



Berger Lahr positioning drives

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General information

The selection of positioning drives was previously limited to either a servomotor drive or a stepping-motor drive. Both of these distinct drive technologies have been combined in the Twin Line product family, enabling you to match the advantages of each system to your particular application.

Three different motor series are available for the Twin Line positioning drives:

3-phase stepping motors

Exceptionally robust, maintenance-free drives. They execute precise, step-by-step movements specified by a positioning controller.

The 3-phase stepping motors can be operated in conjunction with Twin Line power electronics (Power range from 350 W to 750 W) at resolutions from 200 to 1000 steps per revolution or, in micro-step mode, from 2000 to 10000 steps per revolution.

Options such as rotation monitoring, holding brake and rugged, low-backlash planetary gears expand the application possibilities.

AC synchronous servomotors - standard

Provide a very high power intensity, enabling highly dynamic positioning drives offering exceptional performance at a low price.

Power range from 750 W to 3 kW.

AC synchronous servomotors - high performance

Offer high impulse torques and a large power bandwidth, making them easy to adapt to your application.

Power range from 750 W to 8 kW.

Berger Lahr servomotors are compatible with standard servo connection dimensions, providing flexible solutions to any problem. They all come equipped with an absolute measuring system, the SinCos[®] (SRS) Singleturn. This measuring system is designed to provide optimum performance with our Twin Line family of devices. You can use the HIPERFACE[®] interface between motor measuring system and device for a self-initialisation of the motor and current-regulator parameters, considerably simplifying the start-up process.

An AC synchronous servomotor module consists of the AC synchronous servomotor itself and the associated controller. Optimum performance is achieved only when motor and controller are perfectly in tune with each other.

Ever more exacting demands are being placed on the applications of modern drive technology, including:

- Positioning precision
- Rotary-speed precision
- Torque precision
- Regulation range
- Dynamics
- Overload compatibility
- Availability

These demands are fully satisfied by the Berger Lahr family of Twin Line products and by both AC synchronous servomotor programs: Standard and High Performance.



Series of High Performance AC synchronous servomotors

AC synchronous servomotors - High Performance

Features

- **High impulse torque** up to five times the continuous stationary torque.
- **Large power bandwidth** encompassing a continuous stationary torque range from 0.34 to 50 Nm, in six model sizes.
- **High adaptability** to your application, because of the availability of individual sizes in several speed/torque variants.

Technical specifications

- 6-pin synchronous motors
- SinCos absolute measuring system[®] (SRS) Singleturn as standard position and rotary-speed measuring system, except for DSM 4-05.x, which only comes with the Resolver
- Use of high-energy neodymium-iron-boron magnets
- Integrated thermal efficiency monitoring (NTC)
- Vibration severity level R according to DIN ISO 2373
- Protection type:
 - Motor housing: IP 65
 - Shaft end, front: IP 64
- Motor and measuring-system connection with mounting sockets, straight exit, except DSM 4-19x, motor connection only via terminal box
- Size (flange)
 - DSM 4-05 (55 x 55 mm²)
 - DSM 4-07 (70 x 70 mm²)
 - DSM 4-09 (92 x 92 mm²)
 - DSM 4-11 (110 x 110 mm²)
 - DSM 4-14 (140 x 140 mm²)
 - DSM 4-19 (190 x 190 mm²)
- Rated speeds, depending on motor length
 - DSM 4-05: 6000 min⁻¹
 - DSM 4-07: 4000/6000 min⁻¹

- DSM 4-09: 3000/4000/6000 min⁻¹
- DSM 4-11: 3000/4000/6000 min⁻¹
- DSM 4-14: 2000/3000/4000 min⁻¹
- DSM 4-19: 1500/2000/3000/4000 min⁻¹

