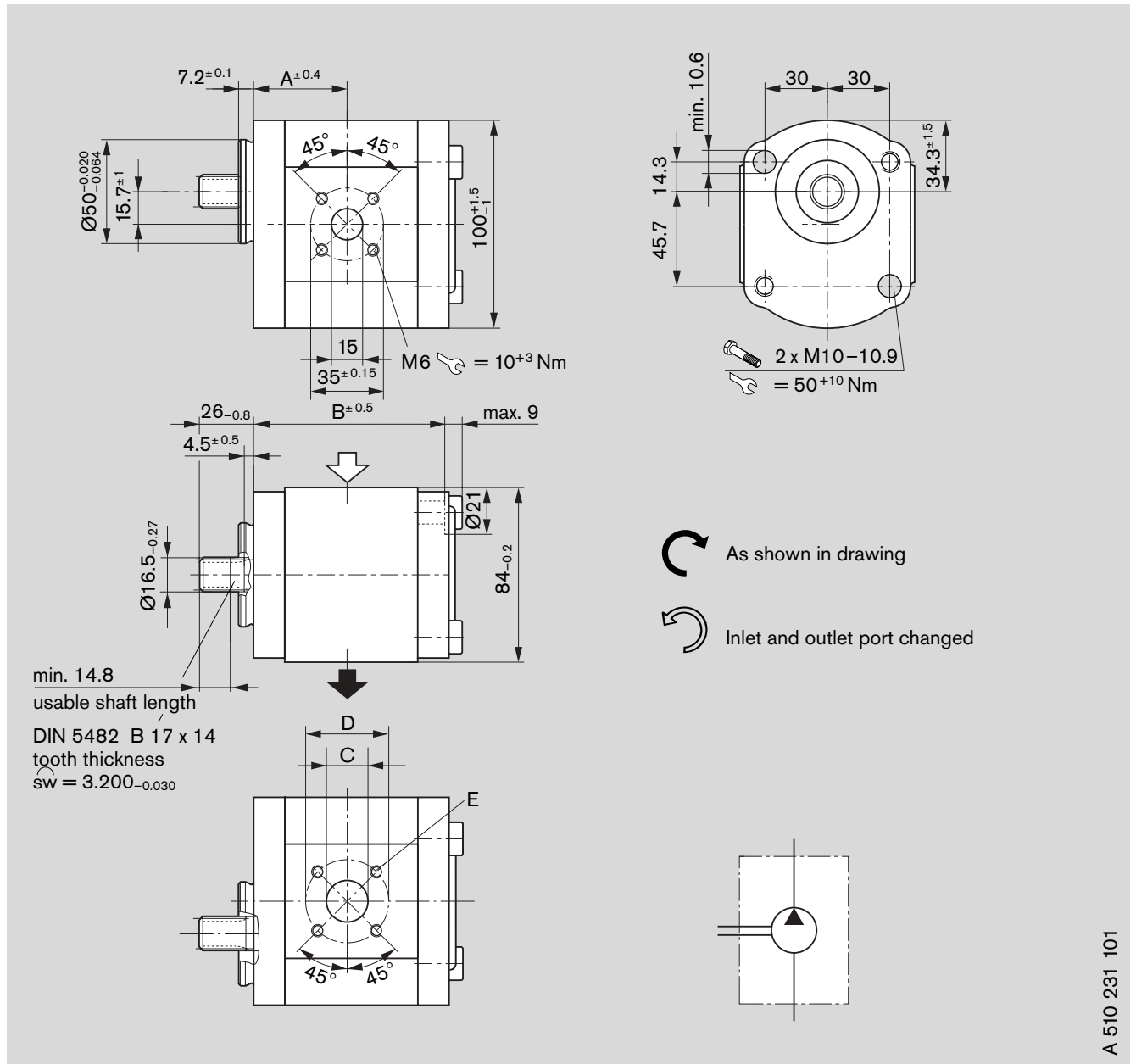
Ordering code

AZPF - 10 - C N 20 M B
 AZPF - 11 - C N 20 M B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	0 510 215 306	0 510 215 006	280	4000	37.4	73.7	15	40	M6 13 depth = 10^{+3} Nm
5.5	0 510 315 304	0 510 315 004	280	4000	38.6	76.2	15	40	
8	0 510 415 313	0 510 415 005	280	4000	40.7	80.3	20	40	
11	0 510 515 310	0 510 515 004	280	3500	44.5	85.3	20	40	
14	-	0 510 515 015*	280	3000	45.0	90.3	20	40	
16	0 510 615 314	0 510 615 006	280	3000	45.0	93.7	20	40	
19	0 510 615 341	-	230	3000	45.0	98.7	20	40	

Dimensions in mm

Preferential range



A 510 231 101

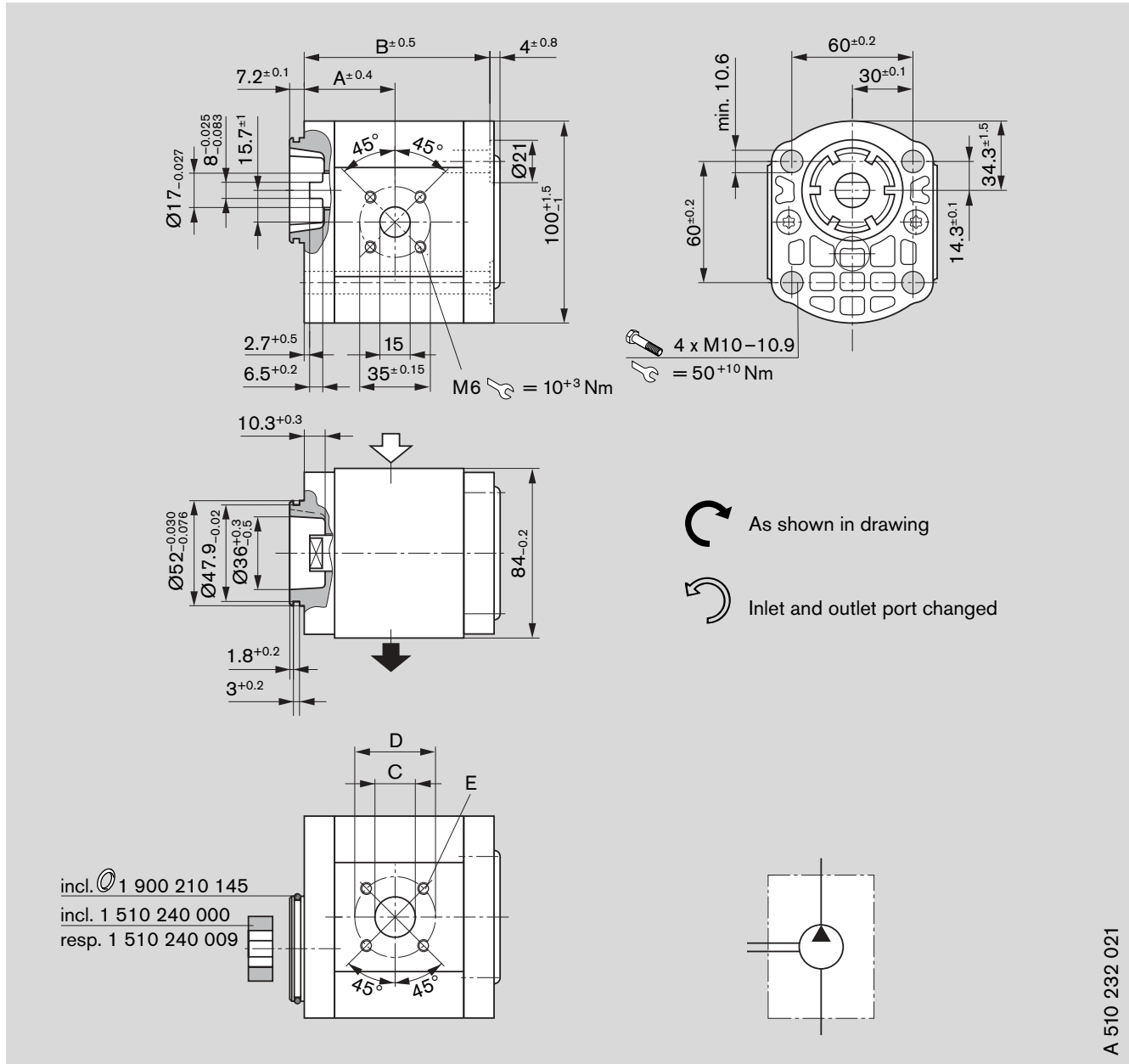
Ordering code

AZPF - 10 - F P 20 P B
 AZPF - 12 - F P 20 P B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
5.5	-	-	-	-	-	-	-	-	M6 13 depth
11	0 510 515 337 *	-	210	3500	44.5	85.3	20	40	
16	-	-	-	-	-	-	-	-	
19	-	-	-	-	-	-	-	-	
22.5	0 510 715 320	0 510 715 008	210	3000	58.6	116.1	20	40	

Dimensions in mm

Preferential range



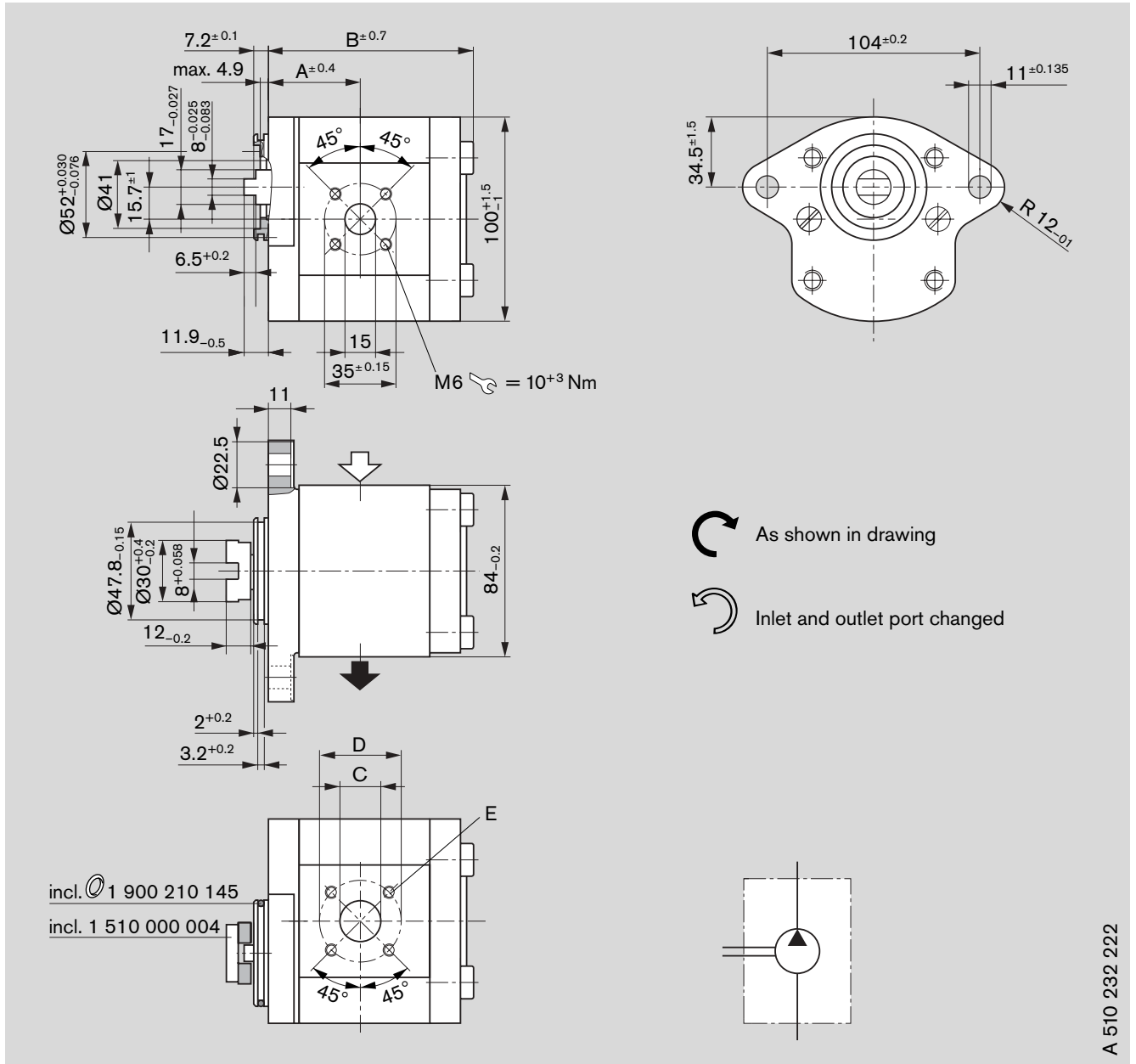
Ordering code

AZPF - XX - N T 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	0 510 215 307	0 510 215 007	280	4000	37.4	73.7	15	40	M6 13 depth = 10 ± 3 Nm
5.5	0 510 315 305	0 510 315 005	280	4000	38.6	76.2	15	40	
8	0 510 415 314	0 510 415 006	280	4000	40.7	80.3	20	40	
11	0 510 515 311	0 510 515 005	280	3500	44.5	85.3	20	40	
14	0 510 515 340	0 510 515 019	280	3000	45.0	90.3	20	40	
16	0 510 615 315	0 510 615 007	230	3000	45.0	93.7	20	40	
19	0 510 615 321	0 510 615 008	190	3000	45.0	98.7	20	40	
22.5	0 510 715 307	0 510 715 004	160	2500	52.6	104.1	20	40	

Dimensions in mm

Preferential range



Ordering code

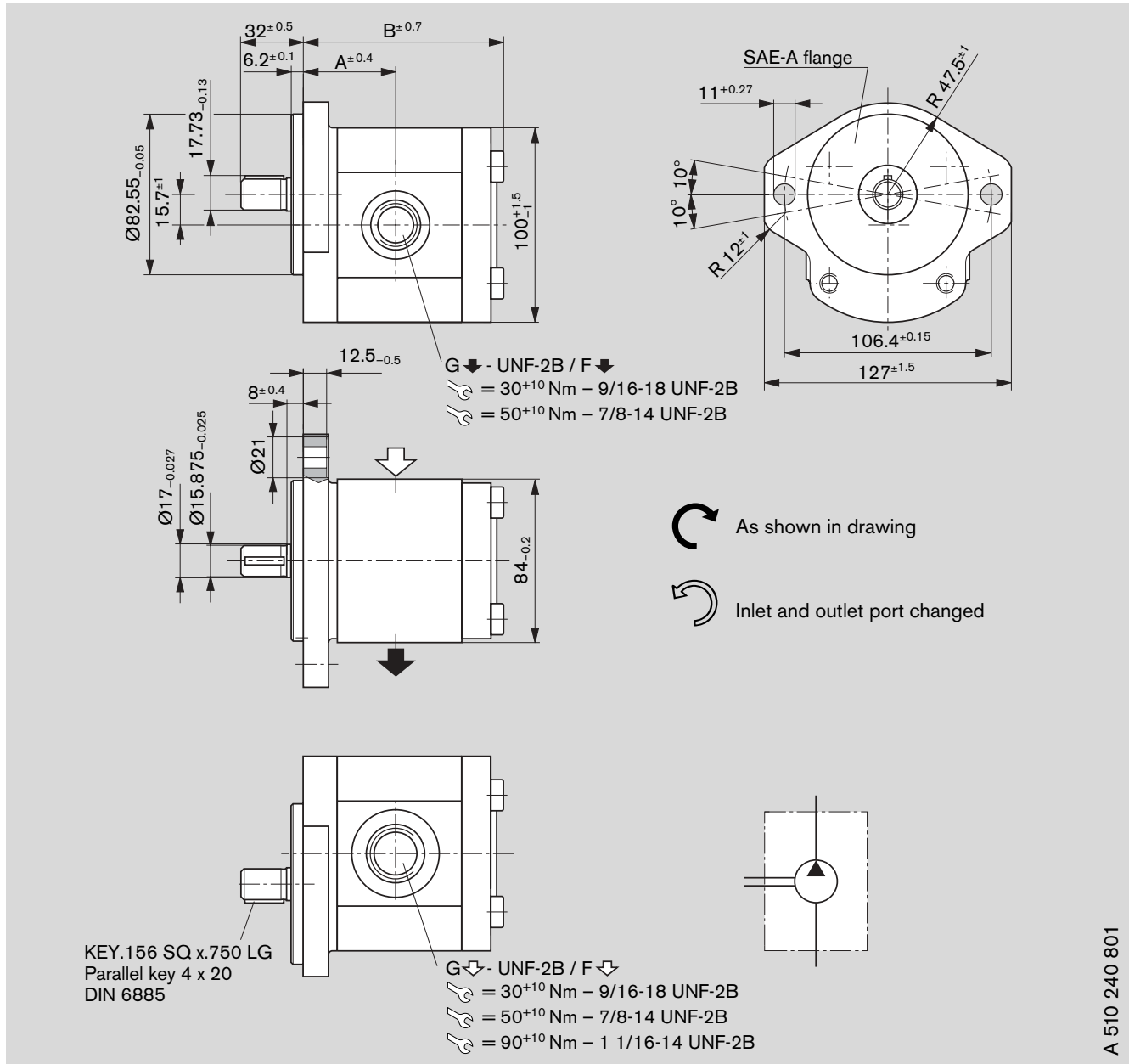
AZPF - 10 - N L 20 K B
 AZPF - 11 - N L 20 K B*

Displacement [cm³/rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	-	0 510 225 012	280	4000	37.4	81.7	15	40	M6 13 depth = 10+3 Nm
5.5	0 510 325 312	0 510 325 002	280	4000	38.6	84.4	15	40	
8	0 510 425 331*	0 510 425 019	280	4000	40.7	88.5	20	40	
11	-	0 510 525 025	280	3500	44.5	93.3	20	40	
16	0 510 625 358*	0 510 625 027*	230	3000	45.0	101.9	20	40	
19	0 510 625 358	0 510 625 032	190	3000	45.0	106.9	20	40	
22.5	-	0 510 725 044*	160	3000	58.6	122.5	20	40	

