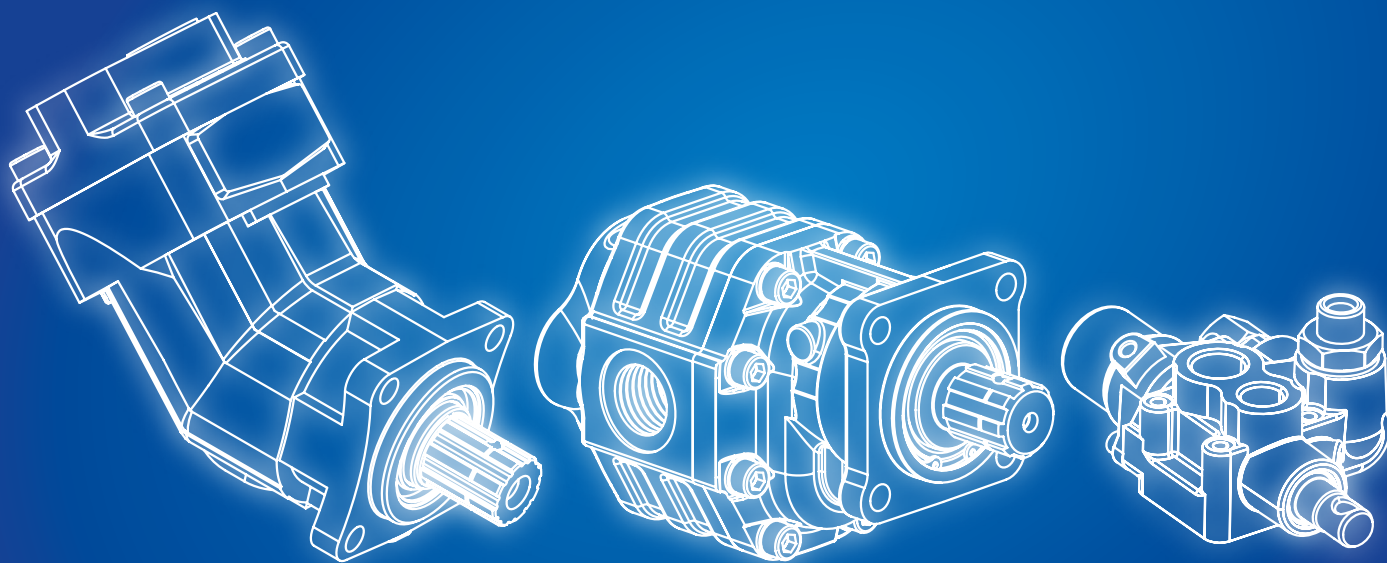




HYDRAULIC COMPONENTS

for truck applications

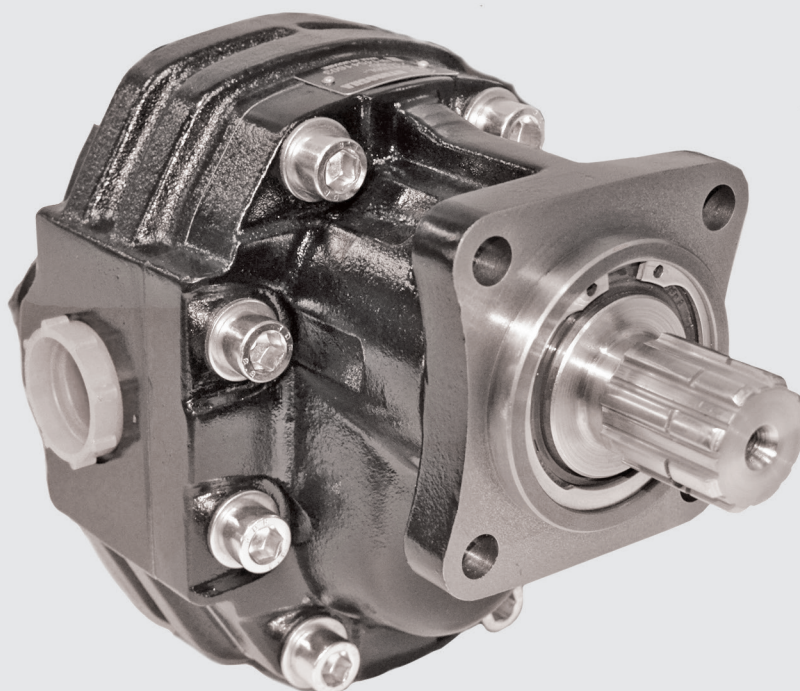
CODING OF CATALOGUES

HS - HCT - 05/042025

HS	-	HTC		-	05	/	04	2025
HYDROSILA								
TYPE OF HYDRAULIC MACHINES	TYPE	SERIES		№ EDITION		MONTH OF EDITION		YEAR OF EDITION
Gear pumps	GP	K						
		T						
		M	A					
Gear motors	GM	K						
Axial piston machines for closed circuit	A	C						
Axial piston machines for open circuit		J						
Bent-axis axial piston machines		B						
Control valves	V	-						
In-line mounting hydraulic valves	LV	-						
Hydraulic cylinders	C	-						
Quick-release coupling	Q	-						
Hydraulic components for truck applications	HCT	-						
Quick-release coupling, Fitting, High pressure hoses	QFH	-						

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GEAR PUMPS SERIES "T"

FEATURES

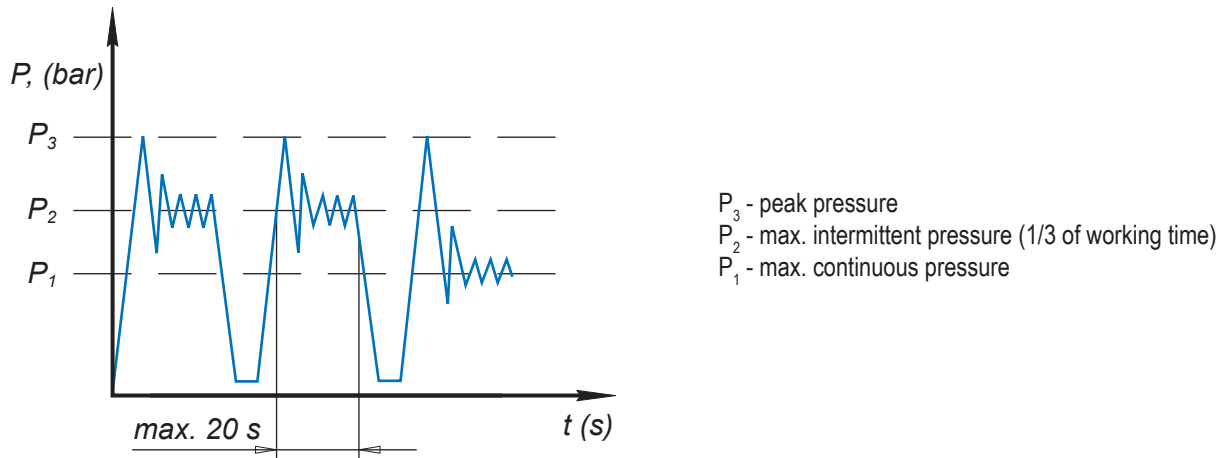
Gear pumps of the "T" series are manufactured with displacement from 16 to 150 cm³. Designed to work in hydraulic systems with nominal pressures up to 290 bar. Mounting flanges comply with ISO and UNI international standards. Supplied with right, left, and reverse direction of rotation of the drive shaft. 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.

Group 2.5	- Displacement from 16 to 45 cm³/rev	- Mounting flange according to ISO standard
	- Maximum continuous pressure up to 250 bar	- Aluminum body - cast iron mounting flange and rear cover
Group 3	- Displacement from 34 to 100 cm³/rev	- Mounting flange according to ISO, UNI standards.
	- Maximum continuous pressure up to 280 bar	- Cast iron body and mounting flange
Group 4	- Displacement from 63 to 150 cm³/rev	- Mounting flange according to ISO standard.
	- Maximum continuous pressure up to 290 bar	- Cast iron body and mounting flange

DEFINITION OF PRESSURES



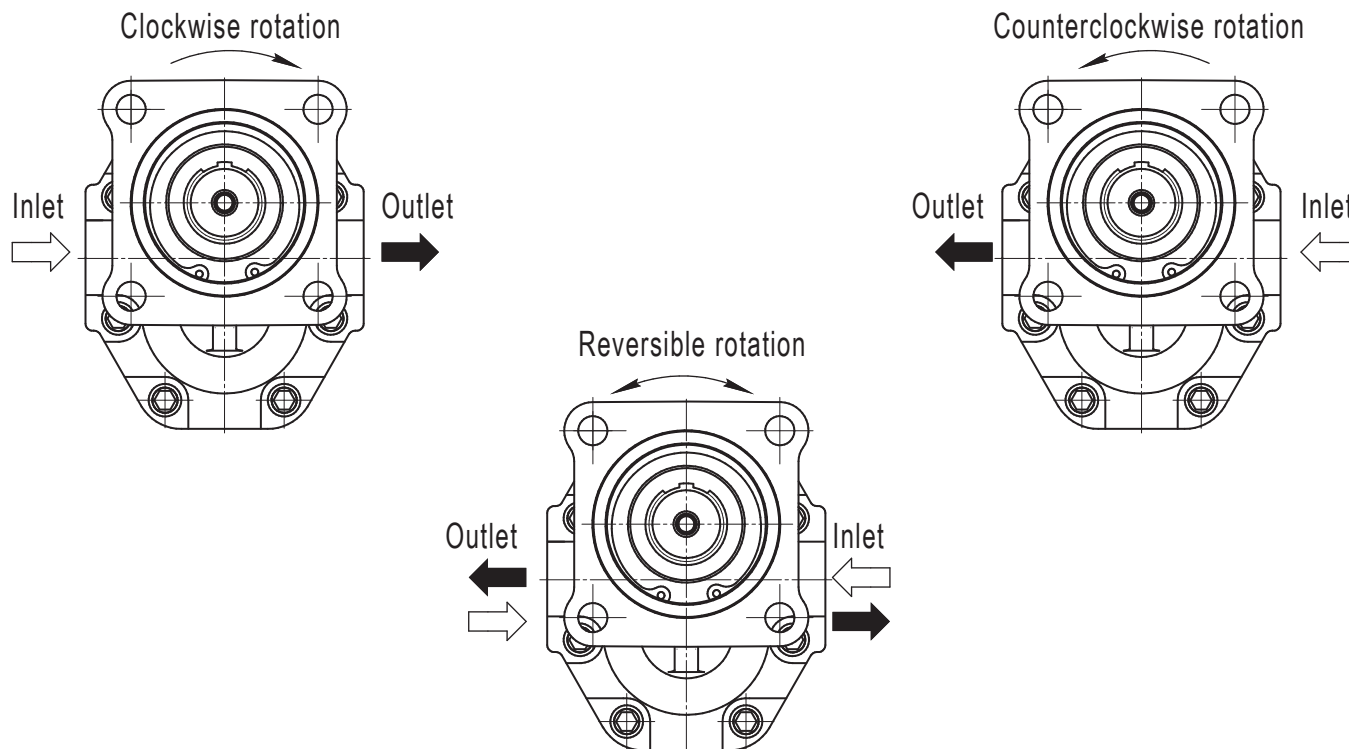
WORKING CONDITIONS

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 INDEX RECOMMENDED

Maximum continuous pressure	>200 bar	<200 bar
Contamination class ISO 4406	18/15	19/16
Contamination class NAS 1638	9	10
Achieved with filter $\beta_{s_x}=75$	15µm	25µm

PUMP ROTATION DIRECTION VIEWED AT THE DRIVE SHAFT



FORMULAS

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

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

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

q displacement (cm³/rev)

n speed (min⁻¹)

η_v volumetric efficiency

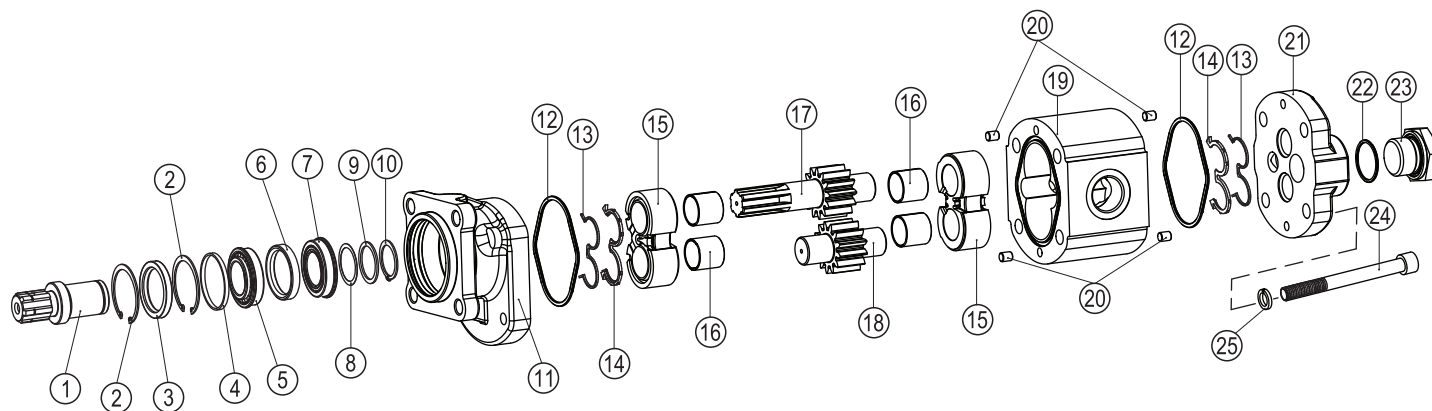
Δp pressure (bar)

η_m mechanical efficiency

TECHNICAL DATA

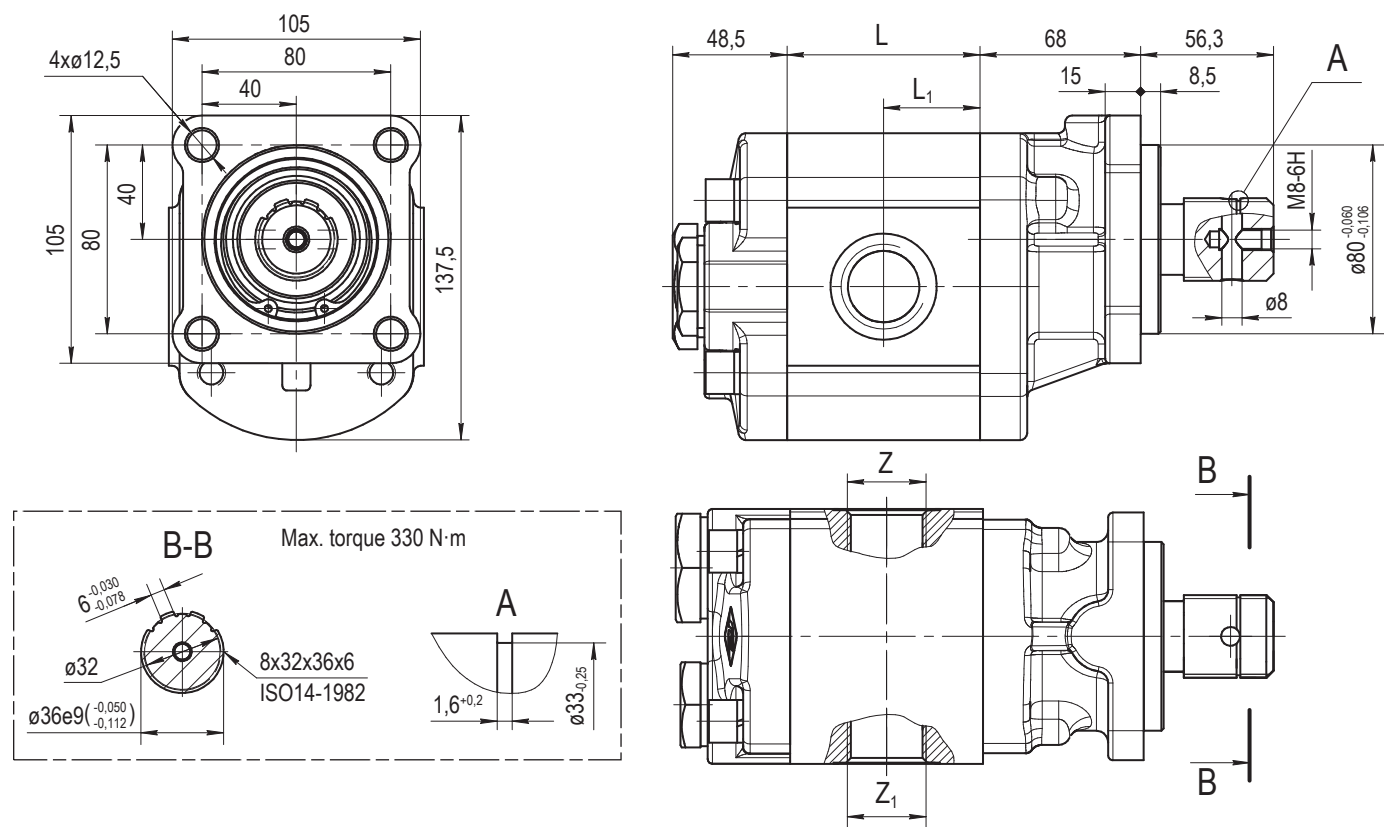
Type		GP2.5T16	GP2.5T19	GP2.5T20	GP2.5T23	GP2.5T25	GP2.5T28	GP2.5T30	GP2.5T32	GP2.5T36	GP2.5T37	GP2.5T38	GP2.5T40	GP2.5T45
Displacement	cm ³ /rev	16	19	20	23	25	28	30	32	36	37	38	40	45
Maximum continuous pressure, P ₁	bar	250								230	200		170	
Maximum intermittent pressure, P ₂	bar	280								250	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		

EXPLOSION SCHEME



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

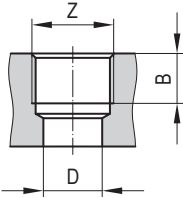
MOUNTING FLANGE - ISO STANDARD



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			10,4
GP2.5T28			85,00	42,50	G1"	G3/4"	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

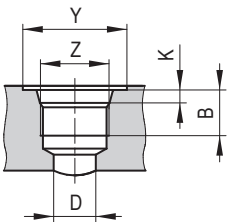
Ordering example: GP2.5T28R-Z1C5G-V
Rotation: R - Clockwise; L - Counterclockwise.

