Technical specifications

Terminal box type (see selection and ordering data for assignment)	Cable entry Power	External signals	Max. outer cable diameter[3] mm (in)	Number of main terminals		Max. cross-section per terminal mm²	Max. rated current[4] A
gk803	1 × M25 × 1.5	1 × M16 × 1.5[1]	20 (0.79)	Phases: Grounding:	3 × M5 2 × M5	1 × 10	52
gk813	1 × M32 × 1.5	1 × M16 × 1.5[1]	24.2 (0.95)	Phases: Grounding:	3 × M5 2 × M5	1 × 16	70
gk823	1 × M32 × 1.5	1 × M16 × 1.5[1]	24.2 (0.95)	Phases: Grounding:	3 × M5 2 × M5	1 × 16	70
gk826	1 × M32 × 1.5	1 × M16 × 1.5[1]	24.2 (0.95)	Phases: Grounding:	6 × M5 2 × M5	1 × 10	52
gk833	1 × M40 × 1.5	1 × M16 × 1.5[1]	32 (1.26)	Phases: Grounding:	3 × M6 2 × M6	1 × 35	110
gk843	1 × M50 × 1.5	1 × M16 × 1.5[1]	38 (1.50)	Phases: Grounding:	3 × M6 2 × M6	1 × 50	133
gk863	1 × M50 × 1.5	1 × M16 × 1.5[1]	38 (1.50)	Phases: Grounding:	3 × M6 2 × M6	1 × 50	133
gk873	1 × M63 × 1.5	1 × M16 × 1.5[1]	42.6 (1.68)	Phases: Grounding:	3 × M6 2 × M6	1 × 50	133
gk874	1 × M63 × 1.5	1 × M16 × 1.5[1]	42.6 (1.68)	Phases: Grounding:	3 × M10 2 × M6	2 × 70	240
1XB7322-P05	2 × M50 × 1.5	1 × PG 13.5[2]	38 (1.50)	Phases: Grounding:	3 × M12 2 × fixing eyelet	2 × 50	210
1XB7422-P06	2 × M63 × 1.5	1 × PG 13.5[2]	53 (2.09)	Phases: Grounding:	3 × M12 2 × fixing eyelet	2 × 70	270
1XB7700-P02	3 × M75 × 1.5	1 × PG 13.5[2]	68 (2.68)	Phases: Grounding:	3 × 2 × M12 2 × fixing eyelet	3 × 150	700
1XB7712-P03	4 × M75 × 1.5	1 × PG 13.5[2]	68 (2.68)	Phases: Grounding:	3 × 4 × M16 4 × M16	4 × 185	1150
With 1PH835 only							
1XB7712-P01	3 × M63 × 1.5	1 × M20 × 1.5[5] 1 × M25 × 1.5[6]	53 (2.09)	Phases: Grounding:	3 × 4 × M16 4 × M16	3 × 95	450
1XB7712-P03	4 × M75 × 1.5	1 × M20 × 1.5[5] 1 × M25 × 1.5[6]	68 (2.68)	Phases: Grounding:	3 × 4 × M16 4 × M16	4 × 185	1150
1XB7820-P00	Undrilled	1 × M20 × 1.5[5] 1 × M25 × 1.5[6]	–	Phases: Grounding:	2 × 3 × 4 × M16 8 × M16	8 × 240	2100

For terminal box type **1XB7712-P01** or **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 x M63 x 1.5 (not for 1XB7712-P01)
P02	Cable entry plate 3 x M75 x 1.5
P03	Cable entry plate 4 x M75 x 1.5 (not for 1XB7712-P03)
P04	Cable entry plate 4 x M63 x 1.5

For terminal box type **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 x M63 x 1.5

For terminal box type **1XB7322-P05** and**1XB7422-P06**, other cable entries (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] Thread M16 × 1.5 arranged with 90° to signal connection; thread only for options A12, A25 and 9th data position "A" (without encoder).
[2] Arranged opposite of signal connection (sideways from cable entry plate).
[3] Dependent on the design of the metric cable gland.
[4] Current-carrying capacity based on EN 60204-1/IEC 60364-5-52 with installation type E.
[5] Mounted on left side of terminal box (viewed toward cable entries).
[6] Mounted on right side of terminal box (viewed toward cable entries).

