

Options

| Terminal box type (See selection and ordering data for assignment) | Cable entry | | Outer cable diameter, max. ¹⁾ mm (in) | Number of main terminals | Cross-section per terminal, max. mm ² | Rated current, max. ²⁾ A |
|---|---------------|-----------------------------|---|---|---|--|
| | Power | External signals | | | | |
| gk803 | 1 × M25 × 1.5 | 1 × M16 × 1.5 ³⁾ | 20 (0.79) | Phases: 3 × M5 Grounding: 2 × M5 | 1 × 10 | 52 |
| gk806 | 1 × M25 × 1.5 | 1 × M16 × 1.5 ³⁾ | 20 (0.79) | Phases: 6 × M5 Grounding: 2 × M5 | 1 × 10 | 52 |
| gk813 | 1 × M32 × 1.5 | 1 × M16 × 1.5 ³⁾ | 24.2 (0.95) | Phases: 3 × M5 Grounding: 2 × M5 | 1 × 16 | 70 |
| gk823 | 1 × M32 × 1.5 | 1 × M16 × 1.5 ³⁾ | 24.2 (0.95) | Phases: 3 × M5 Grounding: 2 × M5 | 1 × 16 | 70 |
| gk826 | 1 × M32 × 1.5 | 1 × M16 × 1.5 ³⁾ | 24.2 (0.95) | Phases: 6 × M5 Grounding: 2 × M5 | 1 × 10 | 52 |
| gk833 | 1 × M40 × 1.5 | 1 × M16 × 1.5 ³⁾ | 32 (1.26) | Phases: 3 × M6 Grounding: 2 × M6 | 1 × 35 | 110 |
| gk843 | 1 × M50 × 1.5 | 1 × M16 × 1.5 ³⁾ | 38 (1.50) | Phases: 3 × M6 Grounding: 2 × M6 | 1 × 50 | 133 |
| gk846 | 1 × M50 × 1.5 | 1 × M16 × 1.5 ³⁾ | 38 (1.50) | Phases: 6 × M6 Grounding: 2 × M6 | 1 × 25 | 88 |
| gk863 | 1 × M50 × 1.5 | 1 × M16 × 1.5 ³⁾ | 38 (1.50) | Phases: 3 × M6 Grounding: 2 × M6 | 1 × 50 | 133 |
| gk873 | 1 × M63 × 1.5 | 1 × M16 × 1.5 ³⁾ | 42.6 (1.68) | Phases: 3 × M6 Grounding: 2 × M6 | 1 × 50 | 133 |
| gk874 | 1 × M63 × 1.5 | 1 × M16 × 1.5 ³⁾ | 42.6 (1.68) | Phases: 3 × M10 Grounding: 2 × M6 | 2 × 70 | 240 |
| 1XB7322-P05 | 2 × M50 × 1.5 | 1 × M16 × 1.5 ⁴⁾ | 38 (1.50) | Phases: 3 × M12 Grounding: 2 × M6 | 2 × 50 | 210 |
| 1XB7422-P06 | 2 × M63 × 1.5 | 1 × M16 × 1.5 ⁴⁾ | 53 (2.09) | Phases: 3 × M12 Grounding: 4 × M8 | 2 × 70 | 270 |
| 1XB7700-P02 | 3 × M75 × 1.5 | 1 × M16 × 1.5 ⁴⁾ | 68 (2.68) | Phases: 3 × 2 × M12 Grounding: 3 × fixing eyelet | 3 × 150 | 700 |
| 1XB7712-P03 | 4 × M75 × 1.5 | 1 × M16 × 1.5 ⁴⁾ | 68 (2.68) | Phases: 3 × 4 × M16 Grounding: 4 × M16 | 4 × 185 | 1150 |

For terminal box **1XB7712-P03**, other cable entries (power) can be ordered via P options, depending on the standard:

| | |
|------------|---|
| P00 | Undrilled cable entry plate |
| P01 | Cable entry plate 3 × M63 × 1.5 (not for 1XB7712-P01) |
| P02 | Cable entry plate 3 × M75 × 1.5 |
| P04 | Cable entry plate 4 × M63 × 1.5 |

For terminal box **1XB7700-P02** other cable entries (power) can be ordered via P options, depending on the standard:

| | |
|------------|---------------------------------|
| P00 | Undrilled cable entry plate |
| P01 | Cable entry plate 3 × M63 × 1.5 |

For terminal boxes **1XB7322-P05** and **1XB7422-P06**, another cable entry (power) can be ordered via the P option, depending on the standard:

| | |
|------------|-----------------------------|
| P00 | Undrilled cable entry plate |
|------------|-----------------------------|

For options **K09** or **K10**, instead of terminal box **gk863**, terminal box **gk873** is used mounted on the side.

