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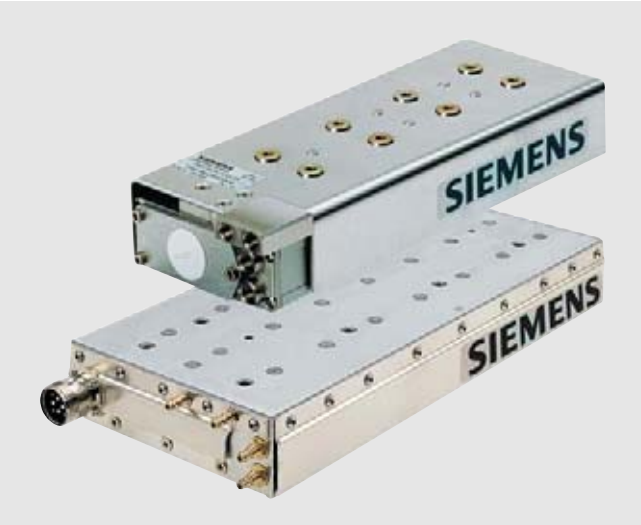
linear motors

1FN1/1FN3

SIEMENS

1FN1/1FN3 linear motors
Water cooling

Overview



In combination with the SINAMICS S120, 1FN1/1FN3 linear motors provide an optimally tuned linear direct drive system for the requirements of modern machine construction.

The motors comprise a primary section and a secondary section with magnets made of rare-earth material. The primary section has fixed dimensions, while the secondary section is made up of individual elements (segments) to suit the required traversing range. Through parallel operation of the motors, feedrate force and length can be scaled beyond the available spectrum.

Benefits

- Outstanding dynamic response and very high traversing velocity
- Excellent precision
- Simple installation
- Drive components are free of wear thanks to contactless drive force transmission

The main advantage of linear direct drive technology is the extensive avoidance of the effects of elasticity, play, and friction, as well as natural oscillation in the drive train. This results in a higher dynamic response and increased precision. If suitable measuring systems are used and the temperature conditions are appropriate, the motors can be positioned in the nanometer range.

Design

The simple mechanical construction without transmission elements, such as ballscrew, coupling or belt, enhances the reliability of the drive components.

Heat loss occurs almost exclusively in the primary section and is dissipated via an integrated liquid cooling system. The Thermo-Sandwich dual-circuit cooling system (integral in 1FN1, optional for 1FN3) permits both a thermal decoupling of the motor from the machine, and also a low-cost cooling concept.

The stainless metal encapsulation of the primary section ensure the high mechanical ruggedness and resistance to soiling required for use in machine tools, as well as high resistance to corrosive liquids. In addition, the motor places minimal demands on the preparation of mounting surfaces thanks to the large air gap. The mounting tolerances for the air gap are ±0.3 mm (0.012 in).

Construction variants

1FN linear motors are available as single-sided or double-sided motors.

- Single-sided motors
  The single-sided version consists of a primary section with standard winding that is mounted parallel to the associated secondary section.
- Double-sided motors
  The secondary section of the double-sided version lies between two primary sections (one primary section with standard winding and one with complementary winding). The construction as double-sided motor is particularly suitable for applications with movable secondary section and small traversing paths with fast acceleration (e.g. non-circular machining).

Application 1FN1 linear motors

- Grinding
- Ultra-precision machining

Application 1FN3 linear motors

Version for peak loads

Used in connection with machine axes that are accelerated for a short time (e.g. S3 operation), or if high power is required for short intervals.

Typical applications:

- High-dynamic and flexible machine tool construction
- Laser machining
- Handling

Version for continuous load

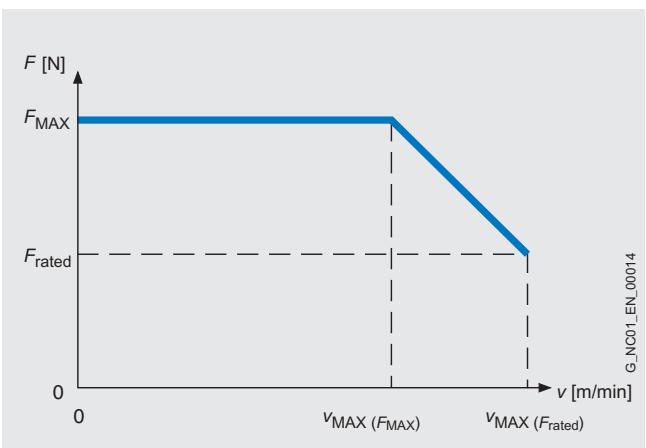
Used in connection with machine axes with constant changing of acceleration (e.g. S1 operation), with high process/weight forces or in operation without water cooling.

Typical applications:

- Non-circular machining
- Vertical axes without counterweight, quills
- Handling, cartesian robots

Technical specifications

The 1FN1/1FN3 linear motors have an overload range available for acceleration processes. The maximum force F_{MAX} can only be utilized up to a maximum velocity $v_{MAX(FMAX)}$; up to velocity $v_{MAX(Frated)}$, only the feedrate force F_{rated} is available.



Technical specifications

Product name	1FN1 linear motors	1FN3 linear motors
Type of motor	Permanently excited synchronous linear motor	
Magnet material	Rare-earth magnet material	
Insulation of stator winding in accordance with EN (IEC) 60034-1	Temperature class F for a winding temperature of 130 °C (266 °F) for 1FN1072 to 1FN1126 140 °C (284 °F) for 1FN1184 to 1FN1246	120 °C (248 °F)
Overload ratio (F_{MAX}:F_{rated}) up to max.	2.25	2.75
Degree of protection in accordance with EN 60034-5 (IEC 60034-5)	IP65	
Cooling method	Water cooling	
Water cooler connections	Fast-fit connector for all primary section coolers	G 1/8 internal thread on all primary and secondary section coolers
Temperature influence on surrounding construction with precision cooling, max.	+2 K	+4 K
Permissible coolant inlet temperature	35 °C (95 °F) (prevent condensation) > 35 °C (95 °F) with reduction of rated motor force	
Temperature monitoring integrated in the primary section winding	Temperature switch (NC contact) KTY 84 temperature sensor	2 monitoring circuits (Temp-S with PTC thermistor) and Temp-F with KTY 84 temperature sensor (for 1FN3050, Temp-S only)
Available configurations	–	Different gradations thanks to modular construction
Cover for secondary section	Segmented, non-exchangeable	Exchangeable through all segments or segment by segment
2nd rating plate	Enclosed separately	
Recommended measuring systems	See "Overview of Measuring Systems"	
Type of connection	Connectors or cable outlet for power and temperature monitoring	Terminal box with cable gland Optional: accessory for connector and cable connection

Overview

Recommended linear measuring systems for 1FN linear motors		LC 182/LC 481 absolute encoder EnDat encapsulated	LS 186 incremental encoder sin/cos 1 V_{pp} encapsulated	LS 486 incremental encoder sin/cos 1 V_{pp} encapsulated	LIDA 185/LIDA 485 incremental encoder sin/cos 1 V_{pp} open	Renishaw RG2 incremental encoder sin/cos 1 V_{pp} open
Signal cycle	µm	20/20	20	20	40/20	20
Max. permissible acceleration in measuring direction	m/s^2 (ft/s^2)	50 (164.04)	50 (164.04)	50 (164.04)	200 (656.16) [1]	300 (984.24) [1]
Max. permissible traversing velocity	m/min (ft/min)	120 (393.7)	120 (393.7)	120 (393.7)	480 (1574.78)	300 (984.24)
Maximum measuring length	mm (in)	3040 (119.68)	3040 (119.68)	2040 (80.31)	30,040 (1182.67)	50,000 (1968.50)
Output signal		EnDat/1 V_{pp}	1 V_{pp}	1 V_{pp}	1 V_{pp}	1 V_{pp}

Temperature sensors

In order to monitor the motor temperature, the temperature sensors (Temp-S and Temp-F) are decoupled from the power cable and connected to the SINAMICS S120 via the SME91 module, in conjunction with an SMC20 Sensor Module Cabinet-Mounted.

As with SIMODRIVE 611 digital/universal HRS, the motor temperature can be evaluated with the thermistor motor protection device 3RN1013-1GW10.

The 1FN3050-2W/-1NE/-2NC motors only have Temp-S sensors.

1) Refers to the measuring head.

