

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 core type motors SH 100 to SH 160

#### Selection and Ordering Data

| Shaft height                                             | Rated speed | Continuous speed, max.                                              |                      | Speed, max. <sup>1)</sup>    |                | Rated power for duty type in accordance with IEC 60034-1 |                    |                    |                      | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Core type |        |  |
|----------------------------------------------------------|-------------|---------------------------------------------------------------------|----------------------|------------------------------|----------------|----------------------------------------------------------|--------------------|--------------------|----------------------|-----------------------------------------------------------------------------|--------|--|
| SH                                                       | $n_{rated}$ | $n_{S1\ cont.}^{2)}$                                                | $n_{S1\ cont.}^{3)}$ | $n_{max}$                    | $n_{max}^{4)}$ | $P_{rated}$                                              |                    |                    |                      |                                                                             |        |  |
|                                                          | rpm         | rpm                                                                 | rpm                  | rpm                          | rpm            | S1<br>kW (HP)                                            | S6-60 %<br>kW (HP) | S6-40 %<br>kW (HP) | S2-30 min<br>kW (HP) |                                                                             |        |  |
| 100                                                      | 2 000       | 5 500                                                               | –                    | 9 000                        | –              | 7 (9.39)                                                 | 8.5 (11.4)         | 10 (13.4)          | 9.25(12.4)           | 1PH7103 - ■ ■ G02 - 0C ■ 0                                                  |        |  |
|                                                          | 1 500       | 5 500                                                               | –                    | 9 000                        | –              | 9 (12.1)                                                 | 11 (14.8)          | 13 (17.4)          | 12 (16.1)            | 1PH7107 - ■ ■ F02 - 0C ■ 0                                                  |        |  |
| 132                                                      | 1 000       | 4 500                                                               | –                    | 8 000                        | –              | 12 (16.1)                                                | 15 (20.1)          | 18.5 (24.8)        | 16 (21.5)            | 1PH7133 - ■ ■ D02 - 0C ■ 0                                                  |        |  |
|                                                          | 2 000       |                                                                     |                      |                              |                | 20 (26.8)                                                | 25 (33.5)          | 30 (40.2)          | 27.5 (36.9)          | 1PH7133 - ■ ■ G02 - 0C ■ 0                                                  |        |  |
|                                                          | 1 000       | 4 500                                                               | –                    | 8 000                        | –              | 17 (22.8)                                                | 20.5 (27.5)        | 25 (33.5)          | 22.5 (30.2)          | 1PH7137 - ■ ■ D02 - 0C ■ 0                                                  |        |  |
|                                                          | 2 000       |                                                                     |                      |                              |                | 28 (37.6)                                                | 35 (46.9)          | 43 (57.7)          | 39 (52.3)            | 1PH7137 - ■ ■ G02 - 0C ■ 0                                                  |        |  |
| 160                                                      | 1 000       | 3 700                                                               | –                    | 6 500                        | –              | 22 (29.5)                                                | 27 (36.2)          | 33 (44.3)          | 30 (40.2)            | 1PH7163 - ■ ■ D03 - 0C ■ 0                                                  |        |  |
|                                                          | 1 500       |                                                                     |                      |                              |                | 30 (40.2)                                                | 37 (49.6)          | 45 (60.4)          | 41 (55.0)            | 1PH7163 - ■ ■ F03 - 0C ■ 0                                                  |        |  |
|                                                          | 1 500       | 3 700                                                               | –                    | 6 500                        | –              | 37 (49.6)                                                | 46 (61.7)          | 56 (75.1)          | 51 (68.4)            | 1PH7167 - ■ ■ F03 - 0C ■ 0                                                  |        |  |
| Fans:                                                    |             | External fan unit, heavy-gauge threaded cable entry in terminal box |                      |                              |                |                                                          |                    |                    |                      | 2                                                                           |        |  |
|                                                          |             | External fan unit, metric cable entry in terminal box               |                      |                              |                |                                                          |                    |                    |                      | 7                                                                           |        |  |
| Encoder systems for motors without DRIVE-CLiQ interface: |             | Incremental encoder sin/cos 1 V <sub>pp</sub> without C and D track |                      |                              |                |                                                          |                    |                    |                      | N                                                                           |        |  |
| Encoder systems for motors with DRIVE-CLiQ interface:    |             | Incremental encoder 22 bit                                          |                      |                              |                |                                                          |                    |                    |                      | Q                                                                           |        |  |
| Type of construction: <sup>5)</sup>                      |             | IM B5 (IM V1, IM V3)                                                |                      |                              |                |                                                          |                    |                    |                      | 2                                                                           |        |  |
|                                                          |             | IM B35 (IM V15, IM V35) <sup>6)</sup>                               |                      |                              |                |                                                          |                    |                    |                      | 3                                                                           |        |  |
| Shaft extension (DE): <sup>5)</sup>                      |             | Balancing:                                                          |                      | Direction of air flow (fan): |                | Blow-out direction:                                      |                    |                    |                      |                                                                             | A<br>J |  |
| Fitted key                                               |             | Half-key                                                            |                      | DE → NDE                     |                | Axial                                                    |                    |                    |                      |                                                                             |        |  |
| Plain shaft                                              |             | –                                                                   |                      | DE → NDE                     |                | Axial                                                    |                    |                    |                      |                                                                             |        |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 core type motors  
SH 100 to SH 160

### Selection and Ordering Data

| Motor type<br>(continued) | Rated torque                | Moment of inertia                                         | Weight, approx. | Rated current for duty type in accordance with IEC 60034-1 |              |              |                 | SINAMICS S120 Motor Module |                     |
|---------------------------|-----------------------------|-----------------------------------------------------------|-----------------|------------------------------------------------------------|--------------|--------------|-----------------|----------------------------|---------------------|
|                           | $M_{rated}$                 | J                                                         | m               | $I_{rated}$                                                |              |              |                 | Rated output current       | Booksize format     |
|                           | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)      | S1<br>A                                                    | S6-60 %<br>A | S6-40 %<br>A | S2- 30 min<br>A | S1<br>A                    | Order No.           |
| 1PH7103-2NG02-...         | 33.4 (24.6)                 | 0.017 (0.15)                                              | 40 (88.2)       | 17.5                                                       | 20.5         | 23.5         | 21.5            | 18                         | 6SL312 - TE21-8AA3  |
| 1PH7107-2NF02-...         | 57.3 (43.3)                 | 0.029 (0.26)                                              | 63 (138.9)      | 23.5                                                       | 27.5         | 31           | 29              | 30                         | 6SL312 - 1TE23-0AA3 |
| 1PH7133-2ND02-...         | 114.6 (84.5)                | 0.076 (0.67)                                              | 90 (198.5)      | 30                                                         | 36           | 43           | 37.5            | 30                         | 6SL312 - 1TE23-0AA3 |
| 1PH7133-2NG02-...         | 95.5 (70.4)                 | 0.076 (0.67)                                              | 90 (198.5)      | 45                                                         | 54           | 63           | 59              | 45                         | 6SL312 - 1TE24-5AA3 |
| 1PH7137-2ND02-...         | 162.3 (119.7)               | 0.109 (0.96)                                              | 130 (287)       | 43                                                         | 50           | 60           | 54              | 45                         | 6SL312 - 1TE24-5AA3 |
| 1PH7137-2NG02-...         | 133.7 (98.6)                | 0.109 (0.96)                                              | 130 (287)       | 60                                                         | 73           | 87           | 80              | 60                         | 6SL312 - 1TE26-0AA3 |
| 1PH7163-2ND03-...         | 210.1 (155)                 | 0.19 (1.68)                                               | 180 (397)       | 55                                                         | 65           | 77           | 71              | 60                         | 6SL312 - 1TE26-0AA3 |
| 1PH7163-2NF03-...         | 191.0 (141)                 | 0.19 (1.68)                                               | 180 (397)       | 72                                                         | 86           | 102          | 94              | 85                         | 6SL312 - 1TE28-5AA3 |
| 1PH7167-2NF03-...         | 235.5 (174)                 | 0.23 (2.04)                                               | 228 (503)       | 82                                                         | 97           | 115          | 104             | 85                         | 6SL312 - 1TE28-5AA3 |