A 510 232 222

Dimensions in mm

Preferential range



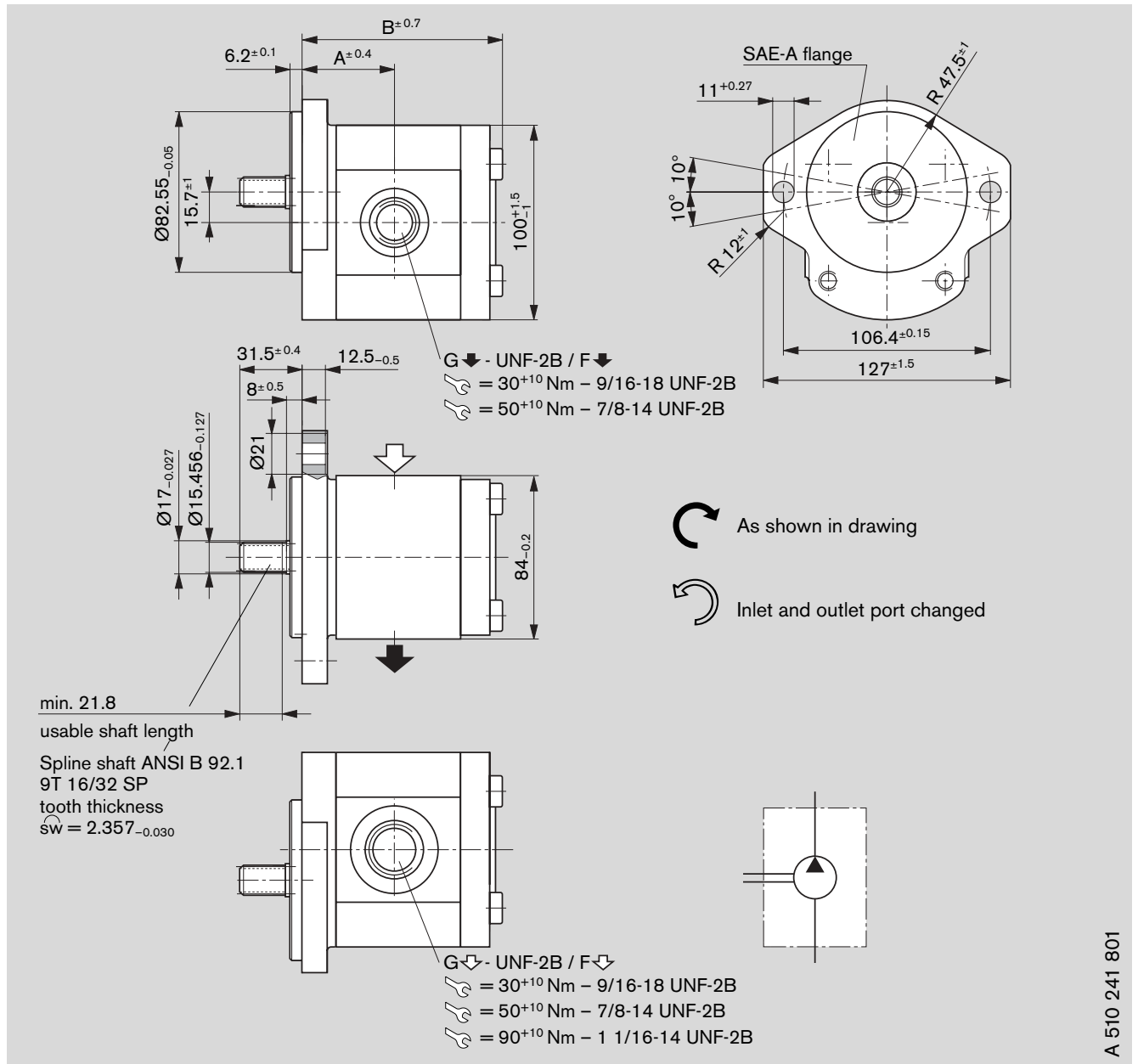
Ordering code

AZPF - 10 - Q R 12 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]					
	L	R			A	B	G \swarrow	G \searrow	F \swarrow	F \searrow
4	-	0 510 225 011	260	4000	39.9	85.0	9/16-18	9/16-18	13	13
5.5	-	0 510 325 011	260	4000	41.1	87.5	9/16-18	9/16-18	13	13
8	-	0 510 425 016	260	4000	43.2	91.6	7/8-14	7/8-14	16	16
11	-	0 510 525 015	260	3500	47.0	96.6	7/8-14	7/8-14	16	16
14	-	0 510 525 031	230	3000	47.5	101.6	11/16-12	7/8-14	19	16
16	-	0 510 625 021	200	3000	47.5	105.0	11/16-12	7/8-14	19	16
19	-	0 510 625 041	170	3500	47.5	110.0	11/16-12	7/8-14	19	16
22.5	-	0 510 725 059	140	2500	55.1	115.4	11/16-12	7/8-14	19	16

Dimensions in mm

Preferential range



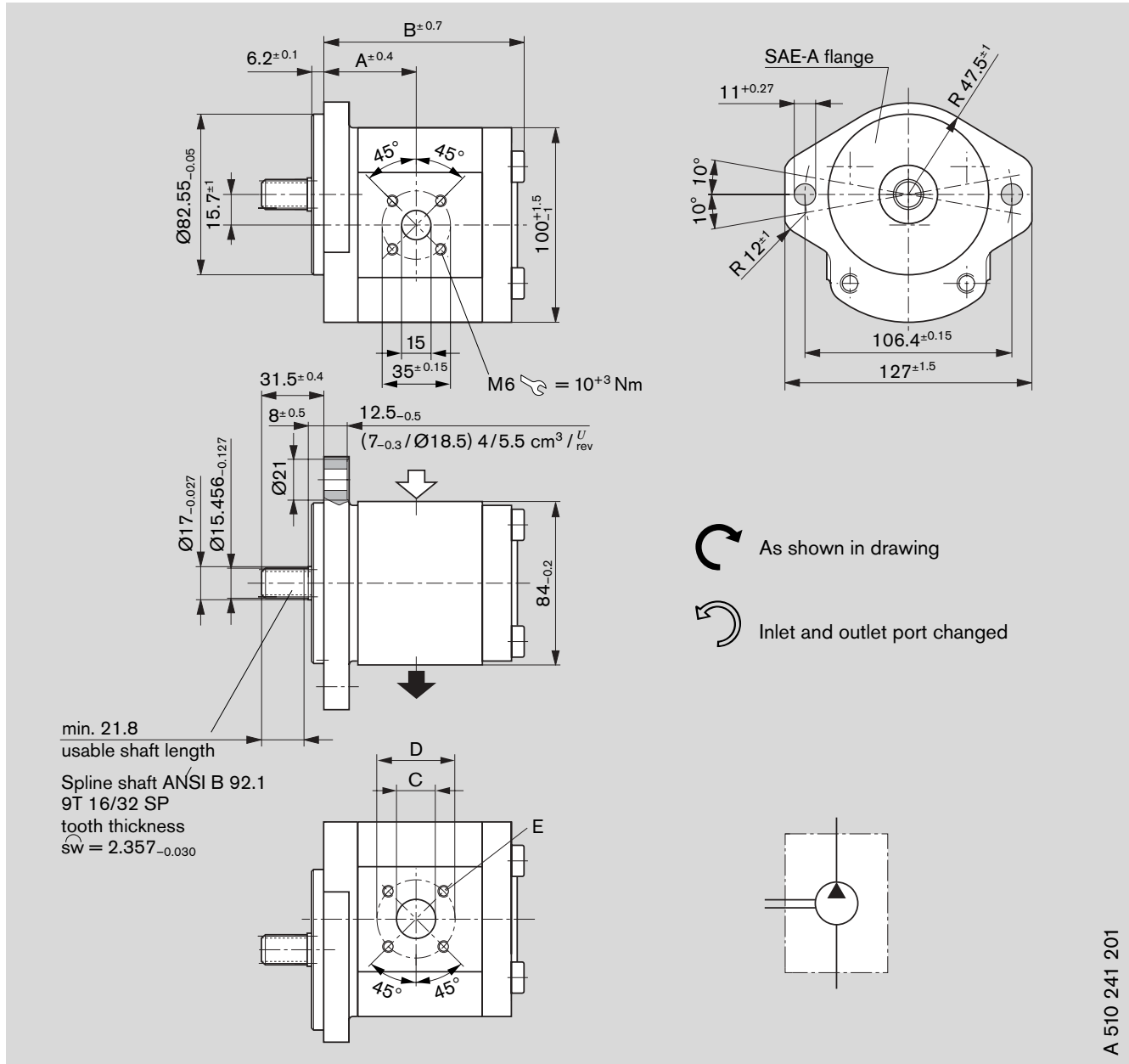
Ordering code

AZPF - 10 - R R 12 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]					
	L	R			A	B	G↘	G↙	F↘	F↙
4	-	0 510 225 010	280	4000	39.9	82.7	9/16-18	9/16-18	13	13
5.5	-	0 510 325 010	280	4000	41.4	85.2	9/16-18	9/16-18	13	13
8	-	0 510 425 015	280	4000	43.2	91.1	7/8-14	7/8-14	16	16
11	0 510 525 315	0 510 525 014	280	3500	47.0	96.1	11/16-12	7/8-14	19	16
14	-	0 510 525 041	280	3000	47.5	101.1	11/16-12	7/8-14	19	16
16	-	0 510 625 020	280	3000	47.5	104.5	11/16-12	7/8-14	19	16
19	0 510 625 346	0 510 625 048	230	3000	47.5	109.5	11/16-12	7/8-14	19	16
22.5	-	0 510 725 063	210	2500	55.1	114.9	11/16-12	7/8-14	19	16

Dimensions in mm

Preferential range



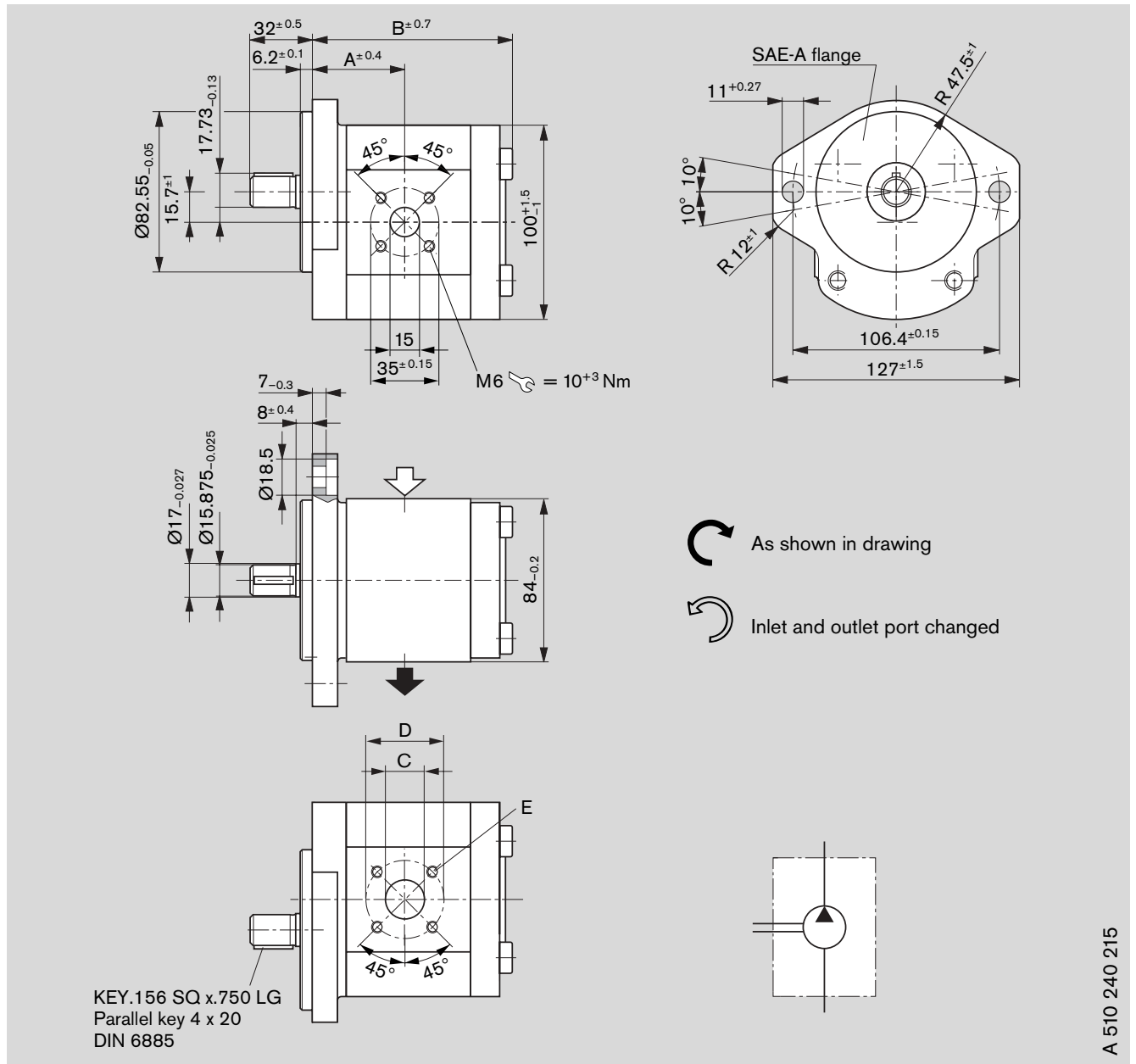
Ordering code

AZPF - 10 - R R 20 M B
 AZPF - 11 - R R 20 K B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
4	0 510 225 314	0 510 225 013	280	4000	39.9	85.0	15	40	M6 13 depth torque = 10 ⁺³ Nm
5.5	0 510 325 313	0 510 325 013	280	4000	41.1	87.5	15	40	
8	0 510 425 314	0 510 425 020	280	4000	43.2	91.6	20	40	
11	0 510 525 324*	0 510 525 019	280	3500	47.0	96.6	20	40	
14	0 510 525 325	0 510 525 020	280	3000	47.5	101.6	20	40	
16	0 510 625 329	0 510 625 028	280	3000	47.5	105.0	20	40	
19	0 510 625 330*	0 510 625 029*	230	3000	47.5	110.0	20	40	
22.5	0 510 725 361	0 510 725 077*	210	2500	55.1	115.4	20	40	

Dimensions in mm

Preferential range



A 510 240 215

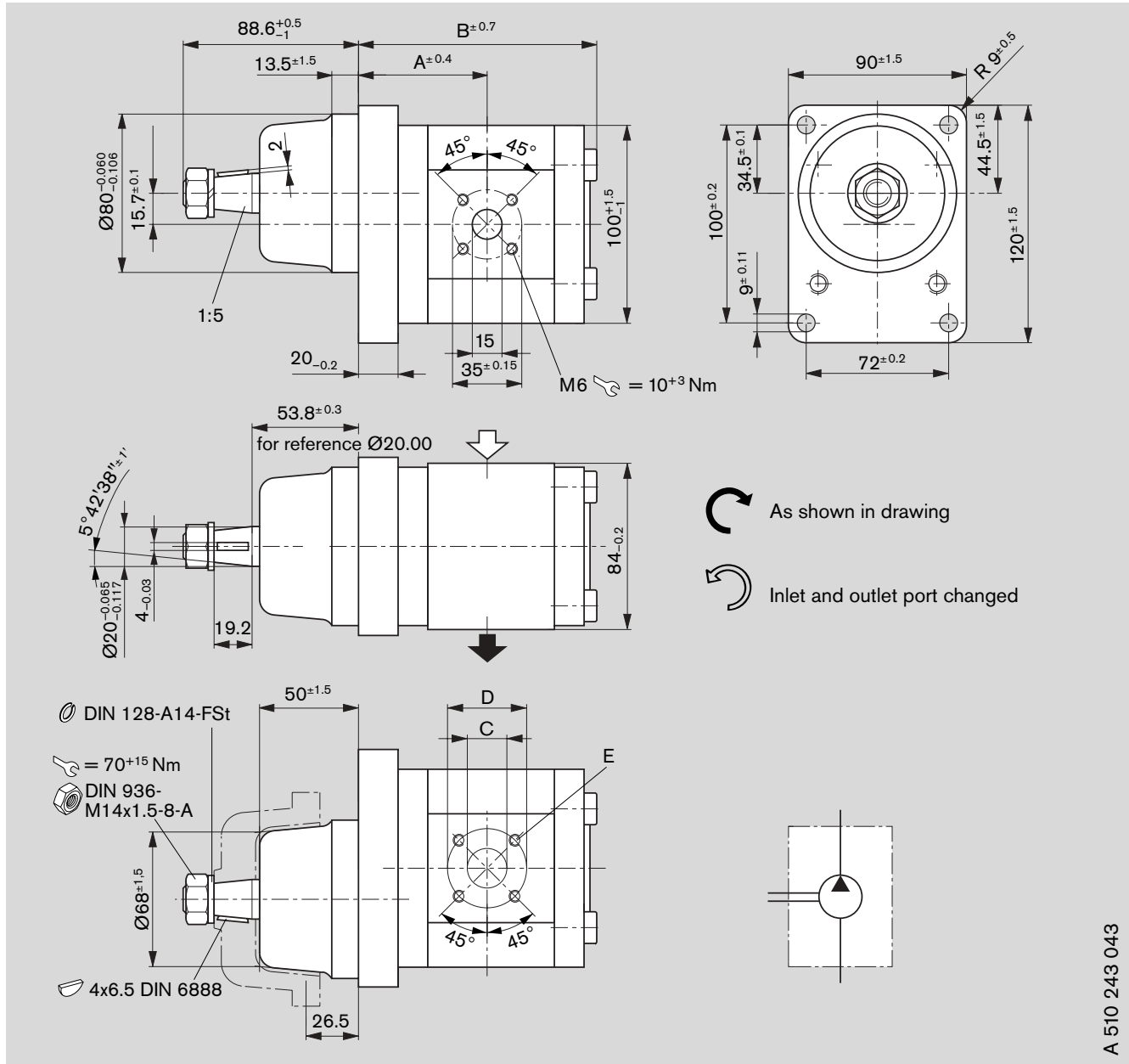
Ordering code

AZPF - 10 - Q R 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	\curvearrowleft L	\curvearrowright R			A	B	C	D	E
4	-	0 510 225 014	280	4000	39.9	84.5	15	40	M6 13 depth $\curvearrowright = 10^{+3}$ Nm
5.5	-	0 510 325 016	280	4000	41.1	87.0	15	40	
8	-	0 510 425 025	280	4000	43.2	91.1	20	40	
11	-	0 510 525 033	280	3500	47.0	96.1	20	40	
16	-	0 510 625 042	200	3000	47.5	104.5	20	40	
19	-	0 510 625 043	170	3000	47.5	109.5	20	40	
22.5	0 510 725 396	0 510 725 060	140	2500	55.1	114.9	20	40	

