

Smart Servopump - SSP

high performance P/Q control and energy saving



SSP is available in single pump (sect. 1.1) or double pump execution (sect. 1.2). SSP systems combine the typical advantages of hydraulic power transmission with the ease of control and adjustment of an electric drive while also ensuring maximum levels of energy efficiency.

Maximum flow: **350 l/min**
 Maximum rated power: **100 kW**
 Maximum continuous pressure:
 cast iron pump **330 bar**
 aluminium pump **250 bar**

They consist of a fixed displacement internal gear pump, driven by a permanent magnet synchronous servomotor controlled by an electronic drive. The latter controls the speed of the servomotor and therefore of the pump, to adjust the flow rate or pressure of the system based on the reference signals received from the PLC of the machine.

A dedicated algorithm optimizes the P/Q function by automatically selecting the activation of the flow or pressure control.

Compared to traditional systems, SSPs offer the following advantages:

- significant reduction in energy consumption, as the pump operates at the speed strictly necessary to generate the required flow rate / pressure
- high dynamics and precision of P/Q control thanks to a dedicated algorithm
- reduction of the noise level, thanks to the design of the pump and the variable speed
- maximum flexibility thanks to dedicated software
- Smart Maintenance allows to plan in advance the replacement of worn components, maximizing productivity and minimizing maintenance costs
- simplified commissioning thanks to the Smart start-up and Smart tuning functions
- possibility of customization up to 4 axes with Multiple axis function

For more details see technical table AS050

1 MODEL CODE

1.1 Single pump execution

For optimal sizing, download the sizing software from MyAtos area at www.atos.com

SSP	-	T-SP	-	NP	-	2020L	-	1024	-	046	/	C	/	T	/	*	/	PE
Smart servopump																Series number		Seals material PE = FKM
<p>Control logic: T-SP = alternated P/Q control with resolver</p> <p>Fieldbus interface, serial port always present: NP = Not present BC = CANopen EH = EtherCAT BP = PROFIBUS DP EP = PROFINET RT/IRT</p> <p>Pump PGI, cast iron pump, Pmax 330 bar (1) - see table AS300: 1011 = 10,8 cm³/rev 2040 = 39,5 cm³/rev 3080 = 80 cm³/rev 1016 = 15,6 cm³/rev 2050 = 49,5 cm³/rev 4080 = 80 cm³/rev 2020 = 20 cm³/rev 4050 = 50 cm³/rev 3100 = 100 cm³/rev 2025 = 24,5 cm³/rev 3064 = 64 cm³/rev 4100 = 100 cm³/rev 2032 = 31,6 cm³/rev 4064 = 64 cm³/rev</p> <p>PGIL, aluminium pump, Pmax 250 bar - see table AS350: 2020L = 20 cm³/rev 2040L = 40,1 cm³/rev 3080L = 80 cm³/rev 2025L = 24,5 cm³/rev 2050L = 50 cm³/rev 3100L = 100 cm³/rev 2032L = 32,1 cm³/rev 3064L = 64 cm³/rev 4125L = 125 cm³/rev</p>																		
<p>Port orientation see section 10: T = standard U, V = optional</p> <p>Hydraulic option see section 8: C = integrated block with relief valve and pressure transducer D = as option C plus Smart Cooling functionality</p> <p>Electronic function see section 9: K = Drive with Safe Torque Off - always present</p> <p>Drive D-MP - see table AS500: 022 = 22 A 060 = 57,5 A 140 = 140 A 032 = 32 A 090 = 87 A 165 = 165 A 046 = 46 A 100 = 100 A 210 = 210 A</p> <p>Motor PMM - see table AS400: 1009 = 8,7 kW 1032 = 30 kW 2080 = 80 kW 1015 = 15 kW 2042 = 42 kW 2100 = 100 kW 1024 = 24 kW 2055 = 55 kW</p>																		

(1) Pmax depends on the pump displacement

1.2 Double pump execution

Second pump must be selected with equal or smaller displacement than first pump
Our specialists are available to give support in the sizing of SSP double pump executions

SSP	-	T-SP	-	NP	-	2020	/	1011	-	1024	-	046	/	K	/	T	/	*	/	PE
Smart servopump																		Series number		Seals material PE = FKM
Control logic: T-SP = alternated P/Q control with resolver																				
Fieldbus interface , serial port always present: NP = Not present BC = CANopen EH = EtherCAT BP = PROFIBUS DP EP = PROFINET RT/IRT																				
First pump PGI, cast iron pump , Pmax 330 bar (1) - see table AS320: 1011 = 10,8 cm ³ /rev 2025 = 24,5 cm ³ /rev 2050 = 49,5 cm ³ /rev 1016 = 15,6 cm ³ /rev 2032 = 31,6 cm ³ /rev 2020 = 20 cm ³ /rev 2040 = 39,5 cm ³ /rev																				
Second pump PGI, cast iron pump , Pmax 330 bar - see table AS320: 1011 = 10,8 cm ³ /rev 1016 = 15,6 cm ³ /rev																				
Drive D-MP - see table AS500: 022 = 22 A 060 = 57,5 A 140 = 140 A 032 = 32 A 090 = 87 A 165 = 165 A 046 = 46 A 100 = 100 A 210 = 210 A																				
Motor PMM - see table AS400: 1009 = 8,7 kW 1024 = 24 kW 2042 = 42 kW 1015 = 15 kW 1032 = 30 kW 2055 = 55 kW																				