Selection guides for 1PH8 motors
Ventilation data/Sound pressure levels

Technical specifications (continued)

Motor type	Direction of air flow	Fan motor max. current consumption at			Volume of air, min.	Sound pressure level L_{pA} (1 m) Motor + external fan operation at 50 Hz tolerance + 3 dB
		A	A	A	m^3/s (ft^3/s)	dB
Forced ventilation		**230 V 50 Hz (± 10 %)**	**230 V 60 Hz (± 10 %)**	**265 V 60 Hz (± 10 %)**		
1PH808	NDE → DE DE → NDE	0.33 0.20	0.25 0.16	0.32 0.19	0.02 (0.71) 0.02 (0.71)	70 [1] 70 [1]
Forced ventilation		**400 V 50 Hz (± 10 %)**	**400 V 60 Hz (± 10 %)**	**480 V 60 Hz (± 10 %)**		
1PH810	NDE → DE DE → NDE	0.12 0.13	0.09 0.09	0.12 0.13	0.04 (1.41) 0.04 (1.41)	70 [1] 70 [1]
1PH813	NDE → DE DE → NDE	0.13 0.21	0.16 0.19	0.17 0.23	0.09 (3.18) 0.09 (3.18)	70 [1] 70 [1]
1PH816	NDE → DE DE → NDE	0.17 0.23	0.22 0.30	0.22 0.30	0.16 (5.65) 0.16 (5.65)	73 [1] 73 [1]
Forced ventilation		**400 V 50 Hz (± 10 %)**	**400 V 60 Hz (+ 5%/- 10 %)**	**480 V 60 Hz (+ 5%/- 10 %)**		
1PH835.-1..1 (IP55 degree of protection)	NDE → DE DE → NDE	4.7	4.6	4.6	0.75 (26.5)	77 [2]
1PH835.-1..4 (IP23 degree of protection)	NDE → DE DE → NDE	4.7	4.6	4.6	1 (35.3)	77 [2]

[1] For rated pulse frequency of 4 kHz and speed range up to 5000 rpm.
[2] For rated pulse frequency of 2.5 kHz and speed range up to 2800 rpm.

Technical specifications (continued)

Cooling data and sound pressure levels

Motor type	Flow volume, min.	Pressure drop	Water connection at NDE thread	Sound pressure level L_{pA} (1 m) motor tolerance + 3 dB
	l/min (US gal./min)	bar	Inch	dB
Water cooling				
1PH808	6 (1.58)	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 variant)	20 (5.28)	0.6	G 3/8	70[2)]
1PH822.-2 (synchronous variant)	25 (6.61)	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. For trouble-free operation, a filter can be installed. The filter fineness should be no less than 100 µm.
Cooling water specifications	
pH value	6.0 ... 9.0
Total hardness	< 170 ppm
Conductivity	< 500 µS/cm
Operating pressure, max.	< 6 bar
Pressure drop at V(N)	< 1 bar
Cooling water inlet temperature, max.	< 30 °C (86 °F)
Cooling water temperature, min.	$T_{cooling\ water} > T_{ambient} - 5$ K
Anti-freeze protection / corrosion protection	20 ... 30 %
NALCO 00GE056 inhibitor	0.2 ... 0.25 %
Components	
Dissolved substances	< 340 ppm
Max. grain size	< 100 µm
Chloride ions	< 40 ppm
Sulfate ions	< 50 ppm
Nitrate ions	< 50 ppm

1) For rated pulse frequency of 4 kHz and speed range up to 5000 rpm.

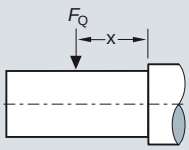
2) For rated pulse frequencies of 2 kHz or 4 kHz and speed ranges:
1PH818 up to 5000 rpm
1PH822 up to 4500 rpm.