Dimensions in mm

Preferential range



A 510 243 043

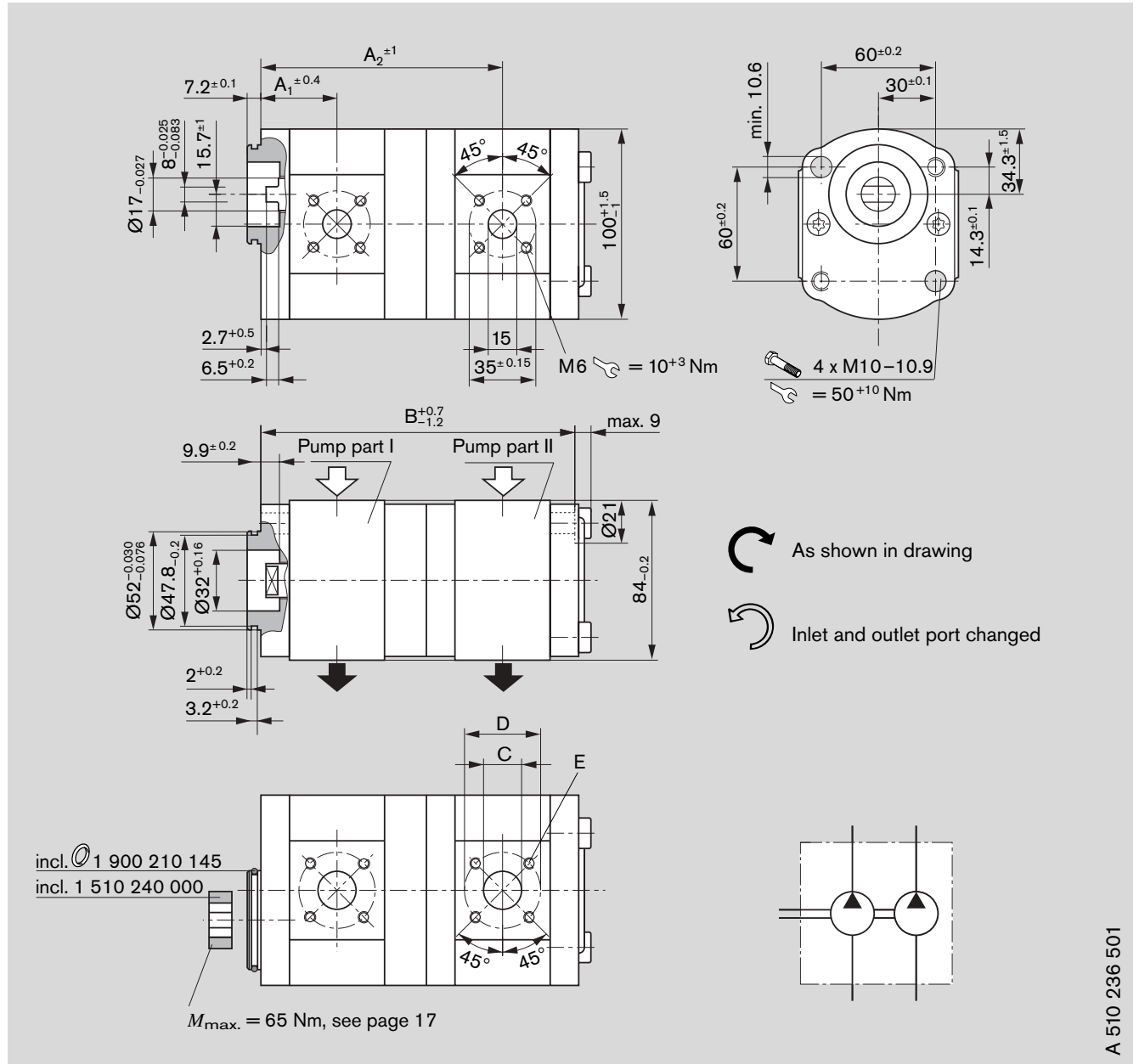
Ordering code

AZPF - 10 - S G 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]				
	L	R			A	B	C	D	E
11	-	0 510 545 003	280	3500	64.5	113.8	20	40	M6 13 depth = 10 ⁺³ Nm
14	0 510 545 302	0 510 545 002	280	3000	65.0	118.8	20	40	
16	-	0 510 645 005	230	3000	65.0	122.0	20	40	
19	-	0 510 645 003	230	3000	65.0	127.0	20	40	

Dimensions in mm

Preferential range



A 510 236 501

Ordering code

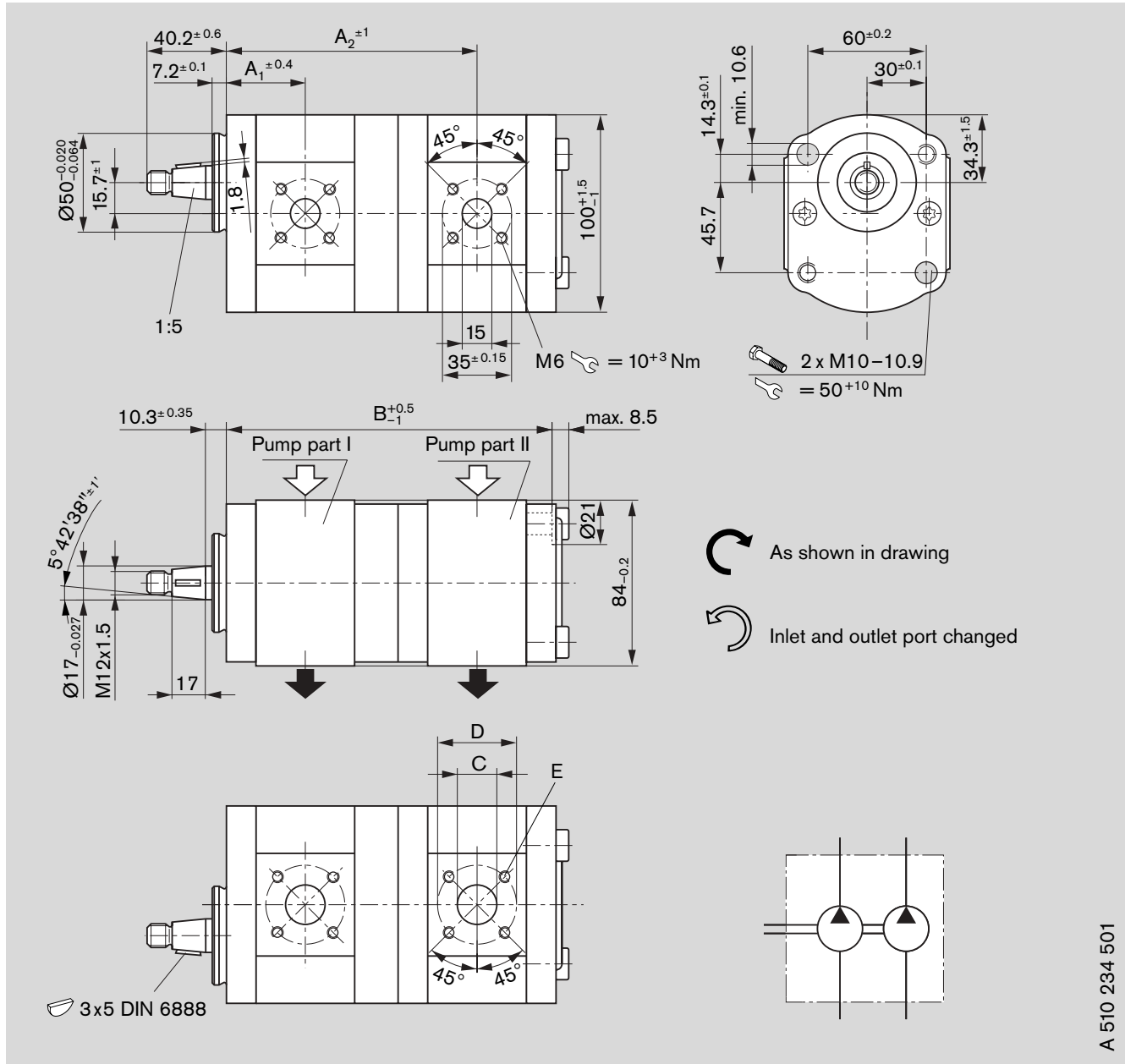
AZPF - 10 - / N M 20 20 M B

Displacement [cm ³ /rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					M6 13 depth = 10 ⁺³ Nm
	L	R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	
5.5 4	0 510 365 314	0 510 365 010	5.75	280	280	4000	38.6	121.6	157.9	15	40	
8 4	-	0 510 465 012	5.8	280	280	4000	40.7	125.7	162.0	20	40	
8 5.5	0 510 465 346	-	5.85	280	280	4000	40.7	126.9	164.5	20	40	
8 8	-	0 510 465 008	5.9	280	380	4000	40.7	129.0	168.6	20	40	
11 4	0 510 565 329	0 510 565 015	5.9	280	280	3500	44.5	130.7	167.0	20	40	
11 5.5	-	0 510 565 016	5.95	280	280	3500	44.5	131.9	169.5	20	40	
11 8	0 510 565 379	0 510 565 078	6.0	280	280	3500	44.5	134.0	173.6	20	40	
16 16	0 510 665 339	0 510 665 030	6.9	280	230	3000	45.0	146.7	195.4	20	40	
22.5 8	0 510 765 312	-	6.8	210	280	2500	52.5	152.8	192.4	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm



Preferential range



A 510 234 501

Ordering code

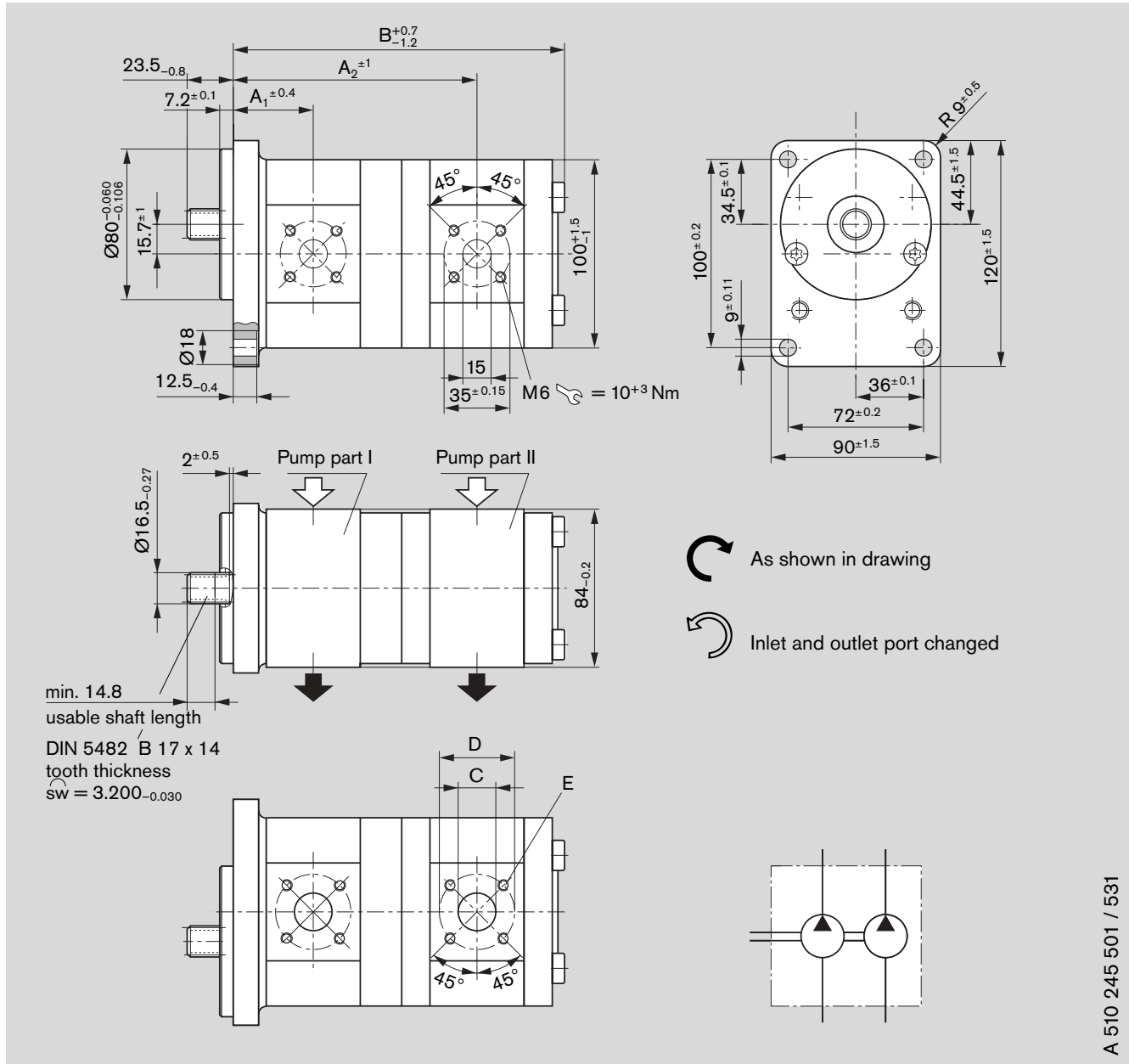
AZPFF - 12 - / C P 20 20 K B

Displacement [cm ³ /rev] P _I P _{II}		Ordering-No.		Max. operating pressure [bar] P _I P _{II}		Max. rotation speed [min ⁻¹]	Dimension [mm] A ₁ A ₂ B C ¹⁾ D E					
		 L	 R									
5.5	4	0 510 365 305	-	280	280	4000	38.6	121.6	157.9	15	40	M6 13 depth = 10 ⁺³ Nm
8	4	0 510 465 324	0 510 465 011	280	280	4000	40.7	125.7	162.0	20	40	
8	5.5	0 510 465 344	0 510 465 032	280	280	4000	40.7	126.9	164.5	20	40	
8	8	0 510 465 320	0 510 465 023	280	280	4000	40.7	129.0	168.6	20	40	
11	4	0 510 565 387	-	280	280	3500	44.5	130.7	167.0	20	40	
11	5.5	0 510 565 319	0 510 565 095	280	280	3500	44.5	131.9	169.5	20	40	
11	8	0 510 565 389	0 510 565 014	280	280	3500	44.5	134.0	173.6	20	40	
11	11	0 510 565 376	0 510 565 061	280	280	3500	44.5	137.8	178.6	20	40	
14	4	0 510 565 406	-	280	280	3000	45.0	135.7	172.0	20	40	
14	8	0 510 565 335	0 510 565 072	280	280	3000	45.0	139.0	178.6	20	40	
14	11	0 510 565 393	-	280	280	3000	45.0	142.8	183.6	20	40	
14	14	-	0 510 565 417	280	280	3000	45.0	143.3	188.6	20	40	
16	4	0 510 665 348	-	280	280	3000	45.0	139.1	175.4	20	40	
16	5.5	0 510 665 337	-	280	280	3000	45.0	140.3	177.9	20	40	
16	8	0 510 665 328	0 510 665 135	280	280	3000	45.0	142.4	182.0	20	40	
16	11	0 510 665 382	0 510 665 152	280	280	3000	45.0	146.2	187.0	20	40	
16	14	0 510 665 381	0 510 665 144	280	280	3000	45.0	146.7	192.0	20	40	
16	16	0 510 665 330	0 510 665 052	280	230	3000	45.0	146.7	195.4	20	40	
19	4	0 510 665 369	-	230	280	3000	45.0	144.1	180.4	20	40	
19	5	0 510 665 442	-	230	280	3000	45.0	145.3	183.2	20	40	
19	11	0 510 665 368	-	230	280	3000	45.0	146.2	192.0	20	40	
19	14	0 510 665 413	-	230	280	3000	45.0	151.7	197.0	20	40	
19	19	0 510 665 336	-	230	190	3000	45.0	151.7	205.4	20	40	
22	8	0 510 765 345	0 510 765 045	210	280	2500	52.6	152.8	192.4	20	40	
22	11	0 510 765 309	0 510 765 049	210	280	2500	52.6	156.7	197.7	20	40	
22	16	0 510 765 343	0 510 765 028	210	230	2500	52.6	157.1	205.8	20	40	

