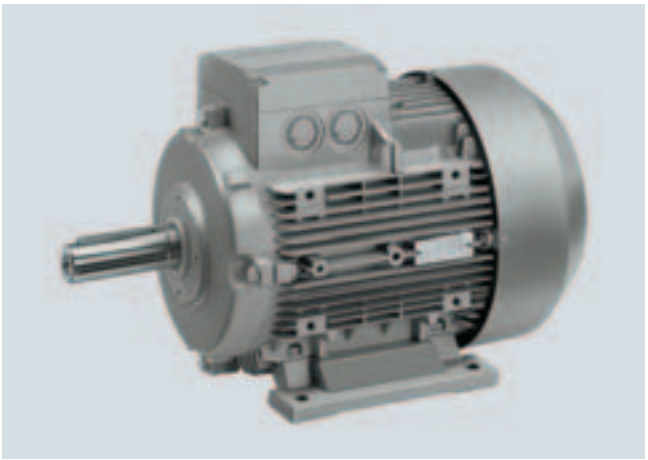
AC motors

3

Overview



1LA and 1LG motors

1LA8 motors

Asynchronous (induction) motors

- 1PH7 and 1PL6 motors
  The full capability of the SINAMICS S120 Vector Control can be utilized when the drive system is combined with motors of this type. The Control Unit evaluates the electronic rating plate via the DRIVE-CLiQ interface as well as the motor-integrated encoder signals. This means that motor and encoder data do not need to be parameterized when the system is started up or serviced.

  1PH7 and 1PL6 motors are designed for converter operation and are characterized by their high power density and wide speed range. These motors are available in a variety of construction types and models for a wide scope of drive applications.
- 1LA, 1LG, 1MA and 1MJ motors
  These motors are designed for direct connection to the three-phase supply system, but they can also operate with the SINAMICS drive system. For technical data and engineering information, please refer to Catalog M 11.
- 1PQ motors
  As these motors are forced-ventilated, no derating or only relatively minor derating (depending on their speed range) is required for constant-torque applications and wide speed ranges.

Synchronous motors

- 1FU8 motors
  1FU8 permanent-magnet-excited SIEMOSYN synchronous motors can be operated in the "*V/f* control" mode. These motors are employed as stand-alone or sectional drives for applications demanding high speeds, excellent speed accuracy and absolute synchronous operation. They are used primarily in the man-made fiber industry. For detailed motor selection, refer to Catalog DA 48.

Non-Siemens motors

Standard asynchronous (induction) motors supplied by other manufacturers can operate on the SINAMICS S120 drive system provided they are designed for converter operation with high-speed IGBT power unit. Motors without a DRIVE-CLiQ interface can easily be integrated into a SINAMICS drive system through the use of SMC modules.

Overview

1PH7 AC motors, shaft heights 100 to 160

1PH7 AC motors, shaft heights 180 and 225

1PH7 AC motors, shaft height 280

The 1PH7 AC motors are compact, forced-ventilated squirrel-cage asynchronous (induction) motors with degree of protection IP55. The motors are ventilated, as standard, using a built-on separately-driven fan unit.

The motor can be ordered either with the air flow from the motor drive shaft end (DE) to the motor non-drive shaft end (NDE) - or vice versa.

They have been designed specifically for use in conjunction with converters. Depending on the control requirements, the appropriate encoder systems are available for the motors. These encoders are used to sense the motor speed and indirect position.

Benefits

- High power density with small motor dimensions
- High degree of protection
- Wide speed control ranges
- Speed down to zero without reducing the torque
- Robustness
- Essentially maintenance-free
- High cantilever force loading
- High smooth running characteristics, even at the lowest speeds
- Integrated encoder system to sense the motor speed, connected using a connector or DRIVE-CLiQ
- Terminal box to connect up power cables
- The motor temperature is monitored using a KTY 84
- Variable cooling versions
- Basic external cooling using a pipe connection
- Optional bearing designs with re-lubrication device and insulated bearings (NDE)

Application

Mounted in dry inside areas (no aggressive atmosphere).

Crane systems:

- Hoisting gears and closing gears for cranes
- Hoisting and traversing gears for high-bay racking vehicles

Printing industry:

- Single and main drives for printing machines

Manufacture of rubber, plastic, wire and glass:

- Drives for extruders, calenders, rubber injection machines, foil machines, fleece plants
- Wire-drawing machines, wire-stranding machines, etc.

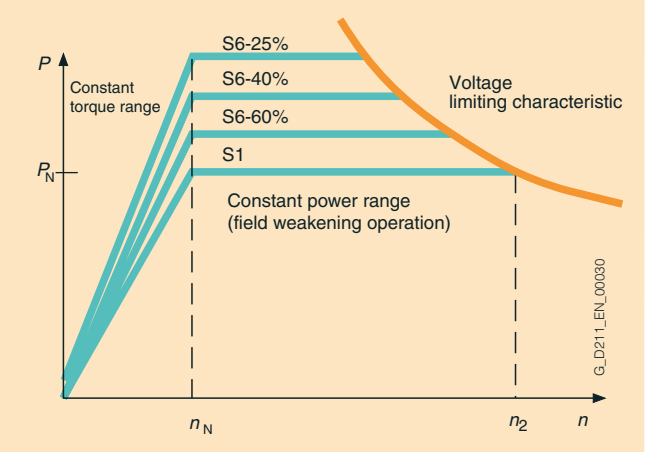
General applications such as coiler and winder drives.

1PH7 motors

Technical data

Insulation of the stator winding in accordance with EN 60034-1 (IEC 60034-1)	Temperature class F for a coolant inlet temperature of up to +40 °C (+104 °F)
Fan supply voltage (see selection guides for technical data)	400 V 3 AC/50 Hz/60 Hz 480 V 3 AC/60 Hz
Type in accordance with EN 60034-7 (IEC 60034-7)	IM B3
Degree of protection in accordance with EN 60034-5 (IEC 60034-5)	IP55 (fan IP54)
Cooling in accordance with EN 60034-6 (IEC 60034-6)	Forced ventilation SH 100 to SH 225: Fan axial mounted NDE SH 280: Fan radial mounted NDE
Temperature monitoring	KTY 84 temperature sensor in stator winding SH 280: Additional KTY 84 as reserve
Paint finish	SH 100 to SH 160: Without paint finish, Standard paint finish, anthracite RAL 7016 SH 180 to SH 280: with primer, Standard paint finish, anthracite RAL 7016
Shaft end on the drive end in accordance with 748-3 (IEC 60072-1)	with key, half-key balancing
Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1)	SH 100 to SH 160: Tolerance R (reduced) SH 180 to SH 280: Tolerance N (normal)
Vibration severity level in accordance with EN 60034-14 (IEC 60034-14)	SH 100 to SH 225: Grade R (reduced) SH 280: Grade N (normal)
Sound pressure level in accordance with DIN EN ISO 1680 tolerance +3 dB	Sound pressure level as a function of air-flow direction see selection guides
Bearing versions and maximum speeds	see selection guides
Encoder system, built-in, for motors with/without DRIVE-CLiQ interface	– Incremental encoder HTL 1024 pulses/revolution – Incremental encoder sin/cos 1 V_{pp}, 2048 pulses/revolution – Absolute encoder EnDat 2048 pulses/revolution – 2-pole resolver
Connection	Signal connectors (mating connector is not included in the scope of supply) Terminal box for power SH 160 to SH 225: Terminal box top SH 280: Terminal box NDE right
Options	See selection and ordering data and Chapter "Options"

Characteristic curves



Power/speed characteristic

Options

Order code	Option description	For use with 1PH7 asynchronous motors with shaft height		
		SH 100 to 160	SH 180 SH 225	SH 280
	Normal paint finish in another color, RAL ...	● 1)	■ 2)	■ 2)
	Special paint finish in another color, RAL ...	●	■ 3)	■ 3)
C30	Winding version 690 V	–	–	■
G14	Fan unit with air filter	–	●	■
G80	POG10 pulse encoder, mounting prepared	–	–	■
K08	Encoder connector mounted opposite	–	–	■
K16	Second standard shaft end (possible only without encoder)	–	–	■
K31	2nd rating plate supplied separately in terminal box	Standard	■	■
K40	Re-lubrication devices, DE and NDE	–	■	Standard
K45	230 V anti-condensation heating	–	–	■
K55	Cable entry plate, terminal box customer-specific (plain text is required)	–	■	■
K83	Terminal box rotated through +90 degrees	–	–	■
K84	Terminal box rotated through -90 degrees	–	–	■
K85	Terminal box rotated through 180 degrees	–	–	■
L27	NDE bearing, insulated version	–	■	Standard
M03	Version for potentially explosive atmospheres, zone 2 (in accordance with EN 50021/IEC 60079-15)	■	–	–
M39	Version for potentially explosive atmospheres, zone 22 (in accordance with EN 50281/IEC 61241)	■	■	■
M83	Additional thread for a setting screw at the motor feet	–	–	■
Y55	Non-standard shaft end DE	●	●	●
Y80	Different rating plate data (plain text is required)	●	●	●
Y82	Supplementary plate with the orderer's data	●	●	●

■ Option possible
● On request
– Not available

1) Order using a code (without plain text), e.g.:
X01: RAL 9005 (flat black)
X02: RAL 9001 (cream)
X03: RAL 6011 (reseda green)
X04: RAL 7032 (pebble grey)
X05: RAL 5015 (sky blue)
X06: RAL 1015 (light ivory)

2) Order with code **R1Y**
(it is necessary to specify the RAL color in plain text).

3) Order with code **R2Y**
(it is necessary to specify the RAL color in plain text).

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f -ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 400 V 3 AC									
400	160	9.5 (12.7)	227 (167.4)	30	274	2000	2000	2000	**1PH7163 – ■■B■■ – ■...**
		13.0 (17.4)	310 (228.7)	37	294	2000	2000	2000	**1PH7167 – ■■B■■ – ■...**
1150	100	4.3 (5.8)	36 (26.6)	10	391	2200	5500	5750	**1PH7103 – ■■D■■ – ■...**
		7.2 (9.7)	60 (44.3)	17.5	360	4200	5500	5750	**1PH7107 – ■■D■■ – ■...**
	132	13.5 (18.1)	112 (82.6)	29	381	3000	4500	5750	**1PH7133 – ■■D■■ – ■...**
		19.5 (26.1)	162 (119.5)	43	367	3800	4500	5750	**1PH7137 – ■■D■■ – ■...**
	160	25 (33.5)	208 (153.4)	55	364	3500	3700	5750	**1PH7163 – ■■D■■ – ■...**
		31 (41.6)	257 (189.6)	70	357	4800	3700	5750	**1PH7167 – ■■D■■ – ■...**
1750	100	4.3 (5.8)	24 (17.7)	10	398	6000	5500	8750	**1PH7101 – ■■F■■ – ■...**
		6.25 (8.4)	34 (25.1)	13	398	3500	5500	8750	**1PH7103 – ■■F■■ – ■...**
		8 (10.7)	44 (32.5)	17.5	398	5800	5500	8750	**1PH7105 – ■■F■■ – ■...**
		10 (13.4)	55 (40.6)	23	381	4500	5500	8750	**1PH7107 – ■■F■■ – ■...**

Fans:	External fan unit and PG cable entry in terminal box		**2**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**M**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**D**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3 (IM V5, IM V6)		**0**
	IM B5 (IM V1, IM V3) compatible only with SH 100 and SH 132		**2**
	IM B35 (IM V15, IM V36)		**3**
Holding brake with Emergency Stop function [4]	without brake		**0**
	Brake supply voltage 230 V 1 AC, 50/60 Hz	with brake	**1**
		with brake (brake has microswitch)	**2**
		with brake (brake has manual release function)	**3**
		with brake (brake has manual release function and microswitch)	**4**
	Brake supply voltage 24 V DC	with brake	**5**
		with brake (brake has microswitch)	**6**
		with brake (brake has manual release function)	**7**
		with brake (brake has manual release function and microswitch)	**8**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Effi-ciency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.88	11.5	0.809	14.3	0.185 (1.64)	175 (386)	**1PH7163 – . . B . . – . ■■■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.88	14.0	0.814	14.3	0.228 (2.02)	210 (463)	**1PH7167 – . . B . . – . ■■■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.81	5.0	0.813	40.6	0.017 (0.15)	40 (88)	**1PH7103 – . . D . . – . ■■■**	9 [8]	**6SL3120 – ■ TE21 – 0AA ■**
0.81	8.8	0.838	40.3	0.029 (0.26)	65 (143)	**1PH7107 – . . D . . – . ■■■**	18	**6SL3120 – ■ TE21 – 8AA ■**
0.85	13	0.877	39.7	0.076 (0.67)	90 (198)	**1PH7133 – . . D . . – . ■■■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.86	19	0.887	39.6	0.109 (0.96)	150 (331)	**1PH7137 – . . D . . – . ■■■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.84	25	0.904	39.2	0.185 (1.64)	175 (386)	**1PH7163 – . . D . . – . ■■■**	60	**6SL3120 – 1 TE26 – 0AA 1**
0.83	34	0.909	39.1	0.228 (2.02)	210 (463)	**1PH7167 – . . D . . – . ■■■**	85	**6SL3120 – 1 TE28 – 5AA 1**
0.75	5.7	0.855	60.0	0.017 (0.15)	40 (88)	**1PH7101 – . . F . . – . ■■■**	9 [8]	**6SL3120 – ■ TE21 – 0AA ■**
0.84	5.3	0.849	61.0	0.017 (0.15)	40 (88)	**1PH7103 – . . F . . – . ■■■**	18	**6SL3120 – ■ TE21 – 8AA ■**
0.77	9.3	0.875	60.0	0.029 (0.26)	65 (143)	**1PH7105 – . . F . . – . ■■■**	18	**6SL3120 – ■ TE21 – 8AA ■**
0.80	10.6	0.870	60.3	0.029 (0.26)	65 (143)	**1PH7107 – . . F . . – . ■■■**	30	**6SL3120 – 1 TE23 – 0AA 1**

Output type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling/belt	R	R	**B**
Coupling/belt	S	R	**C**
Coupling/belt	SR	R	**D**
Coupling/belt	N	N (with brake mounting)	**K**
Increased maximum speed [5]	SR	R	**L**
Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [7]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [7]	**D**
Plain shaft	—	DE → NDE	**J**
Plain shaft	—	NDE → DE [7]	**K**
Seal:	**Color:**		
—	without		**0**
Flange and shaft sealing ring [6]	without		**2**
—	Anthracite (RAL 7016), standard paint finish		**3**
Flange and shaft sealing ring [6]	Anthracite (RAL 7016), standard paint finish		**5**
—	Anthracite (RAL 7016), special paint finish		**6**
Flange and shaft sealing ring [6]	Anthracite (RAL 7016), special paint finish		**8**
Special versions:	Specify suppl. order code plain text if applicable (see Options).		**–Z**
Motor Module:	Single Motor Module		**1**
	Double Motor Module		**2**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
4) Version with brake is compatible if:
12th data position "2" or "3"
14th data position "K"
15th data position "A", "B", "J" or "K"
16th data position "0", "3" or "6"
5) Max. possible speed (see also selection guides):
SH 100: 12000 rpm, SH 132: 10000 rpm,
SH 160: 8000 rpm, with plain shaft only (15th data position "J" or "K" and 16th data position "0", "3" or "6").
6) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6) or on version with increased maximum speed.
7) Preferred air-flow direction in polluted environment.
8) The rated output current of the Motor Module is lower than the motor rated current.

