

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Overview



1PL6 motors, shaft heights 180 to 225



1PL6 motors, shaft height 280

The 1PL6 AC motors are compact, force-ventilated or enclosed-ventilated squirrel-cage asynchronous motors with degree of protection IP23. The motors are ventilated using a mounted external fan unit.

The motor can be ordered either with the air flow from the motor drive end (DE) to the motor non-drive 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 (IEC 60034-5).

Benefits

- Extremely high power density with small motor dimensions (50 to 60 % higher output as compared to 1PH7 in degree of protection IP55)
- Speed down to zero without reducing the torque
- Ruggedness
- Essentially maintenance-free
- Bearings for high cantilever load
- High rotational accuracy, even at the lowest speeds
- Integrated encoder system to sense the motor speed, connected using a connector or DRIVE-CLiQ interface
- Terminal box to connect the power cables
- Motor temperature monitoring with KTY84
- Various types of cooling systems
- Basic external cooling using a pipe connection
- Optional bearing versions with re-lubrication device and insulated bearings (NDE)

Application

Crane systems:

- Hoisting 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, cable-stranding machines, etc.

General applications such as coiler and winder drives.

The 1PL6 motors are suitable for installation in dry indoor areas without corrosive atmospheres.

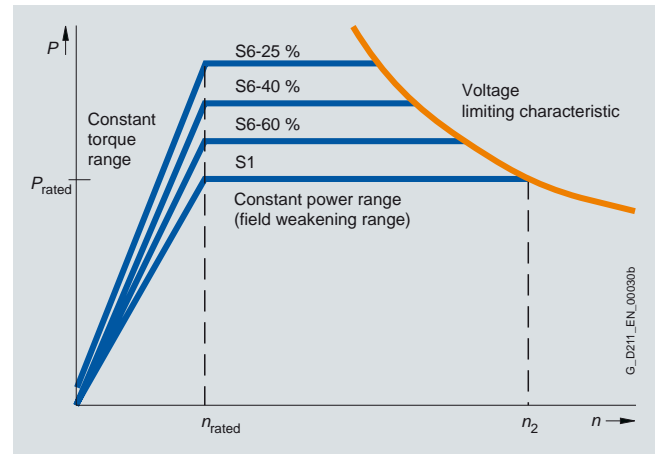
Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Technical specifications

1PL6 motor	
Insulation of the stator winding in accordance with EN 60034-1 (IEC 60034-1)	Temperature class 155 (F) for a coolant temperature of up to 40 °C (104°F)
Cooling in accordance with EN 60034-6 (IEC 60034-6)	
<ul style="list-style-type: none"> 1PL618/1PL622 	Forced ventilation and enclosed ventilation Fan mounted axially at NDE
<ul style="list-style-type: none"> 1PL628 	Forced ventilation, the fan is mounted radially at the NDE
Temperature monitoring	Temperature sensor KTY84 in the stator winding
<ul style="list-style-type: none"> 1PL628 	1 additional KTY84 as reserve
Motor fan ratings	400 V 3 AC 50/60 Hz 480 V 3 AC 60 Hz
Type of construction in accordance with EN 60034-7 (IEC 60034-7)	IM B3, IM B35
Degree of protection in accordance with EN 60034-5 (IEC 60034-5)	IP23
Shaft extension on the drive end in accordance with DIN 748-3 (IEC 60072-1)	With fitted key, half-key/full-key balancing
Shaft and flange accuracy in accordance with DIN 42955 (IEC 60072-1)¹⁾	Tolerance N/Tolerance R
Vibration magnitude in accordance with Siemens/EN 60034-14 (IEC 60034-14)	
<ul style="list-style-type: none"> 1PL618/1PL622 1PL628 	Grade R/A, grade S/A, grade SR/A Grade A, grade R/A
Sound pressure level L_{pA} (1 m) in accordance with EN ISO 1680, max. Tolerance + 3 dB	Sound pressure level as a function of the air-flow direction
Connection	Connector for signals (mating connector not supplied) Terminal box for power
<ul style="list-style-type: none"> 1PL618/1PL622 1PL628 	Terminal box at top terminal box NDE right
Paint finish	Primed anthracite RAL 7016

Characteristic curves



Typical speed/power characteristic for 1PL6 motors

¹⁾ Shaft extension run-out, concentricity of centering ring and shaft and perpendicularity of flange to shaft.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Selection and ordering data