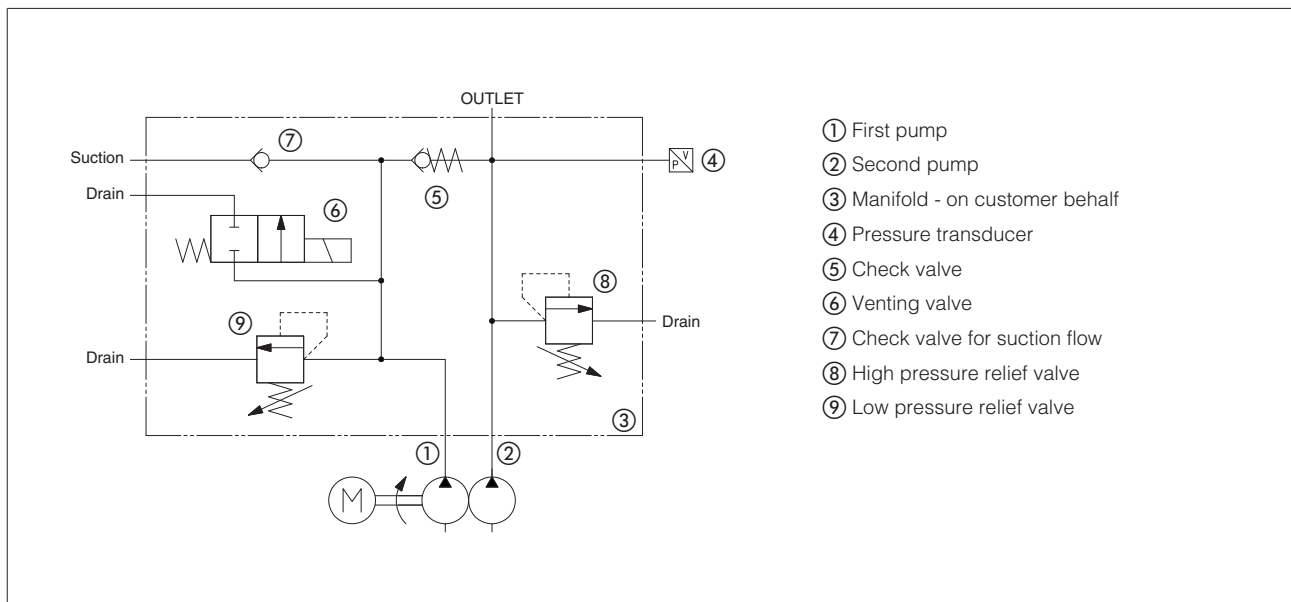
(1) Pmax depends on the pump displacement

Typical double pump application

The double pump execution is particularly suitable for machine cycles in which phases with high flow rate and low pressure alternate with phases of high pressure and very low flow rate. This configuration allows, in fact, to limit the required shaft torque, reducing the size of the electrical motor and drive. When the machine cycle requires high pressure and low flow rate, the venting valve ⑥ must be activated.

The suction valve ⑦ is necessary to allow oil suction from the tank in case SSP revolves in opposite direction when in pressure control phase, while the venting valve is activated.

The image below represents an example of hydraulic scheme for double pump execution. The assembled manifold is on customer behalf.



Contact the Atos technical department for more details and support regarding the sizing of the SSP with a double pump execution.

8 HYDRAULIC OPTION - not for double pump execution

C = This option provides a hydraulic block mounted directly on the pump outlet, which integrates a mechanical pressure relief valve with safety function on the maximum system pressure and a pressure transducer for the feedback of the actual pressure on the delivery line.

- ① Mechanical pressure relief valve; the valve is supplied with zero adjustment, and must be adjusted by the user at a pressure slightly higher than the maximum pressure required by the system.
- ② Pressure transducer E-ATR-8/400/I - see technical table GS465

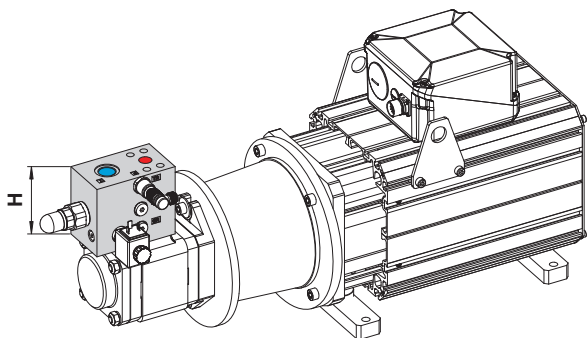
D = This option allows to protect the pump from overheating when it is subjected to particularly heavy duty cycles, in particular in the prolonged phases of static pressure control.