1FN1 standard type linear motors
Water cooling

Selection and Ordering Data

Feedrate force		Maximum velocity [3]		1FN1 linear motors Water cooling		Weight approx.		
F_{rated} [1] [2]	F_{MAX}	v_{MAX} at F_{MAX}	v_{MAX} at F_{rated}	**Primary section** Order No.	**Secondary section** Order No.	Primary section	Secondary section -0AA0	Secondary section -1AA0
N (lb_f)	N (lb_f)	m/min (ft/min)	m/min (ft/min)			kg (lb)	kg (lb)	kg (lb)
790 (177.6)	1720 (386.7)	97 (318.3)	203 (666.1)	**1FN1072-3 A F7 ■-0AA0**	**1FN1070-0AA00- ■ AA0**	10.1 (22.3)	3 (6.6)	7.5 (16.5)
1580 (355.2)	3450 (775.6)	96 (315)	202 (662.9)	**1FN1076-3 A F7 1 -0AA0**	**1FN1070-0AA00- ■ AA0**	17.5 (38.6)	3 (6.6)	7.5 (16.5)
1475 (331.6)	3250 (730.6)	72 (236.3)	163 (534.9)	**1FN1122-5 ■ C7 1 -0AA0**	**1FN1120-0AA00- ■ AA0**	23.2 (51.2)	6.8 (15)	15.9 (35.1)
		105 (344.6)	214 (702.2)	**1FN1122-5 ■ F7 1 -0AA0**		23.2 (51.2)	6.8 (15)	15.9 (35.1)
2200 (494.6)	4850 (1090.3)	89 (292.1)	189 (620.2)	**1FN1124-5 ■ C7 1 -0AA0**	**1FN1120-0AA00- ■ AA0**	31.9 (70.3)	6.8 (15)	15.9 (35.1)
		101 (331.3)	208 (682.6)	**1FN1124-5 ■ F7 1 -0AA0**		31.9 (70.3)	6.8 (15)	15.9 (35.1)
2950 (663.2)	6500 (1461.2)	71 (233)	162 (531.6)	**1FN1126-5 ■ C7 1 -0AA0**	**1FN1120-0AA00- ■ AA0**	40.7 (89.7)	6.8 (15)	15.9 (35.1)
		104 (341.3)	213 (699)	**1FN1126-5 A F7 1 -0AA0**		40.7 (89.7)	6.8 (15)	15.9 (35.1)
3600 (809.3)	7920 (1780.5)	74 (242.8)	162 (531.6)	**1FN1184-5 A C7 1 -0AA0**	**1FN1180-0AA00- ■ AA0**	44.5 (98.1)	10 (22.1)	23.3 (51.4)
		100 (328.2)	204 (669.4)	**1FN1184-5 A F7 1 -0AA0**		44.5 (98.1)	10 (22.1)	23.3 (51.4)
4800 (1079)	10600 (2382.9)	68 (223.1)	152 (498.8)	**1FN1186-5 A C7 1 -0AA0**	**1FN1180-0AA00- ■ AA0**	57.7 (127.2)	10 (22.1)	23.3 (51.4)
		100 (328.2)	204 (669.4)	**1FN1186-5 A F7 1 -0AA0**		57.7 (127.2)	10 (22.1)	23.3 (51.4)
4950 (1112.8)	10900 (2450.3)	65 (213.3)	149 (488.9)	**1FN1244-5 A C7 1 -0AA0**	**1FN1240-0AA00- ■ AA0**	60.1 (132.5)	11.9 (26.2)	27.7 (61.1)
		100 (328.2)	203 (666.1)	**1FN1244-5 A F7 1 -0AA0**		60.1 (132.5)	11.9 (26.2)	27.7 (61.1)
6600 (1483.7)	14500 (3259.6)	67 (219.9)	151 (495.5)	**1FN1246-5 A C7 1 -0AA0**	**1FN1240-0AA00- ■ AA0**	76 (167.6)	11.9 (26.2)	27.7 (61.1)

Power connector for pre-assembled cables	**A**
Cable outlet, not pre-assembled Length: 3 m (9.84 ft)	**K**
Standard winding for single-sided variant	**1**
Complementary winding for double-sided version (special secondary section for double-sided motors available on request)	**2**
Length: 215.4 mm (8.48 in) (for 1FN1070: 225 mm (8.86 in)). 503.4 mm (19.82 in) (for 1FN1070: 563.4 mm (22.18 in)).	**0** **1**

Dimension drawings

Primary section	Dimensions in mm (in)						**Secondary section**	Dimensions in mm (in)							
					Primary section length							Secondary section length			
Type	b_M		h_M		L_P		Type	b_S		h_S		L_{S1N}		L_{S2N}	
1FN1, water cooling															
1FN1072	137.0	(5.39)	80.7	(3.18)	320.3	(12.61)	**1FN1070-0AA00-0AA0**	125	(4.92)	20.2	(0.8)	225.6	(8.88)	241.0	(9.49)
							1FN1070-0AA00-1AA0	125	(4.92)	20.2	(0.8)	564.0	(22.2)	579.5	(22.81
1FN1076	137.0	(5.39)	80.7	(3.18)	545.9	(21.49)									
1FN1122	198.8	(7.83)	106.7	(4.2)	407.8	(16.06)	**1FN1120-0AA00-0AA0**	180	(7.09)	30.2	(1.19)	216.0	(8.5)	234.0	(9.21)
							1FN1120-0AA00-1AA0	180	(7.09)	30.2	(1.19)	504.0	(19.84)	522.0	(20.55)
1FN1124	198.8	(7.83)	106.7	(4.2)	551.8	(21.72)									
1FN1126	198.8	(7.83)	106.7	(4.2)	695.8	(27.39)									
1FN1184	258.8	(10.19)	106.7	(4.2)	551.8	(21.72)	**1FN1180-0AA00-0AA0**	246	(9.69)	30.2	(1.19)	216.0	(8.5)	232.4	(9.15)
							1FN1180-0AA00-1AA0	246	(9.69)	30.2	(1.19)	504.0	(19.84)	520.4	(20.49)
1FN1186	258.8	(10.19)	106.7	(4.2)	695.8	(27.39)									
1FN1244	318.8	(12.55)	106.7	(4.2)	551.8	(21.72)	**1FN1240-0AA00-0AA0**	306	(12.05)	30.2	(1.19)	216.0	(8.5)	231.3	(9.11)
							1FN1240-0AA00-1AA0	306	(12.05)	30.2	(1.19)	504.0	(19.84)	519.3	(20.44)
1FN1246	318.8	(12.55)	106.7	(4.2)	695.8	(27.39)									

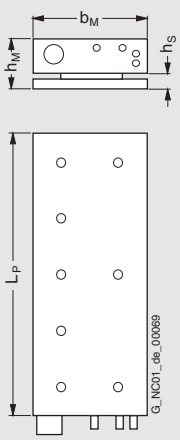
1) For water cooling with inlet temperature 35 °C (95 °F).
2) A reduction of up to 30% must be expected in case of motor standstill, at very low speeds, or with very short traverse paths.
3) Velocity values refer to a converter DC link voltage of 600 V DC.
4) Motor Modules are designed for feedrate force F_{rated}. If feedrate force F_{MAX} is utilized, the next largest Motor Module must be used.

Selection and Ordering Data

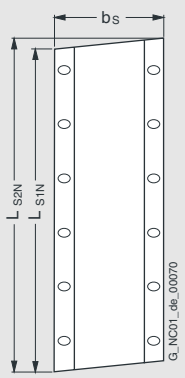
Motor type (continued) Primary section	Motor phase current		Calculated power	SINAMICS Motor Module		Power cable with complete shield Motor connection via power connector			
				Required rated current	Order No.	Power connector	Cable cross-section		Order No. Pre-assembled cable
	I_{rated} [1]	I_{MAX}	P_{calc}	I_{rated}/I_{MAX}	For complete Order No., see "SINAMICS S120 drive system".		Motor	Sensor	
	A	A	kW (HP)	A		Size	mm^2	mm^2	
1FN1072-3AF7.-...	5.6	14	7.9 (10.59)	9/18	**6SL312 ■ - ■ TE21-0A..**				Pre-assembled cables available soon.
1FN1076-3AF71-...	11.1	28	15.7 (21.05)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN1122-5.C71-...	8.9	22.4	12.5 (16.76)	9/18 [4]	**6SL312 ■ - ■ TE21-0A..**				
1FN1122-5.F71-...	11.3	28	14.3 (19.17)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN1124-5.C71-...	15	37.5	19.9 (26.68)	18/36 [4]	**6SL312 ■ - ■ TE21-8A..**				
1FN1124-5.F71-...	16.2	40.8	21.0 (28.15)	18/36 [4]	**6SL312 ■ - ■ TE21-8A..**				
1FN1126-5.C71-...	17.7	44.8	24.9 (33.38)	18/36 [4]	**6SL312 ■ - ■ TE21-8A..**				
1FN1126-5AF71-...	22.1	56	28.4 (38.07)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN1184-5AC71-...	22.6	54.1	29.0 (38.87)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN1184-5AF71-...	26.1	65.5	32.3 (43.30)	30/56 [4]	**6SL312 ■ - 1 TE23-0A..**				
1FN1186-5AC71-...	27.2	67.9	37.0 (49.60)	30/56 [4]	**6SL312 ■ - 1 TE23-0A..**				
1FN1186-5AF71-...	34.8	86.9	43.1 (57.77)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN1244-5AC71-...	28	69.9	38.0 (50.94)	30/56 [4]	**6SL312 ■ - 1 TE23-0A..**				
1FN1244-5AF71-...	36.3	90.8	43.8 (58.71)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN1246-5AC71-...	37.7	93.7	50.3 (67.43)	60/113	**6SL312 ■ - 1 TE26-0A..**				

