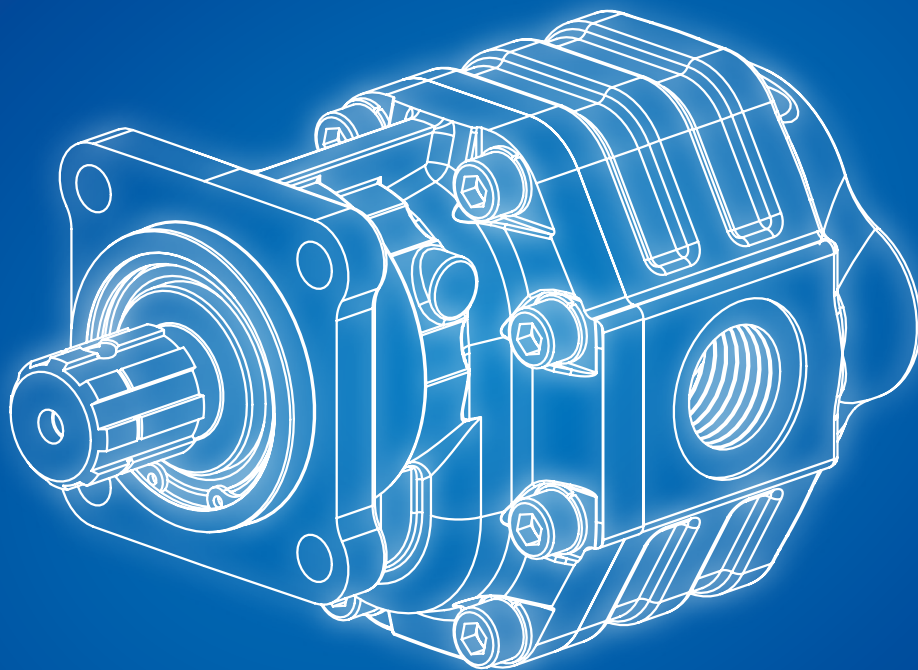




GEAR PUMPS

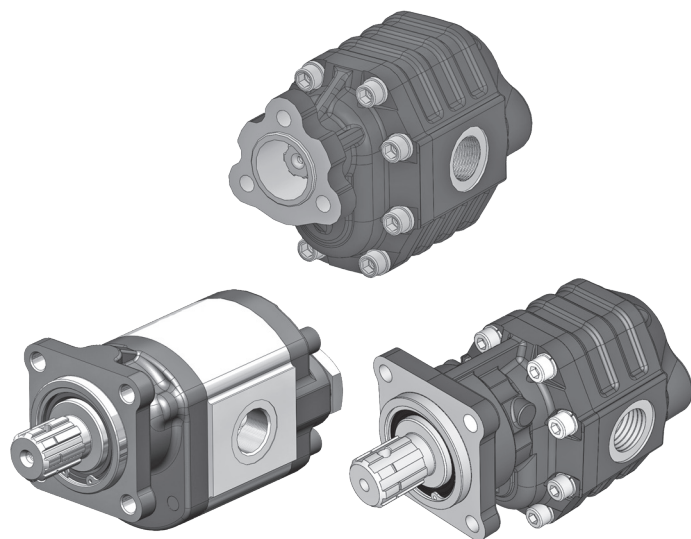
series **T**

FEATURES	2
DESIGN FEATURES. EXPLOSION SCHEME GP2.5T, GP3T, GP4T	3-4
DEFINITION OF PRESSURES. WORKING CONDITIONS. FILTRATION INDEX RECOMMENDED	5
DEFINITION OF PUMP SHAFT ROTATIONAL DIRECTION. FORMULAS	6-7
PORT CONNECTIONS	8
GP2.5T	
Technical data and assembling dimensions	9
Mounting flange - ISO standard	10
Ports	11
Performance curves	12-15
Ordering instructions	16
GP3T	
Technical data and assembling dimensions	17
Mounting flange - ISO standard	18
Mounting flange - UNI standard	19
Mounting flange - ISO standard	20
Ports	21
Performance curves	22-24
Ordering instructions	25
GP4T	
Technical data and assembling dimensions	26
Mounting flange - ISO standard	27
Performance curves	28-30
Ordering instructions	31
НАСОСЫ СЕКЦИОННЫЕ MULTIPLE PUMPS	
GP3T+GP3T. Mounting flange - ISO standard	32-33
GP3T+GP3T. Mounting flange - UNI standard	34-35
GP4T+GP3T. Mounting flange - ISO standard	36-37
RECOMMENDATIONS ON INSTALLATION	38
NOTES	39-40

FEATURES

Gear pumps series "T" are manufactured with left, right and reversible rotation of drive shaft hydraulic systems of various mobile machines: trucks, truck mounted cranes, aerial work platform, municipal vehicles and other types of machines.

- ◆ Mounting flanges and shafts according to European (ISO) and Italian (UNI) standards.
- ◆ Direct installation on PTO.
- ◆ High efficiency for the whole working life.
- ◆ Rear and side ports.
- ◆ Low working noise.



Displacements

16-150 cm³/rev

Pressure

Max. continuous pressure - 290 bar

Max. intermittent pressure - 315 bar

Max. peak pressure - 325 bar

Rotational speed

Max. speed - 3000 min⁻¹

Min. speed - 300 min⁻¹



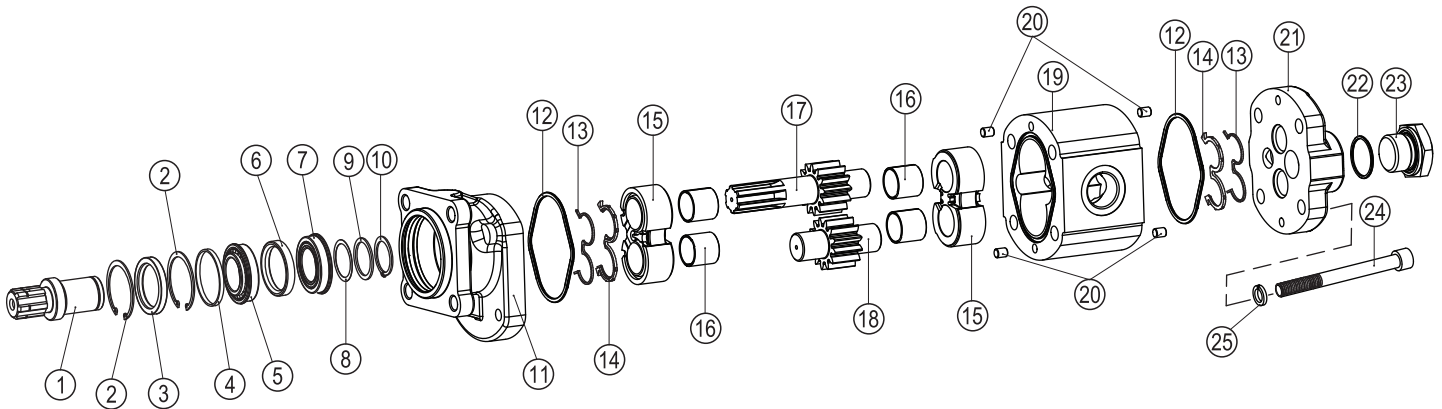
DESIGN FEATURES

Gear pumps Group 2.5 are manufactured with thru-bolt of rolled aluminium. Mounting flange and rear cover are made of cast iron. Solid bushings are manufactured by injection molding of anti-friction high-strength aluminum alloy.

To minimize leaks and get a high efficiency the bushings are securely sealed.

The main characteristic this pumps is availability in mounting flange of rolled angular contact bearings, which perceive the axial and radial loads and allow the installation of the drive shaft pulley or gears including helical.

EXPLOSION SCHEME



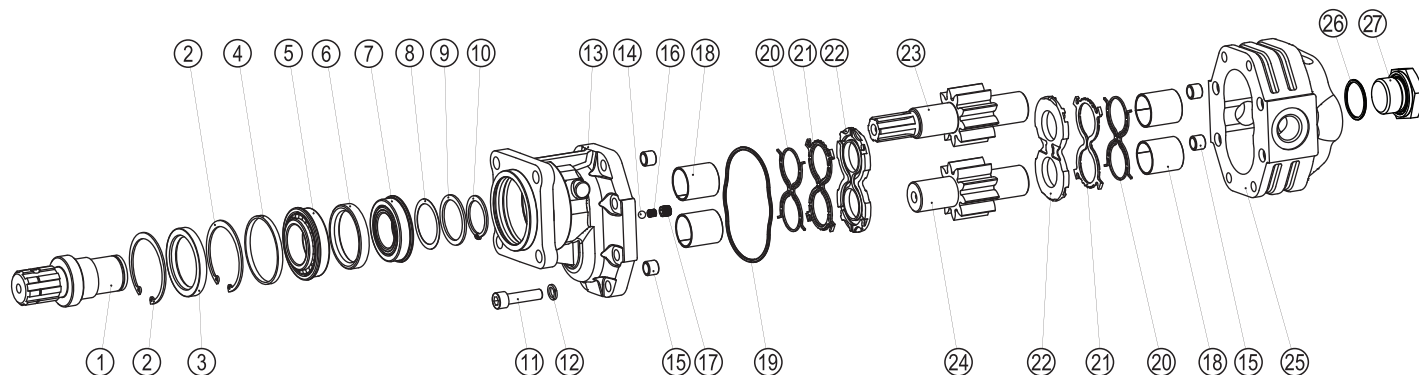
1. Shaft 2. Retaining ring 3. Shaft seal 4. Ring 5. Roller bearing 6. Washer 7. Bearing 8. Washer 9. Thrust washer 10. Retaining ring
 11. Screw 12. Washer 13. Mounting flange 14. Ball 15. Centering pin 16. Spring 17. Screw 18. Bearing housing 19. Sealing ring
 20. Anti-extrusion plate 21. Compensation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

DESIGN FEATURES

Gear pumps Group 3 and 4 are manufactured with cast iron. The faces of the gears are secured with brass compensators equipped with compensating chambers and sealed with O-rings and protective elements. The gears rotate in PTFE sliding bearings pressed into the housing parts.

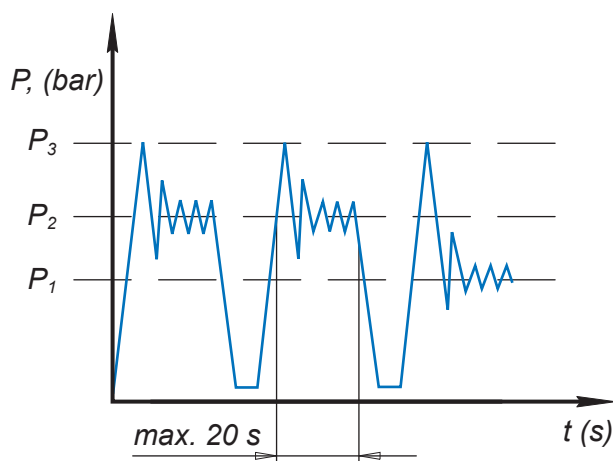
The main characteristic this pumps is availability in mounting flange of rolled angular contact bearings, which perceive the axial and radial loads and allow the installation of the drive shaft pulley or gears including helical.