For options **K09** or **K10**, instead of terminal box **gk833**, terminal box **gk843** is used mounted on the side.

For options **K09** or **K10**, instead of terminal box **gk813**, terminal box **gk823** is used mounted on the side.

¹⁾ Depending on the version of metric cable gland (based on the MOTION-CONNECT cable type and cable glands from HUGRO or from AGRO)

²⁾ Current-carrying capacity based on EN 60204-1/IEC 60364-5-52 with installation type E.

³⁾ Thread M16 × 1.5 arranged at 90° to signal port; thread only with options A12, A25 and when 9th data position is A (without encoder).

⁴⁾ Thread M16 × 1.5 arranged opposite the signal port (lateral to the cable entry plate); thread only with option A12 and encoder version A (without encoder).

SIMOTICS M main motors

SIMOTICS M-1PH8 asynchronous, synchronous reluctance and synchronous motors for SINAMICS S120

Selection guides for SIMOTICS M-1PH8 motors > Ventilation data/Sound pressure level

Technical specifications

| Motor type | Fan motor current consumption, max. | | | Air flow direction | Volume of air, min. m ³ /s (ft ³ /s) | Sound pressure level L _{pA} (1 m) Motor + separately driven fan operation 50 Hz, tolerance + 3 dB dB |
|--|--|--------------------------------------|--------------------------------------|----------------------|---|--|
| | A | A | A | | | |
| Forced ventilation | 230 V 1 AC/50 Hz (± 10 %) | 230 V 1 AC/60 Hz (± 10 %) | 265 V 1 AC/60 Hz (± 10 %) | | | |
| 1PH808 | 0.33 0.20 | 0.25 0.16 | 0.32 0.19 | NDE → DE DE → NDE | 0.02 (0.71) | 70 ¹⁾ |
| Forced ventilation | 400 V 3 AC/50 Hz (± 10 %) | 400 V 3 AC/60 Hz (± 10 %) | 480 V 3 AC/60 Hz (± 10 %) | | | |
| 1PH810 | 0.08 0.10 | 0.07 0.08 | 0.11 0.11 | NDE → DE DE → NDE | 0.04 (1.41) | 70 ¹⁾ |
| 1PH813 | 0.11 0.10 | 0.13 0.12 | 0.13 0.12 | NDE → DE DE → NDE | 0.09 (3.18) | 70 ¹⁾ |
| 1PH816 | 0.16 0.16 | 0.21 0.21 | 0.21 0.21 | NDE → DE DE → NDE | 0.16 (5.65) | 73 ¹⁾ |
| Forced ventilation (EC fan) | 380 V ... 480 V 3 AC/ 50 Hz, 60 Hz (± 10 %) | | | | | |
| 1PH818 | 1.1 ... 1.3 | – | – | NDE → DE DE → NDE | 0.17 (6.00) | 73 ²⁾ |
| 1PH822 | 0.75 ... 0.9 | – | – | NDE → DE DE → NDE | 0.31 (10.95) | 73 ²⁾ |
| Forced ventilation | 380 V ... 480 V 3 AC/ 50 Hz, 60 Hz (± 10 %) | | | | | |
| 1PH828 | 0.75 ... 0.9 | – | – | NDE → DE DE → NDE | 0.31 (10.95) | 74 ²⁾ |

Note: For separately driven fans, e.g. explosion protection (options **M03** and **M39**), the technical specifications may differ. Additional information on separately driven fans is provided in the current Configuration Manual.

You can find the Configuration Manual for SIMOTICS M-1PH8 for SINAMICS S120 at:

<https://support.industry.siemens.com/cs/ww/en/view/109744012>

¹⁾ At rated pulse frequencies 2 kHz and speed ranges:
Forced ventilation (IP55 degree of protection):
1PH818 up to 5000 r/min
1PH822 up to 3500 r/min
1PH828 up to 3300 r/min

Forced ventilation (IP23 degree of protection):
1PH818 up to 3000 r/min
1PH822 up to 2000 r/min
1PH828 up to 2800 r/min

²⁾ At a rated pulse frequency of 4 kHz and a speed range up to 5000 r/min.