1) 4 and 5.5 cm³ Ø 15



Dimensions in mm

Preferential range



Ordering code

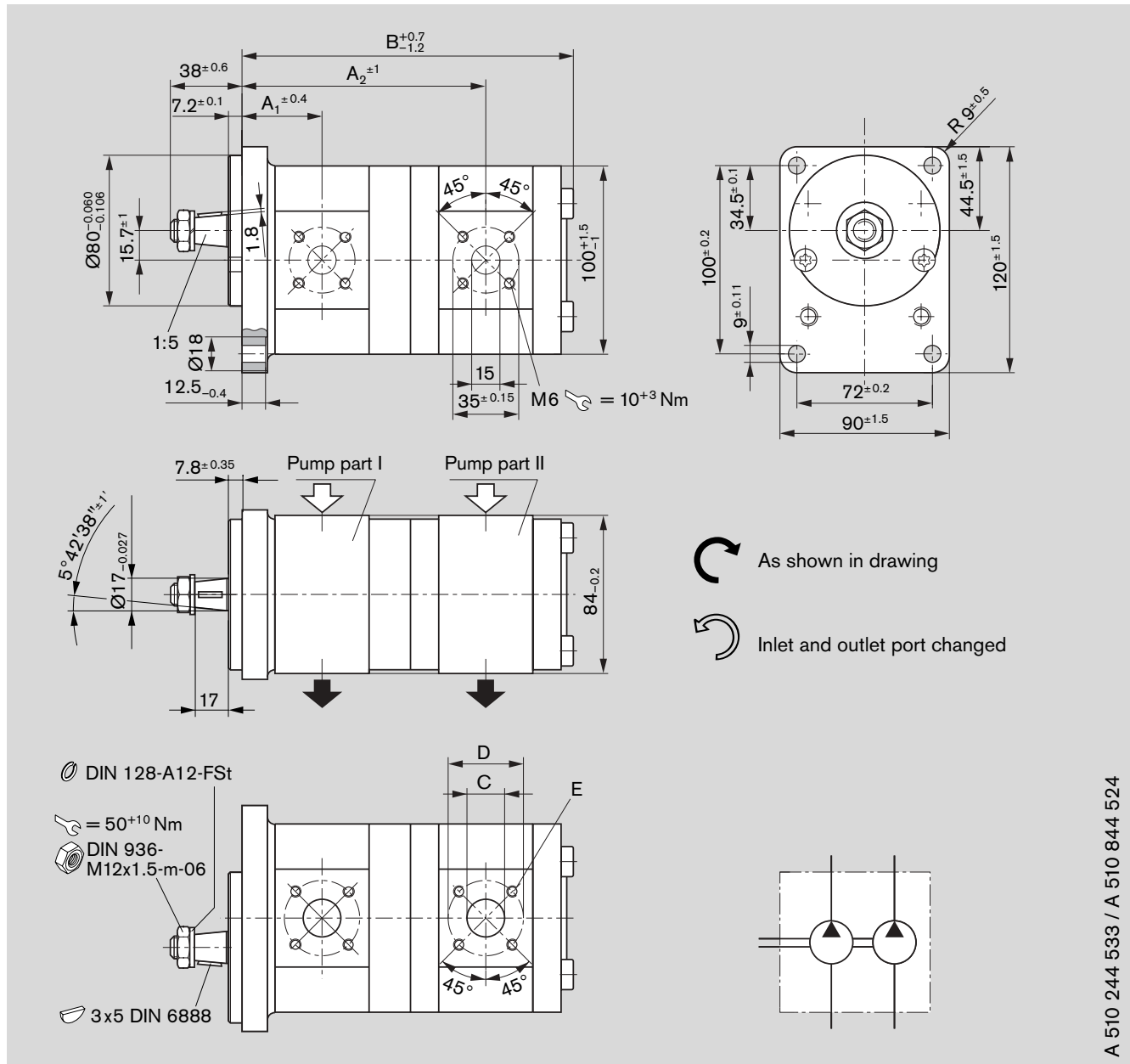
AZPFF - 10 - / F B 20 20 M BAZPFF - 11 - / F B 20 20 M B*

Displacement [cm ³ /rev]		Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					
P _I	P _{II}	 L	 R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	E
8	5.5	0 510 465 345	-	6.25	280	280	4000	43.2	129.4	174.0	20	40	M6 13 depth ⌚ = 10 ⁺³ Nm
8	8	0 510 465 326 *	-	6.3	280	280	4000	43.2	131.5	178.1	20	40	
11	4	-	0 510 565 032	6.3	280	280	3500	47.0	133.2	176.5	20	40	
11	5.5	0 510 565 332	0 510 565 034	6.35	280	280	3500	47.0	134.4	179.0	20	40	
11	8	0 510 565 334 *	0 510 565 018	6.4	280	280	3500	47.0	136.5	183.1	20	40	
11	11	0 510 565 328	0 510 565 035	6.5	280	280	3500	47.0	140.3	188.1	20	40	
14	4	0 510 565 367	-	6.4	280	280	3000	47.5	138.2	181.5	20	40	
14	5.5	0 510 565 069	-	6.5	280	280	3500	47.5	139.4	183.7	20	40	
14	8	0 510 565 356	0 510 565 019	6.5	280	280	3000	47.5	141.5	188.1	20	40	
16	4	-	0 510 665 058	6.7	280	280	3000	47.5	141.6	184.9	20	40	
16	8	0 510 665 333	0 510 665 064	6.8	280	280	3000	47.5	144.9	191.5	20	40	
16	11	0 510 665 347	0 510 665 036	6.9	280	280	3000	47.5	148.7	196.5	20	40	
16	16	0 510 665 334	0 510 665 029	7.3	280	230	3000	47.5	149.2	204.9	20	40	
19	4	-	0 510 665 115	-	230	280	3000	47.5	146.6	189.0	20	40	
19	11	0 510 665 375 *	-	-	230	280	3000	47.5	153.7	201.5	20	40	
19	19	0 510 665 420	0 510 665 097	-	230	190	3000	47.5	154.2	214.9	20	40	
22.5	5.5	0 510 765 317	0 510 765 022	-	210	280	2500	61.1	165.2	209.8	20	40	
22.5	8	0 510 765 331	-	-	210	280	2500	61.1	167.3	213.9	20	40	
22.5	16	0 510 765 341	-	-	210	230	2500	61.1	171.6	227.3	20	40	
22.5	22.5	0 510 765 338	-	-	210	160	2500	61.1	185.2	249.7	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm



Preferential range



A 510 244 533 / A 510 844 524

Ordering code

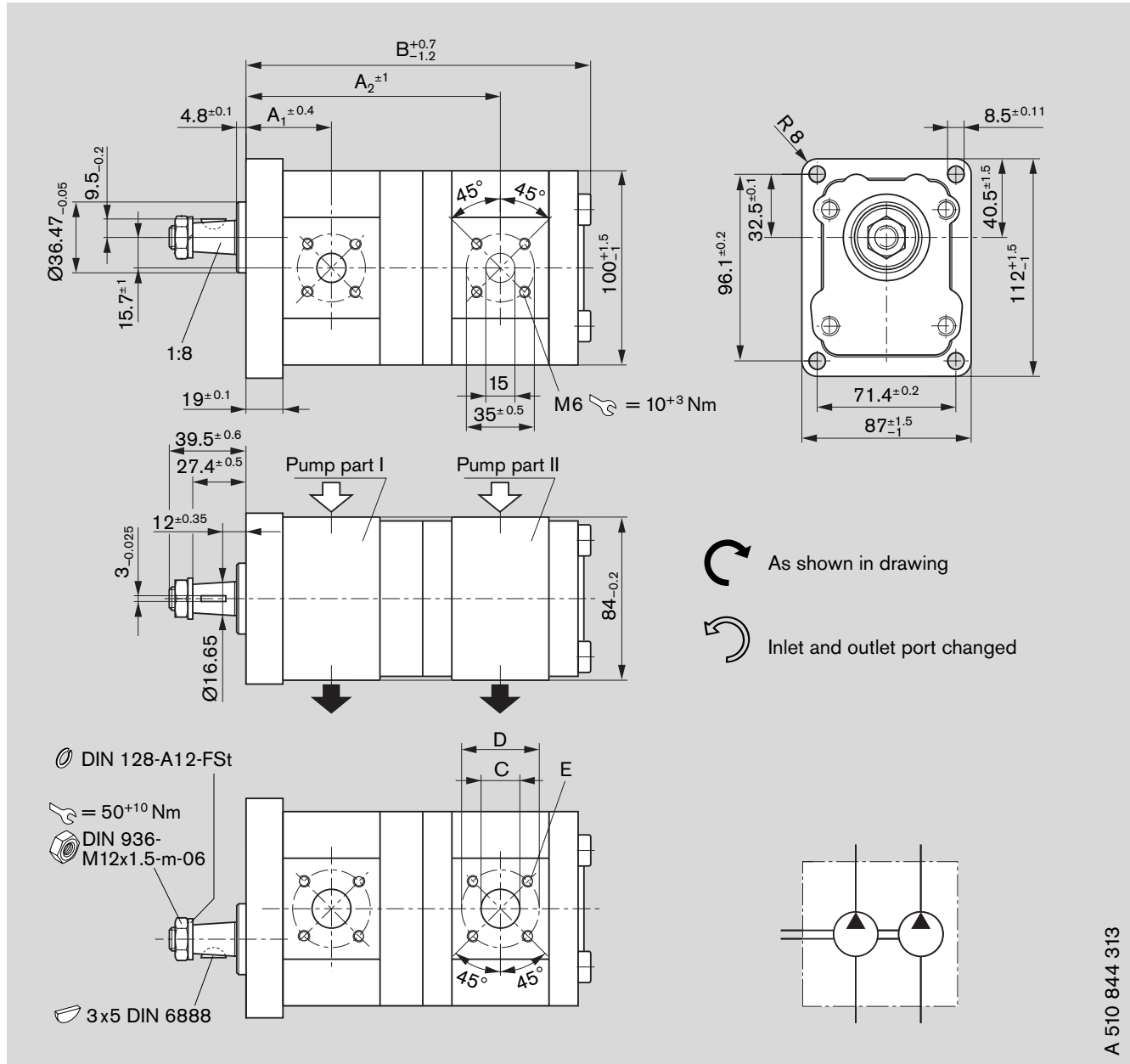
AZPFF – 10 – / C B 20 20 M BAZPFF – 11 – / C B 20 20 M B*

Displacement [cm ³ /rev]		Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					
P _I	P _{II}	 L	 R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	E
4	4	0 510 900 002*	0 510 900 001*	–	280	280	4000	39.9	121.6	164.4	15	40	M6 13 depth τ = 10 ⁺³ Nm
5.5	4	0 510 900 005*	–	–	280	280	4000	41.1	124.1	166.9	15	40	
5.5	5.5	0 510 900 004*	0 510 900 003*	–	280	280	4000	41.1	125.3	169.4	15	40	
8	16	–	0 510 900 042*	–	280	230	3000	43.2	135.8	191.0	20	40	
8	4	0 510 900 008*	0 510 900 051*	–	280	280	4000	43.2	128.2	171.0	20	40	
8	5.5	0 510 900 009*	0 510 900 007*	–	280	280	4000	43.2	129.4	173.5	20	40	
8	8	0 510 900 010*	0 510 900 006*	–	280	280	4000	43.2	131.5	177.6	20	40	
11	4	0 510 900 015*	0 510 900 012*	–	280	280	3500	47.0	133.2	176.0	20	40	
11	5.5	0 510 900 017*	0 510 900 046*	–	280	280	3500	47.0	134.4	178.5	20	40	
11	8	0 510 900 016*	0 510 900 044*	–	280	280	3500	47.0	136.5	182.6	20	40	
11	11	0 510 900 018*	0 510 900 039*	–	280	280	3500	47.0	140.3	187.6	20	40	
14	4	0 510 900 036*	–	–	280	280	3000	47.5	138.2	181	20	40	
14	5.5	–	0 510 900 060*	–	280	280	3000	47.5	139.4	183.5	20	40	
14	8	0 510 900 020*	0 510 900 011*	–	280	280	3000	47.5	141.5	187.6	20	40	
14	8	0 510 565 364	0 510 565 012	–	280	280	3000	47.5	141.5	188.1	20	40	
14	11	0 510 900 019*	0 510 900 013*	–	280	280	3000	47.5	145.3	192.6	20	40	
14	11	0 510 565 353	0 510 565 033	–	280	280	3000	47.5	145.3	193.1	20	40	
14	14	–	0 510 900 014*	–	280	280	3000	47.5	145.8	197.6	20	40	
14	14	–	0 510 565 037	–	280	280	3000	47.5	145.8	198.1	20	40	
16	4	0 510 900 059*	0 510 900 021*	–	280	280	3000	47.5	141.6	184.4	20	40	
16	5.5	0 510 900 028*	–	–	280	280	3000	47.5	142.8	186.9	20	40	
16	8	0 510 900 035*	0 510 900 022*	–	280	280	3000	47.5	144.9	191.0	20	40	
16	11	0 510 900 029*	0 510 900 023*	–	280	280	3000	47.5	148.7	196.0	20	40	
16	14	–	0 510 900 061*	–	280	280	3000	47.5	149.2	201.0	20	40	
16	16	0 510 900 030*	0 510 900 024*	–	280	230	3000	47.5	149.2	204.4	20	40	
19	4	0 510 900 043*	0 510 900 049*	–	230	280	3000	47.5	146.6	189.4	20	40	
19	5.5	–	0 510 665 067	–	230	280	3000	47.5	147.8	192.4	20	40	
19	5.5	–	0 510 900 027*	–	230	280	3000	47.5	147.8	191.9	20	40	
19	8	0 510 900 031*	0 510 900 047*	–	230	280	3000	47.5	149.9	196.0	20	40	
19	8	0 510 665 325*	0 510 665 024	–	230	280	3000	47.5	149.9	196.5	20	40	
19	11	0 510 900 032*	0 510 900 052*	–	230	280	3000	47.5	153.7	201.0	20	40	
19	11	0 510 665 326	–	–	230	280	3000	47.5	153.9	201.5	20	40	
19	14	0 510 900 053*	–	–	230	280	3000	47.5	154.2	206.0	20	40	
19	16	0 510 665 327	0 510 665 053	–	230	230	3000	47.5	154.2	209.9	20	40	
19	16	0 510 900 033*	0 510 900 026*	–	230	230	3000	47.5	154.2	209.4	20	40	
19	19	0 510 900 034*	0 510 900 025*	–	230	210	3000	47.5	154.2	214.4	20	40	
19	19	0 510 665 400	0 510 665 025	–	230	190	3000	47.5	154.2	214.9	20	40	
22.5	4	–	0 510 900 050*	–	210	280	2500	55.1	152.0	194.8	20	40	
22.5	5.5	0 510 900 055*	0 510 900 045*	–	210	280	2500	55.1	153.2	197.3	20	40	
22.5	8	0 510 900 057*	0 510 900 040*	–	210	280	2500	55.1	155.3	201.4	20	40	
22.5	8	–	0 510 765 023	–	230	280	3000	61.0	167.3	213.9	20	40	
22.5	11	–	0 510 900 054*	–	210	280	2500	55.1	159.1	206.4	20	40	
22.5	11	0 510 765 320	–	–	210	250	3000	61.0	171.1	218.9	20	40	
22.5	14	0 510 900 048*	0 510 900 058*	–	210	280	2500	55.1	159.6	211.4	20	40	
22.5	16	0 510 900 041*	0 510 900 037*	–	210	230	2500	55.1	159.6	214.8	20	40	
22.5	16	0 510 765 340	–	–	210	230	3000	61.0	171.6	227.3	20	40	
22.5	22.5	0 510 900 056*	0 510 900 038*	–	210	180	2500	55.1	167.2	225.2	20	40	
22.5	22.5	–	0 510 765 012	–	210	160	3000	61.0	185.2	249.7	20	40	

1) 4 and 5.5 cm³ Ø 15



Dimensions in mm

Preferential range



Ordering code

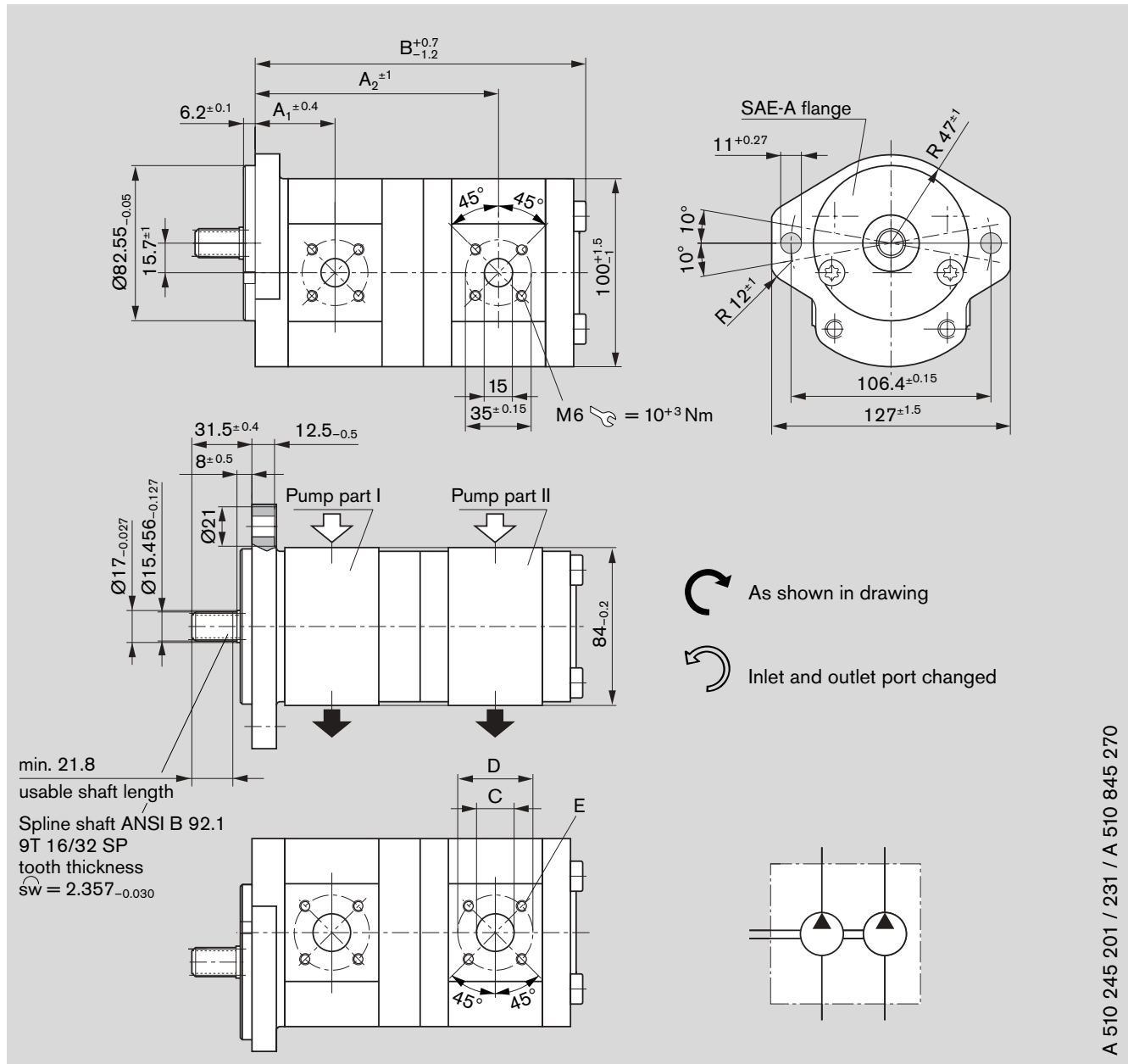
AZPFF - 10 - / H O 20 20 M BAZPFF - 10 - / H O 20 20 K B*

