

System overview

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SINAMICS V90 basic servo drive system

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Selection and ordering data

SIMOTICS S-1FL6 servomotors Further info in section SIMOTICS S-1FL6 servomotors.														SINAMICS V90 servo drive Further info in section SINAMICS V90 servo drive.		MOTION-CONNECT connection systems Further info in section MOTION-CONNECT connection systems.						MOTION-CONNECT connection systems			Line filter			Recommended standard fuse		Recommended circuit breaker			
Max. speed	Rated power ¹⁾	Static torque	Rated torque ¹⁾	Max. torque ¹⁾	Rated current	Max. current		Torque constant	Moment of inertia of rotor	Recom- mended load to motor inertia ratio, max.	Weight ²⁾			Max. motor power	Frame size	No. of cores x conduc- tor cross- section	Pre-assembled power cables		Pre-assembled signal cables		Connectors		Connectors (continued)			With one of the recommended line filters, EN 61008-3 category C2 can be reached in combination with SINAMICS V90. For more information please refer to SINAMICS V90 Operating instructions.			corresponding to IEC standard	corresponding to UL standard	corresponding to IEC standard/ UL standard		
n_{max}	P_{rated} at $\Delta T=100\text{ K}$	M_0 at $\Delta T=100\text{ K}$	M_{rated} at $\Delta T=100\text{ K}$	M_{max}	I_{rated} at $\Delta T=100\text{ K}$	I_{max}			$J_{without\ brake}$ $J_{with\ brake}$		$m_{without\ brake}$ $m_{with\ brake}$											Motor side for incremental encoder	for absolute encoder	for brake		Line supply voltage	I_{rated}						
rpm	kW (hp)	Nm	Nm	Nm	A	A	Article No.	Nm/A	10 ⁻⁴ kgm ²		kg	kg		kW (hp)	Article No.	mm ²	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.	Article No.	V	A	Article No.	A	Article No.	A	Article No.	
SIMOTICS S-1FL6 Low Inertia servomotors – High dynamic performance														SINAMICS V90 servo drive		MOTION-CONNECT connection systems																	
Shaft height 20 – Rated speed n_{rated} 3000 rpm														Line supply 200 ... 240 V 1 AC/3 AC																			
5000	0.05 (0.07)	0.16	0.16	0.48	1.2	3.6	1FL6022-2AF21-1 ■ ■ 1	0.14	0.031	0.038	30x	0.47	0.7	0.10 (0.14)	6SL3210-5FB10-1U ■ 1 FSA	4 × 0.75	6FX3002-5CK01-1 ■ ■ 0	6FX3002-2CT20-1 ■ ■ 0	6FX3002-2DB20-1 ■ ■ 0	6FX3002-5BK02-1 ■ ■ 0	6FX2003-0LL12	6FX2003-0SL12	6FX2003-0DB12	6FX2003-0LL52	1 AC 200 ... 240 18	6SL3203-0BB21-8VA0	6	3NA3801	6	Listed JDDZ	3RV2011-1EA10		
																									3 AC 200 ... 240 5	6SL3203-0BE15-0VA0							
5000	0.10 (0.14)	0.32	0.32	0.96	1.2	3.6	1FL6024-2AF21-1 ■ ■ 1	0.29	0.052	0.059	30x	0.63	0.86													1 AC 200 ... 240 18	6SL3203-0BB21-8VA0						
																									3 AC 200 ... 240 5	6SL3203-0BE15-0VA0							
Shaft height 30 – Rated speed n_{rated} 3000 rpm														Line supply 200 ... 240 V 1 AC/3 AC																			