Technical specifications**Cooling data and sound pressure level**

| Motor type | Flow volume, min. l/min (US gal./min.) | Pressure drop bar | Water connection at the NDE Thread Inches | Sound pressure level L_{pA} (1 m) Motor Tolerance + 3 dB dB |
|----------------------------------|---|----------------------|--|--|
| Water cooling | | | | |
| 1PH808 | 6 (1.59) | 0.6 | G 1/8 | 68 ¹⁾ |
| 1PH810 | 8 (2.11) | 0.4 | G 1/4 | 68 ¹⁾ |
| 1PH813 | 12 (3.17) | 0.9 | G 3/8 | 68 ¹⁾ |
| 1PH816 | 15 (3.96) | 0.2 | G 1/2 | 69 ¹⁾ |
| 1PH8184 | 15 (3.96) | 0.6 | G 3/8 | 70 ²⁾ |
| 1PH8186 | 15 (3.96) | 0.7 | G 3/8 | 70 ²⁾ |
| 1PH822.-1 (asynchronous version) | 20 (5.28) | 0.6 | G 3/8 | 70 ²⁾ |
| 1PH822.-2 (synchronous version) | 25 (6.60) | 0.9 | G 3/8 | 70 ³⁾ |
| 1PH828 | 35 (9.25) | 0.6 | G 1/2 | 72 ³⁾ |

Water specification**Cooling water quality**

The values specified for the cooling water correspond to the requirements for a closed cooling circuit. Not all of the specified concentrations will occur in the cooling water at the same time. A filter can be installed to ensure fault-free operation. The filter fineness should be no less than 100 µm.

| Cooling water specifications | Quality of the water used as coolant for motors with stainless steel tubes + cast iron or steel jacket 1PH808 ... 1PH816 | Quality of the water used as coolant for motors with stainless steel tubes 1PH818 ... 1PH828 |
|---|---|---|
| pH value | 6.0 ... 9.0 | |
| Total hardness | < 170 ppm | |
| Conductivity | < 500 µS/cm | < 2000 µS/cm |
| Operating pressure, max. | < 6 bar | |
| Pressure drop at V(N) | < 1 bar | |
| Cooling water inlet temperature, max. | < 30 °C (86 °F) | |
| Frost protection / corrosion protection | 20 ... 30 % | |
| NALCO 00GE056 inhibitor | 0.2 ... 0.25 % | |
| Constituent elements | | |
| Dissolved substances | < 340 ppm | |
| Particle size, max. | < 100 µm | |
| Chloride ions | < 40 ppm | < 250 ppm |
| Sulfate ions | < 50 ppm | < 240 ppm |
| Nitrate ions | < 50 ppm | |

¹⁾ At a rated pulse frequency of 4 kHz and a speed range up to 5000 r/min.

²⁾ At rated pulse frequencies 2 kHz or 4 kHz and speed ranges:
1PH818 up to 5000 r/min,
1PH822 up to 4500 r/min.

³⁾ At rated pulse frequency 2 kHz and speed ranges:
1PH822 up to 4500 r/min,
1PH828 up to 3300 r/min.

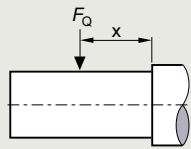
SIMOTICS M main motors

SIMOTICS M-1PH8 asynchronous, synchronous reluctance and synchronous motors for SINAMICS S120

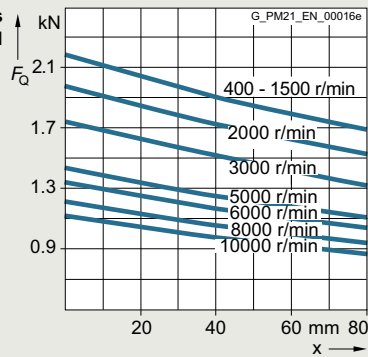
Selection guides for SIMOTICS M-1PH8 motors > Radial force diagrams

Characteristic curves

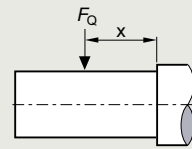
**Permissible radial forces
1PH808 motors Standard
and Standard with
location bearing**