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f -ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply Voltage 400 V 3 AC									
1750	132	13 (17.4)	71 (52.4)	24	398	4800	4500	8000	**1PH7131 – ■■F■■ – ■...**
		17.5 (23.5)	96 (70.8)	34	398	5000	4500	8000	**1PH7133 – ■■F■■ – ■...**
		21.5 (28.8)	117 (86.3)	42	398	5500	4500	8000	**1PH7135 – ■■F■■ – ■...**
		25 (33.5)	136 (100.3)	56	357	4000	4500	8000	**1PH7137 – ■■F■■ – ■...**
	160	34 (45.6)	186 (137.2)	72	364	4000	3700	6500	**1PH7163 – ■■F■■ – ■...**
		41 (54.9)	224 (165.2)	79	398	2800	3700	6500	**1PH7167 – ■■F■■ – ■...**
2300	100	7.5 (10.1)	31 (22.9)	17	388	6000	5500	9000	**1PH7103 – ■■G■■ – ■...**
		12 (16.1)	50 (36.9)	26	400	6000	5500	9000	**1PH7107 – ■■G■■ – ■...**
	132	22.5 (30.2)	93 (68.6)	45	398	4000	4500	8000	**1PH7133 – ■■G■■ – ■...**
		29 (38.9)	120 (88.5)	56	398	4000	4500	8000	**1PH7137 – ■■G■■ – ■...**
	160	38 (50.9)	158 (116.5)	80	374	3000	3700	6500	**1PH7163 – ■■G■■ – ■...**
		44 (58.9)	183 (135)	85	398	3000	3700	6500	**1PH7167 – ■■G■■ – ■...**

Fans:	External fan unit and PG cable entry in terminal box		**2**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**M**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**D**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3 (IM V5, IM V6)		**0**
	IM B5 (IM V1, IM V3) compatible only with SH 100 and SH 132		**2**
	IM B35 (IM V15, IM V36)		**3**
Holding brake with Emergency Stop function [4]	without brake		**0**
	Brake supply voltage 230 V 1 AC, 50/60 Hz	with brake	**1**
		with brake (brake has microswitch)	**2**
		with brake (brake has manual release function)	**3**
		with brake (brake has manual release function and microswitch)	**4**
	Brake supply voltage 24 V DC	with brake	**5**
		with brake (brake has microswitch)	**6**
		with brake (brake has manual release function)	**7**
		with brake (brake has manual release function and microswitch)	**8**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
cos φ	I_μ A	η_{rated}	f_{rated} Hz	J kgm² (lb_f-in-s²)	kg (lb)	Order No.	I_{rated} A	Order No.
Supply voltage 400 V 3 AC								
0.88	8.1	0.902	59.7	0.076 (0.67)	90 (198)	**1PH7131 – . . F . . – . ■ ■ ■**	30	**6SL3120 – 1 TE23-0AA 1**
0.85	14	0.900	59.7	0.076 (0.67)	90 (198)	**1PH7133 – . . F . . – . ■ ■ ■**	45	**6SL3120 – 1 TE24-5AA 1**
0.86	16	0.906	59.5	0.109 (0.96)	150 (331)	**1PH7135 – . . F . . – . ■ ■ ■**	45	**6SL3120 – 1 TE24-5AA 1**
0.85	23	0.902	59.5	0.109 (0.96)	150 (331)	**1PH7137 – . . F . . – . ■ ■ ■**	60	**6SL3120 – 1 TE26-0AA 1**
0.86	28	0.915	59.2	0.185 (1.64)	175 (386)	**1PH7163 – . . F . . – . ■ ■ ■**	85	**6SL3120 – 1 TE28-5AA 1**
0.86	30	0.920	59.2	0.228 (2.02)	210 (463)	**1PH7167 – . . F . . – . ■ ■ ■**	85	**6SL3120 – 1 TE28-5AA 1**
0.79	8.2	0.866	78.8	0.017 (0.15)	40 (88)	**1PH7103 – . . G . . – . ■ ■ ■**	18	**6SL3120 – ■ TE21-8AA ■**
0.80	12	0.878	78.7	0.029 (0.26)	65 (143)	**1PH7107 – . . G . . – . ■ ■ ■**	30	**6SL3120 – 1 TE23-0AA 1**
0.86	17	0.900	78.0	0.076 (0.67)	90 (198)	**1PH7133 – . . G . . – . ■ ■ ■**	45	**6SL3120 – 1 TE24-5AA 1**
0.87	21	0.903	77.8	0.109 (0.96)	150 (331)	**1PH7137 – . . G . . – . ■ ■ ■**	60	**6SL3120 – 1 TE26-0AA 1**
0.83	36	0.900	77.3	0.185 (1.64)	175 (386)	**1PH7163 – . . G . . – . ■ ■ ■**	85	**6SL3120 – 1 TE28-5AA 1**
0.84	40	0.911	77.4	0.228 (2.02)	210 (463)	**1PH7167 – . . G . . – . ■ ■ ■**	85	**6SL3120 – 1 TE28-5AA 1**

Output type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling/belt	R	R	**B**
Coupling/belt	S	R	**C**
Coupling/belt	SR	R	**D**
Coupling/belt	N	N (with brake mounting)	**K**
Increased maximum speed [5]	SR	R	**L**
Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [7]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [7]	**D**
Plain shaft	—	DE → NDE	**J**
Plain shaft	—	NDE → DE [7]	**K**
Seal:	**Color:**		
—	without		**0**
Flange and shaft sealing ring [6]	without		**2**
—	Anthracite (RAL 7016), standard paint finish		**3**
Flange and shaft sealing ring [6]	Anthracite (RAL 7016), standard paint finish		**5**
—	Anthracite (RAL 7016), special paint finish		**6**
Flange and shaft sealing ring [6]	Anthracite (RAL 7016), special paint finish		**8**
Special versions:	Specify suppl. order code plain text if applicable (see Options).		**–Z**
Motor Module:	Single Motor Module		**1 2**
	Double Motor Module		**1 0**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.
4) Version with brake is compatible if:
12th data position "2" or "3"
14th data position "K"
15th data position "A", "B", "J" or "K"
16th data position "0", "3" or "6"
5) Max. possible speed (see also selection guides):
SH 100: 12000 rpm, SH 132: 10000 rpm,
SH 160: 8000 rpm, with plain shaft only (15th data position "J" or "K" and 16th data position "0", "3" or "6").
6) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6) or on version with increased maximum speed.
7) Preferred air-flow direction in polluted environment.
8) The rated output current of the Motor Module is lower than the motor rated current.

1PH7 motors

Selection and ordering data

Rated speed	Shaft height SH	Rated power	Rated torque	Rated current	Rated voltage	Field-weakening speed [1]	Max. permissible continuous speed [2]	Max. speed [3]	1PH7 asynchronous motor
n_{rated}		P_{rated}	M_{rated}	I_{rated}	V_{rated}	n_2	n_{S1}	n_{max}	
rpm		kW (HP)	Nm (lb_f -ft)	A	V	rpm	rpm	rpm	Order No.
Supply voltage 400 V 3 AC									
400	180	16.3 (21.8)	390 (287.7)	51	271	2000	2000	2000	**1PH7184 – ■■B■■ – ■...**
		21.2 (28.4)	505 (372.5)	67	268	2000	2000	2000	**1PH7186 – ■■B■■ – ■...**
	225	30.4 (40.7)	725 (534.8)	88	268	2000	2000	2000	**1PH7224 – ■■B■■ – ■...**
		39.2 (52.5)	935 (689.7)	114	264	2000	2000	2000	**1PH7226 – ■■B■■ – ■...**
		48 (64.3)	1145 (844.6)	136	272	2000	2000	2000	**1PH7228 – ■■B■■ – ■...**
1150	180	44 (58.9)	366 (270)	89	383	4200	3500 [4]	5000	**1PH7184 – ■■D■■ – ■...**
		58 (77.7)	482 (355.5)	116	390	4400	3500 [4]	5000	**1PH7186 – ■■D■■ – ■...**
	225	81 (108.6)	670 (494.2)	160	385	2900	3100 [4]	4500	**1PH7224 – ■■D■■ – ■...**
		105 (140.7)	870 (641.7)	197	390	2900	3100 [4]	4500	**1PH7226 – ■■D■■ – ■...**
		129 (172.9)	1070 (789.2)	238	390	2900	3100 [4]	4500 [4]	**1PH7228 – ■■D■■ – ■...**

Fans:	External fan unit and PG cable entry in terminal box			**2**		
	Without external fan unit, for pipe connection, PG cable entry in terminal box			**6**		
	External fan unit and metric cable entry in terminal box			**7**		
	Without external fan unit, for pipe connection, metric cable entry in terminal box			**8**		
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder			**A**		
	Absolute encoder EnDat 2048 pulses/revolution			**E**		
	Incremental encoder HTL 1024 pulses/revolution			**H**		
	Incremental encoder HTL 2048 pulses/revolution			**J**		
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]			**M**		
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]			**N**		
	2-pole resolver			**R**		
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution			**F**		
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]			**D**		
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]			**Q**		
	2-pole resolver			**P**		
Terminal box/cable entry (view onto DE):	top/from right				**0**	
	top/from DE				**1**	
	top/from NDE				**2**	
	top/from left				**3**	
Type of construction:	IM B3					**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)				**1**
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)					**3**
	IM B35 (only for 1PH7184 with flange A 450)					**4**
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)				**5**
	IM B35 (only for1PH7184 with flange A 450)	Hoisting system for different construction types (IM V15, IM V36)				**6**
Holding brake with Emergency Stop function (suitable for coupling output in construction type IM B3) [5]:	without brake					**0**
	with brake (brake has emergency release screws and microswitch)					**2**
	with brake (brake has manual release function and microswitch)					**4**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
cos φ	I_μ A	η_{rated}	f_{rated} Hz	J kgm² (lb_f-in-s²)	kg (lb)	Order No.	I_{rated} A	Order No.
Supply coltage 400 V 3 AC								
0.84	26	0.830	14.2	0.503 (4.45)	370 (816)	**1PH7184 – . . B . . – . ■■■**	60	**6SL3120 –1T E26–0AA1**
0.81	38.5	0.845	14.0	0.666 (5.89)	440 (970)	**1PH7186 – . . B . . – . ■■■**	85	**6SL3120 –1T E28–5AA1**
0.87	36.5	0.864	14.0	1.479 (13.10)	630 (1389)	**1PH7224 – . . B . . – . ■■■**	85 [9]	**6SL3120 –1T E28–5AA1**
0.86	49	0.880	14.0	1.930 (17.08)	750 (1654)	**1PH7226 – . . B . . – . ■■■**	132	**6SL3120 –1T E31–3AA0**
0.85	60.5	0.888	13.9	2.326 (20.58)	860 (1896)	**1PH7228 – . . B . . – . ■■■**	132 [9]	**6SL3120 –1T E31–3AA0**
0.82	42	0.920	39.2	0.503 (4.45)	370 (816)	**1PH7184 – . . D . . – . ■■■**	85 [9]	**6SL3120 –1T E28–5AA1**
0.81	58	0.925	39.1	0.666 (5.89)	440 (970)	**1PH7186 – . . D . . – . ■■■**	132	**6SL3120 –1T E31–3AA0**
0.81	79	0.938	38.9	1.479 (13.10)	630 (1389)	**1PH7224 – . . D . . – . ■■■**	200	**6SL3120 –1T E32–0AA0**
0.84	87.5	0.941	38.9	1.930 (17.08)	750 (1654)	**1PH7226 – . . D . . – . ■■■**	200	**6SL3120 –1T E32–0AA0**
0.85	98	0.943	38.9	2.326 (20.58)	860 (1896)	**1PH7228 – . . D . . – . ■■■**	260	**6SL3320 –1T E32–6AA0**

Output type:	**Vibrat. severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**
Increased maximum speed [6]	S	R	**J**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [8]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [8]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [8]	**K**

Seal:	**Color:**	
–	primed	**0**
Flange and shaft sealing ring [7]	primed	**2**
–	Anthracite (RAL 7016), standard paint finish	**3**
Flange and shaft sealing ring [7]	Anthracite (RAL 7016), standard paint finish	**5**
–	Anthracite (RAL 7016), special paint finish	**6**
Flange and shaft sealing ring [7]	Anthracite (RAL 7016), special paint finish	**8**

Special versions:	Specify supplemenhtary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Version with brake is compatible if:
12th data position "0"
14th data position "A"
15th data position "A" or "B"
16th data position "0", "3" or "6"

6) For SH 180 n_{max} = 7000 rpm, 1PH7224 n_{max} = 5500 rpm, only coupling output possible and 16th data position "0", "3" or "6".

7) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6), on version with increased maximum speed, on version for belt output or increased cantilever forces.

8) Preferred air-flow direction in polluted environment.

9) The rated output current of the Motor Module is lower than the motor rated current.

10) Only in conjunction with option **M84** (insulated version of encoder).

1PH7 motors

Selection and ordering data

Rated speed	Shaft height SH	Rated power	Rated torque	Rated current	Rated voltage	Field-weakening speed [1]	Max. permissible continuous speed [2]	Max. speed [3]	1PH7 asynchronous motor
n_{rated} rpm		P_{rated} kW (HP)	M_{rated} Nm (lb_f -ft)	I_{rated} A	V_{rated} V	n_2 rpm	n_{S1} rpm	n_{max} rpm	Order No.
Supply voltage 400 V 3 AC									
1750	180	60 (80.4)	327 (241.2)	120	388	5000	3500 [4]	5000	**1PH7184 – ■■ F ■■ – ■ . . .**
		85 (113.9)	465 (343)	169	385	5000	3500 [4]	5000	**1PH7186 – ■■ F ■■ – ■ . . .**
	225	110 (147.4)	600 (442.6)	203	395	2900	3100 [4]	4500	**1PH7224 – ■■ U ■■ – ■ . . .**
		135 (180.9)	737 (543.6)	254	395	2900	3100 [4]	4500	**1PH7226 – ■■ F ■■ – ■ . . .**
		179 (239.9)	975 (719.2)	342	395	2900	3100 [4]	4500 [4]	**1PH7228 – ■■ F ■■ – ■ . . .**
2900	180	81 (108.6)	265 (195.5)	158	395	5000	3500 [4]	5000	**1PH7184 – ■■ L ■■ – ■ . . .**
		101 (135.4)	333 (245.6)	206	385	5000	3500 [4]	5000	**1PH7186 – ■■ L ■■ – ■ . . .**
	225	149 (199.7)	490 (361.4)	274	395	3500	3100 [4]	4500	**1PH7224 – ■■ L ■■ – ■ . . .**
		185 (247.9)	610 (450)	348	390	3500	3100 [4]	4500	**1PH7226 – ■■ L ■■ – ■ . . .**
		215 (288.2)	708 (522.2)	402	395	3500	3100 [4]	4500 [4]	**1PH7228 – ■■ L ■■ – ■ . . .**

Fans:	External fan unit and PG cable entry in terminal box			**2**	
	Without external fan unit, for pipe connection, PG cable entry in terminal box			**6**	
	External fan unit and metric cable entry in terminal box			**7**	
	Without external fan unit, for pipe connection, metric cable entry in terminal box			**8**	
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder				**A**
	Absolute encoder EnDat 2048 pulses/revolution				**E**
	Incremental encoder HTL 1024 pulses/revolution				**H**
	Incremental encoder HTL 2048 pulses/revolution				**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]				**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]				**N**
	2-pole resolver				**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution				**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]				**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]				**Q**
	2-pole resolver				**P**
Terminal box/cable entry (view onto DE):	top/from right					**0**
	top/from DE					**1**
	top/from NDE					**2**
	top/from left					**3**
Type of construction:	IM B3					**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)				**1**
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)					**3**
	IM B35 (only for 1PH7184 with flange A 450)					**4**
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)				**5**
	IM B35 (only for1PH7184 with flange A 450)	Hoisting system for different construction types (IM V15, IM V36)				**6**
Holding brake with Emergency Stop function (suitable for coupling output in construction type IM B3) [5]:	without brake						**0**
	with brake (brake has emergency release screws and microswitch)						**2**
	with brake (brake has manual release function and microswitch)						**4**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.78	64	0.934	59.0	0.503 (4.45)	370 (816)	**1PH7184 – . . F . . – . ■■■**	132	**6SL3120 – 1TE31 – 3AA0**
0.80	84	0.940	59.0	0.666 (5.89)	440 (970)	**1PH7186 – . . F . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.84	88	0.944	58.9	1.479 (13.10)	630 (1389)	**1PH7224 – . . U . . – . ■■■**	200 [9]	**6SL3120 – 1TE32 – 0AA0**
0.82	120	0.947	58.9	1.930 (17.08)	750 (1654)	**1PH7226 – . . F . . – . ■■■**	260	**6SL3320 – 1TE32 – 6AA0**
0.81	169	0.948	58.8	2.326 (20.58)	860 (1896)	**1PH7228 – . . F . . – . ■■■**	380	**6SL3320 – 1TE33 – 8AA0**
0.80	77	0.934	97.4	0.503 (4.45)	370 (816)	**1PH7184 – . . L . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.78	107	0.936	97.3	0.666 (5.89)	440 (970)	**1PH7186 – . . L . . – . ■■■**	200 [9]	**6SL3120 – 1TE32 – 0AA0**
0.84	115	0.946	97.3	1.479 (13.10)	630 (1389)	**1PH7224 – . . L . . – . ■■■**	310	**6SL3320 – 1TE33 – 1AA0**
0.83	154	0.946	97.2	1.930 (17.08)	750 (1654)	**1PH7226 – . . L . . – . ■■■**	380	**6SL3320 – 1TE33 – 8AA0**
0.82	186	0.946	97.2	2.326 (20.58)	860 (1896)	**1PH7228 – . . L . . – . ■■■**	490	**6SL3320 – 1TE35 – 0AA0**

Output type:	**Vibrat. severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Coupling	R	R	**C**
Coupling	S	R	**D**
Belt	SR	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**
Increased maximum speed [6]	R	R	**J**
	S		

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [8]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [8]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [8]	**K**

Seal:	**Color:**	
–	primed	**0**
Flange and shaft sealing ring [7]	primed	**2**
–	Anthracite (RAL 7016), standard paint finish	**3**
Flange and shaft sealing ring [7]	Anthracite (RAL 7016), standard paint finish	**5**
–	Anthracite (RAL 7016), special paint finish	**6**
Flange and shaft sealing ring [7]	Anthracite (RAL 7016), special paint finish	**8**

Special versions:	Specify supplemenhtary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Version with brake is compatible if:
12th data position "0"
14th data position "A"
15th data position "A" or "B"
16th data position "0", "3" or "6"

6) For SH 180 n_{max} = 7000 rpm, 1PH7224 n_{max} = 5500 rpm, only coupling output possible and 16th data position "0", "3" or "6".

7) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6), on version with increased maximum speed, on version for belt output or increased cantilever forces.

8) Preferred air-flow direction in polluted environment.

9) The rated output current of the Motor Module is lower than the motor rated current.

10) Only in conjunction with option **M84** (insulated version of encoder).