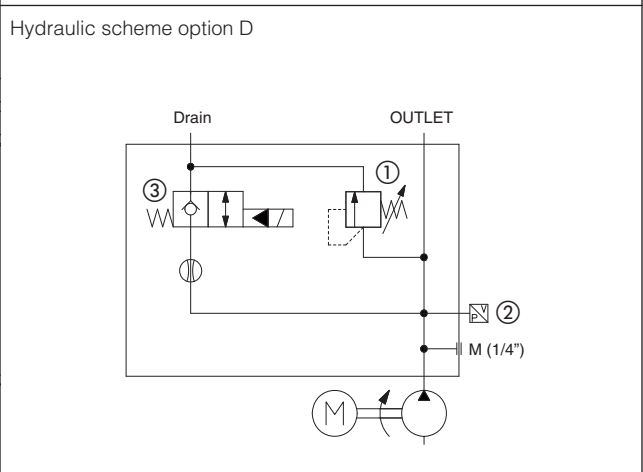
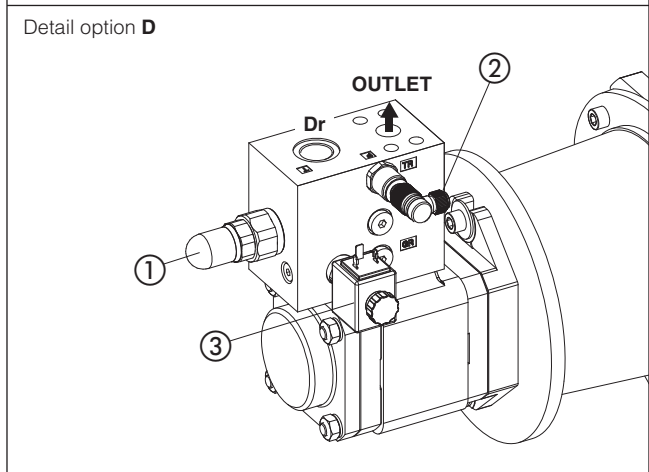
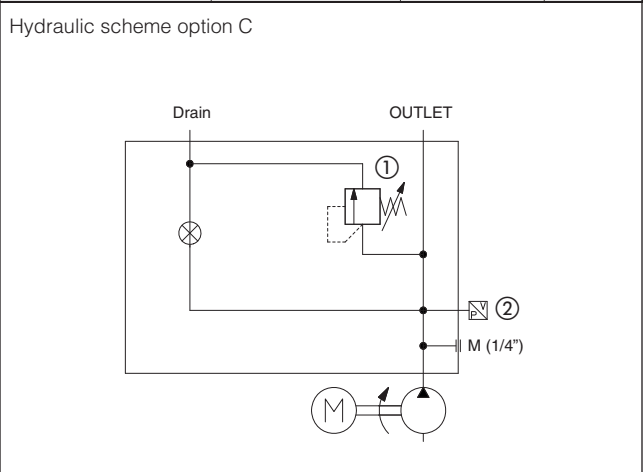
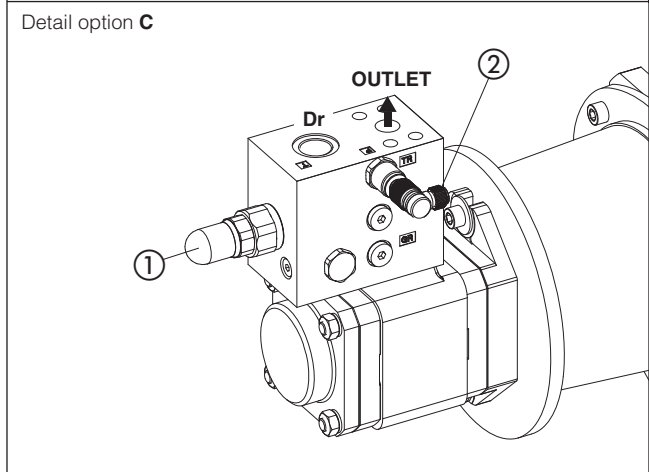
This option includes a hydraulic block with relief valve and pressure transducer, as for the /C option, with also integrated:

- ③ Smart Cooling cartridge valve JO-DL-4-2/NC-X 24DC - see technical table E105

When a temperature considered critical is reached, the Smart Cooling valve opens ③ as to cause a small recirculation of oil through the pump which protects it from dangerous overheating.

The sizing software for SSP suggests the need for the /D option based on the machine cycle.

Options C and D dimensions	SSP CODE	OUTLET	Dr (drain)	H (mm)
	SSP-T-SP**-1011	1/2" SAE3000	G1/2"	105
	SSP-T-SP**-1016			
	SSP-T-SP**-2020*	3/4" SAE3000	G3/4"	110
	SSP-T-SP**-2025*			
	SSP-T-SP**-2032*			
	SSP-T-SP**-2040*	1" SAE3000	G1"	115
	SSP-T-SP**-2050*			
	SSP-T-SP**-4050	1" SAE6000	G1"	115
	SSP-T-SP**-3064*	1" SAE6000	G1 1/4"	125
	SSP-T-SP**-4064			
	SSP-T-SP**-3080*	1 1/4" SAE6000	G1 1/2"	140
	SSP-T-SP**-4080*			
	SSP-T-SP**-3100*			
	SSP-T-SP**-4100			
	SSP-T-SP**-4125	1 1/2" SAE6000	G 2"	140



9 ELECTRONIC FUNCTION - always present

K = The drive implements the Safe Torque Off (STO) function as a prevention of unexpected starts according to 2006/42/EC Machinery Directive (MD) - standard EN 61800-5-2.