#### Cooling:

Internal air cooling  
External air cooling

0  
1

#### Motor Module:

Single Motor Module  
Double Motor Module

1  
2



1PH7 motor (SH 100 to SH 160)

- 1) For continuous duty (with 30 %  $n_{max}$ , 60 %  $\frac{2}{3} n_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased maximum speed.
- 4) Version for increased maximum speed only possible with vibration magnitude grade SR. The following options are not possible:
  - Shaft seal.
- 5) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Shaft with fitted key and full-key balancing
- 6) Motors of shaft height 160 and higher require foot support.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 standard type motors SH 100

#### Selection and Ordering Data

| Shaft height                                                                                                                                        | Rated speed        | Continuous speed, max.                                                                                                                                                        |                            | Speed, max. <sup>1)</sup>                                                                                             |                       | Rated power for duty type in accordance with IEC 60034-1                  |                       |                       |                         | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Standard type |  |  |  |                            |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------|-----------------------|-----------------------|-------------------------|---------------------------------------------------------------------------------|--|--|--|----------------------------|--|
| SH                                                                                                                                                  | $n_{\text{rated}}$ | $n_{\text{S1 cont.}}^{2)}$                                                                                                                                                    | $n_{\text{S1 cont.}}^{3)}$ | $n_{\text{max}}$                                                                                                      | $n_{\text{max}}^{4)}$ | $P_{\text{rated}}$                                                        |                       |                       |                         |                                                                                 |  |  |  |                            |  |
|                                                                                                                                                     | rpm                | rpm                                                                                                                                                                           | rpm                        | rpm                                                                                                                   | rpm                   | S1<br>kW<br>(HP)                                                          | S6-60 %<br>kW<br>(HP) | S6-40 %<br>kW<br>(HP) | S2-30 min<br>kW<br>(HP) |                                                                                 |  |  |  |                            |  |
| 100                                                                                                                                                 | 1 500              | 5 500                                                                                                                                                                         | 10 000                     | 9 000                                                                                                                 | 12 000                | 3.7 (4.96)                                                                | 4.5 (6.03)            | 5.25 (7.04)           | 4.9 (6.57)              | 1PH7101 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 1 000              | 5 500                                                                                                                                                                         | 10 000                     | 9 000                                                                                                                 | 12 000                | 3.7 (4.96)                                                                | 4.5 (6.03)            | 5.25 (7.04)           | 4.7 (6.30)              | 1PH7103 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 1 500              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 5.5 (7.38)                                                                | 6.7 (8.98)            | 7.7 (10.3)            | 7 (9.39)                | 1PH7103 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 2 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 7 (9.39)                                                                  | 8.5 (11.4)            | 10 (13.4)             | 9.25 (12.4)             | 1PH7103 - ■ ■ G ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 1 500              | 5 500                                                                                                                                                                         | 10 000                     | 9 000                                                                                                                 | 12 000                | 7 (9.39)                                                                  | 8.5 (11.4)            | 10 (13.4)             | 9.25 (12.4)             | 1PH7105 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 1 000              | 5 500                                                                                                                                                                         | 10 000                     | 9 000                                                                                                                 | 12 000                | 6.25 (8.38)                                                               | 7.5 (10.1)            | 8.8 (11.8)            | 7.75 (10.4)             | 1PH7107 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 1 500              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 9 (12.1)                                                                  | 11 (14.8)             | 13 (17.4)             | 12 (16.1)               | 1PH7107 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
|                                                                                                                                                     | 2 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 10.5 (14.1)                                                               | 12.5 (16.8)           | 14.5 (19.4)           | 13.5 (18.1)             | 1PH7107 - ■ ■ G ■ ■ - 0 ■ ■ ■                                                   |  |  |  |                            |  |
| Fans:                                                                                                                                               |                    | External fan unit, heavy-gauge threaded cable entry in terminal box<br>External fan unit, metric cable entry in terminal box                                                  |                            |                                                                                                                       |                       |                                                                           |                       |                       |                         | 2<br>7                                                                          |  |  |  |                            |  |
| Encoder systems for motors without DRIVE-CLiQ interface:                                                                                            |                    | Absolute encoder EnDat 2 048 S/R<br>Incremental encoder sin/cos 1 V <sub>pp</sub> with C and D track<br>Incremental encoder sin/cos 1 V <sub>pp</sub> without C and D track   |                            |                                                                                                                       |                       |                                                                           |                       |                       |                         | E<br>M<br>N                                                                     |  |  |  |                            |  |
| Encoder systems for motors with DRIVE-CLiQ interface:                                                                                               |                    | Absolute encoder, 22 bit single-turn + 12 bit multi-turn<br>Incremental encoder, 22 bit with 11 bit commutation position<br>Incremental encoder, 22 bit                       |                            |                                                                                                                       |                       |                                                                           |                       |                       |                         | F<br>D<br>Q                                                                     |  |  |  |                            |  |
| Terminal box/<br>Cable entry:                                                                                                                       |                    | Top/right<br>Top/NDE<br>Top/left                                                                                                                                              |                            |                                                                                                                       |                       |                                                                           |                       |                       |                         | 0<br>2<br>3                                                                     |  |  |  |                            |  |
| Type of construction: <sup>5)</sup>                                                                                                                 |                    | IM B3 (IM V5, IM V6)<br>IM B5 (IM V1, IM V3)<br>IM B35 (IM V15, IM V35) <sup>7)</sup>                                                                                         |                            |                                                                                                                       |                       |                                                                           |                       |                       |                         | 0<br>2<br>3                                                                     |  |  |  |                            |  |
| Bearing version for:<br>Coupling/belt output<br>Coupling/belt output<br>Coupling/belt output<br>Increased speed<br>(coupling/belt output)           |                    | Vibration magnitude:<br>Grade R<br>Grade S<br>Grade SR<br>Grade SR                                                                                                            |                            | Shaft and flange accuracy:<br>Tolerance R<br>Tolerance R<br>Tolerance R<br>Tolerance R                                |                       |                                                                           |                       |                       |                         |                                                                                 |  |  |  | B<br>C<br>D<br>L           |  |
| Shaft extension (DE): <sup>5)</sup><br>Fitted key<br>Fitted key<br>Fitted key<br>Fitted key<br>Plain shaft<br>Plain shaft                           |                    | Balancing:<br>Half-key<br>Half-key<br>Full-key<br>Full-key<br>–<br>–                                                                                                          |                            | Direction of air flow (fan):<br>DE → NDE<br>NDE → DE<br>DE → NDE<br>NDE → DE<br>DE → NDE<br>NDE → DE                  |                       | Blow-out direction:<br>Axial<br>Axial<br>Axial<br>Axial<br>Axial<br>Axial |                       |                       |                         |                                                                                 |  |  |  | A<br>B<br>C<br>D<br>J<br>K |  |
| Degree of protection:<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54 |                    | Seal:<br>–<br>DE flange with shaft sealing ring <sup>6)</sup><br>–<br>DE flange with shaft sealing ring <sup>6)</sup><br>–<br>DE flange with shaft sealing ring <sup>6)</sup> |                            | Paint finish:<br>Unpainted<br>Unpainted<br>Anthracite<br>Anthracite<br>Anthracite, two coats<br>Anthracite, two coats |                       |                                                                           |                       |                       |                         |                                                                                 |  |  |  | 0<br>2<br>3<br>5<br>6<br>8 |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 standard type motors  
SH 100

