

Part number:

**103-10005****HYDROMA**

HYDRAULICKÉ SYSTÉMY

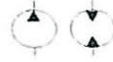
**HIDROMA  
SYSTEMS**

UKŁADY HYDRAULICZNE

**HYDROMA**

ГИДРАВЛИЧЕСКИЕ СИСТЕМЫ

300 КД/2007



Sheet 2

Sheets 12

2.1 Fixed displacement hydraulic pumps and motors 310 series

**Designation structure diagram for fixed displacement pumps and hydraulic motors**

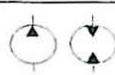
310			
Bent-axis fixed displacement hydraulic machines 310, 210			
Model: 0, 1, 2, 3, 4			
Displacement, cm <sup>3</sup> : 12, 28, 56, 80, 112, 160, 250			
Mounting flange 4 holes ISO 3019/2			0
Hydraulic machine	Shaft rotation*	Shaft design	
hydraulic motor	reversible	splined	0
hydraulic motor	reversible	keyed	1
hydraulic motor	reversible	shaft-gear	2
pump	clockwise	Splined	3
pump	counterclockwise	splined	4
pump	clockwise	keyed	5
pump	counterclockwise	keyed	6
hydraulic motor	reversible	with pitch splines 1 " 23T 16/32 DP ANSI B 92.1a	A
NBR		Climatic version	
FKM			
Pineline connections/directions			
0	2 threaded connections on end (outlet channel at 25° to shaft axis)		
1	2 threaded connections on end (outlet channel parallel to shaft axis)		
2	2 threaded connections on end (outlet channel at 50° to shaft axis)		
3	2 threaded connections on each side 2 threaded connections on end		
4	1 threaded connection sideways 1 flange on end		
5	1 threaded connection sideways 1 threaded connection on end		
6	2 flanges on end		
7	1 flange sideways 1 flange on end		
8	2 flanges on each side		
9	2 threaded connections on each side		
Valve:			
0	absent		
1	adjustable safety valve (on the Nleft*)		
2	adjustable safety valve (on the right*)		
3	Nonadjustable safety valve (on the left*)		
4	Nonadjustable safety valve (on the right*)		
5	docked block of check safety valves		
6	docked block of check safety valves and flushing valve		
7	docked block of rinsing valves		

\* -shaft rotation and valve location -- as viewed from the shaft end



**Back cover design variants**

Articles	Left pump	Right pump	Hydraulic motor
310.12 210.12 310.2.28 (View A)			
210.12 310.12 (View B)			
210.12 310.12 (View B)			
310.2.28 (View B)			
310.2.28 (View B)			
310...56 310...80    310...160 310...112    310...250 (View Г)			
310...160 310...250 (View Г)			
Hydraulic motors 310.12 210.12 (View A)			



In the pump operating mode, the shaft is set in rotation by the engine. Pistons mounted in the cylinder block turn on the cylinder block axis and reciprocate at the same time, with the piston sucking working fluid in one half revolution and pumping it into hydraulic system in another half revolution.

The output pressure is determined by working member load and limited by hydraulic system safety valve

The feed is determined by the rotation frequency of the pump shaft and working displacement of the pump.

In the motor operating mode, working fluid delivered from hydraulic system through openings in the cover and through a groove in the distributor

enters the cylinder block where it sets the pistons in motion.

The pistons transfer the force to a spherical joint. As the shaft axis and cylinder block axis are at an angle, the force acting on the joint is resolved into an axial and a tangential component.

The axial load is taken up by bearings while the tangential one develops a torque at the hydraulic motor shaft.

This shaft torque is directly proportional to the motor displacement ( $V$ ) and pressure difference ( $p$ ), its value is limited by the safety valve.

