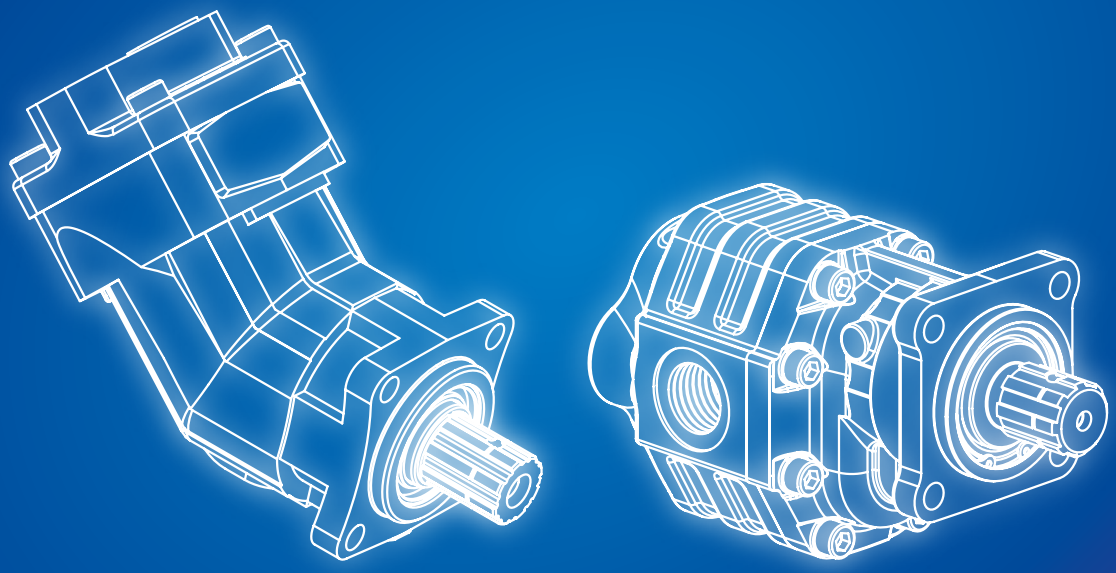
HYDROSILA



HYDRAULIC COMPONENTS

for truck applications

HS-HCT-07/122025

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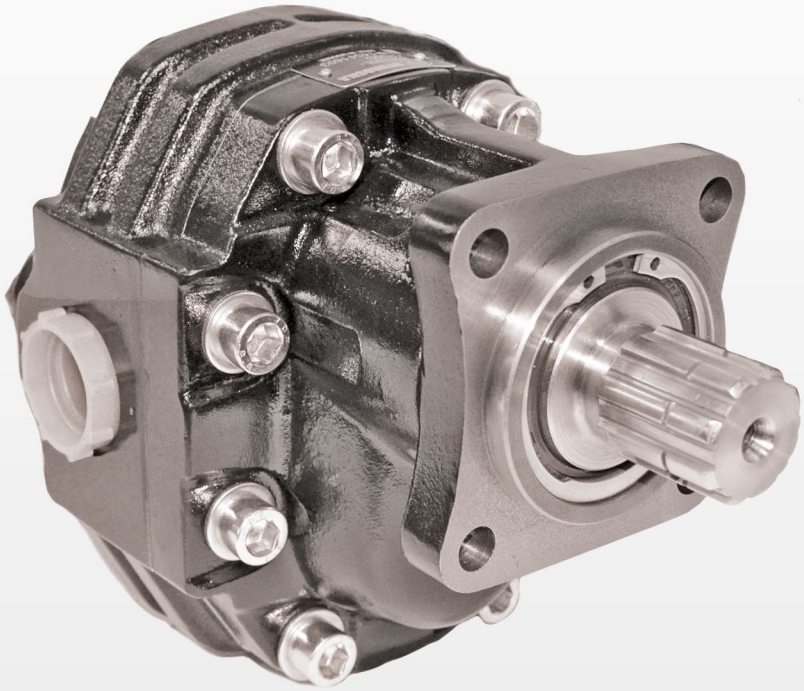


"T" SERIES GEAR PUMPS

FEATURES

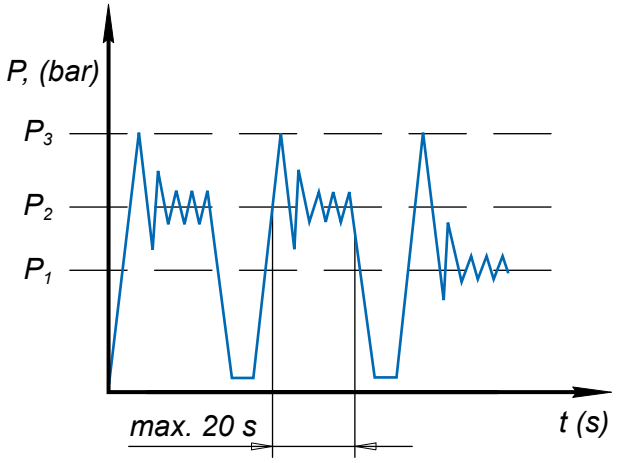
T-series gear pumps are manufactured with displacement from 16 to 150 cm^3. Designed to work in hydraulic systems with nominal pressures up to 290 bar. Mounting flanges comply with ISO and UNI international standards. Supplied with right, left, and reverse direction of rotation of the drive shaft. Designed to work in hydraulic systems mobile vehicles on chassis: dump trucks, loader cranes, aerial platforms, communal vehicles and other equipment.

The drive unit provides the ability to install the pump directly on the PTO. Rear and side hydraulic line feeds make convenient installation of the pump on equipment.

Modern technologies and many years of experience of the Hydrosila company make it possible to create pumps with high reliability and durability.

		- Mounting flange according to ISO standard
	- Displacement from 16 to 45 cm^3/rev	- Aluminum body
Group 2.5	- Maximum continuous pressure up to 250 bar	- Cast iron mounting flange and rear cover
	- Displacement from 34 to 100 cm^3/rev	- Mounting flange according to ISO, UNI standards.
Group 3	- Maximum continuous pressure up to 280 bar	- Cast iron body and mounting flange
	- Displacement from 63 to 150 cm^3/rev	- Mounting flange according to ISO standard.
Group 4	- Maximum continuous pressure up to 290 bar	- Cast iron body and mounting flange

DEFINITION OF PRESSURES



P_3 - peak pressure
P_2 - max. intermittent pressure (1/3 of working time)
P_1 - max. continuous pressure

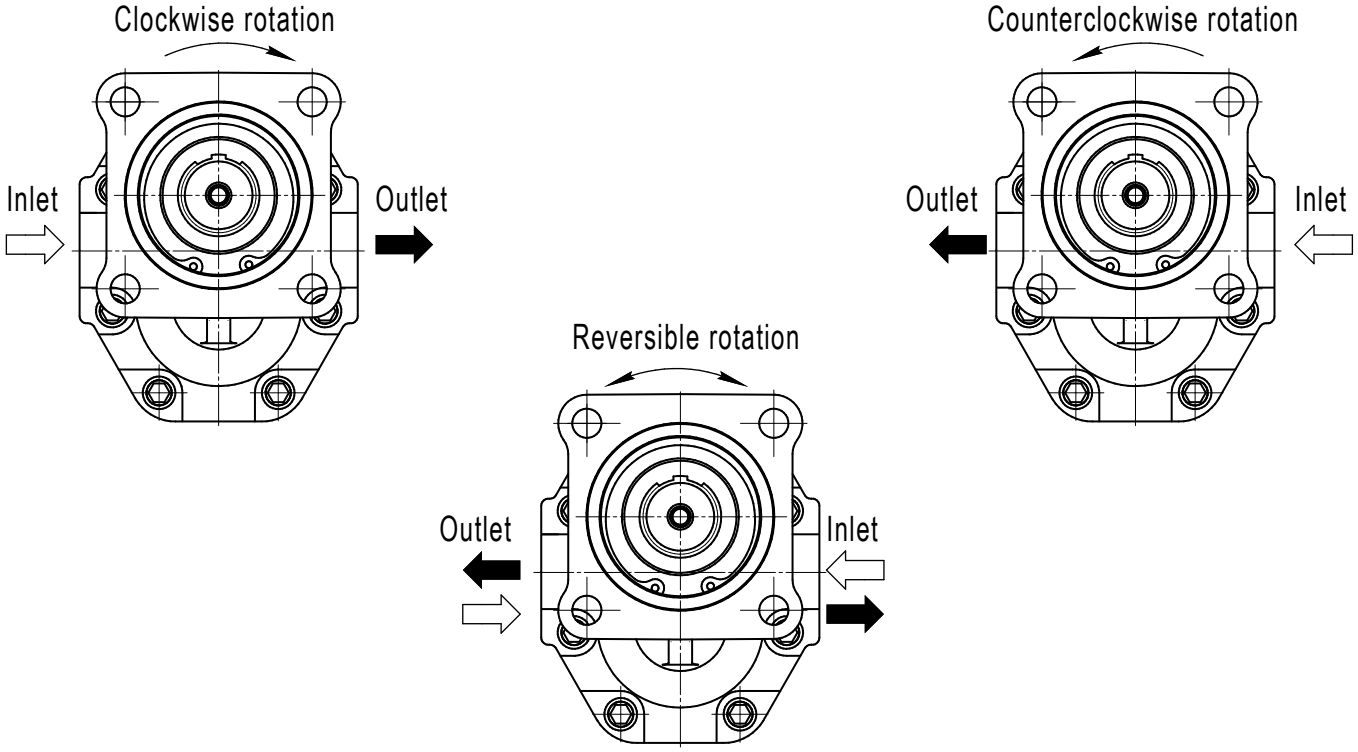
WORKING CONDITIONS

Pump inlet pressure (absolute pressure)	0,5 ÷ 2,5 bar
Minimum operating fluid viscosity	15 mm^2/sec
Max. starting viscosity (cold start)	1000 mm^2/sec
Fluid viscosity recommended range	17 ÷ 65 mm^2/sec
Fluid operating temperature range with NBR seals	-40 ÷ +100 °C
Fluid operating temperature range with FPM seals (Viton)	-20 ÷ +170 °C
Hydraulic fluid	mineral oil

FILTRATION OF THE HYDRAULIC FLUID

Maximum continuous pressure	>200 bar	<200 bar
Cleanliness class ISO 4406	18/15	19/16
Cleanliness class NAS 1638	9	10
Filtration rating with filter $ß_x$=75	15µm	25µm

PUMP ROTATION DIRECTION VIEWED AT THE DRIVE SHAFT



FORMULAS

Outlet flow $$Q = \frac{q \cdot n \cdot \eta_v}{1000} \quad [l/min]$$

Input torque $$M = \frac{q \cdot \Delta p}{62{,}8 \cdot \eta_m} \quad [N \cdot m]$$

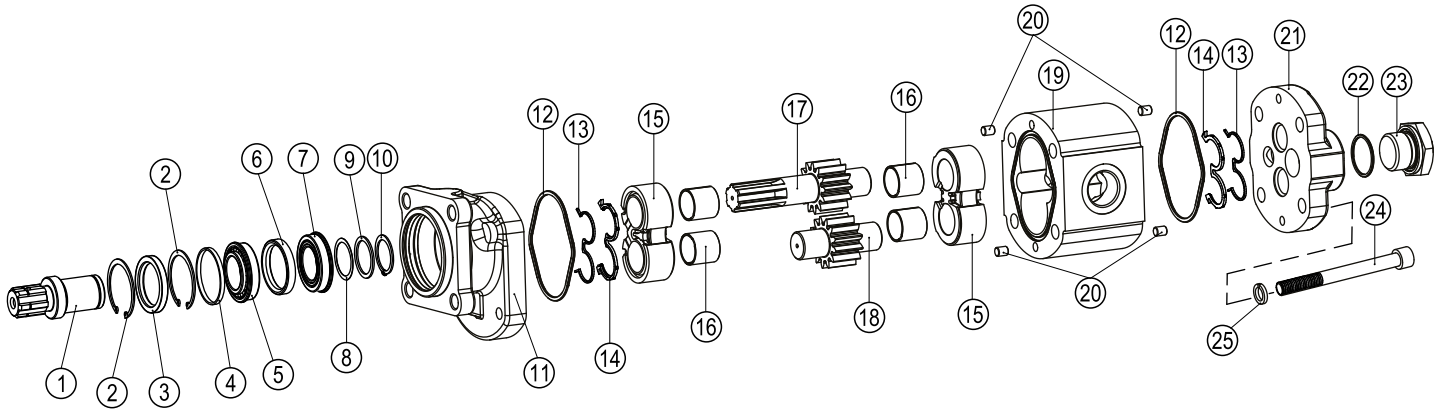
Input power $$P = \frac{q \cdot n \cdot \Delta p \cdot 10^{-3}}{600 \cdot \eta_m} \quad [kW]$$

q	displacement (cm^3/rev)
n	speed (min^{-1})
η_v	volumetric efficiency
Δp	pressure (bar)
η_m	mechanical efficiency