### Selection and Ordering Data

| Motor type<br>(continued)                                          | Rated torque                | Moment of inertia                                         | Weight, approx. | Rated current for duty type in accordance with IEC 60034-1 |              |              |                 | SINAMICS S120 Motor Module |                      |
|--------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------|-----------------|------------------------------------------------------------|--------------|--------------|-----------------|----------------------------|----------------------|
|                                                                    | $M_{rated}$                 | $J$                                                       | $m$             | $I_{rated}$                                                |              |              |                 | Rated output current       | Booksize format      |
|                                                                    | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)      | S1<br>A                                                    | S6-60 %<br>A | S6-40 %<br>A | S2- 30 min<br>A | S1<br>A                    | Order No.            |
| 1PH7101 - ..F...                                                   | 23.6 (17.4)                 | 0.017 (0.15)                                              | 40 (88.2)       | 10                                                         | 11.5         | 12.5         | 12              | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7103 - ..D...                                                   | 35.3 (26.0)                 | 0.017 (0.15)                                              | 40 (88.2)       | 10                                                         | 11.5         | 13           | 12              | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7103 - ..F...                                                   | 35.0 (25.8)                 | 0.017 (0.15)                                              | 40 (88.2)       | 13                                                         | 16           | 18           | 16.5            | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7103 - ..G...                                                   | 33.4 (24.6)                 | 0.017 (0.15)                                              | 40 (88.2)       | 17.5                                                       | 20.5         | 23.5         | 21.5            | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7105 - ..F...                                                   | 44.6 (32.9)                 | 0.029 (0.26)                                              | 63 (139)        | 17.5                                                       | 21           | 23.5         | 22              | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7107 - ..D...                                                   | 59.7 (44.0)                 | 0.029 (0.26)                                              | 63 (139)        | 17.5                                                       | 20.5         | 23           | 21              | 18                         | 6SL312 - TE21-8AA3   |
| 1PH7107 - ..F...                                                   | 57.3 (43.3)                 | 0.029 (0.26)                                              | 63 (139)        | 23.5                                                       | 27.5         | 31           | 29              | 30                         | 6SL312 - 1 TE23-0AA3 |
| 1PH7107 - ..G...                                                   | 50.1 (37.0)                 | 0.029 (0.26)                                              | 63 (139)        | 26                                                         | 28.5         | 33           | 31              | 30                         | 6SL312 - 1 TE23-0AA3 |
| <b>Cooling:</b><br>Internal air cooling<br>External air cooling    |                             |                                                           |                 |                                                            |              |              |                 | 0<br>1                     |                      |
| <b>Motor Module:</b><br>Single Motor Module<br>Double Motor Module |                             |                                                           |                 |                                                            |              |              |                 |                            | 1<br>2               |



1PH7 motor (SH 100 to SH 160)

- 1) For continuous duty (with 30 %  $n_{max}$ , 60 %  $\frac{2}{3} n_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased maximum speed.
- 4) Version for increased maximum speed only possible with vibration magnitude grade SR. The following options are not possible:
  - Shaft sealing ring.
- 5) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Types of construction IM B5 or IM B35
  - Shaft with fitted key and full-key balancing
- 6) Only appropriate if the sealing ring is occasionally lubricated with oil spray/mist. A sealing ring is not possible with increased maximum speed.
- 7) Motors of shaft height 160 and higher require foot support.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 standard type motors SH 132

#### Selection and Ordering Data

| Shaft height                                             | Rated speed        | Continuous speed, max.                                                                |                            | Speed, max. <sup>1)</sup>    |                       | Rated power for duty type in accordance with IEC 60034-1 |                       |                            |                               | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Standard type |           |  |  |  |  |  |
|----------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------|----------------------------|------------------------------|-----------------------|----------------------------------------------------------|-----------------------|----------------------------|-------------------------------|---------------------------------------------------------------------------------|-----------|--|--|--|--|--|
| SH                                                       | $n_{\text{rated}}$ | $n_{\text{S1 cont.}}^{2)}$                                                            | $n_{\text{S1 cont.}}^{3)}$ | $n_{\text{max}}$             | $n_{\text{max}}^{4)}$ | $P_{\text{rated}}$                                       |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
|                                                          | rpm                | rpm                                                                                   | rpm                        | rpm                          | rpm                   | S1<br>kW<br>(HP)                                         | S6-60 %<br>kW<br>(HP) | S6-40 %<br>kW<br>(HP)      | S2-30 min<br>kW<br>(HP)       |                                                                                 | Order No. |  |  |  |  |  |
| 132                                                      | 1 500              | 4 500                                                                                 | 8 500                      | 8 000                        | 10 000                | 11 (14.8)                                                | 13.5 (18.1)           | 16.5 (22.1)                | 15 (20.1)                     | 1PH7131 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |
|                                                          | 1 000              | 4 500                                                                                 | 8 500                      | 8 000                        | 10 000                | 12 (16.1)                                                | 15 (20.1)             | 18.5 (24.8)                | 16 (21.5)                     | 1PH7133 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |
|                                                          | 15 (20.1)          |                                                                                       |                            |                              |                       | 18.5 (24.8)                                              | 23 (30.8)             | 20.5 (27.5)                | 1PH7133 - ■ ■ F ■ ■ - 0 ■ ■ ■ |                                                                                 |           |  |  |  |  |  |
|                                                          | 20 (26.8)          |                                                                                       |                            |                              |                       | 25 (33.5)                                                | 30 (40.2)             | 27.5 (36.9)                | 1PH7133 - ■ ■ G ■ ■ - 0 ■ ■ ■ |                                                                                 |           |  |  |  |  |  |
|                                                          | 1 500              | 4 500                                                                                 | 8 500                      | 8 000                        | 10 000                | 18.5 (24.8)                                              | 23 (30.8)             | 28 (37.6)                  | 25.5 (34.2)                   | 1PH7135 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |
|                                                          | 1 000              | 4 500                                                                                 | 8 500                      | 8 000                        | 10 000                | 17 (22.8)                                                | 20.5 (27.5)           | 25 (33.5)                  | 22.5 (30.2)                   | 1PH7137 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |
|                                                          | 22 (29.5)          |                                                                                       |                            |                              |                       | 27.5 (36.9)                                              | 33 (44.3)             | 30 (40.2)                  | 1PH7137 - ■ ■ F ■ ■ - 0 ■ ■ ■ |                                                                                 |           |  |  |  |  |  |
|                                                          | 28 (37.6)          |                                                                                       |                            |                              |                       | 35 (46.9)                                                | 43 (57.7)             | 39 (52.3)                  | 1PH7137 - ■ ■ G ■ ■ - 0 ■ ■ ■ |                                                                                 |           |  |  |  |  |  |
| Fans:                                                    |                    | External fan unit, heavy-gauge threaded cable entry in terminal box                   |                            |                              |                       |                                                          |                       |                            |                               | 2                                                                               |           |  |  |  |  |  |
| External fan unit, metric cable entry in terminal box    |                    |                                                                                       |                            |                              |                       |                                                          |                       | 7                          |                               |                                                                                 |           |  |  |  |  |  |
| Encoder systems for motors without DRIVE-CLiQ interface: |                    | Absolute encoder EnDat 2 048 S/R                                                      |                            |                              |                       |                                                          |                       |                            |                               | E                                                                               |           |  |  |  |  |  |
|                                                          |                    | Incremental encoder sin/cos 1 V <sub>pp</sub> with C and D track                      |                            |                              |                       |                                                          |                       |                            |                               | M                                                                               |           |  |  |  |  |  |
|                                                          |                    | Incremental encoder sin/cos 1 V <sub>pp</sub> without C and D track                   |                            |                              |                       |                                                          |                       |                            |                               | N                                                                               |           |  |  |  |  |  |
| Encoder systems for motors with DRIVE-CLiQ interface:    |                    | Absolute encoder, 22 bit single-turn + 12 bit multi-turn                              |                            |                              |                       |                                                          |                       |                            |                               | F                                                                               |           |  |  |  |  |  |
|                                                          |                    | Incremental encoder, 22 bit with 11 bit commutation position                          |                            |                              |                       |                                                          |                       |                            |                               | D                                                                               |           |  |  |  |  |  |
|                                                          |                    | Incremental encoder, 22 bit                                                           |                            |                              |                       |                                                          |                       |                            |                               | Q                                                                               |           |  |  |  |  |  |
| Terminal box/<br>Cable entry:                            |                    | Top/right<br>Top/NDE<br>Top/left                                                      |                            |                              |                       |                                                          |                       |                            |                               | 0                                                                               |           |  |  |  |  |  |
|                                                          |                    |                                                                                       |                            |                              |                       |                                                          |                       |                            |                               | 2                                                                               |           |  |  |  |  |  |
|                                                          |                    |                                                                                       |                            |                              |                       |                                                          |                       |                            |                               | 3                                                                               |           |  |  |  |  |  |
| Type of construction: <sup>5)</sup>                      |                    | IM B3 (IM V5, IM V6)<br>IM B5 (IM V1, IM V3)<br>IM B35 (IM V15, IM V35) <sup>7)</sup> |                            |                              |                       |                                                          |                       |                            |                               | 0                                                                               |           |  |  |  |  |  |
|                                                          |                    |                                                                                       |                            |                              |                       |                                                          |                       |                            |                               | 2                                                                               |           |  |  |  |  |  |
|                                                          |                    |                                                                                       |                            |                              |                       |                                                          |                       |                            |                               | 3                                                                               |           |  |  |  |  |  |
| Bearing version for:                                     |                    | Vibration magnitude:                                                                  |                            | Shaft and flange accuracy:   |                       |                                                          |                       |                            |                               | B<br>C<br>D<br>L                                                                |           |  |  |  |  |  |
| Coupling/belt output                                     |                    | Grade R                                                                               |                            | Tolerance R                  |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Coupling/belt output                                     |                    | Grade S                                                                               |                            | Tolerance R                  |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Coupling/belt output                                     |                    | Grade SR                                                                              |                            | Tolerance R                  |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Increased speed<br>(coupling/belt output)                |                    | Grade SR                                                                              |                            | Tolerance R                  |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Shaft extension (DE): <sup>5)</sup>                      |                    | Balancing:                                                                            |                            | Direction of air flow (fan): |                       | Blow-out direction:                                      |                       |                            |                               | A<br>B<br>C<br>D<br>J<br>K                                                      |           |  |  |  |  |  |
| Fitted key                                               |                    | Half-key                                                                              |                            | DE → NDE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Fitted key                                               |                    | Half-key                                                                              |                            | NDE → DE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Fitted key                                               |                    | Full-key                                                                              |                            | DE → NDE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Fitted key                                               |                    | Full-key                                                                              |                            | NDE → DE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Plain shaft                                              |                    | –                                                                                     |                            | DE → NDE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Plain shaft                                              |                    | –                                                                                     |                            | NDE → DE                     |                       | Axial                                                    |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| Degree of protection:                                    |                    | Seal:                                                                                 |                            | Paint finish:                |                       |                                                          |                       | 0<br>2<br>3<br>5<br>6<br>8 |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | –                                                                                     |                            | Unpainted                    |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | DE flange with shaft sealing ring <sup>6)</sup>                                       |                            | Unpainted                    |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | –                                                                                     |                            | Anthracite                   |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | DE flange with shaft sealing ring <sup>6)</sup>                                       |                            | Anthracite                   |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | –                                                                                     |                            | Anthracite, two coats        |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |
| IP55, fan IP54                                           |                    | DE flange with shaft sealing ring <sup>6)</sup>                                       |                            | Anthracite, two coats        |                       |                                                          |                       |                            |                               |                                                                                 |           |  |  |  |  |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 standard type motors  
SH 132