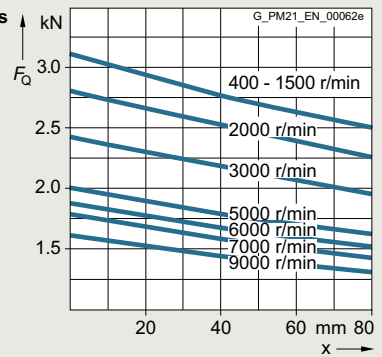
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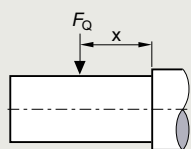
**Permissible radial forces
1PH810 motors
Standard and Standard
with location bearing**



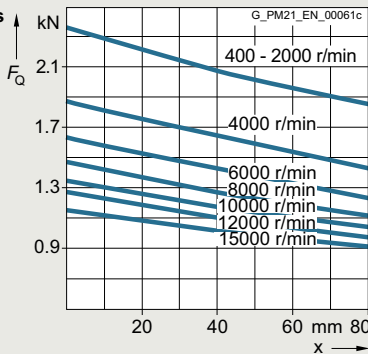
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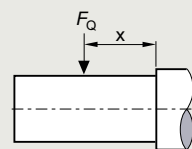
**Permissible radial forces
1PH808 motors
Performance**



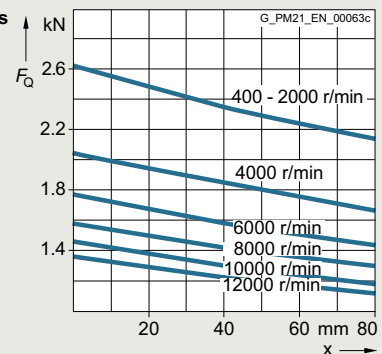
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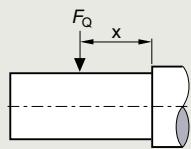
**Permissible radial forces
1PH810 motors
Performance**



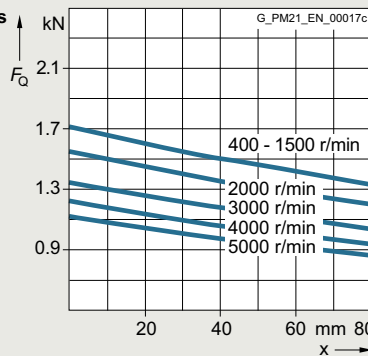
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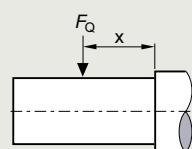
**Permissible radial forces
1PH808 motors
Advanced lifetime**



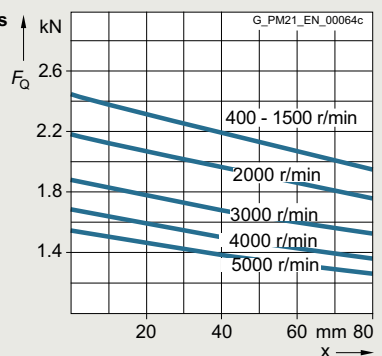
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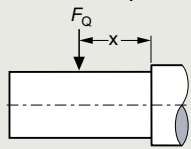
**Permissible radial forces
1PH810 motors
Advanced lifetime**



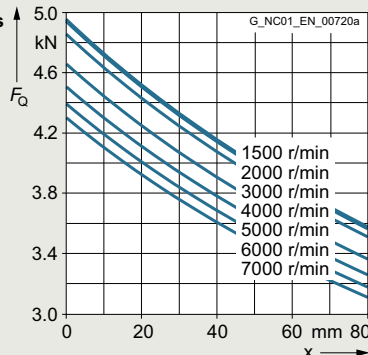
$L_{10h} = 40000 \text{ h}$



**Permissible radial forces
1PH810 motors with
increased radial force.
Minimal radial force:
0.5 kN (112 lbf)**



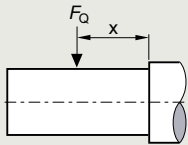
$L_{10h} = 20000 \text{ h}$



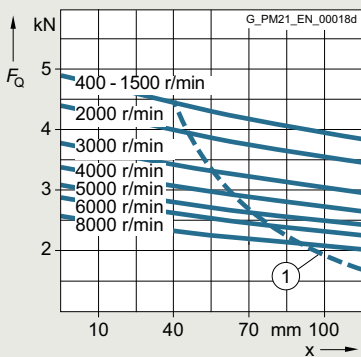
The roller bearings used here (bearings with increased radial force) could sustain damage if they are operated under no load. Observe the specified minimum radial forces. The permissible radial/axial forces can be found in the Configuration Manual.