Optional accessories

- Measuring system
 - SinCos[®] (SRM) Multiturn
 - Resolver only for DSM 4-05.x
- Integrated holding brake
- Gearbox
- Mounting sockets, 90°, can be rotated for:
 - Motor (except DSM 4-19.x)
 - Measuring system
- Special shaft, special flange
- Vibration severity level S
- Level R flange precision
- Different colour scheme

Environmental influences

Ambient conditions (based on DIN 50019-R14):

- Temperature: -20 °C to +40 °C
- Humidity: 75 % R.H. yearly average, 95 % R.H. on 30 days, non-condensing

Storage and transport temperature:

- Temperature: -20 °C to +60 °C

Technical Data

AC synchronous servomotors - High Performance

Technical data for DSM 4-05

| | U_{DC-Bus} | M_{dO} | I_{dO} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|-----|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-05.1-1xx.x6 | 325 | 0.34 | 1.20 | 0.32 | 1.3 | 6000 | 0.20 | 20.0 | 1.7 | 7.07 | 0.17 | 1.0 |
| DSM 4-05.1-2xx.x6 | 560 | 0.34 | 0.85 | 0.32 | 0.9 | 6000 | 0.20 | 27.6 | 1.7 | 5.02 | 0.17 | 1.0 |
| DSM 4-05.2-1xx.x6 | 325 | 0.50 | 1.50 | 0.48 | 1.7 | 6000 | 0.30 | 20.0 | 2.5 | 9.05 | 0.24 | 1.2 |
| DSM 4-05.2-2xx.x6 | 560 | 0.50 | 1.00 | 0.48 | 1.1 | 6000 | 0.30 | 32.8 | 2.5 | 6.01 | 0.24 | 1.2 |
| DSM 4-05.3-1xx.x6 | 325 | 0.65 | 2.00 | 0.60 | 2.3 | 6000 | 0.375 | 20.0 | 3.2 | 10.80 | 0.31 | 1.4 |
| DSM 4-05.3-2xx.x6 | 560 | 0.65 | 1.20 | 0.60 | 1.3 | 6000 | 0.375 | 35.2 | 3.2 | 6.51 | 0.31 | 1.4 |
| DSM 4-05.4-1xx.x6 | 325 | 1.00 | 3.20 | 0.80 | 3.4 | 6000 | 0.500 | 20.0 | 5.0 | 16.97 | 0.45 | 1.8 |
| DSM 4-05.4-2xx.x6 | 560 | 1.00 | 1.60 | 0.80 | 1.7 | 6000 | 0.500 | 40.0 | 5.0 | 8.49 | 0.45 | 1.8 |