TECHNICAL DATA

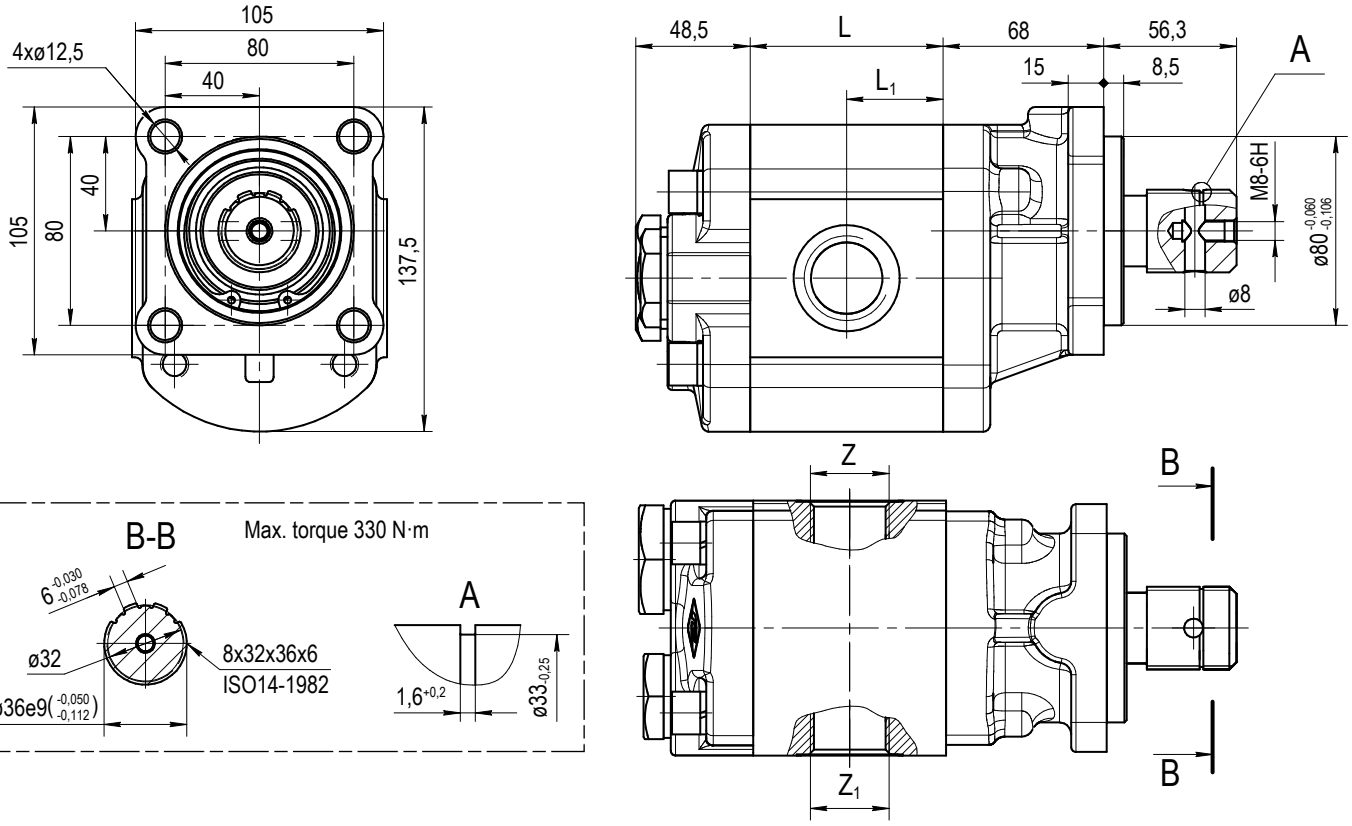
Type		GP2.5T16	GP2.5T19	GP2.5T20	GP2.5T23	GP2.5T25	GP2.5T28	GP2.5T30	GP2.5T32	GP2.5T36	GP2.5T37	GP2.5T38	GP2.5T40	GP2.5T45
Displacement	**cm^3/rev**	16	19	20	23	25	28	30	32	36	37	38	40	45
Maximum continuous pressure, P_1	**bar**	250							230		200		170	
Maximum intermittent pressure, P_2	**bar**	280							250		220		190	
Max. peak pressure, P_3	**bar**	300							260		240		210	
Maximum rotational speed	**min^{-1}**	3000									2750		500	
Minimum rotational speed	**min^{-1}**	700				600					500			

EXPLOADED VIEW DIAGRAM



1. Shaft **2.** Retaining ring **3.** Shaft seal **4.** Ring **5.** Roller bearing **6.** Washer **7.** Bearing **8.** Washer **9.** Thrust washer **10.** Retaining ring **11.** Screw **12.** Washer **13.** Mounting flange **14.** Ball **15.** Centering pin **16.** Spring **17.** Screw **18.** Bearing housing **19.** Sealing ring **20.** Anti-extrusion plate **21.** Compensation seal **22.** Thrust plate **23.** Drive shaft **24.** Driven shaft **25.** Body

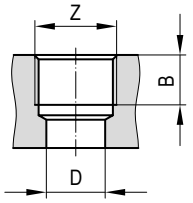
GROUP 2.5 PUMPS DIMENSIONS. ISO STANDARD MOUNTING FLANGE



Type			Dimensions mm				Weight kg
			L	L_1	Z	Z_1	
GP2.5T16	R L	Z1C5G-V	71,80	35,90	G3/4"	G1/2"	9,9
GP2.5T19			75,00	37,50			10,1
GP2.5T20			76,20	38,10			10,2
GP2.5T23			79,50	39,75			10,3
GP2.5T25			81,70	40,85	G1"	G3/4"	10,4
GP2.5T28			85,00	42,50			10,5
GP2.5T30			87,30	43,65			10,6
GP2.5T32			89,50	44,75			10,7
GP2.5T36			94,00	47,00			11,0
GP2.5T37			95,00	47,50			11,0
GP2.5T38			96,00	48,00			11,0
GP2.5T40			98,00	49,00			11,1
GP2.5T45			103,50	51,75			11,4

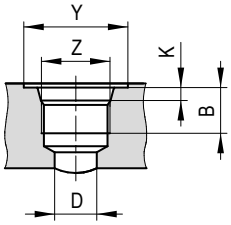
Ordering example: GP2.5T28R-Z1C5G-V
Rotation: R - Clockwise; L - Counterclockwise.

PORTS



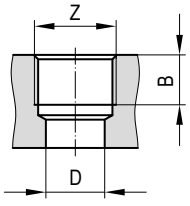
E METRIC THREADED

Type	Inlet			Outlet		
	Z	B	D	Z	B	D
GP2.5T16-23	M27x2	19	22	M22x1,5	16	18
GP2.5T25-45	M33x2	21	25	M27x2	19	22



F SAE THREADED

Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP2.5T16-23	1-1/16-12 UN (SAE#12)	19	20	42	3,3	7/8-14 UNF (SAE#10)	19	15	32	2,5
GP2.5T25-45	1-5/16-12 UN (SAE#16)		23	51		1-1/16-12 UN (SAE#12)		20	42	3,3



G GAS THREADED

Type	Inlet			Outlet		
	Z	B	D	Z	B	D
GP2.5T16-23	3/4″ GAS	19	20	1/2″ GAS	16	13
GP2.5T25-45	1″ GAS	21	27	3/4″ GAS	19	20

ORDERING INSTRUCTIONS

GP	2.5	T	38	R	–	Z1	C5	G	–	V	–	

GEAR PUMP	GP

GROUP	2.5

SERIES	T

DISPLACEMENT	CODE
16 cm^3/rev	16
19 cm^3/rev	19
20 cm^3/rev	20
23 cm^3/rev	23
25 cm^3/rev	25
28 cm^3/rev	28
30 cm^3/rev	30
32 cm^3/rev	32
36 cm^3/rev	36
37 cm^3/rev	37
38 cm^3/rev	38
40 cm^3/rev	40
45 cm^3/rev	45

ROTATION	CODE
Clockwise rotation	R
Counterclockwise rotation	L

* SPECIAL FEATURES

SEAL MATERIAL	CODE
FPM	V

PORTS	CODE
METRIC THREADED	E
SAE THREADED	F
GAS THREADED PORTS	G

MOUNTING FLANGES	CODE
ISO	C5

DRIVE SHAFTS	CODE
DIN 5462 B8x32x6g7	Z1

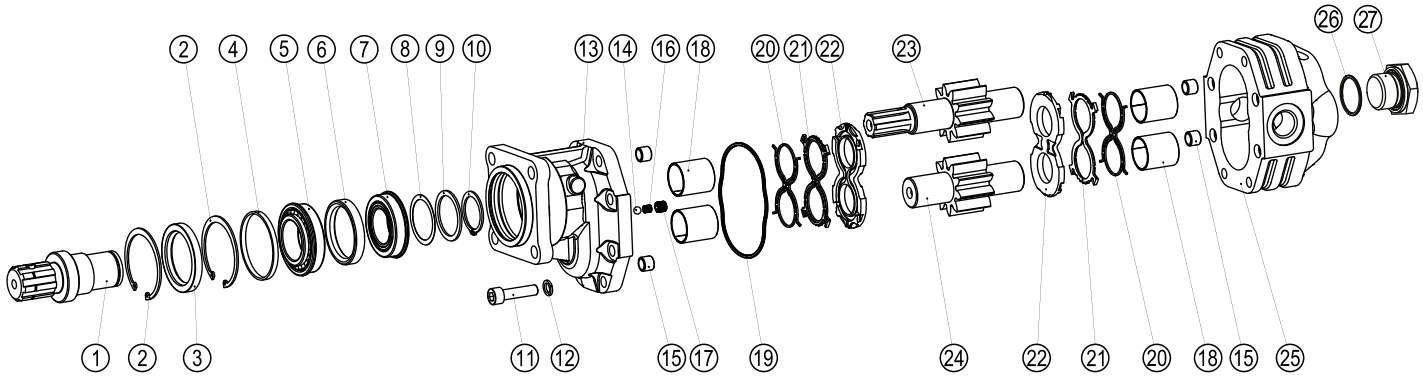
* Special option code - assigned if necessary after agreement of special conditions with the customer

TECHNICAL DATA

Type		GP3T34	GP3T43	GP3T51	GP3T61	GP3T82	GP3T100
Displacement	**cm^3/rev**	34	43	51	61	82	100
Maximum continuous pressure, P_1	**bar**	280	270	240	220	190	180
Maximum intermittent pressure, P_2	**bar**	300	280	260	240	210	200
Max. peak pressure, P_3	**bar**	310	300	280	250	220	
Maximum rotational speed	**min^{-1}**	2800	2500		2000	1800	
Minimum rotational speed	**min^{-1}**	500					

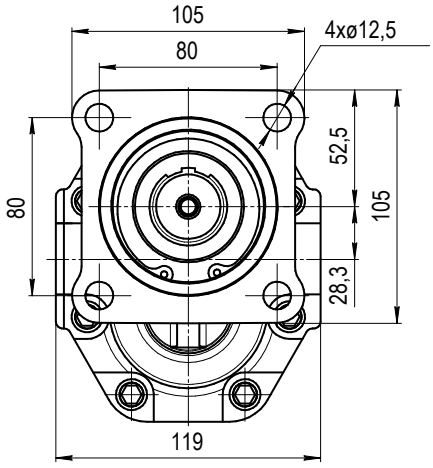
* Maximum pressures for reversible pumps are 15% lower than shown in table.

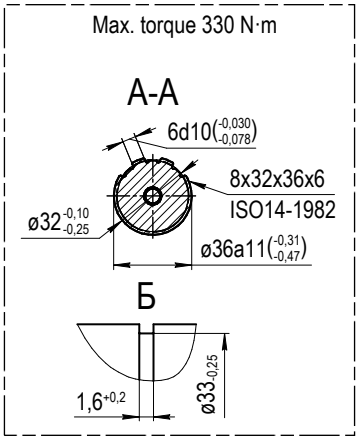
EXPLODED VIEW DIAGRAM

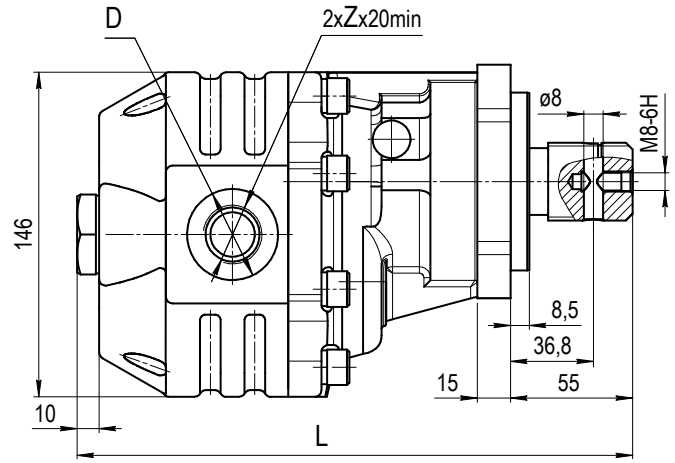


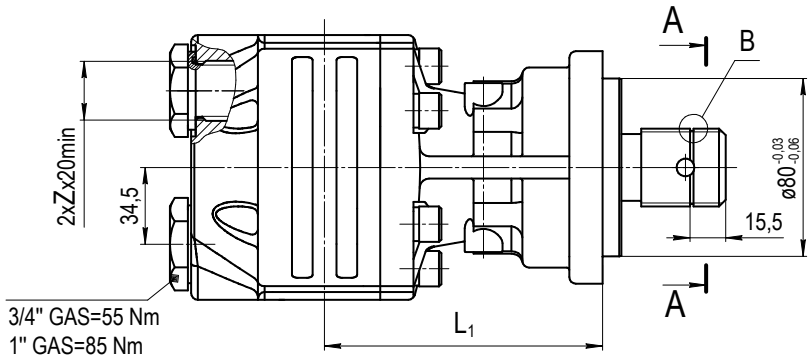
1. Shaft **2.** Retaining ring **3.** Shaft seal **4.** Ring **5.** Roller bearing **6.** Washer **7.** Bearing **8.** Washer **9.** Thrust washer **10.** Retaining ring **11.** Grub screw **12.** Washer **13.** Mounting flange **14.** Ball **15.** Centering pin **16.** Spring **17.** Grub screw **18.** Slide bearing **19.** Sealing ring **20.** Anti-extrusion plate **21.** Compensation seal **22.** Thrust plate **23.** Drive shaft **24.** Driven shaft **25.** Body **26.** Sealing ring **27.** Metal cap