Rated speed	Shaft height	Rated power	Rated torque	Rated current	Rated voltage	Speed during field weakening ¹⁾	Continuous speed, max. ²⁾	Speed, max. ³⁾	1PL6 asynchronous motor Forced ventilation
n_{rated} rpm	SH	P_{rated} kW (HP)	M_{rated} Nm (lb-ft)	I_{rated} A	U_{rated} V	n_2 rpm	n_{S1} rpm	n_{max} rpm	Order No.
Line voltage 400 V 3 AC, Smart/Basic Line Module									
400	180	20.5 (27.5)	489 (361)	58	290	1500	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6184- ■ ■ B ■ ■ - 0 ...
		30.5 (40.9)	728 (537)	87	290	1600	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6186- ■ ■ B ■ ■ - 0 ...
	225	40 (53.6)	955 (704)	105	296	1400	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6224- ■ ■ B ■ ■ - 0 ...
		57 (76.4)	1361 (1004)	145	305	1400	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6226- ■ ■ B ■ ■ - 0 ...
		72 (96.6)	1719 (1268)	181	305	1300	3100 ⁴⁾⁵⁾	4500 ⁴⁾⁵⁾	1PL6228- ■ ■ B ■ ■ - 0 ...
1000	180	57 (76.4)	544 (401)	122	345	2100	3500 ⁴⁾	5000	1PL6184- ■ ■ D ■ ■ - 0 ...
		74 (99.2)	707 (522)	157	345	2400	3500 ⁴⁾	5000	1PL6186- ■ ■ D ■ ■ - 0 ...
	225	105 (141)	1003 (740)	220	345	2500	3100 ⁴⁾	4500	1PL6224- ■ ■ D ■ ■ - 0 ...
		135 (181)	1289 (951)	278	345	2200	3100 ⁴⁾	4500	1PL6226- ■ ■ D ■ ■ - 0 ...
		165 (221)	1576 (1163)	331	348	2200	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ D ■ ■ - 0 ...
1500	180	76 (102)	484 (357)	165	345	4000	3500 ⁴⁾	5000	1PL6184- ■ ■ F ■ ■ - 0 ...
		108 (145)	688 (508)	233	340	4000	3500 ⁴⁾	5000	1PL6186- ■ ■ F ■ ■ - 0 ...
	225	142 (190)	904 (667)	292	345	2900	3100 ⁴⁾	4500	1PL6224- ■ ■ F ■ ■ - 0 ...
		175 (235)	1114 (822)	356	345	2900	3100 ⁴⁾	4500	1PL6226- ■ ■ F ■ ■ - 0 ...
		230 (308)	1465 (1081)	468	345	2900	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ F ■ ■ - 0 ...
2500	180	100 (134)	382 (282)	208	345	5000	3500 ⁴⁾	5000	1PL6184- ■ ■ L ■ ■ - 0 ...
		130 (174)	497 (367)	275	340	5000	3500 ⁴⁾	5000	1PL6186- ■ ■ L ■ ■ - 0 ...
	225	178 (239)	680 (502)	358	345	3500	3100 ⁴⁾	4500	1PL6224- ■ ■ L ■ ■ - 0 ...
		235 (315)	698 (515)	476	340	3500	3100 ⁴⁾	4500	1PL6226- ■ ■ L ■ ■ - 0 ...
		265 (355)	1013 (747)	535	345	3500	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ L ■ ■ - 0 ...

For versions, see
Order No. supplement and
options on page 5/90.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Motor type (repeated)	Power factor	Magne- tizing current	Efficiency	Rated frequency	Moment of inertia	Weight, approx.	Terminal box	SINAMICS S120 Motor Module	
								Rated output current ⁶⁾	For additional versions and components see chapter SINAMICS S120 drive system
	$\cos \varphi$	I_{μ}	η_{rated}	f_{rated}	J			I_{rated}	Order No.
		A		Hz	kgm ² (lb _r -in-s ²)	kg (lb)	Type	A	
1PL6184-..B...	0.84	33.4	0.820	14.2	0.503 (4.45)	370 (816)	1XB7322	60	6SL3120-1TE26-0AA3
1PL6186-..B...	0.84	48.6	0.828	14.1	0.666 (5.89)	440 (970)	1XB7322	85 ⁷⁾	6SL3120-1TE28-5AA3
1PL6224-..B...	0.86	45.8	0.864	14	1.479 (13.1)	630 (1389)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6226-..B...	0.85	67	0.868	14	1.930 (17.1)	750 (1654)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6228-..B...	0.86	77	0.871	14.1	2.326 (20.6)	860 (1896)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6184-..D...	0.87	45	0.897	34.4	0.503 (4.45)	370 (816)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6186-..D...	0.86	61	0.907	34.3	0.666 (5.89)	440 (970)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6224-..D...	0.86	86	0.927	34.5	1.479 (13.1)	630 (1389)	1XB7422	210 ⁷⁾	6SL3320-1TE32-1AA3
1PL6226-..D...	0.88	90	0.927	31.1	1.930 (17.1)	750 (1654)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6228-..D...	0.89	103	0.928	34.2	2.326 (20.6)	860 (1896)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6184-..F...	0.84	70	0.924	50.9	0.503 (4.45)	370 (816)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6186-..F...	0.85	91	0.930	50.9	0.666 (5.89)	440 (970)	1XB7422	260	6SL3320-1TE32-1AA3
1PL6224-..F...	0.87	91	0.940	50.9	1.479 (13.1)	630 (1389)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6226-..F...	0.87	125	0.944	50.7	1.930 (17.1)	750 (1654)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6228-..F...	0.86	177	0.947	50.7	2.326 (20.6)	860 (1896)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6184-..L...	0.86	80	0.936	84.2	0.503 (4.45)	370 (816)	1XB7422	210	6SL3320-1TE32-1AA3
1PL6186-..L...	0.85	113	0.943	84.1	0.666 (5.89)	440 (970)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6224-..L...	0.87	119	0.950	84.1	1.479 (13.1)	630 (1389)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6226-..L...	0.88	157	0.953	84	1.930 (17.1)	750 (1654)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6228-..L...	0.87	189	0.952	84	2.326 (20.6)	860 (1896)	1XB7700	745	6SL3320-1TE37-5AA3

5

1) n_2 : Max. permissible thermal speed at constant power or speed which is at the voltage limit when $P = P_{rated}$.

2) n_{S1} : Maximum permissible speed that is continuously permitted without speed duty cycles.

3) n_{max} : Maximum speed that must not be exceeded.

4) Speed is reduced with increased radial forces, see selection guides.

5) The speed is limited to lower values in some cases. The following restriction applies: Maximum output frequency < 5 × motor rated frequency.

6) The rated pulse frequencies must be taken into account. The rated motor data is valid for 4 kHz or 2 kHz.