The rotational speed ( $n$ ) is direct proportional to working fluid supply and inversely proportional to the displacement

## Technical data

210, 310.2, 310.3 series

310.4 series

Max operating pressure (bar):

- |              |     |     |
|--------------|-----|-----|
| • Continuous | 280 | 400 |
| • Peak       | 350 | 450 |

## Technical data of pumps

Size			12	28	56	80	112	160	250	
Displacement	Vgmax	cm <sup>3</sup>	11,6	28	56	80	112	160	250	
Rotation speed at p= 0,2MPa	nmax	min -1	6000	4750	3750	3350	3000	2650	2100	
Delivery at nmax	QV max	l/min	70	133	210	268	336	424	525	
Rated power consumed at Δp=450 bar*	N max	kW	49	93	147	187	235	296	367	
			at Δp=400 bar	43	83	130	166	209	263	326
			at Δp=350 bar	38	72	114	146	183	230	285
			at Δp=250 bar.	27	52	81	104	130	165	204
Torque at Δp=450 bar*	M max	Nm	70	187	373	534	747	1067	1667	
			at Δp=400 bar	69	166	332	474	664	948	1482
			at Δp=350 bar	60	145	290	415	581	830	1297
			at Δp=250 bar	43	104	207	296	415	593	926
Fixed displacement pump weight	m max	kg	4	9,5	17	19,2	29	45	65	

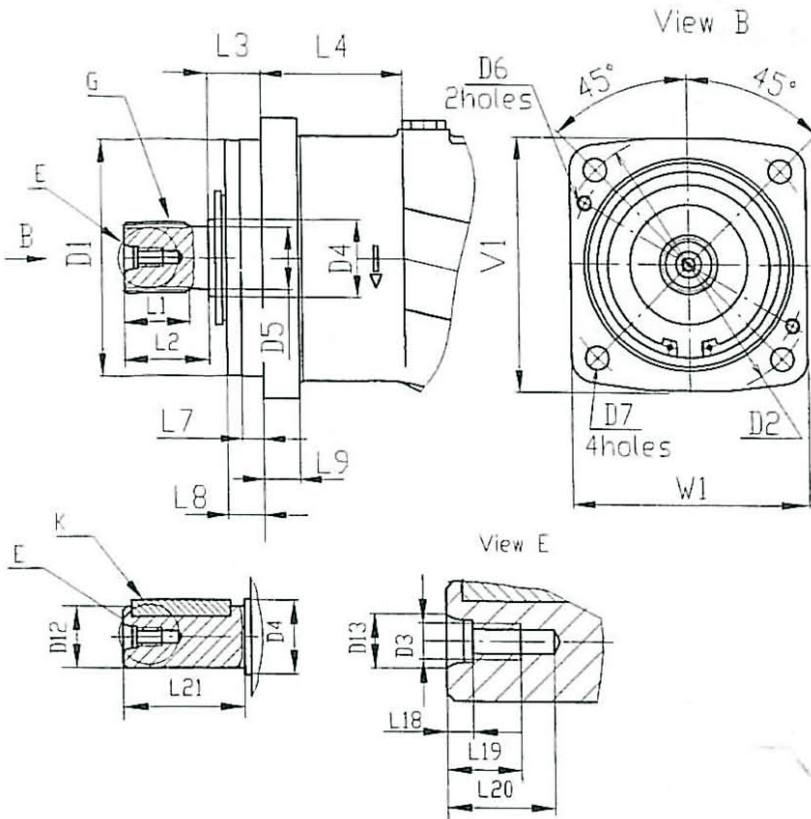
## Technical data of motors

Size			12	28	56	80	112	160	250	
Displacement	Vg	cm <sup>3</sup>	11,6	28	56	80	112	160	250	
Rotation speed at p= 0,2MPa	nmax	min -1	6000	4750	3750	3350	3000	2650	2100	
Consumed flow	QV max	l/min	70	133	210	268	336	424	525	
Torque at Δp=450 bar	M max	Nm	74	179	358	511	715	1022	1597	
			at Δp=400 bar	66	159	318	454	636	909	1420
			at Δp=350 bar	58	139	278	397	556	795	1242
			at Δp=250 bar	41	99	199	284	397	568	887
Weight	m max	kg	4	9,5	17	19,2	29	45	65	