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f -ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 400 V 3 AC									
500	280	80 (107.2)	1529 (1127.8)	144	400	1700	2200	2500	**1PH7 284 –■■B■■– 0 . . .**
		100 (134.1)	1909 (1408.1)	180	400	1800	2200	2500	**1PH7 286 –■■B■■– 0 . . .**
		130 (174.3)	2481 (1830)	233	400	1800	2200	2500	**1PH7 288 –■■B■■– 0 . . .**
800	280	125 (167.6)	1492 (1100.5)	220	400	2200	2200	3300	**1PH7 284 –■■C■■– 0 . . .**
		155 (207.8)	1850 (1364.6)	285	385	2200	2200	3300	**1PH7 286 –■■C■■– 0 . . .**
		190 (254.7)	2268 (1672.9)	365	370	2200	2200	3300	**1PH7 288 –■■C■■– 0 . . .**
1150	280	170 (227.9)	1414 (1043)	314	400	2200	2200	3300	**1PH7 284 –■■D■■– 0 . . .**
		210 (281.5)	1745 (1287.1)	414	380	2200	2200	3300	**1PH7 286 –■■D■■– 0 . . .**
		260 (348.5)	2160 (1593.2)	497	385	2200	2200	3300	**1PH7 288 –■■D■■– 0 . . .**
1750	280	225 (301.6)	1228 (905.8)	393	400	2200	2200	3300	**1PH7 284 –■■F■■– 0 . . .**
		270 (361.9)	1474 (1087.2)	466	400	2200	2200	3300	**1PH7 286 –■■F■■– 0 . . .**
		340 (455.8)	1856 (1369)	586	400	2200	2200	3300	**1PH7 288 –■■F■■– 0 . . .**

Fans [4]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**
	External fan unit, NDE right, air-flow direction NDE to DE	**1**
	External fan unit, NDE left, air-flow direction NDE to DE	**2**
	External fan unit, DE top, air-flow direction DE to NDE	**3**
	External fan unit, DE right, air-flow direction DE to NDE	**4**
	External fan unit, DE left, air-flow direction DE to NDE	**5**
	Without external fan unit, for single pipe connection at NDE right	**6**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder	**A**
	Absolute encoder EnDat 2048 pulses/revolution	**E**
	Incremental encoder HTL 1024 pulses/revolution	**H**
	Incremental encoder HTL 2048 pulses/revolution	**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**N**
	Resolver on request	
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution	**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**Q**
	Resolver on request	
Terminal box/cable entry (view onto DE) [4]:	NDE right/from below/encoder connector DE	**0**
	NDE left/from below/encoder connector DE	**1**
	NDE top/from right/encoder connector DE	**2**
	DE top/from right/encoder connector NDE	**5**
Type of construction [4]:	IM B3	**0**
	IM V5 (subsequent modification to IM V6 possible)	**1**
	IM B35 (with flange A 660)	**3**
	IM B35 (with flange A 660, subsequent modification to IM V6 possible)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.87	60	0.922	17	4.2 (37.17)	1300 (2866)	**1PH7284 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 – 1TE32 – 0AA0**
0.86	78	0.930	17	5.2 (46.02)	1500 (3307)	**1PH7286 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 – 1TE32 – 0AA0**
0.87	100	0.933	17	6.3 (55.75)	1700 (3748)	**1PH7288 – . . B . . – 0 ■ ■ ■**	260	**6SL3320 – 1TE32 – 6AA0**
0.86	95	0.944	27	4.2 (37.17)	1300 (2866)	**1PH7284 – . . C . . – 0 ■ ■ ■**	260	**6SL3320 – 1TE32 – 6AA0**
0.85	135	0.948	27	5.2 (46.02)	1500 (3307)	**1PH7286 – . . C . . – 0 ■ ■ ■**	310	**6SL3320 – 1TE33 – 1AA0**
0.84	170	0.951	27	6.3 (55.75)	1700 (3748)	**1PH7288 – . . C . . – 0 ■ ■ ■**	380	**6SL3320 – 1TE33 – 8AA0**
0.82	158	0.956	38.6	4.2 (37.17)	1300 (2866)	**1PH7284 – . . D . . – 0 ■ ■ ■**	310 [5]	**6SL3320 – 1TE33 – 1AA0**
0.81	218	0.958	38.6	5.2 (46.02)	1500 (3307)	**1PH7286 – . . D . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.82	252	0.960	38.6	6.3 (55.75)	1700 (3748)	**1PH7288 – . . D . . – 0 ■ ■ ■**	490 [5]	**6SL3320 – 1TE35 – 0AA0**
0.86	163	0.962	58.7	4.2 (37.17)	1300 (2866)	**1PH7284 – . . F . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.87	184	0.963	58.7	5.2 (46.02)	1500 (3307)	**1PH7286 – . . F . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.87	234	0.965	58.7	6.3 (55.75)	1700 (3748)	**1PH7288 – . . F . . – 0 ■ ■ ■**	605	**6SL3320 – 1TE36 – 1AA0**

Output type [4]:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	–		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
500	160	12 (16.1)	230 (169.6)	30	340	2500	2500	2500	**1PH7163 – ■■B■■ – ■...**
		16 (21.4)	306 (225.7)	35	350	2300	2500	2500	**1PH7167 – ■■B■■ – ■...**
1350	100	4.7 (6.3)	33 (24.3)	9.5	433	3500	5500	6750	**1PH7103 – ■■D■■ – ■...**
		8 (10.7)	57 (42)	17	405	5100	5500	6750	**1PH7107 – ■■D■■ – ■...**
	132	15 (20.1)	106 (78.19)	30	433	3500	4500	6750	**1PH7133 – ■■D■■ – ■...**
		22 (29.5)	156 (115.1)	42	416	4600	4500	6750	**1PH7137 – ■■D■■ – ■...**
	160	28 (37.5)	198 (146)	53	413	4100	3700	6500	**1PH7163 – ■■D■■ – ■...**
		34 (45.6)	241 (177.8)	67	400	5700	3700	6500	**1PH7167 – ■■D■■ – ■...**
2000	100	4.7 (6.3)	22 (16.2)	10	459	7400	5500	9000	**1PH7101 – ■■F■■ – ■...**
		7 (9.4)	33 (24.3)	13	459	3400	5500	9000	**1PH7103 – ■■F■■ – ■...**
		9 (12.1)	43 (31.7)	17.5	450	7000	5500	9000	**1PH7105 – ■■F■■ – ■...**
		11 (14.7)	53 (39.1)	23	433	5300	5500	9000	**1PH7107 – ■■F■■ – ■...**

Fans:	External fan unit and PG cable entry in terminal box		**2**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**M**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**D**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**Q**
	2-pole resolver		**P**
Terminal box/ cable entry (view onto DE):	top/from right		**0**
	top/from NDE		**2**
	top/from left		**3**
Type to construction:	IM B3 (IM V5, IM V6)		**0**
	IM B5 (IM V1, IM V3) compatible only with SH 100 and SH 132		**2**
	IM B35 (IM V15, IM V36)		**3**
Holding brake with Emergency Stop function [4]	without brake		**0**
	Brake supply voltage 230 V 1 AC, 50/60 Hz	with brake	**1**
		with brake (brake has microswitch)	**2**
		with brake (brake has manual release function)	**3**
		with brake (brake has manual release function and microswitch)	**4**
	Brake supply voltage 24 V DC	with brake	**5**
		with brake (brake has microswitch)	**6**
		with brake (brake has manual release function)	**7**
		with brake (brake has manual release function and microswitch)	**8**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.86	13	0.841	17.6	0.185 (1.64)	175 (385.9)	**1PH7163 – . . B . . – . ■ ■ ■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.89	13	0.836	17.7	0.228 (2.02)	210 (463.1)	**1PH7167 – . . B . . – . ■ ■ ■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.81	4.5	0.830	47.1	0.017 (0.15)	40 (88.2)	**1PH7103 – . . D . . – . ■ ■ ■**	18	**6SL3120 – ■TE21 – 8AA■**
0.80	8.1	0.853	47.0	0.029 (0.26)	65 (143.3)	**1PH7107 – . . D . . – . ■ ■ ■**	18	**6SL3120 – ■TE21 – 8AA■**
0.84	12	0.887	46.4	0.076 (0.67)	90 (198.5)	**1PH7133 – . . D . . – . ■ ■ ■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.85	17	0.895	46.3	0.109 (0.96)	150 (330.8)	**1PH7137 – . . D . . – . ■ ■ ■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.83	24	0.911	45.8	0.185 (1.64)	175 (385.9)	**1PH7163 – . . D . . – . ■ ■ ■**	60	**6SL3120 – 1 TE26 – 0AA 1**
0.83	34	0.910	45.8	0.228 (2.02)	210 (463.1)	**1PH7167 – . . D . . – . ■ ■ ■**	85	**6SL3120 – 1 TE28 – 5AA 1**
0.72	6.0	0.862	68.2	0.017 (0.15)	40 (88.2)	**1PH7101 – . . F . . – . ■ ■ ■**	18	**6SL3120 – ■TE21 – 8AA■**
0.82	5.6	0.860	69.1	0.017 (0.15)	40 (88.2)	**1PH7103 – . . F . . – . ■ ■ ■**	18	**6SL3120 – ■TE21 – 8AA■**
0.78	9.3	0.878	68.3	0.029 (0.26)	65 (143.3)	**1PH7105 – . . F . . – . ■ ■ ■**	18	**6SL3120 – ■TE21 – 8AA■**
0.79	10.8	0.876	68.6	0.029 (0.26)	65 (143.3)	**1PH7107 – . . F . . – . ■ ■ ■**	30	**6SL3120 – 1 TE23 – 0AA 1**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling/belt	R	R	**B**
Coupling/belt	S	R	**C**
Coupling/belt	SR	R	**D**
Coupling/belt	N	N (with brake mounting)	**K**
Increased maxim. speed [5]	SR	R	**L**
Drive end shaft ext. (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [7]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [7]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [7]	**K**
Seal:	**Color:**		
–	without		**0**
Flange & shaft sealing ring [6]	without		**2**
–	Anthracite (RAL 7016), standard paint finish		**3**
Flange & shaft sealing ring [6]	Anthracite (RAL 7016), standard paint finish		**5**
–	Anthracite (RAL 7016), special paint finish		**6**
Flange & shaft sealing ring [6]	Anthracite (RAL 7016), special paint finish		**8**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**
Motor Module:	Single Motor Module		**1**
	Double Motor Module		**2**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Version with brake is compatible if:
12th data position "2" or "3"
14th data position "K"
15th data position "A", "B", "J" or "K"
16th data position "0", "3" or "6"

5) Max. possible speed (see also selection guides):
SH 100: 12000 rpm, SH 132: 10000 rpm,
SH 160: 8000 rpm, with smooth shaft only (15th data position "J" or "K" and 16th data position "0", "3" or "6").

6) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6) or on version with increased maximum speed.

7) Preferred air-flow direction in polluted environment.

8) The rated output current of the Motor Module is lower than the motor rated current.

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
2000	132	15 (20.1)	72 (53.1)	25	459	5500	4500	8000	**1PH7131 – ■■ F ■■ – ■ . . .**
		20 (26.8)	96 (70.8)	34	459	5800	4500	8000	**1PH7133 – ■■ F ■■ – ■ . . .**
		24 (32.2)	115 (84.8)	42	459	6600	4500	8000	**1PH7135 – ■■ F ■■ – ■ . . .**
		28 (37.5)	134 (98.8)	55	402	4000	4500	8000	**1PH7137 – ■■ F ■■ – ■ . . .**
	160	37 (49.6)	177 (130.6)	70	412	4000	3700	6500	**1PH7163 – ■■ F ■■ – ■ . . .**
		45 (60.3)	215 (158.6)	76	459	3300	3700	6500	**1PH7167 – ■■ F ■■ – ■ . . .**
2650	100	8 (10.7)	29 (21.4)	16.5	440	7400	5500	9000	**1PH7103 – ■■ G ■■ – ■ . . .**
		13 (17.4)	47 (34.7)	24.5	459	7400	5500	9000	**1PH7107 – ■■ G ■■ – ■ . . .**
	132	24 (32.2)	87 (64.2)	42	450	4000	4500	8000	**1PH7133 – ■■ G ■■ – ■ . . .**
		30 (40.2)	108 (79.7)	52	450	4200	4500	8000	**1PH7137 – ■■ G ■■ – ■ . . .**
	160	40 (53.6)	144 (106.2)	76	433	3500	3700	6500	**1PH7163 – ■■ G ■■ – ■ . . .**
		44 (58.9)	159 (117.3)	77	459	3300	3700	6500	**1PH7167 – ■■ G ■■ – ■ . . .**

Fans:	External fan unit and PG cable entry in terminal box		**2**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**M**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track		**D**
	Incremental encoder sin/cos 1 V_{pp} no C or D track		**Q**
	2-pole resolver		**P**
Terminal box/ cable entry (view onto DE):	top/from right		**0**
	top/from NDE		**2**
	top/from left		**3**
Type to construction:	IM B3 (IM V5, IM V6)		**0**
	IM B5 (IM V1, IM V3) compatible only with SH 100 and SH 132		**2**
	IM B35 (IM V15, IM V36)		**3**
Holding brake with Emergency Stop function [4]	without brake		**0**
	Brake supply voltage 230 V 1 AC, 50/60 Hz	with brake	**1**
		with brake (brake has microswitch)	**2**
		with brake (brake has manual release function)	**3**
		with brake (brake has manual release function and microswitch)	**4**
	Brake supply voltage 24 V DC	with brake	**5**
		with brake (brake has microswitch)	**6**
		with brake (brake has manual release function)	**7**
		with brake (brake has manual release function and microswitch)	**8**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.88	8.5	0.903	68.0	0.076 (0.67)	90 (198)	**1PH7131 – . . F . . – . ■■■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.84	15	0.900	68.0	0.076 (0.67)	90 (198)	**1PH7133 – . . F . . – . ■■■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.85	17	0.905	67.8	0.109 (0.96)	150 (331)	**1PH7135 – . . F . . – . ■■■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.85	23	0.900	67.9	0.109 (0.96)	150 (331)	**1PH7137 – . . F . . – . ■■■**	60	**6SL3120 – 1 TE26 – 0AA 1**
0.85	29	0.912	67.5	0.185 (1.64)	175 (386)	**1PH7163 – . . F . . – . ■■■**	85	**6SL3120 – 1 TE28 – 5AA 1**
0.84	32	0.916	67.4	0.228 (2.02)	210 (463)	**1PH7167 – . . F . . – . ■■■**	85	**6SL3120 – 1 TE28 – 5AA 1**
0.78	8.2	0.871	90.3	0.017 (0.15)	40 (88)	**1PH7103 – . . G . . – . ■■■**	18	**6SL3120 – ■TE21 – 8AA■**
0.78	12	0.887	90.2	0.029 (0.26)	65 (143)	**1PH7107 – . . G . . – . ■■■**	30	**6SL3120 – 1 TE23 – 0AA 1**
0.85	17	0.898	89.6	0.076 (0.67)	90 (198)	**1PH7133 – . . G . . – . ■■■**	45	**6SL3120 – 1 TE24 – 5AA 1**
0.84	21	0.894	89.4	0.109 (0.96)	150 (331)	**1PH7137 – . . G . . – . ■■■**	60	**6SL3120 – 1 TE26 – 0AA 1**
0.82	37	0.895	89.0	0.185 (1.64)	175 (386)	**1PH7163 – . . G . . – . ■■■**	85	**6SL3120 – 1 TE28 – 5AA 1**
0.80	40	0.911	89.0	0.228 (2.02)	210 (463)	**1PH7167 – . . G . . – . ■■■**	85	**6SL3120 – 1 TE28 – 5AA 1**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling/belt	R	R	**B**
Coupling/belt	S	R	**C**
Coupling/belt	SR	R	**D**
Coupling/belt	N	N (with brake mounting)	**K**
Increased maxim. speed [5]	SR	R	**L**
Drive end shaft ext. (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [7]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [7]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [7]	**K**
Seal:	**Color:**		
–	without		**0**
Flange & shaft sealing ring [6]	without		**2**
–	Anthracite (RAL 7016), standard paint finish		**3**
Flange & shaft sealing ring [6]	Anthracite (RAL 7016), standard paint finish		**5**
–	Anthracite (RAL 7016), special paint finish		**6**
Flange & shaft sealing ring [6]	Anthracite (RAL 7016), special paint finish		**8**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**
Motor Module:	Single Motor Module		**1**
	Double Motor Module		**2**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Version with brake is compatible if:
12th data position "2" or "3"
14th data position "K"
15th data position "A", "B", "J" or "K"
16th data position "0", "3" or "6"

5) Max. possible speed (see also selection guides):
SH 100: 12000 rpm, SH 132: 10000 rpm,
SH 160: 8000 rpm, with smooth shaft only (15th data position "J" or "K" and 16th data position "0", "3" or "6").

6) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6) or on version with increased maximum speed.

7) Preferred air-flow direction in polluted environment.

8) The rated output current of the Motor Module is lower than the motor rated current.