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

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Selection and ordering data

Rated speed	Shaft height	Rated power	Rated torque	Rated current	Rated voltage	Speed during field weakening ¹⁾	Continuous speed, max. ²⁾	Speed max. ³⁾	1PL6 asynchronous motor Forced ventilation	
n_{rated} rpm	SH	P_{rated} kW (HP)	M_{rated} Nm (lb-ft)	I_{rated} A	U_{rated} V	n_2 rpm	n_{S1} rpm	n_{max} rpm	Order No.	
Line voltage 400 V 3 AC, Active Line Module										
400	180	24.5 (32.9)	585 (432)	69	300	1700	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6184- ■ ■ B ■ ■ - 0 ...	
		31.5 (42.2)	752 (555)	90	290	1900	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6186- ■ ■ B ■ ■ - 0 ...	
	225	45 (60.4)	1074 (792)	117	300	1600	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6224- ■ ■ B ■ ■ - 0 ...	
		57 (76.4)	1361 (1004)	145	305	1800	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6226- ■ ■ B ■ ■ - 0 ...	
		72 (96.6)	1719 (1268)	181	305	1800	3100 ⁴⁾⁵⁾	4500 ⁴⁾⁵⁾	1PL6228- ■ ■ B ■ ■ - 0 ...	
800	280	195 (262)	2328 (1717)	335	400	1700	2200	3300	1PL6284- ■ ■ C ■ ■ - 0 ...	
		250 (335)	2984 (2201)	440	385	1900	2200	3300	1PL6286- ■ ■ C ■ ■ - 0 ...	
		310 (416)	3701 (2730)	570	370	2200	2200	3300	1PL6288- ■ ■ C ■ ■ - 0 ...	
1150	180	65 (87.2)	540 (398)	121	400	2500	3500 ⁴⁾	5000	1PL6184- ■ ■ D ■ ■ - 0 ...	
		85 (114)	706 (521)	158	400	2700	3500 ⁴⁾	5000	1PL6186- ■ ■ D ■ ■ - 0 ...	
	225	120 (161)	997 (735)	218	400	2800	3100 ⁴⁾	4500	1PL6224- ■ ■ D ■ ■ - 0 ...	
		155 (208)	1287 (949)	275	400	2600	3100 ⁴⁾	4500	1PL6226- ■ ■ D ■ ■ - 0 ...	
		190 (255)	1578 (1164)	334	400	2500	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ D ■ ■ - 0 ...	
	280	280 (375)	2325 (1715)	478	400	2200	2200	2200	3300	1PL6284- ■ ■ D ■ ■ - 0 ...
		355 (476)	2944 (2172)	637	380	2200	2200	2200	3300	1PL6286- ■ ■ D ■ ■ - 0 ...
435 (583)		3607 (2688)	765	385	2200	2200	2200	3300	1PL6288- ■ ■ D ■ ■ - 0 ...	
1750	180	89 (119)	486 (359)	166	400	4500	3500 ⁴⁾	5000	1PL6184- ■ ■ F ■ ■ - 0 ...	
		125 (168)	682 (503)	231	400	4500	3500 ⁴⁾	5000	1PL6186- ■ ■ F ■ ■ - 0 ...	
	225	165 (221)	900 (664)	292	400	2900	3100 ⁴⁾	4500	1PL6224- ■ ■ F ■ ■ - 0 ...	
		200 (268)	1091 (805)	350	400	2900	3100 ⁴⁾	4500	1PL6226- ■ ■ F ■ ■ - 0 ...	
		265 (355)	1446 (1067)	470	400	2900	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ F ■ ■ - 0 ...	
	280	370 (496)	2019 (1489)	616	400	2200	2200	2200	3300	1PL6284- ■ ■ F ■ ■ - 0 ...
		445 (597)	2429 (1792)	736	400	2200	2200	2200	3300	1PL6286- ■ ■ F ■ ■ - 0 ...
560 (751)		3055 (2253)	924	400	2200	2200	2200	3300	1PL6288- ■ ■ F ■ ■ - 0 ...	
2900	180	113 (152)	372 (274)	209	400	5000	3500 ⁴⁾	5000	1PL6184- ■ ■ L ■ ■ - 0 ...	
		150 (201)	494 (364)	280	390	5000	3500 ⁴⁾	5000	1PL6186- ■ ■ L ■ ■ - 0 ...	
	225	205 (275)	675 (498)	365	400	3500	3100 ⁴⁾	4500	1PL6224- ■ ■ L ■ ■ - 0 ...	
		270 (362)	889 (656)	470	400	3500	3100 ⁴⁾	4500	1PL6226- ■ ■ L ■ ■ - 0 ...	
		300 (402)	988 (729)	530	400	3500	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ L ■ ■ - 0 ...	