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**

Dimension drawings



Primary section



Secondary section

1FN3 standard type linear motors version for peak loads – water cooling

Selection and Ordering Data

Feedrate force		Maximum velocity [3]		1FN3 linear motors – version for peak loads Water cooling		Weight approx.	
F_{rated} [1] [2]	F_{MAX}	v_{MAX} at F_{MAX}	v_{MAX} at F_{rated}	**Primary section** Order No.	**Secondary section** Order No.	Primary section without/with precision cooling	Secondary section without/with heatsink profile
N (lb_f)	N (lb_f)	m/min (ft/min)	m/min (ft/min)			kg (lb)	kg (lb)
200 (45)	550 (123.6)	146 (479)	373 (1223.8)	**1FN3050-2WC00-0AA0**	**1FN3050-4SA00-0AA0**	2.4/2.9 (5.3/6.4)	0.4/0.5 (0.9/1.1)
200 (45)	490 (110.2)	138 (452.8)	322 (1056.4)	**1FN3100-1WC00-0AA1**	**1FN3100-4SA00-0AA0**	2.2/– (4.9/–) [4]	0.7/0.8 (1.5/1.8)
450 (101.2)	1100 (247.3)	131 (429.8)	297 (974.4)	**1FN3100-2WC00-0AA1**		3.8/4.4 (8.4/9.7)	
450 (101.2)	1100 (247.3)	237 (777.6)	497 (1630.6)	**1FN3100-2WE00-0AA1**		3.8/4.4 (8.4/9.7)	
675 (151.7)	1650 (370.9)	120 (393.8)	277 (908.8)	**1FN3100-3WC00-0AA1**		5.4/6.2 (11.9/13.7)	
675 (151.7)	1650 (370.9)	237 (777.6)	497 (1630.6)	**1FN3100-3WE00-0AA1**		5.4/6.2 (11.9/13.7)	
900 (202.3)	2200 (494.6)	131 (429.8)	297 (974.4)	**1FN3100-4WC00-0AA1**		7.4/8.5 (16.3/18.7)	
1125 (252.9)	2750 (618.2)	109 (357.6)	255 (836.6)	**1FN3100-5WC00-0AA1**		9.1/10.4 (20.1/22.9)	
340 (76.4)	820 (184.3)	126 (413.4)	282 (925.2)	**1FN3150-1WC00-0AA1**	**1FN3150-4SA00-0AA0**	3.0/– (6.6/–) [4]	1.2/1.3 (2.7/2.9)
675 (151.7)	1650 (370.9)	126 (413.4)	282 (925.2)	**1FN3150-2WC00-0AA1**		5.3/6 (11.7/13.2)	
1015 (228.2)	2470 (555.3)	126 (413.4)	282 (925.2)	**1FN3150-3WC00-0AA1**		7.8/8.7 (17.2/19.2)	
1350 (303.5)	3300 (741.8)	126 (413.4)	282 (925.2)	**1FN3150-4WC00-0AA1**		10.2/11.4 (22.5/25.1)	
1690 (379.9)	4120 (926.2)	126 (413.4)	282 (925.2)	**1FN3150-5WC00-0AA1**		12.8/14.2 (28.2/31.3)	
615 (138.3)	1720 (386.66)	128 (419.9)	309 (1013.8)	**1FN3300-1WC00-0AA1**	**1FN3300-4SA00-0AA0**	6.2/– (13.7/–) [4]	2.4/2.6 (5.3/5.7)
1225 (275.4)	3450 (775.56)	63 (206.7)	176 (577.4)	**1FN3300-2WB00-0AA1**		11.4/12.4 (25.1/27.3)	
1225 (275.4)	3450 (775.56)	125 (410.1)	297 (974.4)	**1FN3300-2WC00-0AA1**		11.4/12.4 (25.1/27.3)	
1840 (413.6)	5170 (1162.22)	125 (410.1)	297 (974.4)	**1FN3300-3WC00-0AA1**		17/18.4 (37.5/40.6)	
2450 (550.8)	6900 (1551.12)	63 (206.7)	176 (577.4)	**1FN3300-4WB00-0AA1**		22.2/24 (48.9/52.9)	
2450 (550.8)	6900 (1551.12)	125 (410.1)	297 (974.4)	**1FN3300-4WC00-0AA1**		22.2/24 (48.9/52.9)	

One temperature monitoring circuit:	Temp-S	**0**
Two temperature monitoring circuits:	Temp-S and Temp-F	**1**

Dimension drawings

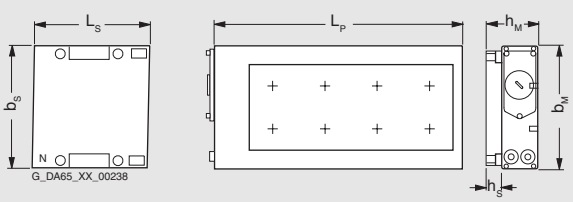
Primary section	Dimensions in mm (in) without precision cooling		with precision cooling		Primary section length	**Secondary section**	Dimensions in mm (in) without precision cooling		with precision cooling and cover		Secondary section length
Type	b_M	h_M	b_M	h_M	L_P	Type	b_S	h_S	b_S	h_S	L_S
1FN3, version for peak loads – water cooling											
1FN3050-2W	67 (2.64)	48.5 (1.91)	76 (2.99)	63.4 (2.50)	255 (10.04)	**1FN3050-4SA00-0AA0**	58 (2.28)	11.8 (0.46)	75 (2.95)	14.8 (0.58)	120 (4.72)
1FN3100-1W	96 (3.78)	48.5 (1.91)	–	–	150 (5.91)	**1FN3100-4SA00-0AA0**	88 (3.46)	11.8 (0.46)	105 (4.13)	14.8 (0.58)	120 (4.72)
1FN3100-2W	96 (3.78)	48.5 (1.91)	105 (4.13)	63.4 (2.50)	255 (10.04)						
1FN3100-3W	96 (3.78)	48.5 (1.91)	105 (4.13)	63.4 (2.50)	360 (14.17)						
1FN3100-4W	96 (3.78)	48.5 (1.91)	105 (4.13)	63.4 (2.50)	465 (18.31)						
1FN3100-5W	96 (3.78)	48.5 (1.91)	105 (4.13)	63.4 (2.50)	570 (22.44)						
1FN3150-1W	126 (4.96)	50.5 (1.99)	–	–	150 (5.91)	**1FN3150-4SA00-0AA0**	118 (4.65)	13.8 (0.54)	135 (5.31)	16.8 (0.66)	120 (4.72)
1FN3150-2W	126 (4.96)	50.5 (1.99)	135 (5.31)	65.4 (2.57)	255 (10.04)						
1FN3150-3W	126 (4.96)	50.5 (1.99)	135 (5.31)	65.4 (2.57)	360 (14.17)						
1FN3150-4W	126 (4.96)	50.5 (1.99)	135 (5.31)	65.4 (2.57)	465 (18.31)						
1FN3150-5W	126 (4.96)	50.5 (1.99)	135 (5.31)	65.4 (2.57)	570 (22.44)						
1FN3300-1W	141 (5.55)	64.1 (2.52)	–	–	221 (8.70)	**1FN3300-4SA00-0AA0**	134 (5.28)	16.5 (0.65)	151 (5.94)	19.5 (0.77)	184 (7.24)
1FN3300-2W	141 (5.55)	64.1 (2.52)	151 (5.94)	79 (3.11)	382 (15.04)						
1FN3300-3W	141 (5.55)	64.1 (2.52)	151 (5.94)	79 (3.11)	543 (21.38)						
1FN3300-4W	141 (5.55)	64.1 (2.52)	151 (5.94)	79 (3.11)	704 (27.72)						