Displacement [cm ³ /rev]		Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					
P _I	P _{II}	 L	 R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	E
4	4	-	0 510 901 500	-	280	280	4000	41.4	123.1	165.9	15	40	M6 13 depth = 10 ⁺³ Nm
8	5.5	0 510 901 512	-	-	280	280	4000	44.7	130.9	175.0	20	40	
8	8	-	0 510 901 504	-	280	280	4000	44.7	133.0	179.1	20	40	
11	4	-	0 510 901 509	-	280	280	3500	48.5	134.7	177.5	20	40	
11	5.5	0 510 565 436 *	0 510 901 503	-	280	280	3500	48.5	135.9	180.0	20	40	
14	5.5	0 510 565 435 *	-	-	280	280	3000	49.0	140.9	185.0	20	40	
14	11	-	0 510 901 513	-	280	280	3000	49.0	146.8	194.1	20	40	
16	5.5	-	0 510 901 510	-	280	280	3000	49.0	144.3	188.4	20	40	
16	8	0 510 901 514	-	-	280	280	3000	49.0	146.4	192.5	20	40	
16	14	-	0 510 901 515	-	280	280	3000	49.0	150.7	202.5	20	40	
16	16	-	0 510 901 501	-	280	230	3000	49.0	150.7	205.9	20	40	
19	8	-	0 510 901 507	-	230	280	3000	49.0	151.4	197.5	20	40	
19	11	-	0 510 901 508	-	230	280	3000	49.0	155.2	202.5	20	40	
19	16	-	0 510 901 502	-	230	230	3000	49.0	155.7	210.9	20	40	
19	19	0 510 901 506	-	-	230	190	3000	49.0	155.7	215.9	20	40	
22.5	16	0 510 901 511	-	-	210	230	2500	56.6	161.1	216.3	20	40	
22.5	19	-	0 510 901 505	-	210	190	2500	56.6	161.7	220.3	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



A 510 245 201 / 231 / A 510 845 270

Ordering code

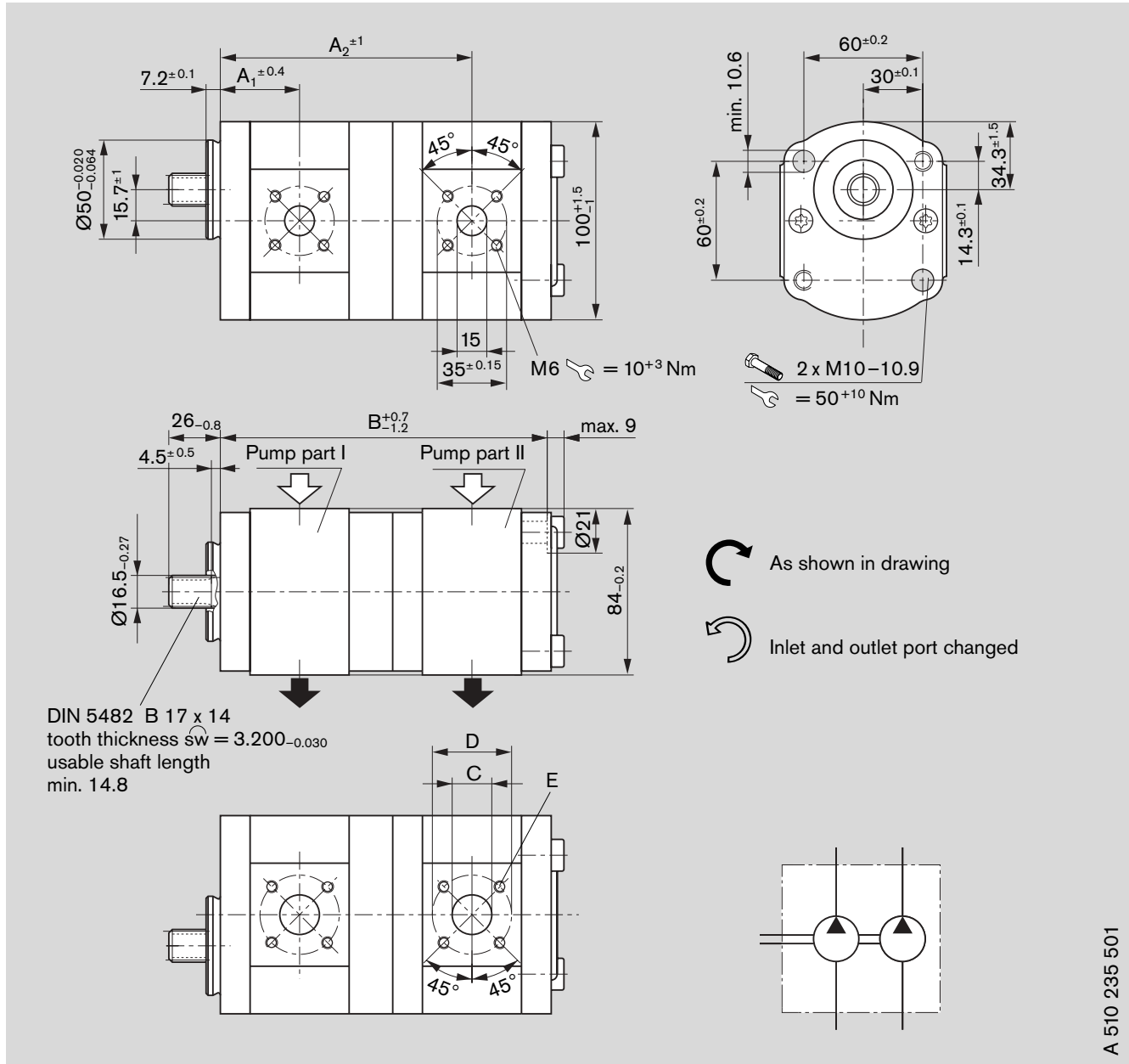
AZPFF - 10 - / R R 20 20 M BAZPFF - 11 - / R R 20 20 M B*AZPFF - 11 - / R R 20 20 K B**

Displacement [cm ³ /rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar] P _I P _{II}		Max. rotation speed [min ⁻¹]	Dimension [mm]					E
	L	R		A ₁	A ₂		B	C ¹⁾	D			
5.5	4	0 510 901 029*	-	280	280	4000	41.1	124.1	166.9	15	40	M6 13 depth = 10 ⁺³ Nm
5.5	5.5	-	0 510 901 042*	280	280	4000	41.1	125.3	169.4	15	40	
8	4	0 510 901 032*	0 510 901 034*	280	280	4000	43.2	128.2	171.0	20	40	
8	5.5	0 510 901 018*	0 510 901 030*	280	280	4000	43.2	129.4	173.5	20	40	
8	8	-	0 510 901 021*	280	280	4000	43.2	131.5	177.6	20	40	
11	4	-	0 510 901 024*	280	280	3500	47.0	133.2	176.0	20	40	
11	4	-	0 510 565 022	280	280	3500	47.0	133.2	176.5	20	40	
11	5.5	0 510 901 015*	0 510 901 000*	280	280	3500	47.0	134.4	178.5	20	40	
11	5.5	-	0 510 565 023	280	280	3500	47.0	134.4	179.0	20	40	
11	8	0 510 901 031*	0 510 901 037*	280	280	3500	47.0	136.5	182.6	20	40	
11	11	0 510 901 009*	0 510 901 035**	280	280	3500	47.0	140.3	187.6	20	40	
14	5.5	0 510 901 033*	-	280	280	3000	47.5	139.4	183.5	20	40	
14	8	-	0 510 901 016*	280	280	3000	47.5	141.5	187.6	20	40	
14	11	0 510 565 346	-	280	280	3000	47.5	145.3	193.1	20	40	
14	11	0 510 901 001*	0 510 901 011*	280	280	3000	47.5	145.3	192.6	20	40	
14	14	-	0 510 901 036*	280	280	3000	47.5	145.8	197.6	20	40	
16	4	-	0 510 901 028*	280	280	3000	47.5	141.6	184.4	20	40	
16	5.5	0 510 901 014*	0 510 901 008*	280	280	3000	47.5	142.8	186.9	20	40	
16	8	0 510 901 006*	0 510 901 005*	280	280	3000	47.5	144.9	191.0	20	40	
16	11	0 510 901 012*	0 510 901 002*	280	280	3000	47.5	148.7	196.0	20	40	
16	11	0 510 665 354	0 510 665 042	280	280	3000	47.5	148.7	196.0	20	40	
16	16	0 510 901 027*	0 510 901 022*	280	280	3000	47.5	149.2	204.4	20	40	
19	4	-	0 510 901 044*	230	280	3000	47.5	146.6	189.4	20	40	
19	5.5	0 510 901 041*	0 510 901 043*	230	280	3000	47.5	147.8	191.9	20	40	
19	8	0 510 901 017*	0 510 901 003*	230	280	3000	47.5	149.9	196.0	20	40	
19	8	-	0 510 665 126**	230	280	3000	47.5	149.9	196.0	20	40	
19	8	-	0 510 665 047	230	280	3000	47.5	149.9	196.0	20	40	
19	11	0 510 665 435	0 510 901 004*	230	280	3000	47.5	153.7	201.0	20	40	
19	14	0 510 901 040*	0 510 901 025*	230	280	3000	47.5	154.2	206.0	20	40	
19	16	0 510 901 039*	0 510 901 045*	230	230	3000	47.5	154.2	209.4	20	40	
19	19	0 510 901 010*	-	230	190	3000	47.5	154.2	214.4	20	40	
19	19	-	0 510 665 132	230	190	3000	47.5	154.2	214.4	20	40	
22.5	4	-	0 510 901 023*	210	280	2500	55.1	152.0	194.8	20	40	
22.5	5.5	-	0 510 901 020*	210	280	2500	55.1	153.2	197.3	20	40	
22.5	8	-	0 510 765 016	180	280	2500	55.1	155.3	201.4	20	40	
22.5	11	0 510 901 019*	0 510 901 026*	210	280	2500	55.1	159.1	206.4	20	40	
22.5	14	0 510 901 013*	0 510 901 007*	210	280	2500	55.1	159.6	211.4	20	40	
22.5	22.5	0 510 901 038*	-	210	180	2500	55.1	167.2	225.2	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



A 510 235 501

Ordering code

AZPFF - 10 - / F P 20 20 M B

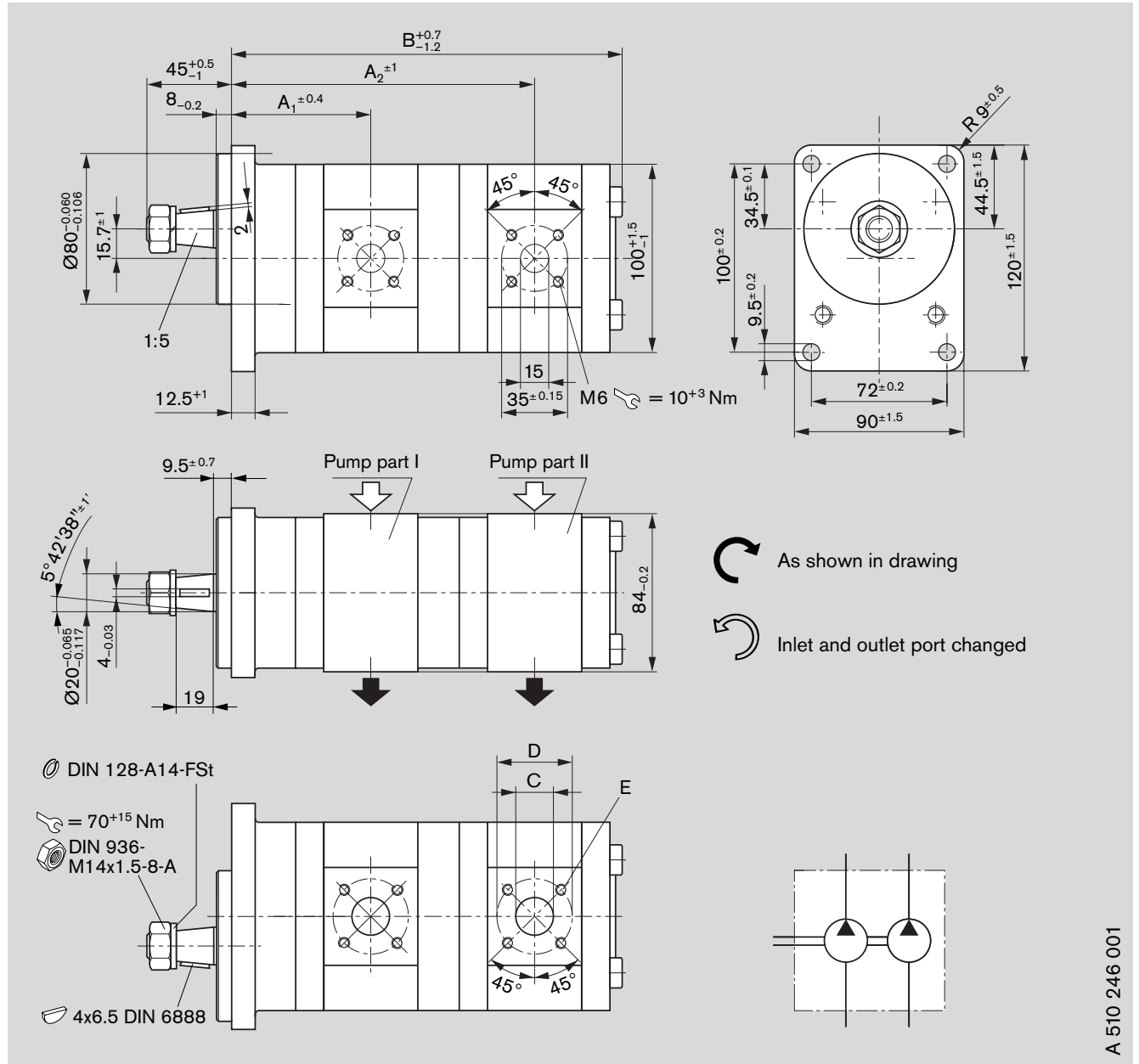
AZPFF - 10 - / F P 20 20 K B*

Displacement [cm ³ /rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar] P _I P _{II}		Max. rotation speed [min ⁻¹]	Dimension [mm]					
							A ₁	A ₂	B	C ¹⁾	D	E
8 4	0 510 465 355	-	5.8	280	280	4000	40.7	125.7	162.0	20	40	M6 13 depth = 10 ⁺³ Nm
11 8	0 510 565 385	-	6.0	280	280	3500	44.5	134.0	173.6	20	40	
16 8	-	0 510 665 071	6.4	280	280	3000	45.0	142.4	182.0	20	40	
16 11	-	0 510 665 076	6.5	280	280	3000	45.0	146.2	187.0	20	40	
16 14	0 510 665 404*	-	6.7	280	280	3000	45.0	146.7	192.0	20	40	
16 16	0 510 665 376	0 510 665 062	6.9	280	230	3000	45.0	146.7	195.4	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

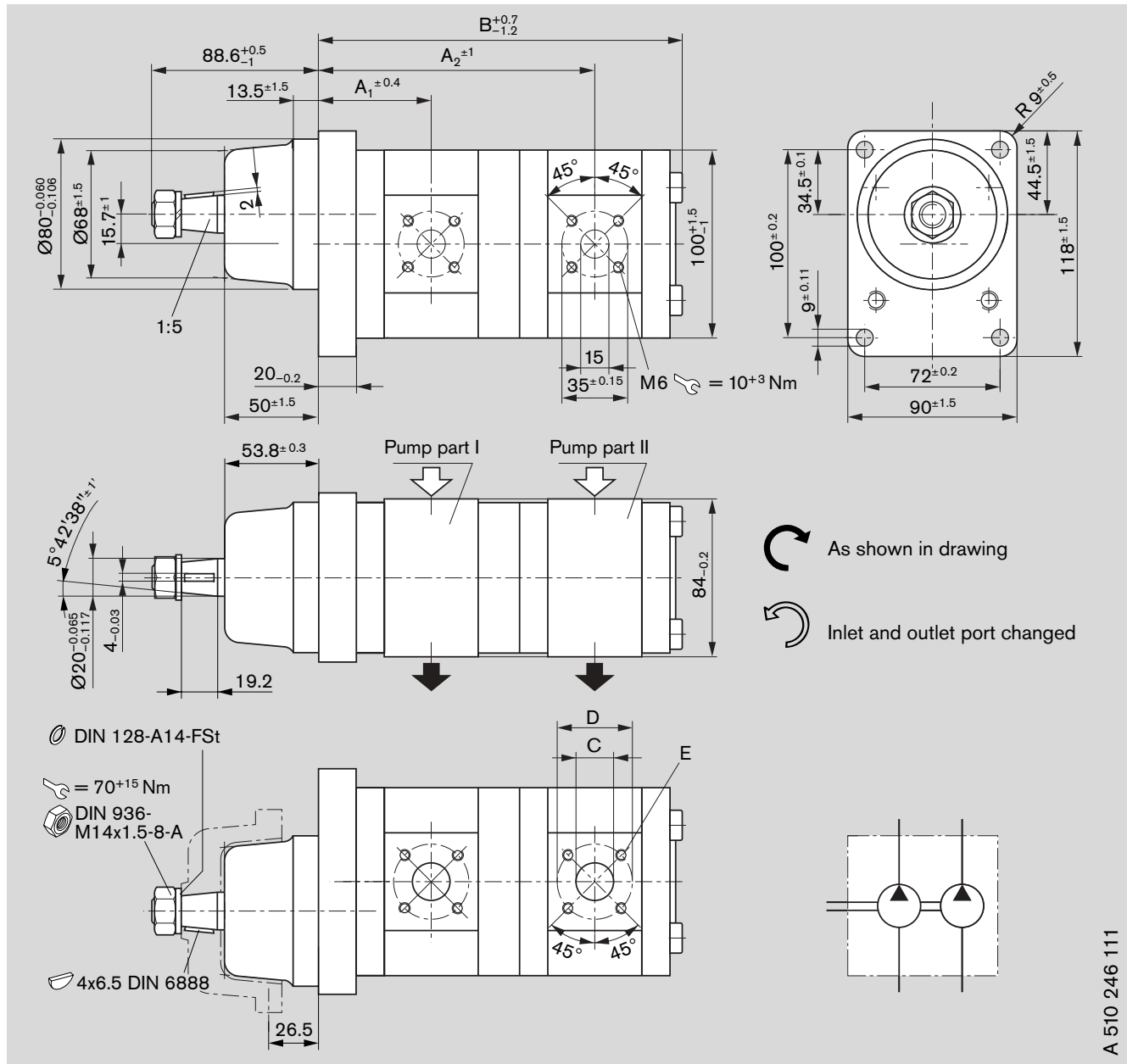
AZPF - 10 - / S A 20 20 M B

Displacement [cm ³ /rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					E
	L	R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	
4 4	0 510 255 300	-	-	280	280	4000	71.3	153.0	197.0	15	40	M6 13 depth = 10 ⁺³ Nm
5.5 4	0 510 355 301	-	-	280	280	4000	72.6	155.5	199.5	15	40	
8 5.5	0 510 455 300	0 510 455 001	-	280	280	4000	74.6	160.8	206.1	20	40	
8 8	0 510 455 301	0 510 455 002	-	280	280	4000	74.6	163.0	210.2	20	40	
11 5.5	0 510 555 300	0 510 555 001	-	280	280	3500	79.0	165.8	211.1	20	40	
11 8	0 510 555 301	0 510 555 002	-	280	280	3500	79.0	168.0	215.2	20	40	
11 11	0 510 555 302	0 510 555 003	-	280	280	3500	79.0	172.3	220.2	20	40	
16 4	0 510 655 300	0 510 655 001	-	280	280	3000	79.0	173.0	217.0	20	40	
16 5.5	0 510 655 301	0 510 655 002	-	280	280	3000	79.0	174.2	219.5	20	40	
16 8	0 510 655 302	0 510 655 003	-	280	280	3000	79.0	176.3	223.6	20	40	
16 11	0 510 655 303	0 510 655 004	-	280	280	3000	79.0	180.7	228.6	20	40	
16 16	0 510 655 304	0 510 655 005	-	280	230	3000	79.0	180.7	237.0	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