3

Selection and ordering data

Rated speed	Shaft height SH	Rated power	Rated torque	Rated current	Rated voltage	Field-weakening speed [1]	Max. permissible continuous speed [2]	Max. speed [3]	1PH7 asynchronous motor
n_{rated}		P_{rated}	M_{rated}	I_{rated}	V_{rated}	n_2	n_{S1}	n_{max}	
rpm		kW (HP)	Nm (lb_f-ft)	A	V	rpm	rpm	rpm	Order No.
Supply voltage 480 V 3 AC									
500	180	20.5 (27.5)	392 (289.1)	51	335	2500	2500	2500	**1PH7184 – ■■B■■–■...**
		26.5 (35.5)	506 (373.2)	67	335	2500	2500	2500	**1PH7186 – ■■B■■–■...**
	225	38 (50.9)	725 (534.8)	86	335	2200	2500	2500	**1PH7224 – ■■B■■–■...**
		49 (65.7)	935 (689.7)	112	330	2500	2500	2500	**1PH7226 – ■■B■■–■...**
		60 (80.4)	1145 (844.6)	135	340	2500	2500	2500	**1PH7228 – ■■B■■–■...**
1350	180	50 (67.0)	355 (261.8)	86	450	5000	3500 [4]	5000	**1PH7184 – ■■D■■–■...**
		67 (89.8)	475 (350.4)	114	460	5000	3500 [4]	5000	**1PH7186 – ■■D■■–■...**
	225	92 (123.3)	650 (479.4)	156	450	2900	3100 [4]	4500	**1PH7224 – ■■D■■–■...**
		120 (160.9)	847 (624.7)	193	460	2900	3100 [4]	4500	**1PH7226 – ■■D■■–■...**
		147 (197.1)	1043 (769.3)	232	460	2900	3100 [4]	4500 [4]	**1PH7228 – ■■D■■–■...**

Fans:	External fan unit and PG cable entry in terminal box		2
	Without external fan unit, for pipe connection, PG cable entry in terminal box		6
	External fan unit and metric cable entry in terminal box		7
	Without external fan unit, for pipe connection, metric cable entry in terminal box		8
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		A
	Absolute encoder EnDat 2048 pulses/revolution		E
	Incremental encoder HTL 1024 pulses/revolution		H
	Incremental encoder HTL 2048 pulses/revolution		J
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]		M
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]		N
	2-pole resolver		R
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		F
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]		D
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]		Q
	2-pole resolver		P
Terminal box/cable entry (view onto DE):	top/from right		0
	top/from DE		1
	top/from NDE		2
	top/from left		3
Type of construction:	IM B3		0
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	1
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)		3
	IM B35 (only for 1PH7184 with flange A 450)		4
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	5
	IM B35 (only for1PH7184 with flange A 450)	Hoisting system for different construction types (IM V15, IM V36)	6
Holding brake with Emergency Stop function (suitable for coupling output in construction type IM B3) [5]:	without brake		0
	with brake (brake has emergency release screws and microswitch)		2
	with brake (brake has manual release function and microswitch)		4

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
cos φ	I_μ A	η_{rated}	f_{rated} Hz	J kgm² (lb_f-in-s²)	kg (lb)	Order No.	I_{rated} A	Order No.
Supply voltage 480 V 3 AC								
0.83	26	0.858	17.5	0.503 (4.45)	370 (816)	**1PH7184 – . . B . . – . ■■■**	60	**6SL3120 – 1TE26 – 0AA1**
0.79	39.5	0.870	17.3	0.666 (5.89)	440 (970)	**1PH7186 – . . B . . – . ■■■**	85	**6SL3120 – 1TE28 – 5AA1**
0.85	37.5	0.888	17.3	1.479 (13.09)	630 (1389)	**1PH7224 – . . B . . – . ■■■**	85 [9]	**6SL3120 – 1TE28 – 5AA1**
0.85	50	0.900	17.3	1.930 (17.08)	750 (1654)	**1PH7226 – . . B . . – . ■■■**	132	**6SL3120 – 1TE31 – 3AA0**
0.84	61.5	0.907	17.2	2.326 (20.58)	860 (1896)	**1PH7228 – . . B . . – . ■■■**	132 [9]	**6SL3120 – 1TE31 – 3AA0**
0.81	42	0.928	45.8	0.503 (4.45)	370 (816)	**1PH7184 – . . D . . – . ■■■**	85 [9]	**6SL3120 – 1TE28 – 5AA1**
0.79	59.5	0.930	45.7	0.666 (5.89)	440 (970)	**1PH7186 – . . D . . – . ■■■**	132	**6SL3120 – 1TE31 – 3AA0**
0.80	78.5	0.942	45.6	1.479 (13.09)	630 (1389)	**1PH7224 – . . D . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.82	88.5	0.945	45.6	1.930 (17.08)	750 (1654)	**1PH7226 – . . D . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.84	99.5	0.947	45.6	2.326 (20.58)	860 (1896)	**1PH7228 – . . D . . – . ■■■**	260	**6SL3320 – 1TE32 – 6AA0**

Out-drive type:	**Vibrat. severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**
Increased maxim. speed [6]	S	R	**J**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [8]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [8]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [8]	**K**

Seal:	**Color:**	
–	primed	**0**
Flange & shaft sealing ring [7]	primed	**2**
–	Anthracite (RAL 7016), standard paint finish	**3**
Flange & shaft sealing ring [7]	Anthracite (RAL 7016), standard paint finish	**5**
–	Anthracite (RAL 7016), special paint finish	**6**
Flange & shaft sealing ring [7]	Anthracite (RAL 7016), special paint finish	**8**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Version with brake is compatible if:
12th data position "0"
14th data position "A"
15th data position "A" or "B"
16th data position "0", "3" or "6"

6) For SH 180 n_{max} = 7000 rpm, 1PH7224 n_{max} = 5500 rpm, only coupling output possible and 16th data position "0", "3" or "6"

7) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6), on version with increased maximum speed, on version for belt output or increased cantilever forces.

8) Preferred air-flow direction in polluted environment.

9) The rated output current of the Motor Module is lower than the motor rated current.

10) Only in conjunction with option **M84** (insulated version of encoder).

3

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
2000	180	68 (91.1)	325 (239.7)	120	450	5000	3500 [4]	5000	**1PH7184 – ■ ■ F ■ ■ – ■ . . .**
		94 (126.0)	450 (331.9)	165	445	5000	3500 [4]	5000	**1PH7186 – ■ ■ F ■ ■ – ■ . . .**
	225	124 (166.2)	590 (435.2)	200	460	2900	3100 [4]	4500	**1PH7224 – ■ ■ U ■ ■ – ■ . . .**
		153 (205.1)	730 (538.5)	254	450	2900	3100 [4]	4500	**1PH7226 – ■ ■ F ■ ■ – ■ . . .**
		196 (262.7)	936 (690.4)	332	450	3000	3100 [4]	4500 [4]	**1PH7228 – ■ ■ F ■ ■ – ■ . . .**
2900	180	81 (108.6)	267 (196.9)	158	395	5000	3500 [4]	5000	**1PH7184 – ■ ■ L ■ ■ – ■ . . .**
		101 (135.4)	333 (245.6)	206	385	5000	3500 [4]	5000	**1PH7186 – ■ ■ L ■ ■ – ■ . . .**
	225	149 (199.7)	490 (361.4)	274	395	3500	3100 [4]	4500	**1PH7224 – ■ ■ L ■ ■ – ■ . . .**
		185 (247.9)	610 (449.9)	348	390	3500	3100 [4]	4500	**1PH7226 – ■ ■ L ■ ■ – ■ . . .**
		215 (288.2)	708 (522.2)	402	395	3500	3100 [4]	4500 [4]	**1PH7228 – ■ ■ L ■ ■ – ■ . . .**

Option	Description	Remark	Code
Fans:	External fan unit and PG cable entry in terminal box		2
	Without external fan unit, for pipe connection, PG cable entry in terminal box		6
	External fan unit and metric cable entry in terminal box		7
	Without external fan unit, for pipe connection, metric cable entry in terminal box		8
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		A
	Absolute encoder EnDat 2048 pulses/revolution		E
	Incremental encoder HTL 1024 pulses/revolution		H
	Incremental encoder HTL 2048 pulses/revolution		J
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]		M
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]		N
	2-pole resolver		R
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		F
	Incremental encoder sin/cos 1 V_{pp} with C and D track [10]		D
	Incremental encoder sin/cos 1 V_{pp} without C and D track [10]		Q
	2-pole resolver		P
Terminal box/cable entry (view onto DE):	top/from right		0
	top/from DE		1
	top/from NDE		2
	top/from left		3
Type of construction:	IM B3		0
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	1
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)		3
	IM B35 (only for 1PH7184 with flange A 450)		4
	IM B35 (only for 1PH7184 with flange A 400, 1PH7186 with flange A 450, 1PH722. with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	5
	IM B35 (only for1PH7184 with flange A 450)	Hoisting system for different construction types (IM V15, IM V36)	6
Holding brake with Emergency Stop function (suitable for coupling output in construction type IM B3) [5]:	without brake		0
	with brake (brake has emergency release screws and microswitch)		2
	with brake (brake has manual release function and microswitch)		4

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.78	66	0.935	67.3	0.503 (4.45)	370 (816)	**1PH7184 – . . F . . – . ■■■**	132	**6SL3120 – 1TE31 – 3AA0**
0.78	87	0.941	67.3	0.666 (5.89)	440 (970)	**1PH7186 – . . F . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.82	91	0.944	67.2	1.479 (13.09)	630 (1389)	**1PH7224 – . . U . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.82	119	0.948	67.2	1.930 (17.08)	750 (1654)	**1PH7226 – . . F . . – . ■■■**	260	**6SL3320 – 1TE32 – 6AA0**
0.79	168	0.950	67.1	2.326 (20.58)	860 (1896)	**1PH7228 – . . F . . – . ■■■**	380	**6SL3320 – 1TE33 – 8AA0**
0.80	77	0.934	97.4	0.503 (4.45)	370 (816)	**1PH7184 – . . L . . – . ■■■**	200	**6SL3120 – 1TE32 – 0AA0**
0.78	107	0.936	97.3	0.666 (5.89)	440 (970)	**1PH7186 – . . L . . – . ■■■**	210	**6SL3320 – 1TE32 – 1AA0**
0.84	115	0.946	97.3	1.479 (13.09)	630 (1389)	**1PH7224 – . . L . . – . ■■■**	310	**6SL3320 – 1TE33 – 1AA0**
0.83	154	0.946	97.2	1.930 (17.08)	750 (1654)	**1PH7226 – . . L . . – . ■■■**	380	**6SL3320 – 1TE33 – 8AA0**
0.82	188	0.954	97.2	2.326 (20.58)	860 (1896)	**1PH7228 – . . L . . – . ■■■**	490	**6SL3320 – 1TE35 – 0AA0**

Out-drive type:	**Vibrat. severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**
Increased maxim. speed [6]	S	R	**J**

Drive end shaft extension (DE):	**Balancing:**	**Luftrichtung (Lüfter):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [8]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [8]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [8]	**K**

Seal:	**Color:**	
–	primed	**0**
Flange & shaft sealing ring [7]	primed	**2**
–	Anthracite (RAL 7016), standard paint finish	**3**
Flange & shaft sealing ring [7]	Anthracite (RAL 7016), standard paint finish	**5**
–	Anthracite (RAL 7016), special paint finish	**6**
Flange & shaft sealing ring [7]	Anthracite (RAL 7016), special paint finish	**8**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Version with brake is compatible if:
12th data position "0"
14th data position "A"
15th data position "A" or "B"
16th data position "0", "3" or "6"

6) For SH 180 n_{max} = 7000 rpm, 1PH7224 n_{max} = 5500 rpm, only coupling output possible and 16th data position "0", "3" or "6"

7) Purposeful only if oil spray or mist occasionally greases the sealing ring. A sealing ring cannot be mounted on type of construction IM B3 (IM V5, IM V6), on version with increased maximum speed, on version for belt output or increased cantilever forces.

8) Preferred air-flow direction in polluted environment.

9) The rated output current of the Motor Module is lower than the motor rated current.

10) Only in conjunction with option **M84** (insulated version of encoder).

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
600	280	95 (127.3)	1519 (1120.4)	144	480	2200	2200	3000	**1PH7284 – ■■ B ■■ – 0 . . .**
		120 (160.9)	1916 (1413.2)	180	480	2200	2200	3000	**1PH7286 – ■■ B ■■ – 0 . . .**
		155 (207.8)	2467 (1819.7)	233	480	2200	2200	3000	**1PH7288 – ■■ B ■■ – 0 . . .**
1000	280	150 (201.1)	1433 (1057)	220	480	2200	2200	3300	**1PH7284 – ■■ C ■■ – 0 . . .**
		185 (247.9)	1767 (1303.3)	285	480	2200	2200	3300	**1PH7286 – ■■ C ■■ – 0 . . .**
		230 (308.3)	2197 (1620.5)	365	460	2200	2200	3300	**1PH7288 – ■■ C ■■ – 0 . . .**
1350	280	200 (268.1)	1416 (1044.4)	314	470	2200	2200	3300	**1PH7284 – ■■ D ■■ – 0 . . .**
		245 (328.4)	1733 (1278.3)	414	445	2200	2200	3300	**1PH7286 – ■■ D ■■ – 0 . . .**
		305 (408.8)	2158 (1591.7)	497	450	2200	2200	3300	**1PH7288 – ■■ D ■■ – 0 . . .**
2000	280	255 (341.8)	1218 (898.4)	393	455	2200	2200	3300	**1PH7284 – ■■ F ■■ – 0 . . .**
		310 (415.5)	1481 (1092.4)	466	455	2200	2200	3300	**1PH7286 – ■■ F ■■ – 0 . . .**
		385 (516.1)	1838 (1355.7)	586	455	2200	2200	3300	**1PH7288 – ■■ F ■■ – 0 . . .**

Fans [4]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**
	External fan unit, NDE right, air-flow direction NDE to DE	**1**
	External fan unit, NDE left, air-flow direction NDE to DE	**2**
	External fan unit, DE top, air-flow direction DE to NDE	**3**
	External fan unit, DE right, air-flow direction DE to NDE	**4**
	External fan unit, DE left, air-flow direction DE to NDE	**5**
	Without external fan unit, for single pipe connection at NDE right	**6**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder	**A**
	Absolute encoder EnDat 2048 pulses/revolution	**E**
	Incremental encoder HTL 1024 pulses/revolution	**H**
	Incremental encoder HTL 2048 pulses/revolution	**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**N**
	Resolver on request	
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution	**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**Q**
	Resolver on request	
Terminal box/cable entry (view onto DE) [4]:	NDE right/from below/encoder connector DE	**0**
	NDE left/from below/encoder connector DE	**1**
	NDE top/from right/encoder connector DE	**2**
	DE top/from right/encoder connector NDE	**5**
Type of construction [4]:	IM B3	**0**
	IM V5 (subsequent modification to IM V6 possible)	**1**
	IM B35 (with flange A 660)	**3**
	IM B35 (with flange A 660, subsequent modification to IM V6 possible)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm^2 (lb$_f$-in-s^2)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.86	61	0.932	20.3	4.2 (37.17)	1300 (2866)	**1PH7284 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 –1TE32 – 0AA0**
0.86	80	0.939	20.3	5.2 (46.02)	1500 (3307)	**1PH7286 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 –1TE32 – 0AA0**
0.86	102	0.941	20.3	6.3 (55.75)	1700 (3748)	**1PH7288 – . . B . . – 0 ■ ■ ■**	260	**6SL3320 –1TE32 – 6AA0**
0.86	90	0.950	34	4.2 (37.17)	1300 (2866)	**1PH7284 – . . C . . – 0 ■ ■ ■**	260	**6SL3320 –1TE32 – 6AA0**
0.84	135	0.954	34	5.2 (46.02)	1500 (3307)	**1PH7286 – . . C . . – 0 ■ ■ ■**	310	**6SL3320 –1TE33 – 1AA0**
0.84	170	0.956	34	6.3 (55.75)	1700 (3748)	**1PH7288 – . . C . . – 0 ■ ■ ■**	380	**6SL3320 –1TE33 – 8AA0**
0.82	159	0.958	45.3	4.2 (37.17)	1300 (2866)	**1PH7284 – . . D . . – 0 ■ ■ ■**	310 [5]	**6SL3320 –1TE33 – 1AA0**
0.80	217	0.960	45.3	5.2 (46.02)	1500 (3307)	**1PH7286 – . . D . . – 0 ■ ■ ■**	490	**6SL3320 –1TE35 – 0AA0**
0.82	250	0.962	45.3	6.3 (55.75)	1700 (3748)	**1PH7288 – . . D . . – 0 ■ ■ ■**	490 [5]	**6SL3320 –1TE35 – 0AA0**
0.86	162	0.962	67	4.2 (37.17)	1300 (2866)	**1PH7284 – . . F . . – 0 ■ ■ ■**	490	**6SL3320 –1TE35 – 0AA0**
0.87	182	0.964	67	5.2 (46.02)	1500 (3307)	**1PH7286 – . . F . . – 0 ■ ■ ■**	490	**6SL3320 –1TE35 – 0AA0**
0.87	232	0.965	67	6.3 (55.75)	1700 (3748)	**1PH7288 – . . F . . – 0 ■ ■ ■**	605	**6SL3320 –1TE36 – 1AA0**

Output type [4]:	**Vibration sev. grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	–		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