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

DEFINITION OF PRESSURES



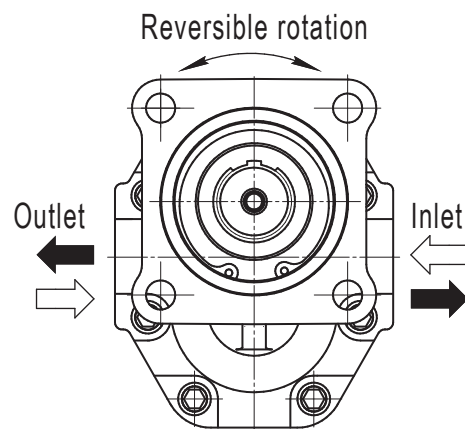
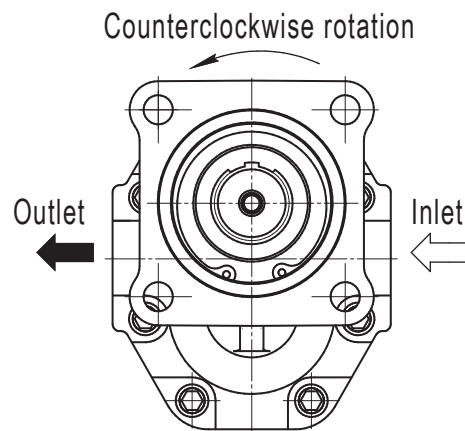
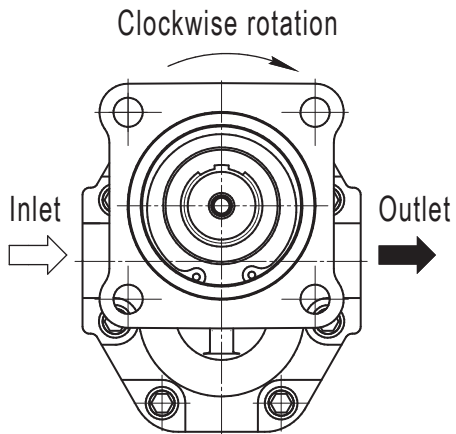
P_3 - peak pressure
 P_2 - max. intermittent pressure (1/3 of working time)
 P_1 - max. continuous pressure

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 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 $\beta_x=75$	15µm	25µm

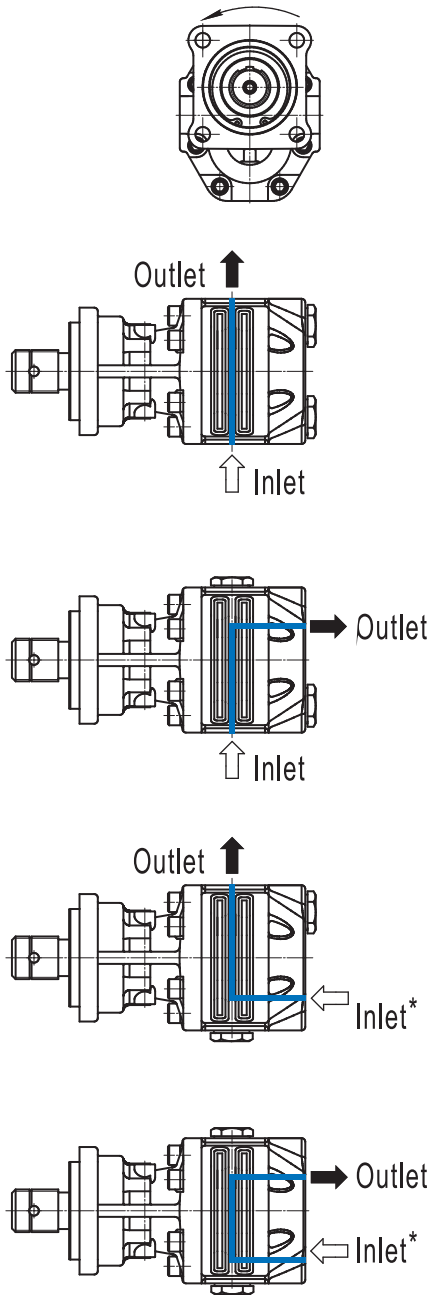


FORMULAS

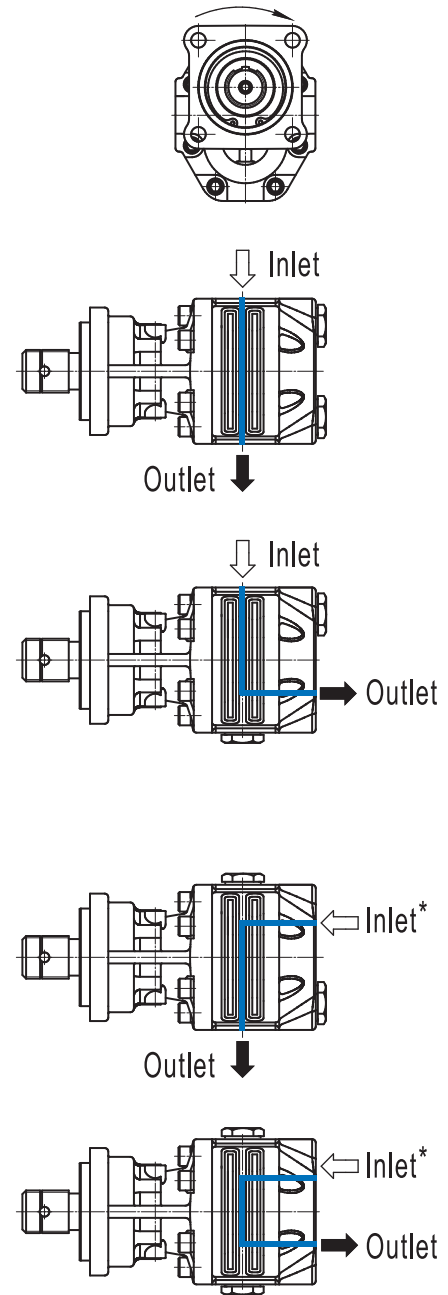
Outlet flow	$Q = \frac{q \cdot n \cdot \eta_v}{1000}$	[l/min]	q displacement (cm ³ /rev)
Input torque	$M = \frac{q \cdot \Delta p}{62,8 \cdot \eta_m}$	[N·m]	n speed (min ⁻¹)
Input power	$P = \frac{q \cdot n \cdot \Delta p \cdot 10^{-3}}{600 \cdot \eta_m}$	[kW]	η_v volumetric efficiency (0,94 min)
Volumetric efficiency at low rpm	$\eta_v' = 1 - \frac{n_{nom}}{n} (1 - \eta_v)$		Δp pressure (bar)
			η_m mechanical efficiency (0,88 min)

The design of gear pumps "T" series provides rear and side connections of hydraulic lines, which ensures quick and convenient pump mounting technique.

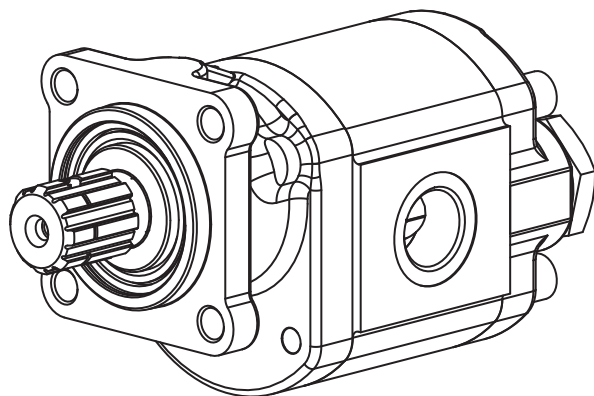
Counterclockwise rotation



Clockwise rotation



* Except pumps GP3T with displacement 82 and 100 cm³, and GP4T all dimensions this type



Displacements

16-45 cm³/rev

Pressure

Max. continuous pressure - 250 bar

Max. intermittent pressure - 280 bar

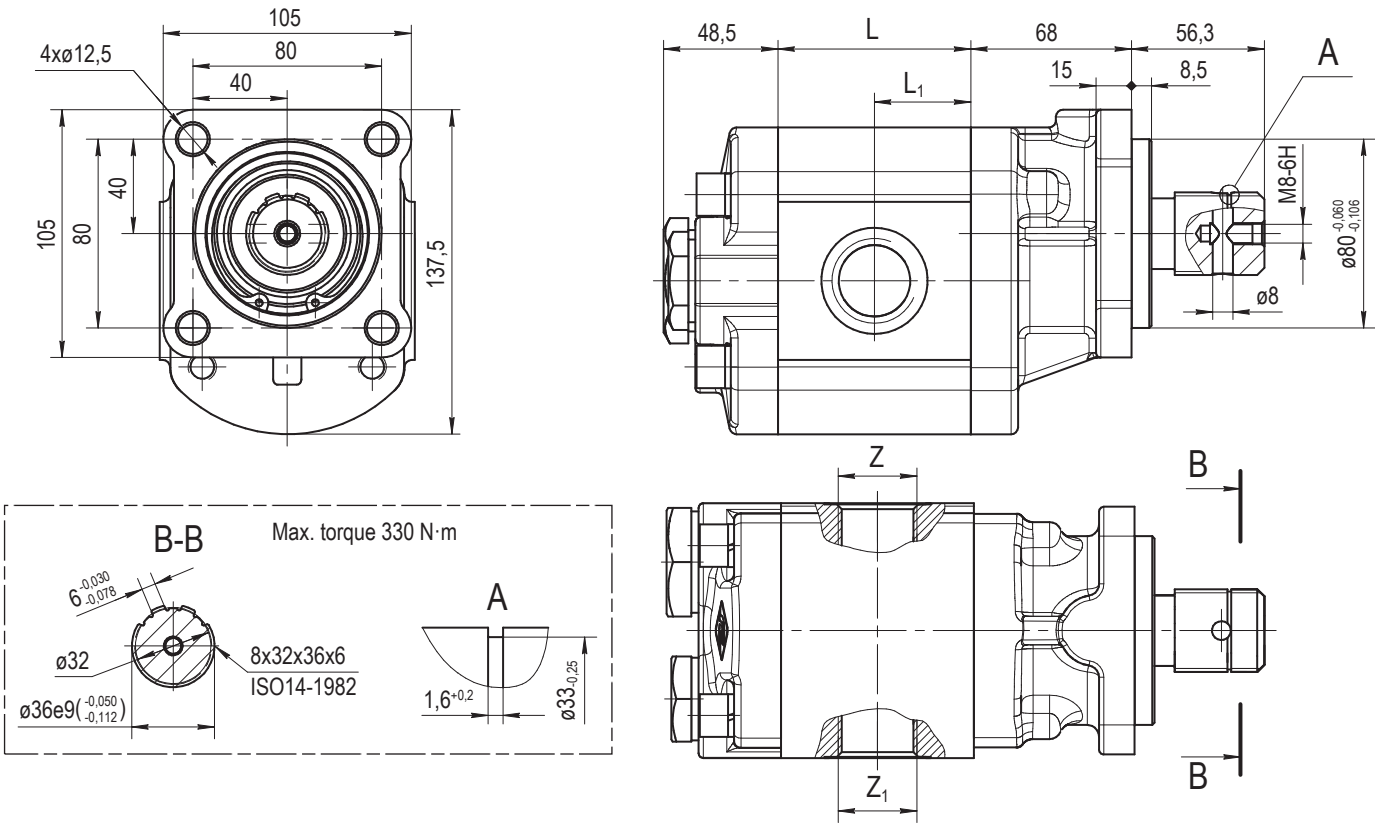
Max. peak pressure - 300 bar

Rotational speed

Max. speed - 3000 min⁻¹

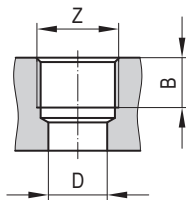
Min. speed - 500 min⁻¹

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	cm³/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	
Max. speed, n _{max}	min ⁻¹	3000									2750		500	
Min. speed at P ₁ ≤100 bar, n _{min}	min ⁻¹	700				600					500			

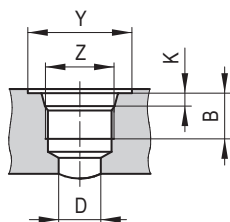


Type			Dimensions mm				Weight kg
			L	L ₁	Z	Z ₁	
GP2.5T16	R L	Z1C5G-V	71,80	35,90	G3/4"	G1/2"	9,9
GP2.5T19			75,00	37,50			10,1
GP2.5T20			76,20	38,10			10,2
GP2.5T23			79,50	39,75			10,3
GP2.5T25			81,70	40,85	G1"	G3/4"	10,4
GP2.5T28			85,00	42,50			10,5
GP2.5T30			87,30	43,65			10,6
GP2.5T32			89,50	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

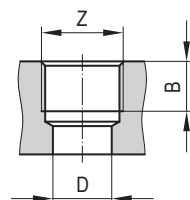
Ordering example: GP2.5T28R-Z1C5G-V
Rotation: R - Clockwise; L - Counterclockwise.



