General description

The gear pumps are designed for transforming the mechanical energy as energy of the working liquid (pressure and flow rate). They are simplified in construction and they have a relatively low cost. All these benefits ensure their wide application in the hydraulic systems.

Drive arangements

The pump drive may be direct or indirect (by gear, chains, or belt transmissions). Both drives should not impose axial or radial forces on the pump shaft. Oldham coupling serrated drive adapters are used with direct drive. For indirect drive refer to the manufacturer.

The gear pumps are designed to work at the conditions mentioned below:

- Working liquid: hydraulic oils with viscosity 16 ... 200 mm^2/s;
- Degree of filtration: 15 ... 25 μm;
- Ambient temperature range: - 22 ... 55 °C;
- Fluid temperature range: - 25 ... 80 °C;
- Inlet pressure, absolute: 0.8 ... 2.2 bar;
- Fluid velocity (suctiun line) 0,5 ... 1 m/s
- Outlet pressure up to 250 bar.

The gear pumps made by "Caproni" are produced in 5 diferent groups: 00, 10, 20 and 20H, 30 and 40. The displacements of the pumps are in the range from 0.25 to 60 cm^3.

Group 00 q = 0.25 ... 2 cm^3;
Group 10 q = 1 ... 9.8 cm^3;
Group 20 q = 4.5 ... 25 cm^3;
Group 20H q = 15 ... 36 cm^3;
Group 30 q = 20 ... 60 cm^3;
Group 40 q = 46 ... 60 cm^3.

There are different variants of flanges, shafts and ports for each pump group (standard; Germany; USA ...).

We offer the next variants too:

- tandem pumps;
- pumps with build-in valves;
- reversible pumps;
- reversible gear motors.

Used symbols:

n - speed of rotation [min^{-1}];
p - pressure [bar];
q - displacement [cm^3];
η - total efficiency $\eta = \eta_q . \eta_{hm}$ [-];
η_{hm} - hydromechanical efficiency [-];
η_q - volumetric efficiency [-].

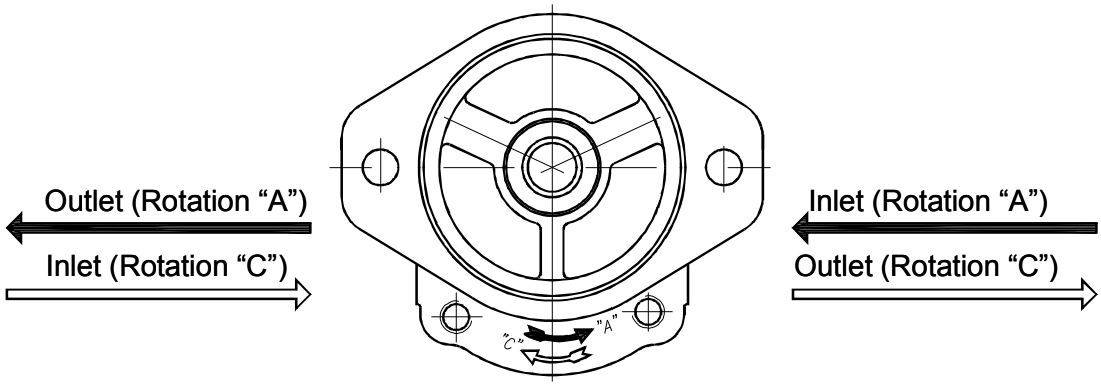
Commonly used formulas:

Flow: $Q = \frac{q.n.\eta}{1000}$ [l/min]

Torque: $M \cong \frac{q.p}{20.\pi}$ [N.m]

Drive power: $P = \frac{Q.p}{600}$ [kW]

A relationship between the direction of rotation and the place of the inlet and outlet ports of the pumps



How to order:

Group	Rotation	Displacement code	Drive shaft	Pump code	Ports
00 **10** **20** **30** **40**	**A** ↺ **C** ↻ **R** Ω		**X** - Through the front cover **Y** - Through the both covers	***(*)	- A flange with metric threads **P4**- A flange with UNC threads **M** - Metric **G** - GAS **U** - SAE J475

Group 00	
Code	cm^3
0,25	0,25
0,3	0,3
0,5	0,5
0,75	0,75
1	1
1,25	1,25
1,5	1,5
1,75	1,75
2	2

Group 10	
Code	cm^3
1	1
1,25	1,25
1,6	1,6
2	2
2,5	2,5
2,65*	2,65
3,15	3,15
3,65	3,65
4,2	4,2
4,7*	4,7
5	5
5,7	5,7
6,1	6,1
7,4	7,4
8*	8
8,5	8,5
9,8	9,8

Group 20	
Code	cm^3
4,5	4,5
6,3	6,3
7*	7
8,2	8,2
10	10
11	11,3
12	12
14	14
15	15
16	16
17*	17,3
19	19
22	22
25	25
28	28
32	32
36	36