Selection and Ordering Data

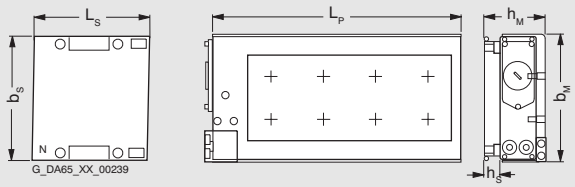
Motor type Primary section (continued)	Motor phase current		Calculated power	SINAMICS Motor Module		Power cable with complete shield Motor connection via adapter cable with power connector for increased velocity/acceleration			
				Required rated current	Order No.	Order No.	Cable cross-section		Order No.
	I_{rated} [1]	I_{MAX}	P_{calc}	I_{rated}/I_{MAX}		Pre-assembled adapter cable	Motor	Power connector	Pre-assembled cable
	A	A	kW (HP)	A	For complete Order No., see "SINAMICS S120 drive system".		mm^2	Size	
1FN3050-2WC00-...	2.7	8.2	4.1 (5.5)	5/10	**6SL312 ■ - ■ TE15-0A..**	Pre-assembled cables available soon.			
1FN3100-1WC00-...	2.4	6.5	3.1 (4.16)	5/10	**6SL312 ■ - ■ TE15-0A..**				
1FN3100-2WC00-...	5.1	13.5	6.3 (8.45)	9/18	**6SL312 ■ - ■ TE21-0A..**				
1FN3100-2WE00-...	8.1	21.5	8.3 (11.13)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3100-3WC00-...	7.2	19.1	9.2 (12.33)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3100-3WE00-...	12.1	32.2	12.4 (16.62)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3100-4WC00-...	10.1	27.0	12.6 (16.89)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3100-5WC00-...	11.0	29.5	14.4 (19.3)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3150-1WC00-...	3.6	9.5	4.3 (5.76)	5/10	**6SL312 ■ - ■ TE15-0A..**				
1FN3150-2WC00-...	7.2	19.1	8.7 (11.66)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3150-3WC00-...	10.7	28.6	13.0 (17.43)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3150-4WC00-...	14.3	38.2	17.4 (23.32)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3150-5WC00-...	17.9	47.7	21.7 (29.09)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3300-1WC00-...	6.5	20.0	8.7 (11.66)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3300-2WB00-...	8.0	24.7	13.2 (17.69)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3300-2WC00-...	12.6	39.2	16.8 (22.52)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3300-3WC00-...	19.0	58.7	25.1 (33.65)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3300-4WB00-...	16.0	49.4	26.3 (35.25)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3300-4WC00-...	25.3	78.3	33.5 (44.91)	60/113	**6SL312 ■ - 1 TE26-0A..**				

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**

Dimension drawings



1FN3050 to 1FN3450 without precision cooling



1FN3050 to 1FN3450 with precision cooling

1) For water cooling with inlet temperature 35 °C (95 °F).
2) A reduction of up to 30% must be expected in case of motor standstill, at very low speeds, or with very short traverse paths.
3) Velocity values refer to a converter DC link voltage of 600 V DC.
4) No precision cooler available.

1FN3 standard type linear motors version for peak loads – water cooling

Selection and Ordering Data

Feedrate force		Maximum velocity [3]		1FN3 linear motors – version for peak loads Water cooling		Weight approx.	
F_{rated} [1] [2]	F_{MAX}	v_{MAX} at F_{MAX}	v_{MAX} at F_{rated}	**Primary section** Order No.	**Secondary section** Order No.	Primary section without/with precision cooling	Secondary section without/with heatsink profile
N (lb_f)	N (lb_f)	m/min (ft/min)	m/min (ft/min)			kg (lb)	kg (lb)
1930 (433.9)	5180 (1164.5)	30 (98.4)	112 (367.5)	**1FN3450-2WA50-0AA1**	**1FN3450-4SA00-0AA0**	15.9/17.1 (35.1/37.7)	3.8/4 (8.4/8.8)
1930 (433.9)	5180 (1164.5)	120 (393.7)	275 (902.2)	**1FN3450-2WC00-0AA1**		15.9/17.1 (35.1/37.7)	
2895 (650.8)	7760 (1744.5)	62 (203.4)	164 (538.1)	**1FN3450-3WB00-0AA1**		22.6/24.3 (49.8/53.6)	
2895 (650.8)	7760 (1744.5)	120 (393.7)	275 (902.2)	**1FN3450-3WC00-0AA1**		22.6/24.3 (49.8/53.6)	
3860 (867.7)	10350 (2326.7)	62 (203.4)	164 (538.1)	**1FN3450-4WB00-0AA1**		30.9/33.1 (68.1/73)	
3860 (867.7)	10350 (2326.7)	120 (393.7)	275 (902.2)	**1FN3450-4WC00-0AA1**		30.9/33.1 (68.1/73)	
3860 (867.7)	10350 (2326.7)	240 (787.4)	519 (1702.8)	**1FN3450-4WE00-0AA1**		30.9/33.1 (68.1/73)	
2610 (586.7)	6900 (1551.1)	36 (118.1)	120 (393.7)	**1FN3600-2WA50-0AA1**	**1FN3600-4SA00-0AA0**	22.2/24.7 (49/54.5)	4.6/5 (10.1/11)
3915 (880.1)	10350 (2326.7)	58 (190.3)	155 (508.5)	**1FN3600-3WB00-0AA1**		31.5/33.4 (69.5/73.7)	
3915 (880.1)	10350 (2326.7)	112 (367.5)	254 (833.3)	**1FN3600-3WC00-0AA1**		31.5/33.4 (69.5/73.7)	
5220 (1173.5)	13800 (3102.2)	58 (190.3)	155 (508.5)	**1FN3600-4WB00-0AA1**		40.8/43.3 (90/95.5)	
5220 (1173.5)	13800 (3102.2)	91 (298.6)	215 (705.4)	**1FN3600-4WB50-0AA1**		40.8/43.3 (90/95.5)	
5220 (1173.5)	13800 (3102.2)	112 (367.5)	254 (833.3)	**1FN3600-4WC00-0AA1**		40.8/43.3 (90/95.5)	
4050 (910.4)	10350 (2326.7)	65 (213.3)	160 (524.9)	**1FN3900-2WB00-0AA1**	**1FN3900-4SA00-0AA0**	28.2/29.7 (62.2/65.4)	7.5/7.9 (16.5/17.4)
4050 (910.4)	10350 (2326.7)	115 (377.3)	253 (830.1)	**1FN3900-2WC00-0AA1**		28.2/29.7 (62.2/65.4)	
6075 (1365.7)	15530 (3491.1)	75 (246.1)	181 (593.8)	**1FN3900-3WB00-0AA1**		42.2/44.3 (93.1/97.6)	
8100 (1820.9)	20700 (4653.4)	65 (213.3)	160 (524.9)	**1FN3900-4WB00-0AA1**		56.2/58.9 (124/130)	
8100 (1820.9)	20700 (4653.4)	115 (377.3)	253 (830)	**1FN3900-4WC00-0AA1**		56.2/58.9 (124/130)	
Two temperature monitoring circuits:			Temp-S and Temp-F	**1**			

Dimension drawings

Primary section	Dimensions in mm (in) without precision cooling		with precision cooling		Primary section length	**Secondary section**	Dimensions in mm (in) without precision cooling		with precision cooling and cover		Second-ary section length
Type	b_M	h_M	b_M	h_M	L_P	Type	b_S	h_S	b_S	h_S	L_S
1FN3, version for peak loads – water cooling											
1FN3450-2W	188 (7.40)	66.1 (2.60)	197 (7.76)	81 (3.19)	382 (15.04)	**1FN3450-4SA00-0AA0**	180 (7.09)	18.5 (0.73)	197 (7.76)	21.5 (0.85)	184 (7.24)
1FN3450-3W	188 (7.40)	66.1 (2.60)	197 (7.76)	81 (3.19)	543 (21.38)						
1FN3450-4W	188 (7.40)	66.1 (2.60)	197 (7.76)	81 (3.19)	704 (27.72)						
1FN3600-2W	248 (9.76)	64.1 (2.52)	257 (10.12)	86 (3.39)	382 (15.04)	**1FN3600-4SA00-0AA0**	240 (9.45)	16.5 (0.65)	247 (9.72)	26.5 (1.04)	184 (7.24)
1FN3600-3W	248 (9.76)	64.1 (2.52)	257 (10.12)	86 (3.39)	543 (21.38)						
1FN3600-4W	248 (9.76)	64.1 (2.52)	257 (10.12)	86 (3.39)	704 (27.72)						
1FN3900-2W	342 (13.46)	66.1 (2.60)	351 (13.82)	88 (3.46)	382 (15.04)	**1FN3900-4SA00-0AA0**	334 (13.15)	18.5 (0.73)	341 (13.43)	28.5 (1.12)	184 (7.24)
1FN3900-3W	342 (13.46)	66.1 (2.60)	351 (13.82)	88 (3.46)	543 (21.38)						
1FN3900-4W	342 (13.46)	66.1 (2.60)	351 (13.82)	88 (3.46)	704 (27.72)						

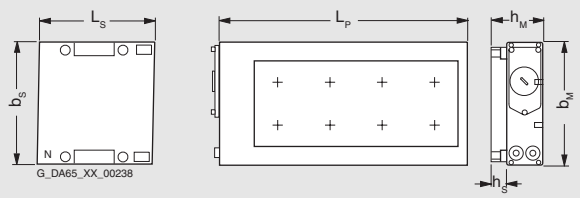
1) For water cooling with inlet temperature 35 °C (95 °F).
2) A reduction of up to 30% must be expected in case of motor standstill, at very low speeds, or with very short traverse paths.
3) Velocity values refer to a converter DC link voltage of 600 V DC.
4) No precision cooler available.