Technical data for the DSM 4-07.x and its variations

| | U_{DC-Bus} | M_{dO} | I_{dO} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|-----|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-07.1-1xx.x4 | 325 | 0.65 | 1.9 | 0.6 | 2.0 | 4000 | 0.25 | 20.8 | 3.1 | 11.38 | 0.22 | 1.5 |
| DSM 4-07.1-2xx.x4 | 560 | 0.65 | 0.9 | 0.6 | 0.9 | 4000 | 0.25 | 47.9 | 3.1 | 5.37 | 0.22 | 1.5 |
| DSM 4-07.1-1xx.x6 | 325 | 0.65 | 2.6 | 0.5 | 2.5 | 6000 | 0.31 | 15.4 | 3.1 | 15.63 | 0.22 | 1.5 |
| DSM 4-07.1-2xx.x6 | 560 | 0.65 | 1.3 | 0.5 | 1.2 | 6000 | 0.31 | 32.1 | 3.1 | 7.85 | 0.22 | 1.5 |
| DSM 4-07.2-1xx.x4 | 325 | 1.50 | 3.2 | 1.3 | 2.9 | 4000 | 0.54 | 27.7 | 7.2 | 19.23 | 0.36 | 2.1 |
| DSM 4-07.2-2xx.x4 | 560 | 1.50 | 1.6 | 1.3 | 1.4 | 4000 | 0.54 | 57.2 | 7.2 | 9.62 | 0.36 | 2.1 |
| DSM 4-07.2-1xx.x6 | 325 | 1.50 | 5.0 | 1.0 | 4.4 | 6000 | 0.62 | 17.8 | 7.2 | 29.98 | 0.36 | 2.1 |
| DSM 4-07.2-2xx.x6 | 560 | 1.50 | 2.4 | 1.0 | 2.1 | 6000 | 0.62 | 37.5 | 7.2 | 14.42 | 0.36 | 2.1 |
| DSM 4-07.3-1xx.x4 | 325 | 2.30 | 5.5 | 2.0 | 4.7 | 4000 | 0.83 | 26.3 | 11.0 | 33.02 | 0.57 | 2.9 |
| DSM 4-07.3-2xx.x4 | 560 | 2.30 | 2.4 | 2.0 | 2.0 | 4000 | 0.83 | 60.4 | 11.0 | 14.42 | 0.57 | 2.9 |
| DSM 4-07.3-1xx.x6 | 325 | 2.30 | 7.7 | 1.5 | 6.6 | 6000 | 0.94 | 18.6 | 11.0 | 46.17 | 0.57 | 2.9 |
| DSM 4-07.3-2xx.x6 | 560 | 2.30 | 3.5 | 1.5 | 3.0 | 6000 | 0.94 | 41.8 | 11.0 | 21.00 | 0.57 | 2.9 |

| | | | |
|--------------|--|-----------|--|
| U_{DC-Bus} | Intermediate-circuit direct voltage from Twin Line drive or controller | P_N | Rated power |
| M_{dO} | Continuous stationary torque | k_E | Voltage constant at 1000 min ⁻¹ |
| I_{dO} | Continuous stationary current | M_{max} | Max. torque |
| M_{dN} | Rated continuous torque | I_{max} | Max. current |
| I_{dN} | Rated continuous current | J_R | Rotor inertia |
| n_N | Rated speed | m | Mass |