PORTS



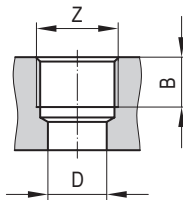
E METRIC THREADED

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

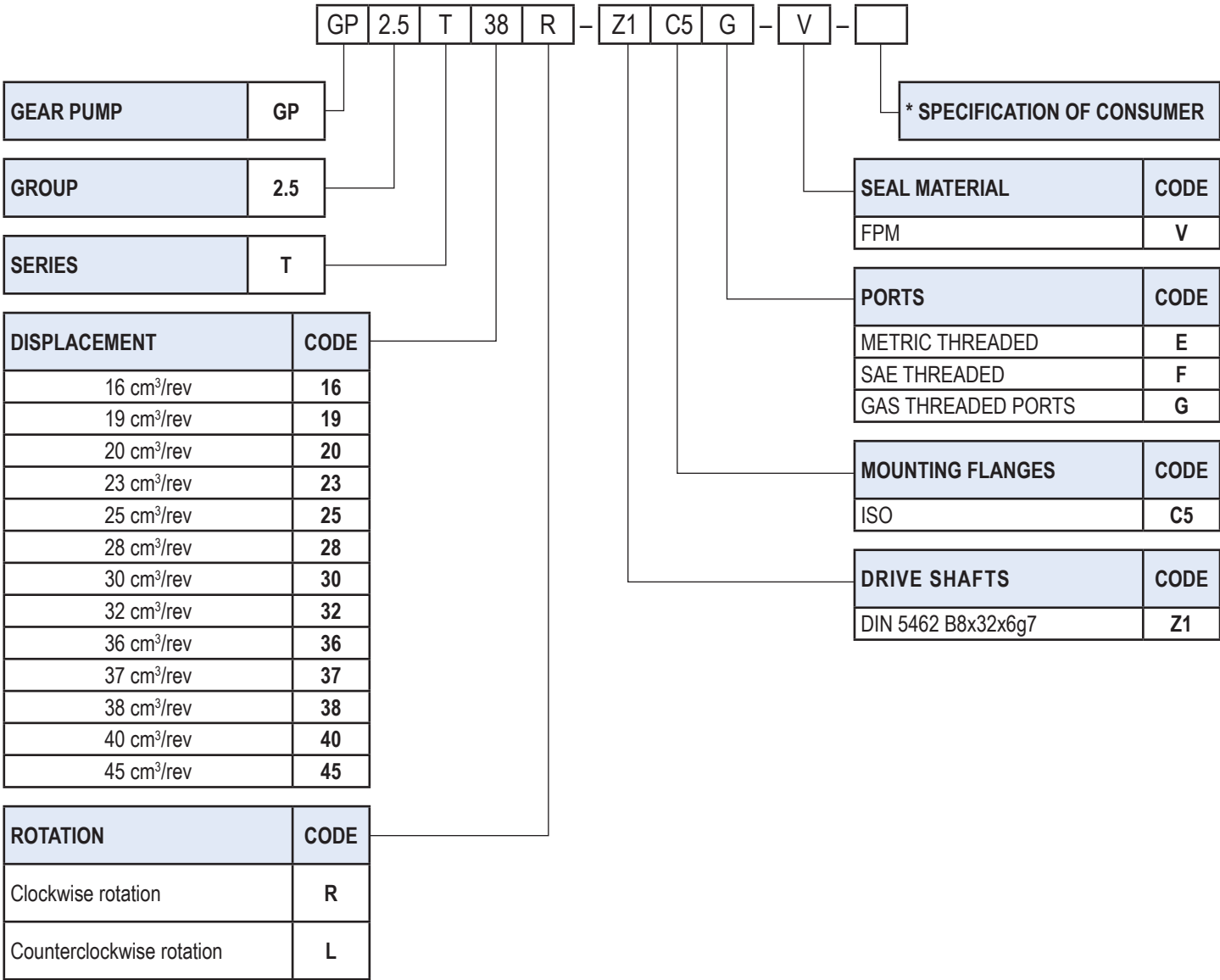
Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP2.5T16-23	1-1/16-12 UN (SAE#12)	19	20	42	3,3	7/8-14 UNF (SAE#10)	19	15	32	2,5
GP2.5T25-45	1-5/16-12 UN (SAE#16)		23	51		1-1/16-12 UN (SAE#12)		20	42	3,3



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



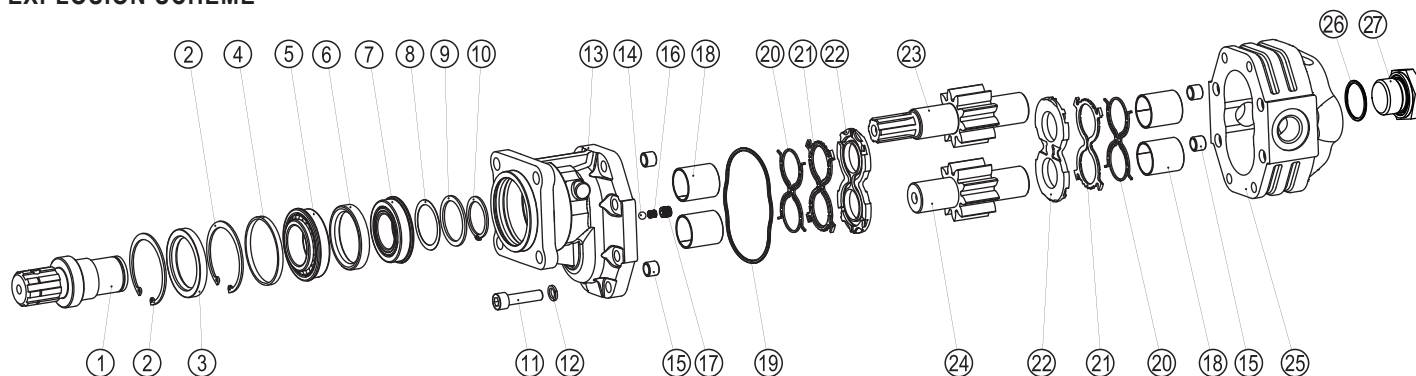
* Specification of consumer assigned if necessary after clarify special conditions with the customer

TECHNICAL DATA

Type		GP3T34	GP3T43	GP3T51	GP3T61	GP3T82	GP3T100
Displacement	cm³/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					

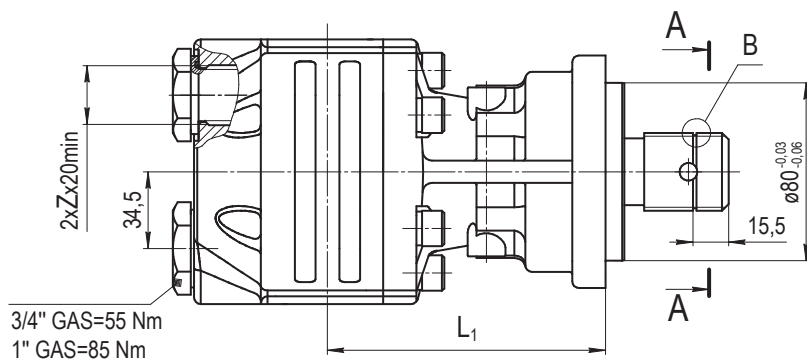
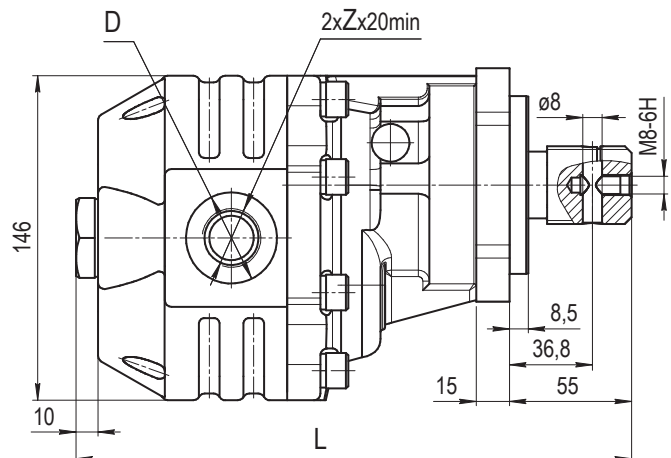
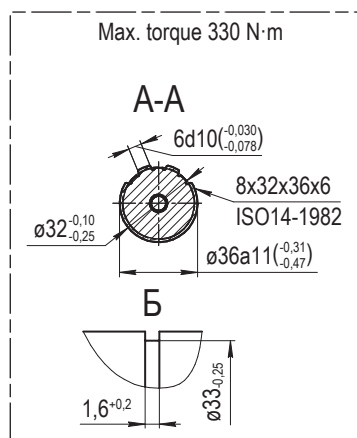
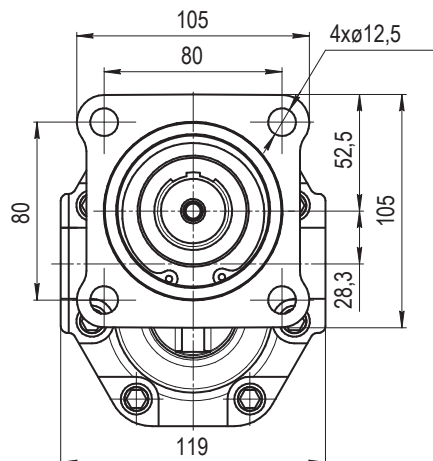
* Maximum pressures for reversible pumps are 15% lower than shown in table.

EXPLOSION SCHEME



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

MOUNTING FLANGE - ISO STANDARD

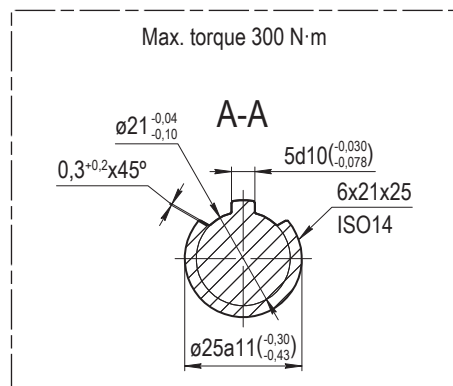
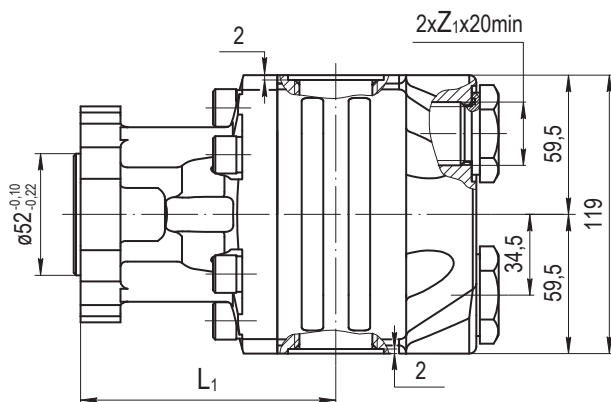
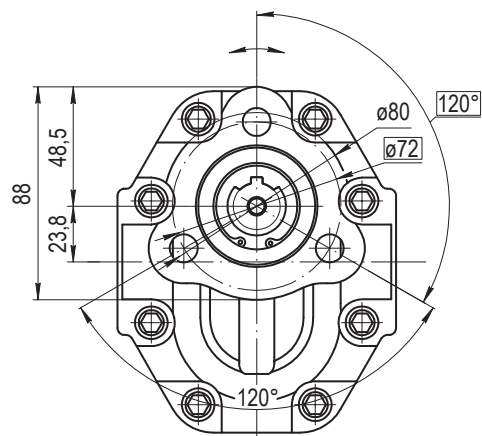
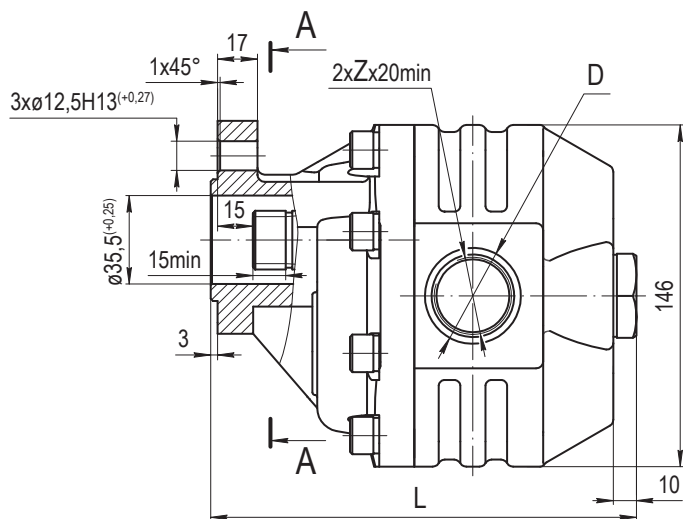


Type			Dimensions mm					Weight kg
			L	L ₁	D	Z	Z ₁	
GP3T34	R L B	Z1C5G-V	250	125	ø41	3/4" GAS		12,9
GP3T43			256	130				13,4
GP3T51			263	130,5	ø45	1" GAS		13,6
GP3T61			269	136,5				14,2
GP3T82			280	140,5	ø54	1 1/4" GAS	—	15,4
GP3T100			292	146				16,3

Ordering example: GP3T61L-Z1C5G-V

Rotation:

R - Clockwise; L - Counterclockwise; B - Reversible.