5000	0.20 (0.27)	0.64	0.64	1.91	1.4	4.2	1FL6032-2AF21-1 ■ ■ 1	0.48	0.214	0.245	30x	1.02	1.48	0.20 (0.27)	6SL3210-5FB10-2U ■ 1 FSA	4 × 0.75	6FX3002-5CK01-1 ■ ■ 0	6FX3002-2CT20-1 ■ ■ 0	6FX3002-2DB20-1 ■ ■ 0	6FX3002-5BK02-1 ■ ■ 0	6FX2003-0LL12	6FX2003-0SL12	6FX2003-0DB12	6FX2003-0LL52	1 AC 200 ... 240 18	6SL3203-0BB21-8VA0	6	3NA3801	6	Listed JDDZ	3RV2011-1EA10		
																										3 AC 200 ... 240 5	6SL3203-0BE15-0VA0						
5000	0.40 (0.54)	1.27	1.27	3.82	2.6	7.8	1FL6034-2AF21-1 ■ ■ 1	0.49	0.351	0.381	30x	1.46	1.92	0.40 (0.54)	6SL3210-5FB10-4U ■ 1 FSB											1 AC 200 ... 240 18	6SL3203-0BB21-8VA0	10	3NA3803	10		3RV2011-1HA10	
																										3 AC 200 ... 240 5	6SL3203-0BE15-0VA0					3RV2011-1EA10	
Shaft height 40 – Rated speed n_{rated} 3000 rpm														Line supply 200 ... 240 V 1 AC/3 AC																			
5000	0.75 (1.02)	2.39	2.39	7.2	4.7	14.2	1FL6042-2AF21-1 ■ ■ 1	0.51	0.897	1.06	20x	2.8	3.68	0.75 (1.02)	6SL3210-5FB10-8U ■ 0 FSC	4 × 0.75	6FX3002-5CK01-1 ■ ■ 0	6FX3002-2CT20-1 ■ ■ 0	6FX3002-2DB20-1 ■ ■ 0	6FX3002-5BK02-1 ■ ■ 0	6FX2003-0LL12	6FX2003-0SL12	6FX2003-0DB12	6FX2003-0LL52	1 AC 200 ... 240 18	6SL3203-0BB21-8VA0	16	3NA3805	20	Listed JDDZ	3RV2011-1KA10		
																										3 AC 200 ... 240 5	6SL3203-0BE15-0VA0					3RV2011-1HA10	
Shaft height 40 – Rated speed n_{rated} 3000 rpm														Line supply 200 ... 240 V 3 AC																			
5000	1.00 (1.36)	3.18	3.18	9.54	6.3	18.9	1FL6044-2AF21-1 ■ ■ 1	0.51	1.15	1.31	20x	3.39	4.2	1.00 (1.36)	6SL3210-5FB11-0U ■ 1 FSD	4 × 0.75	6FX3002-5CK01-1 ■ ■ 0	6FX3002-2CT20-1 ■ ■ 0	6FX3002-2DB20-1 ■ ■ 0	6FX3002-5BK02-1 ■ ■ 0	6FX2003-0LL12	6FX2003-0SL12	6FX2003-0DB12	6FX2003-0LL52	3 AC 200 ... 240 12	6SL3203-0BE21-2VA0	16	3NA3805	20	Listed JDDZ	3RV2011-1JA10		
Shaft height 50 – Rated speed n_{rated} 3000 rpm														Line supply 200 ... 240 V 3 AC																			
5000	1.50 (2.04)	4.78	4.78	14.3	10.6	31.8	1FL6052-2AF21-2 ■ ■ 1	0.46	2.04	2.24	15x	5.45	6.96	1.50 (2.04)	6SL3210-5FB11-5U ■ 0 FSD	4 × 2.5	6FX3002-5CK32-1 ■ ■ 0	6FX3002-2CT12-1 ■ ■ 0	6FX3002-2DB12-1 ■ ■ 0	6FX3002-5BL03-1 ■ ■ 0	6FX2003-0LL13	6FX2003-0SL13	6FX2003-0DB13	6FX2003-0LL53	3 AC 200 ... 240 12	6SL3203-0BE21-2VA0	25	3NA3810	25	Listed JDDZ	3RV2011-4AA10		
5000	2.00 (2.72)	6.37	6.37	19.1	11.6	34.8	1FL6054-2AF21-2 ■ ■ 1	0.55	2.62	2.82		6.66	8.2	2.00 (2.72)	6SL3210-5FB12-0U ■ 0																		
SIMOTICS S-1FL6 High Inertia servomotors – Smooth operational performance														SINAMICS V90 servo drive		MOTION-CONNECT connection systems																	
Shaft height 45 – Rated speed n_{rated} 3000 rpm														Line supply 380 ... 480 V 3 AC																			
4000	0.4 (0.54)	1.9	1.27	3.8	1.2	3.6	1FL6042-1AF61-2 ■ ■ 1	1.1	2.7	3.2	10x	3.4	4.8	0.4 (0.54)	6SL3210-5FE10-4U ■ 0 FSAA	4 × 1.5	6FX3002-5CL02-1 ■ ■ 0	6FX3002-2CT12-1 ■ ■ 0	6FX3002-2DB10-1 ■ ■ 0	6FX3002-5BL03-1 ■ ■ 0	6FX2003-0LL13	6FX2003-0SL13	6FX2003-0DB11	6FX2003-0LL53	3 AC 380 ... 480 5	6SL3203-0BE15-0VA0	6	3NA3801-6	10	Listed JDDZ	3RV2021-1DA10		