E METRIC THREADED



F SAE THREADED



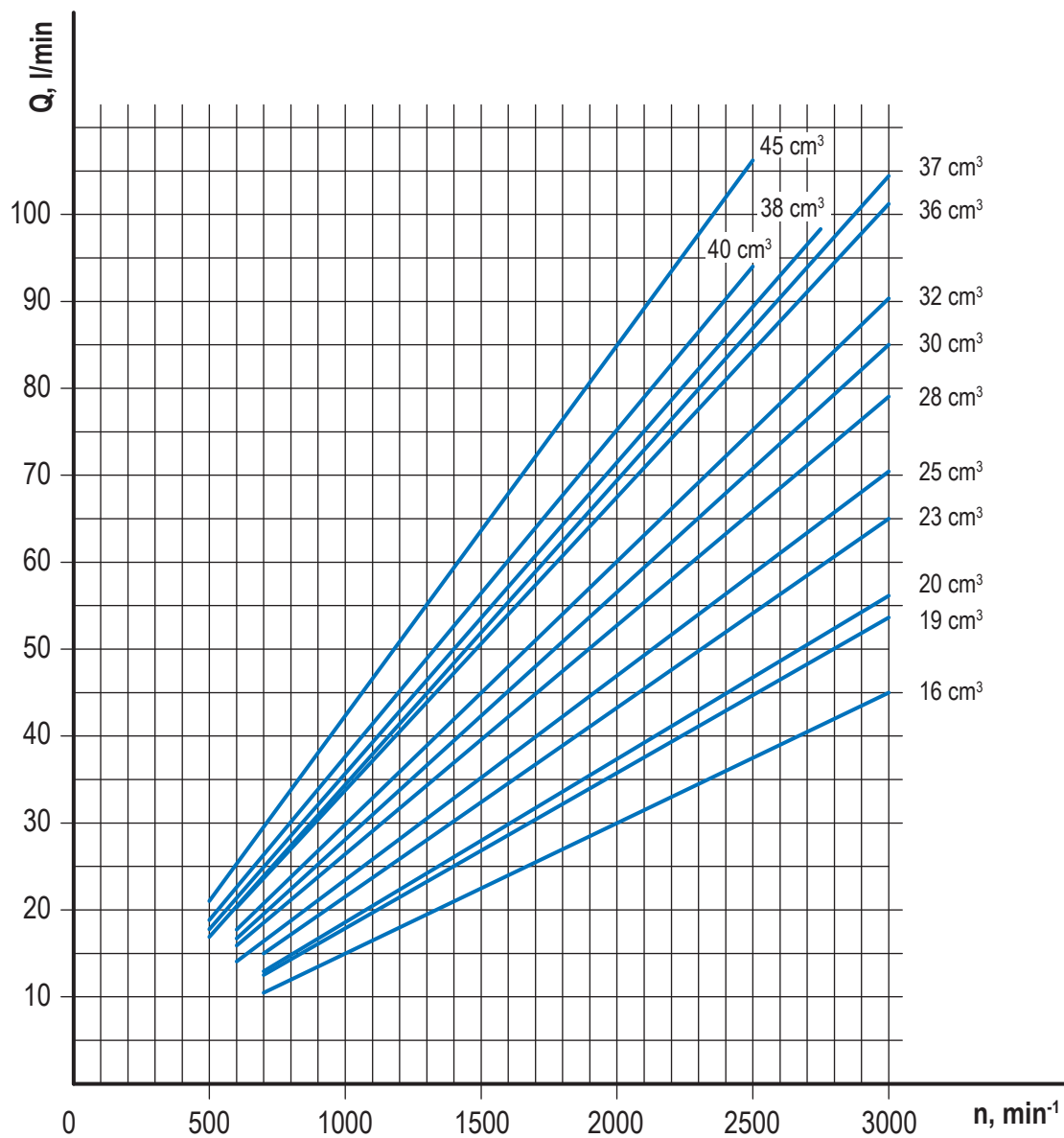
G GAS THREADED

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

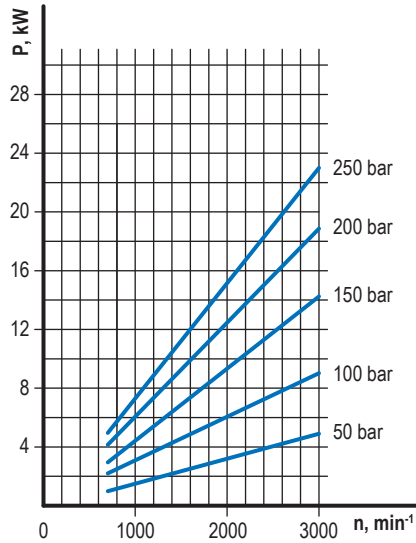
Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP2.5T16-23	1-1/16-12 UN (SAE#12)	19	20	42	3,3	7/8-14 UNF (SAE#10)	19	15	32	2,5
GP2.5T25-45	1-5/16-12 UN (SAE#16)		23	51		1-1/16-12 UN (SAE#12)		20	42	3,3

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

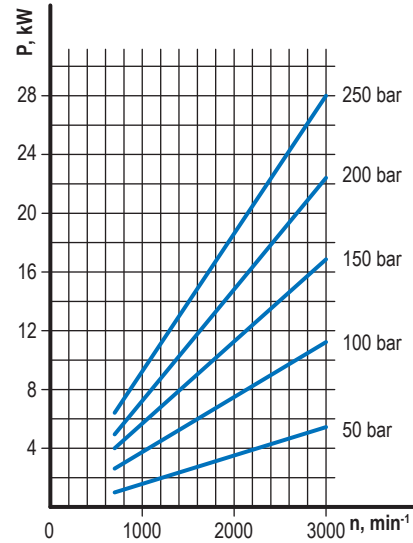
Performance curves carried out with oil viscosity at 16 mm²/sec, oil temperature at 60°C and max. continuous pressures for each type.



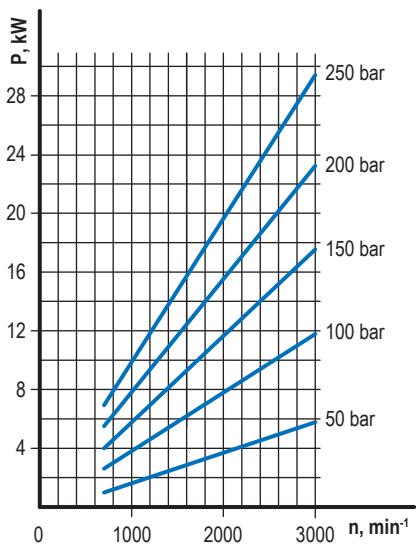
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



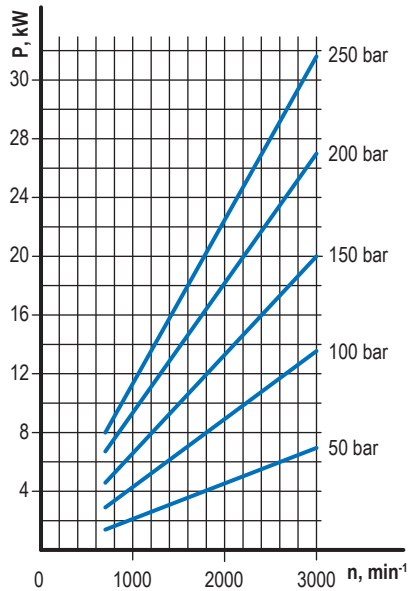
GP2.5T16



GP2.5T19

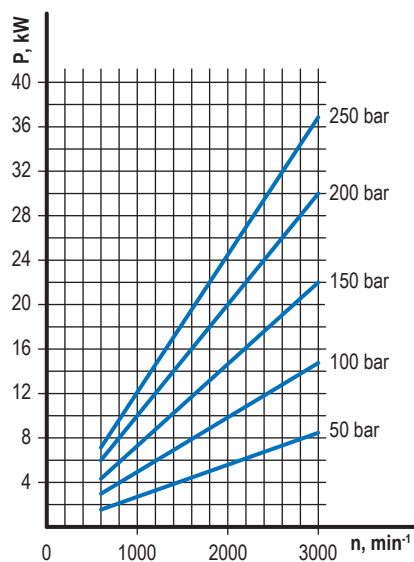


GP2.5T20

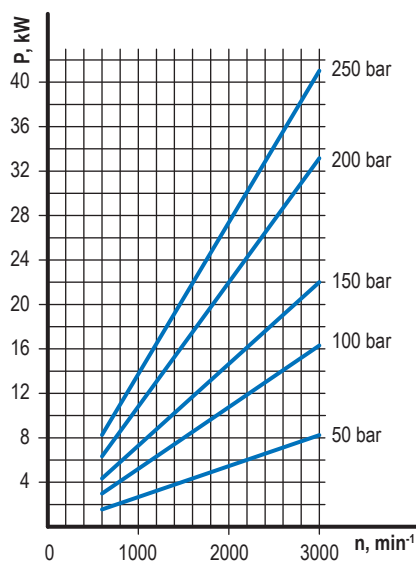


GP2.5T23

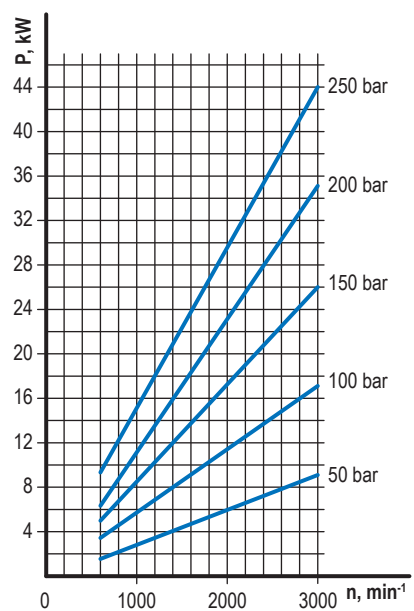
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



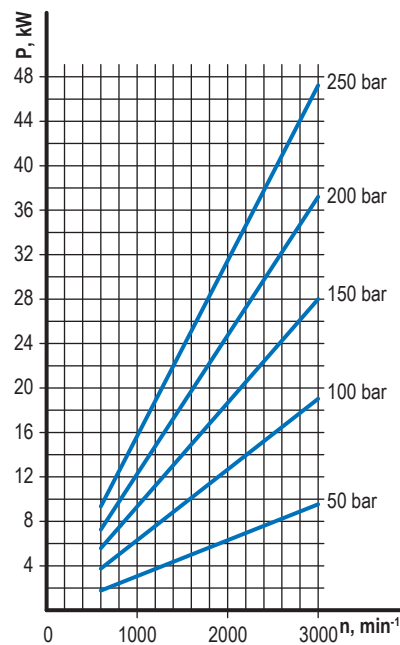
GP2.5T25



GP2.5T28

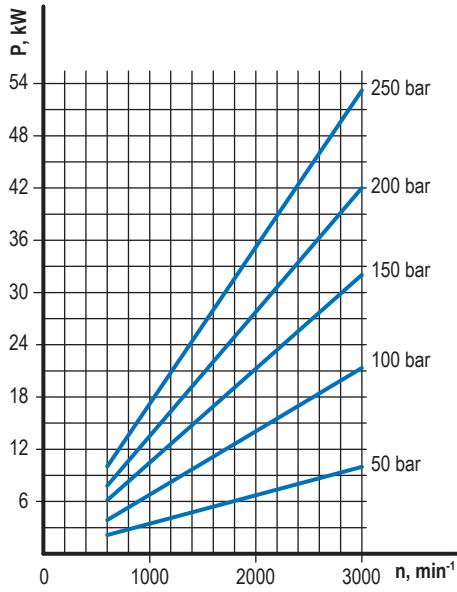


GP2.5T30

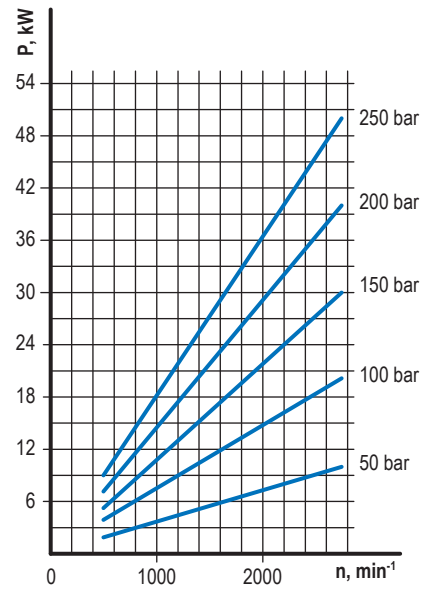


GP2.5T32

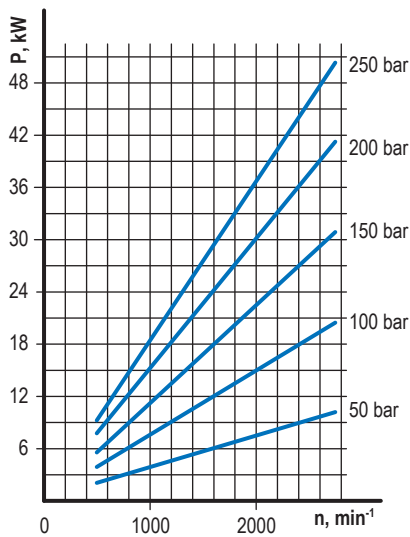
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