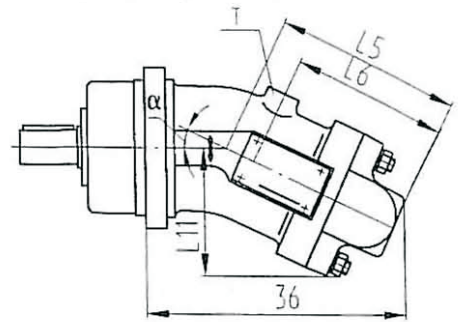
\* - to be considered while calculating drive motor overload



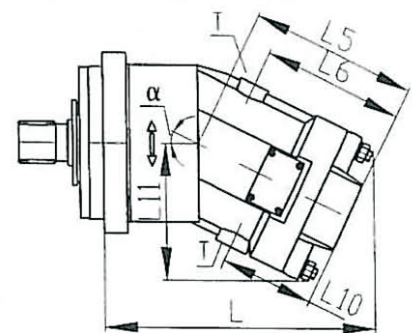
### Mounting dimensions of hydraulic machines



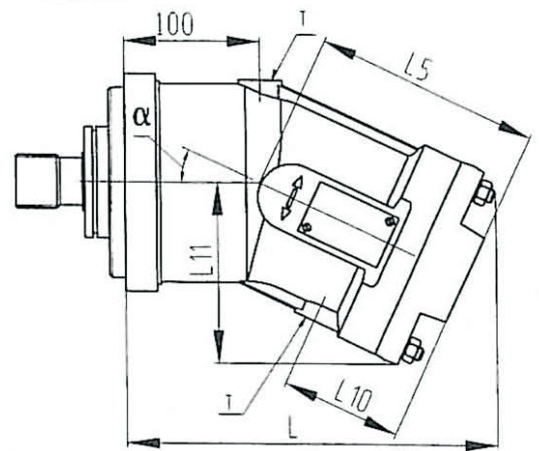
210.12, 310.12, 310.2.28



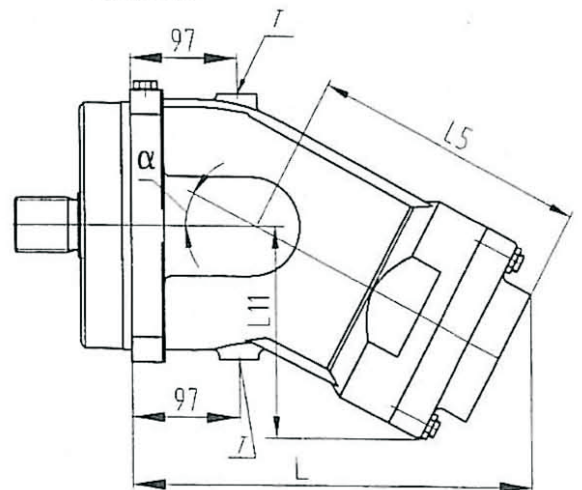
310...56, 310...112, 31...160



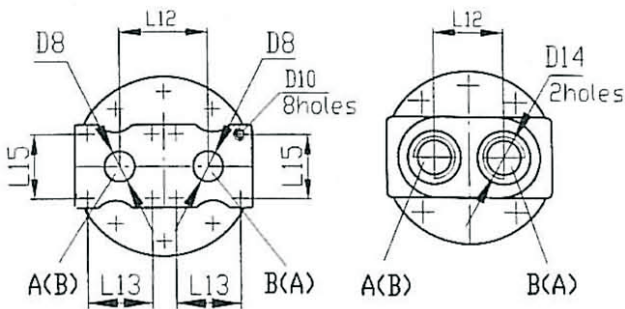
310...80



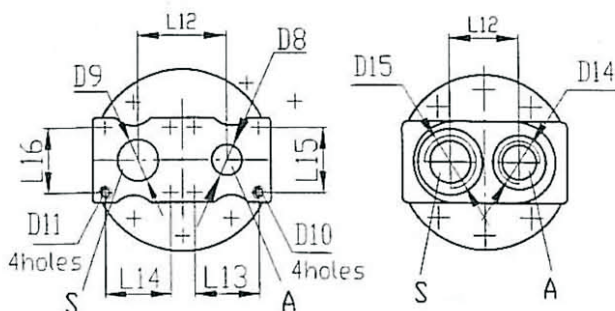
310...250



### Hydraulic motors



### Pumps



Size	210.12	310.12	310.2.28	310.3.56, 310.4.56	310.3.80 310.4.80	310.3.112 310.4.112	310.3.160 310.4.160	310.3.250 310.4.250
G spline DIN 5480	WA20x1,5x30x12x f7x9g *W20-1,5x30x15x 9g		WA25x1,5x30x15x f7x9g *W25-1,5x30x15x 9g	WA35x2x30x16x 7x9g *W35- 2x30x16x9g	WA40x2x30x18x f7x9g *W40- 2x30x18x9g	WA45x2x30x21xh8x9g *W45-2x30x21x9g		WA50x2x30x24x h8x9g *W50-2x30x24 x9g
K key DIN 6885	AS 6x6x32		AS 8x7x40	AS 8x7x50 AS 10x8x50*	AS 10x8x56	AS 12x8x63	AS 14x9x70	AS 14x9x80
D1	80 h7		100 h7	125 h7	140 h7	160 h7	180 h7	224 h7
D2	100		125	160	180	200	224	280
D3	M6-7H		M8-7H	M12-7H	M12-7H	M12-7H	M16-7H	M16-7H
D4	25h8		30h8	40 h8	45 h8	50 h8	50 h8	55 h8
D5	16,6		21,2	30 h11	35 h11	40 h11	40 h11	45 h11