1PH7 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PH7 asynchronous motor Order No.
Supply voltage 690 V 3 AC									
500	280	77 (103.2)	1471 (1085)	80	690	1700	2200	2500	**1PH7284 – ■■B■■ – 0 . . .**
		96 (128.7)	1834 (1352.8)	101	690	1800	2200	2500	**1PH7286 – ■■B■■ – 0 . . .**
		125 (167.6)	2388 (1761.4)	130	690	1900	2200	2500	**1PH7288 – ■■B■■ – 0 . . .**
800	280	115 (154.2)	1373 (1012.7)	120	690	2200	2200	3300	**1PH7284 – ■■C■■ – 0 . . .**
		145 (184.4)	1731 (1276.8)	160	665	2200	2200	3300	**1PH7286 – ■■C■■ – 0 . . .**
		185 (247.9)	2208 (1628.6)	210	640	2200	2200	3300	**1PH7288 – ■■C■■ – 0 . . .**
1150	280	164 (219.8)	1362 (1004.6)	176	690	2200	2200	3300	**1PH7284 – ■■D■■ – 0 . . .**
		203 (272.1)	1686 (1243.6)	233	655	2200	2200	3300	**1PH7286 – ■■D■■ – 0 . . .**
		251 (336.5)	2084 (1537.2)	280	665	2200	2200	3300	**1PH7288 – ■■D■■ – 0 . . .**
1750	280	217 (290.9)	1184 (873.3)	221	690	2200	2200	3300	**1PH7284 – ■■F■■ – 0 . . .**
		261 (349.9)	1424 (1050.3)	262	690	2200	2200	3300	**1PH7286 – ■■F■■ – 0 . . .**
		329 (441.0)	1795 (1323.9)	330	690	2200	2200	3300	**1PH7288 – ■■F■■ – 0 . . .**

Fans [4]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**
	External fan unit, NDE right, air-flow direction NDE to DE	**1**
	External fan unit, NDE left, air-flow direction NDE to DE	**2**
	External fan unit, DE top, air-flow direction DE to NDE	**3**
	External fan unit, DE right, air-flow direction DE to NDE	**4**
	External fan unit, DE left, air-flow direction DE to NDE	**5**
	Without external fan unit, for single pipe connection at NDE right	**6**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder	**A**
	Absolute encoder EnDat 2048 pulses/revolution	**E**
	Incremental encoder HTL 1024 pulses/revolution	**H**
	Incremental encoder HTL 2048 pulses/revolution	**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**N**
	Resolver on request	
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution	**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**Q**
	Resolver on request	
Terminal box/cable entry (view onto DE) [4]:	NDE right/from below/encoder connector DE	**0**
	NDE left/from below/encoder connector DE	**1**
	NDE top/from right/encoder connector DE	**2**
	DE top/from right/encoder connector NDE	**5**
Type of construction [4]:	IM B3	**0**
	IM V5 (subsequent modification to IM V6 possible)	**1**
	IM B35 (with flange A 660)	**3**
	IM B35 (with flange A 660, subsequent modification to IM V6 possible)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PH7 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 690 V 3 AC								
0.87	34	0.923	17	4.2 (37.17)	1300 (2866)	**1PH7284 – . . B . . – 0 ■ ■ ■**	85	**6SL3320 – 1TH28 – 5AA0**
0.86	45	0.927	17	5.2 (46.02)	1500 (3307)	**1PH7286 – . . B . . – 0 ■ ■ ■**	100 [5]	**6SL3320 – 1TH31 – 0AA0**
0.86	57	0.930	17	6.3 (55.75)	1700 (3748)	**1PH7288 – . . B . . – 0 ■ ■ ■**	150	**6SL3320 – 1TH31 – 5AA0**
0.85	55	0.943	27	4.2 (37.17)	1300 (2866)	**1PH7284 – . . C . . – 0 ■ ■ ■**	120	**6SL3320 – 1TH31 – 2AA0**
0.84	80	0.947	27	5.2 (46.02)	1500 (3307)	**1PH7286 – . . C . . – 0 ■ ■ ■**	175	**6SL3320 – 1TH31 – 8AA0**
0.84	100	0.950	27	6.3 (55.75)	1700 (3748)	**1PH7288 – . . C . . – 0 ■ ■ ■**	215	**6SL3320 – 1TH32 – 2AA0**
0.81	91	0.955	38.6	4.2 (37.17)	1300 (2866)	**1PH7284 – . . D . . – 0 ■ ■ ■**	175 [5]	**6SL3320 – 1TH31 – 8AA0**
0.80	125	0.957	38.6	5.2 (46.02)	1500 (3307)	**1PH7286 – . . D . . – 0 ■ ■ ■**	260	**6SL3320 – 1TH32 – 6AA0**
0.81	145	0.959	38.6	6.3 (55.75)	1700 (3748)	**1PH7288 – . . D . . – 0 ■ ■ ■**	330	**6SL3320 – 1TH33 – 3AA0**
0.86	94	0.961	58.7	4.2 (37.17)	1300 (2866)	**1PH7284 – . . F . . – 0 ■ ■ ■**	260	**6SL3320 – 1TH32 – 6AA0**
0.87	105	0.963	58.7	5.2 (46.02)	1500 (3307)	**1PH7286 – . . F . . – 0 ■ ■ ■**	260 [5]	**6SL3320 – 1TH32 – 6AA0**
0.86	134	0.964	58.7	6.3 (55.75)	1700 (3748)	**1PH7288 – . . F . . – 0 ■ ■ ■**	330	**6SL3320 – 1TH33 – 3AA0**

Output type [4]:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	–		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

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1PH7 motors, shaft height 280

Selection and ordering data

Permissible combinations of mechanical models

1PH7 28 . motors shaft height 280

Position in Order No. 8. 9. 10. 11. 12. 13. 14. 15. 16.
1PH7 28 . – ■ . . ■ ■ – . ■ . .

Permissible combinations of mechanical models

Separately driven fan
8th Position in Order No.
1PH7 28 . – ■ . . . . – . . . .

Order No. Supplement

0	1	2	3	4	5	6
NDE **Top** NDE --> DE	NDE **Right** NDE --> DE	NDE **Left** NDE --> DE	DE **Top** DE --> NDE	DE **Right** DE --> NDE	DE **Left** DE --> NDE	**Simple pipe connection NDE Right** (can be converted to NDE left)
1PH7 28 . – . . . . 0 – . . . . Type of construction IM B3						
1PH7 28 . – . . . . 1 – . . . . Type of construction IM V5 (Can be converted later to IM V6)						
1PH7 28 . – . . . . 3 – . . . . Type of construction IM B35						
1PH7 28 . – . . . . 5 – . . . . Type of construction IM V15 (Can be converted later to IM V36)						

Option codes							
R1Y Standard finish RAL ...							
R2Y Special finish RAL ...							
G14 With air filter							
K08 Encoder connector attachment, facing							
K55 Customer-specific entry plate for terminal box[1)]							
K83 Terminal box rotation by +90 degrees							
K84 Terminal box rotation by -90 degrees							
K85 Terminal box rotation by 180 degrees							
K16 Additional normal shaft end (only available with no encoder)							
K31 Additional rating plate							
K45 230 V standstill heating							
C30 690 V model							
Y55 Atypical shaft end DE							
Y80 Different rating plate data[1)]							
Y82 Additional plate with customer information[1)]							
M83 Additional pulling thread on motor feet							

Standard model

Approved supplemental types

1) Plain text required

	Terminal box 11th position in Order No. **1PH7 28 . – . . . ■ . – . . . .**				**Construction type** 12th position in Order No. **1PH7 28 . – . . . . ■ – . . . .**				**Drive type** 14th position in Order No. **1PH7 28 . – . . . . . – . ■ . .**			
	Order No. supplement				**Order No. supplement**				**Order No. supplement**			
	0	**1**	**2**	**5**	**0**	**1**	**3**	**5**	**A**	**B**	**E**	**F**
	NDE **Right** Cable entry below, DE enc. conn.	NDE **Left** Cable entry below, DE enc. conn.	NDE **Top** Cable entry on right, DE enc. conn.	DE **Top** Cable entry on right, NDE enc. conn.	Construc-tion type **IM B3**	Construc-tion type **IM V5** (IM V6)	Construc-tion type **IM B35**	Construc-tion type **IM V15** (IM V36)	**Coupling N/N**	**Coupling R/R**	**Belt/ increased cantile-ver forces N/N**	**Belt/ increased cantile-ver forces R/R**

1PL6 motors

Overview

1PL6 AC motors, shaft heights 180 to 225

1PL6 AC motors, shaft height 280

The 1PL6 AC motors are compact, forced-ventilated and also enclosed-ventilated squirrel-cage asynchronous (induction) motors with degree of protection IP23. The motors are ventilated, as standard, using a built-on separately-driven fan unit.

The motor can be ordered either with the air flow from the motor drive shaft end (DE) to the motor non-drive shaft end (NDE) - or vice versa.

Depending on the control requirements, the appropriate encoder systems are available for the motors. These encoders are used to sense the motor speed and indirect position.

The motors comply with DIN standards and have degree of protection IP23 in accordance with EN 60034-5 (or IEC 60034-5). With this degree of protection, the motors are not suitable for operation in aggressive atmospheres or for installation outdoors.

Benefits

- Extremely high power density with compact dimensions (50 to 60% higher output as compared to 1PH7 in degree of protection IP55)
- Speed down to zero without reducing the torque
- Robustness
- Essentially maintenance-free
- High cantilever force loading
- High smooth running characteristics, even at the lowest speeds
- Integrated encoder system to sense the motor speed, connected using a connector or DRIVE-CLiQ
- Terminal box to connect up power cables
- The motor temperature is monitored using a KTY 84
- Variable cooling versions
- Basic external cooling using a pipe connection
- Optional bearing designs with re-lubrication device and insulated bearings (NDE)

Application

Mounted in dry inside areas (no aggressive atmosphere).

Crane systems:

- Hoisting gears and closing gears for cranes

Printing industry:

- Main drives for printing machines

Manufacture of rubber, plastic and wire:

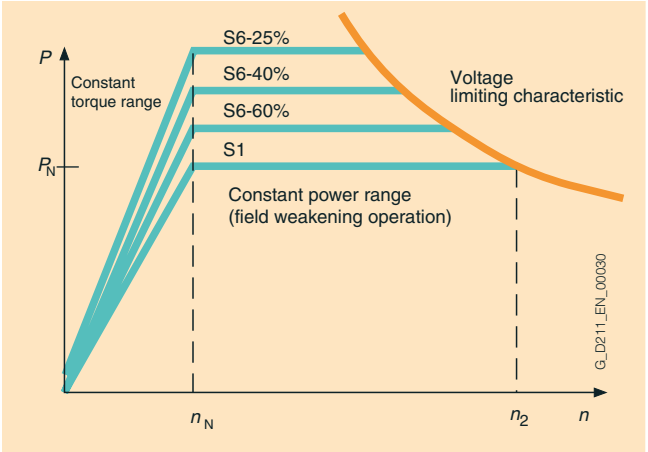
- Drives for extruders, calenders, rubber injection machines, foil machines, fleece plants
- Wire-drawing machines, wire-stranding machines, etc.

General applications such as coiler and winder drives.

Technical data

Insulation of the stator winding in accordance with EN 60034-1 (IEC 60034-1)	Temperature class F for a coolant inlet temperature of up to +40 °C (+104 °F)
Fan supply voltage (see selection guides for technical data)	400 V 3 AC/50 Hz/60 Hz 480 V 3 AC/60 Hz
Type in accordance with EN 60034-7 (IEC 60034-7)	IM B3
Degree of protection in accordance with EN 60034-5 (IEC 60034-5)	IP23
Cooling in accordance with EN 60034-6 (IEC 60034-6)	Forced ventilation and open-circuit ventilation SH 180 and 225: Fan axial mounted NDE SH 280: Fan radial mounted NDE
Temperature monitoring	KTY 84 temperature sensor in stator winding SH 280: Additional KTY 84 as reserve
Paint finish	with primer, standard paint finish, anthracite RAL 7016
Shaft end on the drive end in accordance with 748-3 (IEC 60072-1)	with key, half-key balancing
Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1)	Tolerance N (normal)
Vibration severity level in accordance with EN 60034-14 (IEC 60034-14)	SH 180 and 225: Grade R (reduced) SH 280: Grade N (normal)
Sound pressure level in accordance with DIN EN ISO 1680 tolerance +3 dB	Sound pressure level as a function of air-flow direction see selection guides
Bearing versions and maximum speeds	see selection guides
Encoder system, built-in, for motors with/without DRIVE-CLiQ interface	– Incremental encoder HTL 1024 pulses/revolution – Incremental encoder sin/cos 1 V_{pp}, 2048 pulses/revolution – Absolute encoder EnDat 2048 pulses/revolution – 2-pole resolver
Connection	Signal connectors (mating connector is not included in the scope of supply) Terminal box for power SH 180 and 225: Terminal box top SH 280: Terminal box NDE right
Options	See selection and ordering data and Chapter "Options"

Characteristic curves



Power/speed characteristic

Options

Order code	Option description	For use with 1PL6 asynchronous motors with shaft height: SH 180 SH 225	SH 280
R1Y	Normal paint finish in another color, RAL ... (plain text description required)	■	■
R2Y	Special paint finish in another color, RAL ... (plain text description required)	■	■
C30	Winding version 690 V	–	■
G14	Fan unit with air filter	●	■
G80	POG10 pulse encoder, mounting prepared	–	■
K08	Encoder connector mounted opposite	–	■
K16	Second standard shaft end (possible only without encoder)	–	■
K31	2nd rating plate supplied separately in terminal box	■	■
K40	Re-lubrication devices, DE and NDE	■	Standard
K45	230 V anti-condensation heating	–	■
K55	Cable entry plate, terminal box customer-specific (plain text is required)	■	■
K83	Terminal box rotated through +90 degrees	–	■
K84	Terminal box rotated through -90 degrees	–	■
K85	Terminal box rotated through 180 degrees	–	■
L27	NDE bearing, insulated version	■	Standard
M83	Additional thread for a setting screw at the motor feet	–	■
Y55	Non-standard shaft end DE	●	●
Y80	Different rating plate data (plain text is required)	●	●
Y82	Supplementary plate with the orderer's data	●	●

■ Option possible
● On request
– not available

3

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order No.
Supply voltage 400 V 3 AC									
400	180	24,5 (32.8)	585 (431.5)	69	300	1700	2000	2000	**1PL6184 – ■■B■■ – 0 . . .**
		31,5 (42.2)	752 (554.7)	90	290	1900	2000	2000	**1PL6186 – ■■B■■ – 0 . . .**
	225	45 (60.3)	1074 (792.2)	117	300	1600	2000	2000	**1PL6224 – ■■B■■ – 0 . . .**
		57 (76.4)	1361 (1003.9)	145	305	1800	2000	2000	**1PL6226 – ■■B■■ – 0 . . .**
		72 (96.5)	1719 (1267.9)	181	305	1800	2000	2000	**1PL6228 – ■■B■■ – 0 . . .**
1150	180	65 (87.1)	540 (398.3)	121	400	2500	3500 [4]	5000	**1PL6184 – ■■D■■ – 0 . . .**
		85 (113.9)	706 (520.7)	158	400	2700	3500 [4]	5000	**1PL6186 – ■■D■■ – 0 . . .**
	225	120 (160.9)	997 (735.4)	218	400	2800	3100 [4]	4500	**1PL6224 – ■■D■■ – 0 . . .**
		155 (207.8)	1287 (949.3)	275	400	2600	3100 [4]	4500	**1PL6226 – ■■D■■ – 0 . . .**
		190 (254.7)	1578 (1161.7)	334	400	2500	3100 [4]	4500 [4]	**1PL6228 – ■■D■■ – 0 . . .**

Fans:	External fan unit and PG cable entry in terminal box		**4**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from DE		**1**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3		**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	**1**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)		**3**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
$\cos\varphi$	A		Hz	kgm^2 (lb$_f$-in-s^2)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.86	33	0.800	14.4	0.503 (0.45)	370 (816)	**1PL6184 – . . B . . – 0 ■ ■ ■**	85	**6SL3120–1TE28–5AA1**
0.85	47	0.814	14.3	0.666 (5.89)	440 (970)	**1PL6186 – . . B . . – 0 ■ ■ ■**	85 [6]	**6SL3120–1TE28–5AA1**
0.87	45	0.844	14.2	1.479 (13.09)	630 (1389)	**1PL6224 – . . B . . – 0 ■ ■ ■**	132	**6SL3120–1TE31–3AA0**
0.85	67	0.868	14.0	1.930 (17.08)	750 (1654)	**1PL6226 – . . B . . – 0 ■ ■ ■**	200	**6SL3120–1TE32–0AA0**
0.86	77	0.871	14.0	2.326 20.58)	860 (1896)	**1PL6228 – . . B . . – 0 ■ ■ ■**	200	**6SL3120–1TE32–0AA0**
0.86	46	0.906	39.4	0.503 (4.45)	370 (815)	**1PL6184 – . . D . . – 0 ■ ■ ■**	132	**6SL3120–1TE31–3AA0**
0.86	62	0.910	39.4	0.666 (5.89)	440 (970)	**1PL6186 – . . D . . – 0 ■ ■ ■**	200	**6SL3120–1TE32–0AA0**
0.85	86	0.930	39.1	1.479 (13.09)	630 (1389)	**1PL6224 – . . D . . – 0 ■ ■ ■**	260	**6SL3320–1TE32–6AA0**
0.87	92	0.930	39.2	1.930 (17.08)	750 (1654)	**1PL6226 – . . D . . – 0 ■ ■ ■**	310	**6SL3320–1TE33–1AA0**
0.88	102	0.931	39.2	2.326 (20.58)	860 (1896)	**1PL6228 – . . D . . – 0 ■ ■ ■**	380	**6SL3320–1TE33–8AA0**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [5]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [5]	**D**
Plain shaft	—	DE → NDE	**J**
Plain shaft	—	NDE → DE [5]	**K**

Color:	
primed	**0**
Anthracite (RAL 7016), standard paint finish	**3**
Anthracite (RAL 7016), special paint finish	**6**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Preferred air-flow direction in polluted environment.