For versions, see
Order No. supplement and
options on page 5/90.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Motor type (repeated)	Power factor $\cos \varphi$	Magnetizing current I_{μ} A	Efficiency η_{rated}	Rated frequency f_{rated} Hz	Moment of inertia J kgm ² (lb _r -in-s ²)	Weight, approx. kg (lb)	Terminal box Type	SINAMICS S120 Motor Module	
								Rated output current ⁶⁾ I_{rated} A	For additional versions and components see chapter SINAMICS S120 drive system Order No.
1PL6184-..B...	0.86	33	0.800	14.4	0.503 (4.45)	370 (816)	1XB7322	85	6SL3120-1TE28-5AA3
1PL6186-..B...	0.85	47	0.814	14.3	0.666 (5.89)	440 (970)	1XB7322	85 ⁷⁾	6SL3120-1TE28-5AA3
1PL6224-..B...	0.87	45	0.844	14.2	1.479 (13.1)	630 (1389)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6226-..B...	0.85	67	0.868	14.0	1.930 (17.1)	750 (1654)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6228-..B...	0.86	77	0.871	14.0	2.326 (20.6)	860 (1896)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6284-..C...	0.90	95	0.929	27.3	4.2 (37.2)	1300 (2867)	1XB7712	380	6SL3320-1TE33-8AA3
1PL6286-..C...	0.90	135	0.934	27.3	5.2 (46.0)	1500 (3308)	1XB7712	490	6SL3320-1TE35-0AA3
1PL6288-..C...	0.90	170	0.939	27.3	6.3 (55.8)	1700 (3749)	1XB7712	745	6SL3320-1TE37-5AA3
1PL6184-..D...	0.86	46	0.906	39.4	0.503 (4.45)	370 (816)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6186-..D...	0.86	62	0.910	39.4	0.666 (5.89)	440 (970)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6224-..D...	0.85	86	0.930	39.1	1.479 (13.1)	630 (1389)	1XB7422	260	6SL3320-1TE32-6AA3
1PL6226-..D...	0.87	92	0.930	39.2	1.930 (17.1)	750 (1654)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6228-..D...	0.88	102	0.931	39.2	2.326 (20.6)	860 (1896)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6284-..D...	0.89	156	0.950	38.9	4.2 (37.2)	1300 (2867)	1XB7712	490	6SL3320-1TE35-0AA3
1PL6286-..D...	0.89	214	0.953	38.9	5.2 (46.0)	1500 (3308)	1XB7712	840	6SL3320-1TE38-4AA3
1PL6288-..D...	0.89	248	0.955	38.9	6.3 (55.8)	1700 (3749)	1XB7712	985	6SL3320-1TE41-0AA3
1PL6184-..F...	0.84	68	0.921	59.3	0.503 (4.45)	370 (816)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6186-..F...	0.84	92	0.935	59.3	0.666 (5.89)	440 (970)	1XB7422	260	6SL3320-1TE32-6AA3
1PL6224-..F...	0.87	90	0.942	59.2	1.479 (13.1)	630 (1389)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6226-..F...	0.87	122	0.942	59.1	1.930 (17.1)	750 (1654)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6228-..F...	0.86	174	0.948	59.0	2.326 (20.6)	860 (1896)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6284-..F...	0.90	162	0.959	59.0	4.2 (37.2)	1300 (2867)	1XB7712	745	6SL3320-1TE37-5AA3
1PL6286-..F...	0.91	182	0.960	59.0	5.2 (46.0)	1500 (3308)	1XB7712	840 ⁷⁾	6SL3320-1TE38-4AA3
1PL6288-..F...	0.91	232	0.962	59.0	6.3 (55.8)	1700 (3749)	1XB7712	1260	6SL3320-1TE41-2AA3
1PL6184-..L...	0.85	79	0.938	97.6	0.503 (4.45)	370 (816)	1XB7422	210	6SL3320-1TE32-1AA3
1PL6186-..L...	0.84	110	0.943	97.5	0.666 (5.89)	440 (970)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6224-..L...	0.86	118	0.950	97.5	1.479 (13.1)	630 (1389)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6226-..L...	0.87	160	0.952	97.4	1.930 (17.1)	750 (1654)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6228-..L...	0.86	188	0.952	97.3	2.326 (20.6)	860 (1896)	1XB7700	745	6SL3320-1TE37-5AA3

1) n_2 : Max. permissible thermal speed at constant power or speed which is at the voltage limit when $P = P_{rated}$.

2) n_{S1} : Maximum permissible speed that is continuously permitted without speed duty cycles.

3) n_{max} : Maximum speed that must not be exceeded.

4) Speed is reduced with increased radial forces, see selection guides.

5) The speed is limited to lower values in some cases. The following restriction applies: Maximum output frequency < 5 × motor rated frequency.

6) The rated pulse frequencies must be taken into account. The rated motor data is valid for 4 kHz or 2 kHz.

7) The rated output current of the Motor Module is lower than the rated motor current at 2 kHz.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Selection and ordering data