Characteristic curves

**Permissible radial forces
1PH813 motors
Standard and Standard
with location bearing**

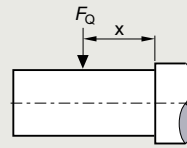


① Maximum load for 1PH7-compatible shaft end (42 x 110 mm) (1.65 x 4.33 in) (option V90)

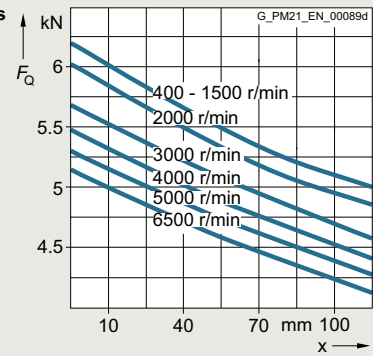


$L_{10h} = 20000$ h

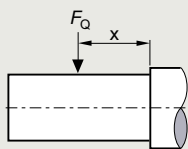
**Permissible radial forces
1PH816 motors
Standard and Standard
with location bearing**



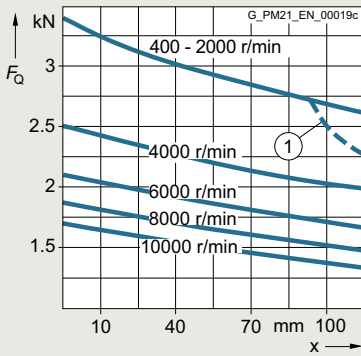
$L_{10h} = 20000$ h



**Permissible radial forces
1PH813 motors
Performance**

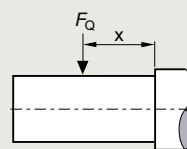


① Maximum load for 1PH7-compatible shaft end (42 x 110 mm) (1.65 x 4.33 in) (option V90)

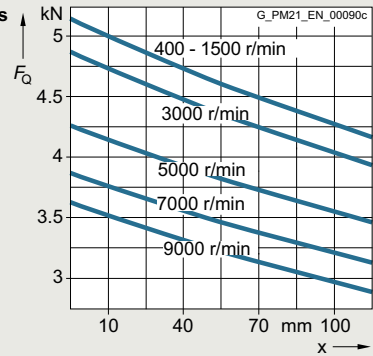


$L_{10h} = 12000$ h

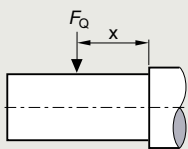
**Permissible radial forces
1PH816 motors
Performance**



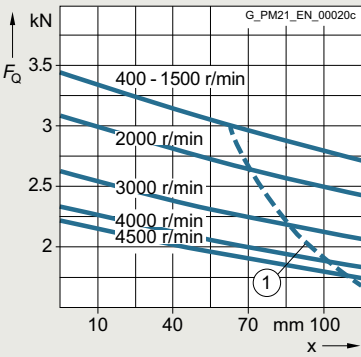
$L_{10h} = 12000$ h



**Permissible radial forces
1PH813 motors
Advanced lifetime**

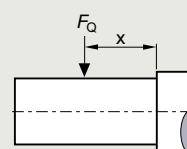


① Maximum load for 1PH7-compatible shaft end (42 x 110 mm) (1.65 x 4.33 in) (option V90)

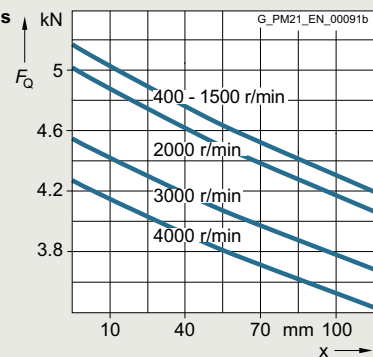


$L_{10h} = 40000$ h

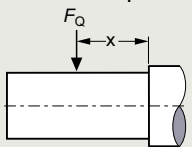
**Permissible radial forces
1PH816 motors
Advanced Lifetime**