6) The rated output current of the Motor Module is lower than the motor rated current.

7) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order No.
Supply voltage 400 V 3 AC									
1750	180	89 (119.3)	486 (358.5)	166	400	4500	3500 [4]	5000	**1PL6184 – ■■ F ■■ – 0 . . .**
		125 (167.6)	682 (503)	231	400	4500	3500 [4]	5000	**1PL6186 – ■■ F ■■ – 0 . . .**
	225	165 (221.2)	900 (663.8)	292	400	2900	3100 [4]	4500	**1PL6224 – ■■ F ■■ – 0 . . .**
		200 (268.1)	1091 (804.7)	350	400	2900	3100 [4]	4500	**1PL6226 – ■■ F ■■ – 0 . . .**
		265 (355.2)	1446 (1066.6)	470	400	2900	3100 [4]	4500 [4]	**1PL6228 – ■■ F ■■ – 0 . . .**
2900	180	113 (151.5)	372 (274.4)	209	400	5000	3500 [4]	5000	**1PL6184 – ■■ L ■■ – 0 . . .**
		150 (201.1)	494 (364.4)	280	390	5000	3500 [4]	5000	**1PL6186 – ■■ L ■■ – 0 . . .**
	225	205 (274.8)	675 (479.9)	365	400	3500	3100 [4]	4500	**1PL6224 – ■■ L ■■ – 0 . . .**
		270 (361.9)	889 (655.7)	470	400	3500	3100 [4]	4500	**1PL6226 – ■■ L ■■ – 0 . . .**
		300 (402.1)	988 (728.7)	530	400	3500	3100 [4]	4500 [4]	**1PL6228 – ■■ L ■■ – 0 . . .**

Fans:	External fan unit and PG cable entry in terminal box		**4**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from DE		**1**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3		**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	**1**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)		**3**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-in-s²)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.84	68	0.921	59.3	0.503 (4.45)	370 (816)	**1PL6184 – . . F . . – 0 ■ ■ ■**	200	**6SL3120–1TE32–0AA0**
0.84	92	0.935	59.3	0.666 (5.89)	440 (970)	**1PL6186 – . . F . . – 0 ■ ■ ■**	260	**6SL3320–1TE32–6AA0**
0.87	90	0.942	59.2	1.479 (13.09)	630 (1389)	**1PL6224 – . . F . . – 0 ■ ■ ■**	310	**6SL3320–1TE33–1AA0**
0.87	122	0.942	59.1	1.930 (17.08)	750 (1654)	**1PL6226 – . . F . . – 0 ■ ■ ■**	380	**6SL3320–1TE33–8AA0**
0.86	174	0.948	59.0	2.326 (20.58)	860 (1896)	**1PL6228 – . . F . . – 0 ■ ■ ■**	490	**6SL3320–1TE35–0AA0**
0.85	79	0.938	97.6	0.503 (4.45)	370 (816)	**1PL6184 – . . L . . – 0 ■ ■ ■**	210	**6SL3320–1TE32–1AA0**
0.84	110	0.943	97.5	0.666 (5.89)	440 (970)	**1PL6186 – . . L . . – 0 ■ ■ ■**	310	**6SL3320–1TE33–1AA0**
0.86	118	0.950	97.5	1.479 (13.09)	630 (1389)	**1PL6224 – . . L . . – 0 ■ ■ ■**	380	**6SL3320–1TE33–8AA0**
0.87	160	0.952	97.4	1.930 (17.08)	750 (1654)	**1PL6226 – . . L . . – 0 ■ ■ ■**	490	**6SL3320–1TE35–0AA0**
0.86	188	0.952	97.3	2.326 (20.58)	860 (1896)	**1PL6228 – . . L . . – 0 ■ ■ ■**	605	**6SL3320–1TE36–1AA0**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [5]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [5]	**D**
Plain shaft	—	DE → NDE	**J**
Plain shaft	—	NDE → DE [5]	**K**

Color:	
primed	**0**
Anthracite (RAL 7016), standard paint finish	**3**
Anthracite (RAL 7016), special paint finish	**6**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Preferred air-flow direction in polluted environment.

6) The rated output current of the Motor Module is lower than the motor rated current.

7) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order No.
Supply voltage 400 V 3 AC									
800	280	195 (261.4)	2328 (1717.1)	335	400	1700	2200	3300	**1PL6284 – ■■C■■ – 0 . . .**
		250 (335.1)	2984 (2201)	440	385	1900	2200	3300	**1PL6286 – ■■C■■ – 0 . . .**
		310 (415.5)	3701 (2729.9)	570	370	2200	2200	3300	**1PL6288 – ■■C■■ – 0 . . .**
1150	280	280 (375.3)	2325 (1714.9)	478	400	2200	2200	3300	**1PL6284 – ■■D■■ – 0 . . .**
		355 (475.9)	2944 (2171.5)	637	380	2200	2200	3300	**1PL6286 – ■■D■■ – 0 . . .**
		435 (538.1)	3607 (2660.5)	765	385	2200	2200	3300	**1PL6288 – ■■D■■ – 0 . . .**
1750	280	370 (495.9)	2019 (1489.2)	616	400	2200	2200	3300	**1PL6284 – ■■F■■ – 0 . . .**
		445 (596.5)	2429 (1791.6)	736	400	2200	2200	3300	**1PL6286 – ■■F■■ – 0 . . .**
		560 (750.7)	3055 (2253.4)	924	400	2200	2200	3300	**1PL6288 – ■■F■■ – 0 . . .**

Fans [4]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**	
	External fan unit, NDE right, air-flow direction NDE to DE	**1**	
	External fan unit, NDE left, air-flow direction NDE to DE	**2**	
	External fan unit, DE top, air-flow direction DE to NDE	**3**	
	External fan unit, DE right, air-flow direction DE to NDE	**4**	
	External fan unit, DE left, air-flow direction DE to NDE	**5**	
	Without external fan unit, for single pipe connection at NDE right	**6**	
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]		**N**
	Resolver on request		
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]		**Q**
	Resolver on request		
Terminal box/cable entry (view onto DE) [4]:	NDE right/from below/encoder connector DE		**0**
	NDE left/from below/encoder connector DE		**1**
	NDE top/from right/encoder connector DE		**2**
	DE top/from right/encoder connector NDE		**5**
Type of construction [4]:	IM B3		**0**
	IM V5 (subsequent modification to IM V6 possible)		**1**
	IM B35 (with flange A 660)		**3**
	IM V15 (with flange A 660, subsequent modification to IM V36 possible)		**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm^2 (lb$_f$-in-s^2)	kg (lb)	Order No.	A	Order No.
Supply voltage 400 V 3 AC								
0.90	95	0.929	27.3	4.2 (37.17)	1300 (2866)	**1PL6284 – . . C . . – 0 ■ ■ ■**	380	**6SL3320 – 1TE33 – 8AA0**
0.90	135	0.934	27.3	5.2 (46.02)	1500 (3307)	**1PL6286 – . . C . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.90	170	0.939	27.3	6.3 (55.75)	1700 (3748)	**1PL6288 – . . C . . – 0 ■ ■ ■**	605	**6SL3320 – 1TE36 – 1AA0**
0.89	156	0.950	38.9	4.2 (37.17)	1300 (2866)	**1PL6284 – . . D . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.89	214	0.953	38.9	5.2 (46.02)	1500 (3307)	**1PL6286 – . . D . . – 0 ■ ■ ■**	745	**6SL3320 – 1TE37 – 5AA0**
0.89	248	0.955	38.9	6.3 (55.75)	1700 (3748)	**1PL6288 – . . D . . – 0 ■ ■ ■**	840	**6SL3320 – 1TE38 – 4AA0**
0.90	162	0.959	59.0	4.2 (37.17)	1300 (2866)	**1PL6284 – . . F . . – 0 ■ ■ ■**	605 [5]	**6SL3320 – 1TE36 – 1AA0**
0.91	182	0.960	59.0	5.2 (46.02)	1500 (3307)	**1PL6286 – . . F . . – 0 ■ ■ ■**	745	**6SL3320 – 1TE37 – 5AA0**
0.91	232	0.962	59.0	6.3 (55.75)	1700 (3748)	**1PL6288 – . . F . . – 0 ■ ■ ■**	985	**6SL3320 – 1TE41 – 0AA0**

Output type [4]:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	–		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
500	180	30 (40.2)	573 (422.6)	66	370	1900	2500	2500	**1PL6184 – ■■B■■ – 0 . . .**
		40 (53.6)	764 (563.5)	91	355	2000	2500	2500	**1PL6186 – ■■B■■ – 0 . . .**
	225	55 (73.7)	1050 (774.5)	114	370	1800	2500	2500	**1PL6224 – ■■B■■ – 0 . . .**
		72 (96.5)	1375 (1014.2)	147	375	2000	2500	2500	**1PL6226 – ■■B■■ – 0 . . .**
		90 (120.6)	1719 (1267.9)	180	380	1900	2500	2500	**1PL6228 – ■■B■■ – 0 . . .**
1350	180	74 (99.2)	523 (385.8)	119	460	3000	3500 [4]	5000	**1PL6184 – ■■D■■ – 0 . . .**
		98 (131.4)	693 (511.2)	156	460	3100	3500 [4]	5000	**1PL6186 – ■■D■■ – 0 . . .**
	225	137 (183.6)	969 (714.7)	215	460	3300	3100 [4]	4500	**1PL6224 – ■■D■■ – 0 . . .**
		172 (230.6)	1217 (897.7)	265	460	3200	3100 [4]	4500	**1PL6226 – ■■D■■ – 0 . . .**
		218 (292.2)	1542 (1137.4)	332	460	2900	3100 [4]	4500 [4]	**1PL6228 – ■■D■■ – 0 . . .**

Fans:	External fan unit and PG cable entry in terminal box		**4**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from DE		**1**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3		**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	**1**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)		**3**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-ins²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.84	34	0.844	17.6	0.503 (4.45)	370 (816)	**1PL6184 – . . B . . – 0 ■ ■ ■**	85	**6SL3120 – 1T E28 – 5AA1**
0.84	46	0.845	17.6	0.666 (5.89)	440 (970)	**1PL6186 – . . B . . – 0 ■ ■ ■**	132	**6SL3120 – 1T E31 – 3AA0**
0.86	46	0.875	17.5	1.479 (13.09)	630 (1389)	**1PL6224 – . . B . . – 0 ■ ■ ■**	132	**6SL3120 – 1T E31 – 3AA0**
0.85	66	0.887	17.4	1.930 (17.08)	750 (1654)	**1PL6226 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 – 1T E32 – 0AA0**
0.85	79	0.894	17.4	2.326 (20.58)	860 (1896)	**1PL6228 – . . B . . – 0 ■ ■ ■**	200	**6SL3120 – 1T E32 – 0AA0**
0.86	44	0.918	46.1	0.503 (4.45)	370 (816)	**1PL6184 – . . D . . – 0 ■ ■ ■**	132	**6SL3120 – 1T E31 – 3AA0**
0.85	60	0.920	46.0	0.666 (5.89)	440 (970)	**1PL6186 – . . D . . – 0 ■ ■ ■**	200	**6SL3120 – 1T E32 – 0AA0**
0.85	82	0.940	45.8	1.479 (13.09)	630 (1389)	**1PL6224 – . . D . . – 0 ■ ■ ■**	210 [6]	**6SL3320 – 1T E32 – 1AA0**
0.87	88	0.940	45.8	1.930 (17.08)	750 (1654)	**1PL6226 – . . D . . – 0 ■ ■ ■**	260 [6]	**6SL3320 – 1T E32 – 6AA0**
0.88	100	0.938	45.8	2.326 (20.58)	860 (1896)	**1PL6228 – . . D . . – 0 ■ ■ ■**	380	**6SL3320 – 1T E33 – 8AA0**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [5]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [5]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [5]	**K**

Color:	
primed	**0**
Anthracite (RAL 7016), standard paint finish	**3**
Anthracite (RAL 7016), special paint finish	**6**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Preferred air-flow direction in polluted environment.

6) The rated output current of the Motor Module is lower than the motor rated current.

7) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed	Shaft height SH	Rated power	Rated torque	Rated current	Rated voltage	Field-weakening speed [1]	Max. permissible continuous speed [2]	Max. speed [3]	1PL6 asynchronous motor
n_{rated}		P_{rated}	M_{rated}	I_{rated}	V_{rated}	n_2	n_{S1}	n_{max}	
rpm		kW (HP)	Nm (lb_f-ft)	A	V	rpm	rpm	rpm	Order No.
Supply voltage 480 V 3 AC									
2000	180	98 (131.4)	468 (345.2)	161	460	5000	3500 [4]	5000	**1PL6184 – ■■ F ■■ – 0 . . .**
		135 (180.9)	645 (475.8)	220	460	5000	3500 [4]	5000	**1PL6186 – ■■ F ■■ – 0 . . .**
	225	178 (238.6)	850 (627)	275	460	2900	3100 [4]	4500	**1PL6224 – ■■ F ■■ – 0 . . .**
		220 (294.9)	1050 (774.5)	342	460	2900	3100 [4]	4500	**1PL6226 – ■■ F ■■ – 0 . . .**
		288 (386.1)	1375 (1014.2)	450	460	2900	3100 [4]	4500 [4]	**1PL6228 – ■■ F ■■ – 0 . . .**
2900	180	113 (151.5)	372 (274.4)	209	400	5000	3500 [4]	5000	**1PL6184 – ■■ L ■■ – 0 . . .**
		150 (201.1)	494 (364.4)	280	390	5000	3500 [4]	5000	**1PL6186 – ■■ L ■■ – 0 . . .**
	225	205 (274.8)	675 (497.9)	365	400	3500	3100 [4]	4500	**1PL6224 – ■■ L ■■ – 0 . . .**
		270 (361.9)	889 (655.7)	470	395	3500	3100 [4]	4500	**1PL6226 – ■■ L ■■ – 0 . . .**
		300 (402.1)	988 (728.7)	530	400	3500	3100 [4]	4500 [4]	**1PL6228 – ■■ L ■■ – 0 . . .**

Fans:	External fan unit and PG cable entry in terminal box		**4**
	Without external fan unit, for pipe connection, PG cable entry in terminal box		**6**
	External fan unit and metric cable entry in terminal box		**7**
	Without external fan unit, for pipe connection, metric cable entry in terminal box		**8**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**N**
	2-pole resolver		**R**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [7]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [7]		**Q**
	2-pole resolver		**P**
Terminal box/cable entry (view onto DE):	top/from right		**0**
	top/from DE		**1**
	top/from NDE		**2**
	top/from left		**3**
Type of construction:	IM B3		**0**
	IM B3	Hoisting system for different construction types (IM B6, IM B7, IM B8, IM V5, IM V6)	**1**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)		**3**
	IM B35 (SH 450: with flange A 450, SH 225: with flange A 550)	Hoisting system for different construction types (IM V15, IM V36)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-ins²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.83	70	0.934	67.5	0.503 (4.45)	370 (816)	**1PL6184 – . . F . . – 0 ■ ■ ■**	200	**6SL3120–1TE32–0AA0**
0.83	94	0.940	67.5	0.666 (5.89)	440 (970)	**1PL6186 – . . F . . – 0 ■ ■ ■**	260	**6SL3320–1TE32–6AA0**
0.86	91	0.944	67.5	1.479 (13.09)	630 (1389)	**1PL6224 – . . F . . – 0 ■ ■ ■**	310	**6SL3320–1TE33–1AA0**
0.86	124	0.948	67.5	1.930 (17.08)	750 (1654)	**1PL6226 – . . F . . – 0 ■ ■ ■**	380	**6SL3320–1TE33–8AA0**
0.85	176	0.948	67.3	2.326 (20.58)	860 (1896)	**1PL6228 – . . F . . – 0 ■ ■ ■**	490	**6SL3320–1TE35–0AA0**
0.85	79	0.938	97.6	0.503 (4.45)	370 (816)	**1PL6184 – . . L . . – 0 ■ ■ ■**	210	**6SL3320–1TE32–1AA0**
0.84	110	0.943	97.5	0.666 (5.89)	440 (970)	**1PL6186 – . . L . . – 0 ■ ■ ■**	310	**6SL3320–1TE33–1AA0**
0.86	118	0.950	97.5	1.479 (13.09)	630 (1389)	**1PL6224 – . . L . . – 0 ■ ■ ■**	380	**6SL3320–1TE33–8AA0**
0.87	160	0.952	97.4	1.930 (17.08)	750 (1654)	**1PL6 226 – . . L . . – 0 ■ ■ ■**	490	**6SL3320–1TE35–0AA0**
0.86	188	0.952	97.3	2.326 (20.58)	860 (1896)	**1PL6228 – . . L . . – 0 ■ ■ ■**	605	**6SL3320–1TE36–1AA0**

Out-drive type:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	R	N	**A**
Coupling	R	R	**B**
Coupling	S	R	**C**
Coupling	SR	R	**D**
Belt	R	N	**E**
Belt	R	R	**F**
Increased cantilever forces	R	N	**G**
Increased cantilever forces	R	R	**H**

Drive end shaft extension (DE):	**Balancing:**	**Direction of air flow (fan):**	
Fitted key	Half-key	DE → NDE	**A**
Fitted key	Half-key	NDE → DE [5]	**B**
Fitted key	Full-key	DE → NDE	**C**
Fitted key	Full-key	NDE → DE [5]	**D**
Plain shaft	–	DE → NDE	**J**
Plain shaft	–	NDE → DE [5]	**K**

Color:	
primed	**0**
Anthracite (RAL 7016), standard paint finish	**3**
Anthracite (RAL 7016), special paint finish	**6**

Special versions:	Specify supplementary order code and plain text if applicable (see Options).	**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) Speed is reduced with increased cantilever forces; see selection guides.