Group 20H	
Code	cm^3
15	15
16	16
19	19
22	22
25	25
28	28
32	32
36	36

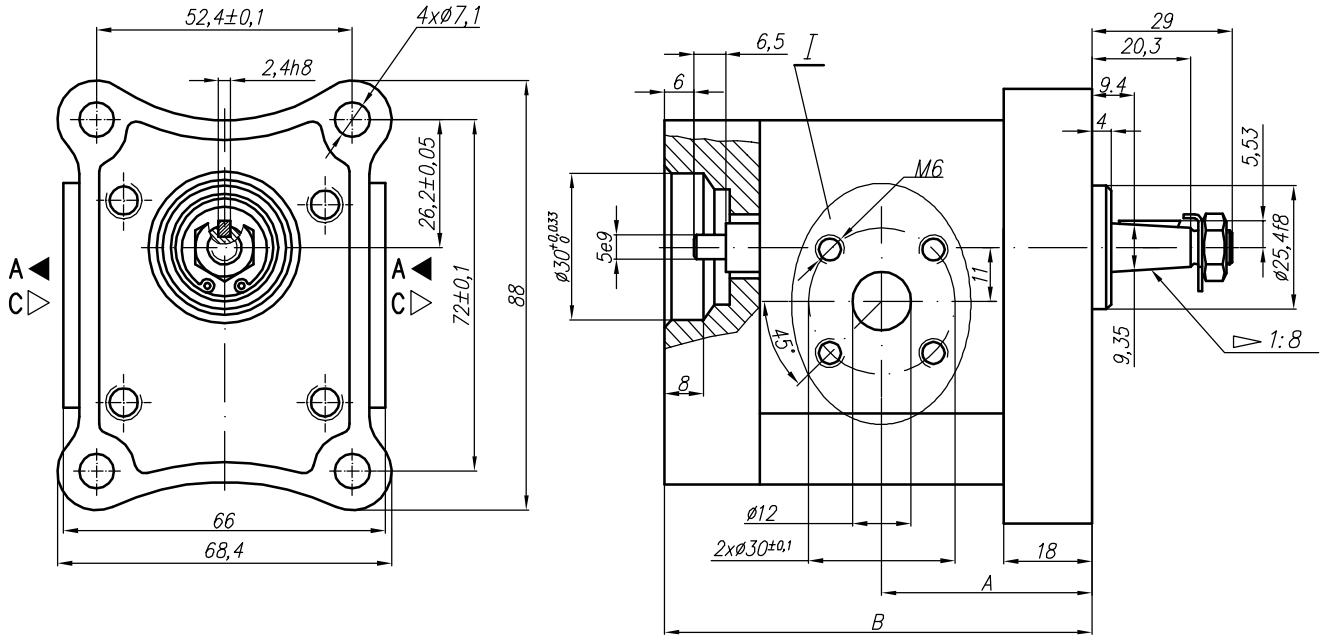
Group 30	
Code	cm^3
20	20
22,5	22,5
25	25
28	28
32	32
36	36
42	42
46	46
50	50
55	55
60	60

Group 40	
Code	cm^3
36	36
42	42
46	46
50	50
55	55
60	60

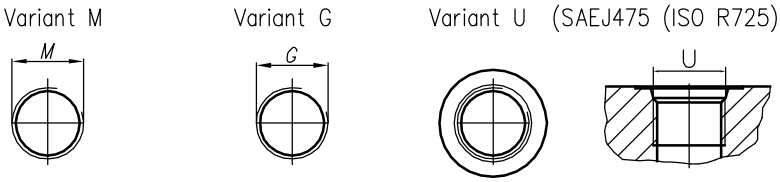
Example: 20A14X073 - Hydraulic gear pump, 20 group, direction of rotation - counter clockwise, displacement 14 cm^3, modification 073.

* - These pumps - only under a special order

The pump 10A(C)...X174 is a first section of multiple pump Gr.11.



I – variants



Variants:
...X174 - Normal version (flange);
...X174M - for M ports (see the picture I and the table below);
...X174G - for G ports (see the picture I and the table below);
...X174U - for U ports (see the picture I and the table below).

Type	Displacement	Flow		Pressure	max Speed	Dimension							
		at 1500 rpm	at max rpm	P_{nom}	n	A	B	Inlet			Outlet		
	cm^3/rev	l/min	l/min	bar	rpm	mm	mm	M	G	U	M	G	U
10A(C)1X174	1	1,40	3,26	250	3500	39,1	81	M16x1,5	G 3/8" - A	3/4" - 16UNF - 2B	M16x1,5	G 3/8" - A	9/16" - 18UNF - 2B
10A(C)1,25X174	1,25	1,74	4,07	250	3500	39,5	82						
10A(C)1,6X174	1,6	2,23	5,21	250	3500	40,3	83,6						
10A(C)2X174	2	2,82	6,58	250	3500	41,1	85,2						
10A(C)2,5X174	2,5	3,53	8,23	250	3500	42,1	87,2						
* *10A(C)2,65X174*	*2,65*	*3,74*	*8,72*	*250*	*3500*	*42,4*	*87,8*						
10A(C)3,15X174	3,15	4,44	10,36	250	3500	43,5	89,8	M20x1,5	G 1/2"-A				
10A(C)3,65X174	3,65	5,15	12,01	250	3500	44,4	91,9						
10A(C)4,2X174	4,2	5,92	13,82	250	3500	45,5	94,1						
* *10A(C)4,7X174*	*4,7*	*6,63*	*15,46*	*250*	*3500*	*46,1*	*96*						
10A(C)5X174	5	7,05	14,10	250	3000	47,1	97,2						
10A(C)5,7X174	5,7	8,12	16,25	200	3000	48,5	100,1						
10A(C)6,1X174	6,1	8,69	14,49	200	2500	49,4	101,8						
10A(C)7,4X174	7,4	10,55	17,58	180	2500	52,1	107,2	M22x1,5		7/8" - 14UNF	M18x1,5		3/4" - 16UNF
* *10A(C)8X174*	*8*	*11,40*	*15,20*	*150*	*2000*	*53,4*	*109,7*						
10A(C)8,5X174	8,5	12,11	16,15	150	2000	54,4	111,7						
10A(C)9,8X174	9,8	13,97	18,62	120	2000	57	117						

* - These pumps - only under a special order