AC synchronous servomotors - High Performance

Technical Data

Technical data for the DSM 4-09.x and its variations

| | U_{DC-Bus} | M_{d0} | I_{d0} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|-----|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-09.1-1xx.x3 | 325 | 0.95 | 1.5 | 0.8 | 1.3 | 3000 | 0.25 | 36.5 | 4.3 | 7.50 | 1.20 | 2.7 |
| DSM 4-09.1-2xx.x3 | 560 | 0.95 | 0.8 | 0.8 | 0.72 | 3000 | 0.25 | 66.5 | 4.3 | 3.96 | 1.20 | 2.7 |
| DSM 4-09.1-1xx.x4 | 325 | 0.95 | 2 | 0.75 | 1.8 | 4000 | 0.31 | 27.5 | 4.3 | 9.97 | 1.20 | 2.7 |
| DSM 4-09.1-2xx.x4 | 560 | 0.95 | 1.1 | 0.75 | 0.9 | 4000 | 0.31 | 50.2 | 4.3 | 5.44 | 1.20 | 2.7 |
| DSM 4-09.1-1xx.x6 | 325 | 0.95 | 3 | 0.7 | 2.4 | 6000 | 0.44 | 18.3 | 4.3 | 14.99 | 1.20 | 2.7 |
| DSM 4-09.1-2xx.x6 | 560 | 0.95 | 1.6 | 0.7 | 1.3 | 6000 | 0.44 | 33.6 | 4.3 | 7.99 | 1.20 | 2.7 |
| DSM 4-09.2-1xx.x3 | 325 | 2.70 | 3.2 | 2.4 | 2.7 | 3000 | 0.75 | 45.5 | 12.2 | 15.98 | 2.70 | 3.9 |
| DSM 4-09.2-2xx.x3 | 560 | 2.70 | 1.9 | 2.4 | 1.6 | 3000 | 0.75 | 78.8 | 12.2 | 9.40 | 2.70 | 3.9 |
| DSM 4-09.2-1xx.x4 | 325 | 2.70 | 4.3 | 2.2 | 3.6 | 4000 | 0.92 | 34.3 | 12.2 | 21.50 | 2.70 | 3.9 |
| DSM 4-09.2-2xx.x4 | 560 | 2.70 | 2.5 | 2.2 | 2.1 | 4000 | 0.92 | 59 | 12.2 | 12.45 | 2.70 | 3.9 |
| DSM 4-09.2-1xx.x6 | 325 | 2.70 | 6.5 | 2.0 | 5.3 | 6000 | 1.25 | 22.3 | 12.2 | 32.46 | 2.70 | 3.9 |
| DSM 4-09.2-2xx.x6 | 560 | 2.70 | 3.7 | 2.0 | 3 | 6000 | 1.25 | 39.4 | 12.2 | 18.46 | 2.70 | 3.9 |
| DSM 4-09.3-2xx.x3 | 560 | 4.50 | 2.9 | 3.9 | 2.4 | 3000 | 1.22 | 83.5 | 20.3 | 14.50 | 4.20 | 5.2 |
| DSM 4-09.3-2xx.x4 | 560 | 4.50 | 3.8 | 3.5 | 3.1 | 4000 | 1.47 | 64.2 | 20.3 | 18.95 | 4.20 | 5.2 |
| DSM 4-09.3-2xx.x6 | 560 | 4.50 | 5.6 | 2.8 | 3.8 | 6000 | 1.76 | 43.4 | 20.3 | 27.93 | 4.20 | 5.2 |
| DSM 4-09.4-2xx.x3 | 560 | 6.00 | 4.2 | 5.0 | 3.4 | 3000 | 1.57 | 79.7 | 27.0 | 21.00 | 5.40 | 6.6 |
| DSM 4-09.4-2xx.x4 | 560 | 6.00 | 5.5 | 4.5 | 4.4 | 4000 | 1.88 | 61.3 | 27.0 | 27.51 | 5.40 | 6.6 |
| DSM 4-09.4-2xx.x6 | 560 | 6.00 | 7.8 | 3 | 4.5 | 6000 | 1.88 | 42.5 | 27.0 | 38.96 | 5.40 | 6.6 |

Technical data for the DSM 4-11.x and its variations

| | U_{DC-Bus} | M_{d0} | I_{d0} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|------|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-11.1-2xx.x3 | 560 | 4.20 | 3 | 3.7 | 2.8 | 3000 | 1.2 | 82.7 | 18.9 | 10.18 | 4.80 | 6.3 |
| DSM 4-11.1-2xx.x4 | 560 | 4.20 | 4 | 3.5 | 3.5 | 4000 | 1.5 | 62 | 18.9 | 13.58 | 4.80 | 6.3 |
| DSM 4-11.1-2xx.x6 | 560 | 4.20 | 6 | 3 | 4.8 | 6000 | 1.9 | 41.3 | 18.9 | 20.36 | 4.80 | 6.3 |
| DSM 4-11.2-2xx.x3 | 560 | 7.00 | 4.8 | 6.1 | 4.5 | 3000 | 1.9 | 84.7 | 31.5 | 16.26 | 7.40 | 7.9 |
| DSM 4-11.2-2xx.x4 | 560 | 7.00 | 6.4 | 5.8 | 5.8 | 4000 | 2.4 | 62.9 | 31.5 | 21.71 | 7.40 | 7.9 |
| DSM 4-11.2-2xx.x6 | 560 | 7.00 | 9.9 | 3.8 | 5.9 | 6000 | 2.4 | 40.9 | 31.5 | 33.59 | 7.40 | 7.9 |
| DSM 4-11.3-2xx.x3 | 560 | 10 | 7.2 | 8.4 | 6.3 | 3000 | 2.6 | 84.7 | 45.0 | 24.40 | 9.80 | 9.6 |
| DSM 4-11.3-2xx.x4 | 560 | 10 | 9.7 | 7.6 | 7.7 | 4000 | 3.2 | 62.4 | 45.0 | 32.88 | 9.80 | 9.6 |
| DSM 4-11.3-2xx.x6 | 560 | 10 | 13.6 | 5 | 7.6 | 6000 | 3.1 | 44.6 | 45.0 | 46.17 | 9.80 | 9.6 |
| DSM 4-11.4-2xx.x3 | 560 | 12 | 8.5 | 9.9 | 7.3 | 3000 | 3.1 | 85.9 | 54.0 | 28.84 | 12.70 | 11.2 |
| DSM 4-11.4-2xx.x4 | 560 | 12 | 11.6 | 8.6 | 8.6 | 4000 | 3.6 | 63.1 | 54.0 | 39.39 | 12.70 | 11.2 |