5) Preferred air-flow direction in polluted environment.

6) The rated output current of the Motor Module is lower than the motor rated current.

7) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order No.
Supply voltage 480 V 3 AC									
1000	280	235 (315.0)	2244 (1655.2)	335	480	2200	2200	3300	**1PL6284 – ■■C■■ – 0 . . .**
		310 (415.5)	2961 (2184)	440	480	2200	2200	3300	**1PL6286 – ■■C■■ – 0 . . .**
		385 (516.1)	3677 (2712.2)	570	460	2200	2200	3300	**1PL6288 – ■■C■■ – 0 . . .**
1350	280	325 (435.7)	2299 (1695.7)	478	470	2200	2200	3300	**1PL6284 – ■■D■■ – 0 . . .**
		410 (549.6)	2901 (2139.8)	637	445	2200	2200	3300	**1PL6286 – ■■D■■ – 0 . . .**
		505 (676.9)	3573 (2635.4)	765	450	2200	2200	3300	**1PL6288 – ■■D■■ – 0 . . .**
2000	280	415 (556.3)	1981 (1461.2)	616	455	2200	2200	3300	**1PL6284 – ■■F■■ – 0 . . .**
		500 (670.2)	2387 (1760.7)	736	455	2200	2200	3300	**1PL6286 – ■■F■■ – 0 . . .**
		630 (844.5)	3009 (2219.4)	924	455	2200	2200	3300	**1PL6288 – ■■F■■ – 0 . . .**

Fans [4]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**
	External fan unit, NDE right, air-flow direction NDE to DE	**1**
	External fan unit, NDE left, air-flow direction NDE to DE	**2**
	External fan unit, DE top, air-flow direction DE to NDE	**3**
	External fan unit, DE right, air-flow direction DE to NDE	**4**
	External fan unit, DE left, air-flow direction DE to NDE	**5**
	Without external fan unit, for single pipe connection at NDE right	**6**
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder	**A**
	Absolute encoder EnDat 2048 pulses/revolution	**E**
	Incremental encoder HTL 1024 pulses/revolution	**H**
	Incremental encoder HTL 2048 pulses/revolution	**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	**N**
	Resolver on request	**F**
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution	**D**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]	**Q**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]	
	Resolver on request	
Terminal box/cable entry (view onto DE) [4]:	NDE right/from below/encoder connector DE	**0**
	NDE left/from below/encoder connector DE	**1**
	NDE top/from right/encoder connector DE	**2**
	DE top/from right/encoder connector NDE	**5**
Type of construction [4]:	IM B3	**0**
	IM V5 (subsequent modification to IM V6 possible)	**1**
	IM B35 (with flange A 660)	**3**
	IM V15 (with flange A 660, subsequent modification to IM V36 possible)	**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
cos φ	A		Hz	kgm² (lb$_f$-ins²)	kg (lb)	Order No.	A	Order No.
Supply voltage 480 V 3 AC								
0.90	90	0.939	34.0	4.2 (37.17)	1300 (2866)	**1PL6284 – . . C . . – 0 ■ ■ ■**	380	**6SL3320 – 1TE33 – 8AA0**
0.90	135	0.945	34.0	5.2 (46.02)	1500 (3307)	**1PL6286 – . . C . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.90	170	0.948	34.0	6.3 (55.75)	1700 (3748)	**1PL6288 – . . C . . – 0 ■ ■ ■**	605	**6SL3320 – 1TE36 – 1AA0**
0.89	157	0.955	45.5	4.2 (37.17)	1300 (2866)	**1PL6284 – . . D . . – 0 ■ ■ ■**	490	**6SL3320 – 1TE35 – 0AA0**
0.89	215	0.957	45.5	5.2 (46.02)	1500 (3307)	**1PL6286 – . . D . . – 0 ■ ■ ■**	745	**6SL3320 – 1TE37 – 5AA0**
0.89	248	0.959	45.5	6.3 (55.75)	1700 (3748)	**1PL6288 – . . D . . – 0 ■ ■ ■**	840	**6SL3320 – 1TE38 – 4AA0**
0.90	161	0.961	67.3	4.2 (37.17)	1300 (2866)	**1PL6284 – . . F . . – 0 ■ ■ ■**	745	**6SL3320 – 1TE37 – 5AA0**
0.91	181	0.963	67.3	5.2 (46.02)	1500 (3307)	**1PL6286 – . . F . . – 0 ■ ■ ■**	745	**6SL3320 – 1TE37 – 5AA0**
0.91	231	0.965	67.3	6.3 (55.75)	1700 (3748)	**1PL6288 – . . F . . – 0 ■ ■ ■**	985	**6SL3320 – 1TE41 – 0AA0**

Output type [4]:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	—		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

1PL6 motors

Selection and ordering data

Rated speed n_{rated} rpm	Shaft height SH	Rated power P_{rated} kW (HP)	Rated torque M_{rated} Nm (lb_f-ft)	Rated current I_{rated} A	Rated voltage V_{rated} V	Field-weakening speed [1] n_2 rpm	Max. permissible continuous speed [2] n_{S1} rpm	Max. speed [3] n_{max} rpm	1PL6 asynchronous motor Order-no.
Supply voltage 690 V 3 AC									
800	280	185 (247.9)	2208 (1628.6)	185	690	2000	2200	3300	**1PL6284 – ■■C■■ – 0 . . .**
		240 (321.7)	2865 (2113.2)	250	665	2100	2200	3300	**1PL6286 – ■■C■■ – 0 . . .**
		300 (402.1)	3581 (2641.3)	320	640	2200	2200	3300	**1PL6288 – ■■C■■ – 0 . . .**
1150	280	272 (364.6)	2259 (1666.2)	270	690	2200	2200	3300	**1PL6284 – ■■D■■ – 0 . . .**
		344 (461.1)	2857 (2107.3)	359	655	2200	2200	3300	**1PL6286 – ■■D■■ – 0 . . .**
		422 (565.7)	3504 (2584.6)	431	665	2200	2200	3300	**1PL6288 – ■■D■■ – 0 . . .**
1750	280	359 (481.2)	1959 (1445)	347	690	2200	2200	3300	**1PL6284 – ■■F■■ – 0 . . .**
		432 (579.1)	2357 (1738.5)	415	690	2200	2200	3300	**1PL6286 – ■■F■■ – 0 . . .**
		543 (727.9)	2963 (2963.5)	520	690	2200	2200	3300	**1PL6288 – ■■F■■ – 0 . . .**

Fans [5]:	External fan unit, NDE top, air-flow direction NDE to DE	**0**	
	External fan unit, NDE right, air-flow direction NDE to DE	**1**	
	External fan unit, NDE left, air-flow direction NDE to DE	**2**	
	External fan unit, DE top, air-flow direction DE to NDE	**3**	
	External fan unit, DE right, air-flow direction DE to NDE	**4**	
	External fan unit, DE left, air-flow direction DE to NDE	**5**	
	Without external fan unit, for single pipe connection at NDE right	**6**	
Encoder systems for motors without DRIVE-CLiQ interface:	Without encoder		**A**
	Absolute encoder EnDat 2048 pulses/revolution		**E**
	Incremental encoder HTL 1024 pulses/revolution		**H**
	Incremental encoder HTL 2048 pulses/revolution		**J**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]		**M**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]		**N**
	Resolver on request		
Encoder systems for motors with DRIVE-CLiQ interface:	Absolute encoder EnDat 2048 pulses/revolution		**F**
	Incremental encoder sin/cos 1 V_{pp} with C and D track [6]		**D**
	Incremental encoder sin/cos 1 V_{pp} without C and D track [6]		**Q**
	Resolver on request		
Terminal box/cable entry (view onto DE) [5]:	NDE right/from below/encoder connector DE		**0**
	NDE left/from below/encoder connector DE		**1**
	NDE top/from right/encoder connector DE		**2**
	DE top/from right/encoder connector NDE		**5**
Type of construction [5]:	IM B3		**0**
	IM V5 (subsequent modification to IM V6 possible)		**1**
	IM B35 (with flange A 660)		**3**
	IM V15 (with flange A 660, subsequent modification to IM V36 possible)		**5**

For further order number supplements (14th to 16th data position of the order number) see next page.

Selection and ordering data

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	1PL6 asynchronous motor	SINAMICS S120 Motor Module Rated output current	
	I_μ	η_{rated}	f_{rated}	J			I_{rated}	
$\cos\varphi$	A		Hz	kgm² (lb_f-ins²)	kg (lb)	Order No.	A	Order No.
Supply voltage 690 V 3 AC								
0.90	55	0.928	27	4.2 (37.17)	1300 (2866)	**1PL6284 – . . C . . – 0 ■ ■ ■**	215	**6SL3320 – 1TH32 – 2AA0**
0.90	80	0.934	27	5.2 (46.02)	1500 (3307)	**1PL6286 – . . C . . – 0 ■ ■ ■**	260	**6SL3320 – 1TH32 – 6AA0**
0.90	100	0.938	27	6.3 (55.75)	1700 (3748)	**1PL6288 – . . C . . – 0 ■ ■ ■**	330	**6SL3320 – 1TH33 – 3AA0**
0.89	89	0.949	38.9	4.2 (37.17)	1300 (2866)	**1PL6284 – . . D . . – 0 ■ ■ ■**	330	**6SL3320 – 1TH33 – 3AA0**
0.89	123	0.953	38.9	5.2 (46.02)	1500 (3307)	**1PL6286 – . . D . . – 0 ■ ■ ■**	410	**6SL3320 – 1TH34 – 1AA0**
0.89	143	0.955	38.9	6.3 (55.75)	1700 (3748)	**1PL6288 – . . D . . – 0 ■ ■ ■**	465	**6SL3320 – 1TH34 – 7AA0**
0.90	93	0.958	59	4.2 (37.17)	1300 (2866)	**1PL6284 – . . F . . – 0 ■ ■ ■**	410	**6SL3320 – 1TH34 – 1AA0**
0.91	105	0.960	59	5.2 (46.02)	1500 (3307)	**1PL6286 – . . F . . – 0 ■ ■ ■**	410 [4]	**6SL3320 – 1TH34 – 1AA0**
0.91	133	0.962	59	6.3 (55.75)	1700 (3748)	**1PL6288 – . . F . . – 0 ■ ■ ■**	575	**6SL3320 – 1TH35 – 8AA0**

Output type [5]:	**Vibration severity grade:**	**Shaft and flange accuracy:**	
Coupling	N	N	**A**
Coupling	R	R	**B**
Belt/increased cantilever forces	N	N	**E**
Belt/increased cantilever forces	R	R	**F**
Drive end shaft extension (DE):	**Balancing:**		
Fitted key	Half-key		**A**
Fitted key	Full-key		**C**
Plain shaft	—		**J**
Color:			
primed			**0**
Anthracite (RAL 7016), standard paint finish			**3**
Anthracite (RAL 7016), special paint finish			**6**
Special versions:	Specify supplementary order code and plain text if applicable (see Options).		**–Z**

1) n_2: Max. permissible thermal speed at constant output or speed, which is at the voltage limit when $P = P_{rated}$.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

2) n_{S1}: The maximum permissible speed that is continuously permitted without speed duty cycles.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

3) n_{max}: Maximum speed which must not be exceeded.
Notice: The speed is limited to lower values in some cases.
The following restriction applies: Max. output frequency < 5 × motor rated frequency.

4) See Table "Permissible combinations of mechanical constructions".

5) The rated output current of the Motor Module is lower than the motor rated current.

6) Only in conjunction with option **M84** (insulated version of encoder).

Selection and ordering data

Permissible combinations of mechanical models

1PL6 28 . motors
shaft height 280
Position in Order No. 8. 9. 10. 11. 12. 13. 14. 15. 16.
1PL6 28 . – ■ . . ■ ■ – . ■ . .

Permissible combinations of mechanical models

Separately driven fan
8th position in Order No.
1PL6 28 . – ■ . . . . – . . . .

Order No. supplement

1PL6 28 . motors	0: NDE **Top** NDE --> DE	1: NDE **Right** NDE --> DE	2: NDE **Left** NDE --> DE	3: DE **Top** DE --> NDE	4: DE **Right** DE --> NDE	5: DE **Left** DE --> NDE	6: **Simple pipe connection NDE Right** (can be converted to NDE left)
1PL6 28 . – . . . . 0 – . . . . Type of construction IM B3	■						
		□					
			□				
				□			
					□		
						□	
							□
1PL6 28 . – . . . . 1 – . . . . Type of construction IM V5 (Can be converted later to IM V6)	■						
		□					
			□				
				□			
					□		
						□	
							□
1PL6 28 . – . . . . 3 – . . . . Type of construction IM B35	■						
		□					
			□				
				□			
					□		
						□	
							□
1PL6 28 . – . . . . 5 – . . . . Type of contruction IM V15 (Can be converted later to IM V36)	■						
		□					
			□				
				□			
					□		
						□	
							□
Option codes							
R1Y Standard finish RAL ...	□	□	□	□	□	□	□
R2Y Special finish RAL ...	□	□	□	□	□	□	□
G14 With air filter	□	□	□	□	□	□	
K08 Encoder connector attachment, facing							
K55 Customer-specific entry plate for terminal box 1)							
K83 Terminal box rotation by +90 degrees							
K84 Terminal box rotation by -90 degrees							
K85 Terminal box rotation by 180 degrees							
K16 Additional normal shaft end (only available with no encoder)							
K31 Additional rating plate	□	□	□	□	□	□	□
K45 230 V standstill heating	□	□	□	□	□	□	□
C30 690 V model	□	□	□	□	□	□	□
Y55 Atypical shaft end DE							
Y80 Different rating plate data 1)	□	□	□	□	□	□	□
Y82 Additional plate with customer information 1)	□	□	□	□	□	□	□
M83 Additional pulling thread on motor feet							

■ **Standard model**
□ **Approved supplemental types**

1) Plain text required

	Terminal box 11th position in Order No. **1PL6 28 . – . . . ■ . – . . . .** b **Order No. supplement**				**Construction type** 12th position in Order No. **1PL6 28 . – . . . . ■ – . . . .** **Order No. supplement**				**Drive type** 14th position in Order No. **1PL6 28 . – . . . . . – . ■ . .** **Order No. supplement**			
	0	**1**	**2**	**5**	**0**	**1**	**3**	**5**	**A**	**B**	**E**	**F**
	NDE **Right** Cable entry below, DE enc. conn.	NDE **Left** Cable entry below, DE enc. conn.	NDE **Top** Cable entry on right, DE enc. conn.	DE **Top** Cable entry on right, NDE enc. conn.	Construc-tion type **IM B3**	Construc-tion type **IM V5** (IM V6)	Construc-tion type **IM B35**	Construc-tion type **IM V15** (IM V36)	**Coupling N/N**	**Coupling R/R**	**Belt/ increased cantile-ver forces N/N**	**Belt/ increased cantile-ver forces R/R**

Additional data for 1PH7 and PL6 motors

Ventilation data and sound pressure level

Shaft height SH	Fan motor: Current consumption at			Direction of air flow	Sound pressure level L_{pA}	Air flow rate at
	400 V/50 Hz (±10%)	400 V/60 Hz (±10%)	480 V/60 Hz (+5%, -10%)		Motor and external fan rated load, 50 Hz tolerance +3 dB	50 Hz approx.
	A	A	A		1 dB (A)	m^3/s (ft^3/s)
1PH7 motors						
100	0.19	0.13	0.18	NDE → DE	70	0.04 (1.41)
	0.20	0.13	0.20	DE → NDE	70	0.04 (1.41)
132	0.35	0.24	0.32	NDE → DE	70	0.10 (3.53)
	0.37	0.24	0.33	DE → NDE	70	0.10 (3.53)
160	0.29	0.31	0.33	NDE → DE	72	0.15 (5.3)
	0.3	0.33	0.34	DE → NDE	75	0.15 (5.3)
180	0.8	1.1	1.1	NDE → DE, DE → NDE	73	0.19 (6.71)
225	1.9	2.2	2.2	NDE → DE	74	0.36 (12.71)
	2.8	2.8	2.8	DE → NDE	76	0.36 (12.71)
280	2.55	2.6	2.6	NDE → DE, DE → NDE	74	0.42 (14.83)
1PL6 motors						
180	0.8	1.1	1.1	NDE → DE, DE → NDE	73 [1)]	0.27 (9.54)
225	1.9	2.2	2.2	NDE → DE	74 [1)]	0.38 (13.42)
	2.8	2.8	2.8	AS → NDE	76 [1)]	0.38 (13.42)
280	2.55	2.6	2.6	NDE → DE, DE → NDE	74 [1)]	0.52 (18.36)

1) Speed range 0 to 2000 rpm.