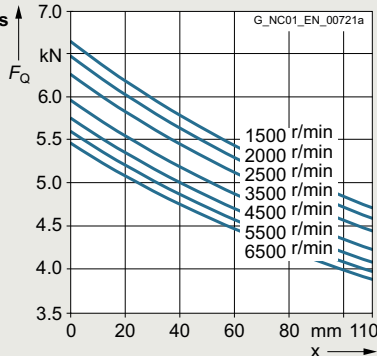
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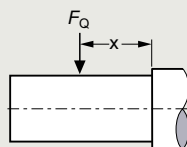
**Permissible radial forces
1PH813 motors with
increased radial force.
Minimal radial force:
0.7 kN (157 lbf)**



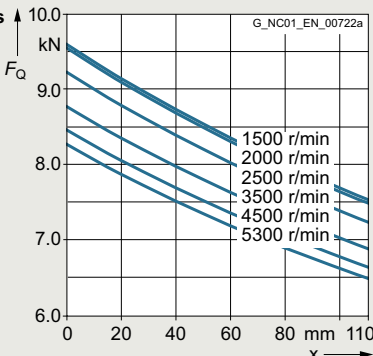
$L_{10h} = 20000$ h



**Permissible radial forces
1PH816 motors with
increased radial force.
Minimal radial force:
1 kN (225 lbf)**



$L_{10h} = 20000$ h



The roller bearings used here (bearings with increased radial force) could sustain damage if they are operated under no load. Observe the specified minimum radial forces. The permissible radial/axial forces can be found in the Configuration Manual.

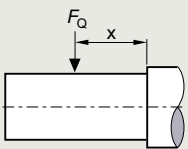
SIMOTICS M main motors

SIMOTICS M-1PH8 asynchronous, synchronous reluctance and synchronous motors for SINAMICS S120

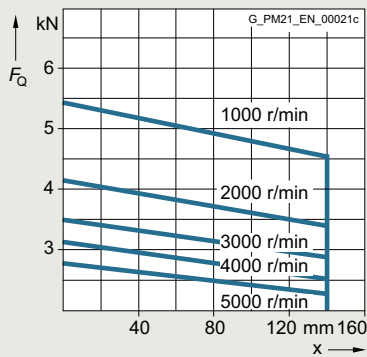
Selection guides for SIMOTICS M-1PH8 motors > Radial force diagrams

Characteristic curves

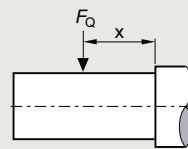
**Permissible radial forces
1PH818 motors
Standard with location
bearing**



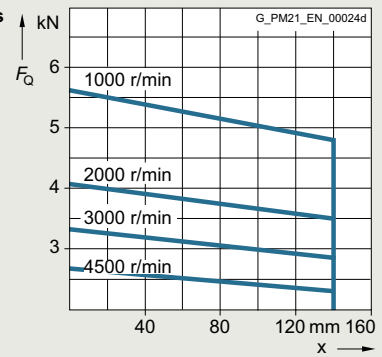
$L_{10h} = 20000$ h



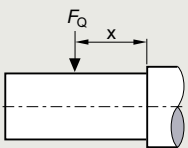
**Permissible radial forces
1PH822 motors
Standard with location
bearing**



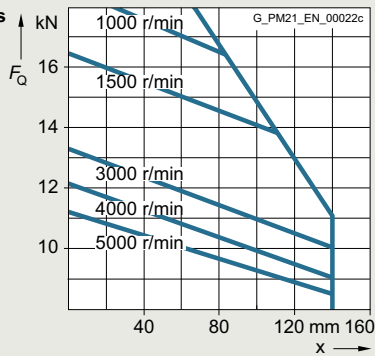
$L_{10h} = 20000$ h



**Permissible radial forces
1PH818 motors
with increased radial
force**

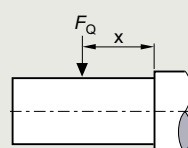


Minimum radial force 4 kN
(899 lbf)