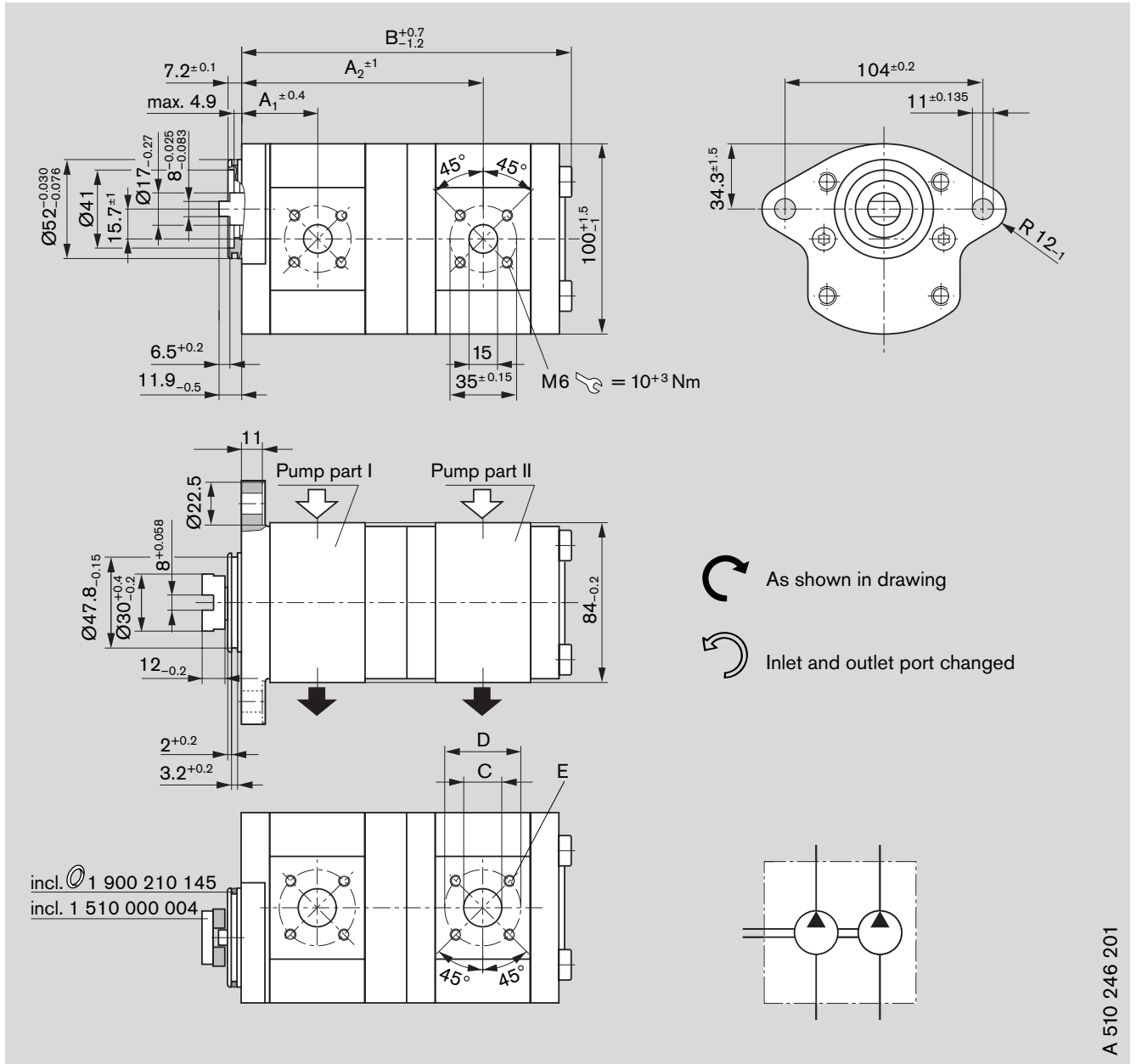
AZPFF - 10 - [] [] [] / [] [] [] SG 20 20 P B

Displacement [cm³/rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					
	L	R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	E
16 16	-	0 510 655 007	-	280	280	3000	65.0	166.7	221.9	20	40	M6
19 19	-	0 510 655 011	-	230	190	3000	65.0	171.7	231.9	20	40	13 depth = 10 ⁺³ Nm

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



A 510 246 201

Ordering code

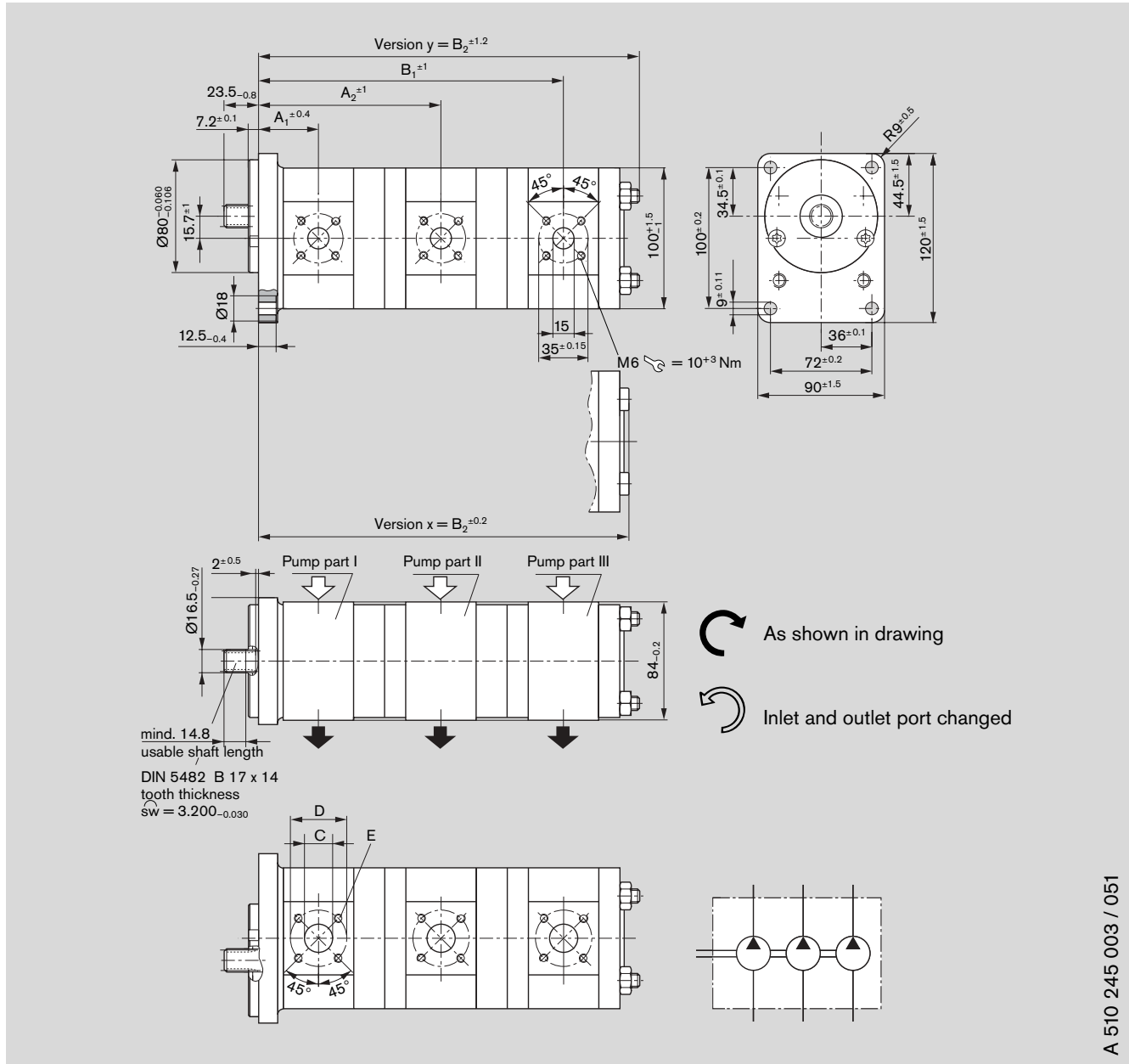
AZPFF - 10 - / N L 20 20 K B

Displacement [cm ³ /rev] P _I P _{II}	Ordering-No.		[kg]	Max. operating pressure [bar]		Max. rotation speed [min ⁻¹]	Dimension [mm]					
	\curvearrowleft L	\curvearrowright R		P _I	P _{II}		A ₁	A ₂	B	C ¹⁾	D	E
5.5 5.5	-	0 510 365 009	-	280	280	4000	38.6	122.8	169.2	15	40	M6
11 11	-	0 510 565 043	-	280	280	3500	44.5	137.5	187.4	20	40	13 depth
16 8	0 510 665 449	-	-	280	280	3000	45.0	142.4	188.4	20	40	$\curvearrowright = 10^{+3} \text{ Nm}$
16 22.5	0 510 665 068	-	-	280	160	2500	45.0	160.3	226.6	20	40	

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

AZPFFF - 10 - / / F B 20 20 20 M B

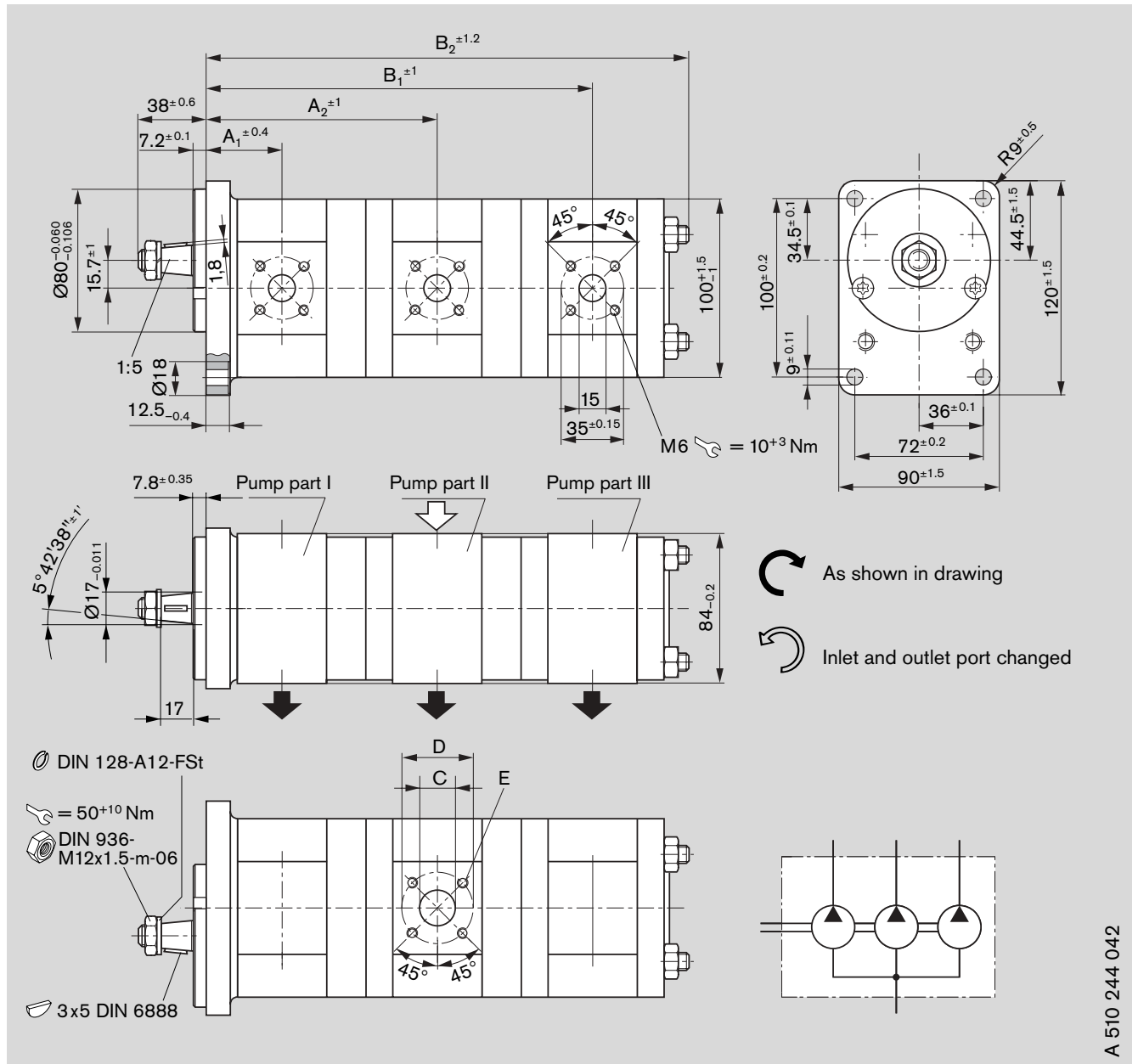
AZPFFF - 11 - / / F B 20 20 20 M B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]						Version	
	L	R			A ₁	A ₂	B ₁	B ₂	C ¹⁾	D		E
P _I P _{II} P _{III}			P _I P _{II} P _{III}		A ₁	A ₂	B ₁	B ₂	C ¹⁾	D	E	
11 4 4	0 510 565 371	-	280 280 280	3500	47.0	133.2	214.9	259.0	20	40	M6	y
14 4 8	0 510 565 408	-	280 280 280	3000	47.5	138.2	223.2	270.6	20	40	13 depth	x
14 8 8	0 510 565 422	-	280 280 280	3000	47.5	141.5	229.8	275.9	20	40	$\hookrightarrow = 10^{+3} \text{ Nm}$	x
16 4 4	0 510 665 379	-	280 280 280	3000	47.5	141.6	223.3	267.4	20	40		x
16 5.5 5.5	0 510 665 416	0 510 665 061	280 280 280	3000	47.5	142.8	227.0	272.4	20	40		x
16 11 4	0 510 665 372	-	280 210 210	3000	47.5	148.7	234.9	276.5	20	40		x
16 11 5.5	-	0 510 665 092*	280 210 120	3000	47.5	148.7	236.1	280.2	20	40		x
16 16 11	0 510 665 371	-	280 120 120	3000	47.5	149.2	250.4	302.5	20	40		x
19 8 5.5	-	0 510 665 111*	230 250 160	3000	47.5	149.9	236.1	280.2	20	40		x
19 11 5.5	-	0 510 665 112*	230 230 230	3000	47.5	153.7	241.1	285.2	20	40		x

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

AZPFFF - 11 - / / C B 20 20 20 M B

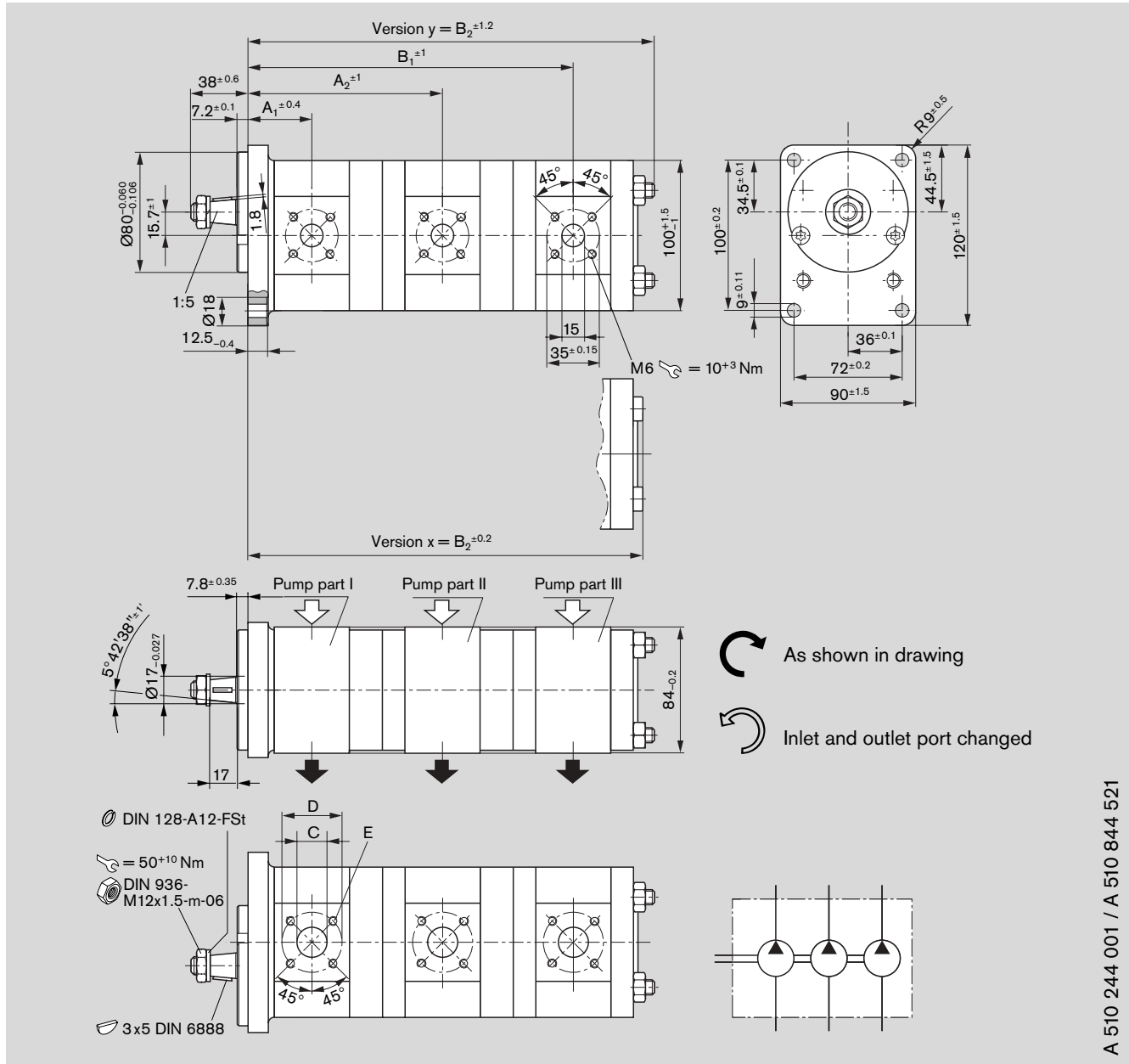
Displacement [cm³/rev] P _I P _{II} P _{III}	Ordering-No.		Max. operating pressure [bar] P _I P _{II} P _{III}	Max. rotation speed [min ⁻¹]	Dimension [mm]						
	L	R			A ₁	A ₂	B ₁	B ₂	C ¹⁾	D	E
8 8 5.5	-	0 510 465 031	230 230 230	4000	43.2	119.5	193.7	238.1	20	40	M6
11 11 8	-	0 510 565 065	230 230 230	3500	47.0	128.3	205.8	251.9	20	40	13 depth
11 11 8	-	0 510 565 080²⁾	280 280 280	3500	47.0	128.3	205.8	251.9	20	40	⌚ = 10 ³ Nm