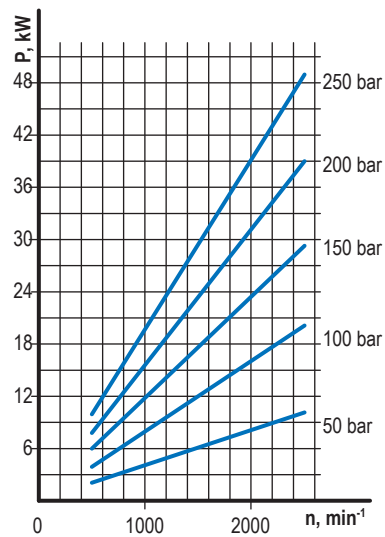
GP2.5T36



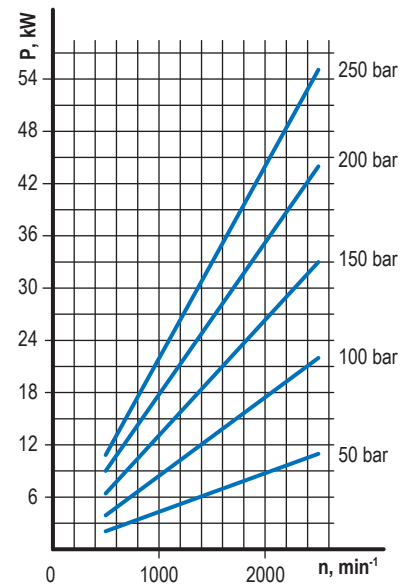
GP2.5T37



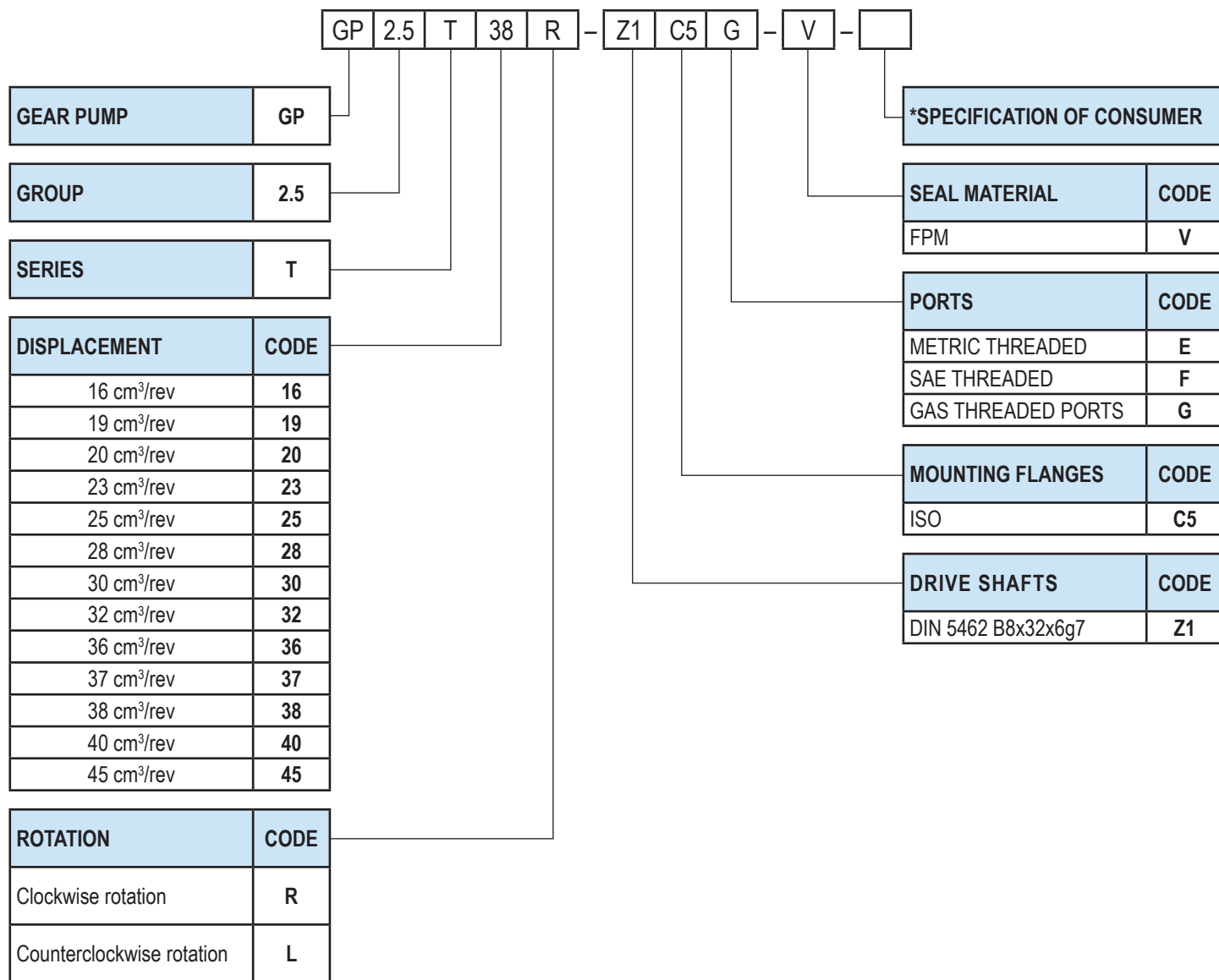
GP2.5T38



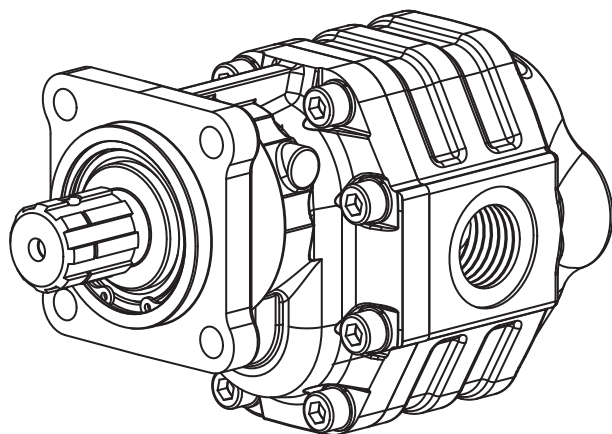
GP2.5T40



GP2.5T45



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

**Displacements**34-100 cm³/rev**Pressure**

Max. continuous pressure - 280 bar

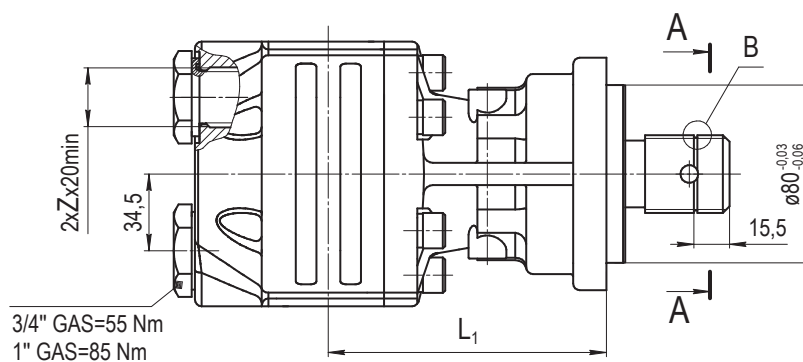
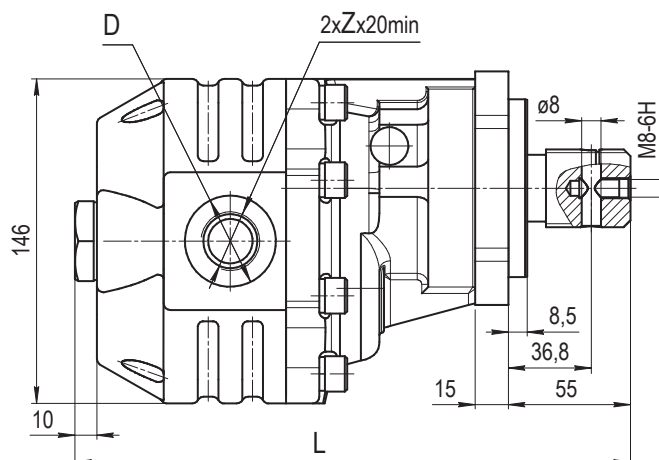
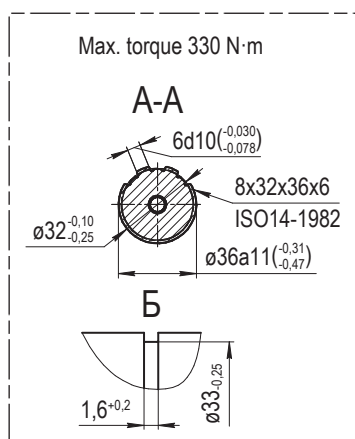
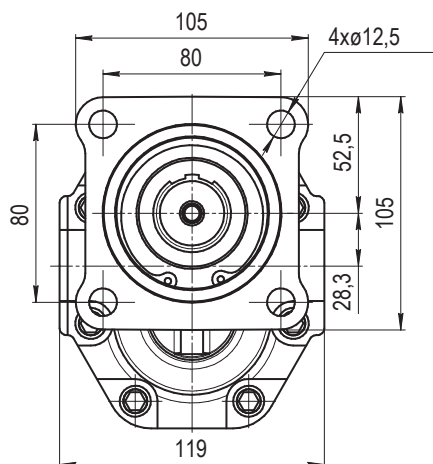
Max. intermittent pressure - 300 bar

Max. peak pressure - 310 bar

Rotational speedMax. speed - 2800 min⁻¹Min. speed - 500 min⁻¹

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	
Max. speed, n _{max}	min ⁻¹	2800	2500		2000	1800	
Min. speed at P ₁ ≤100 bar, n _{min}	min ⁻¹	500					

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

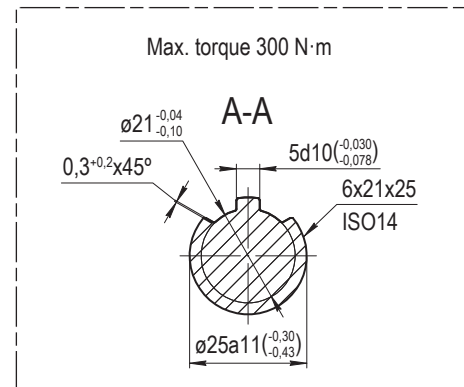
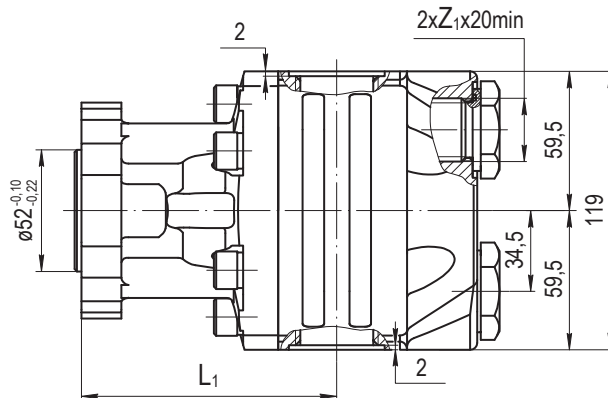
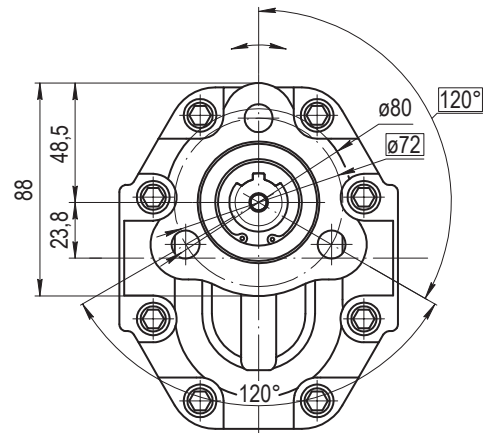
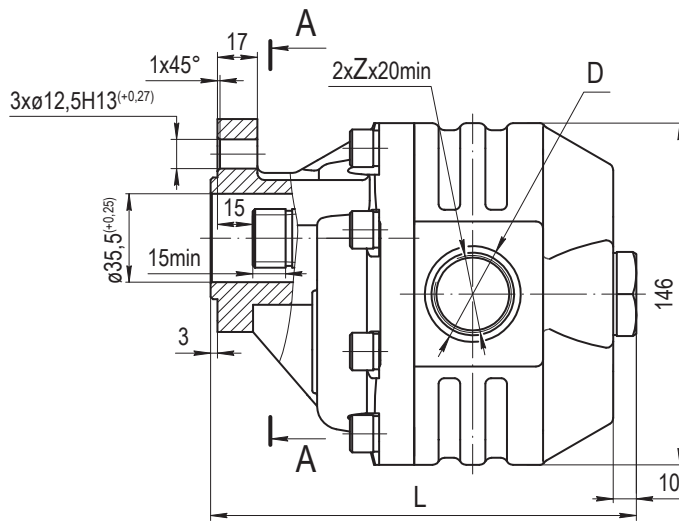


Type			Dimensions mm					Weight kg
			L	L ₁	D	Z	Z ₁	
GP3T34	R L B	Z1C5G-V	250	125	ø41	3/4" GAS		12,9
GP3T43			256	130				13,4
GP3T51			263	130,5	ø45	1" GAS		13,6
GP3T61			269	136,5				14,2
GP3T82			280	140,5	ø54	1 1/4" GAS	—	15,4
GP3T100			292	146				16,3

Ordering example: GP3T61L-Z1C5G-V

Rotation:

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

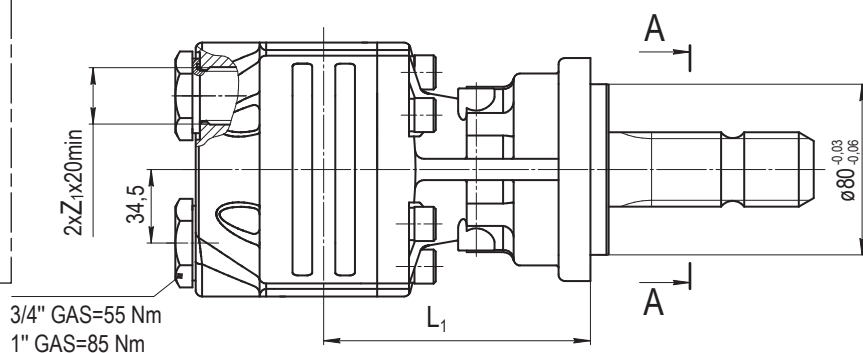
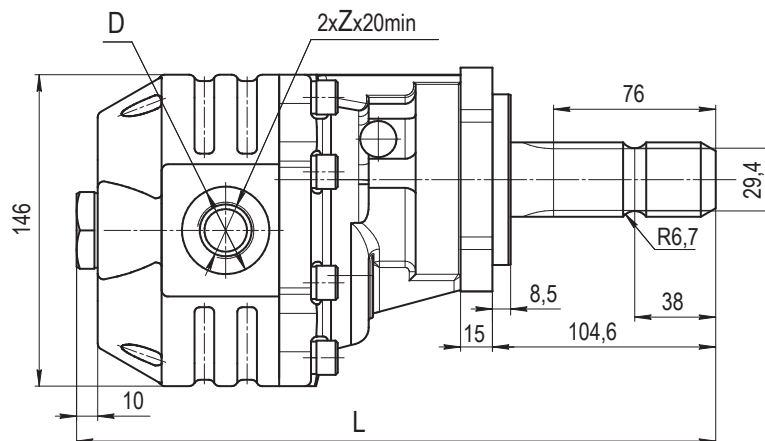
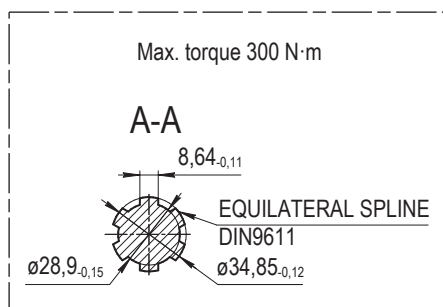
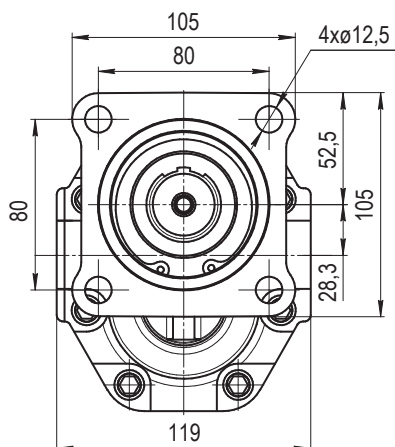


Type			Dimensions mm					Weight kg
			L	L ₁	D	Z	Z ₁	
GP3T34	R L B	Z2C7G-V	182	109	Ø41	3/4" GAS		12,8
GP3T43			188	114				13,3
GP3T51			193	114,5	Ø45	1" GAS		13,5
GP3T61			199	120,5				14,1
GP3T82			202	124,5	Ø54	1 1/4" GAS	—	15,2
GP3T100			214	130				16,1

Ordering example: GP3T34R-Z2C7G-V

Rotation:

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



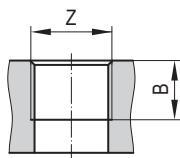
3/4" GAS=55 Nm
1" GAS=85 Nm

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	—	15,4
GP3T100			342	146				16,3

Ordering example: GP3T61L-Z3C5G

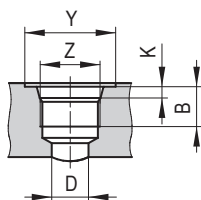
Rotation:

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



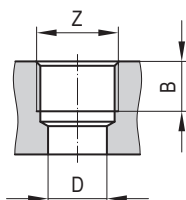
E METRIC THREADED

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



F SAE THREADED

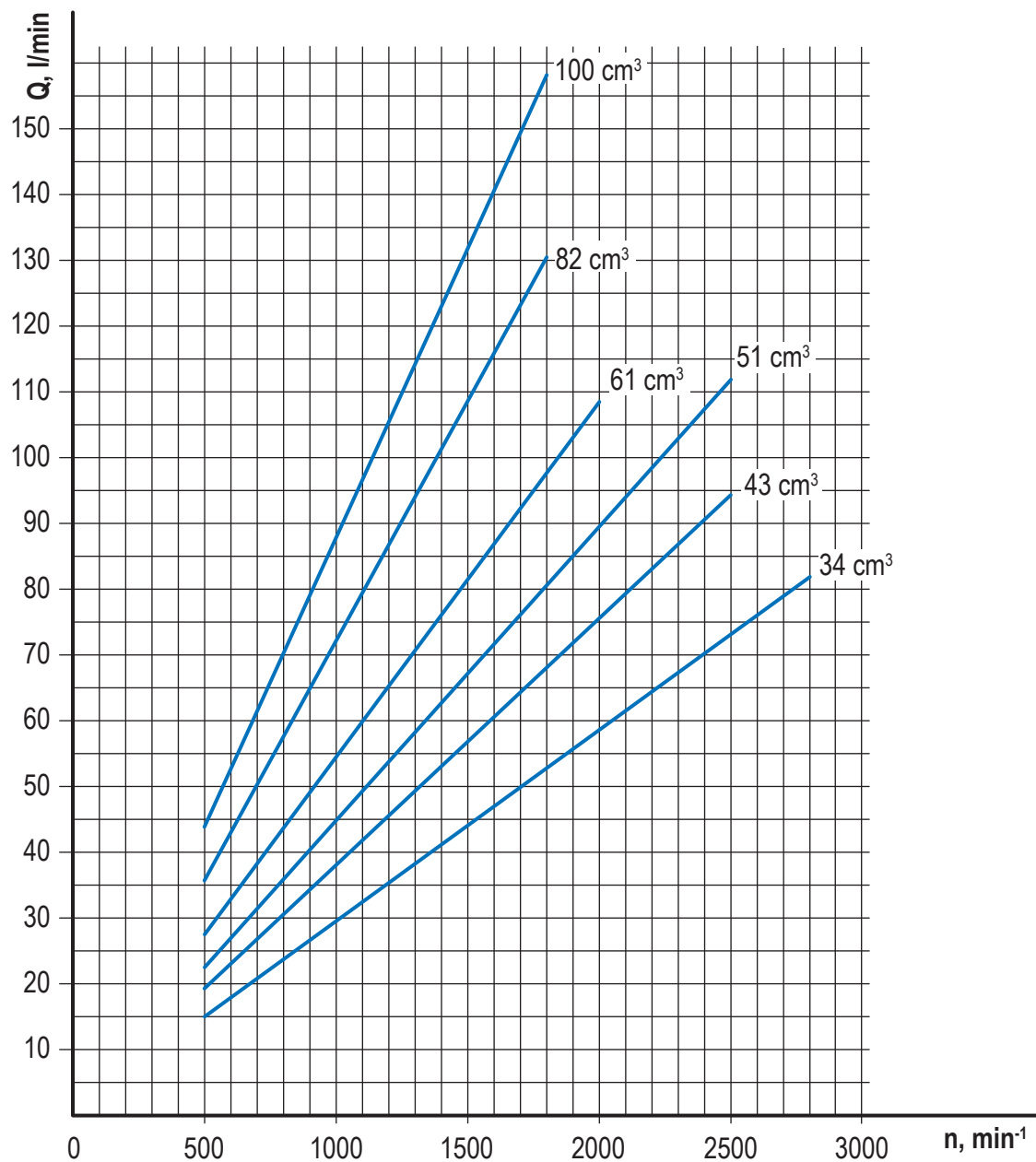
Type	Inlet					Outlet				
	Z	B	D	Y	K	Z	B	D	Y	K
GP3T34	1 5/16-12 UN	20	23	49	3,3	1 1/16-12 UN	19	20	41	3,3
GP3T43	1 5/8-12 UN		30	58		1 5/16-12 UN	20	23	49	
GP3T51										
GP3T61										
GP3T82	1 7/8-12 UN		37	65		1 5/8-12 UN	30	58		
GP3T100										



G GAS THREADED

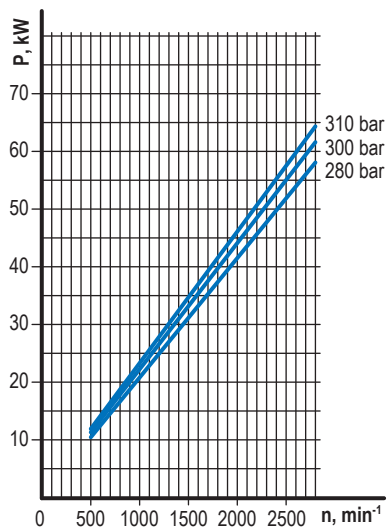
Type	Inlet			Outlet		
	Z	B	D	Z	B	D
GP3T34	3/4" GAS	19	20	3/4" GAS	19	20
GP3T43						
GP3T51	1" GAS	21	27	1" GAS	21	27
GP3T61						
GP3T82	1 1/4" GAS		33	1 1/4" GAS		
GP3T100						

Performance curves carried out with oil viscosity at 30 mm²/sec, oil temperature at 50°C and max. continuous pressures for each type.

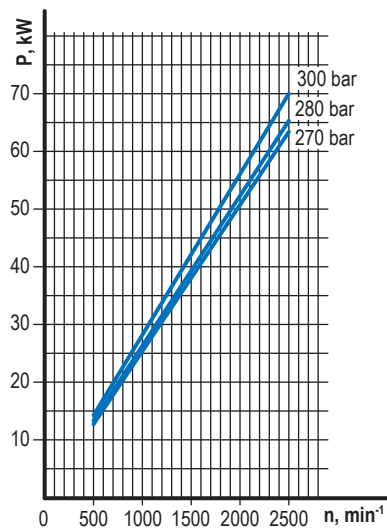


PERFORMANCE CURVES

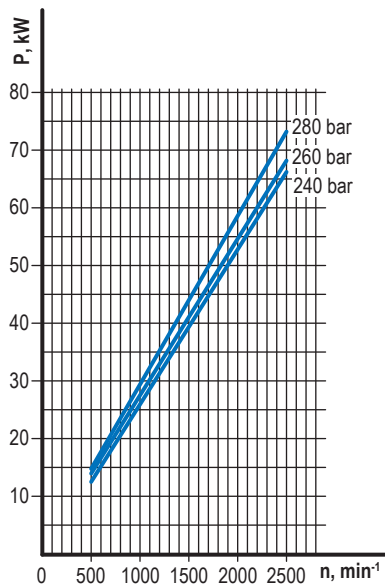
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



GP3T34

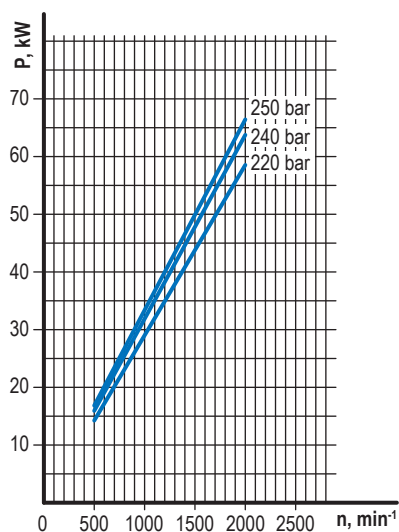


GP3T43

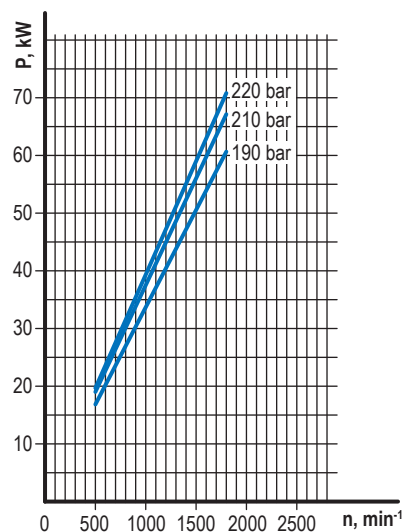


GP3T51

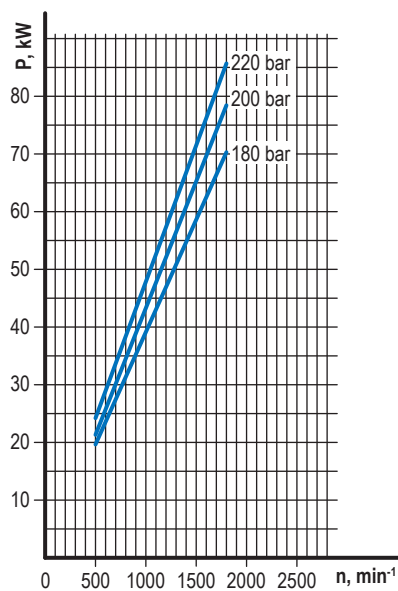
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