GROUP 3 PUMPS DIMENSIONS. ISO STANDARD MOUNTING FLANGE





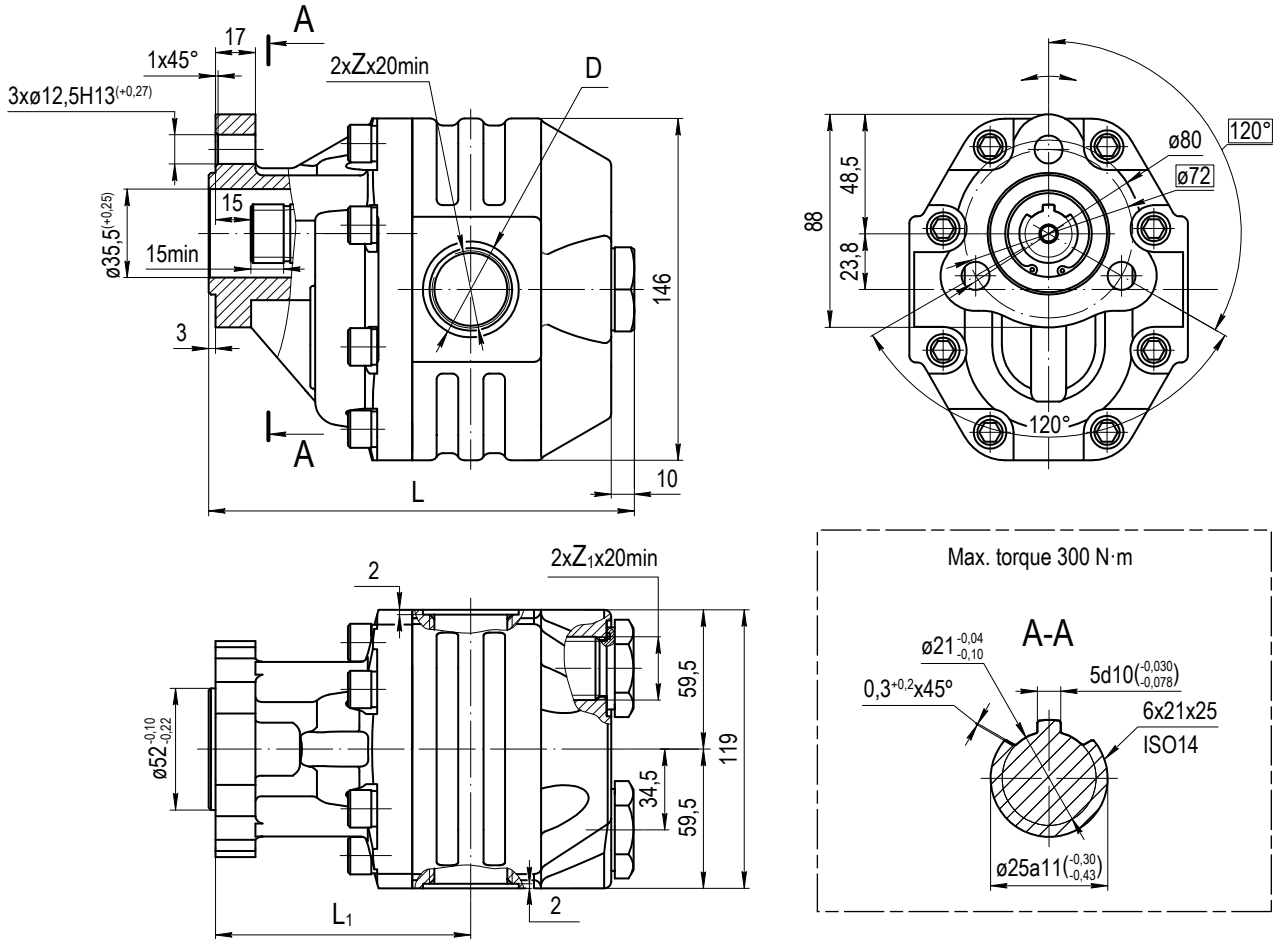




Type			Dimensions mm					Weight kg
			L	L_1	D	Z	Z_1	
GP3T34	R L B	Z1C5G-V	250	125	ø41	3/4" GAS		12,9
GP3T43			256	130				13,4
GP3T51			263	130,5	ø45	1" GAS		13,6
GP3T61			269	136,5				14,2
GP3T82			280	140,5	ø54	1 1/4" GAS	1" GAS	15,4
GP3T100			292	146			–	16,3

Ordering example: GP3T61L-Z1C5G-V
Rotation: R - Clockwise; L - Counterclockwise; B - Reversible.

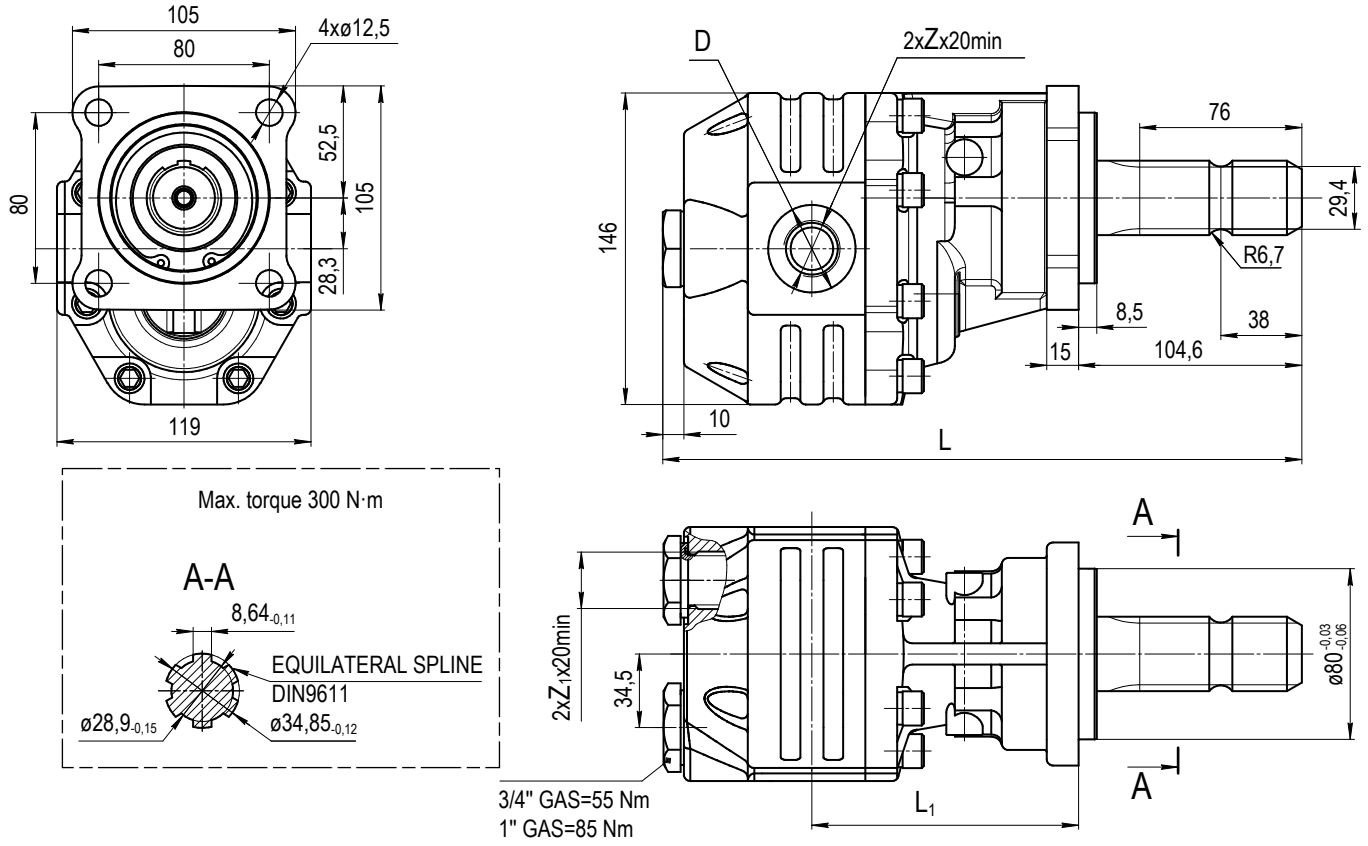
GROUP 3 PUMPS DIMENSIONS. UNI STANDARD MOUNTING FLANGE



Type			Dimensions mm					Weight kg
			L	L_1	D	Z	Z_1	
GP3T34	R L B	Z2C7G-V	182	109	ø41	3/4" GAS		12,8
GP3T43			188	114				13,3
GP3T51			193	114,5	ø45	1" GAS		13,5
GP3T61			199	120,5				14,1
GP3T82			202	124,5	ø54	1 1/4" GAS	1" GAS	15,2
GP3T100			214	130			–	16,1

Ordering example: GP3T34R-Z2C7G-V
Rotation: R - Clockwise; L - Counterclockwise; B - Reversible.

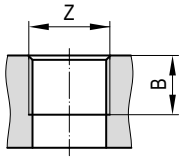
GROUP 3 PUMPS DIMENSIONS. ISO STANDARD MOUNTING FLANGE, SHAFT TO DIN 9611



Type			Dimensions mm					Weight kg
			L	L_1	D	Z	Z_1	
GP3T34	R L B	Z3C5G-V	300	125	ø41	3/4" GAS		12,9
GP3T43			306	130				13,4
GP3T51			313	130,5	ø45	1" GAS		13,6
GP3T61			319	136,5				14,2
GP3T82			330	140	ø54	1 1/4" GAS	1" GAS	15,4
GP3T100			342	146			–	16,3

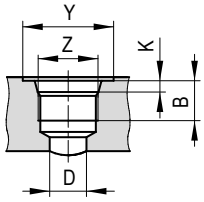
Ordering example: GP3T61L-Z3C5G
Rotation: R - Clockwise; L - Counterclockwise; B - Reversible.

PORTS



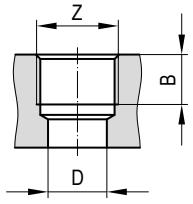
E METRIC THREADED

Type	Inlet		Outlet	
	Z	B	Z	B
GP3T34	M33x2	24	M33x2	24
GP3T43				
GP3T51				
GP3T61	M42x2		M42x2	
GP3T82				
GP3T100				



F SAE THREADED

Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP3T34	1 5/16-12 UN	20	23	49	3,3	1 1/16-12 UN	19	20	41	3,3
GP3T43	1 5/8-12 UN		30	58		1 5/16-12 UN	20	23	49	
GP3T51										
GP3T61										
GP3T82	1 7/8-12 UN		37	65		1 5/8-12 UN		30	58	
GP3T100										



G GAS THREADED

Type	Inlet			Outlet		
	Z	B	D	Z	B	D
GP3T34	3/4" GAS	19	20	3/4" GAS	19	20
GP3T43						
GP3T51	1" GAS	21	27	1" GAS	21	27
GP3T61						
GP3T82	1 1/4" GAS		33	1 1/4" GAS		33
GP3T100						

ORDERING INSTRUCTIONS

GP	3	T	61	R	–	Z1	C5	G	–	V	–	

GEAR PUMP	GP

GROUP	3

SERIES	T

DISPLACEMENT	CODE
34 cm³/rev	34
43 cm³/rev	43
51 cm³/rev	51
61 cm³/rev	61
82 cm³/rev	82
100 cm³/rev	100

ROTATION	CODE
Clockwise rotation	R
Counterclockwise rotation	L
Reversible rotation	B

* SPECIAL FEATURES

SEAL MATERIAL	CODE
FPM	V

PORTS	CODE
METRIC THREADED	E
SAE THREADED	F
GAS THREADED PORTS	G

MOUNTING FLANGES	CODE
ISO	C5
UNI	C7

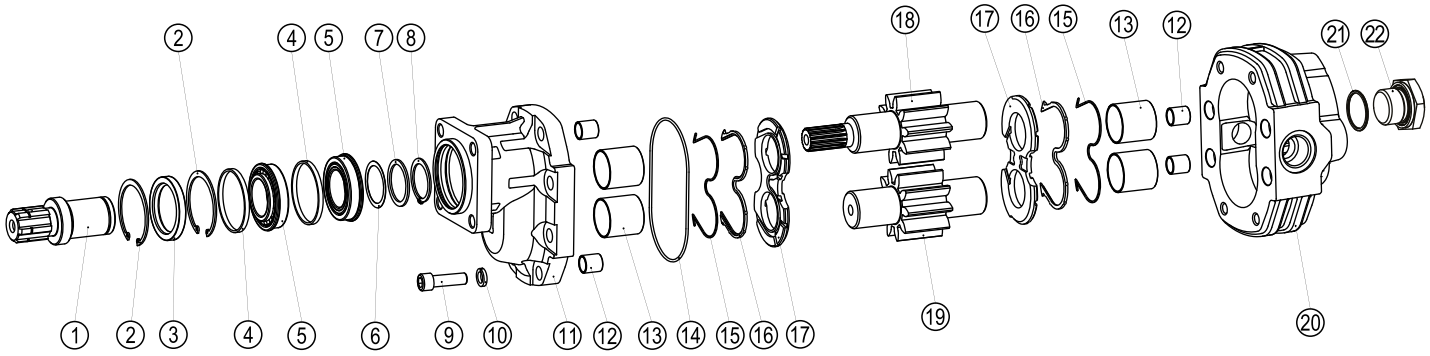
DRIVE SHAFTS	CODE
DIN 5462 B8x32x6g7	Z1
ISO14 Shaft 6x21x25	Z2
EQUILATERAL SPLINE DIN9611	Z3

* Special option code - assigned if necessary after agreement of special conditions with the customer