4000	0.75 (1.02)	3.5	2.39	7.2	2.1	6.3	1FL6044-1AF61-2 ■ ■ 1	1.2	5.2	5.7		5.2	6.6	0.75 (1.02)	6SL3210-5FE10-8U ■ 0 FSA																3RV2021-1EA10		
Shaft height 65 – Rated speed n_{rated} 2000 rpm														Line supply 380 ... 480 V 3 AC																			
3000	0.75 (1.02)	4	3.58	10.7	2.5	7.5	1FL6061-1AC61-2 ■ ■ 1	1.5	8	9.1	5x	5.7	8.8	1 (1.36)	6SL3210-5FE11-0U ■ 0 FSA	4 × 1.5	6FX3002-5CL02-1 ■ ■ 0	6FX3002-2CT12-1 ■ ■ 0	6FX3002-2DB10-1 ■ ■ 0	6FX3002-5BL03-1 ■ ■ 0	6FX2003-0LL13	6FX2003-0SL13	6FX2003-0DB11	6FX2003-0LL53	3 AC 380 ... 480 5	6SL3203-0BE15-0VA0	10	3NA3803-6	10	Listed JDDZ	3RV2021-1FA10		
3000	1 (1.36)	6	4.78	14.3	3	9	1FL6062-1AC61-2 ■ ■ 1	1.7	11.7	13.5		7	10.1																				
3000	1.5 (2.04)	8	7.16	21.5	4.6	13.8	1FL6064-1AC61-2 ■ ■ 1	1.6	15.3	16.4		8.4	11.5	1.75 (2.38)	6SL3210-5FE11-5U ■ 0 FSB	4 × 2.5	6FX3002-5CL12-1 ■ ■ 0														3RV2021-1HA10		
3000	1.75 (2.38)	11	8.36	25.1	5.3	15.9	1FL6066-1AC61-2 ■ ■ 1	1.7	22.6	23.7		11.1	14.2													12	6SL3203-0BE21-2VA0			15			
3000	2 (2.72)	15	9.55	28.7	5.9	17.7	1FL6067-1AC61-2 ■ ■ 1	1.7	29.9	31		13.7	16.8	2.5 (3.40)	6SL3210-5FE12-0U ■ 0														16	3NA3805-6			3RV2021-4AA10
Shaft height 90 – Rated speed n_{rated} 2000 rpm														Line supply 380 ... 480 V 3 AC																			
3000	2.5 (3.40)	15	11.9	35.7	7.8	23.4	1FL6090-1AC61-2 ■ ■ 1	1.6	47.4	56.3	5x	15.4	21.5	2.5 (3.40)	6SL3210-5FE12-0U ■ 0 FSB	4 × 2.5	6FX3002-5CL12-1 ■ ■ 0	6FX3002-2CT12-1 ■ ■ 0	6FX3002-2DB10-1 ■ ■ 0	6FX3002-5BL03-1 ■ ■ 0	6FX2003-0LL13	6FX2003-0SL13	6FX2003-0DB11	6FX2003-0LL53	3 AC 380 ... 480 12	6SL3203-0BE21-2VA0	16	3NA3805-6	15	Listed JDDZ	3RV2021-4AA10		
3000	3.5 (4.76)	22	16.7	50	11	33	1FL6092-1AC61-2 ■ ■ 1	1.6	69.1	77.9		19.8	25.9	3.5 (4.76)	6SL3210-5FE13-5U ■ 0 FSC										20	6SL3203-0BE22-0VA0	20	3NA3807-6	25		3RV2021-4BA10		
2500	5 (6.80)	30	23.9	70	12.6	36.9	1FL6094-1AC61-2 ■ ■ 1	2.0	90.8	99.7		24.4	30.5	5 (6.80)	6SL3210-5FE15-0U ■ 0																		
2000	7 (9.52)	40	33.4	90	13.2	35.6	1FL6096-1AC61-2 ■ ■ 1	2.7	134.3	143.2		33.3	39.3	7 (9.52)	6SL3210-5FE17-0U ■ 0														25	3NA3810-6			3RV2021-4DA10
Encoder type														SINAMICS V90, pulse train (PTI) version		Length		Length		Length		Length		Drive side									
Incremental encoder TTL, 2500 S/R														A		3 m	A D	3 m	A D	3 m	A D	3 m	A D	for incremental encoder	for absolute encoder								
•1FL6 High Inertia: Absolute encoder 20-bit single-turn + 12-bit multi-turn														L		5 m	A F	5 m	A F	5 m	A F	5 m	A F	Article No.	Article No.								
•1FL6 Low Inertia: Absolute encoder 21-bit single-turn														M		7 m ³⁾	A H	7 m ³⁾	A H	7 m ³⁾	A H	7 m ³⁾	A H	6FX2003-0SB14	6FX2003-0SB14								
Shaft extension																10 m	B A	10 m	B A	10 m	B A	10 m	B A										
Feather key														A		15 m ³⁾	B F	15 m ³⁾	B F	15 m ³⁾	B F	15 m ³⁾	B F										
Feather key														B		20 m	C A	20 m	C A	20 m	C A	20 m	C A										
Plain shaft														G																			
Plain shaft														H																			