Bearing version, drive type and maximum speeds

Shaft height/ motor type	Bearing type/ drive type	Bearing type		Max. continuous speed for S1 duty		Max. speed limit [1]	
		Motor side	Bearing designation	n_{S1} rpm	n_{S1} [2] rpm	$n_{max.}$ rpm	$n_{max.}$ [2] rpm
100	Deep-groove ball bearings for coupling or belt output	DE NDE	6308 C4 6208 C4	5500	10000	9000	12000
132	Deep-groove ball bearings for coupling or belt output	DE NDE	6310 C4 6210 C4	4500	8500	8000	10000
160	Deep-groove ball bearings for coupling or belt output	DE NDE	6312 C4 6212 C4	3700	7000	6500	8000
180	Deep-groove ball bearings for coupling output	DE NDE	6214 C3 6214 C3	3500	4500	5000	7000
	Cylindrical roller bearings for belt output	DE NDE	NU22 14E 6214 C3	3500	–	5000	–
	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU22 14E 6214 C3	3000	–	5000	–
225	Deep-groove ball bearings for increased cantilever forces	DE NDE	6216 C3 6216 C3	3100	3600 (for 1PH7224)	4500	5500 (for 1PH7224)
	Cylindrical roller bearings for belt output	DE NDE	NU22 16E 6216 C3	3100		4500	–
Type 224, 226	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU22 16E 6216 C3	2700	–	4500	–
Type 228	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU22 16E 6216 C3	2500	–	4000	–
280	Deep-groove ball bearings for coupling output	DE NDE	6220 C3 6220 C3	2200	–	3300	–
	Cylindrical roller bearings for belt output	DE NDE	NU22 0E 6220 C3	2200	–	3300	–

Bearing lifetime

The bearing lifetime is limited by material fatigue (fatigue lifetime) or if the lubrication fails (grease lifetime).

The fatigue lifetime (static bearing lifetime L_{10h}) is primarily dependent on the mechanical load. This correlation can be seen in the cantilever force/axial force diagrams. The values are determined according to DIN/ISO 281.

The grease lifetime is mainly dependent on the bearing size, speed, temperature as well as the vibrational load.

The grease lifetime can be extended by especially favorable operating conditions (low average speed, low bearing temperature, cantilever force or vibration load).

A reduction can be expected for difficult operating conditions and when motors are mounted vertically.

Further information can be found in the Planning Guides.

Permanent lubrication

For permanent lubrication, the bearing grease lifetime is harmonized with the bearing lifetime.

In the basic version, the motors up to and including shaft height 225 have permanent lubrication.

Re-greasing

For motors which can be re-greased at defined re-greasing intervals, the bearing lifetime can be extended and/or unfavorable factors such as mounting conditions, speed, bearing size and mechanical load can be compensated.

A nipple for regreasing is provided as standard on motors with SH 280.

A nipple for re-greasing can be ordered as an optional extra for motors with SH 180 and 225, order code **K40**.

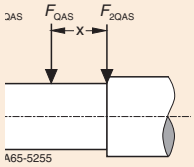
1) For continuous operation (with 30% n_{max}, 60% 2/3 n_{max}, 10% standstill) for a duty cycle duration of 10 min.

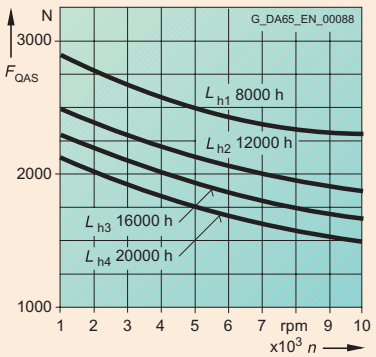
2) Version for increased maximum speed, see selection and ordering data for 1PH7.

Additional data for 1PH7 and PL6 motors

Cantilever force diagrams

Permissible cantilever forces 1PH7 motors shaft height 100

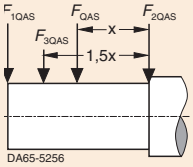


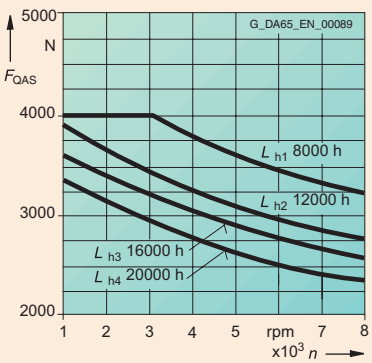


x = 40 mm (1.57 in)
F_{1QAS} = 0.9 F_{QAS}
F_{2QAS} = 1.1 F_{QAS}
L_{h1}, L_{h2}, L_{h3}, L_{h4} = Estimated lifetime for varying operating conditions (F_{QAS}; n)
q = residual effect [%] at constant conditions

$$L_{10htot} = \frac{100}{\frac{q_1}{L_{h1}} + \frac{q_2}{L_{h2}} + \frac{q_3}{L_{h3}} + \frac{q_4}{L_{h4}}}$$

Permissible cantilever forces 1PH7 motors shaft height 132

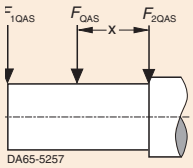


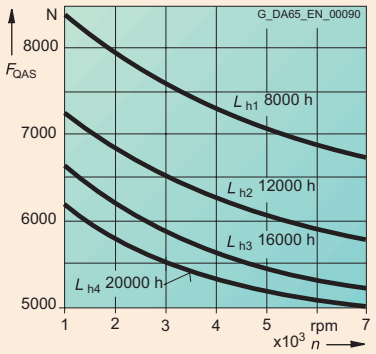


x = 55 mm (2.17 in)
F_{1QAS} = max. 2.000 N (450 lb_f)
F_{2QAS} = 1.1 F_{QAS}
F_{3QAS} = max. 2.500 N (560 lb_f)
L_{h1}, L_{h2}, L_{h3}, L_{h4} = Estimated lifetime for varying operating conditions (F_{QAS}; n)
q = residual effect [%] at constant conditions

$$L_{10htot} = \frac{100}{\frac{q_1}{L_{h1}} + \frac{q_2}{L_{h2}} + \frac{q_3}{L_{h3}} + \frac{q_4}{L_{h4}}}$$

Permissible cantilever forces 1PH7 motors shaft height 160

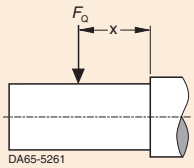


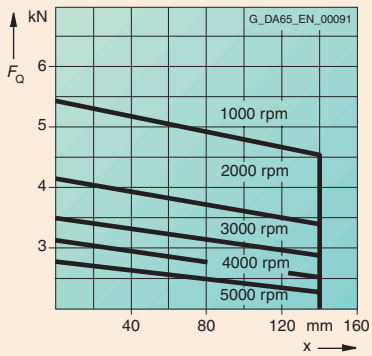


x = 55 mm (2.17 in)
F_{1QAS} = 0.9 F_{QAS}
F_{2QAS} = 1.1 F_{QAS}
L_{h1}, L_{h2}, L_{h3}, L_{h4} = Estimated lifetime for varying operating conditions (F_{QAS}; n)
q = residual effect [%] at constant conditions

$$L_{10htot} = \frac{100}{\frac{q_1}{L_{h1}} + \frac{q_2}{L_{h2}} + \frac{q_3}{L_{h3}} + \frac{q_4}{L_{h4}}}$$

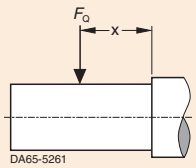
Permissible cantilever forces motors 1PH718. and 1PL618. shaft height 180 for coupling drive

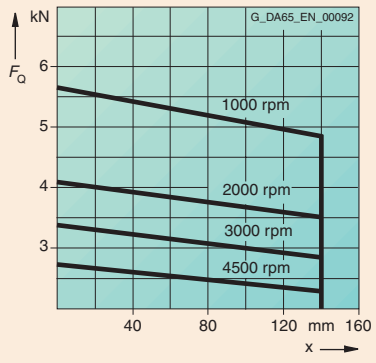




L_{10h} = 20.000 h

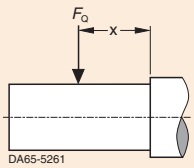
Permissible cantilever forces motors 1PH722. and 1PL622. shaft height 225 for coupling drive



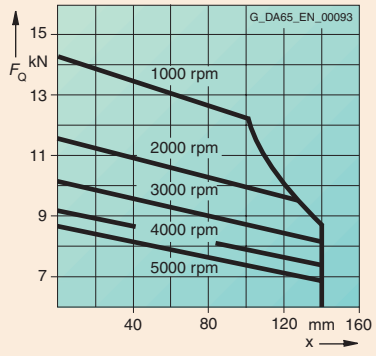


L_{10h} = 20.000 h

Permissible cantilever forces motors 1PH718. and 1PL618. shaft height 180 for belt drive



Minimum cantilever force 3 kN (675 lb_f)

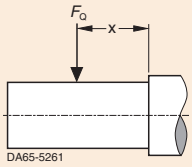


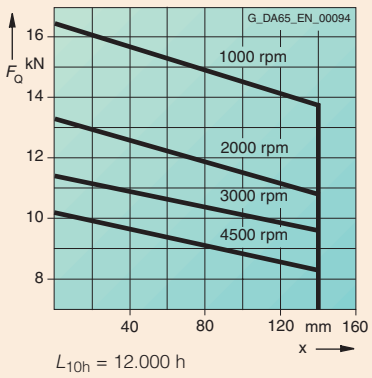
L_{10h} = 12.000 h

No-load operation of the roller bearings used here can damage the bearings.
Note the specified minimum cantilever forces!

Cantilever force diagrams

Permissible cantilever forces motors 1PH722. and 1PL622. shaft height 225 for belt drive

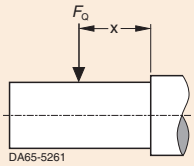


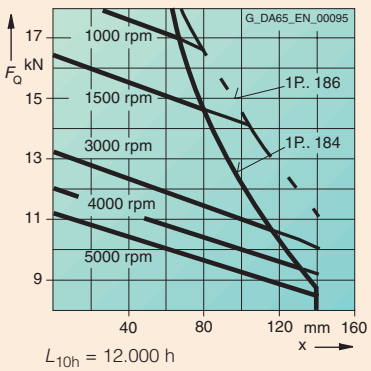


L_{10h} = 12.000 h

Minimum cantilever force 4 kN (900 lb_f)

Permissible cantilever forces motors 1PH718. and 1PL618. shaft height 180 for belt drive with Increased cantilever force

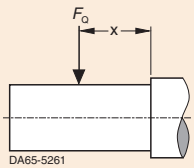


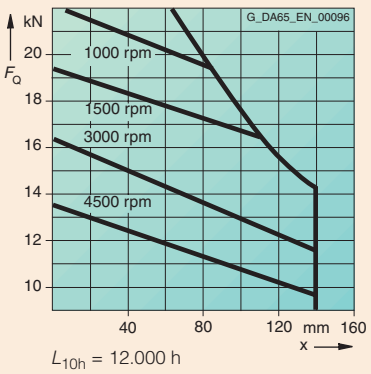


L_{10h} = 12.000 h

Minimum cantilever force 4 kN (900 lb_f)

Permissible cantilever forces motors 1PH722. and 1PL622. shaft height 225 for belt drive with increased cantilever force

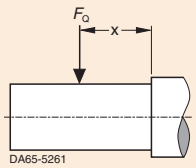


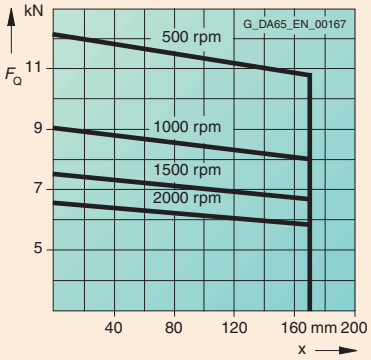


L_{10h} = 12.000 h

Minimum cantilever force 5 kN (1125 lb_f)

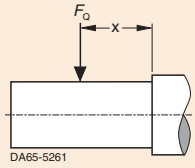
Permissible cantilever forces motors 1PH728. and 1PL628. shaft height 280 for coupling drive

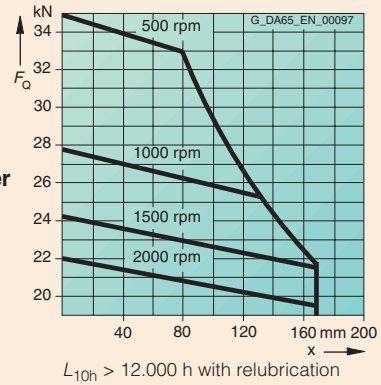




L_{10h} > 20.000 h with relubrication

Permissible cantilever forces motors 1PH728. and 1PL628. shaft height 280 for belt drive with increased cantilever force





L_{10h} > 12.000 h with relubrication

Minimum cantilever force 9 kN (2025 lb_f)

No-load operation of the roller bearings used here can damage the bearings.
Note the specified minimum cantilever forces!

Additional data for 1PH7 and 1PL6 motors

Terminal box assignment, max. connectable cross section per terminal

Shaft height SH	Motor type	Terminal box type	Cable gland	Max. poss. cable outer diameter	Cable gland	Max. poss. cable outer diameter [2]	Number of main terminals	Max. connectable cross section per terminal	Max. poss. current per terminal [1]
			Valid for the 8th position of the Order No. "2", "4" or "6" [3]		Valid for the 8th position of the Order No. "7" or "8"				
				mm (in)		mm (in)		mm^2	A
1PH7 motors									
100	1PH710.–...	integriert	PG 29	28 (1.1)	M 32 x 1.5	21 (0.83)	6 x M 5	25	84
132	1PH713.–...	integriert	PG 36	34 (1.34)	M 40 x 1.5	28 (1.1)	6 x M 6	35	104
160	1PH716.–...	integriert	PG 42	40 (1.57)	M 50 x 1.5	38 (1.5)	6 x M 6	50	123
180	1PH7184–...	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7186–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7186–..D	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7186–..F	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PH7186–..L	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
225	1PH7224–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7224–..D	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7224–..U	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PH7224–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PH7226–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7226–..D	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PH7226–..F	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PH7226–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PH7228–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PH7228–..D	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PH7228–..F	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PH7228–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
280	1PH728.–..B 1PH7284–..D	1XB7712	3 x M 63 x 1.5	53 (2.09)	–	–	(3+1)[4] x 3 x M 16	3 x 95	450
	1PH7286–..D 1PH7288–..D 1PH728.–..F	1XB7712	3 x M 75 x 1.5	68 (2.68)	–	–	(3+1)[4] x 3 x M 16	3 x 185	710

1) Current load capability based on IEC 60204-1, routing type C.
2) Dependent on the design of the metric cable gland.
3) Not for SH 280.
4) Including grounding terminal.

Terminal box assignment, max. connectable cross section per terminal

Shaft height SH	Motor type	Terminal box type	Cable gland	Max. poss. cable outer diameter	Cable gland	Max. poss. cable outer diameter [2]	Number of main terminals	Max. connectable cross section per terminal	Max. poss. current per terminal [1]
			Valid for the 8th position of the Order No. "2", "4" or "6" [3]		Valid for the 8th position of the Order No. "7" or "8"				
				mm (in)		mm (in)		mm^2	A
1PL6 motors									
180	1PL6184–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6184–..D	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6184–..F	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6184–..L	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PL6186–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6186–..D	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6186–..F	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PL6186–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
225	1PL6224–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6224–..D	1XB7422	2 x M 72 x 2	56 (2.2)	2 x M 63 x 1.5	53 (2.09)	3 x M 12	2 x 70	242
	1PL6224–..F	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6224–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6226–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6226–..D	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6226–..F	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6226–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6228–..B	1XB7322	2 x PG 42	40 (1.57)	2 x M 50 x 1.5	38 (1.5)	3 x M 12	2 x 50	191
	1PL6228–..D	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6228–..F	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
	1PL6228–..L	1XB7700	3 x M 72 x 2	56 (2.2)	3 x M 75 x 1.5	68 (2.68)	3 x 2 x M 12	3 x 150	583
280	1PL628.	1XB7712	4 x M 75 x 1.5	68 (2.68)	–	–	(3+1) [4] x 4 x M 16	4 x 185	925

1) Current load capability based on IEC 60204-1, routing type C.

2) Dependent on the design of the metric cable gland.

3) Not for SH 280.

4) Including grounding terminal.

Additional data for 1PH7 and 1PL6 motors

Overview of available construction types

Motors 1PH7 and 1PL6 are available in construction types IM B3 (standard model), IM B5, and IM B35. Other construction types (IM V15, IM V36, IM B6, IM B7, IM B8 etc.) are also available. When ordering the motors with shaft heights 180 and 225 from the factory, the correct number of lifting lugs for the intended mounting position should be specified (position 12 in the motor order number). For motors with shaft heights 100 to 160, the internal lifting lugs can be converted for other mounting schemes.

Note: There are no condensate drain holes in the motors.