D6			M8-7H	M8-7H	M10-7H	M10-7H	M12-7H	M12-7H
D7	9		11	14	14	18	18	22
D8				22	22	28	32	32
D9				30	30	38	42	62
D10				M10	M10	M12	M14	M16
D11				M10	M10	M12	M12	M16
D12	20k6		25k5	30k6 (32h6)**	35k6	40k6	45k6	50k6
D13	11		12,5	17	17	17	21	21
D1	M22x1,5		M27x2					
D15	M27x2		M33x2					
L	160	192	196	244	275	290	320	367
L1	23,5		33	32,5	34,5	39,5	39,5	43,5
L2	40		50	49	50	55	55	58
L3	40	9	50	33,5	32	40	40	50
L4	50	81	62	85	99	101	108,5	162
L5	113		147	153	166	177	210	251,2
L6	93		122	128		150	190	
L7	9	5,5	10	9	10	11	10	9
L8	38	7	48	18	12	25	34	48
L9	13		16	20	23	25	28	30
L10				90	88	100	118	
L11	81		99	120	135	145	165	191
L12	36		50	67	67	82	99	102
L13				48	48	60	66,7	75
L14				48	48	60	69,9	75
L15				48	48	60	31,8	75
L16				48	48	60	35,7	75
L18	5,5		7	8,5	8,5	8,5	8,5	9
L19	14		17	24	24	25	36	36
L20	19		23	35	35	35	46	46
L21	40		50	58	70	80	90	82
V1	90		118	140	160	180	200	246
W1	90		118	140	160	180	200	246
a	25°		25°	25°	25°	26°	25°	27°
T ***	M12x1,5		M18x1,5	M18x1,5	M18x1,5	M18x1,5	M22x1,5	M22x1,5

\* - sizes at special order

\*\* - size for 310.3.56 with keyed shaft 10x8x50

\*\*\* - joint leakproofness by rubber rinas