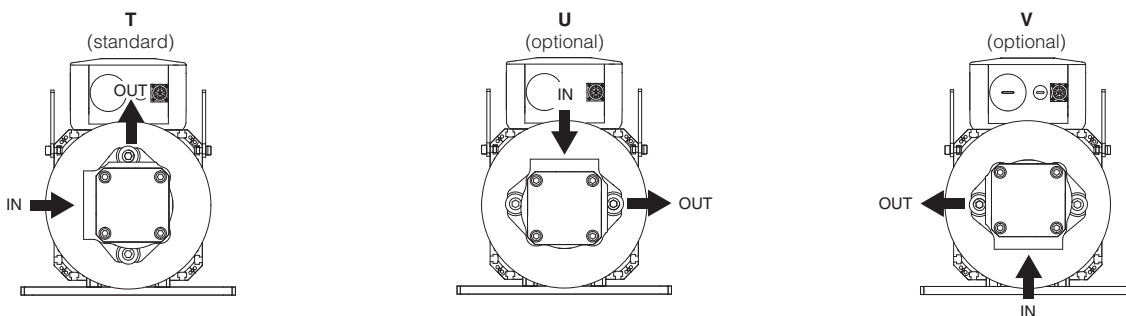
This function prevents the generation of a rotating magnetic field removing the power semiconductor control voltage allowing short-term operations (such as cleaning and / or maintenance work on parts of non-electrical devices of the machine) without disconnecting drive power supply or the connection between the drive and the servomotor.

For detailed descriptions, please refer to the S-MAN-HW installation manual.

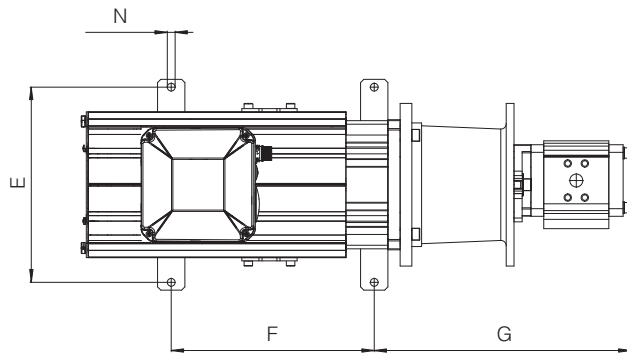
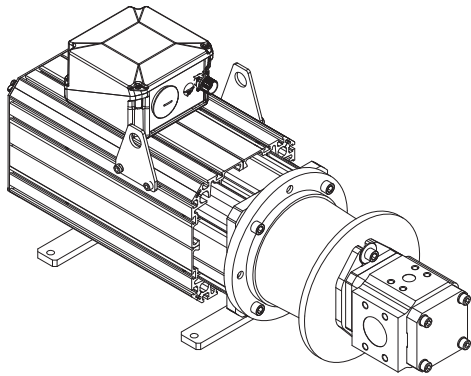
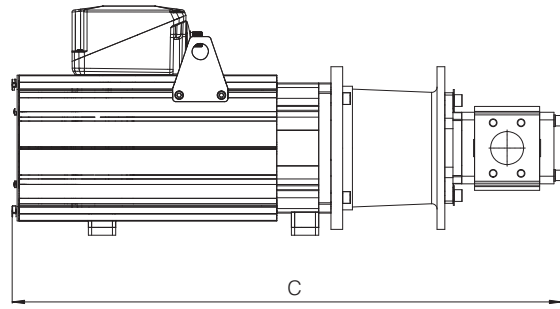
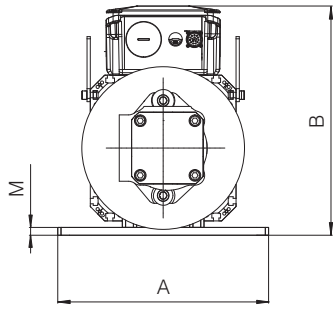
Possible combined option - not for double pump execution
/CK, /DK

10 PORTS ORIENTATION

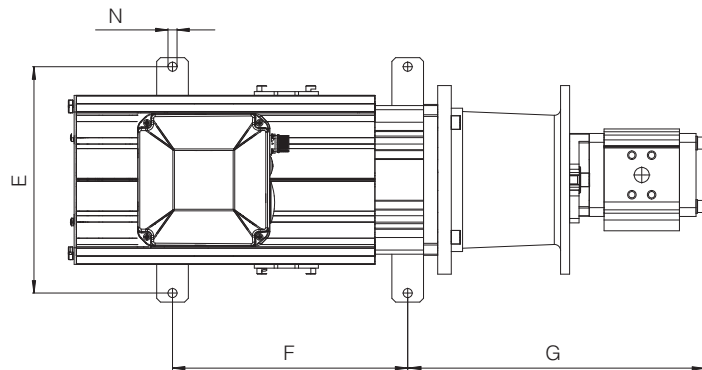
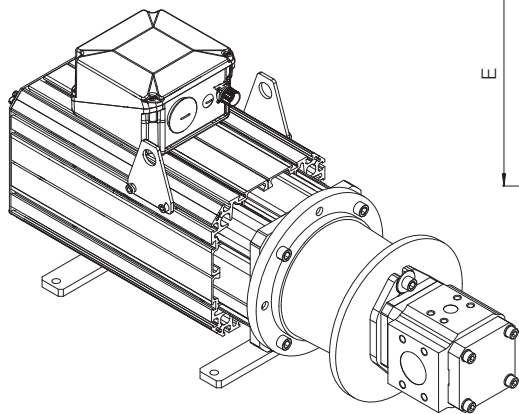
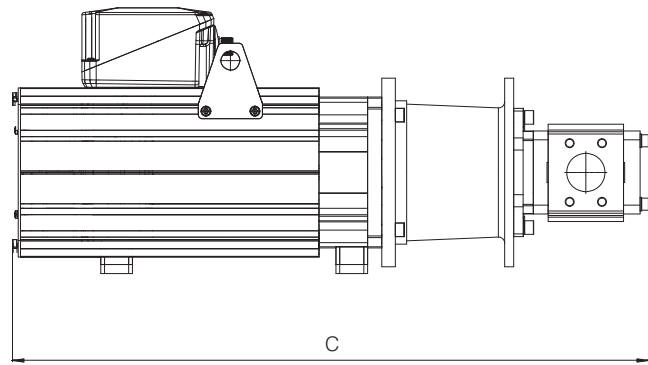
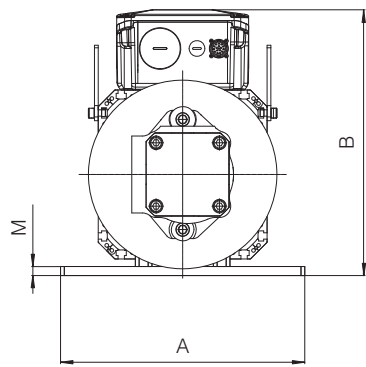
The pump can be supplied with inlet and outlet ports oriented in different configurations, as shown in the figure (seen from the bottom of the pump)