### Selection and Ordering Data

| Motor type<br>(continued) | Rated torque                | Moment of inertia                                         | Weight, approx. | Rated current for duty type in accordance with IEC 60034-1 |              |              |                | SINAMICS S120 Motor Module |                            |
|---------------------------|-----------------------------|-----------------------------------------------------------|-----------------|------------------------------------------------------------|--------------|--------------|----------------|----------------------------|----------------------------|
|                           | $M_{rated}$                 | $J$                                                       | $m$             | $I_{rated}$                                                |              |              |                | Rated output current       | Booksize format            |
|                           | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)      | S1<br>A                                                    | S6-60 %<br>A | S6-40 %<br>A | S2-30 min<br>A | S1<br>A                    | Order No.                  |
| 1PH7131 - ..F...          | 70.0 (51.6)                 | 0.076 (0.67)                                              | 90 (198)        | 24                                                         | 29           | 34           | 31.5           | 30                         | <b>6SL312 - 1TE23-0AA3</b> |
| 1PH7133 - ..D...          | 114.6 (84.5)                | 0.076 (0.67)                                              | 90 (198)        | 30                                                         | 36           | 43           | 37.5           | 30                         | <b>6SL312 - 1TE23-0AA3</b> |
| 1PH7133 - ..F...          | 95.5 (70.4)                 | 0.076 (0.67)                                              | 90 (198)        | 34                                                         | 41           | 49           | 43.5           | 45                         | <b>6SL312 - 1TE24-5AA3</b> |
| 1PH7133 - ..G...          | 95.5 (70.4)                 | 0.076 (0.67)                                              | 90 (198)        | 45                                                         | 54           | 63           | 59             | 45                         | <b>6SL312 - 1TE24-5AA3</b> |
| 1PH7135 - ..F...          | 117.8 (86.9)                | 0.109 (0.96)                                              | 130 (287)       | 42                                                         | 50           | 58           | 54             | 45                         | <b>6SL312 - 1TE24-5AA3</b> |
| 1PH7137 - ..D...          | 162.3 (119.7)               | 0.109 (0.96)                                              | 130 (287)       | 43                                                         | 50           | 60           | 54             | 45                         | <b>6SL312 - 1TE24-5AA3</b> |
| 1PH7137 - ..F...          | 140.1 (103.3)               | 0.109 (0.96)                                              | 130 (287)       | 57                                                         | 68           | 79           | 73             | 60                         | <b>6SL312 - 1TE26-0AA3</b> |
| 1PH7137 - ..G...          | 133.7 (98.6)                | 0.109 (0.96)                                              | 130 (287)       | 60                                                         | 73           | 87           | 80             | 60                         | <b>6SL312 - 1TE26-0AA3</b> |

#### Cooling:

Internal air cooling  
External air cooling

0  
1

#### Motor Module:

Single Motor Module

1



1PH7 motor (SH 100 to SH 160)

- 1) For continuous duty (with 30 %  $n_{max}$ , 60 %  $\frac{2}{3} n_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased maximum speed.
- 4) Version for increased maximum speed only possible with vibration magnitude grade SR. The following options are not possible:
  - Shaft sealing ring.
- 5) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Types of construction IM B5 or IM B35
  - Shaft with fitted key and full-key balancing
- 6) Only appropriate if the sealing ring is occasionally lubricated with oil spray/mist. A sealing ring is not possible with increased maximum speed.
- 7) Motors of shaft height 160 and higher require foot support.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 standard type motors SH 160