TECHNICAL DATA

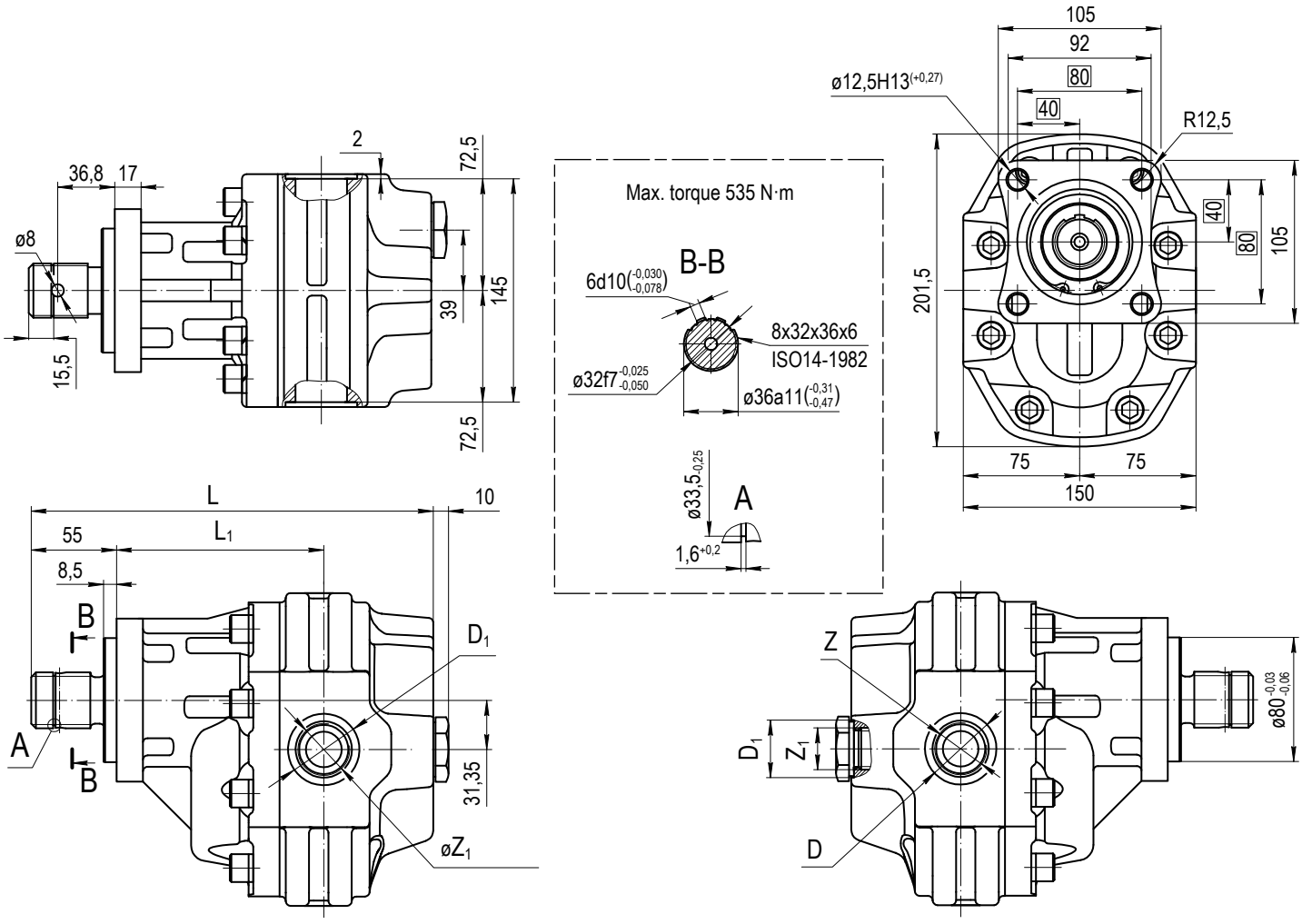
Type		GP4T63	GP4T73	GP4T86	GP4T100	GP4T119	GP4T135	GP4T150
Displacement	**cm^3/rev**	63	73	86	100	119	135	150
Maximum continuous pressure, P_1	**bar**	290	280	260	250	240	220	180
Maximum intermittent pressure, P_2	**bar**	315	300	280	270	260	250	210
Max. peak pressure, P_3	**bar**	325	315	290	280	270	260	220
Maximum rotational speed	**min^{-1}**	2700					2500	
Minimum rotational speed	**min^{-1}**	300						

EXPLOADED VIEW DIAGRAM



1. Shaft **2.** Retaining ring **3.** Shaft seal **4.** Ring **5.** Roller bearing **6.** Washer **7.** Thrust washer **8.** Retaining ring **9.** Grub screw **10.** Washer **11.** Mounting flange **12.** Centering pin **13.** Slide bearing **14.** Sealing ring **15.** Anti-extrusion plate **16.** Compensation seal **17.** Thrust plate **18.** Drive shaft **19.** Driven shaft **20.** Body **21.** Sealing ring **22.** Metal cap

GROUP 4 PUMPS DIMENSIONS. ISO STANDARD MOUNTING FLANGE



Type			Dimensions mm						Weight kg
			L	L_1	D	D_1	Z	Z_1	
GP4T63	R L	Z1C5G-V	259	136,5	ø46,1	ø37	1" GAS	3/4" GAS	23,5
GP4T73			262	140,5					23,7
GP4T86			266	141,0	ø54	ø46,1	1 1/4" GAS	1" GAS	24,5
GP4T100			272	144,5					25,1
GP4T119			278	150,5					25,8
GP4T135			284	153,5	ø60,5		1 1/2" GAS		26,7
GP4T150			289	158,5					27,3

Ordering example: GP4T86R-Z1C5G-V
Rotation: R - Clockwise; L - Counterclockwise.

ORDERING INSTRUCTIONS

GP	4	T	63	R	–	Z1	C5	G	–	V	–	

GEAR PUMP	GP

GROUP	4

SERIES	T

DISPLACEMENT	CODE
63 cm^3/rev	63
73 cm^3/rev	73
86 cm^3/rev	86
100 cm^3/rev	100
119 cm^3/rev	119
135 cm^3/rev	135
150 cm^3/rev	150

ROTATION	CODE
Clockwise rotation	R
Counterclockwise rotation	L

* SPECIAL FEATURES

SEAL MATERIAL	CODE
FPM	V

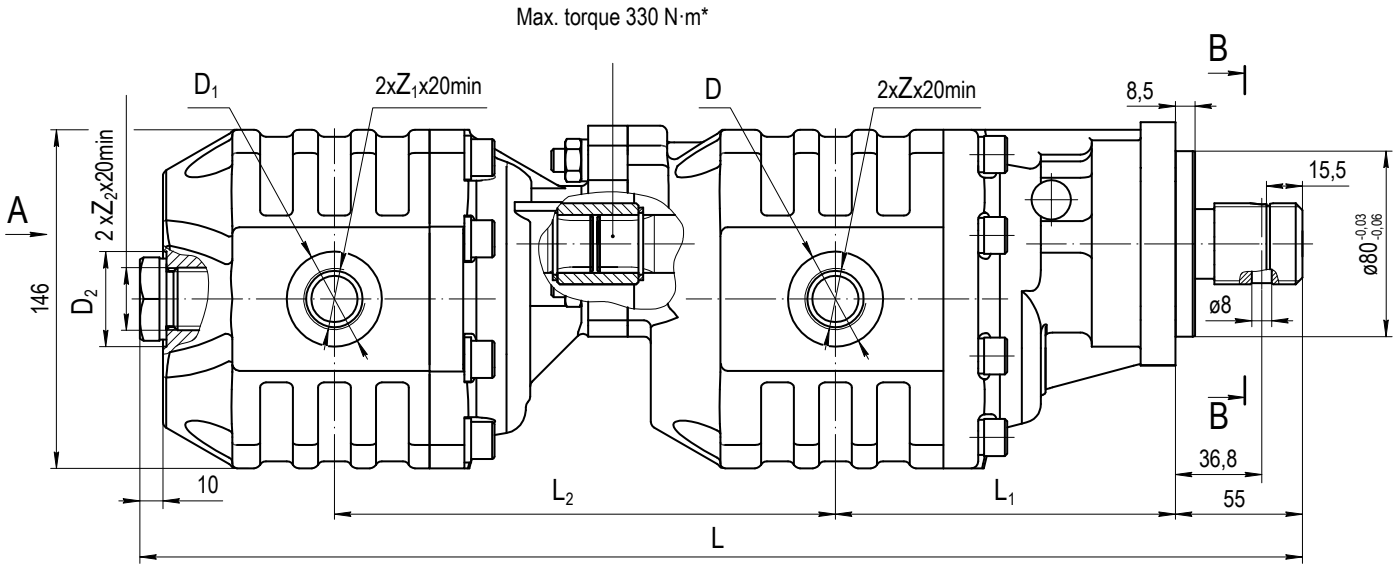
PORTS	CODE
METRIC THREADED	E
SAE THREADED	F
GAS THREADED PORTS	G

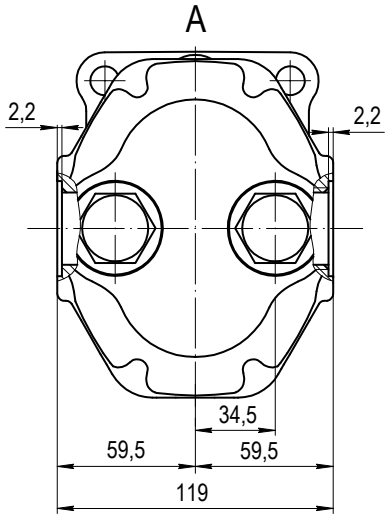
MOUNTING FLANGES	CODE
ISO	C5

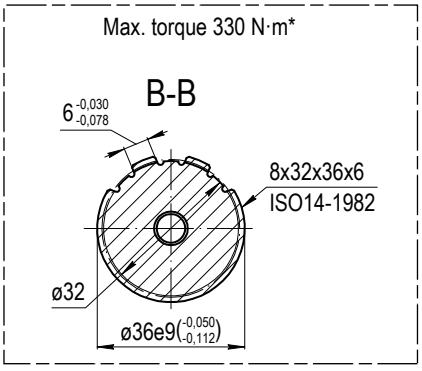
DRIVE SHAFTS	CODE
DIN 5462 B8x32x6g7	Z1

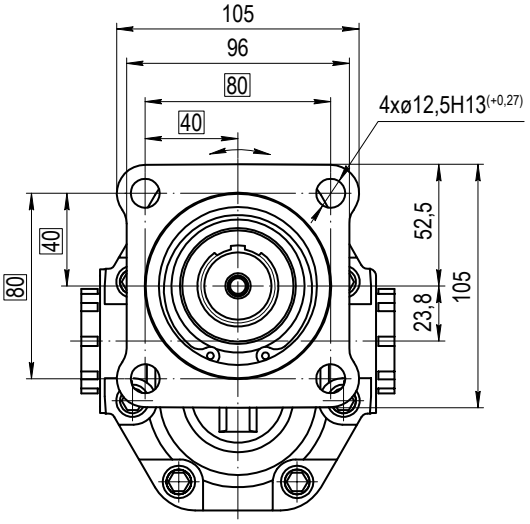
* Special option code - assigned if necessary after agreement of special conditions with the customer

MULTIPLE PUMPS GROUP 3+3 DIMENSIONS. ISO STANDARD MOUNTING FLANGE



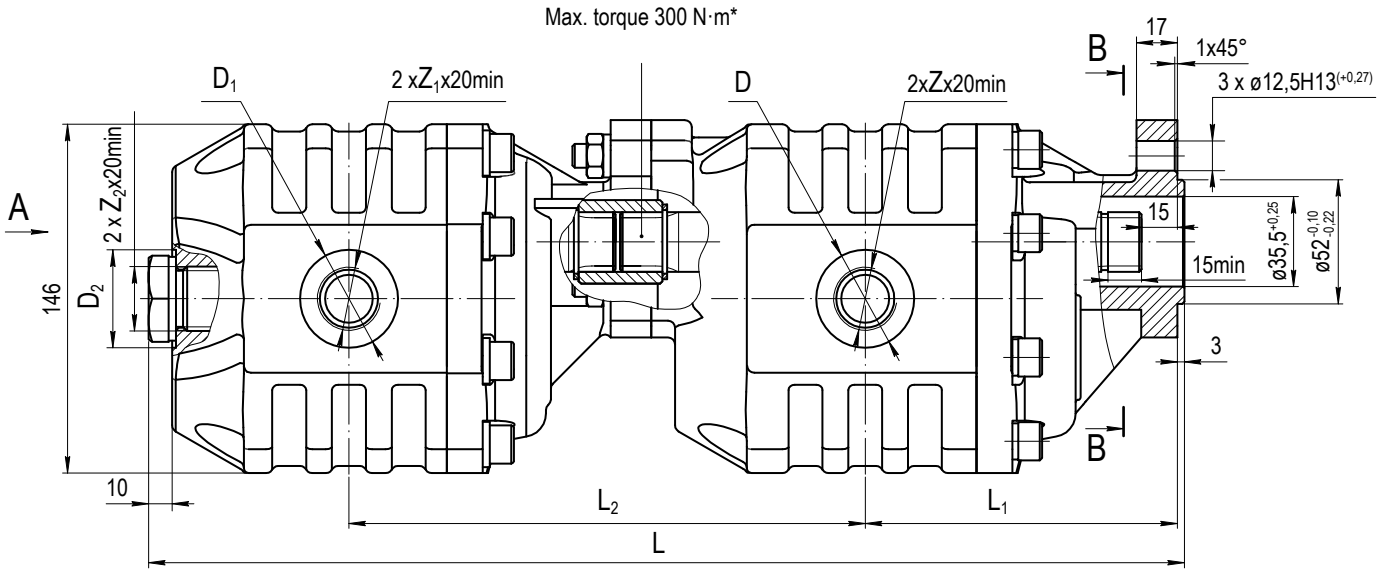


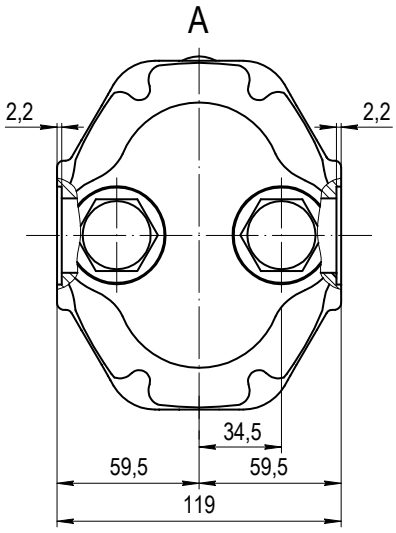


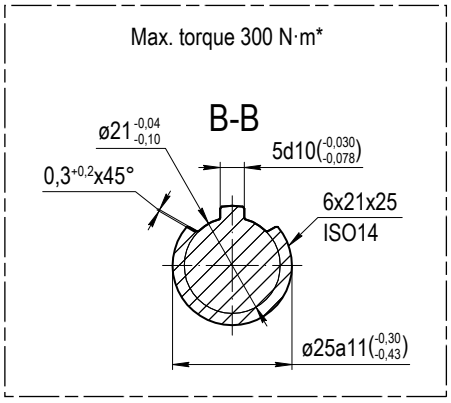


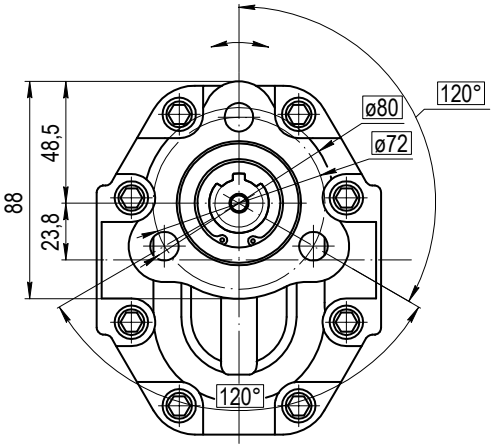
Type			Dimensions mm									Weight kg
			L	L_1	L_2	D	D_1	D_2	Z	Z_1	Z_2	
GP3T34/3T34	R L	Z1C5GG-V	426	125	176	ø41			3/4" GAS			27,0
GP3T43/3T34			433	130	177							27,5
GP3T43/3T43			438		182							28,1
GP3T51/3T34			442	130,5	181,5	ø46,1	ø41		1" GAS	3/4" GAS		27,8
GP3T51/3T43			447,5		186,5							28,3
GP3T51/3T51			448		187	ø46,1				1" GAS		28,5
GP3T61/3T34			448,5	136,5	181,5	ø46,1	ø41			3/4" GAS		28,4
GP3T61/3T43			453,5		186,5							28,9
GP3T61/3T51			454		187	ø46,1				1" GAS		29,1
GP3T61/3T61			460		193							29,8
GP3T82/3T34			460,5	140,5	190,5	ø54	ø41		1 1/4" GAS	3/4" GAS		29,6
GP3T82/3T43			465,5		195,5							30,2
GP3T82/3T51			466		196		ø46,1			1" GAS		30,4
GP3T100/3T34			479	146	197	ø54	ø41			3/4" GAS		30,6
GP3T100/3T43			484		202							31,1
GP3T100/3T51			484,5		202,5		ø46,1			1" GAS		31,3
GP3T100/3T61			490,5		208,5							32,0