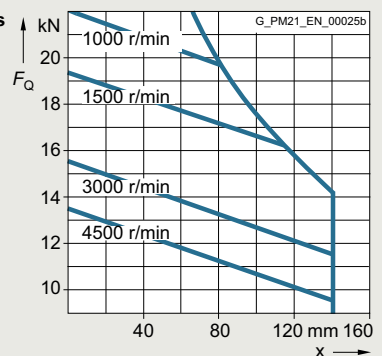


$L_{10h} = 12000$ h

**Permissible radial forces
1PH822 motors
with increased radial
force**

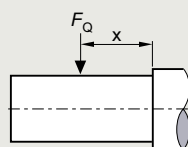


Minimum radial force 5 kN
(1124 lbf)

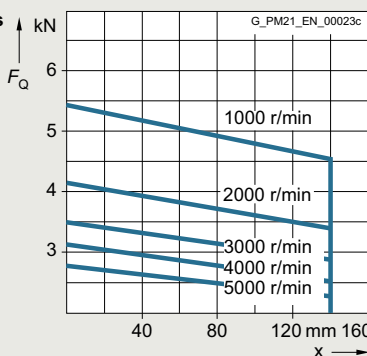


$L_{10h} = 12000$ h

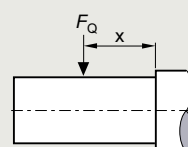
**Permissible radial forces
1PH818 motors
Performance**



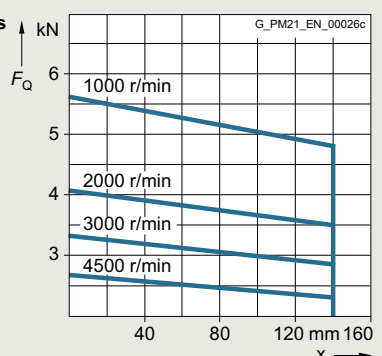
$L_{10h} = 12000$ h



**Permissible radial forces
1PH822 motors
Performance**



$L_{10h} = 12000$ h



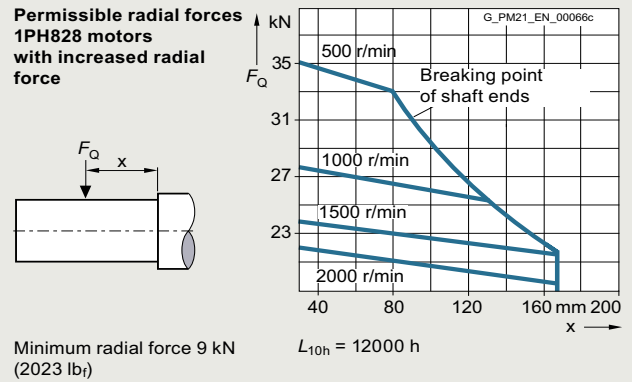
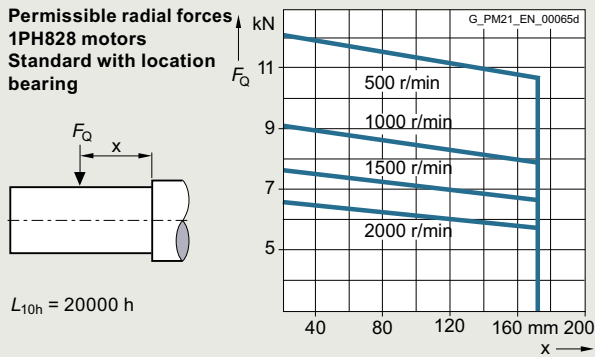
The roller bearings used here (bearings with increased radial force) could sustain damage if they are operated under no load. Observe the specified minimum radial forces. The permissible radial/axial forces can be found in the Configuration Manual.

SIMOTICS M main motors

SIMOTICS M-1PH8 asynchronous, synchronous reluctance and synchronous motors for SINAMICS S120

Selection guides for SIMOTICS M-1PH8 motors > Radial force diagrams

Characteristic curves



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SIMOTICS M main motors

SIMOTICS M-1PH8 asynchronous, synchronous reluctance and synchronous motors for SINAMICS S120

Selection guides for SIMOTICS M-1PH8 motors > Mounted holding brakes

Overview

Mounted holding brake for SIMOTICS M-1PH8 motors

A brake can be mounted on the DE of 1PH808 to 1PH822 motors.