1) 4 and 5.5 cm³ Ø 15

2) with higher transfer torques

Dimensions in mm

Preferential range



Ordering code

AZPFFF - 10 - / / C B 20 20 20 M B

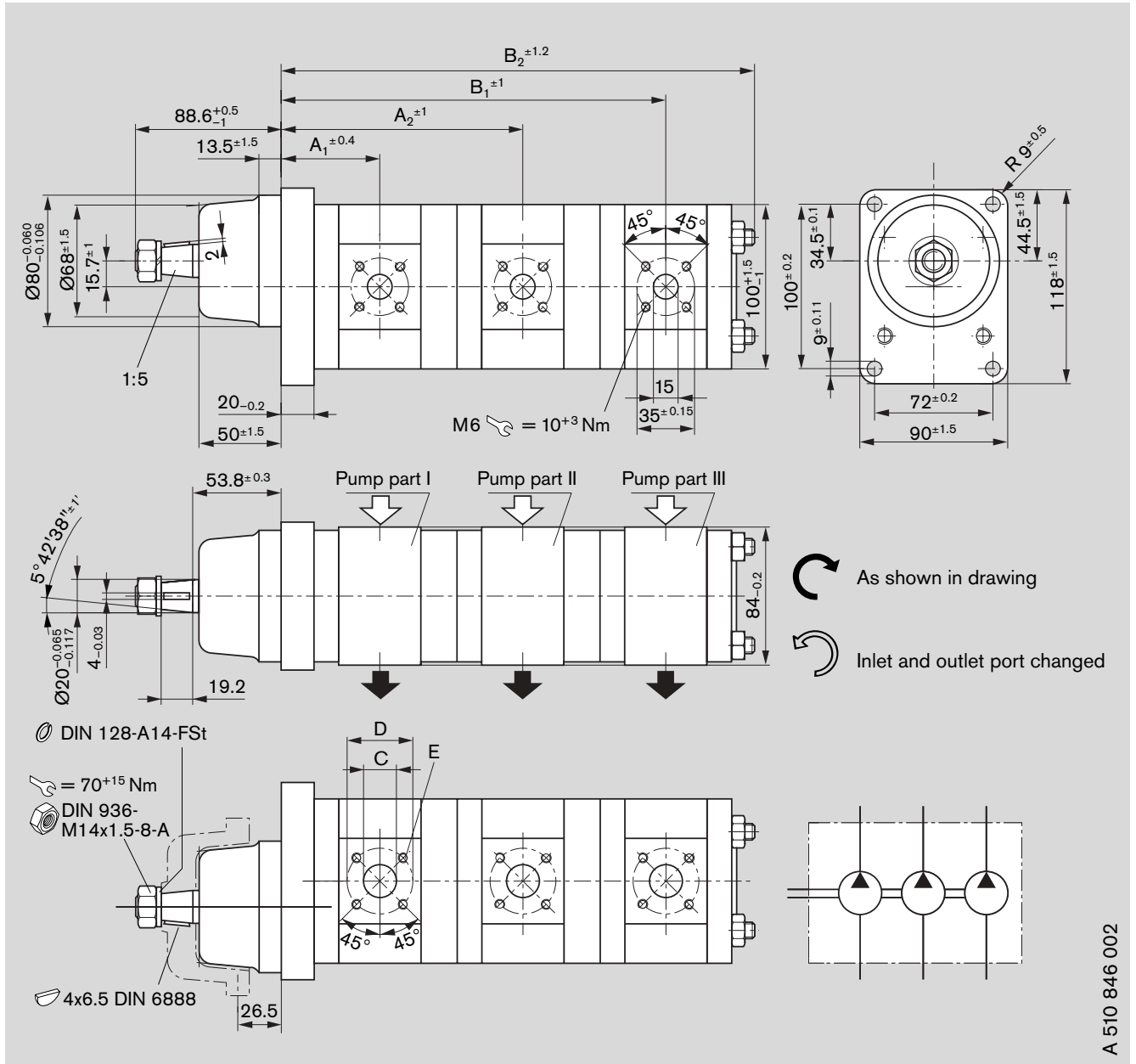
AZPFFF - 11 - / / C B 20 20 20 K B*

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]							Version				
					P _I	P _{II}	P _{III}	A ₁	A ₂	B ₁	B ₂		C ¹⁾	D	E	
8	8	4	-	0 510 465 027	280	280	280	4000	43.2	131.5	216.5	260.6	20	40	M6	x
11	8	8	-	0 510 565 081	280	230	230	3500	47.0	136.5	224.8	272.2	20	40	13 depth	x
16	4	4	0 510 665 419*	-	280	280	280	3000	47.5	141.6	223.3	267.4	20	40	$\tau = 10^{+3}$ Nm	x
16	8	4	-	0 510 665 134	280	280	280	3000	47.5	144.9	229.9	272.7	20	40		x
22.5	8	9	0 510 765 334*	-	230	210	210	3000	61.6	167.3	255.6	307.5	20	40		y

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



A 510 846 002

Ordering code

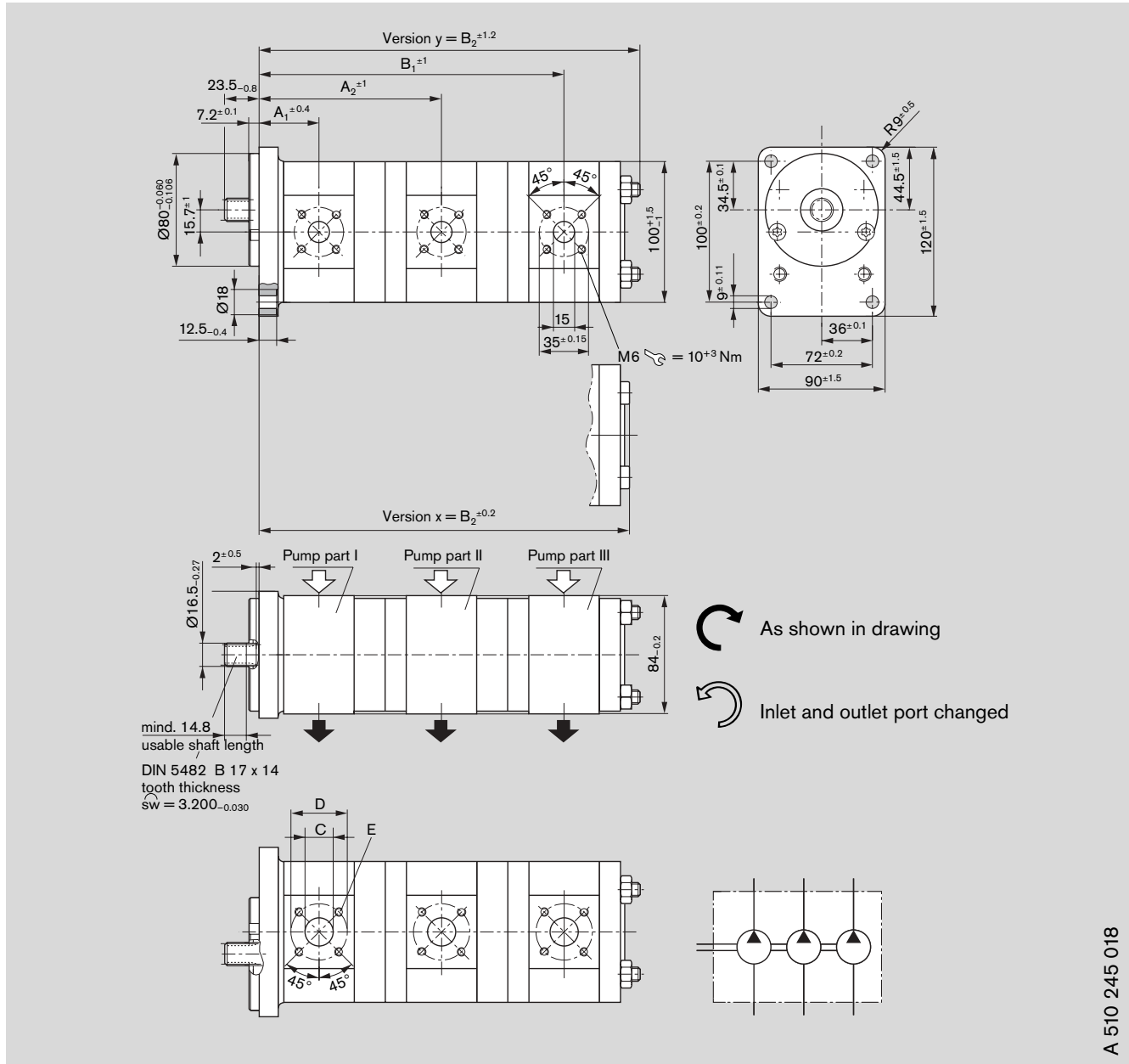
AZPFFF - 10 - / / S G 20 20 20 M B

Displacement [cm ³ /rev]	Ordering-No.			Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]									
	P _I	P _{II}	P _{III}			L	R	A ₁	A ₂	B ₁	B ₂	C ¹⁾	D	E	
8	8	5.5	-	0 510 455 004	280	250	250	4000	60.7	149.0	235.2	284.0	20	40	M6
14	14	5.5	-	0 510 555 007	280	210	210	3000	65.0	163.3	255.3	304.0	20	40	13 depth = 10 ⁺³ Nm

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

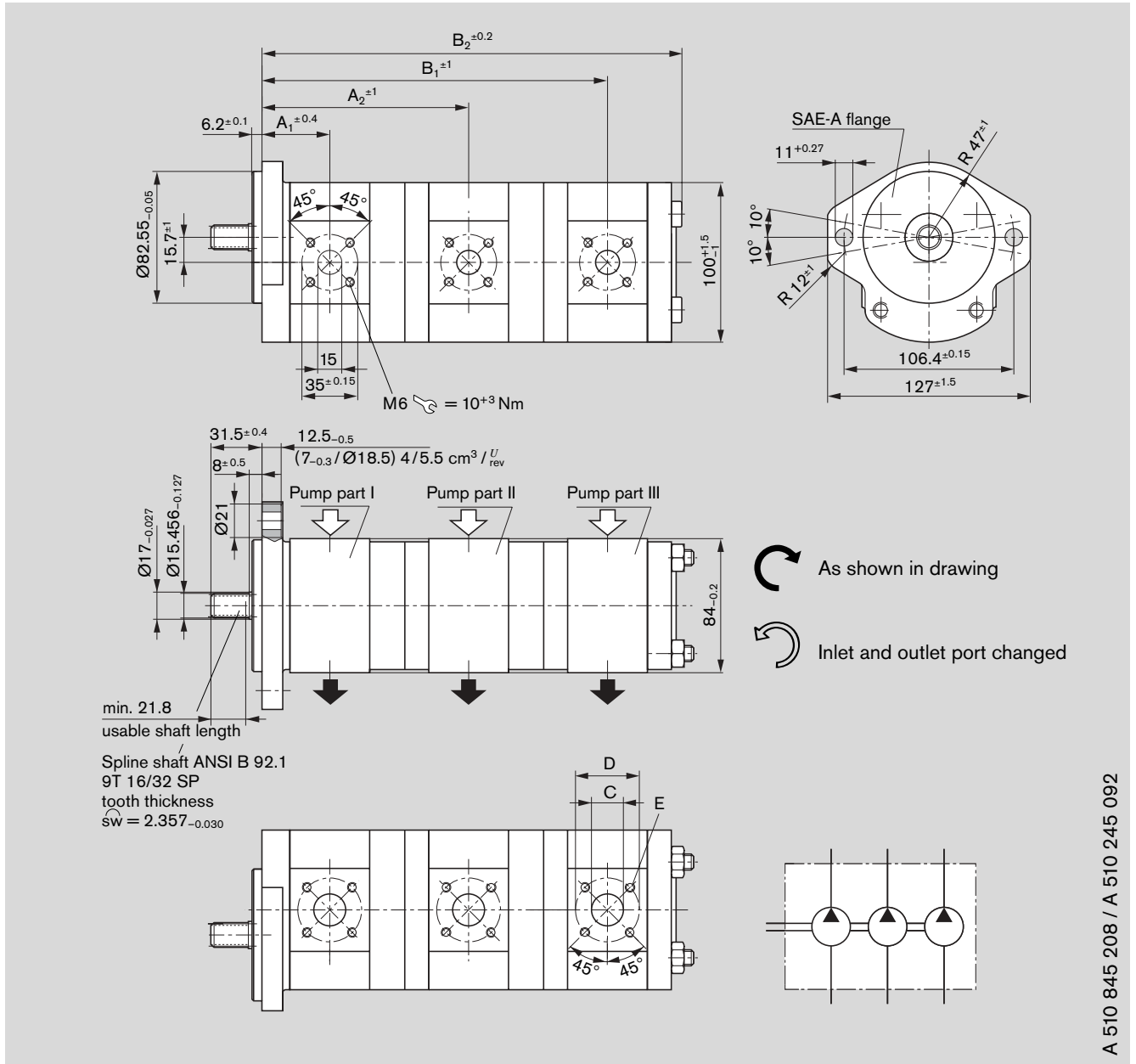
AZPFFF - 10 - / / F B 20 20 20 M B

Displacement [cm ³ /rev]	Ordering-No.		Max. operating pressure [bar]	Max. rotation speed [min ⁻¹]	Dimension [mm]							Version		
	L	R			P _I	P _{II}	P _{III}	A ₁	A ₂	B ₁	B ₂		C ¹⁾	D
8 8 4	-	0 510 465 019	280	280	280	4000	43.2	131.5	216.5	260.8	20	40	M6	x
19 16 4	0 510 665 380	-	230	190	190	3000	47.5	154.2	248.3	297.5	20	40	13 depth ⚙ = 10 ⁺³ Nm	y

1) 4 and 5.5 cm³ Ø 15

Dimensions in mm

Preferential range



Ordering code

AZPFFF - 10 - / / R R 20 20 20 M B

Displacement [cm ³ /rev] P _I P _{II} P _{III}	Ordering-No.		Max. operating pressure [bar] P _I P _{II} P _{III}	Max. rotation speed [min ⁻¹]	Dimension [mm]						
	L	R			A ₁	A ₂	B ₁	B ₂	C ¹⁾	D	E
8 5.5 5.5	-	0 510 465 025	280 280 280	4000	43.2	129.4	213.6	257.7	20	40	M6 13 depth = 10 ⁺³ Nm