MOUNTING FLANGE - UNI STANDARD

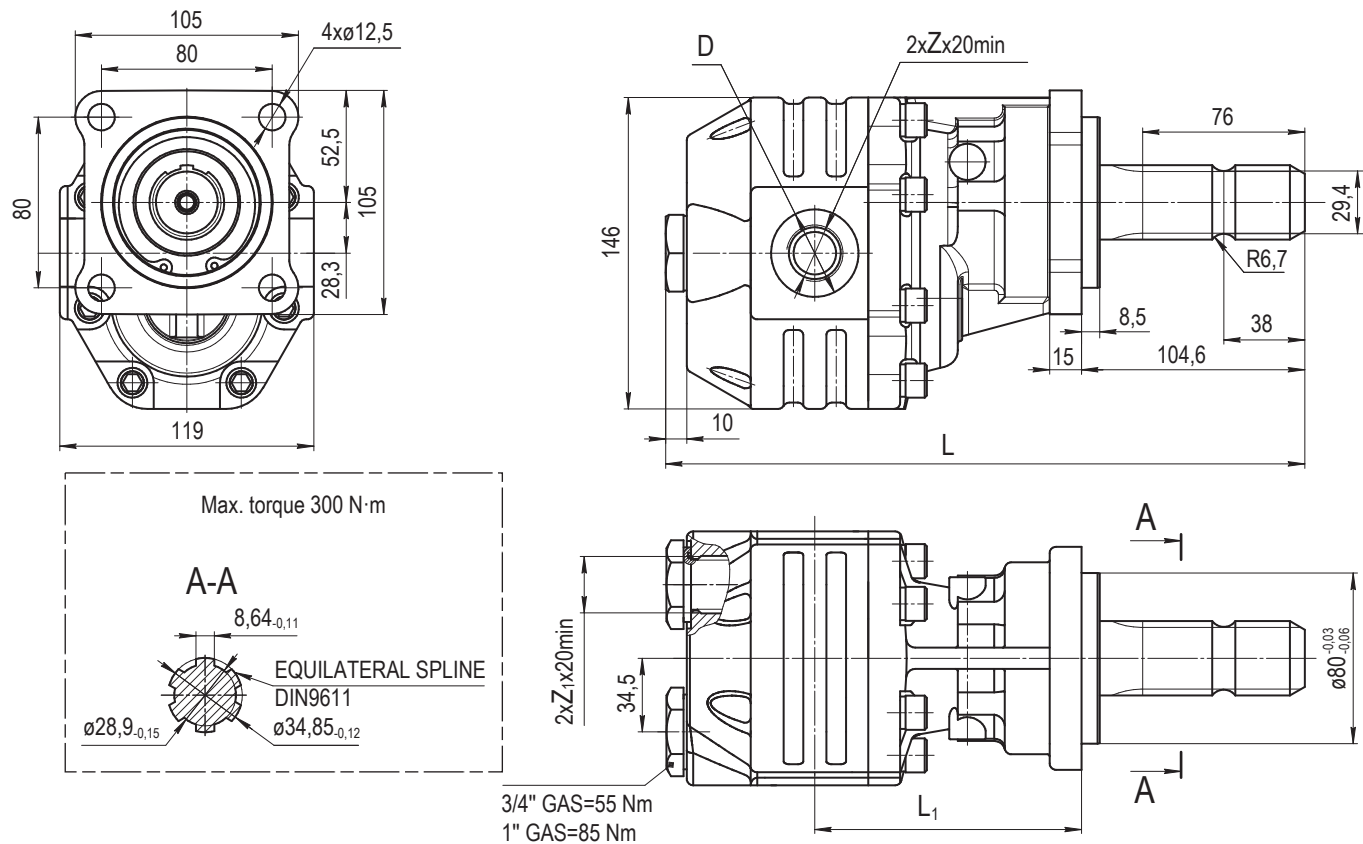
Type			Dimensions mm					Weight kg
			L	L ₁	D	Z	Z ₁	
GP3T34	R L B	Z2C7G-V	182	109	ø41	3/4" GAS		12,8
GP3T43			188	114				13,3
GP3T51			193	114,5	ø45	1" GAS		13,5
GP3T61			199	120,5				14,1
GP3T82			202	124,5	ø54	1 1/4" GAS	—	15,2
GP3T100			214	130				16,1

Ordering example: GP3T34R-Z2C7G-V

Rotation:

R - Clockwise; L - Counterclockwise; B - Reversible.

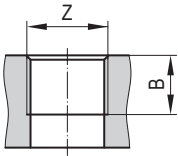
MOUNTING FLANGE - ISO STANDARD, SHAFT TO DIN 9611



Type			Dimensions mm					Weight kg
			L	L ₁	D	Z	Z ₁	
GP3T34	R L B	Z3C5G-V	300	125	$\varnothing 41$	3/4" GAS		12,9
GP3T43			306	130				13,4
GP3T51			313	130,5	$\varnothing 45$	1" GAS		13,6
GP3T61			319	136,5				14,2
GP3T82			330	140	$\varnothing 54$	1 1/4" GAS	—	15,4
GP3T100			342	146				16,3

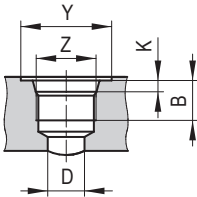
Ordering example: GP3T61L-Z3C5G
Rotation:
R - Clockwise; L - Counterclockwise; B - Reversible.

PORTS



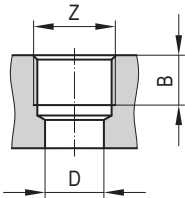
E METRIC THREADED

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



F SAE THREADED

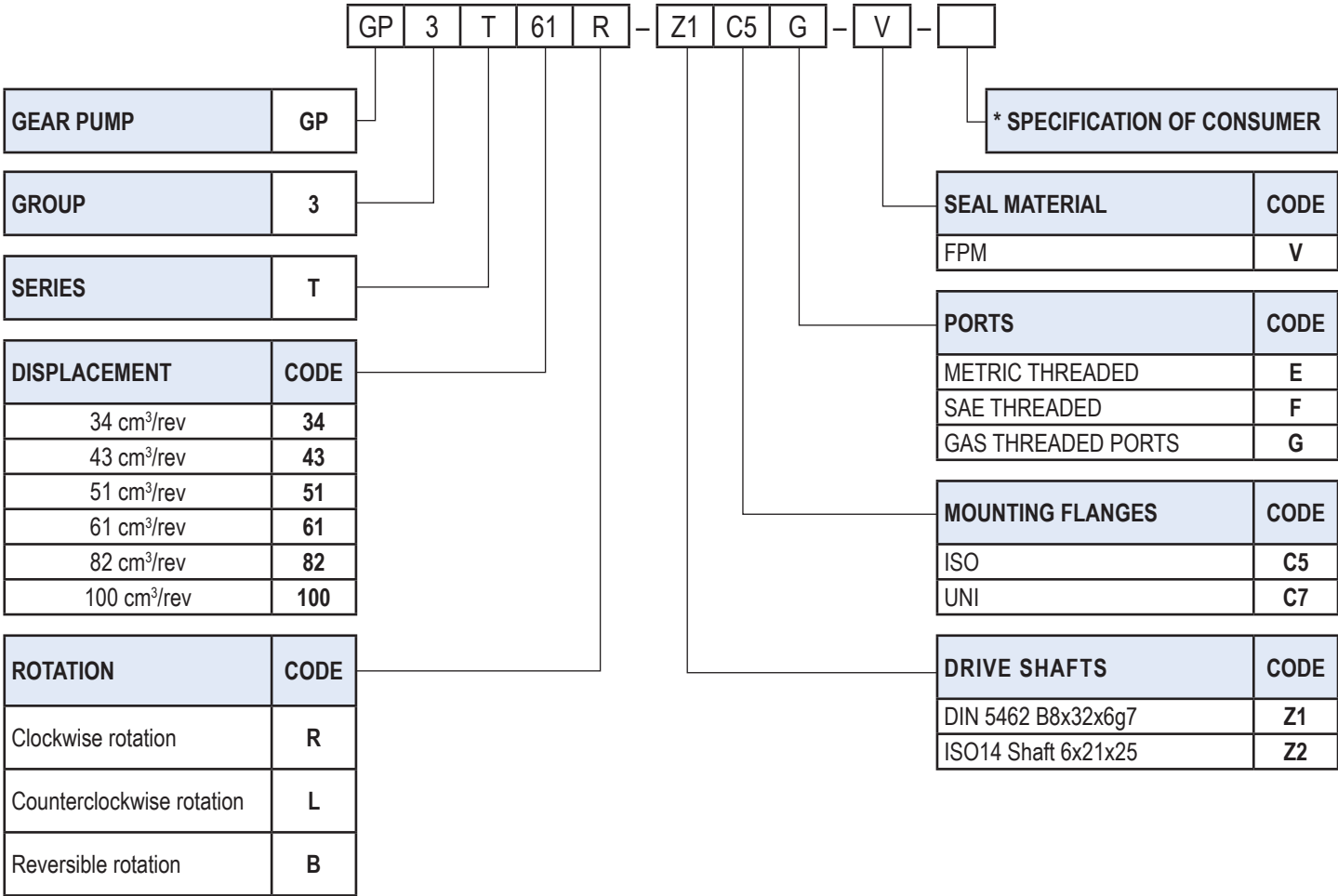
Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP3T34	1 5/16-12 UN	20	23	49	3,3	1 1/16-12 UN	19	20	41	3,3
GP3T43	1 5/8-12 UN		30	58		1 5/16-12 UN	20	23	49	
GP3T51										
GP3T61										
GP3T82						1 7/8-12 UN	37	65	1 5/8-12 UN	
GP3T100										



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			
GP3T100							

ORDERING INSTRUCTIONS

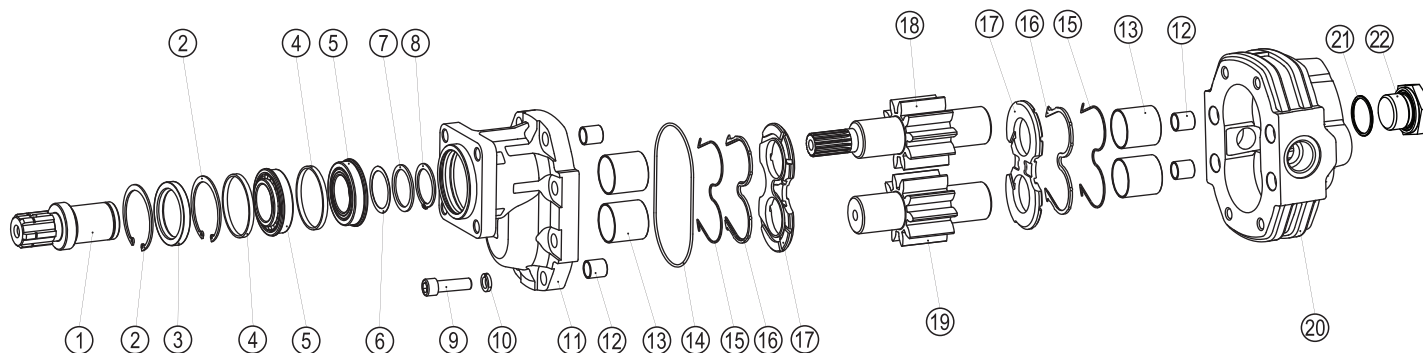


* Specification of consumer assigned if necessary after clarify special conditions with the customer

TECHNICAL DATA

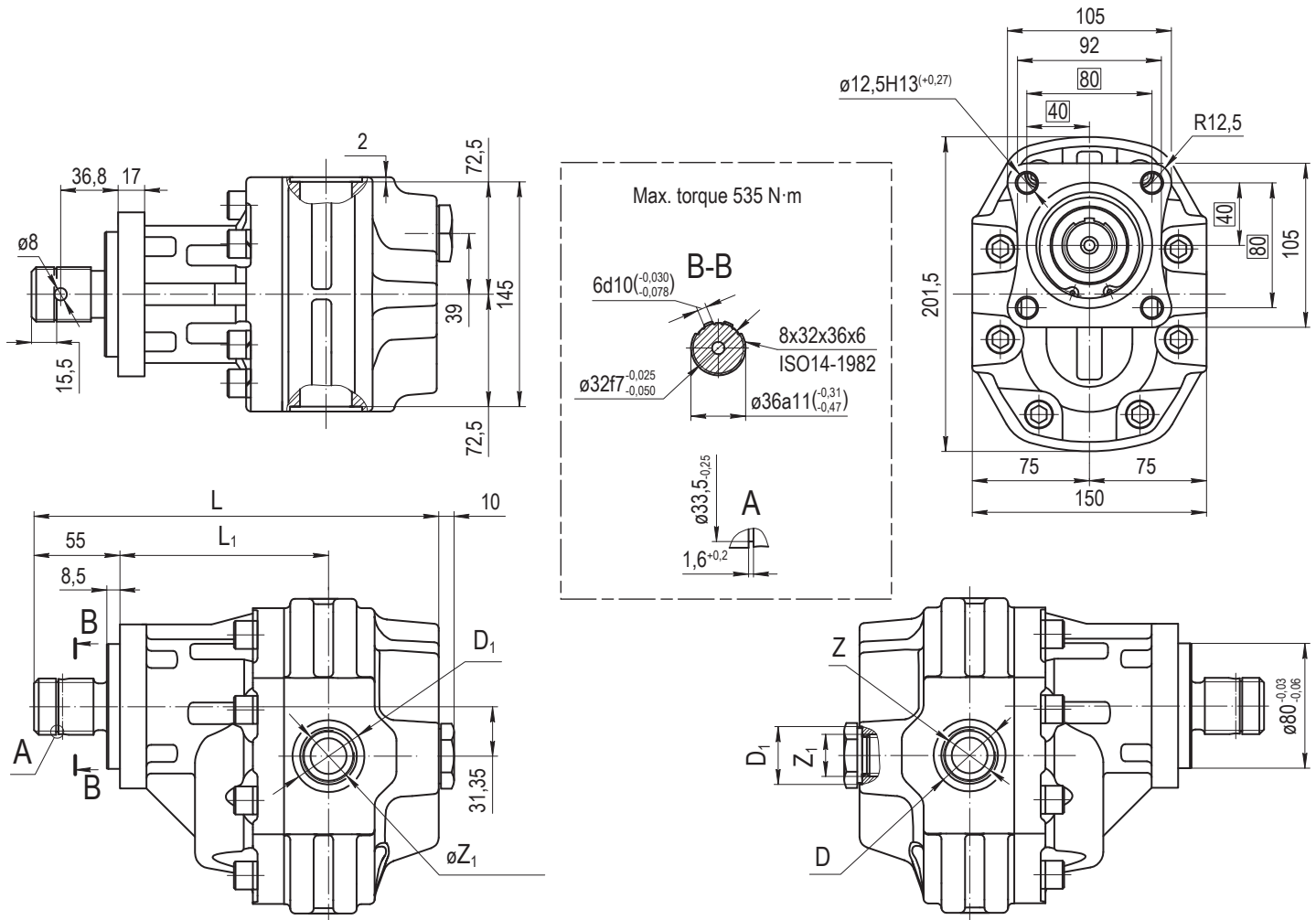
Type		GP4T63	GP4T73	GP4T86	GP4T100	GP4T119	GP4T135	GP4T150
Displacement	cm³/rev	63	73	86	100	119	135	150
Maximum continuous pressure, P ₁	bar	290	280	260	250	240	220	180
Maximum intermittent pressure, P ₂	bar	315	300	280	270	260	250	210
Max. peak pressure, P ₃	bar	325	315	290	280	270	260	220
Maximum rotational speed	min ⁻¹	2700					2500	
Minimum rotational speed	min ⁻¹	300						

EXPLOSION SCHEME



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

MOUNTING FLANGE - ISO STANDARD



Type			Dimensions mm					
			L	L1	D	D1	Z	Z1
GP4T63	R L	Z1C5G-V	259	136,5	ø46,1	ø37	1" GAS	3/4" GAS
GP4T73			262	140,5				
GP4T86			266	141,0	ø54	ø46,1	1 1/4" GAS	1" GAS
GP4T100			272	144,5				
GP4T119			278	150,5				
GP4T135			284	153,5	ø60,5	1 1/2" GAS		
GP4T150			289	158,5				

Ordering example: GP4T86R-Z1C5G-V

Rotation: R - Clockwise; L - Counterclockwise.

* Weight of pumps have to clarify with manufacturer.