U_{DC-Bus} Intermediate-circuit direct voltage from Twin Line drive or controller

M_{d0} Continuous stationary torque

I_{d0} Continuous stationary current

M_{dN} Rated continuous torque

I_{dN} Rated continuous current

n_N Rated speed

P_N Rated power

k_E Voltage constant at 1000 min⁻¹

M_{max} Max. torque

I_{max} Max. current

J_R Rotor inertia

m Mass

Technical Data

AC synchronous servomotors - High Performance

Technical data for the DSM 4-14.x and its variations

| | U_{DC-Bus} | M_{dO} | I_{dO} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|-----|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-14.1-2xx.x2 | 560 | 8.5 | 3.7 | 7 | 3.1 | 2000 | 1.5 | 142.3 | 42 | 19.80 | 12.3 | 10 |
| DSM 4-14.1-2xx.x3 | 560 | 8.5 | 5.6 | 6.5 | 4.5 | 3000 | 2.0 | 94.0 | 42 | 29.70 | 12.3 | 10 |
| DSM 4-14.1-2xx.x4 | 560 | 8.5 | 7.4 | 5.2 | 4.8 | 4000 | 2.2 | 71.0 | 42 | 39.60 | 12.3 | 10 |
| DSM 4-14.2-2xx.x2 | 560 | 14.00 | 5.6 | 12.2 | 4.9 | 2000 | 2.6 | 145.4 | 70 | 29.70 | 19.50 | 12 |
| DSM 4-14.2-2xx.x3 | 560 | 14.00 | 9.0 | 11.0 | 7 | 3000 | 3.5 | 96.3 | 70 | 48.08 | 19.50 | 12 |
| DSM 4-14.2-2xx.x4 | 560 | 14.00 | 12.0 | 7.6 | 6.5 | 4000 | 3.2 | 73.1 | 70 | 63.64 | 19.50 | 12 |
| DSM 4-14.3-2xx.x2 | 560 | 19.0 | 8.1 | 16.5 | 7.3 | 2000 | 3.5 | 141.1 | 85.0 | 38.89 | 26.70 | 16 |
| DSM 4-14.3-2xx.x3 | 560 | 19.0 | 12.4 | 14.6 | 9.9 | 3000 | 4.6 | 92.5 | 85.0 | 59.40 | 26.70 | 16 |
| DSM 4-14.3-2xx.x4 | 560 | 19.0 | 16.2 | 8.7 | 7.7 | 4000 | 3.6 | 70.7 | 85.0 | 77.78 | 26.70 | 16 |
| DSM 4-14.4-2xx.x2 | 560 | 27.0 | 11.9 | 21.4 | 9.4 | 2000 | 4.5 | 148.0 | 121.0 | 56.57 | 36 | 20 |
| DSM 4-14.4-2xx.x3 | 560 | 27.0 | 17.3 | 15.5 | 9.9 | 3000 | 4.9 | 101.0 | 121.0 | 82.73 | 36 | 20 |