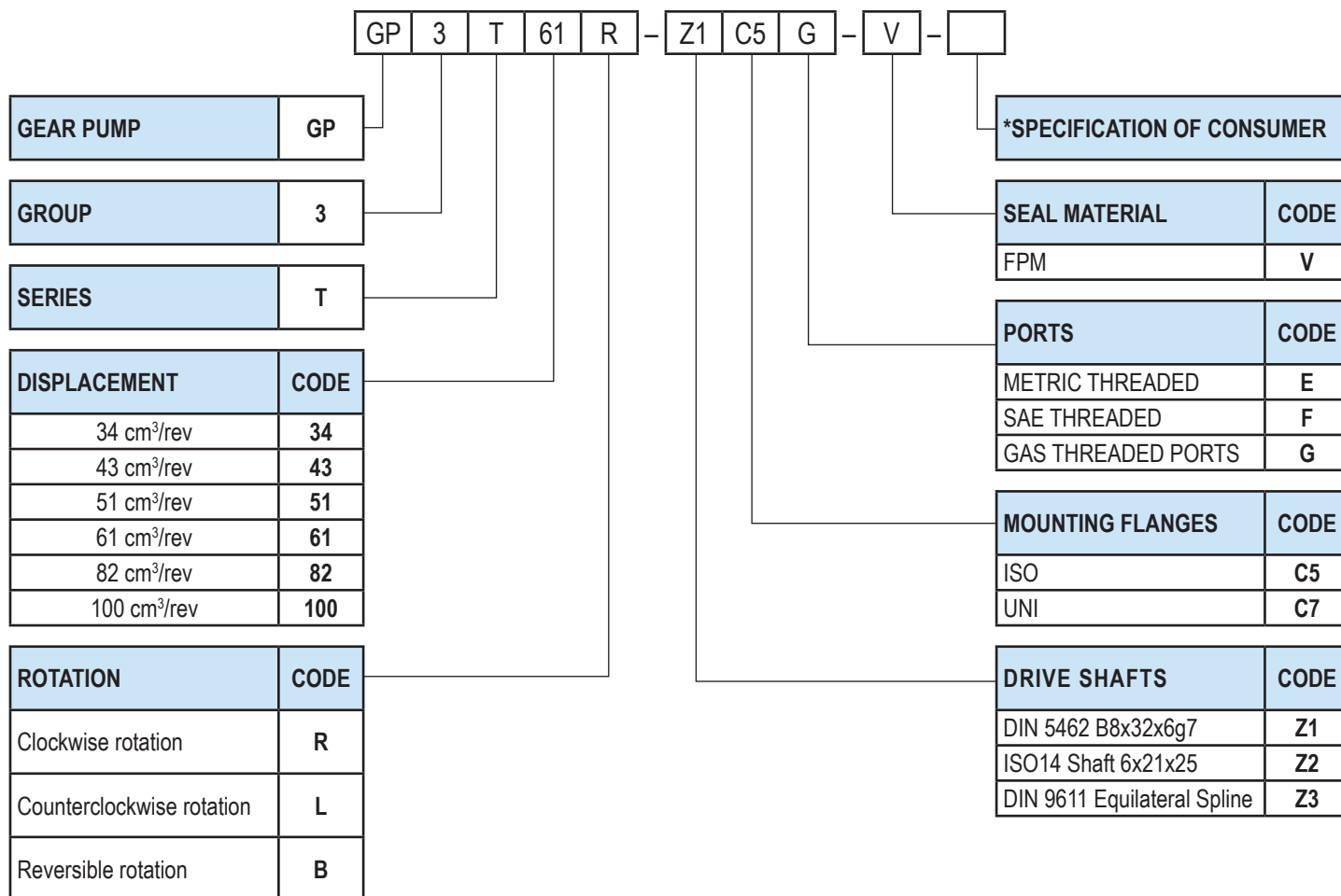
GP3T61

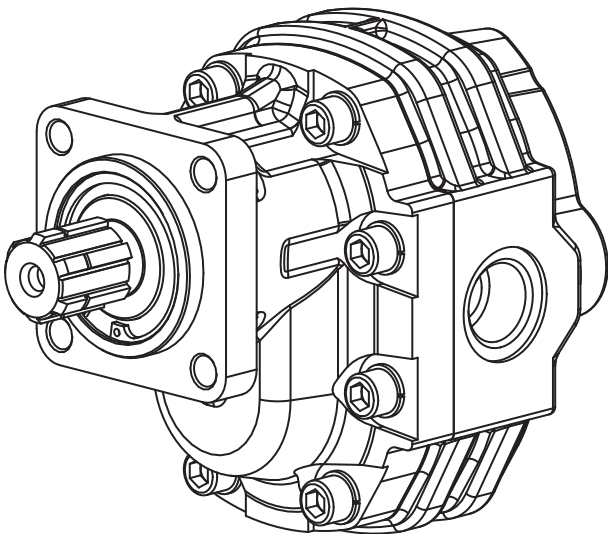


GP3T82



GP3T100



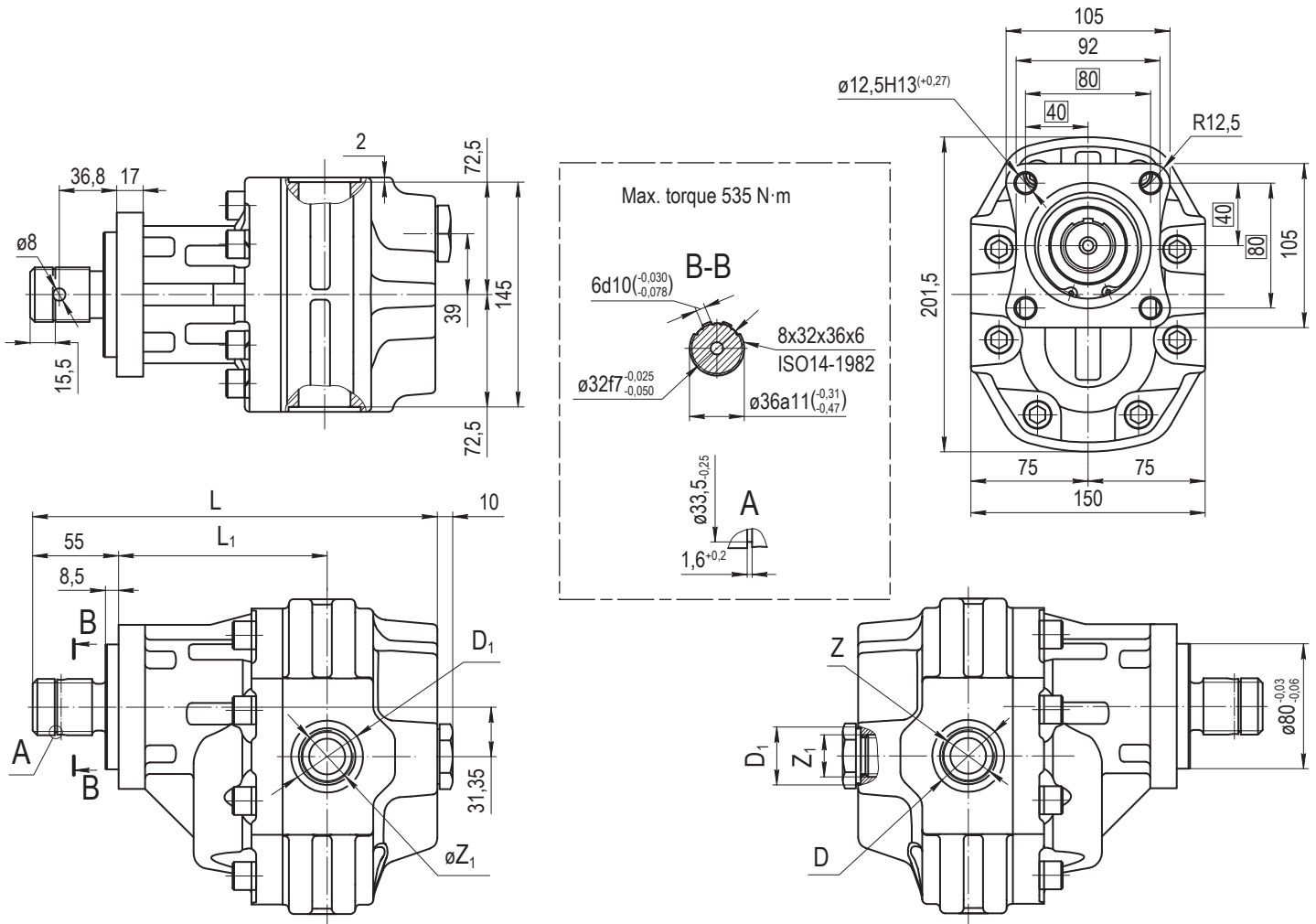


Displacements
63-150 cm³/rev

Pressure
Max. continuous pressure - 290 bar
Max. intermittent pressure - 315 bar
Max. peak pressure - 325 bar

Rotational speed
Max. speed - 2700 min⁻¹
Min. speed - 300 min⁻¹

Обозначение Type		GP4T63	GP4T73	GP4T86	GP4T100	GP4T119	GP4T135	GP4T150
Рабочий объем Displacement	cm³/rev	63	73	86	100	119	135	150
Максимальное продолжительное давление, P ₁ Maximum continuous pressure, P ₁	bar	290	280	260	250	240	220	180
Максимальное кратковременное давление, P ₂ Maximum intermittent pressure, P ₂	bar	315	300	280	270	260	250	210
Максимальное пиковое давление, P ₃ Max. peak pressure, P ₃	bar	325	315	290	280	270	260	220
Максимальная частота вращения, n _{max} Max. speed, n _{max}	min ⁻¹	2700					2500	
Минимальная частота вращения при P ₁ ≤100 bar, n _{min} Min. speed at P ₁ ≤100 bar, n _{min}	min ⁻¹	300						

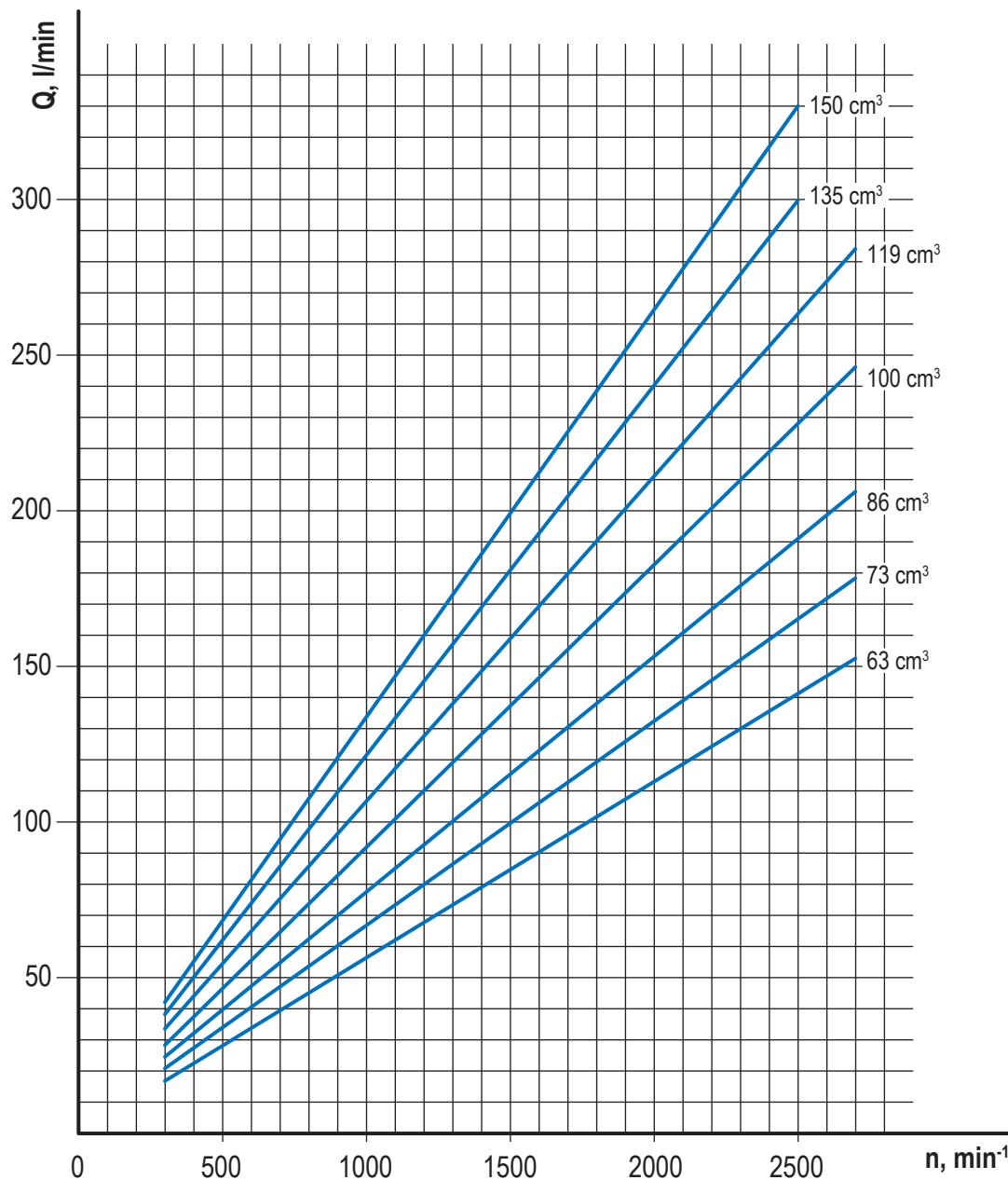


Type			Dimensions mm						Weight kg
			L	L ₁	D	D ₁	Z	Z ₁	
GP4T63	R L	Z1C5G-V	259	136,5	$\varnothing 46,1$	$\varnothing 37$	1" GAS	3/4" GAS	23,5
GP4T73			262	140,5					23,7
GP4T86			266	141,0	$\varnothing 54$	$\varnothing 46,1$	1 1/4" GAS	1" GAS	24,5
GP4T100			272	144,5					25,1
GP4T119			278	150,5					25,8
GP4T135			284	153,5	$\varnothing 60,5$		1 1/2" GAS		26,7
GP4T150			289	158,5					27,3