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

* SPECIFICATION OF CONSUMER

SEAL MATERIAL	CODE
FPM	V

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

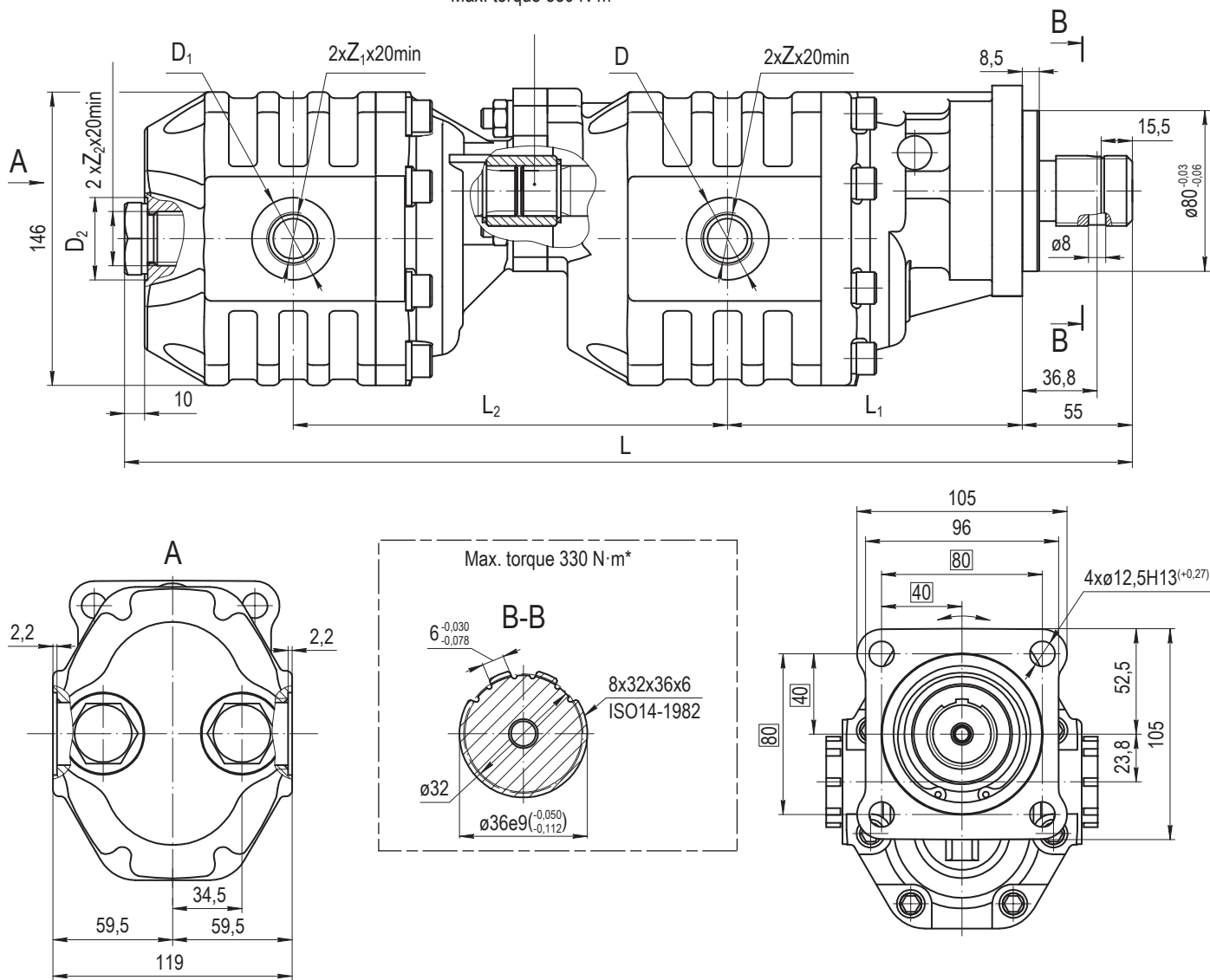
MOUNTING FLANGES	CODE
ISO	C5

DRIVE SHAFTS	CODE
DIN 5462 B8x32x6g7	Z1

* Specification of consumer assigned if necessary after clarify special conditions with the customer

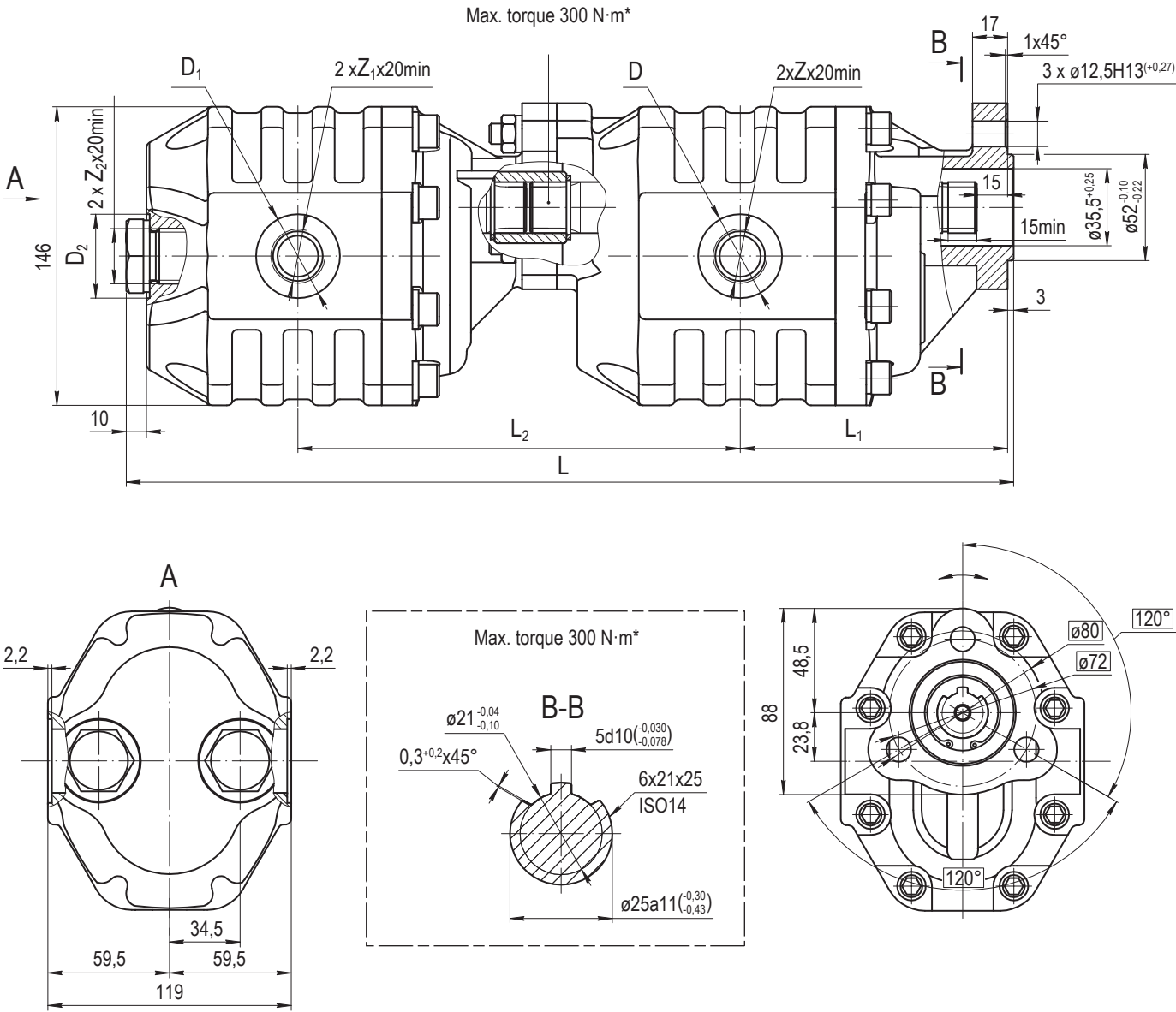
MULTIPLE PUMPS GROUPS 3+3. MOUNTING FLANGE - ISO STANDARD

Max. torque 330 N·m*



Type			Dimensions mm								Weight kg
			L	L ₁	L ₂	D	D ₁	D ₂	Z	Z ₁	
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	1" GAS	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					

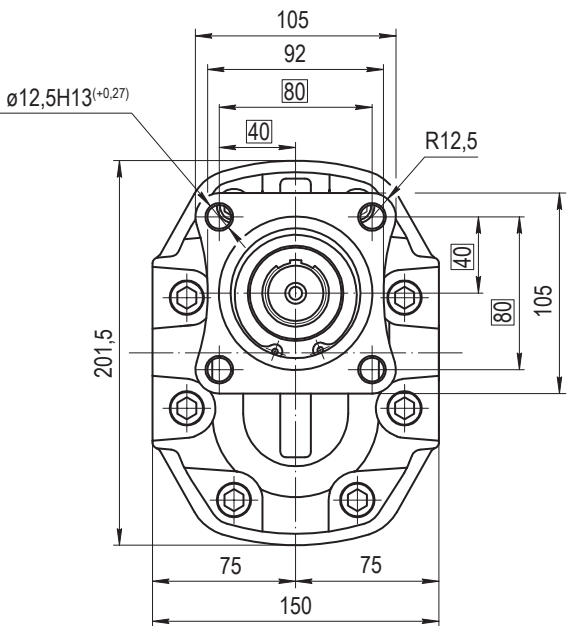
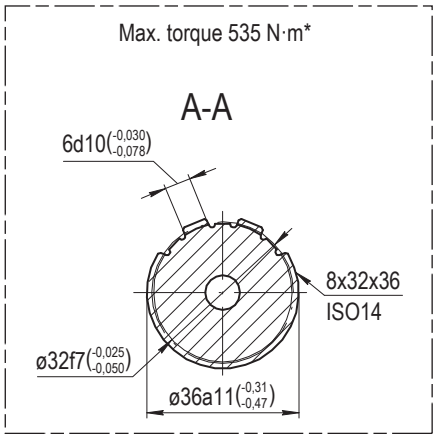
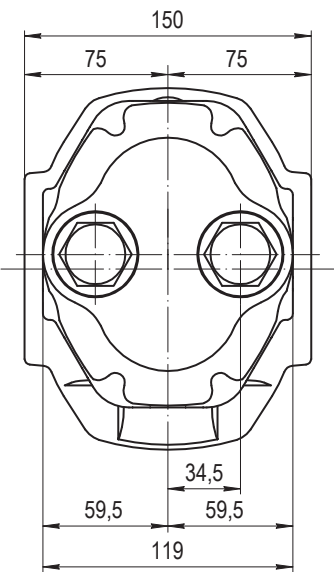
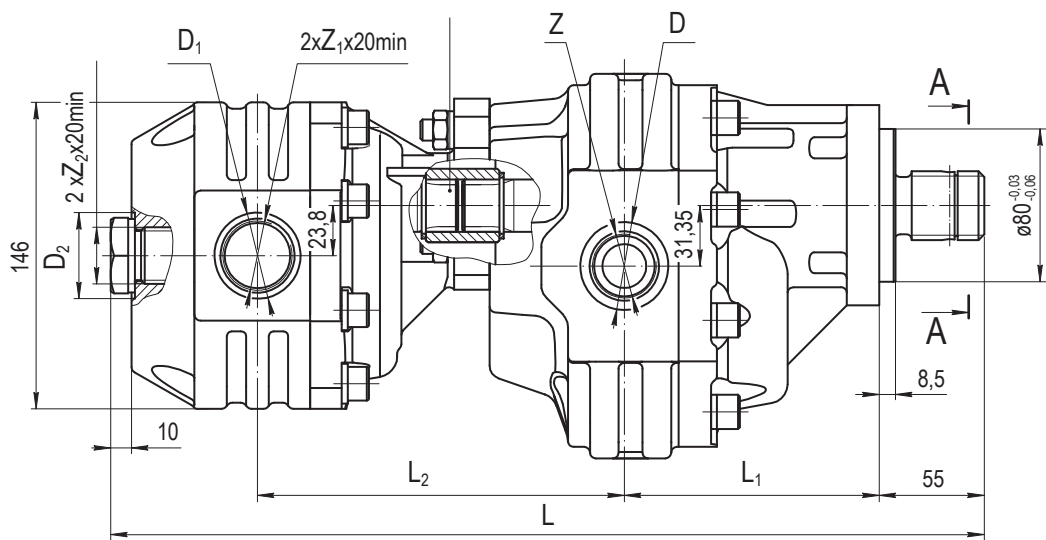
MULTIPLE PUMPS GROUPS 3+3. MOUNTING FLANGE - UNI STANDARD



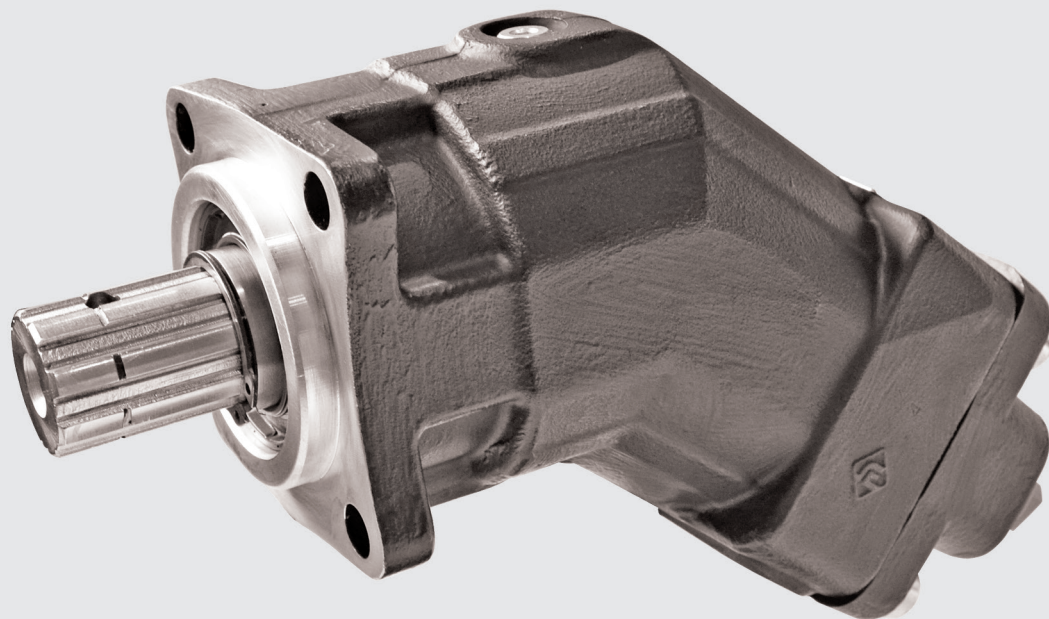
Type			Dimensions mm									
			L	L ₁	L ₂	D	D ₁	D ₂	Z	Z ₁	Z ₂	Weight kg
GP3T34/3T34	R L	Z2C7GG-V	355	109	179	ø41			3/4" GAS			26,9
GP3T43/3T34			362	114	177							27,5
GP3T43/3T43			367		182							28,0
GP3T51/3T34			371,5	114,5	181,5	ø46,1	ø41	1" GAS	3/4" GAS	27,7		
GP3T51/3T43			376,5		186,5					28,2		
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 GROUPS 4+3. MOUNTING FLANGE - ISO STANDARD

Max. torque 300 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	—	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	
GP4T150/3T43			471		186,5		40,7							



**FIXED DISPLACEMENT BENT AXIS
AXIAL-PISTON PUMPS SERIES BF20T, BF20TH**

GENERAL INFORMATION**PBF20T, PBF20TH**

Fixed displacement bent axis axial piston pumps in a high strength aluminum alloy (PBF20T) and cast iron (PBF20TH) body.

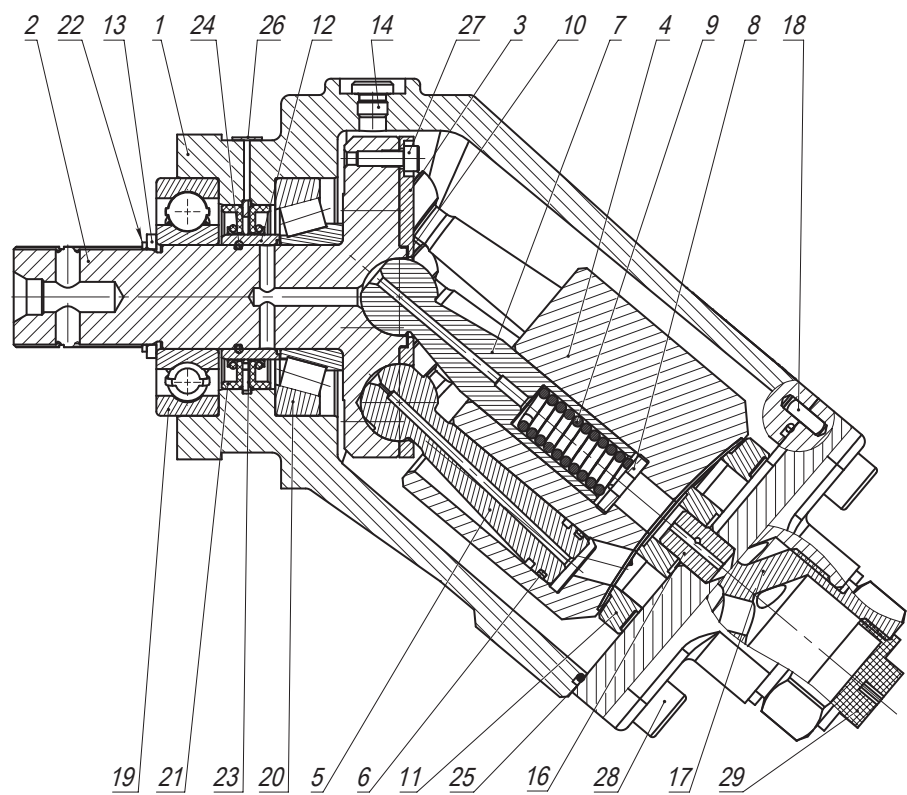
The possibility of mounting directly on the PTO makes these pumps an excellent solution for use on commercial vehicles and special vehicles on the chassis.