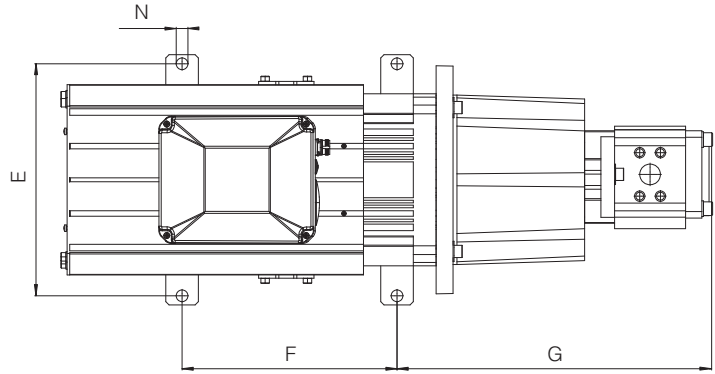
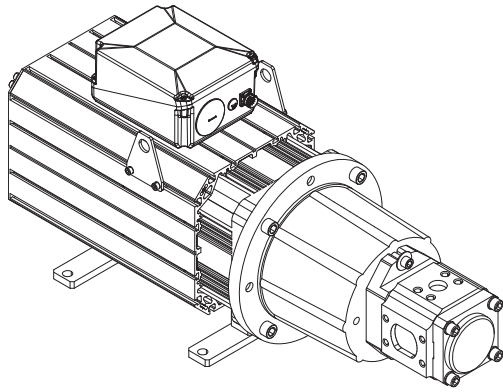
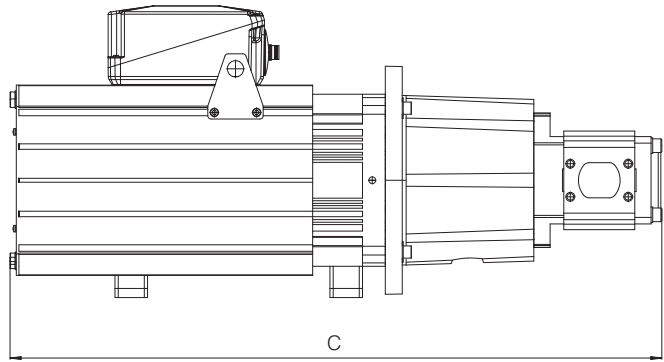
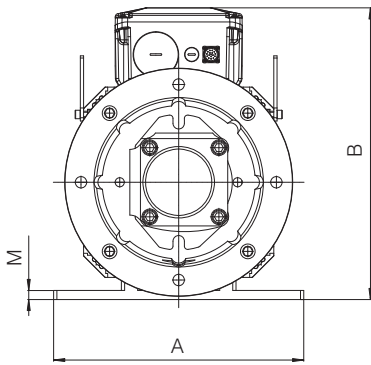
11 INSTALLATION DIMENSIONS - motor pump unit [mm] for drive dimensions see AS500



MODEL CODE	A	B	C	E	F	G	M	N	Mass [Kg]
SSP-*-1011-1009-*	324	335	630	300	168	324	12	12	56
SSP-*-1011-1015-*		355	700		240				68
SSP-*-1016-1009-*	324	335	640	300	168	334	12	12	56
SSP-*-1016-1015-*		355	710		240				68
SSP-*-2020*-1009-*	324	355	335	300	168	373	12	12	62
SSP-*-2020*-1015-*			750		240				74
SSP-*-2020*-1024-*			820		312				90
SSP-*-2020*-1032-*			890		385				105
SSP-*-2025-1009-*	324	355	335	300	168	363	12	12	62
SSP-*-2025-1015-*			750		240				75
SSP-*-2025-1024-*			820		312				90
SSP-*-2025-1032-*			890		385				106
SSP-*-2032*-1009-*	324	355	335	300	168	368	12	12	63
SSP-*-2032*-1015-*			750		240				76
SSP-*-2032*-1024-*			820		312				91
SSP-*-2032*-1032-*			890		385				107
SSP-*-2032-2042-*	384	435	890	356	275	417	14	18	145
SSP-*-2040*-1009-*	324	355	690	300	168	381	12	12	67
SSP-*-2040*-1015-*			760		240				79
SSP-*-2040*-1024-*			830		312				94
SSP-*-2040*-1032-*			900		385				110
SSP-*-2040*-2042-*	384	435	900	356	275	430	14	18	148
SSP-*-2050*-1009-*	324	355	700	300	168	395	12	12	69
SSP-*-2050*-1015-*			770		240				81
SSP-*-2050*-1024-*			840		312				96
SSP-*-2050*-1032-*			910		385				112
SSP-*-2050*-2042-*	384	435	910	356	275	444	14	18	150
SSP-*-2050*-2055-*		450	970		330				172