MULTIPLE PUMPS GROUP 3+3 DIMENSIONS. UNI STANDARD MOUNTING FLANGE





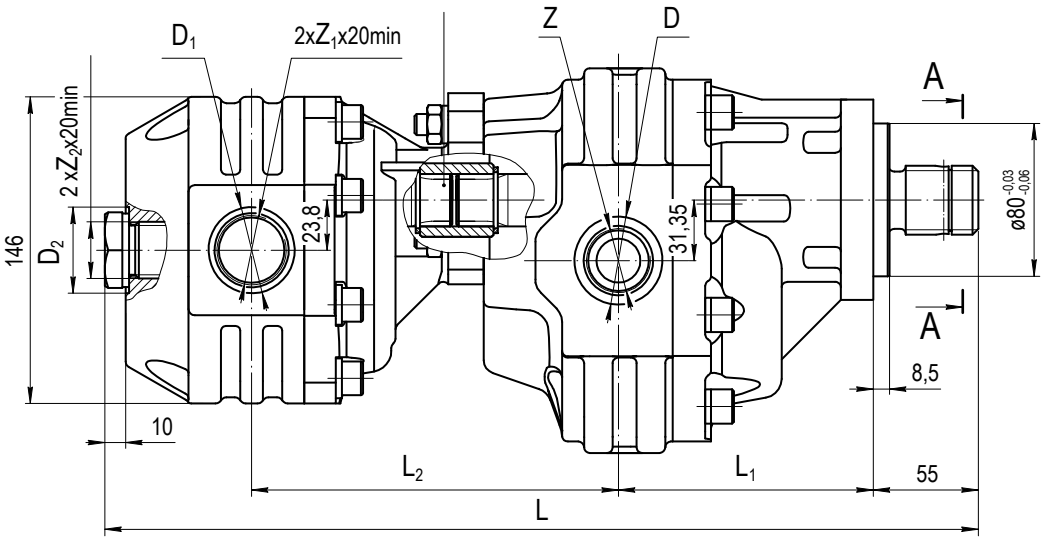


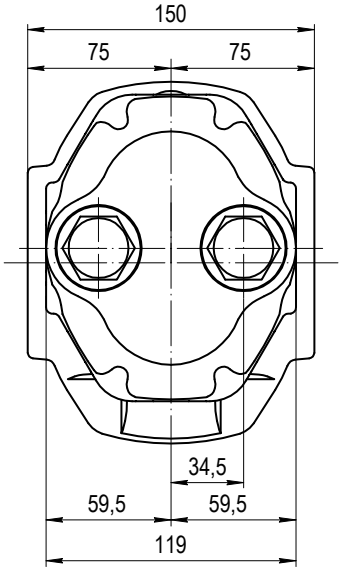


Type			Dimensions mm									Weight kg
			L	L_1	L_2	D	D_1	D_2	Z	Z_1	Z_2	
GP3T34/3T34	R L	Z2C7GG-V	355	109	179	ø41			3/4" GAS			26,9
GP3T43/3T34			362	114	177							27,5
GP3T43/3T43			367		182							28,0
GP3T51/3T34			371,5	114,5	181,5	ø46,1	ø41		1" GAS	3/4" GAS		27,7
GP3T51/3T43			376,5		186,5							28,2
GP3T51/3T51			377		187	ø46,1				1" GAS		28,5
GP3T61/3T34			374,5	120,5	181,5	ø46,1	ø41			3/4" GAS		28,4
GP3T61/3T43			382,5		186,5							28,9
GP3T61/3T51			383		187	ø46,1				1" GAS		29,1
GP3T61/3T61			389		193							29,8
GP3T82/3T34			389,5	124,5	190,5	ø54	ø41		1 1/4" GAS	3/4" GAS		29,6
GP3T82/3T43			394,5		195,5							30,1
GP3T82/3T51			395		196		ø46,1			1" GAS		30,2
GP3T100/3T34			408	130	197	ø54	ø41			3/4" GAS		30,3
GP3T100/3T43			413		202							30,9
GP3T100/3T51			413,5		202,5		ø46,1			1" GAS		31,2
GP3T100/3T61			419,5		208,5							31,7

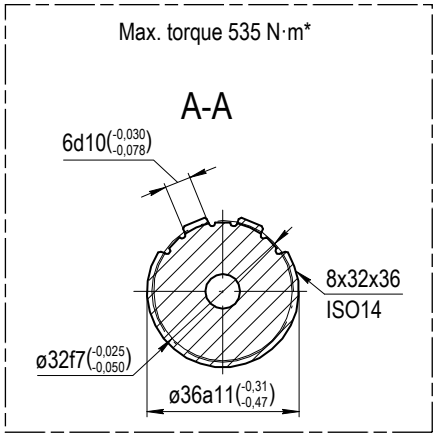
MULTIPLE PUMPS GROUP 4+3 DIMENSIONS. ISO STANDARD MOUNTING FLANGE

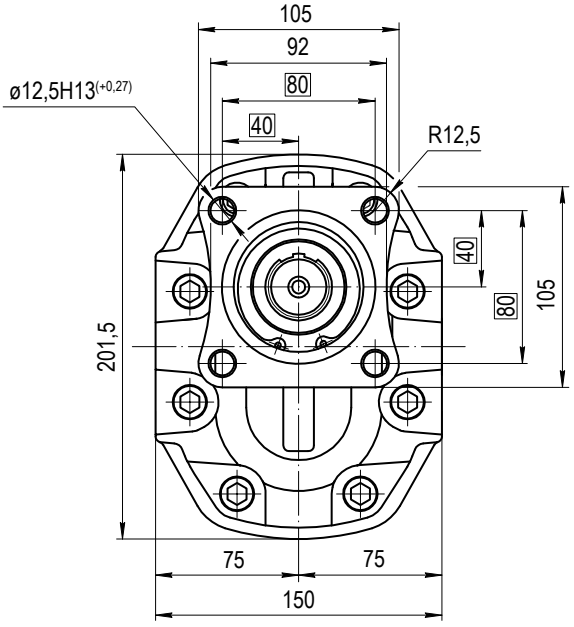
Max. torque 300 N·m*





Max. torque 535 N·m*





Type			Dimensions mm									
			L	L_1	L_2	D	D_1	D_2	Z	Z_1	Z_2	Weight kg
GP4T63/3T34	R L	Z1C5GG-V	435	177	173,5	ø46,1	ø41		1" GAS	3/4" GAS		36,4
GP4T63/3T43			441		178,5							36,9
GP4T63/3T51			446		179		ø45			1" GAS		37,1
GP4T63/3T61			452		185							37,7
GP4T73/3T34			438	187	172,5		ø41			3/4" GAS		36,6
GP4T73/3T43			444		177,5							37,1
GP4T73/3T51			449		178		ø45			1" GAS		37,3
GP4T73/3T61			455		184							37,9
GP4T86/3T34			442	193	176	ø54	ø41		1 1/4" GAS	3/4" GAS		37,4
GP4T86/3T43			448		181							37,9
GP4T86/3T51			453		181,5		ø45			1" GAS		38,1
GP4T86/3T61			459		187,5							38,7
GP4T100/3T34			448	206	178,5		ø41			3/4" GAS		38,0
GP4T100/3T43			454		183,5							38,5
GP4T100/3T51			459		184		ø45			1" GAS		38,7
GP4T100/3T61			465		190							39,3
GP4T100/3T82			468		194		ø54	–		1 1/4" GAS	1" GAS	40,5
GP4T119/3T34			454	208,5	178,5		ø41			3/4" GAS		38,7
GP4T119/3T43			460		183,5							39,2
GP4T119/3T51			465		184		ø45			1" GAS		39,4
GP4T119/3T61			471		190							40,0
GP4T135/3T34			460	206	181,5	ø60,5	ø41		1 1/2" GAS	3/4" GAS		39,6
GP4T135/3T43			466		186,5							40,1
GP4T135/3T51			471		187		ø45			1" GAS		40,3
GP4T150/3T34			465	208,5	181,5		ø41			3/4" GAS		40,2
GP4T150/3T43			471		186,5							40,7

PBF20TH-SERIES FIXED DISPLACEMENT AXIAL PISTON PUMPS

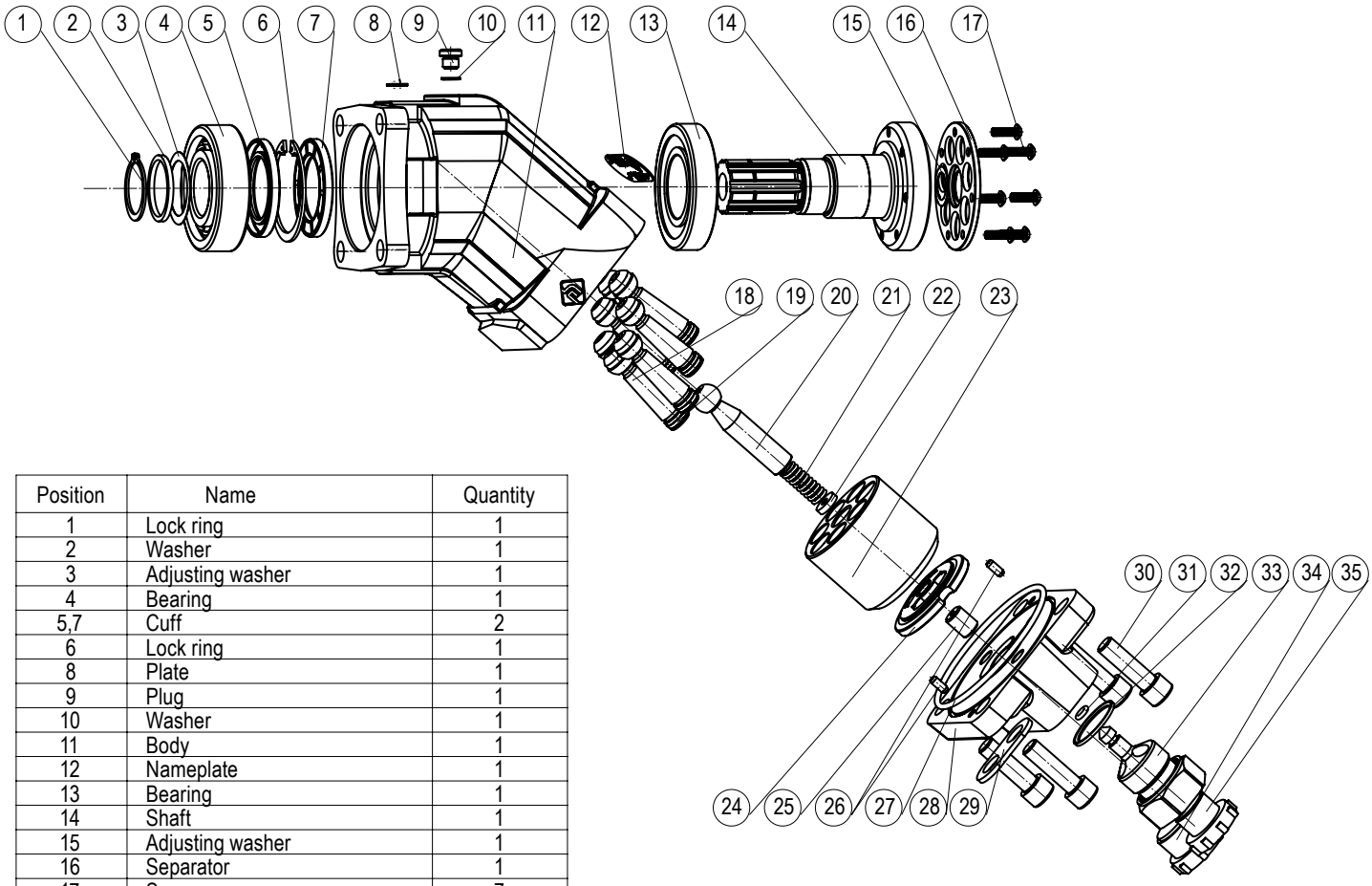
FEATURES

The PBF20TH series is a range of fixed displacement axial piston pumps with displacements from 56 to 107 cm³. They are designed for use in hydraulic systems with a nominal pressure of up to 350 bar. Mounting flanges meet ISO international standards.
Pumps are available with either clockwise or counterclockwise shaft rotation, and the rotation direction can be easily reversed if required. The design allows direct installation on a power take-off (PTO) unit.

These pumps are intended for hydraulic systems of mobile equipment built on truck chassis, including dump trucks, loader and forestry cranes, hook lifts, aerial platforms, plough trucks, and other machinery.

- Bent-axis design, single-flow pump.
- Cast iron body.
- Conical pistons with compressive rings.
- Bimetal cylinder block of the pumping unit has a high wear-resistance.
- No drain line is required.
- Mounting directly on PTO.
- Simple change of rotation.