#### Selection and Ordering Data

| Shaft height                                                                                                                                        | Rated speed        | Continuous speed, max.                                                                                                                                                        |                            | Speed, max. <sup>1)</sup>                                                                                             |                       | Rated power for duty type in accordance with IEC 60034-1 |                      |                            |                         | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Standard type |                            |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------|----------------------|----------------------------|-------------------------|---------------------------------------------------------------------------------|----------------------------|--|--|--|--|--|
| SH                                                                                                                                                  | $n_{\text{rated}}$ | $n_{\text{S1 cont.}}^{2)}$                                                                                                                                                    | $n_{\text{S1 cont.}}^{3)}$ | $n_{\text{max}}$                                                                                                      | $n_{\text{max}}^{4)}$ | $P_{\text{rated}}$                                       |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
|                                                                                                                                                     | rpm                | rpm                                                                                                                                                                           | rpm                        | rpm                                                                                                                   | rpm                   | S1<br>kW<br>(HP)                                         | S6-60%<br>kW<br>(HP) | S6-40%<br>kW<br>(HP)       | S2-30 min<br>kW<br>(HP) |                                                                                 |                            |  |  |  |  |  |
| 160                                                                                                                                                 | 500                | 3 700                                                                                                                                                                         | 7 000                      | 6 500                                                                                                                 | 8 000                 | 12 (16.1)                                                | 15 (20.1)            | 18 (24.1)                  | 16.5 (22.1)             | 1PH7163 - ■ ■ B ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 1 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 22 (29.5)                                                | 27 (36.2)            | 33 (44.3)                  | 30 (40.2)               | 1PH7163 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 1 500              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 30 (40.2)                                                | 37 (49.6)            | 45 (60.4)                  | 41 (55.0)               | 1PH7163 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 2 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 36 (48.3)                                                | 44 (59.0)            | 52 (69.7)                  | 48 (64.4)               | 1PH7163 - ■ ■ G ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 500                | 3 700                                                                                                                                                                         | 7 000                      | 6 500                                                                                                                 | 8 000                 | 16 (21.5)                                                | 19.5 (26.1)          | 24 (32.2)                  | 21.5 (28.8)             | 1PH7167 - ■ ■ B ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 1 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 28 (37.5)                                                | 34.5 (46.3)          | 42 (56.3)                  | 38 (51.0)               | 1PH7167 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 1 500              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 37 (49.6)                                                | 46 (61.7)            | 56 (75.1)                  | 51 (68.4)               | 1PH7167 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
|                                                                                                                                                     | 2 000              |                                                                                                                                                                               |                            |                                                                                                                       |                       | 41 (55.0)                                                | 51 (68.4)            | 61 (81.8)                  | 56 (75.1)               | 1PH7167 - ■ ■ G ■ ■ - 0 ■ ■ ■                                                   |                            |  |  |  |  |  |
| Fans:                                                                                                                                               |                    | External fan unit, heavy-gauge threaded cable entry in terminal box                                                                                                           |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | 2                                                                               |                            |  |  |  |  |  |
|                                                                                                                                                     |                    | External fan unit, metric cable entry in terminal box                                                                                                                         |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | 7                                                                               |                            |  |  |  |  |  |
| Encoder systems for motors without DRIVE-CLiQ interface:                                                                                            |                    | Absolute encoder EnDat 2 048 S/R<br>Incremental encoder sin/cos 1 V <sub>pp</sub> with C and D track<br>Incremental encoder sin/cos 1 V <sub>pp</sub> without C and D track   |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | E<br>M<br>N                                                                     |                            |  |  |  |  |  |
| Encoder systems for motors with DRIVE-CLiQ interface:                                                                                               |                    | Absolute encoder, 22 bit single-turn + 12 bit multi-turn<br>Incremental encoder, 22 bit with 11 bit commutation position<br>Incremental encoder, 22 bit                       |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | F<br>D<br>Q                                                                     |                            |  |  |  |  |  |
| Terminal box/<br>Cable entry:                                                                                                                       |                    | Top/right<br>Top/NDE<br>Top/left                                                                                                                                              |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | 0<br>2<br>3                                                                     |                            |  |  |  |  |  |
| Type of construction: <sup>5)</sup>                                                                                                                 |                    | IM B3 (IM V5, IM V6)<br>IM B35 (IM V15, IM V35) <sup>7)</sup>                                                                                                                 |                            |                                                                                                                       |                       |                                                          |                      |                            |                         | 0<br>3                                                                          |                            |  |  |  |  |  |
| Bearing version for:<br>Coupling/belt output<br>Coupling/belt output<br>Coupling/belt output<br>Increased speed<br>(coupling/belt output)           |                    | Vibration magnitude:<br>Grade R<br>Grade S<br>Grade SR<br>Grade SR                                                                                                            |                            | Shaft and flange accuracy:<br>Tolerance R<br>Tolerance R<br>Tolerance R<br>Tolerance R                                |                       |                                                          |                      |                            |                         | B<br>C<br>D<br>L                                                                | A<br>B<br>C<br>D<br>J<br>K |  |  |  |  |  |
| Shaft extension (DE): <sup>5)</sup>                                                                                                                 |                    | Balancing:                                                                                                                                                                    |                            | Direction of air flow (fan):                                                                                          |                       | Blow-out direction:                                      |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Fitted key                                                                                                                                          |                    | Half-key                                                                                                                                                                      |                            | DE → NDE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Fitted key                                                                                                                                          |                    | Half-key                                                                                                                                                                      |                            | NDE → DE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Fitted key                                                                                                                                          |                    | Full-key                                                                                                                                                                      |                            | DE → NDE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Fitted key                                                                                                                                          |                    | Full-key                                                                                                                                                                      |                            | NDE → DE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Plain shaft                                                                                                                                         |                    | –                                                                                                                                                                             |                            | DE → NDE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Plain shaft                                                                                                                                         |                    | –                                                                                                                                                                             |                            | NDE → DE                                                                                                              |                       | Axial                                                    |                      |                            |                         |                                                                                 |                            |  |  |  |  |  |
| Degree of protection:<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54<br>IP55, fan IP54 |                    | Seal:<br>–<br>DE flange with shaft sealing ring <sup>6)</sup><br>–<br>DE flange with shaft sealing ring <sup>6)</sup><br>–<br>DE flange with shaft sealing ring <sup>6)</sup> |                            | Paint finish:<br>Unpainted<br>Unpainted<br>Anthracite<br>Anthracite<br>Anthracite, two coats<br>Anthracite, two coats |                       |                                                          |                      | 0<br>2<br>3<br>5<br>6<br>8 |                         |                                                                                 |                            |  |  |  |  |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 standard type motors  
SH 160

### Selection and Ordering Data

| Motor type<br>(continued) | Rated<br>torque             | Moment of<br>inertia                                      | Weight,<br>approx. | Rated current<br>for duty type<br>in accordance with IEC 60034-1 |              |              |                 | SINAMICS S120 Motor Module |                     |
|---------------------------|-----------------------------|-----------------------------------------------------------|--------------------|------------------------------------------------------------------|--------------|--------------|-----------------|----------------------------|---------------------|
|                           |                             |                                                           |                    |                                                                  |              |              |                 | Rated<br>output<br>current | Booksize format     |
|                           |                             |                                                           |                    |                                                                  |              |              |                 |                            |                     |
|                           | $M_{rated}$                 | $J$                                                       | $m$                | $I_{rated}$                                                      |              |              |                 | $I_{rated}$                |                     |
|                           | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)         | S1<br>A                                                          | S6-60 %<br>A | S6-40 %<br>A | S2- 30 min<br>A | S1<br>A                    | Order No.           |
| 1PH7163 - ..B...          | 229.2 (169)                 | 0.19 (1.68)                                               | 180 (397)          | 30                                                               | 36           | 42           | 39              | 30                         | 6SL312 - 1TE23-0AA3 |
| 1PH7163 - ..D...          | 210.1 (155)                 | 0.19 (1.68)                                               | 180 (397)          | 55                                                               | 65           | 77           | 71              | 60                         | 6SL312 - 1TE26-0AA3 |
| 1PH7163 - ..F...          | 191.0 (141)                 | 0.19 (1.68)                                               | 180 (397)          | 72                                                               | 86           | 102          | 94              | 85                         | 6SL312 - 1TE28-5AA3 |
| 1PH7163 - ..G...          | 171.9 (127)                 | 0.19 (1.68)                                               | 180 (397)          | 85                                                               | 100          | 114          | 107             | 85                         | 6SL312 - 1TE28-5AA3 |
| 1PH7167 - ..B...          | 305.5 (225)                 | 0.23 (2.04)                                               | 228 (503)          | 37                                                               | 44           | 53           | 48              | 45                         | 6SL312 - 1TE24-5AA3 |
| 1PH7167 - ..D...          | 267.4 (197)                 | 0.23 (2.04)                                               | 228 (503)          | 71                                                               | 85           | 100          | 92              | 85                         | 6SL312 - 1TE28-5AA3 |
| 1PH7167 - ..F...          | 235.5 (174)                 | 0.23 (2.04)                                               | 228 (503)          | 82                                                               | 97           | 115          | 104             | 85                         | 6SL312 - 1TE28-5AA3 |
| 1PH7167 - ..G...          | 195.8 (144)                 | 0.23 (2.04)                                               | 228 (503)          | 89                                                               | 106          | 124          | 115             | 132                        | 6SL312 - 1TE31-3AA3 |

#### Cooling:

Internal air cooling  
External air cooling

0  
1

#### Motor Module:

Single Motor Module

1



1PH7 motor (SH 100 to SH 160)