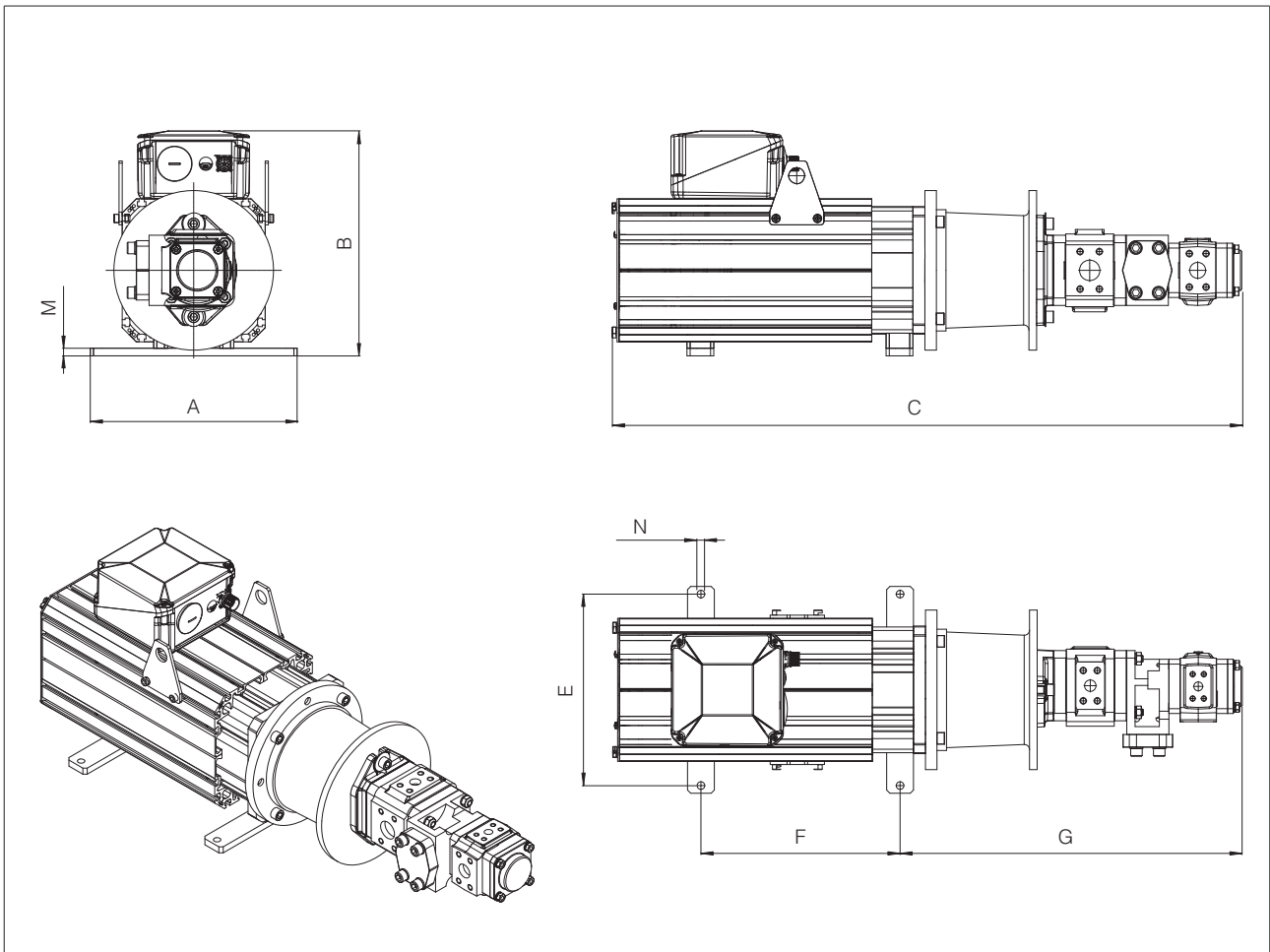


MODEL CODE	A	B	C	E	F	G	M	N	Mass [Kg]
SSP-*-3064*-1024-*	324	355	830	300	312	383.5	12	12	94
SSP-*-3064*-1032-*			900		385				111
SSP-*-3064*-2042-*	384	435	930	356	275	456.5	14	18	149
SSP-*-3064*-2055-*			980		330				170
SSP-*-3064*-2080-*		450	112		476				213
SSP-*-3080*-1024-*			840		312				97
SSP-*-3080*-1032-*	324	355	920	300	385	395.5	12	12	113
SSP-*-3080*-2042-*			940		275				151
SSP-*-3080*-2055-*	384	435	1000	356	330	468.5	14	12	172
SSP-*-3080*-2080-*			1123		476				216
SSP-*-3080*-2100-*		450	1200		583				257
SSP-*-3100*-1024-*			860		312				98
SSP-*-3100*-1032-*	324	355	930	300	385	411.5	12	12	115
SSP-*-3100*-2042-*		435	950		275				152
SSP-*-3100*-2055-*	384	450	1011	356	330	484.5	14	18	174
SSP-*-3100*-2080-*			1140		476				217
SSP-*-3100*-2100-*		490	1210		583				258
SSP-*-4050*-1015-*			810		240				108
SSP-*-4050*-1024-*	324	355	870	300	312	427	12	12	122
SSP-*-4050*-1032-*			950		385				138
SSP-*-4050*-2042-*	384	435	950	356	275	481	14	18	166
SSP-*-4050*-2055-*			1011		330				187