Rated speed	Shaft height	Rated power	Rated torque	Rated current	Rated voltage	Speed during field weakening ¹⁾	Continuous speed, max. ²⁾	Speed max. ³⁾	1PL6 asynchronous motor Forced ventilation	
n_{rated} rpm	SH	P_{rated} kW (HP)	M_{rated} Nm (lb-ft)	I_{rated} A	U_{rated} V	n_2 rpm	n_{S1} rpm	n_{max} rpm	Order No.	
Line voltage 480 V 3 AC, Smart/Basic/Active Line Module										
500	180	30 (40.2)	573 (423)	66	370	1900	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6184- ■ ■ B ■ ■ - 0 ...	
		40 (53.6)	764 (564)	91	355	2000	3500 ⁴⁾⁵⁾	5000 ⁵⁾	1PL6186- ■ ■ B ■ ■ - 0 ...	
	225	55 (73.8)	1050 (774)	114	370	1800	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6224- ■ ■ B ■ ■ - 0 ...	
		72 (96.6)	1375 (1014)	147	375	2000	3100 ⁴⁾⁵⁾	4500 ⁵⁾	1PL6226- ■ ■ B ■ ■ - 0 ...	
		90 (121)	1719 (1268)	180	380	1900	3100 ⁴⁾⁵⁾	4500 ⁴⁾⁵⁾	1PL6228- ■ ■ B ■ ■ - 0 ...	
1000	280	235 (315)	2244 (1655)	335	480	2200	2200	3300	1PL6284- ■ ■ C ■ ■ - 0 ...	
		310 (416)	2961 (2184)	440	480	2200	2200	3300	1PL6286- ■ ■ C ■ ■ - 0 ...	
		385 (516)	3677 (2712)	570	460	2200	2200	3300	1PL6288- ■ ■ C ■ ■ - 0 ...	
1350	180	74 (99.2)	523 (386)	119	460	3000	3500 ⁴⁾	5000	1PL6184- ■ ■ D ■ ■ - 0 ...	
		98 (131)	693 (511)	156	460	3100	3500 ⁴⁾	5000	1PL6186- ■ ■ D ■ ■ - 0 ...	
	225	137 (184)	969 (715)	215	460	2900	3100 ⁴⁾	4500	1PL6224- ■ ■ D ■ ■ - 0 ...	
		172 (231)	1217 (898)	265	460	2900	3100 ⁴⁾	4500	1PL6226- ■ ■ D ■ ■ - 0 ...	
		218 (292)	1542 (1137)	332	460	2900	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ D ■ ■ - 0 ...	
	280	325 (436)	2299 (1696)	478	470	2200	2200	2200	3300	1PL6284- ■ ■ D ■ ■ - 0 ...
		410 (550)	2901 (2140)	637	445	2200	2200	2200	3300	1PL6286- ■ ■ D ■ ■ - 0 ...
		505 (677)	3573 (2635)	765	450	2200	2200	3300	1PL6288- ■ ■ D ■ ■ - 0 ...	
2000	180	98 (131)	468 (345)	161	460	5000	3500 ⁴⁾	5000	1PL6184- ■ ■ F ■ ■ - 0 ...	
		135 (181)	645 (476)	220	460	5000	3500 ⁴⁾	5000	1PL6186- ■ ■ F ■ ■ - 0 ...	
	225	178 (239)	850 (627)	275	460	2900	3100 ⁴⁾	4500	1PL6224- ■ ■ F ■ ■ - 0 ...	
		220 (295)	1050 (774)	342	460	2900	3100 ⁴⁾	4500	1PL6226- ■ ■ F ■ ■ - 0 ...	
		288 (386)	1375 (1014)	450	460	2900	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ F ■ ■ - 0 ...	
	280	415 (557)	1981 (1461)	616	455	2200	2200	2200	3300	1PL6284- ■ ■ F ■ ■ - 0 ...
		500 (671)	2387 (1761)	736	455	2200	2200	2200	3300	1PL6286- ■ ■ F ■ ■ - 0 ...
		630 (845)	3009 (2219)	924	455	2200	2200	3300	1PL6288- ■ ■ F ■ ■ - 0 ...	
2900	180	113 (152)	372 (274)	209	400	5000	3500 ⁴⁾	5000	1PL6184- ■ ■ L ■ ■ - 0 ...	
		150 (201)	494 (364)	280	390	5000	3500 ⁴⁾	5000	1PL6186- ■ ■ L ■ ■ - 0 ...	
	225	205 (275)	675 (498)	365	400	3500	3100 ⁴⁾	4500	1PL6224- ■ ■ L ■ ■ - 0 ...	
		270 (362)	889 (656)	470	395	3500	3100 ⁴⁾	4500	1PL6226- ■ ■ L ■ ■ - 0 ...	
		300 (402)	988 (729)	530	400	3500	3100 ⁴⁾	4500 ⁴⁾	1PL6228- ■ ■ L ■ ■ - 0 ...	