- 1) For continuous duty (with 30 %  $n_{max}$ , 60 %  $^{2/3} n_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased maximum speed.
- 4) Version for increased maximum speed only possible with vibration magnitude grade SR. The following options are not possible:
  - Shaft sealing ring.
- 5) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Types of construction IM B5 or IM B35
  - Shaft with fitted key and full-key balancing
- 6) Only appropriate if the sealing ring is occasionally lubricated with oil spray/mist. A sealing ring is not possible with increased maximum speed.
- 7) Motors of shaft height 160 and higher require foot support.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 standard type motors SH 180

#### Selection and Ordering Data

| Shaft height                                                    | Rated speed | Continuous speed, max.     |                            |                            | Speed, max. <sup>1)</sup>                                                             |                | Rated power for duty type in accordance with IEC 60034-1 |                       |                       |                         | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Standard type |           |  |  |  |  |  |  |   |  |
|-----------------------------------------------------------------|-------------|----------------------------|----------------------------|----------------------------|---------------------------------------------------------------------------------------|----------------|----------------------------------------------------------|-----------------------|-----------------------|-------------------------|---------------------------------------------------------------------------------|-----------|--|--|--|--|--|--|---|--|
| SH                                                              | $n_{rated}$ | $n_{S1\text{ cont.}}^{2)}$ | $n_{S1\text{ cont.}}^{3)}$ | $n_{S1\text{ cont.}}^{4)}$ | $n_{max}$                                                                             | $n_{max}^{5)}$ | $P_{rated}$                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
|                                                                 | rpm         | rpm                        | rpm                        | rpm                        | rpm                                                                                   | rpm            | S1<br>kW<br>(HP)                                         | S6-60 %<br>kW<br>(HP) | S6-40 %<br>kW<br>(HP) | S2-30 min<br>kW<br>(HP) |                                                                                 | Order No. |  |  |  |  |  |  |   |  |
| 180                                                             | 500         | 3500                       | 3000                       | 4500                       | 5000                                                                                  | 7000           | 21.5 (28.8)                                              | 26.5 (35.5)           | 30.5 (40.9)           | 30 (40.2)               | 1PH7184 - ■ ■ T ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 1000        |                            |                            |                            |                                                                                       |                | 39 (52.3)                                                | 48 (64.4)             | 58 (77.8)             | 58 (77.8)               | 1PH7184 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 1250        |                            |                            |                            |                                                                                       |                | 40 (53.6)                                                | 50 (67.1)             | 56 (75.1)             | 66 (88.5)               | 1PH7184 - ■ ■ E ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 1500        |                            |                            |                            |                                                                                       |                | 51 (68.4)                                                | 68 (91.2)             | 81 (109)              | 81 (109)                | 1PH7184 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 2500        |                            |                            |                            |                                                                                       |                | 78 (105)                                                 | 97 (130)              | 115 (154)             | 115 (154)               | 1PH7184 - ■ ■ L ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 500         | 3500                       | 3000                       | 4500                       | 5000                                                                                  | 7000           | 29.6 (39.7)                                              | 36.5 (48.9)           | 43 (57.7)             | 38 (51.0)               | 1PH7186 - ■ ■ T ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 1000        |                            |                            |                            |                                                                                       |                | 51 (68.4)                                                | 65 (87.2)             | 77 (103)              | 77 (103)                | 1PH7186 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 | 1250        |                            |                            |                            |                                                                                       |                | 60 (80.5)                                                | 71 (95.2)             | 80 (107)              | 84 (113)                | 1PH7186 - ■ ■ E ■ ■ - 0 ■ ■ ■                                                   |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            |                                                                                       |                |                                                          |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            |                                                                                       |                |                                                          |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
| Fans:                                                           |             |                            |                            |                            | External fan unit, heavy-gauge threaded cable entry in terminal box                   |                |                                                          |                       |                       |                         | 2                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | External fan unit, metric cable entry in terminal box                                 |                |                                                          |                       |                       |                         | 7                                                                               |           |  |  |  |  |  |  |   |  |
| Encoder systems for motors <u>without</u> DRIVE-CLiQ interface: |             |                            |                            |                            | Absolute encoder EnDat 2 048 S/R                                                      |                |                                                          |                       |                       |                         | E                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Incremental encoder sin/cos 1 V <sub>pp</sub> 2 048 S/R with C and D track            |                |                                                          |                       |                       |                         | M                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Incremental encoder sin/cos 1 V <sub>pp</sub> 2 048 S/R without C and D track         |                |                                                          |                       |                       |                         | N                                                                               |           |  |  |  |  |  |  |   |  |
| Encoder systems for motors <u>with</u> DRIVE-CLiQ interface:    |             |                            |                            |                            | Absolute encoder, 22 bit single-turn + 12 bit multi-turn                              |                |                                                          |                       |                       |                         | F                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Incremental encoder, 22 bit with 11 bit commutation position                          |                |                                                          |                       |                       |                         | D                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Incremental encoder, 22 bit                                                           |                |                                                          |                       |                       |                         | Q                                                                               |           |  |  |  |  |  |  |   |  |
| Terminal box/<br>Cable entry:                                   |             |                            |                            |                            | Top/right                                                                             |                |                                                          |                       |                       |                         | 0                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Top/DE                                                                                |                |                                                          |                       |                       |                         | 1                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Top/NDE                                                                               |                |                                                          |                       |                       |                         | 2                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | Top/left                                                                              |                |                                                          |                       |                       |                         | 3                                                                               |           |  |  |  |  |  |  |   |  |
| Type of construction:                                           |             |                            |                            |                            | IM B3                                                                                 |                |                                                          |                       |                       |                         | 0                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | IM B3 (IM V5, IM V6) (hoisting system for vertical types)                             |                |                                                          |                       |                       |                         | 1                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | IM B35 <sup>9)</sup>                                                                  |                |                                                          |                       |                       |                         | 3                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | IM B35 (for 1PH7184 with 450 mm (17.7 in) flange only) <sup>9)</sup>                  |                |                                                          |                       |                       |                         | 4                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | IM B35 (IM V15, IM V35) (hoisting system for vertical types) <sup>9)</sup>            |                |                                                          |                       |                       |                         | 5                                                                               |           |  |  |  |  |  |  |   |  |
|                                                                 |             |                            |                            |                            | IM B35 (IM V15, IM V35) (for 1PH7184 with 450 mm (17.7 in) flange only) <sup>9)</sup> |                |                                                          |                       |                       |                         | 6                                                                               |           |  |  |  |  |  |  |   |  |
| Bearing version for:                                            |             |                            |                            |                            | Vibration magnitude:                                                                  |                | Shaft and flange accuracy:                               |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
| Coupling output                                                 |             |                            |                            |                            | Grade R                                                                               |                | Tolerance N                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | A |  |
| Coupling output                                                 |             |                            |                            |                            | Grade R                                                                               |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | B |  |
| Coupling output                                                 |             |                            |                            |                            | Grade S                                                                               |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | C |  |
| Coupling output                                                 |             |                            |                            |                            | Grade SR                                                                              |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | D |  |
| Belt output                                                     |             |                            |                            |                            | Grade R                                                                               |                | Tolerance N                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | E |  |
| Belt output                                                     |             |                            |                            |                            | Grade R                                                                               |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | F |  |
| Increased cantilever force (belt output)                        |             |                            |                            |                            | Grade R                                                                               |                | Tolerance N                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | G |  |
| Increased cantilever force (belt output)                        |             |                            |                            |                            | Grade R                                                                               |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | H |  |
| Increased speed (coupling output)                               |             |                            |                            |                            | Grade S                                                                               |                | Tolerance R                                              |                       |                       |                         |                                                                                 |           |  |  |  |  |  |  | J |  |
| Shaft extension (DE): <sup>7)</sup>                             |             |                            |                            |                            | Balancing:                                                                            |                | Direction of air flow (fan):                             |                       | Blow-out direction:   |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
| Fitted key                                                      |             |                            |                            |                            | Half-key                                                                              |                | DE → NDE                                                 |                       | Right                 |                         |                                                                                 |           |  |  |  |  |  |  | A |  |
| Fitted key                                                      |             |                            |                            |                            | Half-key                                                                              |                | NDE → DE                                                 |                       | Axial                 |                         |                                                                                 |           |  |  |  |  |  |  | B |  |
| Fitted key                                                      |             |                            |                            |                            | Full-key                                                                              |                | DE → NDE                                                 |                       | Right                 |                         |                                                                                 |           |  |  |  |  |  |  | C |  |
| Fitted key                                                      |             |                            |                            |                            | Full-key                                                                              |                | NDE → DE                                                 |                       | Axial                 |                         |                                                                                 |           |  |  |  |  |  |  | D |  |
| Plain shaft                                                     |             |                            |                            |                            | –                                                                                     |                | DE → NDE                                                 |                       | Right                 |                         |                                                                                 |           |  |  |  |  |  |  | J |  |
| Plain shaft                                                     |             |                            |                            |                            | –                                                                                     |                | NDE → DE                                                 |                       | Axial                 |                         |                                                                                 |           |  |  |  |  |  |  | K |  |
| Degree of protection:                                           |             |                            |                            |                            | Seal:                                                                                 |                |                                                          |                       | Paint finish:         |                         |                                                                                 |           |  |  |  |  |  |  |   |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | –                                                                                     |                |                                                          |                       | Primed                |                         |                                                                                 |           |  |  |  |  |  |  | 0 |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | DE flange with shaft sealing ring <sup>6)</sup>                                       |                |                                                          |                       | Primed                |                         |                                                                                 |           |  |  |  |  |  |  | 2 |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | –                                                                                     |                |                                                          |                       | Anthracite            |                         |                                                                                 |           |  |  |  |  |  |  | 3 |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | DE flange with shaft sealing ring <sup>6)</sup>                                       |                |                                                          |                       | Anthracite            |                         |                                                                                 |           |  |  |  |  |  |  | 5 |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | –                                                                                     |                |                                                          |                       | Anthracite, two coats |                         |                                                                                 |           |  |  |  |  |  |  | 6 |  |
| IP55, fan IP54                                                  |             |                            |                            |                            | DE flange with shaft sealing ring <sup>6)</sup>                                       |                |                                                          |                       | Anthracite, two coats |                         |                                                                                 |           |  |  |  |  |  |  | 8 |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 standard type motors  
SH 180