SSP-*-4050*-2080-*		450	1155		476				239

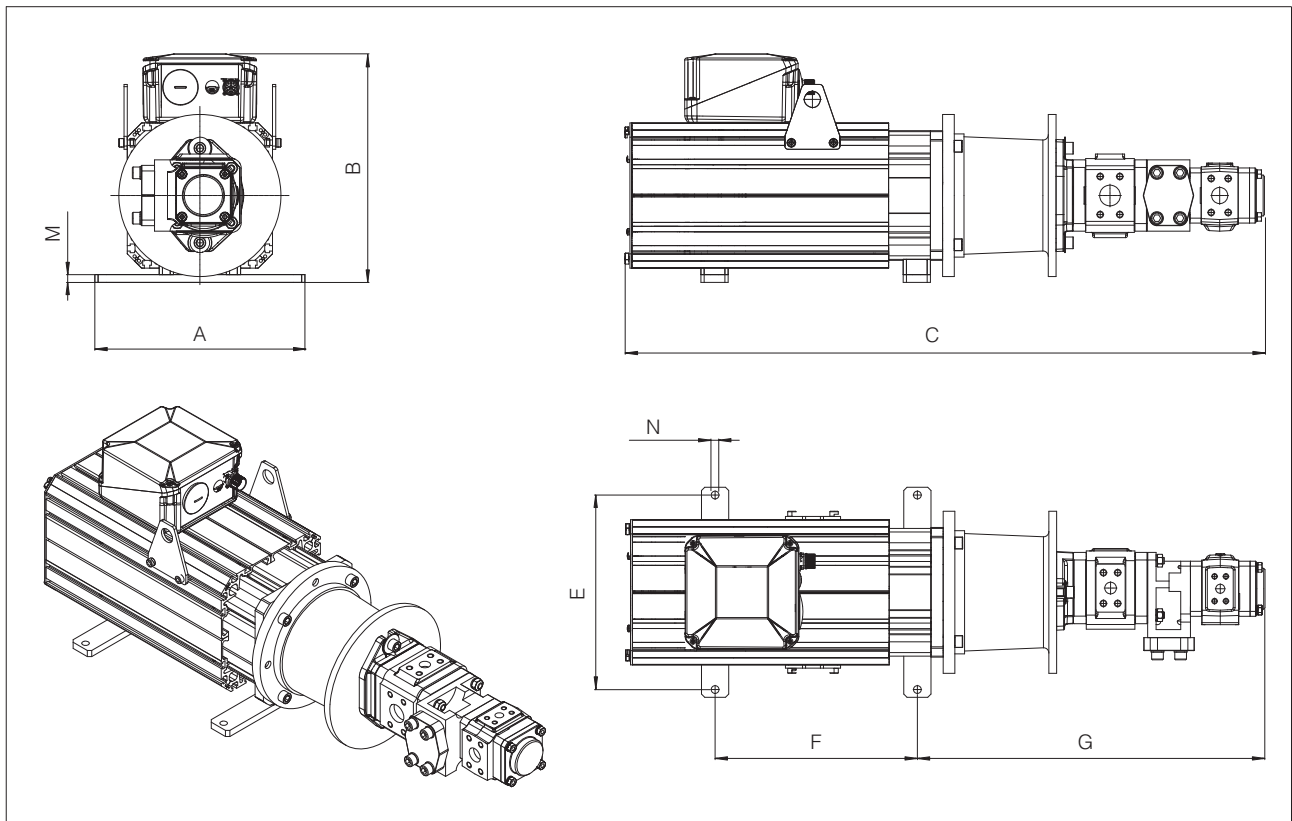


MODEL CODE	A	B	C	E	F	G	M	N	Mass [Kg]
SSP.*-4064-1024.*	324	355	860	300	312	438	12	12	124
SSP.*-4064-1032.*			960		385				140
SSP.*-4064-2042.*	384	445	48	356	275	492	14	18	168
SSP.*-4064-2055.*			1020		330				189
SSP.*-4064-2080.*		450	476		511	241			
SSP.*-4080-1024.*		355	890		312	447			12
SSP.*-4080-1032.*	384	435	970	356	385	501	14	18	142
SSP.*-4080-2042.*			970		275				170
SSP.*-4080-2055.*		1032	330		191				
SSP.*-4080-2080.*		450	476		520	243			
SSP.*-4080-2100.*		1175	583		520	284			
SSP.*-4080-2100.*		1250	583		520	284			
SSP.*-4100-1032.*	324	355	980	300	385	460	12	12	145
SSP.*-4100-2042.*	384	435	980	356	275	514	14	18	173
SSP.*-4100-2055.*			1040		330				194
SSP.*-4100-2080.*		450	476		533	246			
SSP.*-4100-2100.*		1188	583		533	287			
SSP.*-4100-2100.*		1260	583		533	287			
SSP.*-4125L-2042.*	384	435	980	356	275	509	14	18	162
SSP.*-4125L-2055.*			1032		330				183
SSP.*-4125L-2080.*		450	476		528	229			
SSP.*-4125L-2100.*		490	1183		583	528			234