- High pressure pump for hydraulic systems with open circuit.
- Displacement 56...107 cm³.
- Rated pressure 350 bar.
- Maximum pressure 400 bar.
- Mounting directly on the PTO.
- Aluminum alloy or high cast iron body.

DESIGN FEATURES

- Construction bent axis block design, inclination angle 40 degrees.
- High hydromechanical efficiency.
- Aluminum alloy or high cast iron body.
- Mounting directly on the PTO.
- Mounting flanges according to ISO 7653.
- Drive shafts according to DIN ISO 14.
- Conical plungers with compression rings.
- Bimetallic block cylinder of unit has a high wear resistance.
- No drainage line is required.
- Simple change of rotation direction.

PBF20T AND PBF20TH PUMPS LAYOUT, SIZE 56, 63, 80, 107 CM³



PBF20T (TH) (56, 63, 80, 107 cm³)			
POSITION	NAME	POSITION	NAME
1	Body	14	Plug
2	Shaft	15	Cover
3	Separator	16	Pin-orifice
4	Cylinder block	17	Pump adapter
5	Piston	18	Pin
6	Compression ring	19, 20	Bearing
7	Pin	21	Cuff
8	Cylindrical pin	22, 23	Lock ring
9	Spring		
10, 13	Adjusting washer	24, 25	O-ring
11	Spreader	26	Plate
12	Bushing	27, 28	Screw
		29	Transport plug

ORDER CODE

PBF20	T	.	63	/	R	E8	1	N			
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FIXED DISPLACEMENT AXIAL PISTON PUMP	PBF20T
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SERIES	CODE
Aluminum alloy body	T
Cast iron body	TH

DISPLACEMENT, CM ³		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	CODE

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

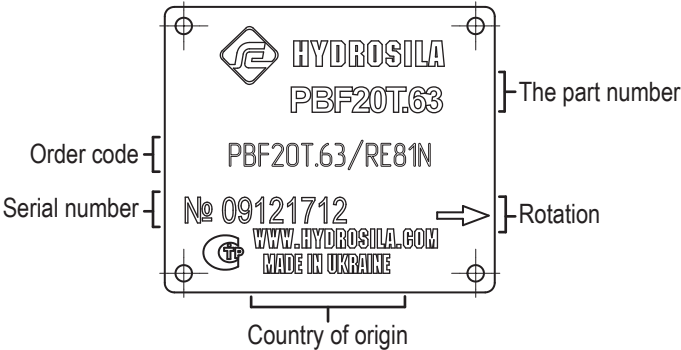
ORDERING EXAMPLE

PBF20T.63/RE81N

PBF20 - bent axis axial piston pump,
T - aluminum body,
63 - displacement 63 cm³,
R - clockwise rotation,
E8 - drive shaft: splined, acc. to DIN ISO 14,
1 - ports options,
N - climatic version - temperate.

PBF20TH.80/RE81N

PBF20 - bent axis axial piston pump,
TH - cast iron body,
80 - displacement 80 cm³,
R - clockwise rotation,
E8 - drive shaft: splined, acc. to DIN ISO 14,
1 - ports options,
N - climatic version - temperate.



TECHNICAL SPECIFICATIONS SERIES PBF20T

SIZE		PBF20T.56	PBF20T.63	PBF20T.80	PBF20T.107
Displacement, V _g	cm ³	56,1	63	80,4	106,7
Speed	min ⁻¹				
minimum		500			
rated, at inlet pressure P _{abs} =0,8 bar		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	bar				
rated		300			
maximum, t≤6 sec		350			
Inlet pressure, P	bar				
minimum		0,8			
rated		1			
maximum		2			
Flow*, Q	l/min				
minimum		28	32	40	53
rated		105	118	147	181
maximum		123	139	173	213
limit		180	202	249	299
Input power*, N	kW				
rated, at inlet pressure P _{abs} =0,8 bar and pressure drop Δp=300 bar		52	59	74	91
maximum, at inlet pressure P _{abs} =1,0 bar and pressure drop Δp=350 bar		72	81	101	124
Efficiency					
hydromechanical		0,96			
volumetric		0,95			
Weight (without fluid), no more	kg	8,2		10,6	15,0

* Without efficiency

TECHNICAL SPECIFICATIONS SERIES PBF20TH

SIZE		PBF20TH.56	PBF20TH.63	PBF20TH.80	PBF20TH.107
Displacement, Vg	cm³	56,1	63	80,4	106,7
Speed	min ⁻¹				
minimum		500			
rated, at inlet pressure P _{abs} =0,8 bar		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	bar				
rated		350			
maximum, t≤6 sec		400			
Inlet pressure, P	bar				
minimum		0,8			
rated		1			
maximum		2			
Flow*, Q	l/min				
minimum		28	32	40	53
rated		105	118	147	181
maximum		123	139	173	213
limit		180	202	249	299
Input power*, N	kW				
rated, at inlet pressure P _{abs} =0,8 bar and pressure drop Δp=350 bar		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

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

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 (cm³)

Δp — pressure drop (bar)

n — speed (min⁻¹)

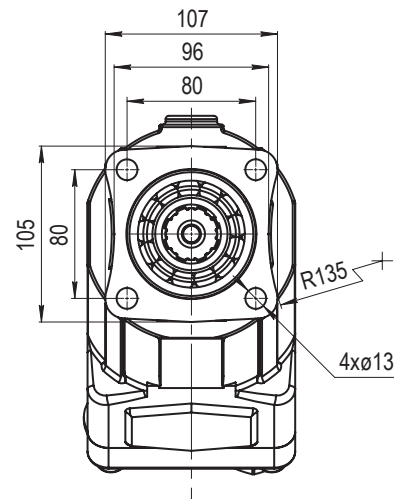
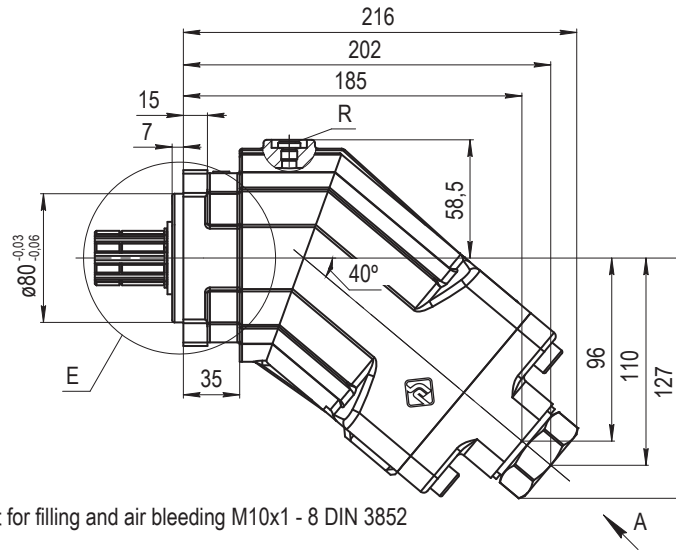
η_v — volumetric efficiency

η_{mh} — hydromechanical efficiency

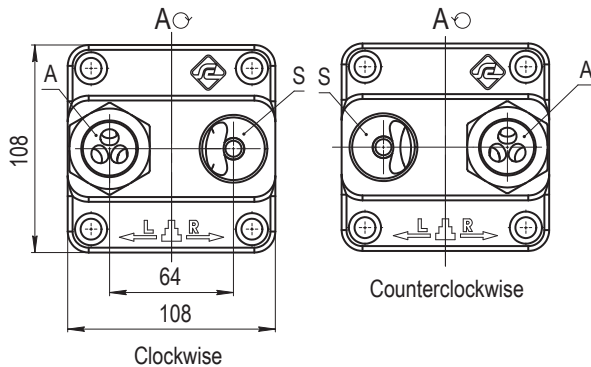
η_t — overall efficiency

DIMENSIONS PUMPS SERIES PBF20T(TH) 56, 63 CM³

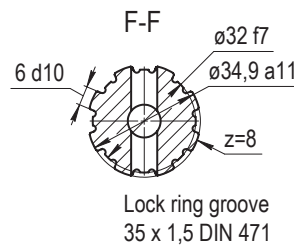
Mounting flange ISO 7653-1985



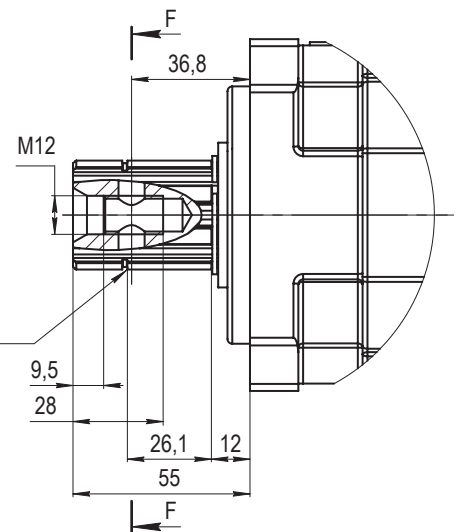
R - port for filling and air bleeding M10x1 - 8 DIN 3852



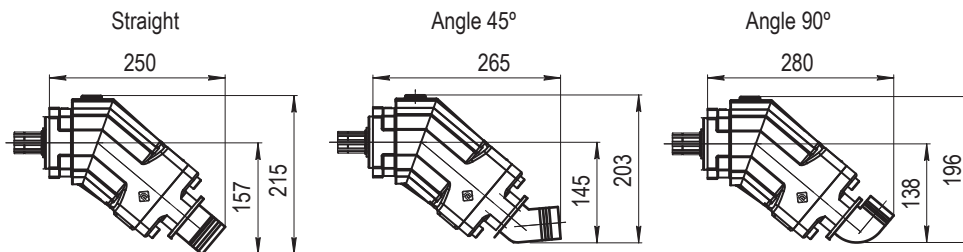
A - pressure line G3/4 - 16 DIN ISO 228
S - suction line G1 - 18 DIN ISO 228



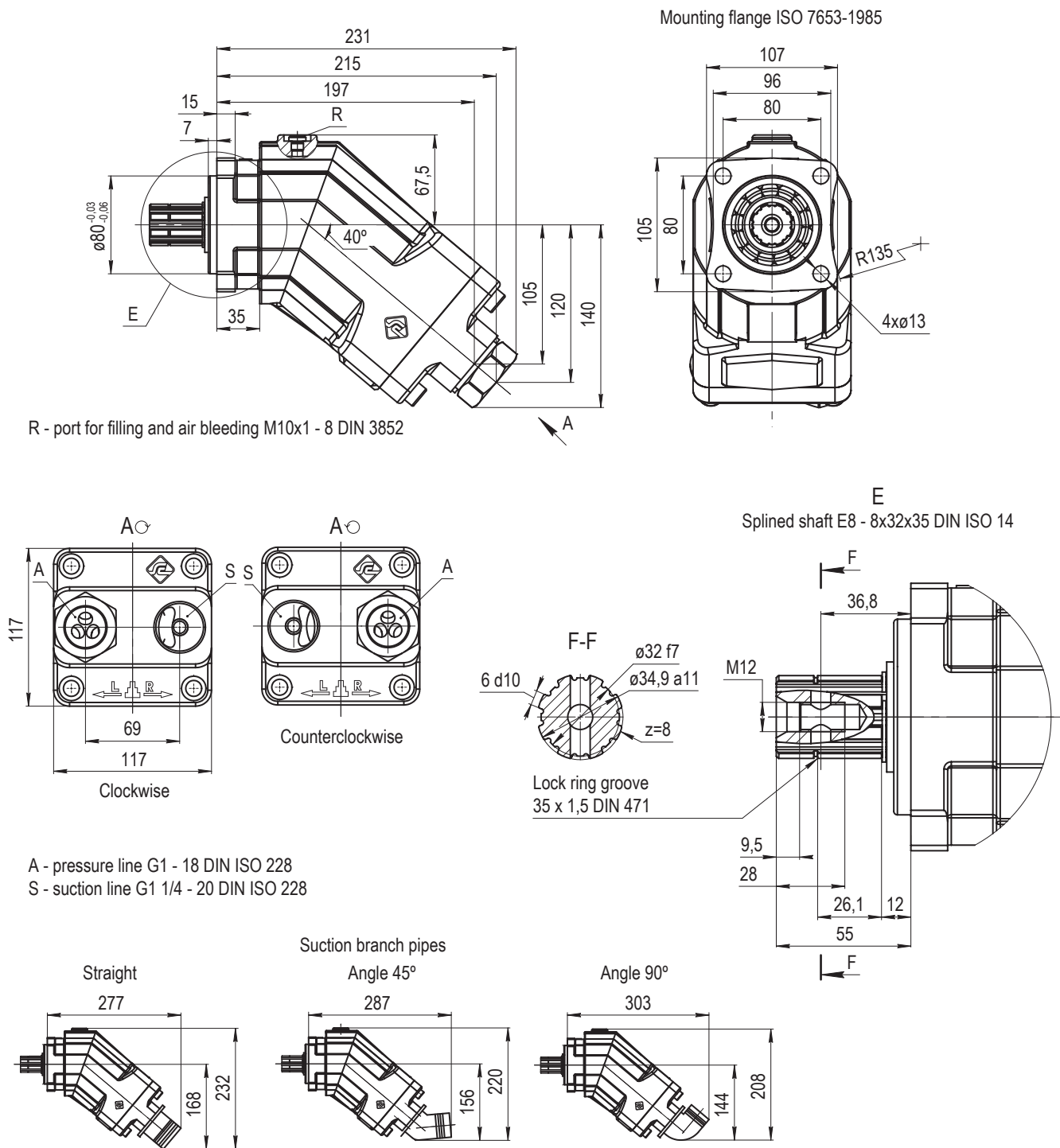
E
Splined shaft E8 - 8x32x35 DIN ISO 14



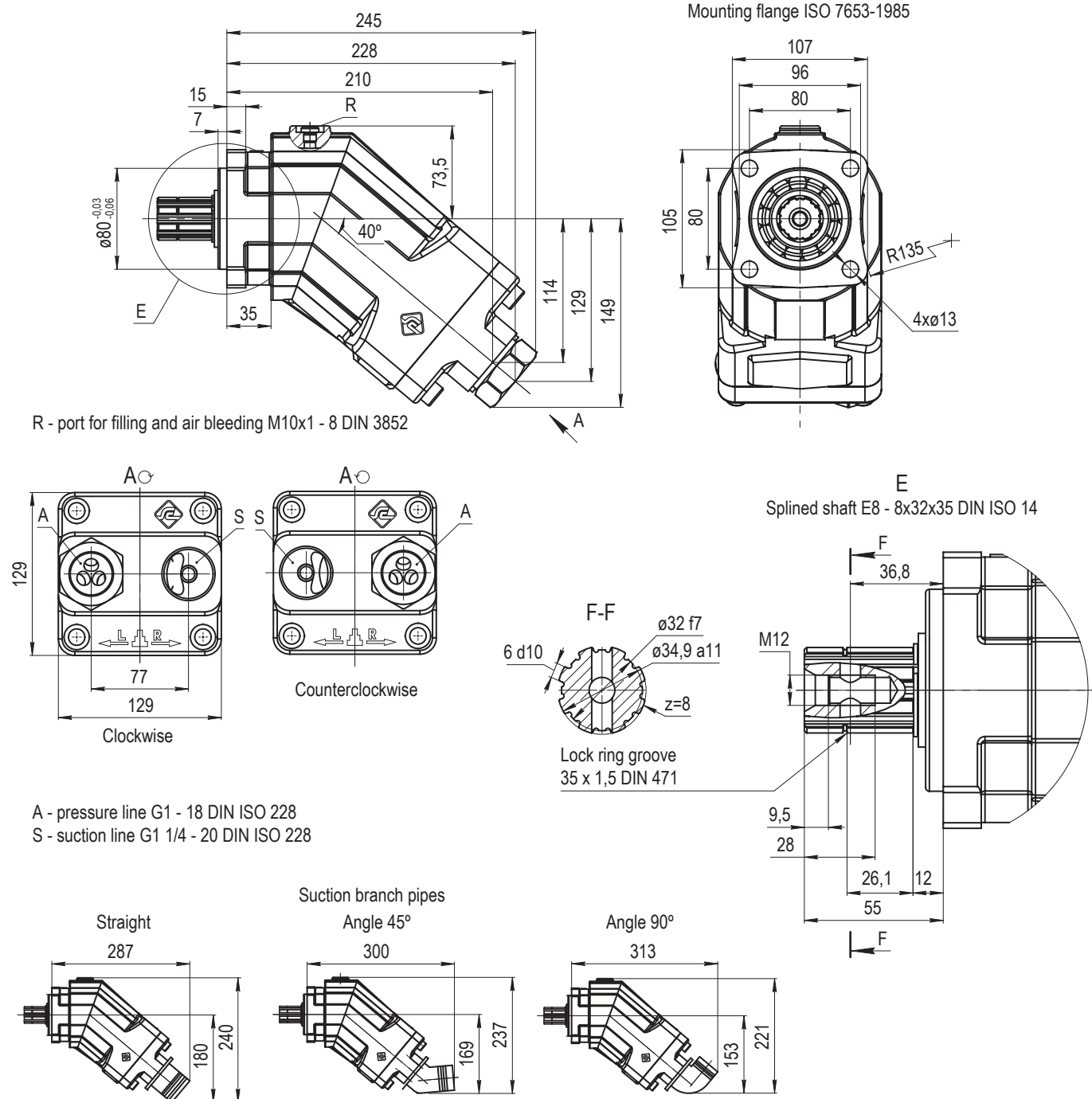
Suction branch pipes



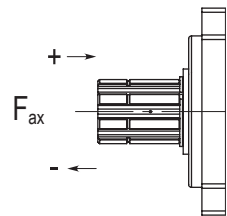
DIMENSIONS PUMPS SERIES PBF20T(TH) 80 CM³



DIMENSIONS PUMPS SERIES PBF20T(TH) 107 CM³



LOAD AND DURABILITY (FOR PBF20T AND PBF20TH SERIES PUMPS)



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.