Selection and Ordering Data

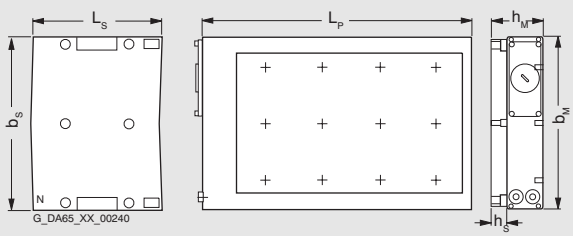
Motor type Primary section (continued)	Motor phase current		Calculated power	SINAMICS Motor Module		Power cable with complete shield Motor connection via adapter cable with power connector for increased velocity/acceleration			
				Required rated current	Order No.	Order No.	Cable cross-section		Order No.
	I_{rated} [1]	I_{MAX}	P_{calc}	I_{rated}/I_{MAX}		Pre-assembled adapter cable	Motor	Power connector	Pre-assembled cable
	A	A	kW (HP)	A	For complete Order No., see "SINAMICS S120 drive system".		mm^2	Size	
1FN3450-2WA50-...	8.6	25.3	15.9 (21.31)	18/36	**6SL312 ■ - ■ TE21-8A..**	Pre-assembled cables available soon.			
1FN3450-2WC00-...	18.8	55.3	23.1 (30.97)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3450-3WB00-...	17.9	52.7	27.5 (36.86)	30/56	**6SL312 ■ - 1 TE23-0A..**				
1FN3450-3WC00-...	28.1	83.0	34.6 (46.38)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3450-4WB00-...	23.8	70.3	36.7 (49.2)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3450-4WC00-...	37.5	110.6	46.2 (61.93)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3450-4WE00-...	67.6	199.5	65.3 (87.53)	132/210	**6SL312 ■ - 1 TE31-3A..**				
1FN3600-2WA50-...	12.4	36.0	21.9 (29.36)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3600-3WB00-...	23.2	67.3	35.4 (47.45)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3600-3WC00-...	35.2	102.4	41.6 (55.76)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3600-4WB00-...	30.9	89.8	47.2 (63.27)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3600-4WB50-...	40.8	118.5	52.2 (69.97)	85/141	**6SL312 ■ - 1 TE28-5A..**				
1FN3600-4WC00-...	46.9	136.5	55.5 (74.4)	85/141	**6SL312 ■ - 1 TE28-5A..**				
1FN3900-2WB00-...	24.7	69.5	34.5 (46.25)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3900-2WC00-...	36.7	103.3	41.0 (54.96)	60/113	**6SL312 ■ - 1 TE26-0A..**				
1FN3900-3WB00-...	40.6	114.0	54.5 (73.06)	85/141	**6SL312 ■ - 1 TE28-5A..**				
1FN3900-4WB00-...	49.4	138.9	68.9 (92.36)	85/141	**6SL312 ■ - 1 TE28-5A..**				
1FN3900-4WC00-...	73.5	206.5	81.9 (109.79)	132/210	**6SL312 ■ - 1 TE31-3A..**				

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**

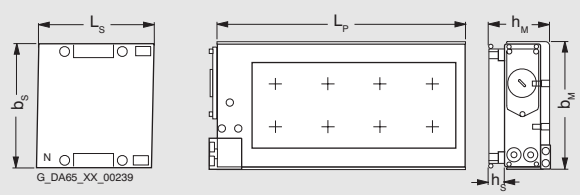
Dimension drawings



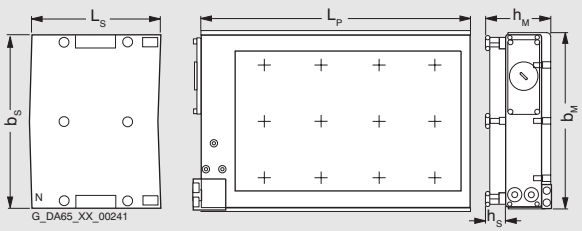
1FN3050 to 1FN3450 without precision cooling



1FN3600 to 1FN3900 without precision cooling
Note: 4-row drill pattern with 1FN3900 for fixing the primary section



1FN3050 to 1FN3450 with precision cooling



1FN3600 to 1FN3900 with precision cooling
Note: 4-row drill pattern with 1FN3900 for fixing the primary section

1FN3 standard type linear motors version for continuous load – water cooling

Selection and Ordering Data

Feedrate force		Maximum velocity [3]		1FN3 linear motors – version for continuous load – water cooling		Weight approx.	
F_{rated} [1] [2]	F_{MAX}	v_{MAX} at F_{MAX}	v_{MAX} at F_{rated}	**Primary section** Order No.	**Secondary section** Order No.	Primary section without/ with precision cooling	Secondary section without/with heatsink profile
N (lb$_f$)	N (lb$_f$)	m/min (ft/min)	m/min (ft/min)			kg (lb)	kg (lb)
150 (33.7) [5] 300 (67.4) [5]	260 (58.5) [5] 510 (114.7) [5]	249 (817) 109 (357.6)	448 (1468.9) 208 (682.5)	**1FN3050-1NE..-0AA0** [6] **1FN3050-2NC..-0AA0** [6]	**1FN3050-4SA00-0AA0**	[4]	0,4/0,5 (0.88/1.1) 0,4/0,5 (0.88/1.1)
300 (67.4) 605 (136)	510 (114.7) 1020 (229.3)	121 (397) 176 (577.5)	221 (725.1) 318 (1043.4)	**1FN3100-1NC10-0AA1** **1FN3100-2ND10-0AA1**	**1FN3100-4SA00-0AA0**	[4]	0,7/0,8 (1.54/1.76)
905 (203.5) 1205 (270.9)	1530 (344) 2040 (458.6)	118 (387.2) 175 (574.2)	218 (715.3) 316 (1036.8)	**1FN3100-3NC10-0AA1** **1FN3100-4ND10-0AA1**			
455 (102.3) 905 (203.5)	770 (173.1) 1530 (344)	134 (439.7) 114 (374)	241 (790.7) 208 (682.5)	**1FN3150-1NC10-0AA1** **1FN3150-2NC10-0AA1**	**1FN3150-4SA00-0AA0**	[4]	1,2/1,3 (2.65/2.87)
1360 (305.7) 1810 (406.9)	2300 (517.1) 3060 (687.9)	168 (551.2) 113 (370.8)	302 (990.9) 207 (679.2)	**1FN3150-3ND10-0AA1** **1FN3150-4NC10-0AA1**			
865 (194.5) [5] 1730 (388.9) [5]	1470 (330.5) [5] 2940 (660.9) [5]	129 (423.3) 127 (416.7)	230 (754.6) 228 (748.1)	**1FN3300-1NC..-0AA1** [6] **1FN3300-2NC..-0AA1** [6]	**1FN3300-4SA00-0AA0**	[4]	2,4/2,6 (5.29/5.73)
2595 (583.4) [5] 3460 (777.8) [5]	4400 (989.2) [5] 5870 (1319.6) [5]	143 (469.2) 108 (354.4)	256 (839.9) 196 (643.1)	**1FN3300-3NC..-0AA1** [6] **1FN3300-4NC..-0AA1** [6]			
2595 (583.4) [5] 3890 (874.5) [5] 5185 (1165.6) [5]	4400 (989.2) [5] 6600 (1483.7) [5] 8810 (1980.6) [5]	153 (502) 152 (498.7) 106 (347.8)	270 (885.9) 270 (885.9) 190 (623.4)	**1FN3450-2ND..-0AA1** [6] **1FN3450-3ND..-0AA1** [6] **1FN3450-4NC..-0AA1** [6]	**1FN3450-4SA00-0AA0**		3,8/4 (8.38/8.82)
3460 (777.8) [5] 5185 (1165.6) [5] 6915 (1554.6) [5]	5870 (1319.6) [5] 8810 (1980.6) [5] 11740 (2639.3) [5]	112 (367.5) 112 (367.5) 112 (367.5)	201 (659.5) 200 (656.2) 200 (656.2)	**1FN3600-2NC..-0AA1** [6] **1FN3600-3NC..-0AA1** [6] **1FN3600-4NC..-0AA1** [6]	**1FN3600-4SA00-0AA0**		4,6/5 (10.14/11.03)
5185 (1165.6) [5] 7780 (1749) [5] 10375 (2332.4) [5]	8810 (1980.6) [5] 13210 (2969.7) [5] 17610 (3958.9) [5]	71 (233) 71 (233) 71 (233)	130 (426.5) 130 (426.5) 130 (426.5)	**1FN3900-2NB..-0AA1** [6] **1FN3900-3NB..-0AA1** [6] **1FN3900-4NB..-0AA1** [6]	**1FN3900-4SA00-0AA0**		7,5/7,9 (16.54/17.42)