PBF20TH PUMPS LAYOUT, ALL SIZES



Position	Name	Quantity
1	Lock ring	1
2	Washer	1
3	Adjusting washer	1
4	Bearing	1
5,7	Cuff	2
6	Lock ring	1
8	Plate	1
9	Plug	1
10	Washer	1
11	Body	1
12	Nameplate	1
13	Bearing	1
14	Shaft	1
15	Adjusting washer	1
16	Separator	1
17	Screw	7
18	Piston	7
19	Compression ring	7
20	Pin	1
21	Spring	1
22	Thrust washer	1
23	Cylinder block	1
24	Valve plate	1
25	Pin-orifice	1
26	Pin	2
27	O-ring	1
28	Cover	1
29	Lifting eye	1
30	Screw	4
31	O-ring	1
32	Shaped sealing ring	1
33	Pressure adapter	1
34	Plug	1
35	Transport plug	1

ORDERING INSTRUCTIONS

PBF20	TH	.	63	/	R	E8	1	N			

FIXED DISPLACEMENT AXIAL PISTON PUMP	PBF20TH

SERIES	CODE
Cast iron body	TH

DISPLACEMENT, CM³		CODE
56	●	56
63	●	63
80	●	80
107	●	107

ROTATION	CODE
Clockwise	R
Counterclockwise	L

SHAFT OPTIONS		CODE
Splined shaft to DIN ISO 14	●	E8
Splined shaft to DIN ISO 14 with coupling	○	C8

* SPECIAL FEATURES

CLIMATIC VERSION	CODE
Temperate	N
Tropical	T

WORKING PORTS OPTION		CODE
Two threaded ports on the rear	●	1
Two threaded ports on the rear with suction branch pipe	○	2

SUCTION SLEEVE	CODE
Straight	0
Angle 45°	1
Angle 90°	2

* Special option code - assigned if necessary after agreement of special conditions with the customer

Notes: ● Standart; ○ Optional; **-** Not available

ORDERING EXAMPLE

PBF20TH.63/LE81N

PBF20TH - fixed displacement bent-axis axial piston pump
63 - displacement 63 cm³,
L - counterclockwise rotation,
E8 - drive shaft: splind, acc. to DIN ISO 14,
1 - ports options,
N - climatic version - temperate.

TECHNICAL DATA

SIZE		PBF20TH.56	PBF20TH.63	PBF20TH.80	PBF20TH.107
Displacement, Vg	cm^3	56,1	63	80,4	106,7
Speed					
minimum		500			
rated, at inlet pressure P_{abs}=0,8 bar	min^{-1}	1870		1830	1700
maximum, at inlet pressure P_{abs}=1,0 bar		2200		2150	2000
maximum, at inlet pressure P_{abs}=2,0 bar		3200		3100	2800
Pressure, P					
rated	bar	350			
maximum, t≤6 sec		400			
Inlet pressure, P					
minimum	bar	0,8			
rated		1			
maximum		2			
Flow*, Q					
minimum	l/min	28	32	40	53
rated		105	118	147	181
maximum		123	139	173	213
limit		180	202	249	299
Input power*, N					
rated, at inlet pressure P_{abs}=0,8 bar and pressure drop Δp=350 bar	κW	61	69	86	106
maximum, at inlet pressure P_{abs}=1,0 bar and pressure drop Δp=400 bar		82	92	115	142
Efficiency					
hydromechanical		0,96			
volumetric		0,95			
Weight (without fluid), no more	kg	11		13,9	19,2

* Without efficiency

FORMULAS

Flow $$Q = \frac{V_g \cdot n \cdot \eta_v}{1000} \text{ [l/min]}$$

Input torque $$T = \frac{V_g \cdot \Delta p}{20 \cdot \pi \cdot \eta_{mh}} = \frac{1.59 \cdot V_g \cdot \Delta p}{100 \cdot \eta_{mh}} \text{ [N·m]}$$

Input power $$P = \frac{2 \cdot \pi \cdot T \cdot n}{60000} = \frac{Q \cdot \Delta p}{600 \cdot \eta_t} \text{ [kW]}$$

V_g — displacement (cm^3)

Δp — pressure drop (bar)

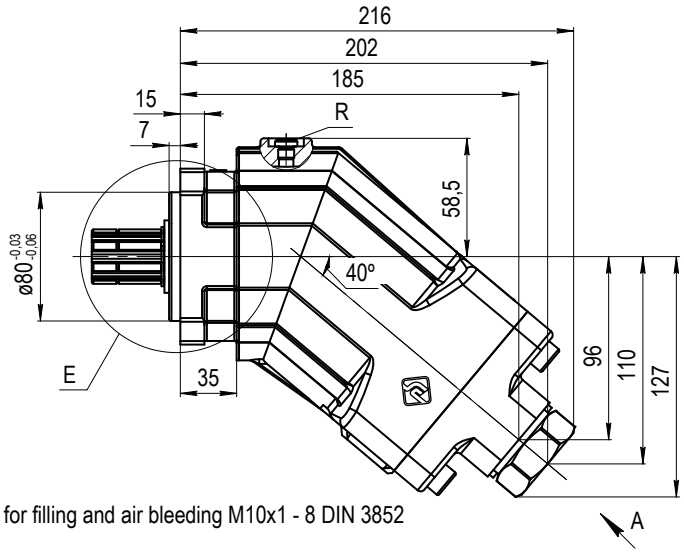
n — speed (min^{-1})

η_v — volumetric efficiency

η_{mh} — hydromechanical efficiency

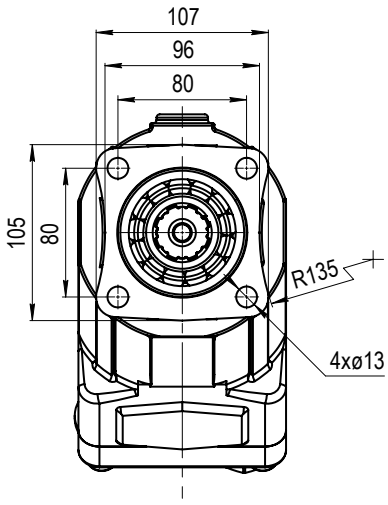
η_t — overall efficiency

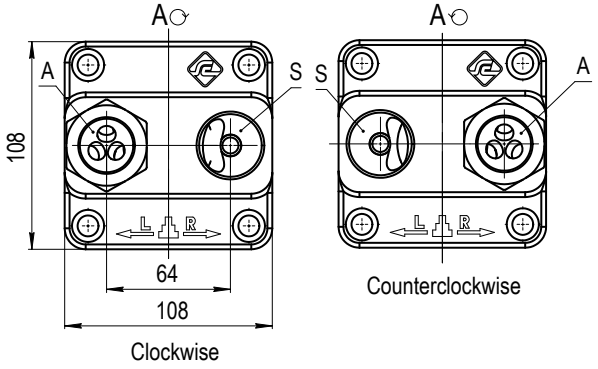
PBF20TH PUMP DIMENSIONS, SIZE 56 AND 63 CM³



R - port for filling and air bleeding M10x1 - 8 DIN 3852

Mounting flange ISO 7653-1985

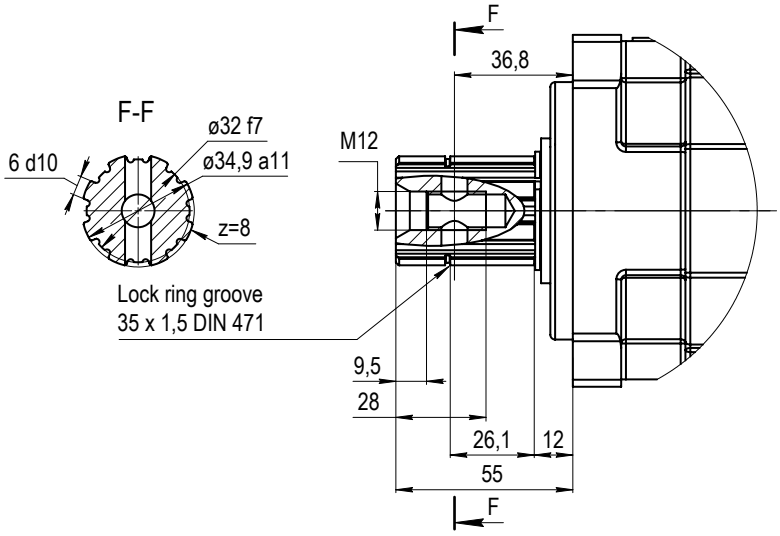




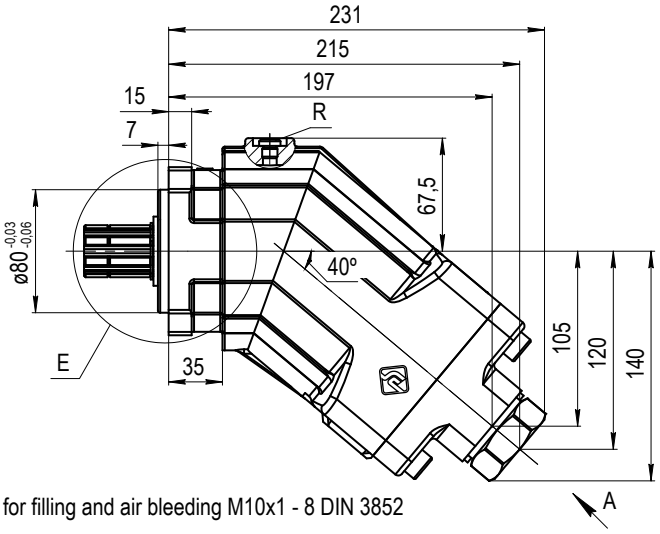
A - pressure line G3/4 - 16 DIN ISO 228
S - suction line G1 - 18 DIN ISO 228