HYDRAULIC FLUID

All parameters and characteristics of hydraulic units suggest that hydraulic system uses high quality hydraulic fluids and additives. They should have a number of properties: anticorrosive, antioxidant, anti-foam, and others. These fluids are high-quality turbine oils, API CD SAE J183 engine oil, automatic transmission fluids (ATF) and some specialty fluids.

Never mix different fluids.

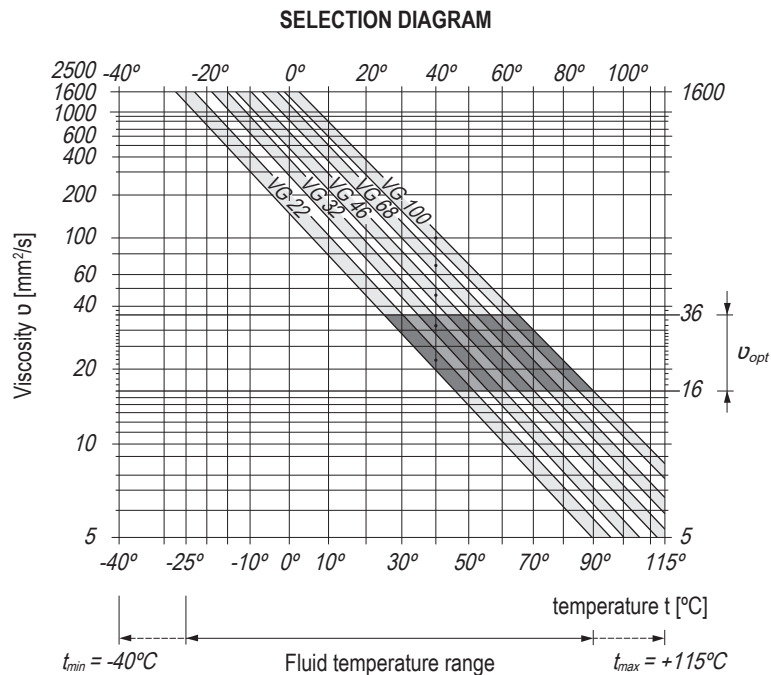
HYDRAULIC FLUID CHOICE

For the correct choice you need to know the working temperature of the fluid in the hydraulic tank (depending on the ambient temperature) and the viscosity of the fluid. The fluid must be selected so that the viscosity be within the allowable range (V_{opt}) at any temperature (t_{min} - t_{max}), (see diagram). It is recommended to select a higher temperature class of the working fluid.

EXAMPLE.

At an ambient temperature of $X^{\circ}\text{C}$, an operating temperature of 60°C is set. In the optimum working range of (V_{opt}) viscosity, this corresponds to classes VG 46 and VG 68. The right choice is VG 68. The temperature of fluid in the drain channel is always higher than the temperature in the tank. At any point in the hydraulic system fluid temperature should not exceed 90°C .

If it is not possible to comply with temperature conditions, consult for advice.



HYDRAULIC FLUID FILTRATION

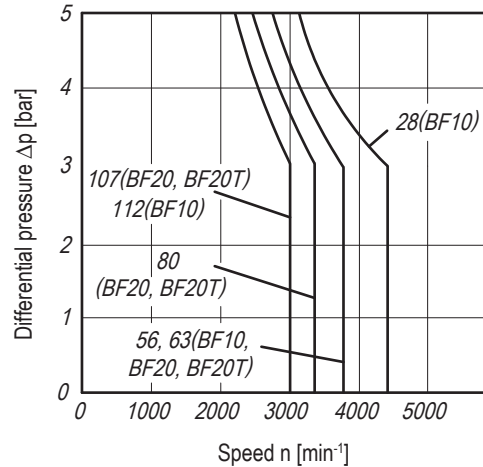
The better filtration provides the higher purity class of the working fluid, which in turn increases the axial piston unit lifetime. To ensure reliable operation of the axial piston unit, it is necessary to determine the working fluid purity according to ISO 4406. At very high temperatures of the working fluid (from 90°C to a maximum of 115°C), a purity class at least 19/17/14 according to ISO 4406 is required. If it is impossible to comply with the purity class, please consult.

VISCOSITY AND TEMPERATURE OF WORKING FLUID

CONDITIONS	VISCOSITY	TEMPERATURE	NOTES
Storage and transportation		$T_{min} \geq -40^{\circ}C$ $T_{opt} = +5^{\circ}C...+20^{\circ}C$	Storage at the factory: Standard – up to 12 months; Long-term – up to 24 months
Cold start	$\nu_{max} \leq 1600\text{ mm}^2/s$	$T \geq -40^{\circ}C$	$t \leq 3\text{ min}$, $n \leq 1000\text{ min}^{-1}$, no load $P \leq 50\text{ bar}$
Permissible temperature drop		$T \leq 25^{\circ}C$	The temperature difference between the axial piston pump and the working fluid in the system
Warm-up period	$\nu = 1600...400\text{ mm}^2/s$	$T = -40^{\circ}C...-25^{\circ}C$	at $P \leq 0.7 \cdot P_{nom}$, $n \leq 0.5 \cdot n_{nom}$ $t \leq 15\text{ min}$
Continuous operating mode	$\nu = 400...10\text{ mm}^2/s$		In case of VG 46 corresponds to a temperature range of $+5^{\circ}C$ to $+85^{\circ}C$
		$\Delta T = 12^{\circ}C$ $T = -25^{\circ}C...+103^{\circ}C$	The temperature difference between the cuff, bearing and drainage Temperature in drain line
	$\nu_{opt} = 36...16\text{ mm}^2/s$		Optimal viscosity range in operating mode
Short-term operating	$\nu_{min} \geq 7\text{ mm}^2/s$	$T = +103^{\circ}C$	$t < 3\text{ min}$, $p < 0.3 \cdot P_{nom}$

SHAFT SEAL

The shaft seal service life depends on the shaft speed and drain pressure. The diagram shows the dependence of the shaft speed on the case pressure that acts on the seal from the pump cavity. When the hydraulic unit is operating at the maximum allowable drain pressure, the shaft seal life is reduced. Short-term pressure ($t < 0,1$ sec) up to 10 bar is allowed, but with the increasing the pressure pulsation frequency the shaft seal service life is reduced. The case pressure must be equal to or higher than the ambient pressure.

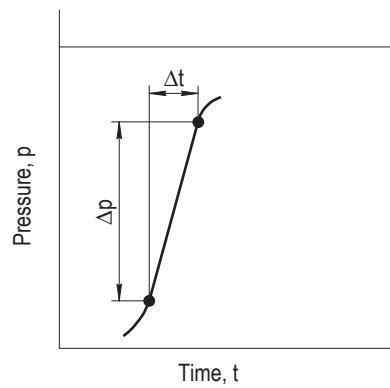


Maximum case pressure:

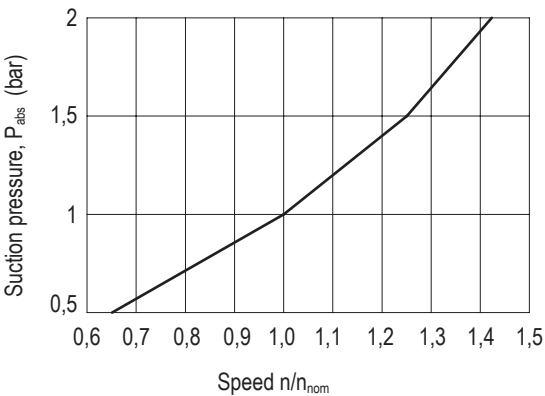
- 1 bar - for 28 cm³ series BF10
- 2,5 bar - 56 cm³ and 112 cm³ series BF10, BV10
- to 3 bar - 56 cm³, 63 cm³, 80 cm³, 107 cm³ series BF20, BF20T

SUCTION PRESSURE AT INCREASED SPEED

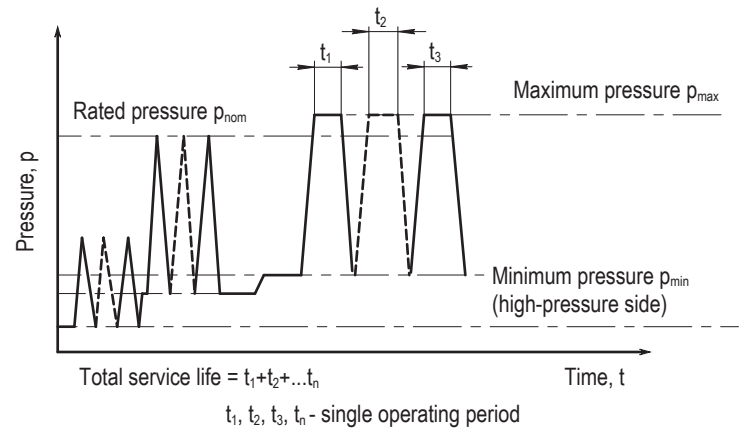
PRESSURE CHANGE RATE



SHAFT ROTATION SPEED TO SUCTION PRESSURE RATE



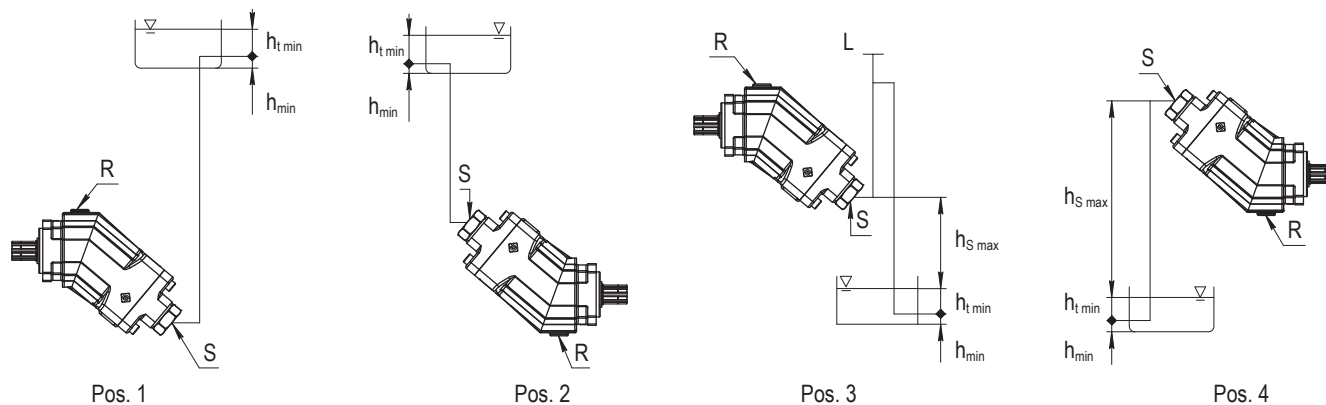
OPERATING PERIODS OF THE PUMP THROUGHOUT THE ENTIRE SERVICE LIFE



INSTALLATION POSITION FOR PUMPS PBF20T(TH)

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.**



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 is installed 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

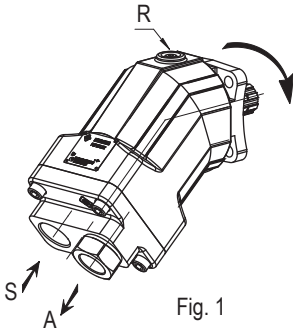
The rotation of the shaft is determined by the location of the pressure "A" and suction "S" lines. Adapter is located in the pressure line.

Changing the rotation of the pump shaft is done by reinstalling the pressure line adapter (line "A") from one port to another. For details of changing the direction of rotation see "Instruction for changing the direction of rotation of the pumps PBF20T, PBF20TH".

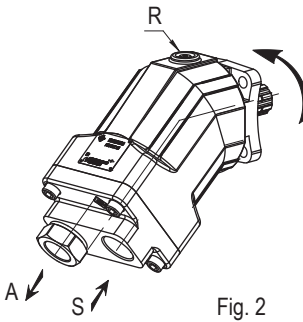
Tightening of threaded connections

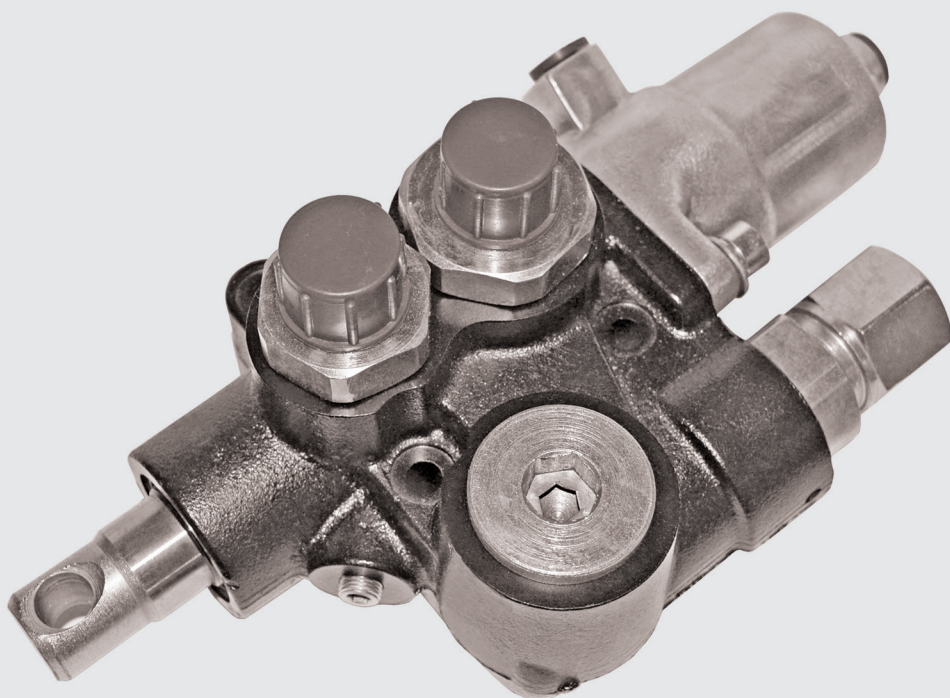
	Air bleed R	Pressure line "A"		Suction line "S"
	M10x1	G3/4	G1	G1 ¼
Tightening torque, Nm	5	60	60	60

Counterclockwise rotation (pressure line adapter on the right side)



Clockwise rotation (pressure line adapter on the left side)





TIPPING VALVES

TIPPING VALVES

TECHNICAL SPECIFICATIONS

Control valves specially designed for tipper trucks. Proportional directional control valves are designed for open center hydraulic systems. Maximum flow up to 220 lpm and maximum pressure up to 350 bar. These valves can be mounted on a frame or on a oil tank, and equipped with various connection fittings.

Features:

- cast iron body for high pressures;
- chrome-plated spool;
- galvanic coating for corrosion protection;
- built-in safety valves;
- various types of spool control;
- mounting on a chassis or on a oil tank.