12 INSTALLATION DIMENSIONS - motor double pump unit [mm] for drive dimensions see AS500



MODEL CODE	A	B	C	E	F	G	M	N	Mass [Kg]
SSP-*-1011/1011-1009-*	324	335	757	300	168	451	12	12	61
SSP-*-1011/1011-1015-*		355	827		240				73
SSP-*-1016/1011-1009-*	324	335	767	300	168	461	12	12	61
SSP-*-1016/1011-1015-*		355	837		240				73
SSP-*-2020/1011-1009-*	324	355	335	300	168	510	12	12	67
SSP-*-2020/1011-1015-*			887		240				79
SSP-*-2020/1011-1024-*			957		312				95
SSP-*-2020/1011-1032-*			1027		385				110
SSP-*-2025/1011-1009-*	324	355	335	300	168	499	12	12	67
SSP-*-2025/1011-1015-*			886		240				80
SSP-*-2025/1011-1024-*			956		312				95
SSP-*-2025/1011-1032-*			1026		385				111
SSP-*-2032/1011-1009-*	324	355	335	300	168	504	12	12	68
SSP-*-2032/1011-1015-*			886		240				81
SSP-*-2032/1011-1024-*			956		312				96
SSP-*-2032/1011-1032-*			1026		385				112
SSP-*-2032/1011-2042-*	384	435	1026	356	275	553	14	18	150
SSP-*-2040/1011-1009-*	324	355	826	300	168	517	12	12	72
SSP-*-2040/1011-1015-*			896		240				84
SSP-*-2040/1011-1024-*			966		312				99
SSP-*-2040/1011-1032-*			1036		385				115
SSP-*-2040/1011-2042-*	384	435	1036	356	275	566	14	18	153
SSP-*-2050/1011-1009-*	324	355	836	300	168	531	12	12	74
SSP-*-2050/1011-1015-*			906		240				86
SSP-*-2050/1011-1024-*			976		312				101
SSP-*-2050/1011-1032-*			1046		385				117
SSP-*-2050/1011-2042-*	384	435	1046	356	275	580	14	18	155
SSP-*-2050/1011-2055-*		450	1106		330				177



MODEL CODE	A	B	C	E	F	G	M	N	Mass [Kg]
SSP-*-1016/1016-1009-*	324	335	777	300	168	471	12	12	65
SSP-*-1016/1016-1015-*		355	847		240				74
SSP-*-2020/1016-1009-*	324	335	806	300	168	510	12	12	68
SSP-*-2020/1016-1015-*		355	876		240				80
SSP-*-2020/1016-1024-*			946		312				96
SSP-*-2020/1016-1032-*			1016		385				111
SSP-*-2025/1016-1009-*			335		799				168
SSP-*-2025/1016-1015-*	324	355	869	240	500	12	12	81	
SSP-*-2025/1016-1024-*			939	312				96	
SSP-*-2025/1016-1032-*			1009	385				111	
SSP-*-2032/1016-1009-*			324	335				826	168
SSP-*-2032/1016-1015-*	896	240			82				
SSP-*-2032/1016-1024-*	966	312			97				
SSP-*-2032/1016-1032-*	1036	385			114				
SSP-*-2032/1016-2042-*	384	435	1036	356	275	554	14	18	151
SSP-*-2040/1016-1009-*	324	355	836	300	168	518	12	12	73
SSP-*-2040/1016-1015-*			906	240	85				
SSP-*-2040/1016-1024-*			976	312	100				
SSP-*-2040/1016-1032-*			1036	385	116				
SSP-*-2040/1016-2042-*	384	435	1036	356	275	567	14	18	154
SSP-*-2050/1016-1009-*	324	355	846	300	168	532	12	12	75
SSP-*-2050/1016-1015-*			916	240	87				
SSP-*-2050/1016-1024-*			986	312	102				
SSP-*-2050/1016-1032-*			1056	385	118				
SSP-*-2050/1016-2042-*	384	435	1056	356	275	581	14	18	156
SSP-*-2050/1016-2055-*		450	1116		330				178

13 RELATED DOCUMENTATION

AS050	Basics for Smart Servopumps - SSP	AS800	Programming tools for pumps & servopumps
AS200	Sizing criteria for servopumps	AS810	Accessories for servopumps
AS300	PGI cast iron internal gear pumps, high pressure	AS910	Operating and maintenance information for servopumps
AS320	PGIX cast iron double internal gear pumps, high pressure	GS510	Fieldbus
AS350	PGIL aluminium internal gear pumps	S-MAN-HW	Servopumps installation manual
AS400	PMM high performance synchronous servomotors	S-MAN-SW	Servopumps programming software manual
AS500	D-MP electronic drives		