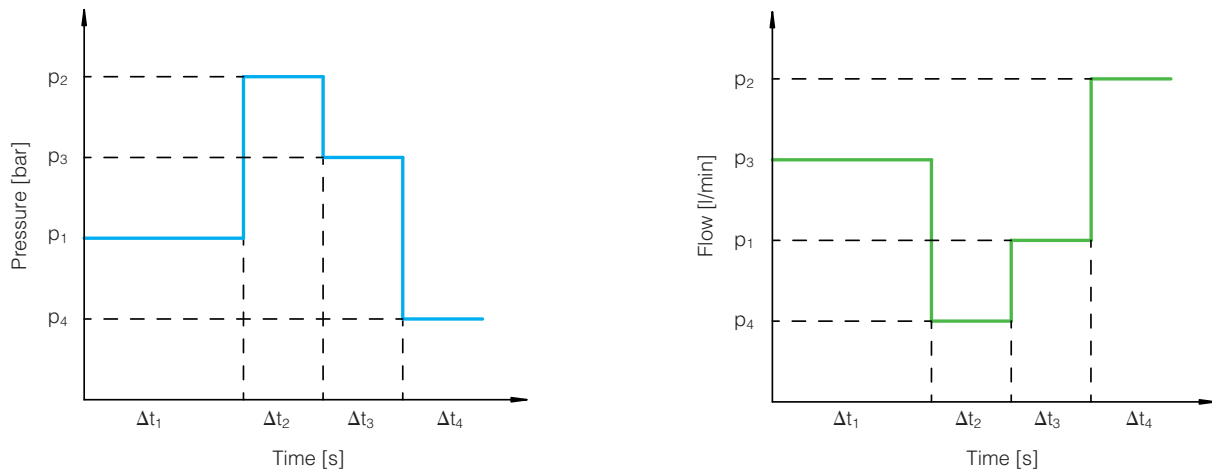


Sizing criteria for Servopumps - SSP

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:

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



The procedure described must be considered only for a preliminary sizing of the servopump. For optimal sizing, use the S-ST 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															
	60	350	2020	122	203	297	330													
	96	350	2032	76	126	185	252	330												
	120	300	2040		101	148	202	280												
	120	340	4050		81	119	162	227	270	297	330									
	150	300	2050		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				81	113	135	149	216	270									
				022	032	046	060	090	100	140	165	210								
													DRIVE D-MP							

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														
	96	320	2032L	76	126	185	250													
	120	300	2040L		101	148	202	250												
	150	280	2050L		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				74	113	134	148	215	250								
	350	280	4125L					91	108	119	173	216								
				022	032	046	060	090	100	140	165	210								
													DRIVE D-MP							