One temperature monitoring circuit:	Temp-S	**0**
Two temperature monitoring circuits:	Temp-S and Temp-F	**1**

Dimension drawings

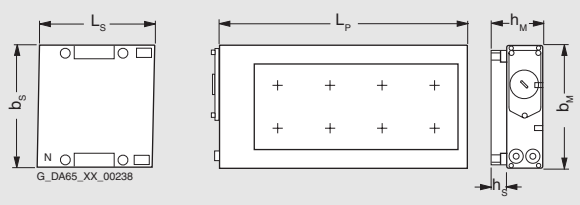
Primary section	Dimensions in mm (in)			**Secondary section**			
	without precision cooling		Primary section length		without precision cooling		Secondary section length
Type	b_M	h_M	L_P	Type	b_S	h_S	L_S
1FN3, version for continuous load – water cooling							
1FN3050-1NE **1FN3050-2NC**	67 (2.64) 67 (2.64)	59.4 (2.34) 59.4 (2.34)	160 (6.3) 265 (10.4)	**1FN3050-4SA00-0AA0**	58 (2.28)	11.8 (0.46)	120 (4.72)
1FN3100-1NC **1FN3100-2ND**	96 (3.78) 96 (3.78)	59.4 (2.34) 59.4 (2.34)	160 (6.3) 265 (10.4)	**1FN3100-4SA00-0AA0**	88 (3.46)	11.8 (0.46)	120 (4.72)
1FN3100-3NC **1FN3100-4ND**	96 (3.78) 96 (3.78)	59.4 (2.34) 59.4 (2.34)	370 (14.6) 475 (18.7)				
1FN3150-1NC **1FN3150-2NC**	126 (4.96) 126 (4.96)	61.4 (2.42) 61.4 (2.42)	160 (6.3) 265 (10.4)	**1FN3150-4SA00-0AA0**	118 (4.65)	13.8 (0.54)	120 (4.72)
1FN3150-3ND **1FN3150-4NC**	126 (4.96) 126 (4.96)	61.4 (2.42) 61.4 (2.42)	370 (14.6) 475 (18.7)				
1FN3300-1NC **1FN3300-2NC**	141 (5.55) 141 (5.55)	78 (3.07) 78 (3.07)	236 (9.3) 397 (15.6)	**1FN3300-4SA00-0AA0**	134 (5.28)	16.5 (0.65)	184 (7.24)
1FN3300-3NC **1FN3300-4NC**	141 (5.55) 141 (5.55)	78 (3.07) 78 (3.07)	558 (22) 719 (28.3)				
1FN3450-2ND **1FN3450-3ND** **1FN3450-4NC**	188 (7.40) 188 (7.40) 188 (7.40)	80 (3.15) 80 (3.15) 80 (3.15)	397 (15.6) 558 (22) 719 (28.3)	**1FN3450-4SA00-0AA0**	180 (7.09)	18.5 (0.73)	184 (7.24)
1FN3600-2NC **1FN3600-3NC** **1FN3600-4NC**	248 (9.76) 248 (9.76) 248 (9.76)	78 (3.07) 78 (3.07) 78 (3.07)	397 (15.6) 558 (22) 719 (28.3)	**1FN3600-4SA00-0AA0**	240 (9.45)	16.5 (0.65)	184 (7.24)
1FN3900-2NB **1FN3900-3NB** **1FN3900-4NB**	342 (13.46) 342 (13.46) 342 (13.46)	80 (3.15) 80 (3.15) 80 (3.15)	397 (15.6) 558 (22) 719 (28.3)	**1FN3900-4SA00-0AA0**	334 (13.15)	18.5 (0.73)	184 (7.24)

Selection and Ordering Data

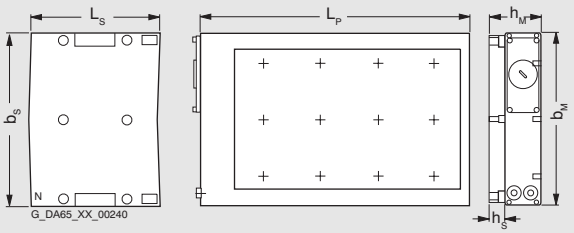
Motor type Primary section (continued)	Motor phase current		Calculated power	SINAMICS Motor Module		Power cable with complete shield Motor connection via adapter cable with power connector for increased velocity/acceleration			
				Required rated current	Order No.	Order No.	Cable cross-section		Order No.
	I_{rated} [1]	I_{MAX}	P_{calc}	I_{rated}/ I_{MAX}		Pre-assembled adapter cable	Motor	Power connector	Pre-assembled cable
	A	A	kW (HP)	A	For complete Order No., see "SINAMICS S120 drive system".		mm^2	Size	
1FN3050-1NE...	2.9 [5]	6 [5]	1.8 (2.41) [5]	3/6	**6SL312 ■ - ■ TE13-0A..**	Pre-assembled cables available soon.			
1FN3050-2NC..	2.9 [5]	6 [5]	2.4 (3.22) [5]	3/6	**6SL312 ■ - ■ TE13-0A..**				
1FN3100-1NC...	2.9	6	2.2 (2.95)	3/6	**6SL312 ■ - ■ TE13-0A..**				
1FN3100-2ND...	8.2	17.1	5.3 (7.10)	9/18	**6SL312 ■ - ■ TE21-0A..**				
1FN3100-3NC...	8.7	18.2	6.5 (8.71)	9/18 [7]	**6SL312 ■ - ■ TE21-0A..**				
1FN3100-4ND...	16.5	34.2	10.6 (14.21)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3150-1NC...	4.7	9.7	3.3 (4.42)	5/10	**6SL312 ■ - ■ TE15-0A..**				
1FN3150-2NC...	8.2	17.1	6.1 (8.18)	9/18	**6SL312 ■ - ■ TE21-0A..**				
1FN3150-3ND...	17.5	36.4	11.2 (15.01)	18/36 [7]	**6SL312 ■ - ■ TE21-8A..**				
1FN3150-4NC...	16.5	34.2	12.1 (16.22)	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3300-1NC...	8.1 [5]	17.1 [5]	5.4 (7.24) [5]	9/18	**6SL312 ■ - ■ TE21-0A..**				
1FN3300-2NC...	16.2 [5]	34.1 [5]	10.8 (14.48) [5]	18/36	**6SL312 ■ - ■ TE21-8A..**				
1FN3300-3NC...	27.3 [5]	57.4 [5]	17.4 (23.32) [5]	30/56 [7]	**6SL312 ■ - 1 TE23-0A..**				
1FN3300-4NC...	28.4 [5]	59.6 [5]	19.8 (26.54) [5]	30/56 [7]	**6SL312 ■ - 1 TE23-0A..**				
1FN3450-2ND...	28.4 [5]	59.6 [5]	17.5 (23.46) [5]	30/56 [7]	**6SL312 ■ - 1 TE23-0A..**				
1FN3450-3ND...	42.5 [5]	89.5 [5]	26.2 (35.12) [5]	45/85 [7]	**6SL312 ■ - 1 TE24-5A..**				
1FN3450-4NC...	40.8 [5]	85.8 [5]	28.1 (37.67) [5]	45/85 [7]	**6SL312 ■ - 1 TE24-5A..**				
1FN3600-2NC...	28.4 [5]	59.6 [5]	19.1 (25.60) [5]	30/56 [7]	**6SL312 ■ - 1 TE23-0A..**				
1FN3600-3NC...	42.5 [5]	89.5 [5]	28.5 (38.20) [5]	45/85 [7]	**6SL312 ■ - 1 TE24-5A..**				
1FN3600-4NC...	56.7 [5]	119.3 [5]	38 (50.94) [5]	60/113 [7]	**6SL312 ■ - 1 TE26-0A..**				
1FN3900-2NB...	28.4 [5]	59.6 [5]	22 (29.49) [5]	30/56 [7]	**6SL312 ■ - 1 TE23-0A..**				
1FN3900-3NB...	42.5 [5]	89.5 [5]	32.9 (44.10) [5]	45/85 [7]	**6SL312 ■ - 1 TE24-5A..**				
1FN3900-4NB...	56.7 [5]	119.3 [5]	43.8 (58.71) [5]	60/113 [7]	**6SL312 ■ - 1 TE26-0A..**				