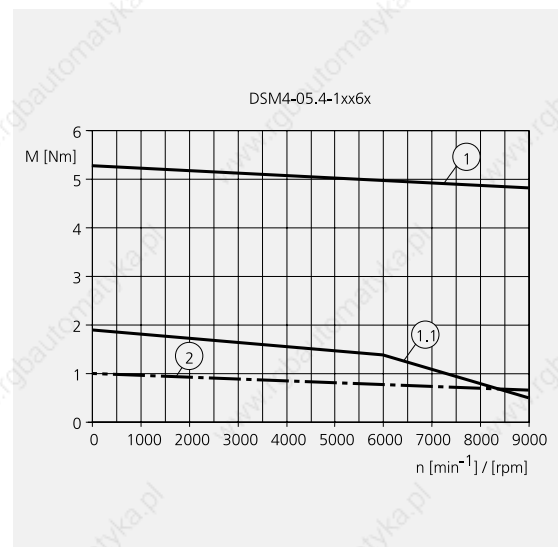
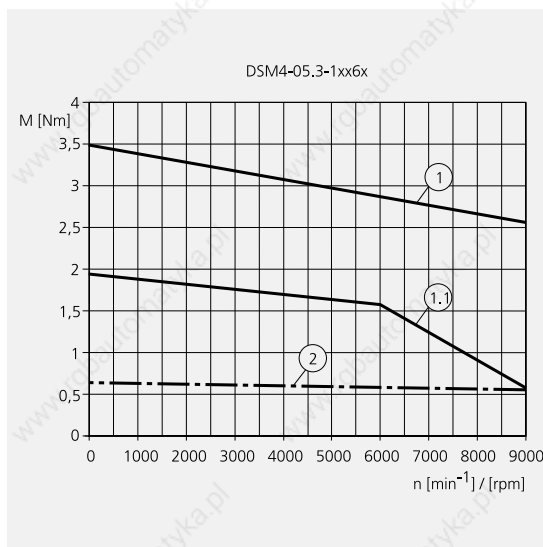
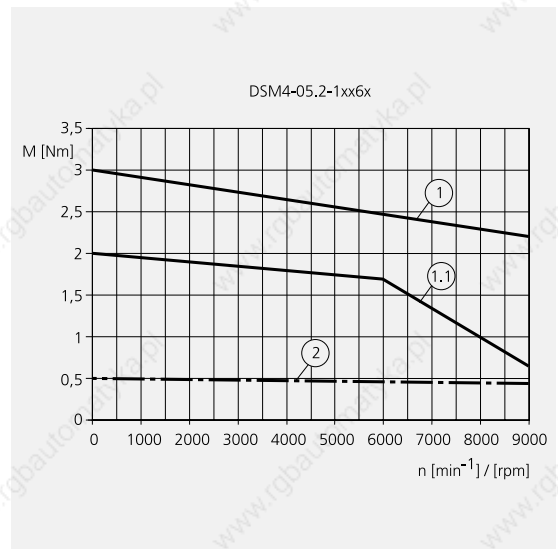
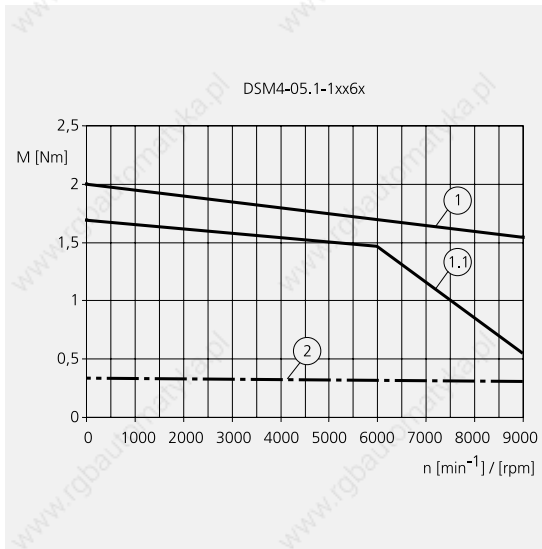
Technical data for the DSM 4-19.x and its variations