### Selection and Ordering Data

| Motor type<br>(continued) | Rated torque                | Moment of inertia                                         | Weight, approx. <sup>8)</sup> | Rated current for duty type in accordance with IEC 60034-1 |              |              |                | SINAMICS S120 Motor Module |                            |
|---------------------------|-----------------------------|-----------------------------------------------------------|-------------------------------|------------------------------------------------------------|--------------|--------------|----------------|----------------------------|----------------------------|
|                           | $M_{rated}$                 | $J$                                                       | $m$                           | $I_{rated}$                                                |              |              |                | Rated output current       | Booksize format            |
|                           | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)                    | S1<br>A                                                    | S6-60 %<br>A | S6-40 %<br>A | S2-30 min<br>A | S1<br>A                    | Order No.                  |
| 1PH7184 - .. T...         | 410 (302)                   | 0.5 (4.43)                                                | 390 (860)                     | 76                                                         | 90           | 103          | 102            | 85                         | <b>6SL312 - 1TE28-5AA3</b> |
| 1PH7184 - .. D...         | 372 (274)                   | 0.5 (4.43)                                                |                               | 90                                                         | 106          | 126          | 126            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |
| 1PH7184 - .. E...         | 305 (225)                   | 0.5 (4.43)                                                |                               | 85                                                         | 100          | 110          | 128            | 85                         | <b>6SL312 - 1TE28-5AA3</b> |
| 1PH7184 - .. F...         | 325 (240)                   | 0.5 (4.43)                                                |                               | 120                                                        | 149          | 174          | 174            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |
| 1PH7184 - .. L...         | 298 (220)                   | 0.5 (4.43)                                                |                               | 172                                                        | 204          | 237          | 237            | 200                        | <b>6SL312 - 1TE32-0AA3</b> |
| 1PH7186 - .. T...         | 565 (417)                   | 0.67 (5.93)                                               | 460 (1014)                    | 105                                                        | 126          | 147          | 130            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |
| 1PH7186 - .. D...         | 487 (359)                   | 0.67 (5.93)                                               |                               | 118                                                        | 141          | 164          | 164            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |
| 1PH7186 - .. E...         | 458 (338)                   | 0.67 (5.93)                                               |                               | 120                                                        | 135          | 150          | 156            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |

#### Cooling:

Internal air cooling  
External air cooling

0  
1

#### Motor Module:

Single Motor Module

1



1PH7 motor (SH 180 and SH 225)

- 1) For continuous duty (with 30 %  $n_{max}$ , 60 %  $\frac{2}{3} n_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased cantilever force.
- 4) Bearing version for increased maximum speed.
- 5) Version for increased maximum speed, only possible in combination with vibration magnitude grade S. The following options are not possible:
  - Shaft sealing ring
- 6) Only appropriate if the sealing ring is occasionally lubricated with oil spray/mist. A sealing ring is not possible for type of construction IM B3 (IM V5, IM V6), version with increased cantilever force or increased maximum speed.
- 7) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Type of construction IM B35, IM V15 (not IM V35)
  - Shaft with fitted key and full-key balancing
  - Bearing version for coupling output
  - Shaft and flange accuracy tolerance R
  - DE flange with shaft sealing ring
- 8) Applies to type of construction IM B35, as type of construction IM B3, the motor is 20 kg (44 lb) lighter.
- 9) Motors of shaft height 160 and higher require foot support.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