Model	Rated flow, lpm	Maximum flow, lpm	Rated pressure, bar	Maximum pressure, bar	Number of spools
MR40.T1	40	50	140	240	1
MR80.T1	80	100	140	280	1
MR100.T1	100	150	160	280	1
MR100.T2	100	150	160	210	1
MR100.T4	100	150	160	210	2
MR220.T1	180	220	250	350	1

FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 50 lpm. Suitable for light-duty tipper trucks with a lifting capacity up to 5 tons.

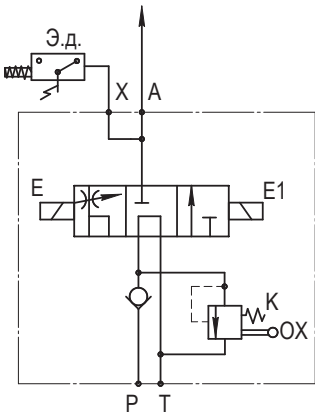
Features:

- hydraulic circuit with open center;
- electric control;
- built-in check valve and adjustable relief valve;
- chassis or oil tank mounting;
- mechanical end-of-stroke;
- pressure gauge port.

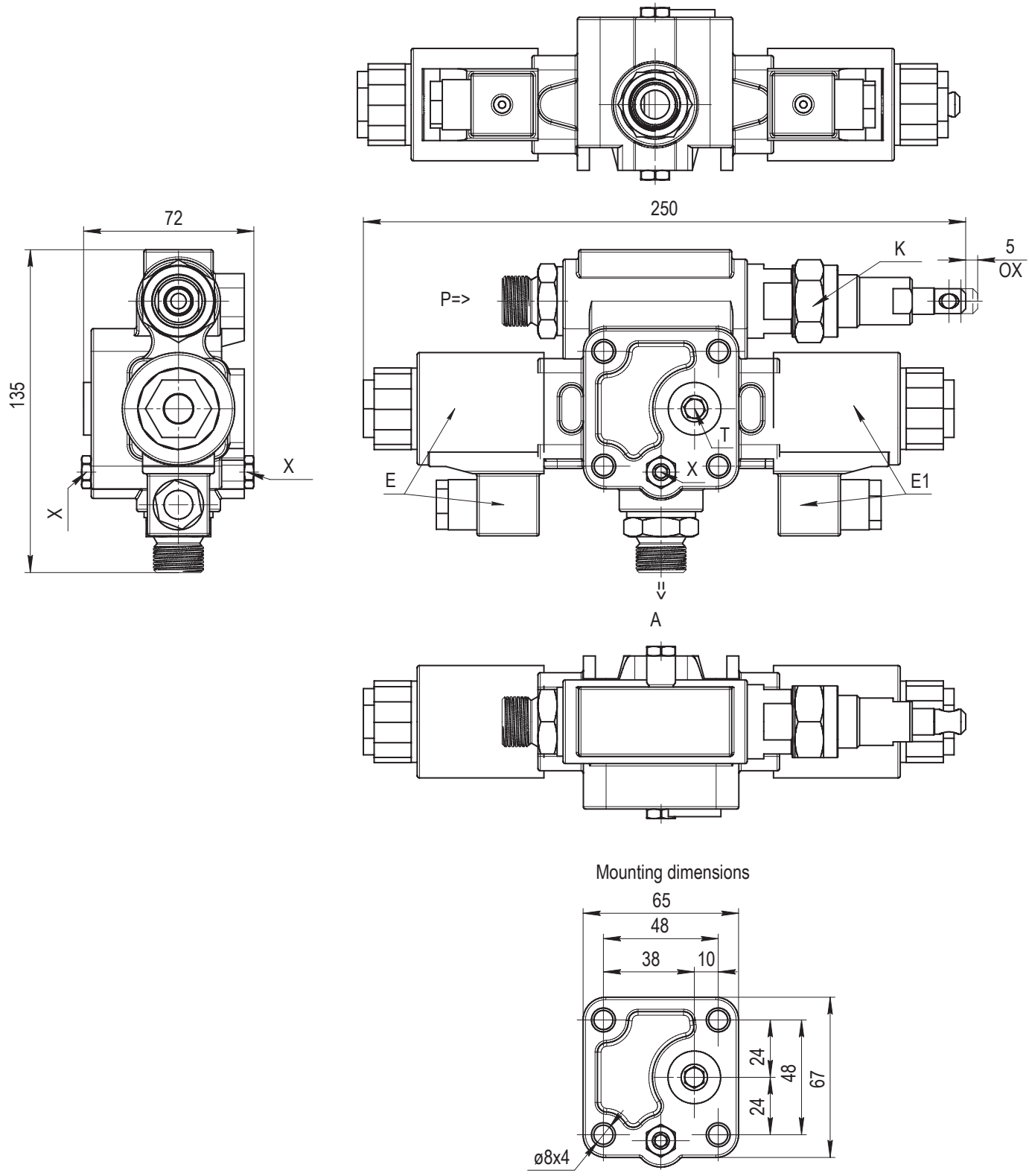
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	40
Maximum	50
Inlet pressure, bar:	
Rated	140
Maximum	240
Voltage, V	12
Switching valve amperage, A	3,75±1,25
Weight, kg	3,95

HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	G1/2"
E, E1	Electromagnets (E - lowering, E1 - tipping)	-
X	Electric detector port (potr plugged when not in use)	K1/8"
K	Relief valve, direct acting	-
P	Inlet port	G1/2"
T	Outlet port	G1/2"
OX	Mechanical end-of-stroke	-



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 50 lpm. Suitable for light-duty tipper trucks with a lifting capacity up to 5 tons.

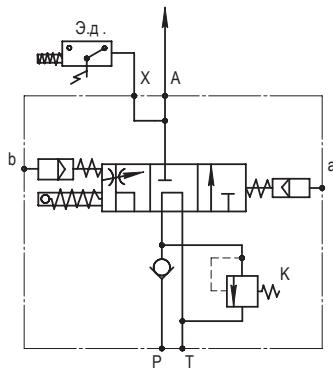
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in check valve and adjustable relief valve;
- chassis or oil tank mounting;
- mechanical end-of-stroke;
- pressure gauge port.

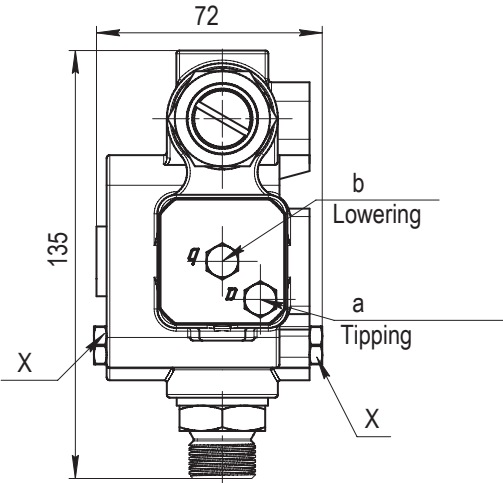
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	40
Maximum	50
Inlet pressure, bar:	
Rated	140
Maximum	240
Air pressure in the control channel a/b, bar	6
Spool switching force in position a/b, kN	0,38 / 0,22
Spool stroke in position a/b, mm	8 / 9
Weight, kg	3,3

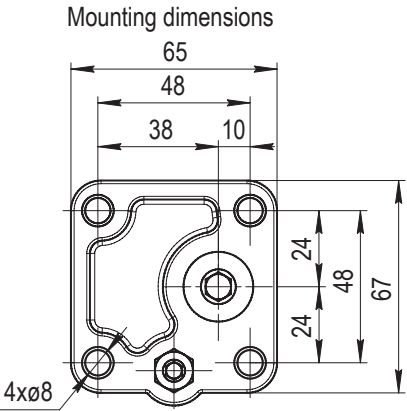
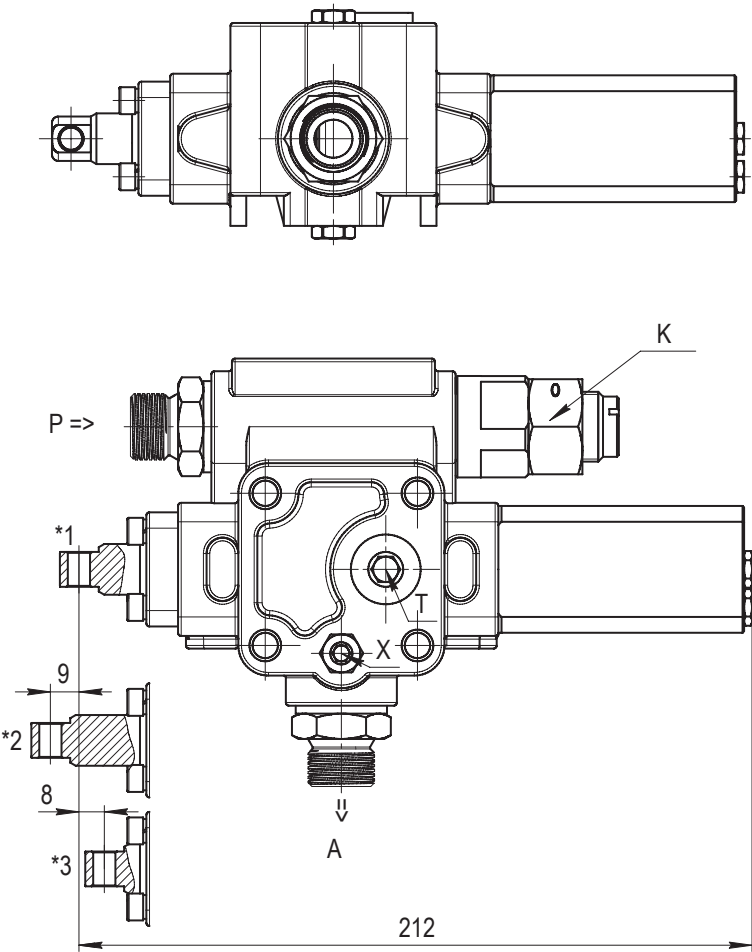
HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	G1/2"
a, b	Pneumatic control ports	G1/8"
X	Electric detector port (potr plugged when not in use)	K1/8"
K	Relief valve, direct acting	-
P	Inlet port	G1/2"
T	Outlet port	G1/2"



- *1 = Neutral position
- *2 = Lowering
- *3 = Tipping



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 100 lpm. Suitable for medium-duty dutipper mp trucks with a lifting capacity 5-10 tons.

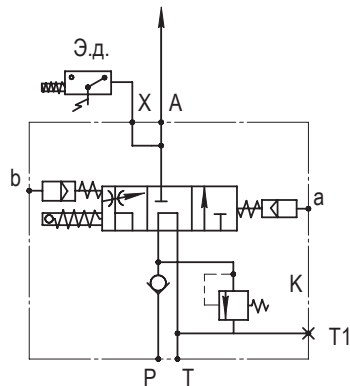
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in check valve and adjustable relief valve;
- chassis or oil tank mounting;
- mechanical end-of-stroke;
- pressure gauge port.

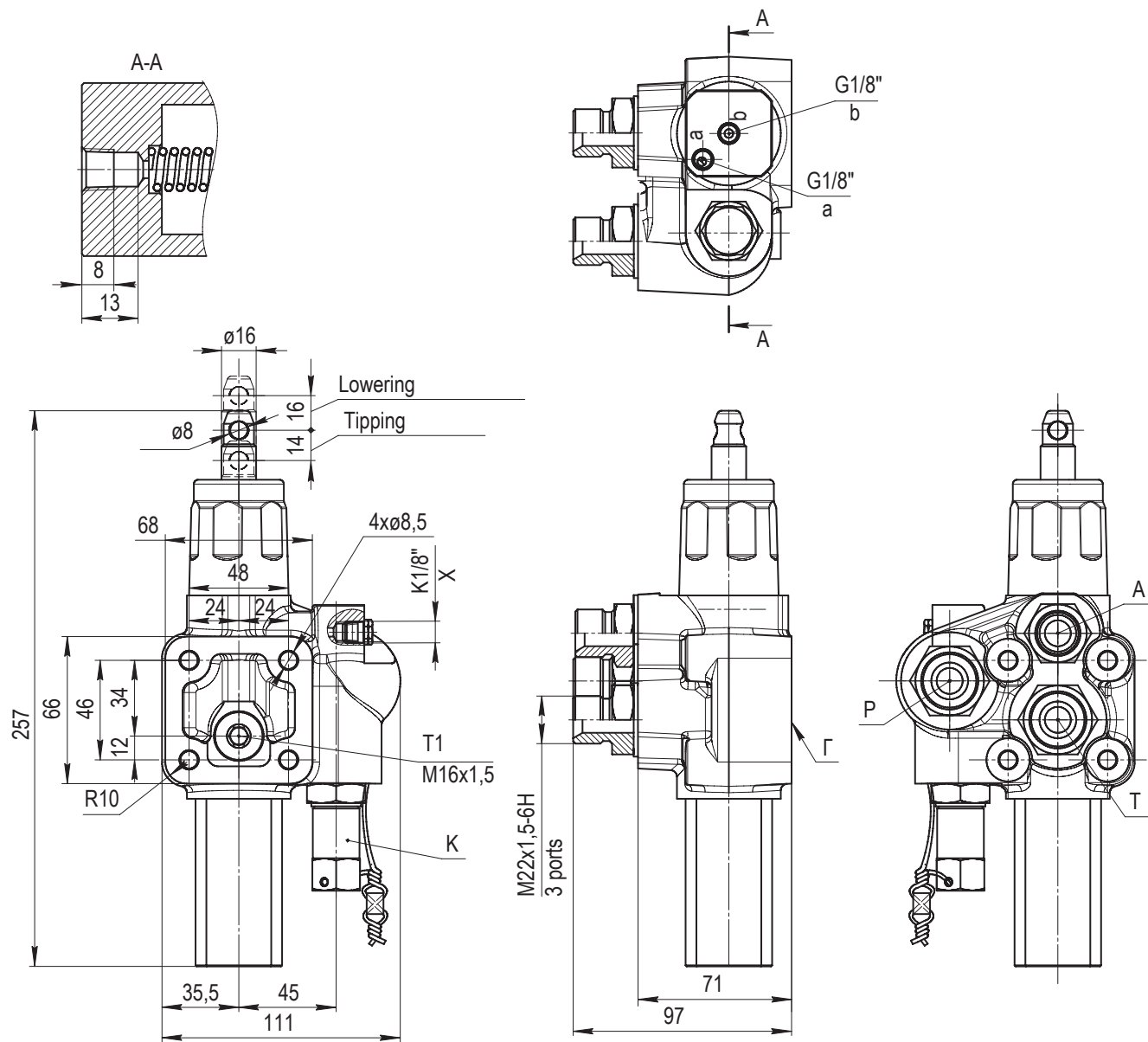
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	80
Maximum	100
Inlet pressure, bar:	
Rated	140
Maximum	280
Air pressure in the control channel a/b, bar	6
Spool switching force in position a/b, kN	0,38 / 0,22
Spool stroke in position a/b, mm	16 / 14
Weight, kg	4,44

HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	G1/2"
a, b	Pneumatic control ports	G1/8"
X	Electric detector port (potr plugged when not in use)	K1/8"
K	Relief valve, direct acting	-
P	Inlet port	G1/2"
T	Outlet port	G1/2"
T1	Outlet port, used when mounting on the oil tank	G1/2"



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 150 lpm. Suitable for medium- and heavy-duty tipper trucks with a lifting capacity 10-20 tons.

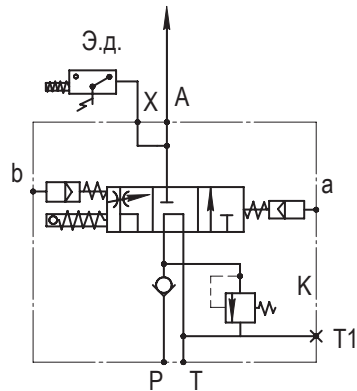
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in check valve and adjustable relief valve;
- chassis or oil tank mounting;
- mechanical end-of-stroke;
- pressure gauge port.