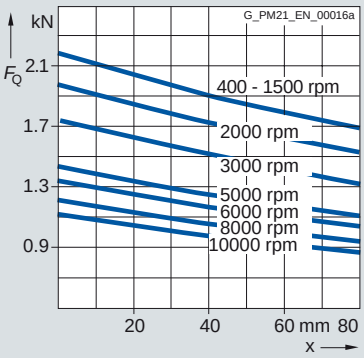
3) At rated pulse frequency of 2 kHz and speed ranges:
1PH822 up to 4500 rpm
1PH828 up to 3300 rpm.

Selection guides for 1PH8 motors
Radial force diagrams

Characteristic curves

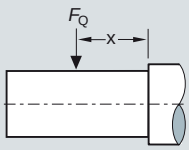
Permissible radial forces
1PH8 motors
Shaft height 80
Standard

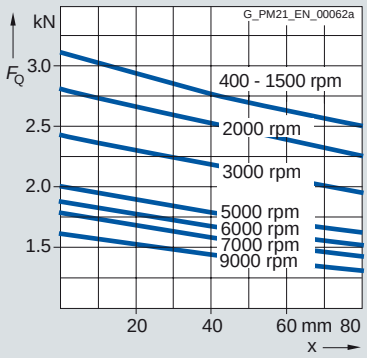




L_{10h} = 20000 h

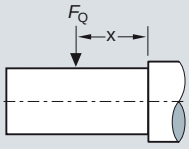
Permissible radial forces
1PH8 motors
Shaft height 100
Standard

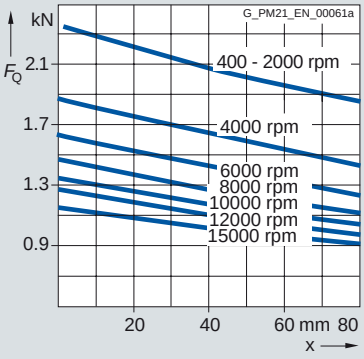




L_{10h} = 20000 h

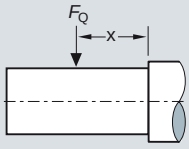
Permissible radial forces
1PH8 motors
Shaft height 80
Performance

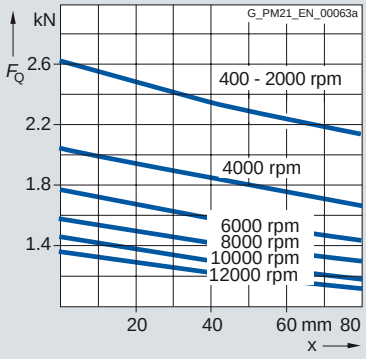




L_{10h} = 12000 h

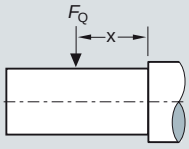
Permissible radial forces
1PH8 motors
Shaft height 100
Performance

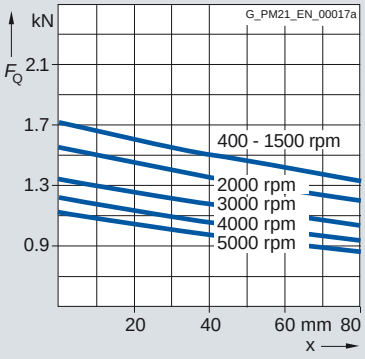




L_{10h} = 12000 h

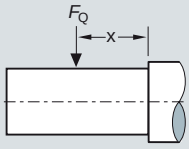
Permissible radial forces
1PH8 motors
Shaft height 80
Advanced lifetime