| | U_{DC-Bus} | M_{dO} | I_{dO} | M_{dN} | I_{dN} | n_N | P_N | k_E | M_{max} | I_{max} | J_R | m |
|-------------------|--------------|----------|------------------|----------|------------------|-------------------|-------|------------------|-----------|------------------|-------------------|-----|
| | V | Nm | A _{eff} | Nm | A _{eff} | min ⁻¹ | kW | V _{eff} | Nm | A _{eff} | kgcm ² | kg |
| DSM 4-19.1-2xx.x1 | 560 | 25 | 8.2 | 22.5 | 7.5 | 1500 | 3.5 | 189.2 | 88 | 28.99 | 84 | 31 |
| DSM 4-19.1-2xx.x2 | 560 | 25 | 11.1 | 21.5 | 9.7 | 2000 | 4.5 | 140.6 | 88 | 38.89 | 84 | 31 |
| DSM 4-19.1-2xx.x3 | 560 | 25 | 17.0 | 20.0 | 13.8 | 3000 | 6.3 | 91.9 | 88 | 60.10 | 84 | 31 |
| DSM 4-19.1-2xx.x4 | 560 | 25 | 22.2 | 16.0 | 14.8 | 4000 | 6.7 | 70.3 | 88 | 77.78 | 84 | 31 |
| DSM 4-19.2-2xx.x1 | 560 | 50 | 17.0 | 42.0 | 14.5 | 1500 | 6.6 | 179.6 | 175 | 60.1 | 147 | 44 |
| DSM 4-19.2-2xx.x2 | 560 | 50 | 22.3 | 38.0 | 17.2 | 2000 | 7.9 | 137.3 | 175 | 78.5 | 147 | 44 |
| DSM 4-19.2-2xx.x3 | 560 | 50 | 32.2 | 31.0 | 20.6 | 3000 | 9.7 | 95.1 | 175 | 113.1 | 147 | 44 |