### 1PH7 standard type motors SH 225

#### Selection and Ordering Data

| Shaft height                                             | Rated speed | Continuous speed, max.                                                                                                                                                      |                            |                              | Speed, max. <sup>1)</sup> |                     | Rated power for duty type in accordance with IEC 60034-1 |                    |                    |                      | 1PH7 asynchronous motor with solid shaft<br>Forced ventilation<br>Standard type |             |                  |  |  |  |  |
|----------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------|---------------------------|---------------------|----------------------------------------------------------|--------------------|--------------------|----------------------|---------------------------------------------------------------------------------|-------------|------------------|--|--|--|--|
| SH                                                       | $n_{rated}$ | $n_{S1\text{ cont.}}^{2)}$                                                                                                                                                  | $n_{S1\text{ cont.}}^{3)}$ | $n_{S1\text{ cont.}}^{4)}$   | $n_{max}$                 | $n_{max}^{5)}$      | $P_{rated}$                                              |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
|                                                          | rpm         | rpm                                                                                                                                                                         | rpm                        | rpm                          | rpm                       | rpm                 | S1<br>kW (HP)                                            | S6-60 %<br>kW (HP) | S6-40 %<br>kW (HP) | S2-30 min<br>kW (HP) |                                                                                 |             |                  |  |  |  |  |
| Order No.                                                |             |                                                                                                                                                                             |                            |                              |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| 225                                                      | 700         | 3 100                                                                                                                                                                       | 2 700                      | 3 600                        | 4 500                     | 5 500               | 55 (73.8)                                                | 66 (88.5)          | 75 (101)           | 78 (105)             | 1PH7224 - ■ ■ C ■ ■ - 0 ■ ■ ■                                                   |             |                  |  |  |  |  |
|                                                          | 1 000       |                                                                                                                                                                             |                            |                              |                           |                     | 71 (95.2)                                                | 88 (118)           | 105 (141)          | 114 (153)            | 1PH7224 - ■ ■ D ■ ■ - 0 ■ ■ ■                                                   |             |                  |  |  |  |  |
|                                                          | 1 500       |                                                                                                                                                                             |                            |                              |                           |                     | 100 (134)                                                | 126 (169)          | 136 (182)          | 140 (188)            | 1PH7224 - ■ ■ F ■ ■ - 0 ■ ■ ■                                                   |             |                  |  |  |  |  |
| Fans:                                                    |             | External fan unit, heavy-gauge threaded cable entry in terminal box                                                                                                         |                            |                              |                           |                     |                                                          |                    |                    |                      | 2                                                                               |             |                  |  |  |  |  |
|                                                          |             | External fan unit, metric cable entry in terminal box                                                                                                                       |                            |                              |                           |                     |                                                          |                    |                    |                      | 7                                                                               |             |                  |  |  |  |  |
| Encoder systems for motors without DRIVE-CLiQ interface: |             | Absolute encoder EnDat 2 048 S/R<br>Incremental encoder sin/cos 1 V <sub>pp</sub> with C and D track<br>Incremental encoder sin/cos 1 V <sub>pp</sub> without C and D track |                            |                              |                           |                     |                                                          |                    |                    |                      |                                                                                 | E<br>M<br>N |                  |  |  |  |  |
| Encoder systems for motors with DRIVE-CLiQ interface:    |             | Absolute encoder, 22 bit single-turn + 12 bit multi-turn<br>Incremental encoder, 22 bit with 11 bit commutation position<br>Incremental encoder, 22 bit                     |                            |                              |                           |                     |                                                          |                    |                    |                      |                                                                                 | F<br>D<br>Q |                  |  |  |  |  |
| Terminal box/<br>Cable entry:                            |             | Top/right<br>Top/DE<br>Top/NDE<br>Top/left                                                                                                                                  |                            |                              |                           |                     |                                                          |                    |                    |                      |                                                                                 |             | 0<br>1<br>2<br>3 |  |  |  |  |
| Type of construction:                                    |             | IM B3<br>IM B3 (IM V5, IM V6) (hoisting system for vertical types)<br>IM B35 <sup>9)</sup><br>IM B35 (IM V15, IM V35) (hoisting system for vertical types) <sup>9)</sup>    |                            |                              |                           |                     |                                                          |                    |                    |                      |                                                                                 |             | 0<br>1<br>3<br>5 |  |  |  |  |
| Bearing version for:                                     |             | Vibration magnitude:                                                                                                                                                        |                            | Shaft and flange accuracy:   |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Coupling output                                          |             | Grade R                                                                                                                                                                     |                            | Tolerance N                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Coupling output                                          |             | Grade R                                                                                                                                                                     |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Coupling output                                          |             | Grade S                                                                                                                                                                     |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Coupling output                                          |             | Grade SR                                                                                                                                                                    |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Belt output                                              |             | Grade R                                                                                                                                                                     |                            | Tolerance N                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Belt output                                              |             | Grade R                                                                                                                                                                     |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Increased cantilever force (belt output)                 |             | Grade R                                                                                                                                                                     |                            | Tolerance N                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Increased cantilever force (belt output)                 |             | Grade R                                                                                                                                                                     |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Increased speed (coupling output)                        |             | Grade S                                                                                                                                                                     |                            | Tolerance R                  |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Shaft extension (DE): <sup>7)</sup>                      |             | Balancing:                                                                                                                                                                  |                            | Direction of air flow (fan): |                           | Blow-out direction: |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Fitted key                                               |             | Half-key                                                                                                                                                                    |                            | DE → NDE                     |                           | Right               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Fitted key                                               |             | Half-key                                                                                                                                                                    |                            | NDE → DE                     |                           | Axial               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Fitted key                                               |             | Full-key                                                                                                                                                                    |                            | DE → NDE                     |                           | Right               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Fitted key                                               |             | Full-key                                                                                                                                                                    |                            | NDE → DE                     |                           | Axial               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Plain shaft                                              |             | –                                                                                                                                                                           |                            | DE → NDE                     |                           | Right               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Plain shaft                                              |             | –                                                                                                                                                                           |                            | NDE → DE                     |                           | Axial               |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| Degree of protection:                                    |             | Seal:                                                                                                                                                                       |                            | Paint finish:                |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | –                                                                                                                                                                           |                            | Primed                       |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | DE flange with shaft sealing ring <sup>6)</sup>                                                                                                                             |                            | Primed                       |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | –                                                                                                                                                                           |                            | Anthracite                   |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | DE flange with shaft sealing ring <sup>6)</sup>                                                                                                                             |                            | Anthracite                   |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | –                                                                                                                                                                           |                            | Anthracite, two coats        |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |
| IP55, fan IP54                                           |             | DE flange with shaft sealing ring <sup>6)</sup>                                                                                                                             |                            | Anthracite, two coats        |                           |                     |                                                          |                    |                    |                      |                                                                                 |             |                  |  |  |  |  |

To select the type of construction and the degree of protection, see Selection guides.

# Asynchronous motors

## Main spindle motors for SINAMICS S120

1PH7 standard type motors  
SH 225

### Selection and Ordering Data

| Motor type<br>(continued)                                       | Rated<br>torque             | Moment of<br>inertia                                      | Weight,<br>approx. <sup>8)</sup> | Rated current<br>for duty type<br>in accordance with IEC 60034-1 |              |              |                | SINAMICS S120 Motor Module |                            |
|-----------------------------------------------------------------|-----------------------------|-----------------------------------------------------------|----------------------------------|------------------------------------------------------------------|--------------|--------------|----------------|----------------------------|----------------------------|
|                                                                 |                             |                                                           |                                  |                                                                  |              |              |                | Rated<br>output<br>current | Booksize format            |
|                                                                 |                             |                                                           |                                  | $I_{rated}$                                                      |              |              |                | $I_{rated}$                | Order No.                  |
|                                                                 | $M_{rated}$                 | $J$                                                       | $m$                              | S1<br>A                                                          | S6-60 %<br>A | S6-40 %<br>A | S2-30 min<br>A | S1<br>A                    |                            |
|                                                                 | Nm<br>(lb <sub>f</sub> -ft) | kgm <sup>2</sup><br>(lb <sub>f</sub> -in-s <sup>2</sup> ) | kg<br>(lb)                       |                                                                  |              |              |                |                            |                            |
| 1PH7224 - ..C...                                                | 750 (553)                   | 1.48 (13.1)                                               | 650 (1433)                       | 117                                                              | 135          | 149          | 155            | 132                        | <b>6SL312 - 1TE31-3AA3</b> |
| 1PH7224 - ..D...                                                | 678 (500)                   | 1.48 (13.1)                                               | 650 (1433)                       | 164                                                              | 190          | 222          | 240            | 200                        | <b>6SL312 - 1TE32-0AA3</b> |
| 1PH7224 - ..F...                                                | 636 (469)                   | 1.48 (13.1)                                               | 650 (1433)                       | 188                                                              | 230          | 248          | 256            | 200                        | <b>6SL312 - 1TE32-0AA3</b> |
| <b>Cooling:</b><br>Internal air cooling<br>External air cooling |                             |                                                           |                                  |                                                                  |              |              |                |                            | 0<br>1                     |
| <b>Motor Module:</b><br>Single Motor Module                     |                             |                                                           |                                  |                                                                  |              |              |                |                            | 1                          |



1PH7 motor (SH 180 and SH 225)

- 1) For continuous duty (with 30 %  $\eta_{max}$ , 60 %  $\frac{2}{3} \eta_{max}$ , 10 % standstill) for a duty cycle time of 10 min. For maintenance intervals for motors and components, see the 1PH Motors Configuration Manual.
- 2) Bearing version for coupling/belt output.
- 3) Bearing version for increased cantilever force.
- 4) Bearing version for increased maximum speed.
- 5) Version for increased maximum speed, only possible in combination with vibration magnitude grade S. The following options are not possible:
  - Shaft sealing ring
- 6) Only appropriate if the sealing ring is occasionally lubricated with oil spray/mist. A sealing ring is not possible for type of construction IM B3 (IM V5, IM V6), version with increased cantilever force or increased maximum speed.
- 7) The following motor versions are required for ZF gearbox mounting prepared (see Gearboxes for gear selection):
  - Type of construction IM B35, IM V15 (not IM V35)
  - Shaft with fitted key and full-key balancing
  - Bearing version for coupling output
  - Shaft and flange accuracy tolerance R
  - DE flange with shaft sealing ring
- 8) Applies to type of construction IM B35, as type of construction IM B3, the motor is 20 kg (44 lb) lighter.
- 9) Motors of shaft height 160 and higher require foot support.