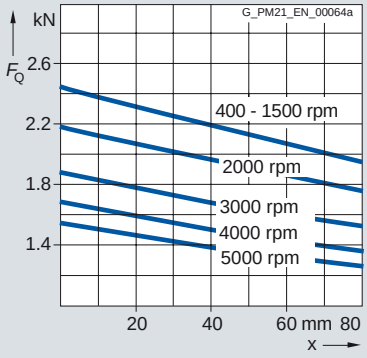




L_{10h} = 40000 h

Permissible radial forces
1PH8 motors
Shaft height 100
Advanced lifetime



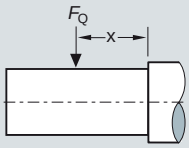


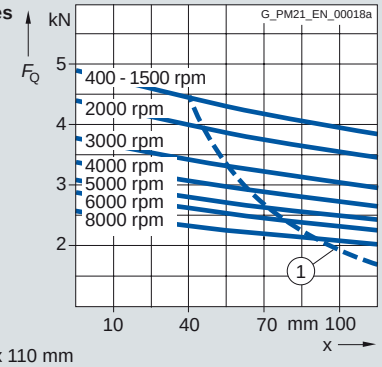
L_{10h} = 40000 h

5

Characteristic curves (continued)

Permissible radial forces
1PH8 motors
Shaft height 132
Standard

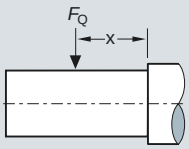


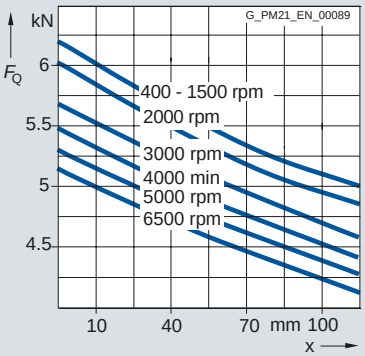


(1) Maximum load for 1PH7-compatible shaft extension (42 x 110 mm (1.65 x 4.33 in)) (option V90)

L_{10h} = 20000 h

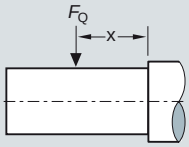
Permissible radial forces
1PH8 motors
Shaft height 160
Standard

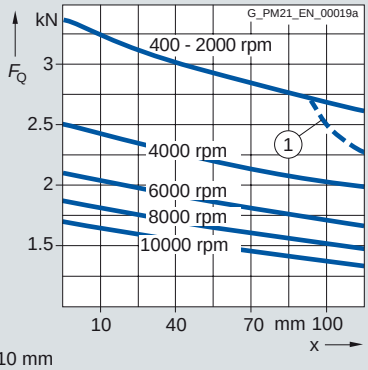




L_{10h} = 20000 h

Permissible radial forces
1PH8 motors
Shaft height 132
Performance

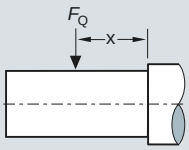


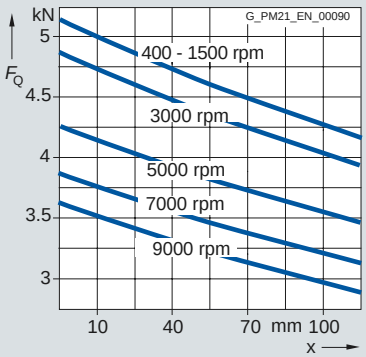


(1) Maximum load for 1PH7-compatible shaft extension (42 x 110 mm (1.65 x 4.33 in)) (option V90)

L_{10h} = 12000 h

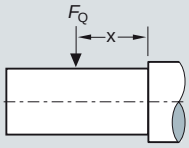
Permissible radial forces
1PH8 motors
Shaft height 160
Performance