E

Splined shaft E8 - 8x32x35 DIN ISO 14

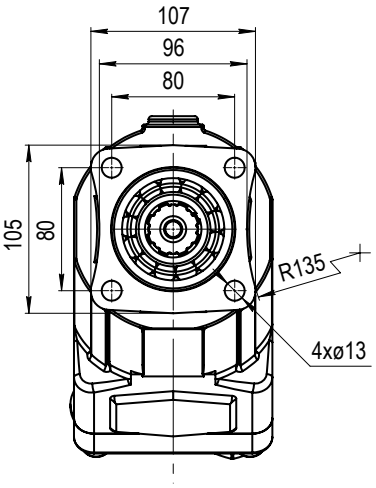


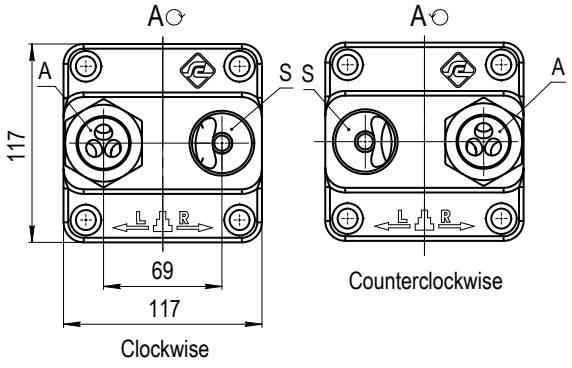
PBF20TH PUMP DIMENSIONS, SIZE 80 CM³



R - port for filling and air bleeding M10x1 - 8 DIN 3852

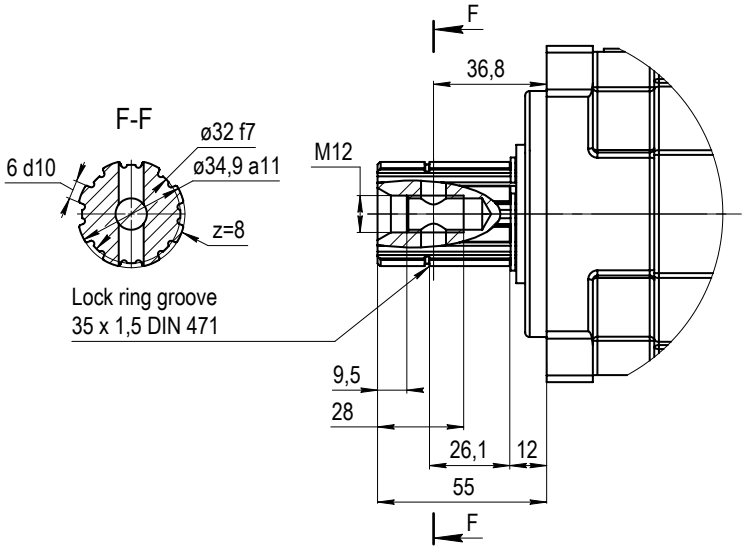
Mounting flange ISO 7653-1985



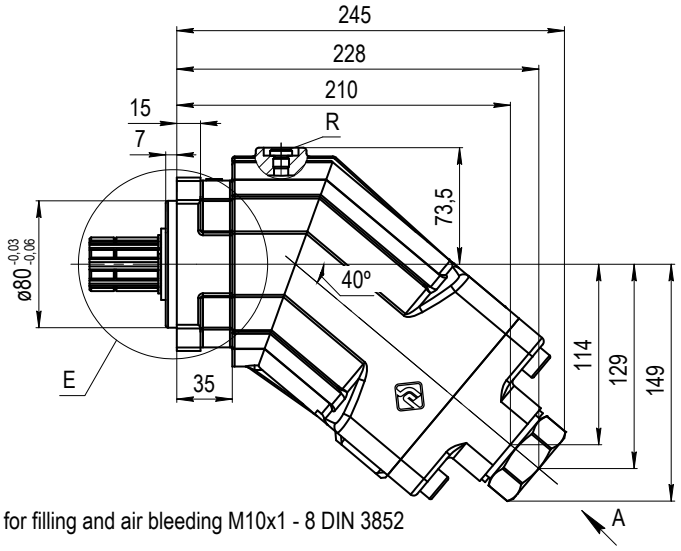


A - pressure line G1 - 18 DIN ISO 228
S - suction line G1 1/4 - 20 DIN ISO 228

E
Splined shaft E8 - 8x32x35 DIN ISO 14

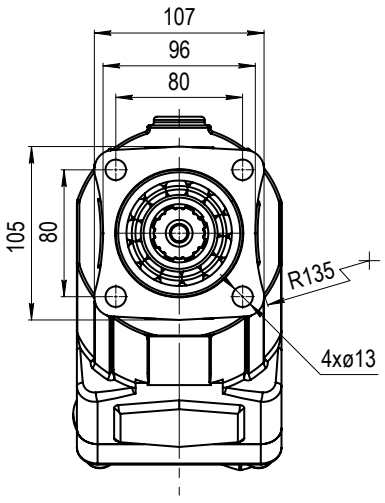


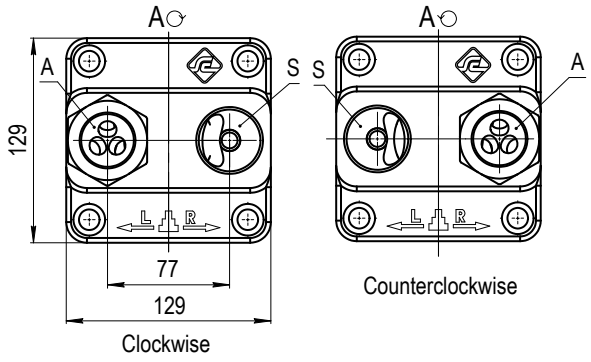
PBF20TH PUMP DIMENSIONS, SIZE 107 CM³



R - port for filling and air bleeding M10x1 - 8 DIN 3852

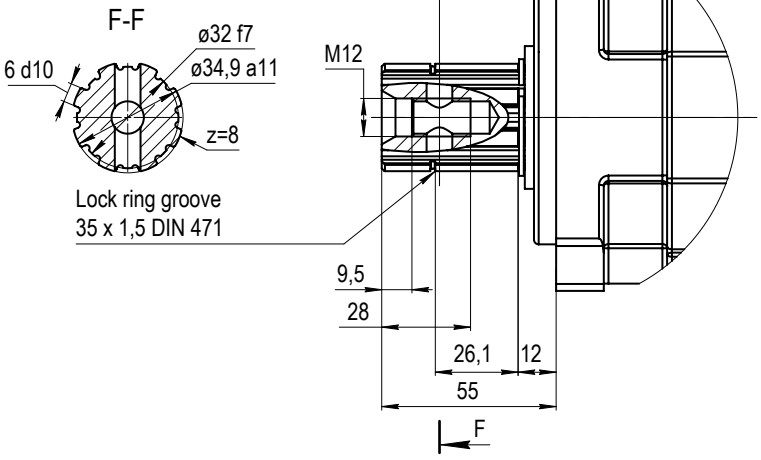
Mounting flange ISO 7653-1985



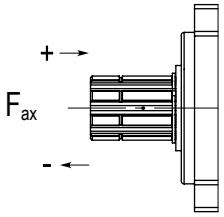


A - pressure line G1 - 18 DIN ISO 228
S - suction line G1 1/4 - 20 DIN ISO 228

E
Splined shaft E8 - 8x32x35 DIN ISO 14



LOAD AND DURABILITY



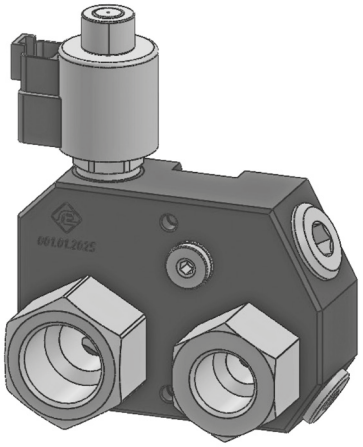
PERMISSIBLE AXIAL AND RADIAL FORCES ON THE DRIVE SHAFT

CHARACTERISTICS		56	63	80	107
A distance to force F from the shaft collar, a, mm		21,5			
Maximum axial force (during standby, no pressure in hydraulic system), F_{ax}	N	0			
Permissible axial force (per bar operating pressure), F_{ax}	$+F_{ax}$, N/bar	50	53	60	71
	$-F_{ax}$, N/bar	0			

NOTE

The direction of the maximum permissible axial force must be consider:
at $-F_{ax}$ - bearing durability is reduced;
at $+F_{ax}$ - bearing durability is increased.

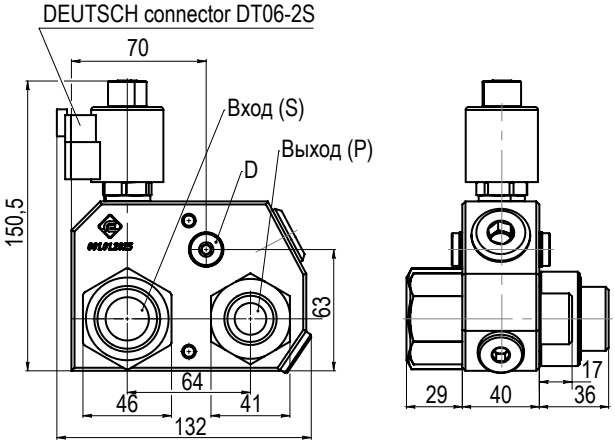
BY-PASS VALVE FOR PBF20TH-SERIES PUMPS



This valve module is designed for hydraulic systems where the pump is driven directly by a power take-off (PTO) that cannot be disengaged. It integrates a poppet-type logic element controlled by a normally open solenoid valve.
Operating Principle.
Solenoid de-energized (default state):
The poppet valve is open, allowing flow from port P to port S (bypass to tank) with minimal pressure drop. This reduces load on the pump during vehicle transit when hydraulics are not in use. Opening the bypass valve during transit prevents energy loss and protects the pump by ensuring it runs unloaded at high speeds.
Solenoid energized:
The poppet is held closed, directing full pump flow from port P to the hydraulic directional control valve. System pressure becomes available for hydraulic actuation.

Port D used optionally to discharge a small volume of oil directly to tank for oil cooling. This valve module can be used in combination with switchable PTOs for additional control. It is mounted directly on the pump using banjo fittings, simplifying installation and reducing space requirements.

DIMENSIONS



TECHNICAL DATA

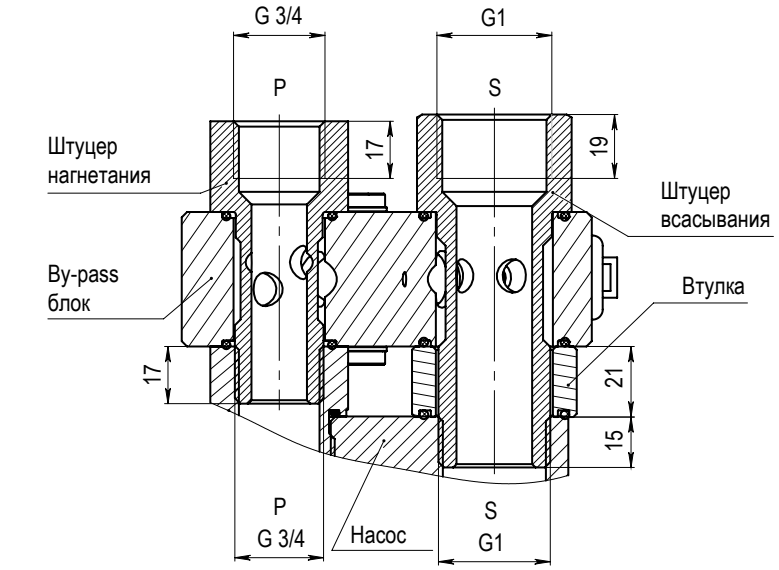
Pump size	PBF20TH.45/56/63
Ordering code, 12V	BP20TH.63-00-00
Ordering code, 24V	BP20TH.63-00-00-01
Max. working pressure	400 bar
Port S	G1
Port P	G 3/4
Port D	G 1/4
Weight	3,4 kg
Ambient temperature range	-40°C to +80°C

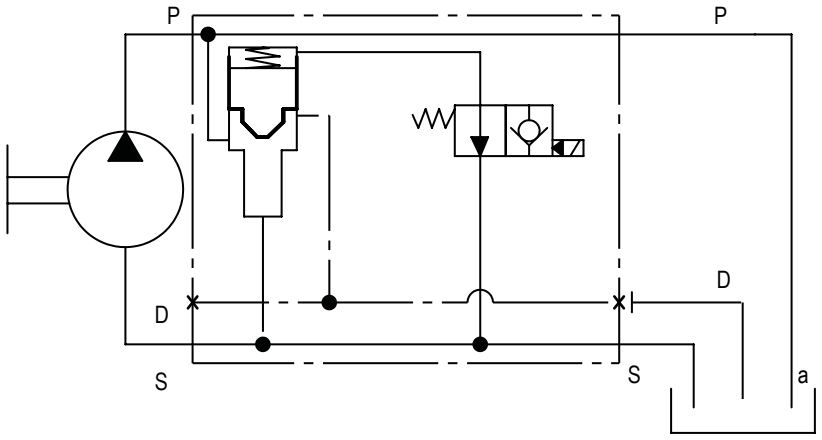
COIL DATA

Power at 20°C	20,5 W
Duty cycle	ED 100%
Protection class	IP67
Coil insulation class	H (180°C)
Wire insulation class	H (185°C)

INSTALLATION INSTRUCTIONS

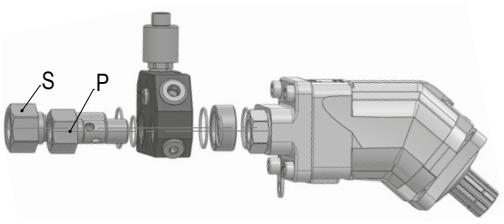
To prevent overheating of the pump during vehicle movement, it is essential to maintain a continuous flow of at least 5 l/min to the tank via port "a" (as shown in the schematic). This requirement applies when the valve is in by-pass mode (i.e., solenoid de-energized) and the system uses an open center main directional valve block.
If the flow to tank through port "a" drops below 5 l/min - which may occur due to a high pressure drop in the main directional control valve - or if the system uses a closed center directional control valve, it is strongly recommended to install an external drain line from port "D" directly to tank to ensure proper cooling and avoid pump overheating.
Refer to the schematic for proper external drain routing.





Hydraulic circuit

MOUNTING INSTRUCTIONS

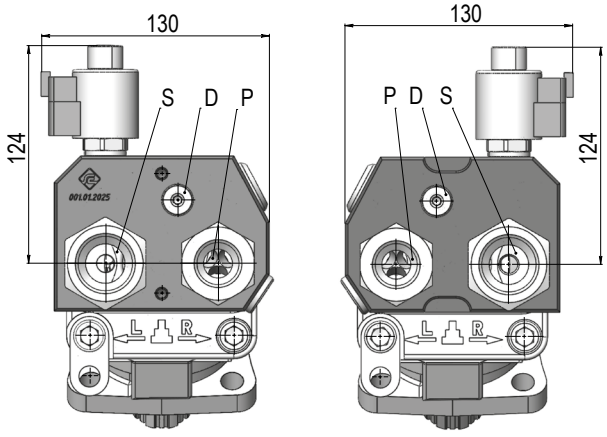


Bypass valve mounting procedure:
1. Clean the surfaces of the pump and the bypass valve from any contaminants.
2. Apply grease to the O-rings.
3. Install and tighten the pressure port fitting, ensuring that the surfaces of the valve and rear cover are in full contact. Tighten according to the torque specified in the table.
4. Install the suction port fitting with the sleeve and fasten it to the cover. Make sure the surfaces of the valve and rear cover are in full contact. Tighten according to the torque specified in the table.
5. Electrical connection: the bypass valve is normally open. To enable oil flow, voltage must be applied to the solenoid valve.

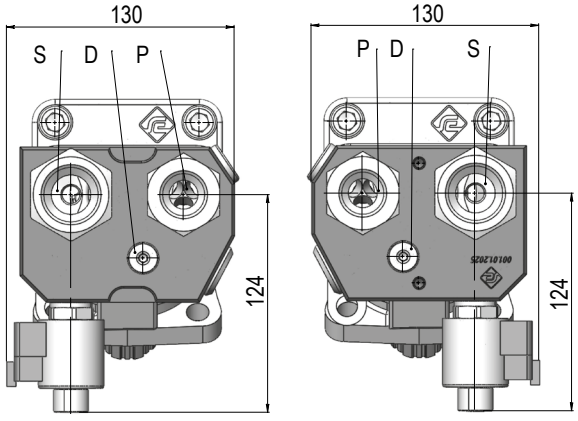
TIGHTENING TORQUE

Pump size	Port P, Nm	Port S, Nm	Port D, Nm
PBF20TH.45/56/63	110	140	40

MOUNTING POSITIONS



Counterclockwise rotation



Clockwise rotation

HYDRAULIC FLUID

Achieving the specified performance and operating parameters of hydraulic units is possible only when using high-quality hydraulic fluids with additives in the hydraulic system. Such fluids must possess a range of properties, including anti-corrosion, anti-oxidation, anti-foaming, and others. These requirements are met by premium turbine oils, machine oil of API CD SAE J183 grade, automatic transmission fluids (ATF), and certain special-purpose fluids.

Never mix different types of fluids.

HYDRAULIC FLUID CHOICE

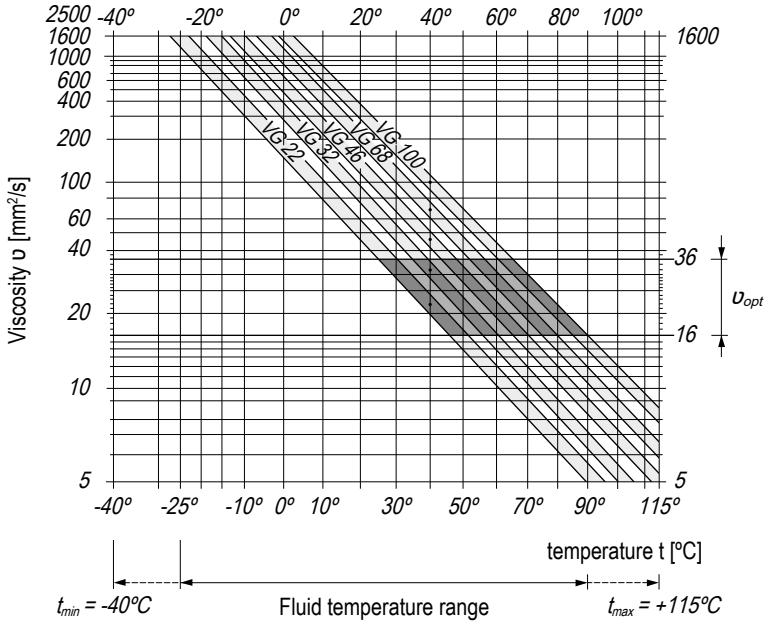
For proper selection, it is necessary to know the operating fluid temperature in the hydraulic tank (depending on ambient temperature) and the fluid viscosity. The fluid should be selected so that its viscosity remains within the permissible range (Vopt) at all temperatures (tmin–tmax) — see diagram. It is recommended to select a working fluid with a higher temperature class accordingly.