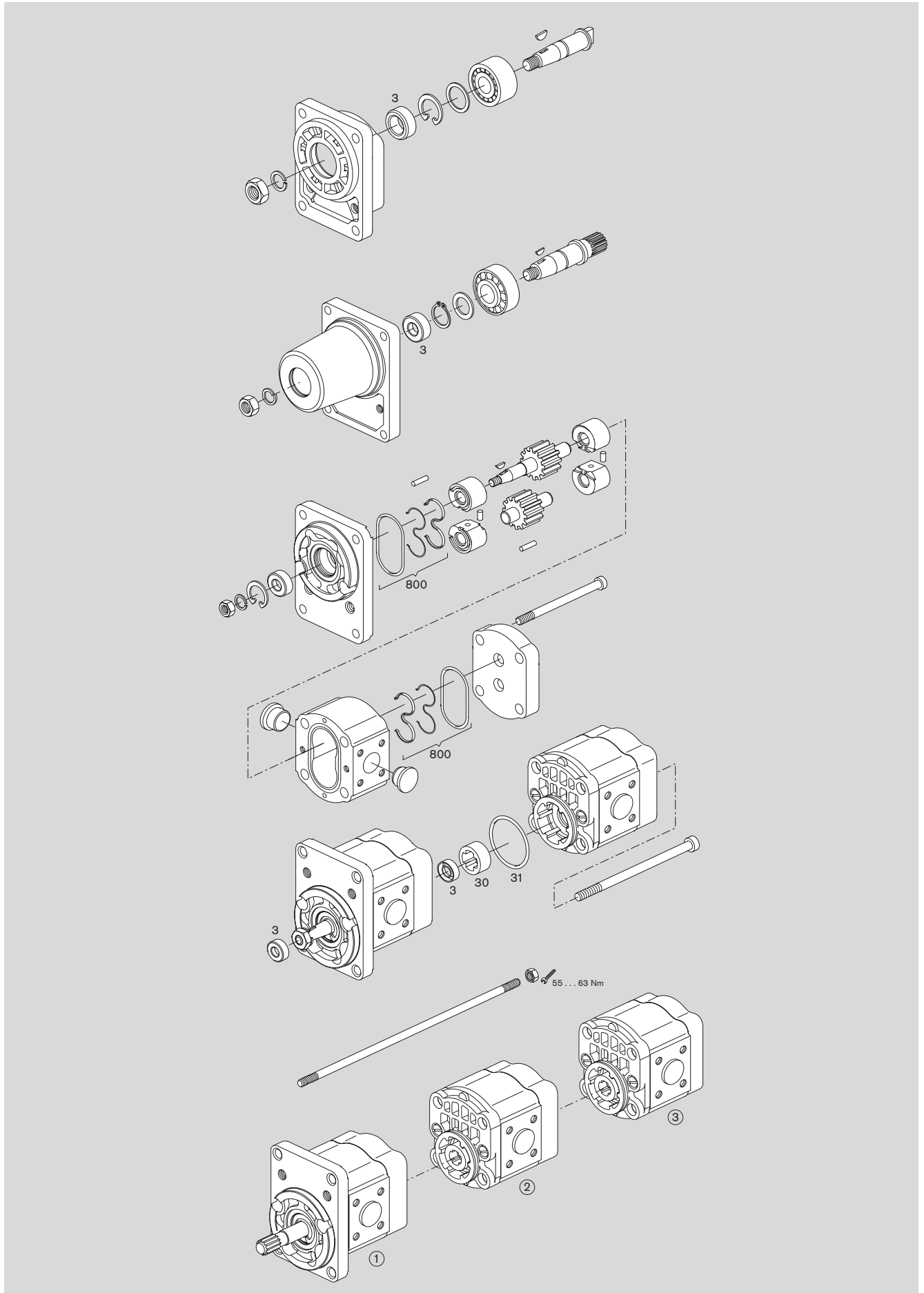
1) 4 and 5.5 cm³ Ø 15

Spare parts

Page	Ordering code	Set of seals Pos. 800 1 517 010 ...	Shaft seal Pos. 3 1 510 283 ...	Material	Dimension	O-ring Pos. 31 1 900 210 ...	Material	Dimension
18	AZPF - 1x - □□□□ CB 20 MB	152 NBR	008	NBR	17 x 30 x 7			
19	AZPF - 1x - □□□□ FB 20 MB	152 NBR	008	NBR	17 x 30 x 7			
20	AZPF - 1x - □□□□ HO 30 KB	152 NBR	044	FPM	18 x 30 x 7			
21	AZPF - 1x - □□□□ FO 30 MB	152 NBR	008	NBR	17 x 30 x 7			
21	AZPF - 1x - □□□□ FO 30 PB	193 FPM	027	FPM	17 x 30 x 7			
22	AZPF - 1x - □□□□ HO 01 MB	152 NBR	008	NBR	17 x 30 x 7			
23	AZPF - 1x - □□□□ AB 01 MB	206 FPM	037	NBR	18 x 30 x 6			
24	AZPF - 1x - □□□□ CP 20 MB	152 NBR	008	NBR	17 x 30 x 7			
24	AZPF - 1x - □□□□ CP 20 KB	152 NBR	027	FPM	17 x 30 x 7			
25	AZPF - 1x - □□□□ CN 20 MB	152 NBR	008	NBR	17 x 30 x 7	145	NBR	45 x 2.5
26	AZPF - 1x - □□□□ FN 20 MB	152 NBR	008	NBR	17 x 30 x 7			
27	AZPF - 1x - □□□□ FP 20 PB	193 FPM	027	FPM	17 x 30 x 7			
28	AZPF - 1x - □□□□ NT 20 MB	152 NBR	008	NBR	17 x 30 x 7	145	NBR	45 x 2.5
29	AZPF - 1x - □□□□ NL 20 KB	152 NBR	027	FPM	17 x 30 x 7	145	NBR	45 x 2.5
30	AZPF - 1x - □□□□ QR 12 MB	152 NBR	008	NBR	17 x 30 x 7			
31	AZPF - 1x - □□□□ RR 12 MB	152 NBR	008	NBR	17 x 30 x 7			
32	AZPF - 1x - □□□□ RR 20 MB	152 NBR	008	NBR	17 x 30 x 7			
32	AZPF - 1x - □□□□ RR 20 KB	152 NBR	027	FPM	17 x 30 x 7			
33	AZPF - 1x - □□□□ QR 20 MB	152 NBR	008	NBR	17 x 30 x 7			
34	AZPF - 1x - □□□□ SG 20 MB	152 NBR	009	NBR	20 x 40 x 7	145	NBR	45 x 2.5
35	AZPFF - 1x - □□□□ / □□□□ NM 20 20 MB	152 (2x) NBR	008	NBR	17 x 30 x 7	145	NBR	45 x 2.5
36	AZPF - 1x - □□□□ CP 20 MB	152 NBR	027/008	NBR	17 x 30 x 7	145	NBR	45 x 2.5
38	AZPFF - 1x - □□□□ / □□□□ FB 20 20 MB	152 (2x) NBR	008 (2x)	NBR	17 x 30 x 7	145	NBR	45 x 2.5
40	AZPFF - 1x - □□□□ / □□□□ CB 20 20 MB	152 (2x) NBR	008 (2x)	NBR	17 x 30 x 7	145	NBR	45 x 2.5
42	AZPFF - 1x - □□□□ / □□□□ HO 20 20 MB	152 (2x) NBR	008 (2x)	NBR	17 x 30 x 7	145	NBR	45 x 2.5
42	AZPFF - 1x - □□□□ / □□□□ HO 20 20 KB	152 (2x) NBR	027/008	FPM/ NBR	17 x 30 x 7	145	NBR	45 x 2.5
44	AZPFF - 1x - □□□□ / □□□□ RR 20 20 MB	152 (2x) NBR	008 (2x)	NBR	17 x 30 x 7	145	NBR	45 x 2.5
44	AZPFF - 1x - □□□□ / □□□□ RR 20 20 KB	152 (2x) NBR	027 (2x)	FPM	17 x 30 x 7	145	NBR	45 x 2.5
46	AZPFF - 1x - □□□□ / □□□□ FP 20 20 MB	152 NBR	008 (2x)	NBR	17 x 30 x 7	145	NBR	45 x 2.5
46	AZPFF - 1x - □□□□ / □□□□ FP 20 20 KB	152 (2x) NBR	027	FPM	17 x 30 x 7	145	NBR	45 x 2.5
47	AZPFF - 1x - □□□□ / □□□□ SA 20 20 MB	152 (2x) NBR	008/009	NBR	17 x 30 x 7	145	NBR	45 x 2.5
48	AZPFF - 1x - □□□□ / □□□□ SG 20 20 PB	193 (2x) FPM	015/027	FPM	17 x 30 x 7	1 520 210 101	FPM	45 x 2.5
49	AZPFF - 1x - □□□□ / □□□□ NL 20 20 KB	152 (2x) NBR	027 (2x)	FPM	17 x 30 x 7	145	NBR	45 x 2.5
50	AZPFFF - 1x - □□□□ / □□□□ / □□□□ FB 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5
51	AZPFFF - 1x - □□□□ / □□□□ / □□□□ CB 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5
52	AZPFFF - 1x - □□□□ / □□□□ / □□□□ CB 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5
52	AZPFFF - 1x - □□□□ / □□□□ / □□□□ CB 20 20 20 KB	152 (3x) NBR	027/008 (2x)	FPM/ NBR	17 x 30 x 7	145	NBR	45 x 2.5
53	AZPFFF - 1x - □□□□ / □□□□ / □□□□ SG 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5
54	AZPFFF - 1x - □□□□ / □□□□ / □□□□ FB 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5
55	AZPFFF - 1x - □□□□ / □□□□ / □□□□ RR 20 20 20 MB	152 (3x) NBR	008 (3x)	NBR	17 x 30 x 7	145 (2x)	NBR	45 x 2.5

NBR = Perbunan® FPM = Viton®

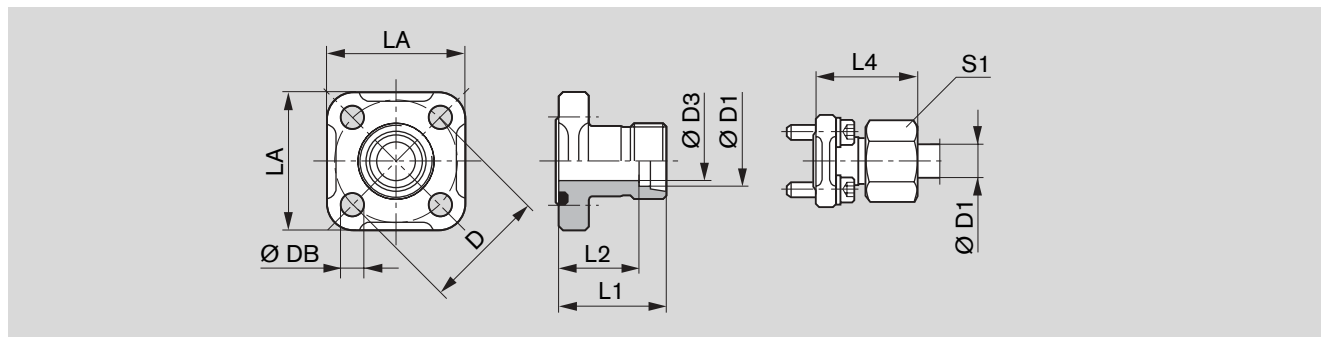
further spare parts see CD-ROM HYparts 1 987 760 010



Connectors

Connectors usable for square flange **20** see page 9

Gear pump flange, straight

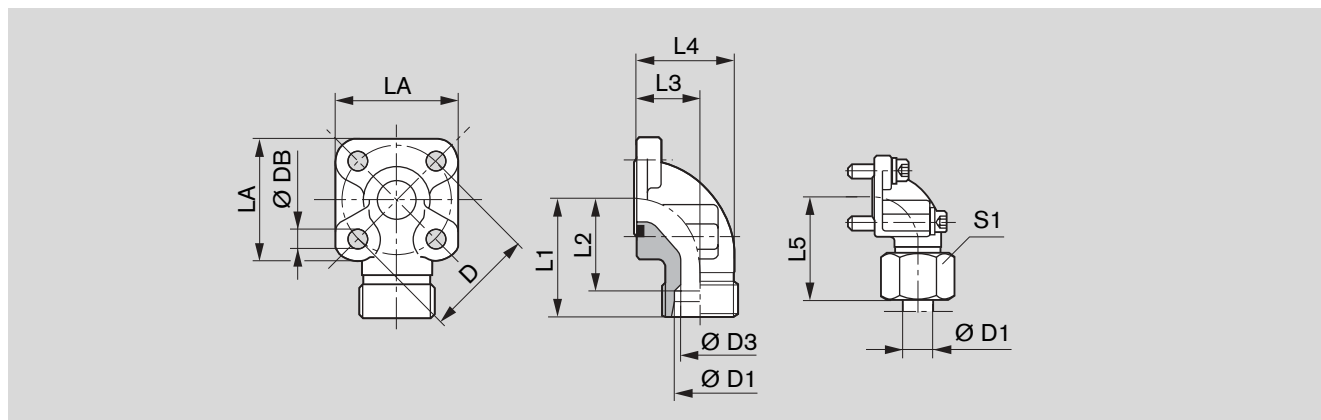


D	D1	D3	L1	L2	L4	LA	S1	DB	Screws (metric) 4 pieces	O-ring	Ordering-No.	p [bar]
35	10L	8	30	23.0	39.0	40	19	6.4	M 6 x 22	20 x 2.5	1 515 702 064	315
35	12L	10	30	23.0	39.0	40	22	6.4	M 6 x 22	20 x 2.5	1 515 702 065	315
35	15L	12	30	23.0	38.0	40	27	6.4	M 6 x 22	20 x 2.5	1 515 702 066	250
40	15L	12	35	28.0	43.0	42	27	6.4	M 6 x 22	24 x 2.5	1 515 702 067	100
40	18L	15	35	27.5	44.0	42	32	6.4	M 6 x 22	24 x 2.5	1 515 702 068	100
40	22L	19	35	27.5	44.5	42	36	6.4	M 6 x 22	24 x 2.5	1 515 702 069	100
40	28L	24	42	27.5	44.5	42	41	6.4	M 6 x 22	24 x 2.5	1 515 702 008	100

Complete screw connection with O-ring, metric screw set, nut/mother and sleeve fitting

Connectors usable for square flange **20** see page 9

Gear pump flange, 90° angle



D	D1	D3	L1	L2	L3	L4	L5	LA	S1	DB	Screws 2 pcs.	2 pcs.	O-ring	Ordering-No.	p [bar]
35	10L	8	38	31.0	16.5	26.5	47.0	40	19	6.4	M 6 x 22	M 6 x 35	20 x 2.5	1 515 702 070	315
35	12L	10	38	31.0	16.5	26.5	47.0	40	22	6.4	M 6 x 22	M 6 x 35	20 x 2.5	1 515 702 071	315
35	15L	12	38	31.0	16.5	26.5	46.0	40	27	6.4	M 6 x 22	M 6 x 35	20 x 2.5	1 515 702 072	250
35	16S	12	38	29.5	20.0	31.0	48.0	40	30	6.4	M 6 x 22	M 6 x 40	20 x 2.5	1 515 702 002	315
35	18L	15	38	29.5	20.0	31.0	47.0	40	32	6.4	M 6 x 22	M 6 x 40	20 x 2.5	1 545 702 006	250
35	20S	16	45	34.5	25.0	38.0	56.0	40	36	6.4	M 6 x 22	M 6 x 45	20 x 2.5	1 515 702 017	315
40	15L	12	38	31.0	22.5	36.5	46.0	42	27	6.4	M 6 x 22	M 6 x 22	24 x 2.5	1 515 702 076	100
40	18L	15	38	30.5	22.5	36.5	47.0	42	32	6.4	M 6 x 22	M 6 x 22	24 x 2.5	1 515 702 074	100
40	20S	16	40	29.5	22.5	35.5	50.0	42	36	6.4	M 6 x 22	M 6 x 45	24 x 2.5	1 515 702 011	250
40	22L	19	38	30.5	22.5	36.5	47.5	42	36	6.4	M 6 x 22	M 6 x 22	24 x 2.5	1 515 702 075	100
40	28L	22	40	32.5	28.0	43.0	49.0	42	41	6.4	M 6 x 20	M 6 x 50	24 x 2.5	1 515 702 010	100
40	35L	31	41	30.5	32.0	55.0	52.0	42	50	6.4	M 6 x 22	M 6 x 60	24 x 2.5	1 515 702 018	100

Complete screw connection with O-ring, metric screw set, nut/mother and sleeve fitting

Installation and start-up

- Fill pump with pressure fluid before installation.
- Check direction of rotation.
- Avoid axial and radial forces when mounting the couplings.
- Pipelines to be cleaned of dirt, cinders, sand, chips etc. Pipes, in particular must be pickled or rinsed.
- The introduction of external forces through pipe or hose lines is to be avoided.
- During the initial start-up the overall hydraulics system is to be carefully vented. Vertical installations, in particular, with a drive shaft pointing upwards may result in air inclusions near the radial lip-type sealing ring.
- Cover up radial lip-type sealing ring when **spraying and painting**.
- Observe parameters, in particular, speeds and pressures as well as vacuum in the intake line.
- Allow pump to run without load and have it deliver in depressurized state for several seconds to ensure it is sufficiently lubricated.
- Do not allow pump to run without any oil.
- If, after approx. 20 seconds, the pump is still operating without bubbles then the system should be checked again. Once the operating values have been reached, check pipe connections for signs of leaks. Check operating temperature.

Filter recommendation

The major share of premature failures in gear-wheel pumps is down to contaminated pressure fluid.

As a warranty cannot be issued for dirt-related wear, we recommend a filter be used, which can reduce the degree of contamination to a permissible dimension in terms of the size and concentration of dirt particles:

Operating pressure [bar]	>160	<160
Contamination class NAS 1638	9	10
Contamination class ISO 4406	18/15	19/16
To be reached with $\beta_x = 75$	20	25

We recommend that a full-flow filter always be used.

Basic contamination of the pressure fluid used may not exceed class 19/16 as under ISO 4406. Experience has shown that new fluid quite often lies above this value. In such instances a filling device with special filter should be used.

General

- The pumps supplied by us have been checked for function and performance. No modifications of any kind may be made to the pumps; any such changes will render the warranty null and void!
- Repairs may only be made by the manufacturer or its authorized dealers and subsidiaries. Repairs conducted on their own will render the warranty null and void.

Important notes

- Assembly, maintenance and repair of the pumps to be performed by authorized, skilled and instructed personnel only.
- Pump to be operated at specified data only (see page 13).
- Pump to be operated in proper working condition only.
- System to be depressurized when work conducted on pump.
- Arbitrary conversions and modifications, which affect safety and function are not allowed.
- Mount guards (e.g. coupling guard) or do not remove given ones.
- Make sure that all fastening screws are tight (observe specified tightening torque values).
- General safety and accident prevention regulations must be adhered to.

Project planning notes

Comprehensive notes and suggestions are available in Hydraulics Trainer, Volume 3 RE 00 281, "Project planning notes and design of hydraulic systems".

Where external gear-wheel pumps are used we recommend that the following note be adhered to.

Technical data

All stated technical data is dependent on production tolerances and is valid for specific marginal conditions. Note that, as a consequence, scattering is possible, and at certain marginal conditions (e.g. viscosity) the technical data may change.

Characteristics

When designing the drive motor note the maximum possible service data based on the characteristics displayed on pages 11 to 13.

Additional information on the proper handling of hydraulic products from Bosch Rexroth is available in our document: "General product information for hydraulic products" RE 07 008.

Safety regulation

All service and repair work shall be executed by Bosch Rexroth AG or specially trained personnel. Bosch Rexroth AG does not cover defects caused by incorrect installation, faulty maintenance or repair from the buyer's side or third parties.

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The given information does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.

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0 510 901 001	45	0 510 901 503	43				
0 510 901 002	45	0 510 901 504	43				
0 510 901 003	45	0 510 901 505	43				
0 510 901 004	45	0 510 901 506	43				
0 510 901 005	45	0 510 901 507	43				
0 510 901 006	45	0 510 901 508	43				
0 510 901 007	45	0 510 901 509	43				
0 510 901 008	45	0 510 901 510	43				

Note

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Subject to change.