For versions, see
Order No. supplement and
options on page 5/90.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Motor type (repeated)	Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight, approx.	Terminal box	SINAMICS S120 Motor Module	
								Rated output current ⁶⁾	For additional versions and components see chapter SINAMICS S120 drive system
	$\cos \varphi$	I_{μ}	η_{rated}	f_{rated}	J			I_{rated}	Order No.
		A		Hz	kgm ² (lb _T -in-s ²)	kg (lb)	Type	A	
1PL6184-..B...	0.84	34	0.844	17.6	0.503 (4.45)	370 (816)	1XB7322	85	6SL3120-1TE28-5AA3
1PL6186-..B...	0.84	46	0.845	17.6	0.666 (5.89)	440 (970)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6224-..B...	0.86	46	0.875	17.5	1.479 (13.1)	630 (1389)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6226-..B...	0.85	66	0.887	17.4	1.930 (17.1)	750 (1654)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6228-..B...	0.85	79	0.894	17.4	2.326 (20.6)	860 (1896)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6284-..C...	0.90	90	0.939	34.0	4.2 (37.2)	1300 (2867)	1XB7712	380	6SL3320-1TE33-8AA3
1PL6286-..C...	0.90	135	0.945	34.0	5.2 (46.0)	1500 (3308)	1XB7712	490	6SL3320-1TE35-0AA3
1PL6288-..C...	0.90	170	0.948	34.0	6.3 (55.8)	1700 (3749)	1XB7712	745	6SL3320-1TE37-5AA3
1PL6184-..D...	0.86	44	0.918	46.1	0.503 (4.45)	370 (816)	1XB7322	132	6SL3120-1TE31-3AA3
1PL6186-..D...	0.85	60	0.920	46.0	0.666 (5.89)	440 (970)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6224-..D...	0.85	82	0.940	45.8	1.479 (13.1)	630 (1389)	1XB7422	210 ⁷⁾	6SL3320-1TE32-1AA3
1PL6226-..D...	0.87	88	0.940	45.8	1.930 (17.1)	750 (1654)	1XB7700	260 ⁷⁾	6SL3320-1TE32-6AA3
1PL6228-..D...	0.88	100	0.938	45.8	2.326 (20.6)	860 (1896)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6284-..D...	0.89	157	0.955	45.5	4.2 (37.2)	1300 (2867)	1XB7712	490	6SL3320-1TE35-0AA3
1PL6286-..D...	0.89	215	0.957	45.5	5.2 (46.0)	1500 (3308)	1XB7712	840	6SL3320-1TE38-4AA3
1PL6288-..D...	0.89	248	0.959	45.5	6.3 (55.8)	1700 (3749)	1XB7712	985	6SL3320-1TE41-0AA3
1PL6184-..F...	0.83	70	0.934	67.5	0.503 (4.45)	370 (816)	1XB7322	200	6SL3120-1TE32-0AA3
1PL6186-..F...	0.83	94	0.940	67.5	0.666 (5.89)	440 (970)	1XB7422	260	6SL3320-1TE32-6AA3
1PL6224-..F...	0.86	91	0.944	67.5	1.479 (13.1)	630 (1389)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6226-..F...	0.86	124	0.948	67.5	1.930 (17.1)	750 (1654)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6228-..F...	0.85	176	0.948	67.3	2.326 (20.6)	860 (1896)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6284-..F...	0.90	161	0.961	67.3	4.2 (37.2)	1300 (2867)	1XB7712	745	6SL3320-1TE37-5AA3
1PL6286-..F...	0.91	181	0.963	67.3	5.2 (46.0)	1500 (3308)	1XB7712	840 ⁷⁾	6SL3320-1TE38-4AA3
1PL6288-..F...	0.91	231	0.965	67.3	6.3 (55.8)	1700 (3749)	1XB7712	1260	6SL3320-1TE41-2AA3
1PL6184-..L...	0.85	79	0.938	97.6	0.503 (4.45)	370 (816)	1XB7422	210	6SL3320-1TE32-1AA3
1PL6186-..L...	0.84	110	0.943	97.5	0.666 (5.89)	440 (970)	1XB7700	310	6SL3320-1TE33-1AA3
1PL6224-..L...	0.86	118	0.950	97.5	1.479 (13.1)	630 (1389)	1XB7700	380	6SL3320-1TE33-8AA3
1PL6226-..L...	0.87	160	0.952	97.4	1.930 (17.1)	750 (1654)	1XB7700	490	6SL3320-1TE35-0AA3
1PL6228-..L...	0.86	188	0.952	97.3	2.326 (20.6)	860 (1896)	1XB7700	745	6SL3320-1TE37-5AA3

1) n_2 : Max. permissible thermal speed at constant power or speed which is at the voltage limit when $P = P_{rated}$.

2) n_{S1} : Maximum permissible speed that is continuously permitted without speed duty cycles.

3) n_{max} : Maximum speed that must not be exceeded.

4) Speed is reduced with increased radial forces, see selection guides.

5) The speed is limited to lower values in some cases. The following restriction applies: Maximum output frequency < 5 × motor rated frequency.

6) The rated pulse frequencies must be taken into account. The rated motor data is valid for 4 kHz or 2 kHz.

7) The rated output current of the Motor Module is lower than the rated motor current at 2 kHz.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Selection and ordering data

Rated speed	Shaft height	Rated power	Rated torque	Rated current	Rated voltage	Speed during field weakening ¹⁾	Continuous speed, max. ²⁾	Speed, max. ³⁾	1PL6 asynchronous motor Forced ventilation	Order code
n_{rated} rpm	SH	P_{rated} kW (HP)	M_{rated} Nm (lb _f -ft)	I_{rated} A	U_{rated} V	n_2 rpm	n_{S1} rpm	n_{max} rpm	Order No.	Order code
Line voltage 690 V 3 AC, Active Line Module										
800	280	185 (248)	2208 (1629)	185	690	2000	2200	3300	1PL6284- ■ ■ C ■ ■ - 0 ... -Z	C30
		240 (322)	2865 (2113)	250	665	2100	2200	3300	1PL6286- ■ ■ C ■ ■ - 0 ... -Z	C30
		300 (402)	3581 (2641)	320	640	2200	2200	3300	1PL6288- ■ ■ C ■ ■ - 0 ... -Z	C30
1150	280	272 (365)	2259 (1666)	270	690	2200	2200	3300	1PL6284- ■ ■ D ■ ■ - 0 ... -Z	C30
		344 (461)	2857 (2107)	359	655	2200	2200	3300	1PL6286- ■ ■ D ■ ■ - 0 ... -Z	C30
		422 (566)	3504 (2585)	431	665	2200	2200	3300	1PL6288- ■ ■ D ■ ■ - 0 ... -Z	C30
1750	280	359 (481)	1959 (1445)	347	690	2200	2200	3300	1PL6284- ■ ■ F ■ ■ - 0 ... -Z	C30
		432 (579)	2357 (1739)	415	690	2200	2200	3300	1PL6286- ■ ■ F ■ ■ - 0 ... -Z	C30
		543 (728)	2963 (2186)	520	690	2200	2200	3300	1PL6288- ■ ■ F ■ ■ - 0 ... -Z	C30