These brakes are electromagnetic units for dry-running operation. An electromagnetic field is used to release the brake which is applied using spring force. They operate in accordance with the quiescent current principle, i.e. when no current is flowing, the spring-operated brake brakes and holds the drive. When current flows, the brake is released and the drive is free to rotate.

In the event of a voltage failure or an Emergency Stop, the drive is braked from its current speed down to standstill.

Connection of the brakes (must be provided on the system side)

- Alternating voltage 230 V 1 AC, 50/60 Hz
- Direct voltage 24 V DC up to 1PH816

The brake control module is designed for an ambient temperature of -5 °C to +40 °C (23 °F to 104 °F).

The maximum speed of a motor with brake is limited to the maximum speed of the brake (refer to the table).

The holding brakes for 1PH818 and 1PH822 are not UL-approved. As a consequence, these motors do not have the cUR marking when mounted on brakes.

| Motor type | Brake type | Holding torque | Maximum speed | Moment of inertia | Weight | Coil current | | Single operating energy, perm. W_E | Total moment of inertia (emergency stop) J_{tot} | Speed (emergency stop) n | Number of emergency stops ¹⁾ z | Opening time | Closing time |
|------------|------------|---------------------------|---------------|--|-----------------|-----------------|----------------|--------------------------------------|--|----------------------------|---|--------------|--------------|
| | | | | | | 230 V AC ± 10 % | 24 V DC ± 10 % | | | | | | |
| | | n_{max} | J_{Br} | m_{Br} | 230 V AC ± 10 % | 24 V DC ± 10 % | W_E | J_{tot} | n | z | | | |
| | | Nm (lb-ft) | r/min | kgm ² (lb _r -in-s ²) | kg (lb) | A | A | kJ | kgm ² (lb _r -in-s ²) | r/min | | ms | ms |
| 1PH808 | Size 13 | 29 (21.4) | 5000 | 0.00093 (0.00823) | 10 (22.1) | 0.8 | 4.1 | 2.2 | 0.0174 (0.1540) | 4800 | 2000 | 150 | 300 |
| 1PH810 | Size 19 | 60 ... 150 (44.3 ... 111) | 5000 | 0.0048 (0.0425) | 21 (46.3) | 1.0 | 4.7 | 7 | 0.063 (0.558) | 4500 | 2000 | 500 | 500 |
| 1PH813 | Size 24 | 140 ... 310 (103 ... 229) | 4500 | 0.0141 (0.1248) | 46 (101) | 1.3 | 6.9 | 15.5 | 0.218 (1.930) | 3600 | 2000 | 650 | 1000 |
| 1PH816 | Size 29 | 280 ... 500 (207 ... 369) | 4000 | 0.0266 (0.2354) | 66 (146) | 1.9 | 6.7 | 24 | 0.456 (4.036) | 3100 | 2000 | 750 | 1100 |
| 1PH818 | NFF-A 63 | 1000 (738) | 3500 | 0.022 (0.195) | 63 (139) | 2.2 | – | 98 | 1.3 (11.5) | 3000 | 2000 | 300 | 80 |
| 1PH822 | NFF-A 100 | 1600 (1180) | 3100 | 0.051 (0.451) | 88 (194) | 2.7 | – | 210 | 3.9 (34.5) | 2800 | 1200 | 300 | 100 |

Explanation of terms

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|---|--|
| Holding torque | For 1PH810 to 1PH816 motors, the holding torque can be continuously set in the specified value range using an adjustment ring. The dynamic braking torque is approximately 70 % of the set holding torque. |
| Single switching energy, perm. W_E | Permissible switching energy in the event of an emergency stop, $W_E = J_{tot} \times n^2 / 182.4 \times 10^{-3}$ (J in kgm ² , n in r/min) |
| Service life switching energy W_{max} | Maximum possible brake switching energy (for emergency stop) until the brake linings must be replaced, $W_{max} = W_E \times z$. |
| Number of emergency stops z | The specified number of emergency stops refers to the specified conditions. A conversion can be made for operation under different conditions: Number of emergency stops $z = W_{max} / W_E$ |
| Coil current | Current to release the brake. |
| Opening time | Separating time until the brake releases (the specified values refer to the maximum braking torque and rated voltage). |
| Closing time | Application time until the brake closes (Values refer to the maximum braking torque and at rated voltage). |

Note: You will find additional information on mounted holding brakes in the Configuration Manual.