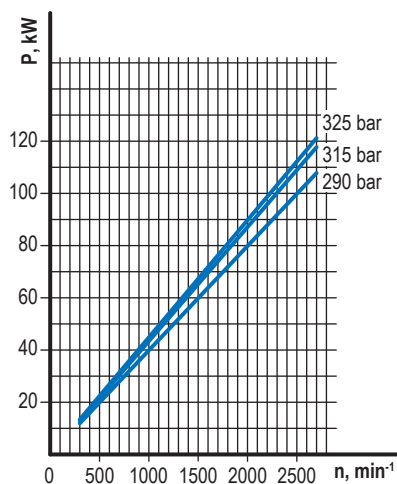
Ordering example: GP4T86R-Z1C5G

Rotation: R - Clockwise; L - Counterclockwise.

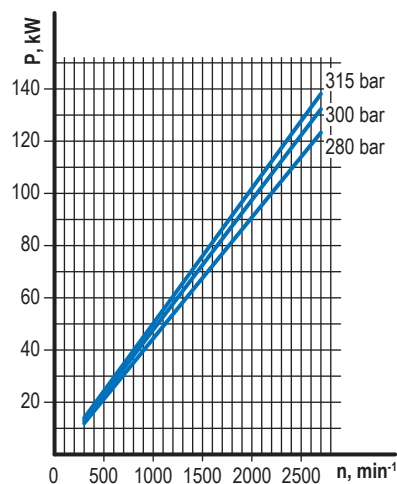
Performance curves carried out with oil viscosity at 30 mm²/sec, oil temperature at 50°C and max. continuous pressures for each type.



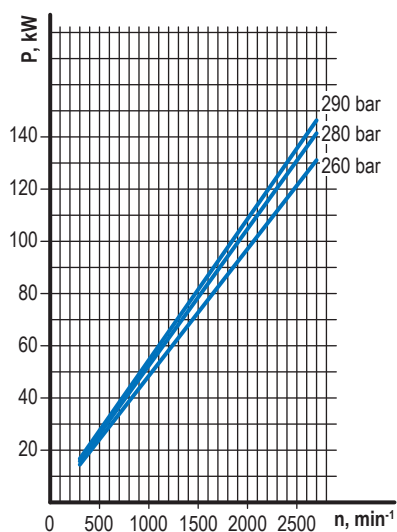
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



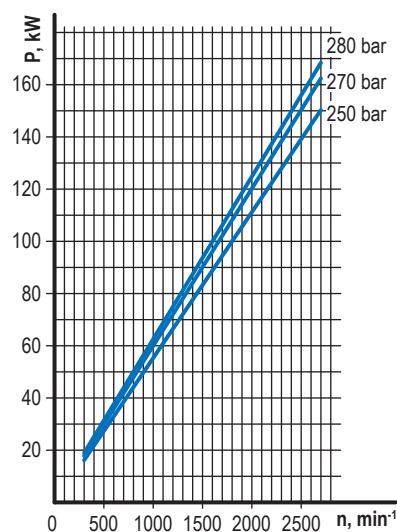
GP4T63



GP4T73

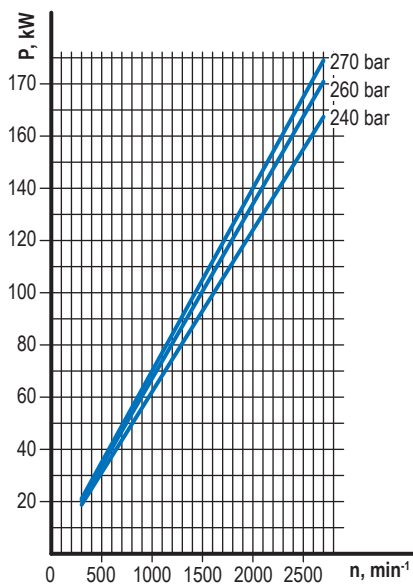


GP4T86

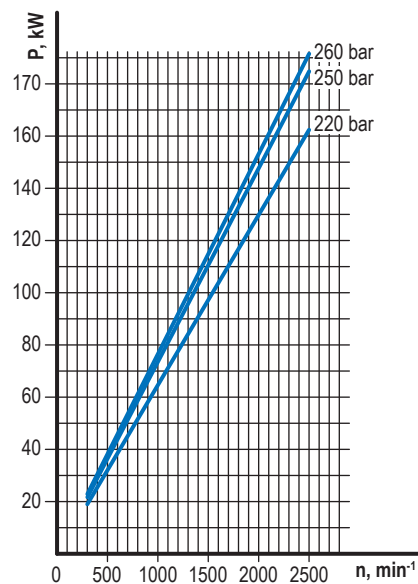


GP4T100

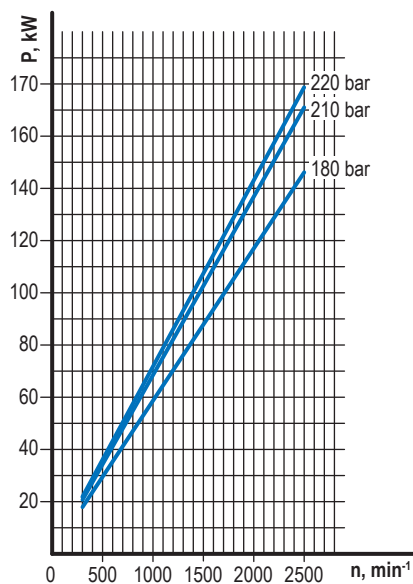
Performance curves carried out with oil viscosity at 16 mm²/sec and oil temperature at 60°C.