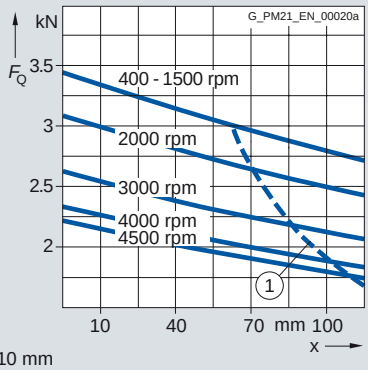




L_{10h} = 12000 h

Permissible radial forces
1PH8 motors
Shaft height 132
Advanced lifetime

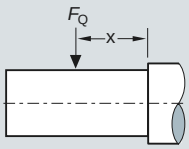


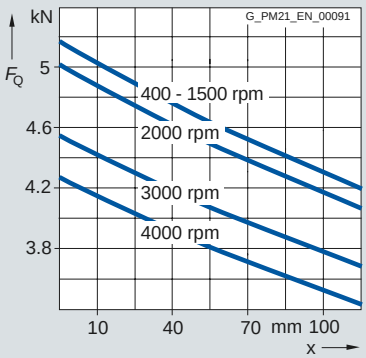


(1) Maximum load for 1PH7-compatible shaft extension (42 x 110 mm (1.65 x 4.33 in)) (option V90)

L_{10h} = 40000 h

Permissible radial forces
1PH8 motors
Shaft height 160
Advanced Lifetime





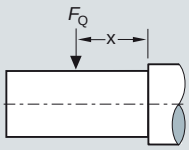
L_{10h} = 40000 h

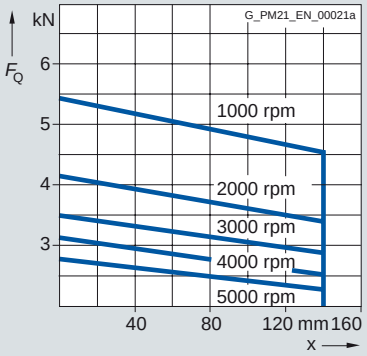
5

Selection guides for 1PH8 motors
Radial force diagrams

Characteristic curves (continued)

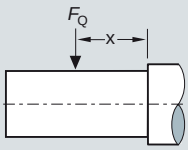
Permissible radial forces
1PH8 motors
Shaft height 180
Standard

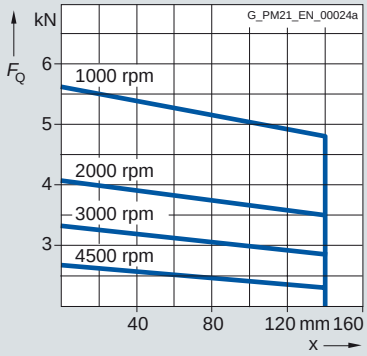




L_{10h} = 20000 h

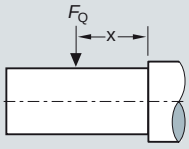
Permissible radial forces
1PH8 motors
Shaft height 225
Standard

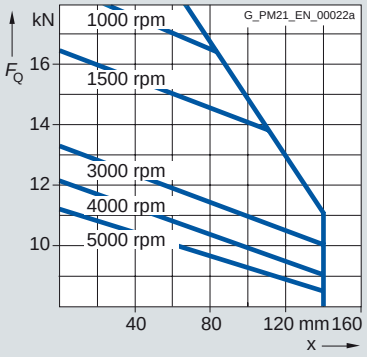




L_{10h} = 20000 h

Permissible radial forces
1PH8 motors
Shaft height 180
With increased radial force

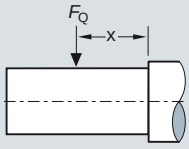


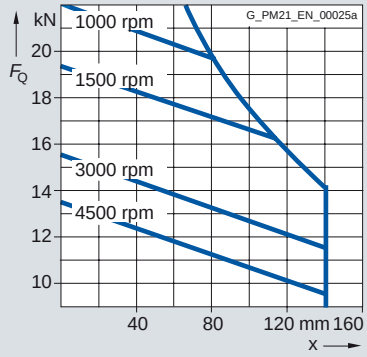


Minimum radial force 4 kN (899 lbf)

L_{10h} = 12000 h

Permissible radial forces
1PH8 motors
Shaft height 225
With increased radial force

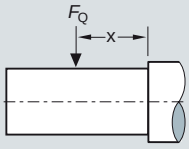


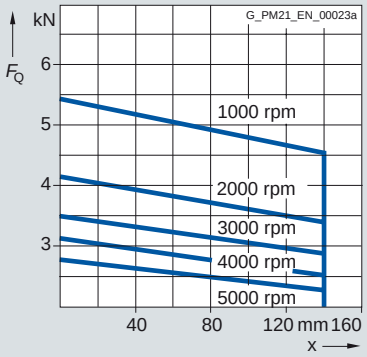


Minimum radial force 5 kN (1124 lbf)