For versions, see Order No. supplement and options on page 5/92.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Motor type (repeated)	Power factor	Magne- tizing current	Efficiency	Rated frequency	Moment of inertia	Weight, approx.	Terminal box	SINAMICS S120 Motor Module	
								Rated output current ⁴⁾	For additional versions and components see chapter SINAMICS S120 drive system Order No.
	$\cos \varphi$	I_{μ}	η_{rated}	f_{rated}	J			I_{rated}	
		A		Hz	kgm^2 (lb _f -in-s ²)	kg (lb)	Type	A	
1PL6284-..C...	0.90	55	0.928	27	4.2 (37.2)	1300 (2867)	1XB7712	215	6SL3320-1TG32-2AA3
1PL6286-..C...	0.90	80	0.934	27	5.2 (46.0)	1500 (3308)	1XB7712	330	6SL3320-1TG33-3AA3
1PL6288-..C...	0.90	100	0.938	27	6.3 (55.8)	1700 (3749)	1XB7712	410	6SL3320-1TG34-1AA3
1PL6284-..D...	0.89	89	0.949	38.9	4.2 (37.2)	1300 (2867)	1XB7712	330	6SL3320-1TG33-3AA3
1PL6286-..D...	0.89	123	0.953	38.9	5.2 (46.0)	1500 (3308)	1XB7712	410	6SL3320-1TG34-1AA3
1PL6288-..D...	0.89	143	0.955	38.9	6.3 (55.8)	1700 (3749)	1XB7712	465 ⁵⁾	6SL3320-1TG34-7AA3
1PL6284-..F...	0.90	93	0.958	59	4.2 (37.2)	1300 (2867)	1XB7712	410	6SL3320-1TG34-1AA3
1PL6286-..F...	0.91	105	0.960	59	5.2 (46.0)	1500 (3308)	1XB7712	465	6SL3320-1TG34-7AA3
1PL6288-..F...	0.91	133	0.962	59	6.3 (55.8)	1700 (3749)	1XB7712	575	6SL3320-1TG35-8AA3

5

- 1) n_2 : Max. permissible thermal speed at constant power or speed which is at the voltage limit when $P = P_{rated}$.
- 2) n_{S1} : Maximum permissible speed that is continuously permitted without speed duty cycles.
- 3) n_{max} : Maximum speed that must not be exceeded.
- 4) The rated pulse frequencies must be taken into account. The rated motor data is valid for 4 kHz or 2 kHz.
- 5) The rated output current of the Motor Module is lower than the rated motor current at 2 kHz.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Order No. supplements for 1PL618/1PL622 motors

Data position of the Order No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
Shaft height 180	1	P	L	6	1	8	.	-	.	■	.	■	■	-	0	■	■	■	-	Z
Shaft height 225	1	P	L	6	2	2	.													
Overall length¹⁾							.													
Fan																				
External fan, PG cable gland in terminal box								2												
Without external fan, for pipe connection, PG cable gland in terminal box								6												
External fan, metric cable gland in terminal box								7												
Without external fan, for pipe connection, metric cable gland in terminal box								8												
Encoder systems for motors without DRIVE-CLiQ interface																				
Without encoder																				A
Absolute encoder 2048 S/R, 4096 revolutions, multi-turn (encoder AM2048S/R)																				E
Incremental encoder HTL 1024 S/R (encoder HTL1024S/R)																				H
Incremental encoder HTL 2048 S/R (encoder HTL2048S/R)																				J
Incremental encoder sin/cos 1 V _{pp} 2048 S/R with C and D tracks (encoder IC2048S/R)																				M
Incremental encoder sin/cos 1 V _{pp} 2048 S/R without C and D tracks (encoder IN2048S/R)																				N
Encoder systems for motors with DRIVE-CLiQ interface																				
Absolute encoder 22 bit (resolution 4194304, internal 2048 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) (encoder AM22DQ)																				F
Incremental encoder 22 bit (resolution 4194304, internal 2048 S/R) + commutation position 11 bit (encoder IC22DQ)																				D
Incremental encoder 22 bit without commutation position (encoder IN22DQ)																				Q
Rated speeds at 380 V to 480 V 3 AC (winding design)																				
400 rpm/500 rpm																				B
1000 rpm/1150 rpm/1350 rpm																				D
1500 rpm/1750 rpm/2000 rpm																				F
2500 rpm/2900 rpm																				L
Cable connection (view of DE)																				
<u>Terminal box</u>																				
<u>Cable entry</u>																				
Top																				0
Top																				1
Top																				2
Top																				3

For 12th to 16th data position of the Order No., see page 5/91.

¹⁾ Not selectable. Determined by the choice of rated power.

Order No. supplements for 1PL618/1PL622 motors (continued)

Data position of the Order No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16								
Shaft height 180	1	P	L	6	1	8	.	-	.	■	.	■	■	-	0	■	■	■	-	Z				
Shaft height 225	1	P	L	6	2	2	.																	
Type of construction																								
IM B3												0												
IM B3					Hoisting system for different types of construction (IM B6, IM B7, IM B8, IM V5, IM V6)							1												
IM B35					1PL618 with A450 flange 1PL622 with A550 flange							3												
IM B35					1PL618 with A450 flange 1PL622 with A550 flange Hoisting system for different types of construction (IM V15, IM V36)							5												
Bearing version																								
					Vibration magnitude acc. to Siemens/EN 60034-14¹⁾				Shaft and flange accuracy¹⁾															
Coupling							R/A						N							A				
Coupling							R/A						R							B				
Coupling							S/A						R							C				
Coupling							SR/A						R							D				
Belt							R/A						N							E				
Belt							R/A						R							F				
Increased cantilever forces							R/A						N							G				
Increased cantilever forces							R/A						R							H				
Shaft extension DE																								
					Balancing				Direction of air flow (fan)															
Fitted key																				A				
Fitted key																				B				
Fitted key																				C				
Fitted key																				D				
Plain shaft							-													J				
Plain shaft							-													K				
Paint finish																								
Primed																				0				
Anthracite RAL 7016																				3				
Special paint finish in anthracite RAL 7016																				6				
Special version (order codes are required for options)																								- Z

1) For definition, see 1PL6 Configuration Manual.

