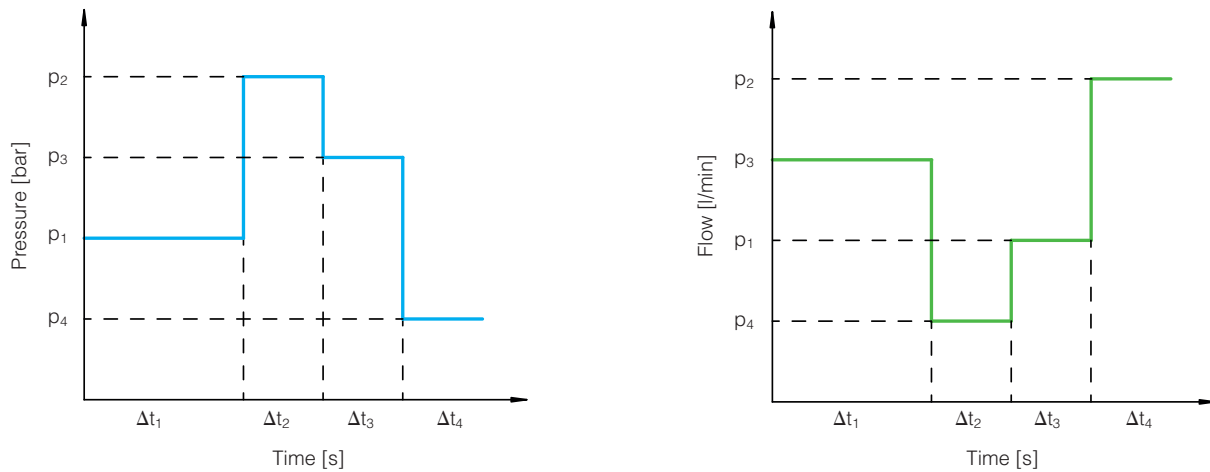


Sizing criteria for Servopumps - SSP

For the sizing must refer to the following Tab.1 and Tab.2 tables, respectively, for servopumps SSP equipped with PGI pumps with cast iron body and pressure up to 330 bar, or PGIL with aluminum body for pressure (up to 250 bar) - see sizing example in section 1.1

Example machine cycle



STEP 1 - Pump sizing


The pump must be selected to satisfy the following equation:

$$\begin{cases} Q_{max,pump} > Q_{max,cycle} \\ P_{peak,pump} > P_{max,cycle} \end{cases} \quad \text{where:} \quad \begin{aligned} Q_{max,pump} &= \text{maximum flow rate of the pump} \\ Q_{max,cycle} &= \text{maximum flow machine cycle} \\ P_{peak,pump} &= \text{maximum pump pressure} \\ P_{max,cycle} &= \text{maximum machine cycle pressure} \end{aligned}$$

STEP 2 - Sizing of the electric servomotor and drive

The electric servomotor and the drive are selected according to the maximum average pressure $P_{med,SSP}$ that the servopump SSP can guarantee, according to the equation:

$$\begin{cases} P_{med,SSP} > P_{rms,cycle} \\ P_{med,SSP} > \frac{P_{max,cycle}}{2} \end{cases} \quad \text{where:} \quad \begin{aligned} P_{med,SSP} &= \text{SSP maximum continuous mean pressure (see Tab.1 and Tab.2)} \\ P_{rms,cycle} &= \sqrt{\frac{p_1^2 \Delta t_1 + p_2^2 \Delta t_2 + \dots + p_n^2 \Delta t_n}{\Delta t_1 + \Delta t_2 + \dots + \Delta t_n}} \\ p_1, p_2 \dots p_n &= \text{pressures [bar] in each phase of the cycle} \\ \Delta t_1, \Delta t_2 \dots \Delta t_n &= \text{duration [s] of each phase of the cycle} \end{aligned}$$

 **The procedure described must be considered only for a preliminary sizing of the servopump. For optimal sizing, use the S-SW-SIZING software. Download it from www.atos.com**

1.1 Sizing example

Machine cycle data:

$$Q_{max,cycle} = 140 \text{ l/min}; \quad P_{max,cycle} = 290 \text{ bar}; \quad P_{rms,cycle} = 200 \text{ bar};$$

STEP 1 - pump sizing

In the "Cycle data" column of the tables Tab.1 and Tab.2 identify the first row of Q_{max} , pump and P_{peak} , pump values that are immediately higher than both machine cycle data:

$$Q_{max,pump} > 140 \text{ l/min}; \quad P_{peak,pump} > 290 \text{ bar};$$

In this case, the identified values that satisfy the machine cycle data are present only in Tab.1:

$$Q_{max,pump} = 150 \text{ l/min and } P_{peak,pump} = 300 \text{ bar, corresponding to the PGI-2050 pump}$$

STEP 2 - PMM servomotor sizing and combination with D-MP drive

In the row corresponding to the identified pump (PGI-2050), move to the right in the table until you find the value of P_{med} , SSP that meets the condition:

$$P_{med,SSP} > 200;$$

$$P_{med,SSP} > \frac{290}{2}$$

In this case, the P_{med} , SSP identified value is = 227

Moving along the column corresponding to the value of P_{med} , SSP identified, it is possible to select:

the electric servomotor: **PMM-2042**;

the drive: **D-MP-090**

The complete code of the SSP servopump is therefore: **SSP-T-SP-**-2050-2042-090*-***

Tab.1 - Sizing of the SSP servopump equipped with PGI pump (cast iron body)

CODE	CYCLE DATA		PGI PUMP Code	PMM MOTOR								
	$Q_{max,pump}$ (l/min)	$P_{peak,pump}$ (bar)		1009	1015	1024	1032	2042	2055	2080	2100	
	$P_{med,SSP}$ (bar)											
SSP-*	32	350	1011	223	330							
	46	350	1016	155	260	330						
	60	350	2020	122	203	297	330					
	75	350	2025	99	165	242	330					
	96	350	2032	76	126	185	252	330				
	120	300	2040	62	101	148	202	280				
	120	340	4050		81	119	162	227	270	297	330	
	150	300	2050	49	81	119	162	227	270	280		
	155	330	4064			93	127	177	211	232	330	
	175	330	4080			74	101	142	169	186	270	300
	195	290	3064			93	127	177	211	232	280	
	220	330	4100				81	113	135	149	216	270
	240	290	3080			74	101	142	169	186	270	280
	300	290	3100			59	81	113	135	149	216	270
				022	032	046	060	090	100	140	165	210
D-MP DRIVE												

Tab. 2 - Sizing of the SSP servopump equipped with PGIL pump (aluminum body)

CODE	CYCLE DATA		PGIL PUMP Code	PMM MOTOR								
	$Q_{max,pump}$ (l/min)	$P_{peak,pump}$ (bar)		1009	1015	1024	1032	2042	2055	2080	2100	
	$P_{med,SSP}$ (bar)											
SSP-*	60	320	2020L	122	203	250						
	75	320	2025L	99	165	242	250					
	96	320	2032L	76	126	185	250					
	120	300	2040L	62	101	148	202	250				
	150	280	2050L	49	81	118	161	225	250			
	195	270	3064L			91	124	174	207	227	250	
	240	270	3080L			74	101	141	168	185	250	
	300	270	3100L			59	74	113	134	148	215	250
	350	280	4125L					91	108	119	173	216
				022	032	046	060	090	100	140	165	210
D-MP DRIVE												