L_{10h} = 12000 h

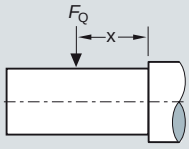
Permissible radial forces
1PH8 motors
Shaft height 180
Performance

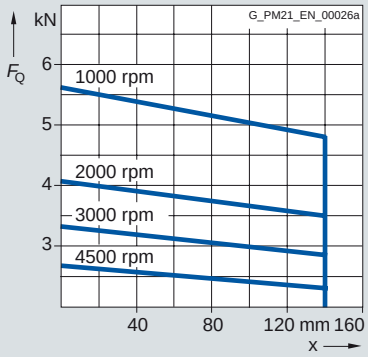




L_{10h} = 12000 h

Permissible radial forces
1PH8 motors
Shaft height 225
Performance



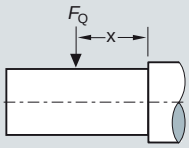


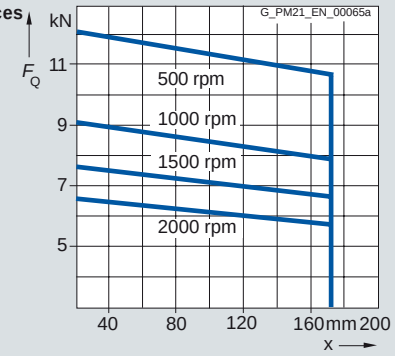
L_{10h} = 12000 h

Note:
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!

Characteristic curves (continued)

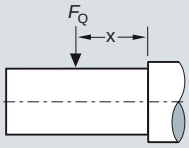
Permissible radial forces
1PH8 motors
Shaft height 280
Standard

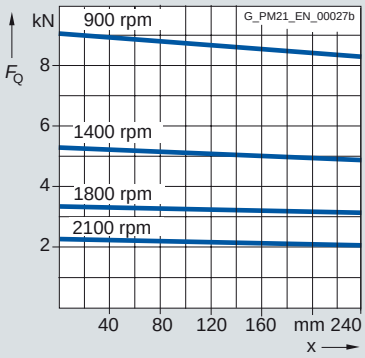




L_{10h} = 20000 h

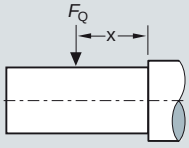
Permissible radial forces
1PH8 motors
Shaft height 355
Standard

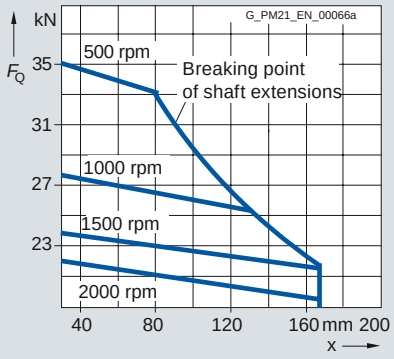




L_{10h} = 20000 h

Permissible radial forces
1PH8 motors
Shaft height 280
With increased radial force

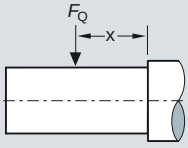


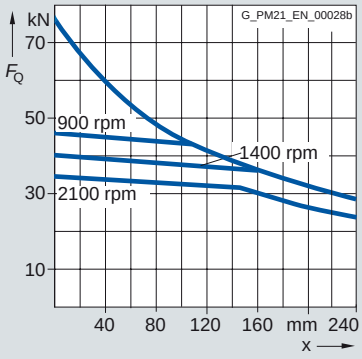


Minimum radial force 9 kN
(2023 lbf)

L_{10h} = 12000 h

Permissible radial forces
1PH8 motors
Shaft height 355
With increased radial force





Minimum radial force 13 kN
(2923 lbf)

L_{10h} = 20000 h

Note:
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!