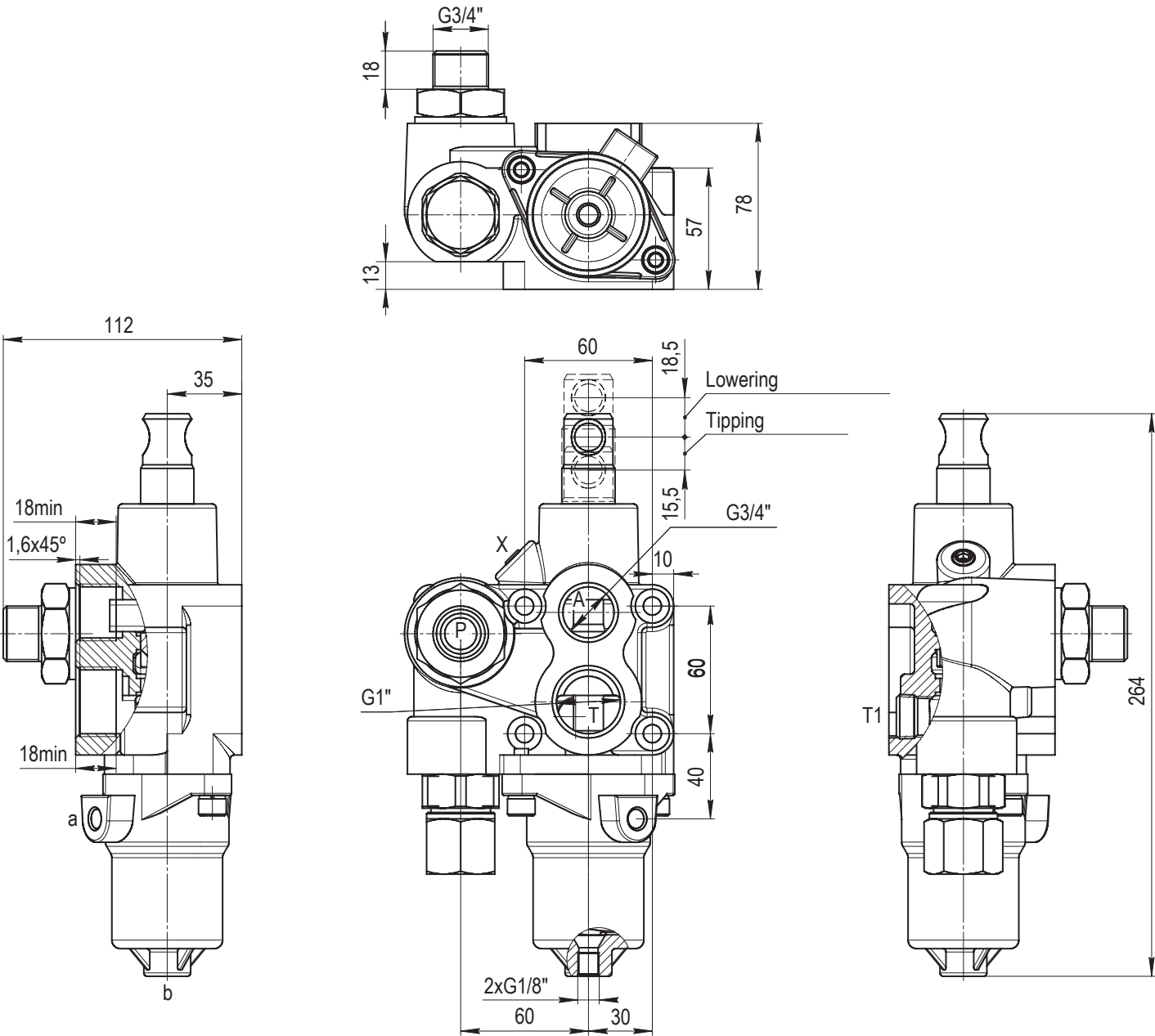
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	100
Maximum	150
Inlet pressure, bar:	
Rated	160
Maximum	280
Air pressure in the control channel a/b, bar	5
Spool switching force in position a/b, kN	0,5 / 0,75
Spool stroke in position a/b, mm	15,5 / 18,5
Weight, kg	6,04

HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	G3/4"
a, b	Pneumatic control ports	G1/8", K1/8"
X	Electric detector port (potr plugged when not in use)	K1/8"
K	Relief valve, direct acting	-
P	Inlet port	G3/4"
T	Outlet port	G1"
T1	Outlet port, used when mounting on the oil tank	G1/2"



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 150 lpm. Suitable for medium- and heavy-duty tipper trucks with a lifting capacity 10-20 tons.

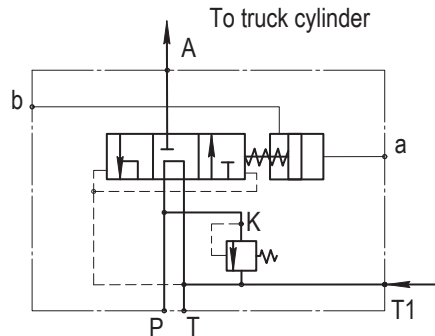
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in relief valve;
- oil tank mounting.

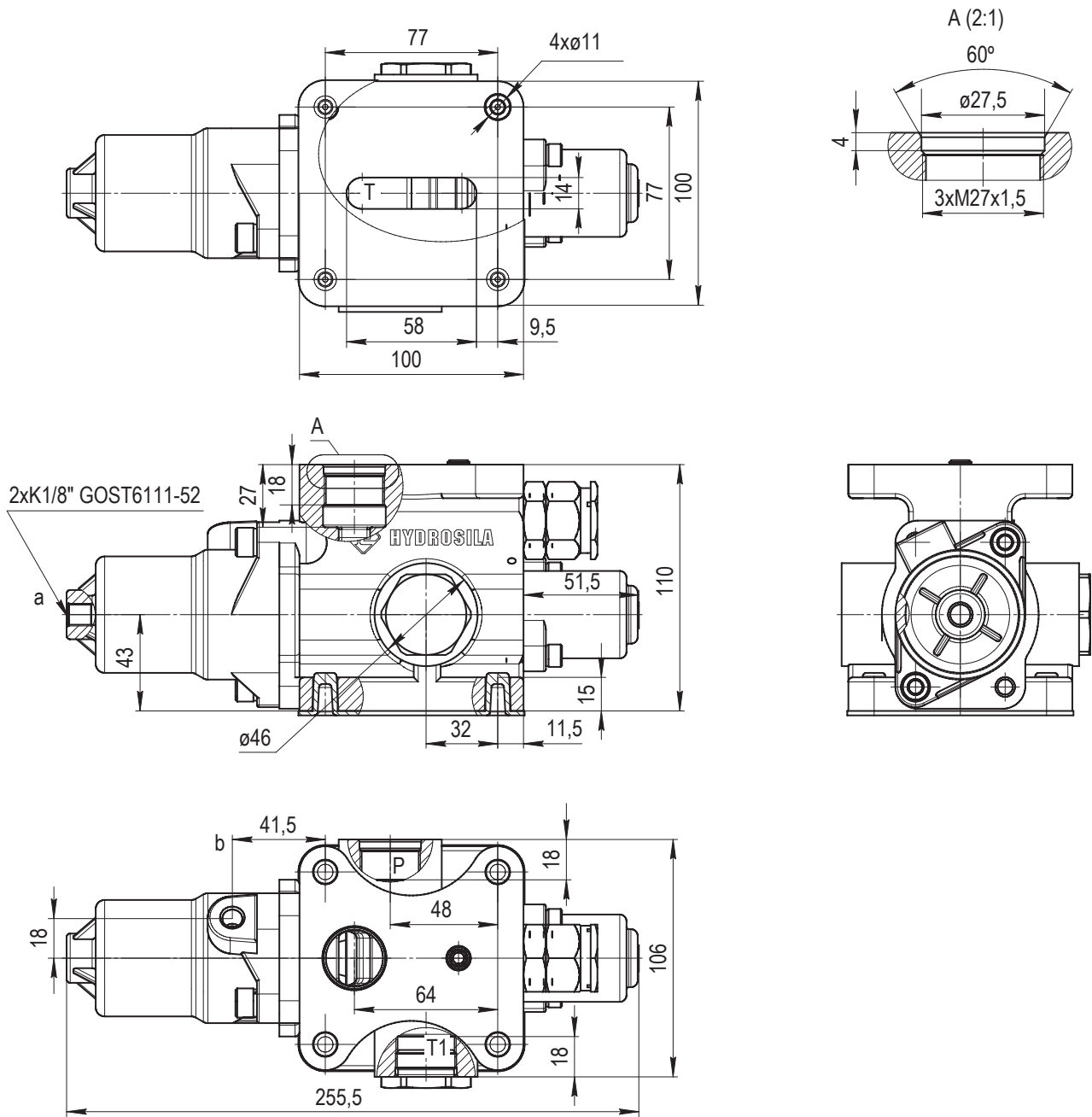
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	100
Maximum	150
Inlet pressure, bar:	
Rated	160
Maximum	210
Air pressure in the control channel a/b, bar	5...6
Weight, kg	5,74

HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	M27x1,5
a, b	Pneumatic control ports	G1/8", K1/8"
K	Relief valve, direct acting	-
P	Inlet port	M27x1,5
T	Outlet port	-
T1	End-of-stroke valve connection	M27x1,5



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 150 lpm. Suitable for medium- and heavy-duty tipper trucks with a lifting capacity 10-20 tons which are operated with dump trailers.

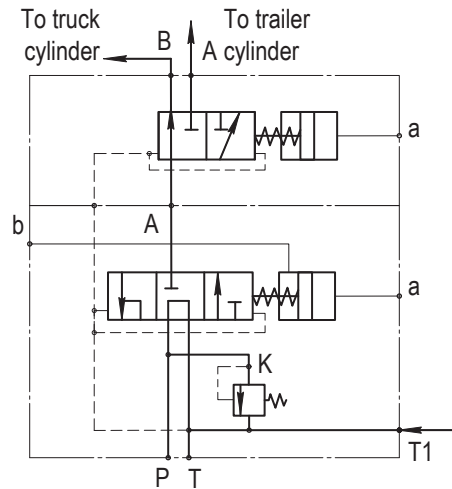
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in relief valve;
- oil tank mounting.

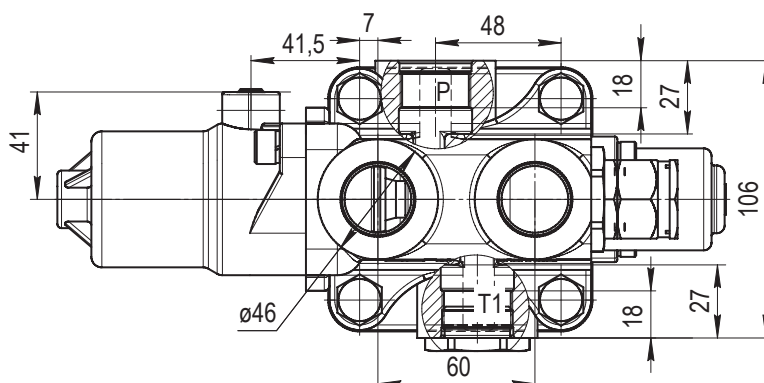
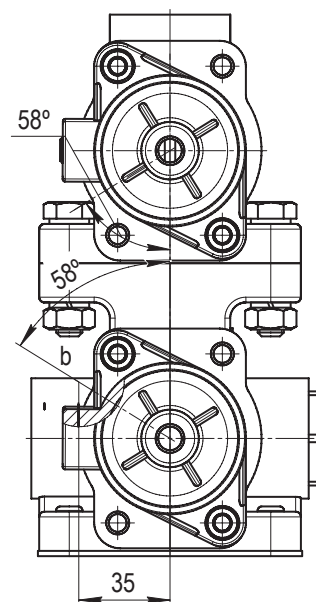
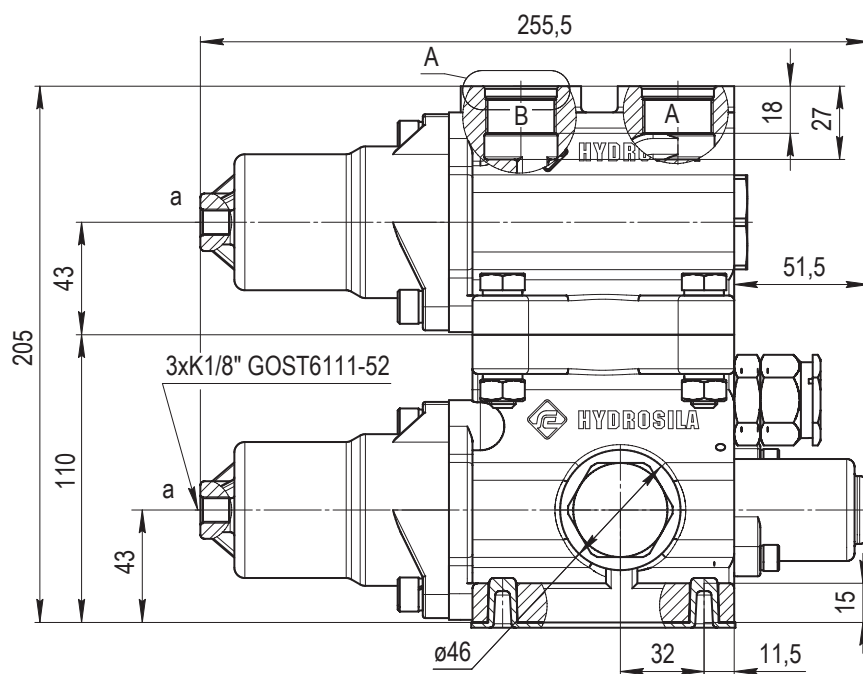
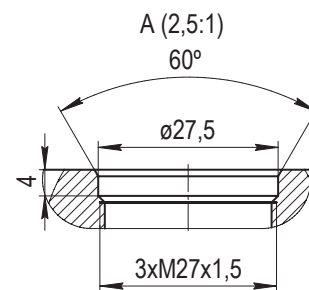
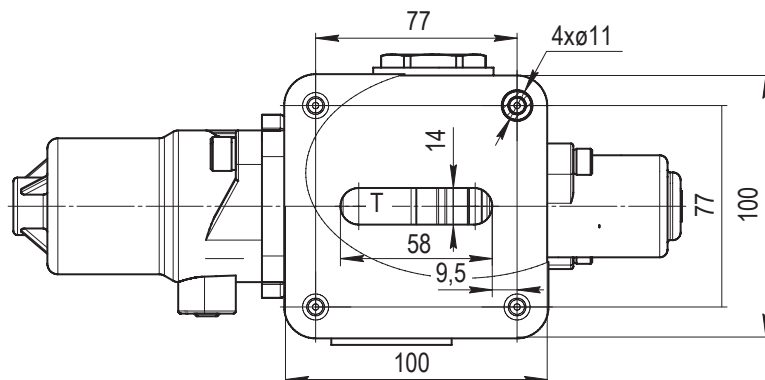
TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	100
Maximum	150
Inlet pressure, bar:	
Rated	160
Maximum	210
Air pressure in the control channel a/b, bar	5...6
Weight, kg	10

HYDRAULIC CIRCUIT



Name		Size
A, B	Outlet to telescopic cylinder	M27x1,5
a, b	Pneumatic control ports	G1/8", K1/8"
K	Relief valve, direct acting	-
P	Inlet port	M27x1,5
T	Outlet port	-
T1	End-of-stroke valve connection	M27x1,5



FEATURES

Tipping valve for tipper trucks, for hydraulic systems with a flow up to 150 lpm. Suitable for heavy-duty tipper trucks with a lifting capacity 15 tons or more.

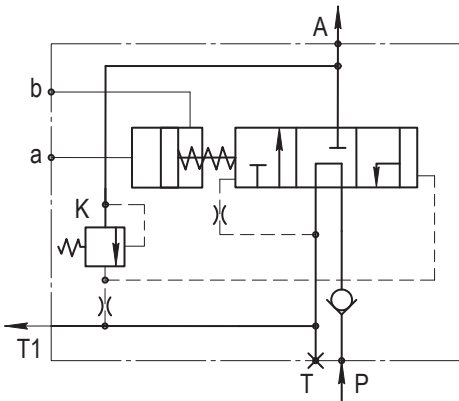
Features:

- hydraulic circuit with open center;
- pneumatic control;
- built-in check valve and adjustable relief valve;
- lowering speed control;
- chassis or oil tank mounting;
- mechanical end-of-stroke;
- pressure gauge port.

TECHNICAL SPECIFICATIONS

Flow, lpm	
Rated	180
Maximum	220
Inlet pressure, bar:	
Rated	250
Maximum	350
Air pressure in the control channel a/b, bar	6
Weight, kg	6,9

HYDRAULIC CIRCUIT



Name		Size
A	Outlet to telescopic cylinder	G1"
a, b	Pneumatic control ports	G1/8"
K	Relief valve, pilot operated	-
P	Inlet port	G1"
T	Outlet port	G1"
T1	Outlet port	R/c 1/2"



NOTES

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