Example.

At an ambient temperature of X °C, the operating fluid temperature is determined to be 60 °C. Within the optimal operating viscosity range (Vopt), this corresponds to VG 46 and VG 68 classes. In this case, VG 68 should be selected. The temperature of the fluid in the drain line is always higher than in the tank. At no point in the hydraulic system should the operating fluid temperature exceed 90 °C.

If it is not possible to maintain the required temperature conditions under maximum operating load, please consult for advice.

SELECTION DIAGRAM



HYDRAULIC FLUID FILTRATION

Improved filtration precision results in a higher hydraulic fluid cleanliness class, thereby increasing the service life of the axial piston unit. For reliable operation of the axial piston assembly, the hydraulic fluid cleanliness must comply with ISO 4406. At very high operating fluid temperatures (from 90 °C up to a maximum of 115 °C), a cleanliness class of at least 19/17/14 according to ISO 4406 is required.

If it is not possible to maintain the required cleanliness class, please consult for advice.

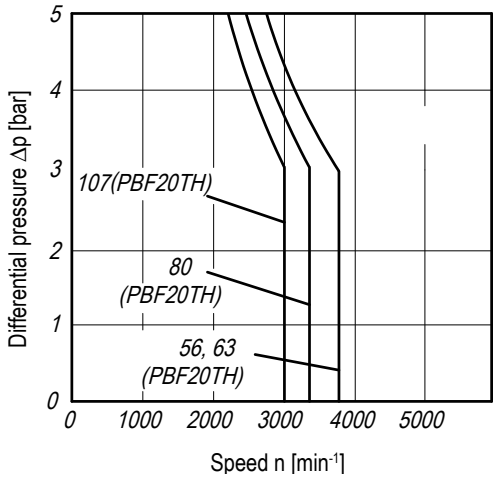
VISCOSITY AND TEMPERATURE OF WORKING FLUID

CONDITIONS	VISCOSITY	TEMPERATURE	NOTES
Storage and transportation		$T_{min} \geq -40°C$ $T_{opt} = +5°C…+20°C$	Storage at the factory: Standard - up to 12 months; Long-term - up to 24 months
Cold start	$\upsilon_{max} \leq 1600$ mm²/s	$T \geq -40°C$	$t \leq 3$ min, $n \leq 1000$ min^{-1}, no load $P \leq 50$ bar
Permissible temperature drop		$T \leq 25°C$	The temperature difference between the axial piston pump and the working fluid in the system
Warm-up period	$\upsilon = 1600...400$ mm²/s	$T = -40°C…-25°C$	at $P \leq 0.7 \cdot P_{nom}$, $n \leq 0.5 \cdot n_{nom}$ $t \leq 15$ min
Continuous operating mode	$\upsilon = 400...10$ mm²/s		In case of VG 46 corresponds to a temperature range of + 5°C to + 85°C
		$\Delta T = 12°C$ $T = -25°C…+103°C$	The temperature difference between the cuff, bearing and drainage Temperature in drain line
	$\upsilon_{opt} = 36...16$ mm²/s		Optimal viscosity range in operating mode
Short-term operating	$\upsilon_{min} \geq 7$ mm²/s	$T = +103°C$	$t < 3$ min, $p < 0.3 \cdot P_{nom}$

SHAFT SEAL

The service life of the shaft seal depends on the shaft rotational speed and the drain pressure. The diagram shows the relationship between the shaft speed and the pressure exerted from the pump housing side onto the seal. When operating the hydraulic unit at the maximum permissible drain pressure, the shaft seal service life is reduced.

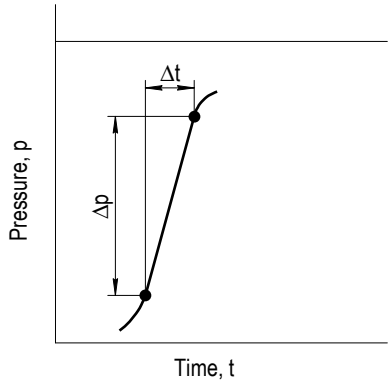
Short-term pressure peaks (t < 0.1 s) up to 10 bar are permissible; however, with an increase in pressure pulsation frequency, the service life of the shaft seal decreases. The case pressure must be equal to or higher than the ambient pressure.



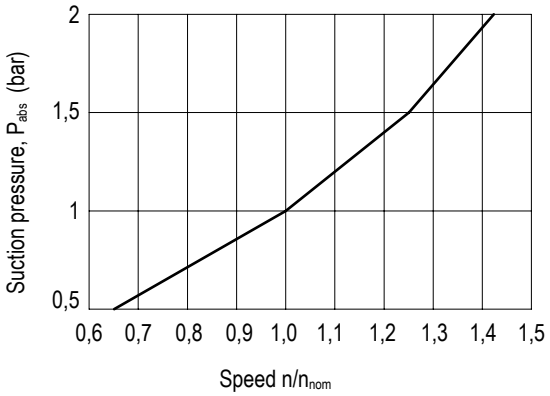
Maximum case pressure - 3 bar.

SUCTION PRESSURE AT INCREASED SPEED

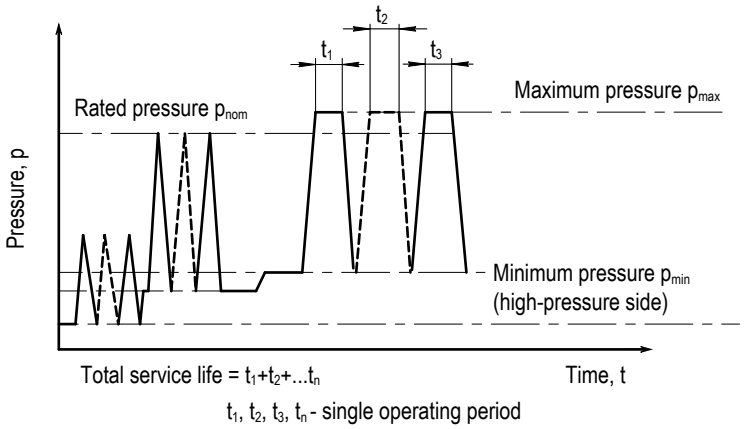
PRESSURE CHANGE RATE



SHAFT ROTATION SPEED TO SUCTION PRESSURE RATE



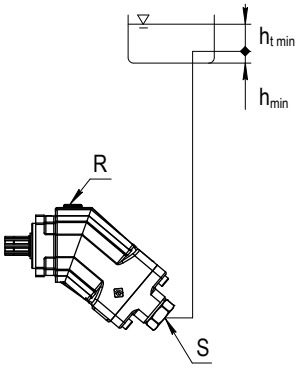
OPERATING PERIODS OF THE PUMP THROUGHOUT THE ENTIRE SERVICE LIFE



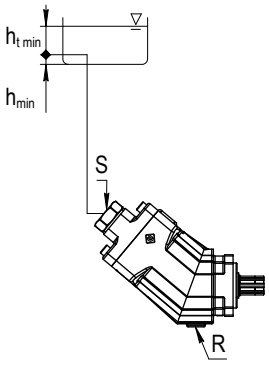
INSTALLATION POSITION FOR PUMPS PBF20TH

Below-reservoir installation (pos. 1 and 2)

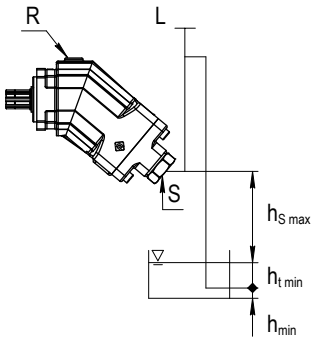
Below-reservoir installation means that the axial piston unit is installed outside of the reservoir below the minimum fluid level. **Installation in positions 1 and 2 is recommended.**



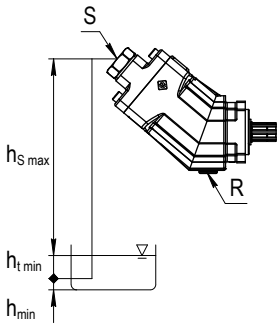
Pos. 1



Pos. 2



Pos. 3



Pos. 4

INSTALLATION POSITIONS	AIR BLEED	FILLING
Pos. 1	R	S
Pos. 2	-	S

Above-reservoir installation (pos. 3 and 4)

Above-reservoir installation means, that the axial piston unit isinstalled above the minimum fluid level.

INSTALLATION POSITIONS	AIR BLEED	FILLING
Pos. 3	R	L
Pos. 4	S	S

S Suction line

R Air bleed

L Filling

$h_{t\,min}$ Minimum required loading depth 200 mm

h_{min} The minimum required distance to the bottom of the tank 100 mm

$h_{S\,max}$ Maximum permissible suction height (800 mm)

MOUNTING INSTRUCTIONS

During commissioning and operation, the axial piston unit must be filled with hydraulic fluid and air bled. This must also be observed following a relatively long standstill as the axial piston unit may drain back to the reservoir via the hydraulic lines.
In case of "above reservoir" installation filling and air bleeding must be carried out completely as there is, for example, a danger of dry running.
To achieve lower noise levels, connect all hydraulic lines using flexible hoses and avoid "above reservoir" installation.
In all operating conditions, the drain line must flow into the reservoir below the minimum fluid level. Maximum permissible suction height is 800 mm.
The minimum pressure in the suction channel S must also not fall below 0.8 bar to absolute pressure (pabs) during the operation and cold start.

ROTATION

The rotation of the shaft is determined by the location of the pressure “A” and suction “S” lines. Adapter is located in the pressure line.

Tightening of threaded connections

	Air bleed R	Pressure line "A"		Suction line "S"
	M10x1	G3/4	G1	G1 ¼
Tightening torque, Nm	5	60	60	60

Counterclockwise rotation (pressure line adapter on the right side)

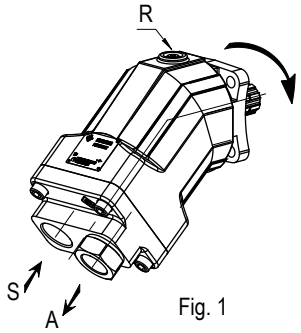


Fig. 1

Clockwise rotation (pressure line adapter on the left side)

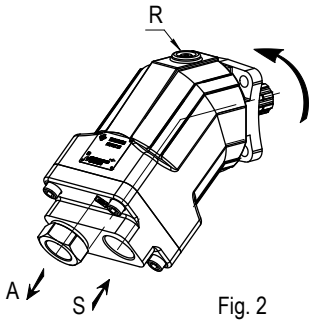
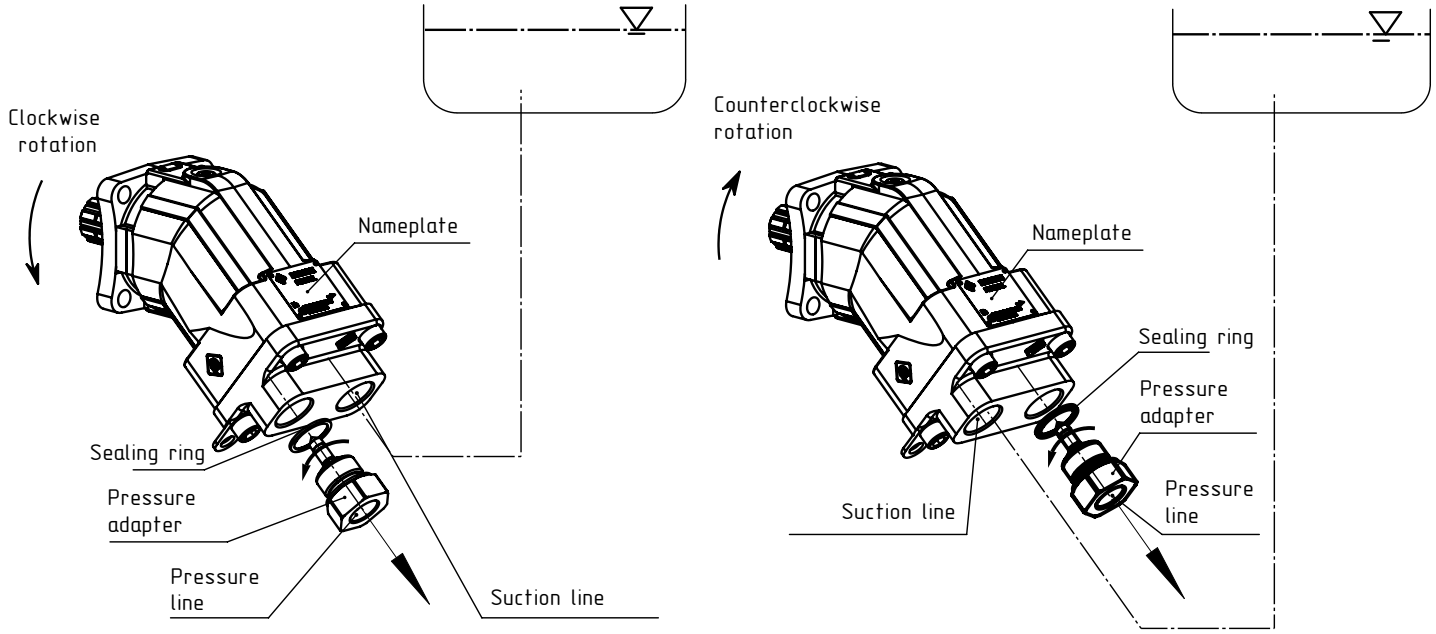


Fig. 2

CHANGING THE DIRECTION OF ROTATION

The direction of rotation of the pump and the PTOs must be the same.
The direction of rotation of the pump indicated on the nameplate.
Also, the direction of rotation of the pump is defined by the position of the pressure adapter, which is screwed into the pump pressure line (see pic. below).



To change the direction of rotation of an axial piston pump, you must perform the following steps:
1. Unscrew the pressure adapter with the sealing ring from the pressure line;
2. Screw the pressure adapter with the sealing ring into the suction line.

The tightening torque for the pressure adapter is 60 Nm.

ATTENTION!
Rotation of the pump shaft while changing the position of the pressure adapter is NOT ALLOWED!
It is prohibited to rotate the pump shaft during and after unscrewing the pressure adapter, as well as while screwing it in. Rotation of the shaft can lead to damage the axial piston pump.

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