GP4T119

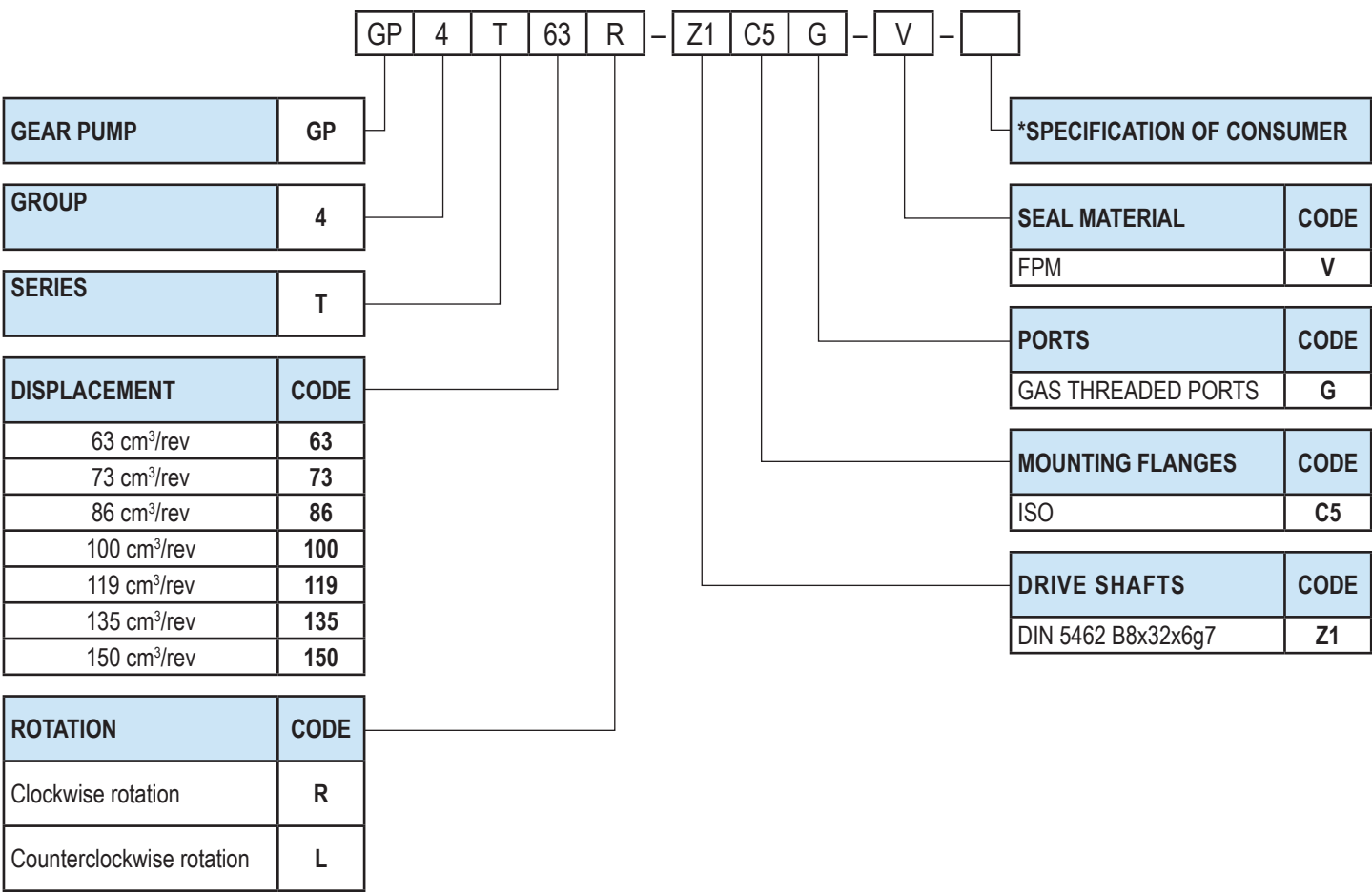


GP4T135



GP4T150

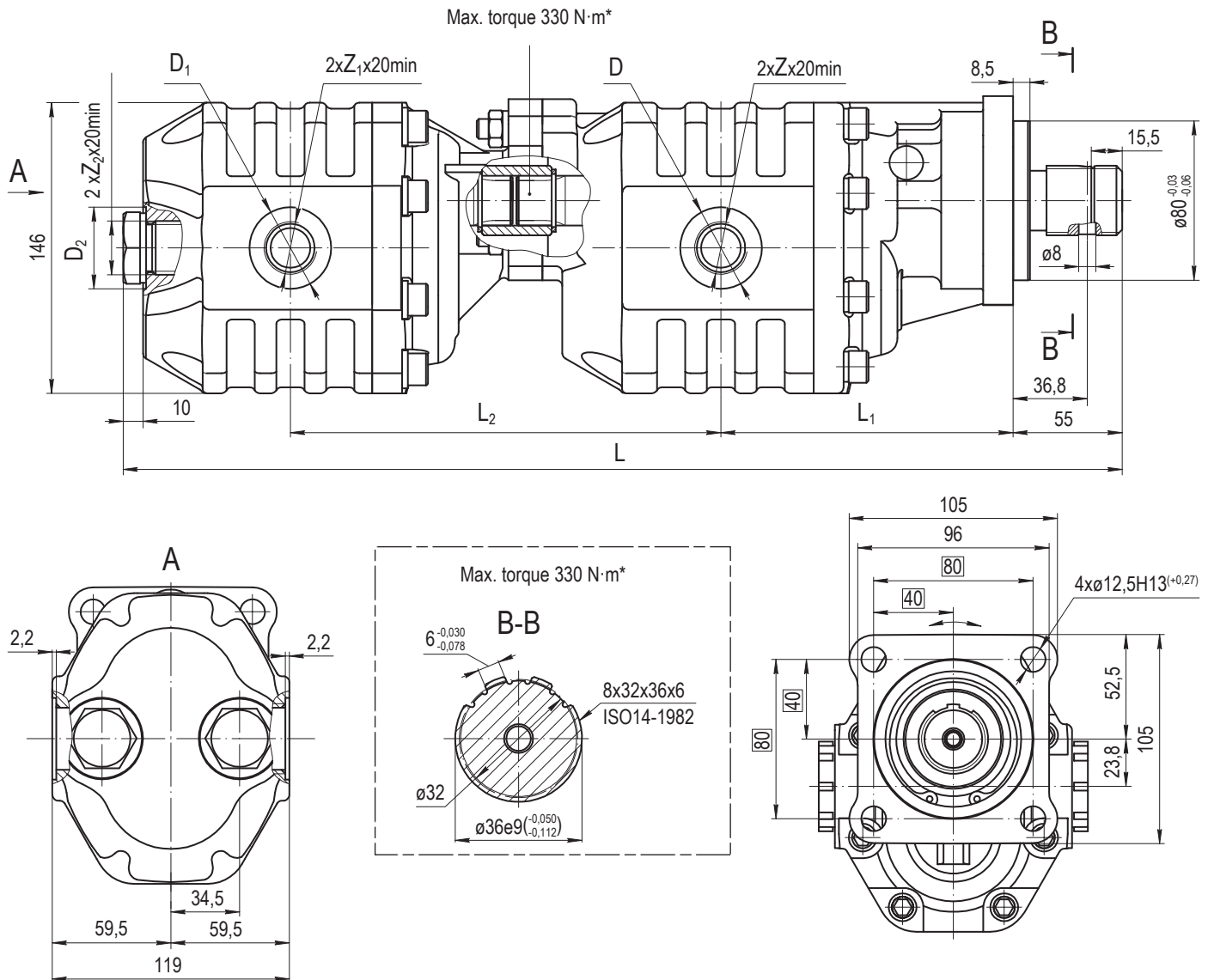
ORDERING INSTRUCTIONS



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

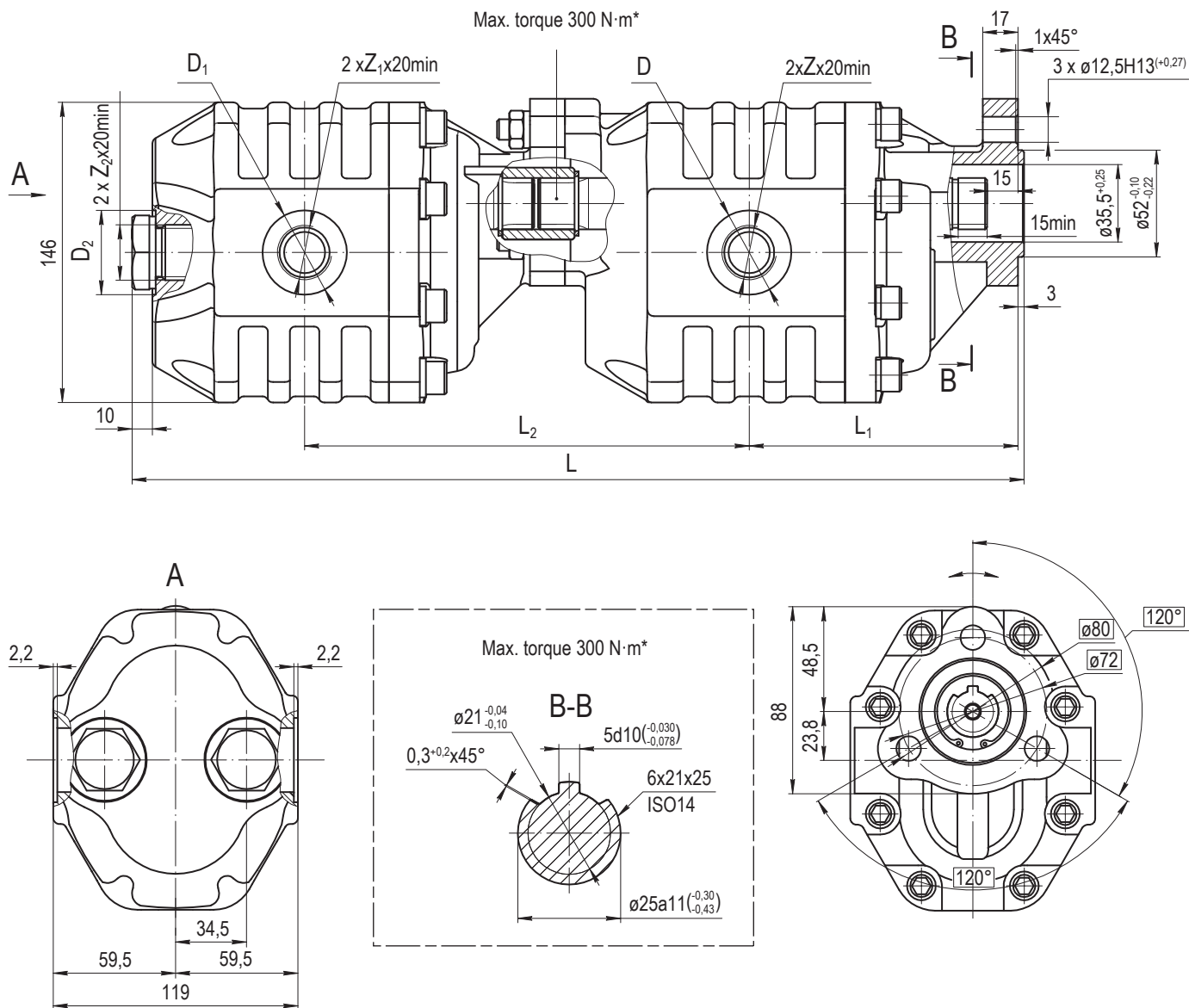
MULTIPLE PUMPS

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



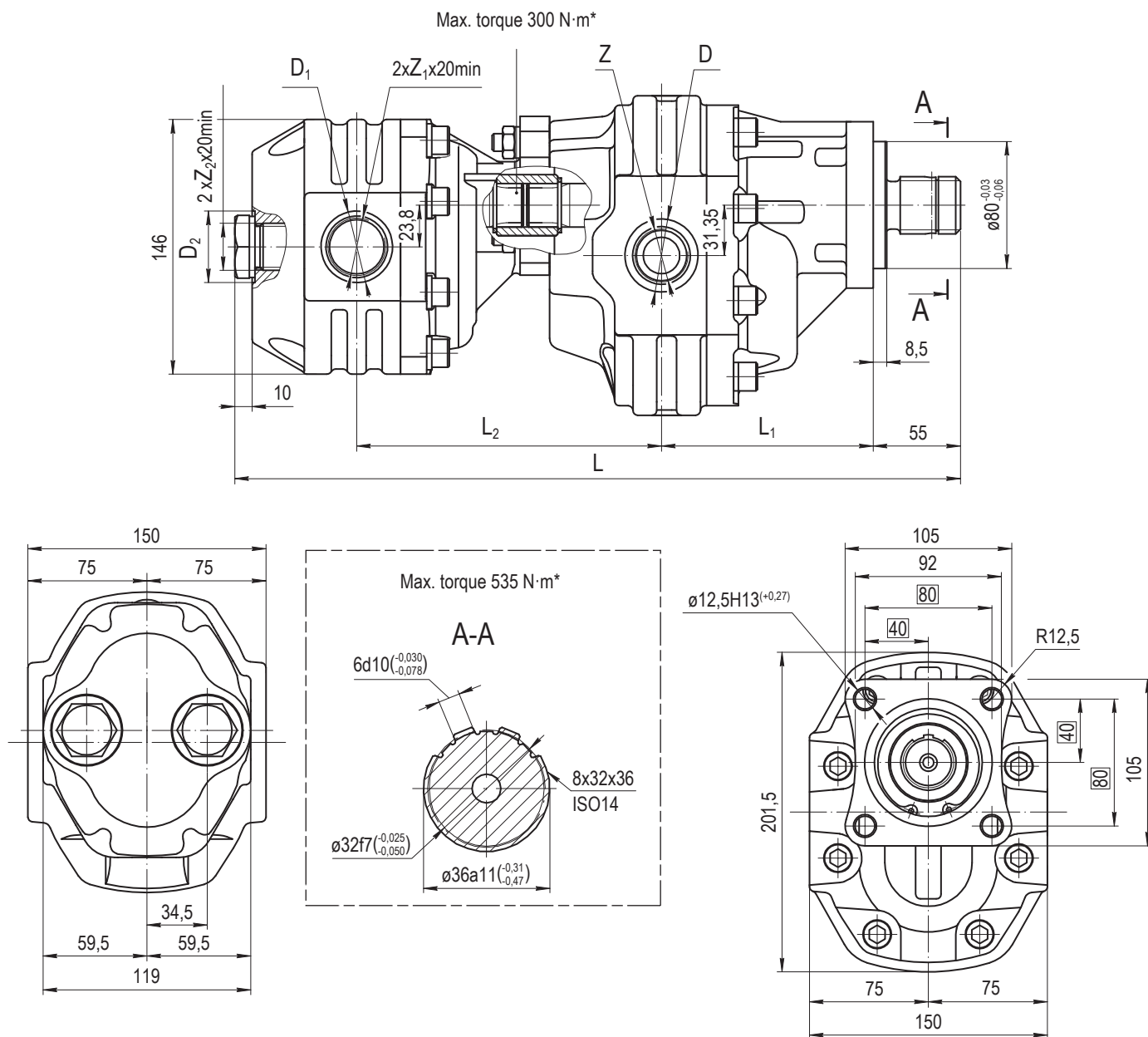
* A pump's torque is equal to the sum of all the pump sections' torques. The total torque mustn't exceed the maximum permitted torque for a pump's driveshaft. For defining the maximum permitted torque of every section use the formula on page 7.

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	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					



* A pump's torque is equal to the sum of all the pump sections' torques. The total torque mustn't exceed the maximum permitted torque for a pump's driveshaft. For defining the maximum permitted torque of every section use the formula on page 7.

Type			Dimensions mm								Weight kg
			L	L ₁	L ₂	D	D ₁	D ₂	Z	Z ₁	
GP3T34/3T34	R L	Z2C7GG-V	355	109	179	ø41		3/4" GAS		26,9	
GP3T43/3T34			114	362	177					27,5	
GP3T43/3T43				367	182					28,0	
GP3T51/3T34			114,5	371,5	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			120,5	374,5	181,5	ø46,1		ø41	1" GAS	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			124,5	389,5	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			130	408	197	ø54	ø41	1 1/4" GAS	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	



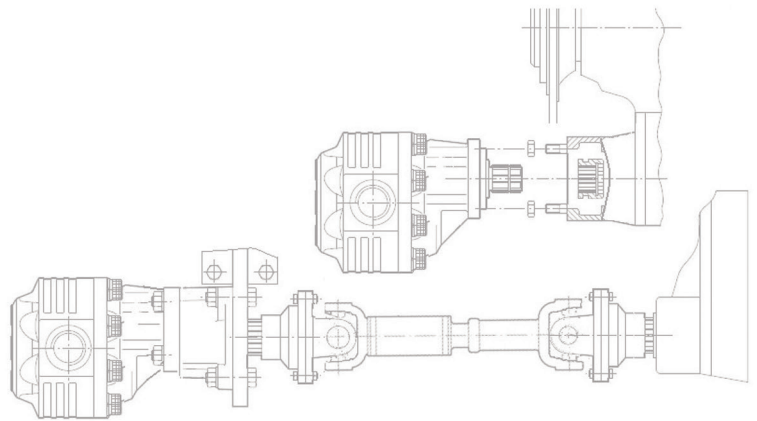
* A pump's torque is equal to the sum of all the pump sections' torques. The total torque mustn't exceed the maximum permitted torque for a pump's driveshaft. For defining the maximum permitted torque of every section use the formula on page 7.

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	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	208,5	194	ø54	—	1 1/4" GAS	—	40,5		
GP4T119/3T34			454		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	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		

Before mounting a gear pump (motor), please, check the hydraulic system (all its components). Early pump (motor) breakdown may occur due to non-observance of usage rules and the condition of the system.

WHEN INSTALLING YOU SHOULD KEEP THE NEXT REQUIREMENTS:

1. Check the rotation of the pump to be consistent with the drive shaft one. To define the rotation direction, check the drive shaft: right - clockwise, left - counterclockwise.
2. The pump is mounted with the screws (nuts), avoiding warp, which can cause radial and axial loads. The screws should be fixed with lock washers.
3. When mounting corners, nipples and others clean the line and o-rings. Grease the o-rings. Inlet and delivery lines should be adjusted with the help of flange.
4. Check the fluid for contamination. If necessary change it. When changing the fluid, change the filter element and the tank valve.
5. After installation it's recommended to fulfill pump run in at low loads. Check all the components of hydraulic system.



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

NOTES

Hydrosila
25006, Ukraine, Kropyvnytskyi
Phone/Fax: +38 0522 39-16-46
e-mail: info@hydrosila.com
www.hydrosila.com



HS-GPT-04/042025