Cooling:	
Internal air cooling	**0**
External air cooling	**1**
Motor Module:	
Single Motor Module	**1**
Double Motor Module	**2**

Dimension drawings



1FN3050 to 1FN3450 without precision cooling



1FN3600 to 1FN3900 without precision cooling
Note: 4-row drill pattern with 1FN3900 for fixing the primary section

1) For water cooling with inlet temperature 35 °C (95 °F).
2) A reduction of up to 30% must be expected in case of motor standstill, at very low speeds, or with very short traverse paths.
3) Velocity values refer to a converter DC link voltage of 600 V DC.
4) No precision cooler available.
5) Preliminary values.
6) On request.
7) Motor Modules are designed for feedrate force F_{rated}. If feedrate force F_{MAX} is utilized, the next largest Motor Module must be used.

1FN3 standard type linear motors
Water cooling

Selection and Ordering Data

Linear motors	Optional components		
	Secondary section cover		Cover end pieces for secondary section cover [2]
Type	Integrated [1]	Segmented	Retaining of the integrated cover without heatsink profiles
	Order No.	Order No.	Order No.
1FN3050-...	**1FN3050-0TB00-1 ■ ■ 0**	**1FN3050-4TP00-1A ■ ■**	**1FN3050-0TC00-0AA0**
1FN3100-...	**1FN3100-0TB00-1 ■ ■ 0**	**1FN3100-4TP00-1A ■ ■**	**1FN3100-0TC00-0AA0**
1FN3150-...	**1FN3150-0TB00-1 ■ ■ 0**	**1FN3150-4TP00-1A ■ ■**	**1FN3150-0TC00-0AA0**
1FN3300-...	**1FN3300-0TB00-1 ■ ■ 0**	**1FN3300-4TP00-1A ■ ■**	**1FN3300-0TC00-0AA0**
1FN3450-...	**1FN3450-0TB00-1 ■ ■ 0**	**1FN3450-4TP00-1A ■ ■**	**1FN3450-0TC00-0AA0**
1FN3600-...	**1FN3600-0TB00-1 ■ ■ 0**	**1FN3600-4TP00-1A ■ ■**	–
1FN3900-...	**1FN3900-0TB00-1 ■ ■ 0**	**1FN3900-4TP00-1A ■ ■**	–

Number of secondary sections	0	**A**		**Number of secondary sections for all frame sizes**	2.5	**C 5**
	10	**B**			3	**D 0**
	20	**C**			3.5	**D 5**
	30	**D**			4	**E 0**
	40	**E**			5	**F 0**
	50	**F**				
	0		**A**	**Number of secondary sections for frame sizes 1FN3600/1FN3900**	5.5	**F 5**
	1		**B**		6.5	**G 5**
	2		**C**			
	3		**D**			
	4		**E**			
	5		**F**			
	6		**G**			
	7		**H**			
	8		**J**			
	9		**K**			

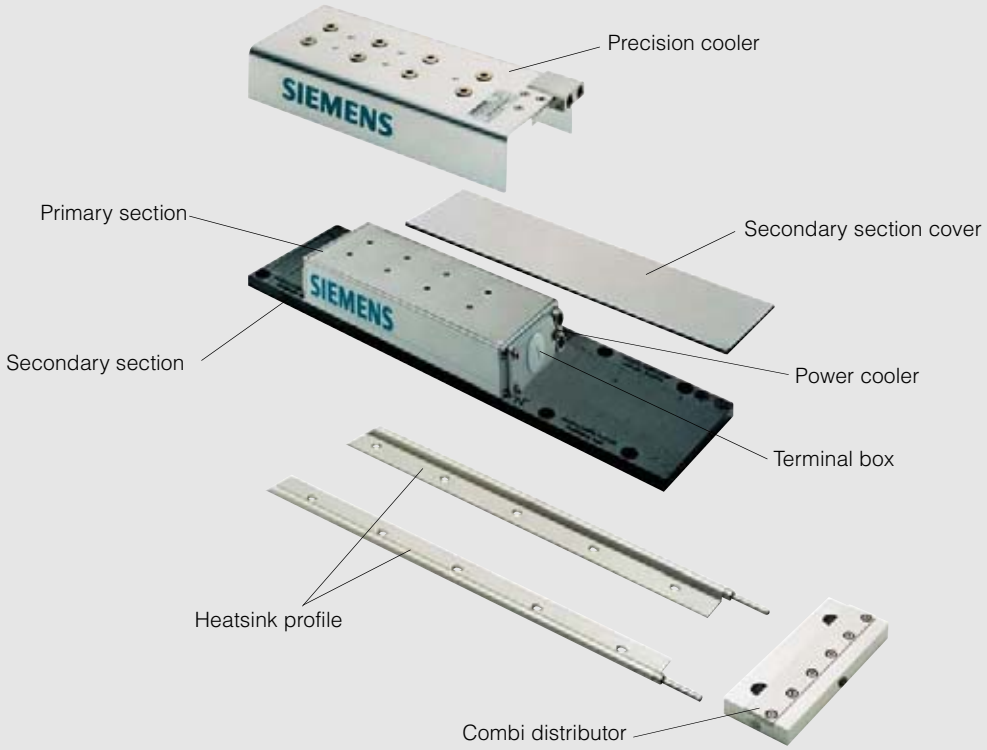
Selection and Ordering Data

Linear motors	Optional components
Type	Precision cooler
	Order No.
1FN3050-2W...	**1FN3050-2PK00-0AA0**
1FN3100-2W...	**1FN3100-2PK00-0AA0**
1FN3100-3W...	**1FN3100-3PK00-0AA0**
1FN3100-4W...	**1FN3100-4PK00-0AA0**
1FN3100-5W...	**1FN3100-5PK00-0AA0**
1FN3150-2W...	**1FN3150-2PK00-0AA0**
1FN3150-3W...	**1FN3150-3PK00-0AA0**
1FN3150-4W...	**1FN3150-4PK00-0AA0**
1FN3150-5W...	**1FN3150-5PK00-0AA0**
1FN3300-2W...	**1FN3300-2PK00-0AA0**
1FN3300-3W...	**1FN3300-3PK00-0AA0**
1FN3300-4W...	**1FN3300-4PK00-0AA0**
1FN3450-2W...	**1FN3450-2PK00-0AA0**
1FN3450-3W...	**1FN3450-3PK00-0AA0**
1FN3450-4W...	**1FN3450-4PK00-0AA0**
1FN3600-2W...	**1FN3600-2PK00-0AA0**
1FN3600-3W...	**1FN3600-3PK00-0AA0**
1FN3600-4W...	**1FN3600-4PK00-0AA0**
1FN3900-2W...	**1FN3900-2PK00-0AA0**
1FN3900-3W...	**1FN3900-3PK00-0AA0**
1FN3900-4W...	**1FN3900-4PK00-0AA0**

1) Continuous cover for several secondary sections. The maximum length of the secondary section cover is 6 m (19.69 ft). For the following frame sizes, this corresponds to: 1FN3050 to 1FN3150, a maximum number of 50 secondary sections (AB to FA). 1FN3300 to 1FN3900, a maximum number of 32 secondary sections (AB to DC).

2) The secondary section end pieces are designed to allow clamping of the integrated secondary section cover.