2) Preferred direction of air flow in a polluted environment.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Order No. supplements for 1PL628 motors

Data position of the Order No.			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
Shaft height 280			1	P	L	6	2	8	.	-	.	■	.	■	■	-	0	■	■	■	-	Z
Overall length¹⁾			.																			
Fans²⁾	Mounting	Direction of air flow																				
External fan	NDE top	NDE → DE	0																			
External fan	NDE right	NDE → DE	1																			
External fan	NDE left	NDE → DE	2																			
External fan	DE top	DE → NDE	3																			
External fan	DE right	DE → NDE	4																			
External fan	DE left	DE → NDE	5																			
Without external fan	NDE right for single pipe connection		6																			
Encoder systems for motors without DRIVE-CLiQ interface																						
Without encoder																						
Absolute encoder 2048 S/R, 4096 revolutions, multi-turn (encoder AM2048S/R)																						
Incremental encoder HTL 1024 S/R (encoder HTL1024S/R)																						
Incremental encoder HTL 2048 S/R (encoder HTL2048S/R)																						
Incremental encoder sin/cos 1 V _{pp} 2048 S/R with C and D tracks (encoder IC2048S/R)																						
Incremental encoder sin/cos 1 V _{pp} 2048 S/R without C and D tracks (encoder IN2048S/R)																						
Encoder systems for motors with DRIVE-CLiQ interface																						
Absolute encoder 22 bit (resolution 4194304, internal 2048 S/R) + 12 bit multi-turn (traversing range 4096 revolutions) (encoder AM22DQ)																						
Incremental encoder 22 bit (resolution 4194304, internal 2048 S/R) + commutation position 11 bit (encoder IC22DQ)																						
Incremental encoder 22 bit without commutation position (encoder IN22DQ)																						
Rated speeds at 380 V to 480 V 3 AC (winding design)																						
800 rpm/1000 rpm																						
1150 rpm/1350 rpm																						
1750 rpm/2000 rpm																						
Rated speeds at 690 V 3 AC (winding design)																						
800 rpm	Order code C30 required		C																			
1150 rpm	Order code C30 required		D																			
1750 rpm	Order code C30 required		F																			
Cable connection (view of DE)²⁾																						
Terminal box	Cable entry	Signal connection																				
NDE right	Bottom	DE	0																			
NDE left	Bottom	DE	1																			
NDE top	Right	DE	2																			
DE top	Right	NDE	5																			

For 12th to 16th data position of the Order No., see page 5/93.

¹⁾ Not selectable. Determined by the choice of rated power.

²⁾ See selection guides.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors
Forced ventilation, IP23 degree of protection

Order No. supplements for 1PL628 motors (continued)

Data position of the Order No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
Shaft height 280	1	P	L	6	2	8	.	-	.	■	.	■	■	-	0	■	■	■	-	Z			
Type of construction¹⁾																							
IM B3													0										
IM V5	Can be subsequently modified to IM V6.												1										
IM B35	With A660 flange												3										
IM V15	With A660 flange												5										
Bearing version													Vibration magnitude acc. to Siemens/EN 60034-14²⁾		Shaft and flange accuracy²⁾								
Coupling													A	N		A							
Coupling													R/A	R		B							
Increased cantilever forces													A	N		E							
Increased cantilever forces													R/A	R		F							
Shaft extension DE													Balancing										
Fitted key													Half-key		A								
Fitted key													Full-key		C								
Plain shaft													-		J								
Paint finish																							
Primed																						0	
Anthracite RAL 7016																						3	
Special paint finish in anthracite RAL 7016																						6	
Special version (order codes are required for options)																						- Z	

Permissible combinations of mechanical variants for 1PL6 motors, see 1PH7 motors, page 5/76.

¹⁾ See technical definitions for AC motors in chapter Servomotors.

²⁾ For definition, see 1PL6 Configuration Manual.

Main motors

Asynchronous and synchronous motors for SINAMICS S120

1PL6 asynchronous motors Forced ventilation, IP23 degree of protection

Options

Order code	Description	For use with motors	
		1PL618 1PL622	1PL628
C30	Winding version 690 V 3 AC	–	✓
G14	Fan unit with air filter	✓	✓
G80	Prepared for mounting an incremental encoder POG 10	–	✓
K08	Signal connector mounted opposite	–	✓
K16	Second standard shaft extension (only possible without encoder)	–	✓
K31	2nd rating plate supplied separately in terminal box	✓	✓
K40	Re-lubrication device DE and NDE (not possible with bearings for increased maximum speed)	✓	Standard
K45	230 V AC standstill heating	–	✓
K55	Cable entry plate, terminal box, customer-specific ¹⁾	✓	✓
K83	Terminal box rotated through +90 degrees	–	✓
K84	Terminal box rotated through -90 degrees	–	✓
K85	Terminal box rotated through 180 degrees	–	✓
L27	NDE bearing in insulated version	✓	Standard
		Only for 1PL618 Standard with 1PL622	
M83	Additional thread for a setting screw on motor feet	–	✓
Y55	Non-standard shaft extension DE	On request	On request
Y80	Different rating plate data ¹⁾	On request	On request
Y82	Additional rating plate with customer data ¹⁾	On request	On request
Primer or paint finish in anthracite RAL 7016		Standard	Standard
R1Y	Paint finish in other RAL color ²⁾	✓	✓
R2Y	Special finish in other RAL color ²⁾	✓	✓

✓ Option available

– Option not available

When ordering a motor with options, **-Z** should be added to the order number.

¹⁾ Plain text is required in addition to order code.

²⁾ RAL color number must be specified in addition to order code.