3) Sizes
1FN3050 to 1FN3450: 2 units per secondary section track.
1FN3600 to 1FN3900: 3 units per secondary section track.
The maximum available length of a single-part heatsink profile is 3 m (9.84 ft).
For the following frame sizes, this corresponds to:
1FN3050 to 1FN3150 a maximum of 24 secondary sections (AB to CE)
1FN3300 to 1FN3900 a maximum of 16 secondary sections (AB to BG)



Selection and Ordering Data

Linear motors Type	Optional components			
	Heatsink profile [3]	Secondary section end pieces [2]		
		Combi distributor	Combi adapter	Combi end piece
		Parallel water connection for all heatsink profiles	Combi adapter and end piece can only be implemented together.	
			Single-sided water connection	Water diversion
	Order No.	Order No.	Order No.	Order No.
1FN3050-...	**1FN3002-0TK0 ■ -1 ■ ■ 0**	**1FN3050-0TJ01-0AA0**	**1FN3050-0TG01-0AA0**	**1FN3050-0TF01-0AA0**
1FN3100-...	**1FN3002-0TK0 ■ -1 ■ ■ 0**	**1FN3100-0TJ01-0AA0**	**1FN3100-0TG01-0AA0**	**1FN3100-0TF01-0AA0**
1FN3150-...	**1FN3002-0TK0 ■ -1 ■ ■ 0**	**1FN3150-0TJ01-0AA0**	**1FN3150-0TG01-0AA0**	**1FN3150-0TF01-0AA0**
1FN3300-...	**1FN3003-0TK0 ■ -1 ■ ■ 0**	**1FN3300-0TJ01-0AA0**	**1FN3300-0TG01-0AA0**	**1FN3300-0TF01-0AA0**
1FN3450-...	**1FN3003-0TK0 ■ -1 ■ ■ 0**	**1FN3450-0TJ01-0AA0**	**1FN3450-0TG01-0AA0**	**1FN3450-0TF01-0AA0**
1FN3600-...	**1FN3004-0TK0 ■ -1 ■ ■ 0**	**1FN3600-0TJ01-0AA0**	–	–
1FN3900-...	**1FN3005-0TK0 ■ -1 ■ ■ 0**	**1FN3900-0TJ01-0AA0**	–	–

				Number of secondary sections
With plug-in coupling prepared for connection to combi distributor with plug-in coupling, combi adapter with plug-in coupling, combi end piece with plug-in coupling, or as intermediate unit for heat-sink profile with cable grommet nipple	**4**		**A**	0
			B	10
			C	20
Frame sizes 1FN3050 to 1FN3450: **Grommet nipple only on right end** of secondary section track Frame sizes 1FN3600/1FN3900: **Grommet nipple on both ends** of secondary section track	**6**		**A**	0
			B	1
			C	2
			D	3
			E	4
			F	5
			G	6
Frame sizes 1FN3050 to 1FN3450: **Grommet nipple only on left end** of secondary section track	**7**		**H**	7
			J	8
			K	9

1FN3 linear motors
Hall-effect sensor box

Overview

The motor position can be identified with an incremental linear measuring system using an additional Hall-effect sensor box, or also motion-based when considering certain additional conditions.

Selection and Ordering Data

Linear motor Type	Hall-effect sensor box Mounted opposite of primary section terminal end	
	Straight cable outlet	Lateral cable outlet
1FN3	Order No.	Order No.
1FN3050-2W... 1FN3100-2W... 1FN3100-4W... 1FN3150-2W... 1FN3150-4W...	**1FN3002-0PH00-0AA0**	**1FN3002-0PH01-0AA0**
1FN3100-1W... 1FN3100-3W... 1FN3100-5W... 1FN3150-1W... 1FN3150-3W... 1FN3150-5W...	**1FN3005-0PH00-0AA0**	**1FN3005-0PH01-0AA0**
1FN3300-2W... 1FN3300-4W... 1FN3450-2W... 1FN3450-4W... 1FN3600-2W... 1FN3600-4W... 1FN3900-2W... 1FN3900-4W...	**1FN3003-0PH00-0AA0**	**1FN3003-0PH01-0AA0**
1FN3300-1W... 1FN3300-3W... 1FN3450-3W... 1FN3600-3W... 1FN3900-3W...	**1FN3006-0PH00-0AA0**	**1FN 006-0PH01-0AA0**

Linear motor Type	Hall-effect sensor box Mounted on primary section terminal end	
	Straight cable outlet	Lateral cable outlet
	Order No.	Order No.
1FN3050-... 1FN3100-... 1FN3150-...	**1FN3002-0PH00-0AA0**	**1FN3002-0PH01-0AA0**
1FN3300-... 1FN3450-... 1FN3600-... 1FN3900-...	**1FN3003-0PH00-0AA0**	**1FN3003-0PH01-0AA0**

1FN1/1FN3 linear motors
Connector box

Overview

A connector box is required to connect a Hall-effect sensor box (option).

Technical specifications

Product name	Connector box
Degree of protection in accordance with EN 60529 (IEC 60529)	IP65
Permissible air humidity in accordance with DIN 40040	95% (without condensation)
Weight, approx.	0.26 kg (0.58 lb)
Dimensions (without sockets or cable glands)	
• Width	69.6 mm (2.74 in)
• Height	54 mm (2.13 in)
• Depth	25 mm (0.98 in)

Selection and Ordering Data

Designation	Order No.
Connector box for connecting an incremental encoder	**1FN1910-0AA00-0AA0**

1FN1/1FN3 linear motors SME91 Sensor Module External

Overview

The SME91 Sensor Module External enables motor and position encoder sensors to be connected in the vicinity of the motor in the case of drives with built-in motors. The SME91 is responsible for protecting the motor and outputting the current operating temperature/overtemperature to the drive/converter system without time delay.

Benefits

- Motor protection
- Fault-free transmission to the drive/converter system
- Low cabling overhead
- PU-molded PCB in the housing, making the module extremely rugged and suitable for direct use in the machine

Application

The SME91 is suitable for 1FN linear motors and 1FW6 torque motors to which external position measuring systems and commutation equipment cannot be connected for reasons of space.

Integration

The SME91 Sensor Module External for 1FN1/1FN3 linear motors and 1FW6 torque motors can be used on the SINAMICS S120 drive system via SMC20 or on the SIMODRIVE 611 converter system.

Technical specifications

Product name	SME91 Sensor Module External
Degree of protection in accordance with EN 60529 (IEC 60529)	IP67
Permissible air humidity in accordance with DIN 40040	5 ... 85% (without condensation)
Weight, approx.	0.721 kg (25.43 oz)
Dimensions (W x H x D) (without sockets or cable gland)	150 mm x 64 mm x 34 mm (5.91 in x 2.52 in x 1.34 in)

Selection and Ordering Data

Designation	Order No.
SME91 Sensor Module External for connecting an absolute position measuring system • 1 x connection for temperature sensors, 7-pole	**1FN1910-0AA20-1AA0**

1FN1/1FN3 linear motors Liquid cooling

Overview

Non-Siemens products whose fundamental suitability is familiar to us. It goes without saying that equivalent products from other manufacturers may be used. Our recommendations are to be seen as helpful information, not as requirements or dictates. We do not warrant the composition, nature, state or quality of non-Siemens products.

Please get in touch with the contact persons of the cooler manufacturers listed below for technical information.

More information

BKW Kälte-Wärme-Versorgungstechnik GmbH

Benzstraße 2
72649 WOLFSCHLUGEN, Germany
Phone: +49 (0) 70 22 - 50 03 - 0
Fax: +49 (0) 70 22 - 50 03 - 30
E-mail: info@bkw-kuema.de
www.bkw-kuema.de

Helmut Schimpke and Team Industriekühlanlagen GmbH + Co. KG

Postfach 101 661
42760 HAAN, Germany
Phone: +49 (0) 21 29 - 94 38 - 0
Fax: +49 (0) 21 29 - 94 38 - 99
E-mail: info@schimpke.de
www.schimpke.com

Hydac System GmbH

Contact:
Mr. Klein

Postfach 12 51
66273 SULZBACH/SAAR, Germany
Phone: +49 (0) 68 97 - 5 09 - 7 08
Fax: +49 (0) 68 97 - 5 09 - 4 54
E-mail: winfried.klein@hydac.com
www.hydac.com

Pfannenberg GmbH

Contact:
Mr. Hille

Werner-Witt-Straße 1
21035 HAMBURG, Germany
Phone: +49 (0) 40 - 7 34 12 - 1 27
Fax: +49 (0) 40 - 7 34 12 - 1 01
E-mail: werner.hille@pfannenberg.com
www.pfannenberg.com

Rittal GmbH & Co. KG

Contact:
Mr. Cieslar

Postfach 16 62
35726 HERBORN, Germany
Phone: +49 (0) 27 72 - 5 05 - 20 63
Fax: +49 (0) 27 72 - 5 05 - 29 66
E-mail: cieslar.g@rittal.de
www.rittal.com

For design of cooling units, see Planning Guide (see documentation for Order No.).

You can find information about this product at Internet website:

www.siemens.com/linearmotors
You can find your local partner under:
www.siemens.com/automation/partner

Or just mail to our infobox:

info@lms.siemens.de

Siemens Linear Motor Systems
GmbH & Co KG
Georg-Reismüller-Str. 32
80999 MÜNCHEN
GERMANY

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