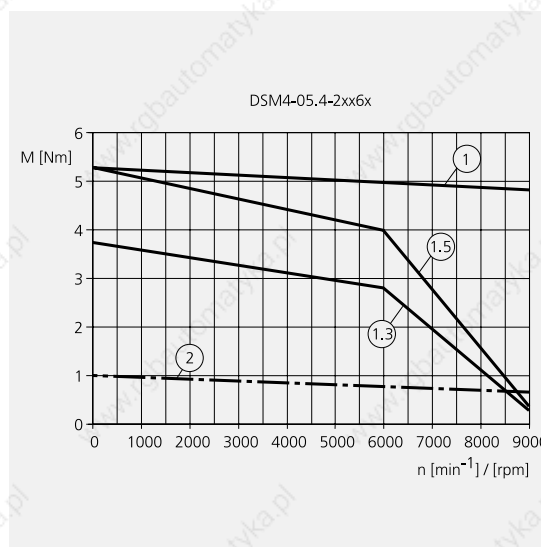
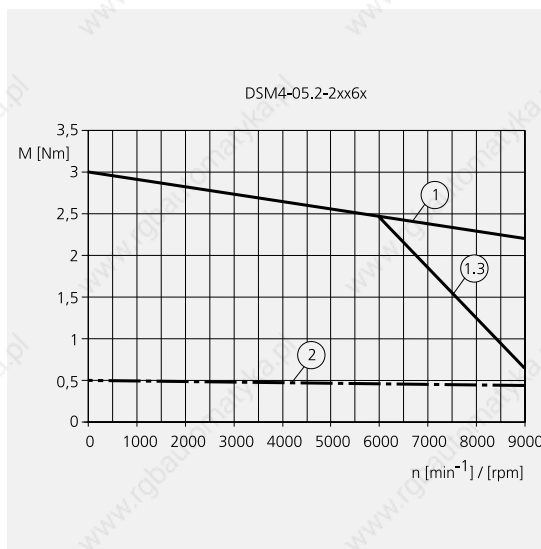
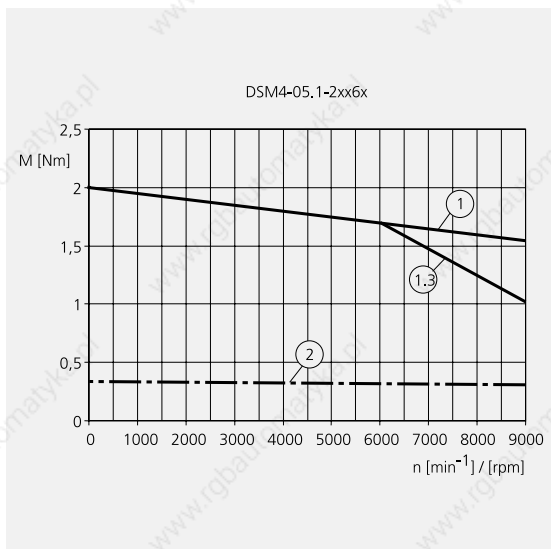
| | | | |
|--------------|--|-----------|--|
| U_{DC-Bus} | Intermediate-circuit direct voltage from Twin Line drive or controller | P_N | Rated power |
| M_{dO} | Continuous stationary torque | k_E | Voltage constant at 1000 min ⁻¹ |
| I_{dO} | Continuous stationary current | M_{max} | Max. torque |
| M_{dN} | Rated continuous torque | I_{max} | Max. current |
| I_{dN} | Rated continuous current | J_R | Rotor inertia |
| n_N | Rated speed | m | Mass |

AC synchronous servomotors - High Performance

Characteristic curves



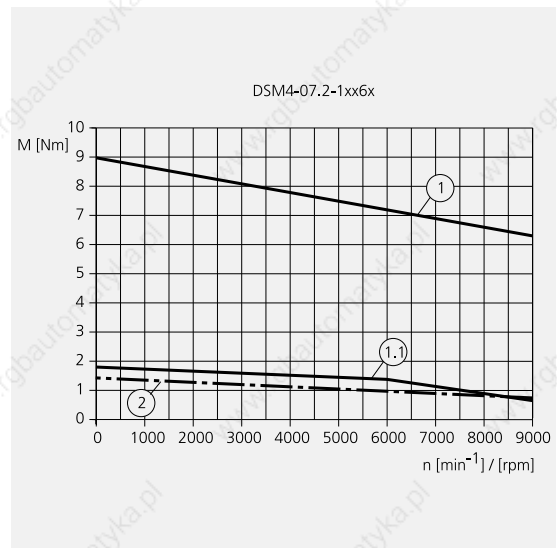
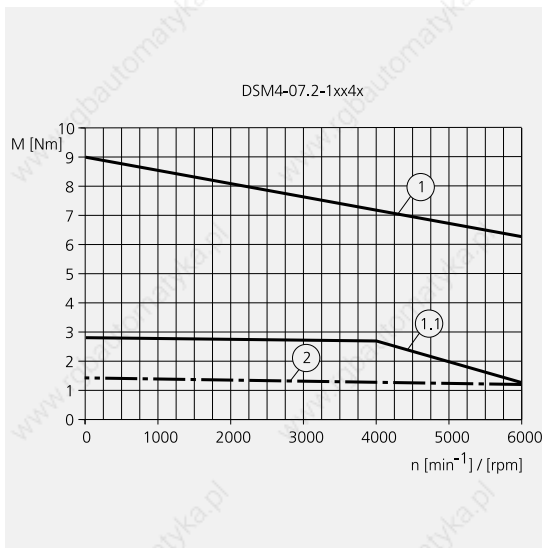
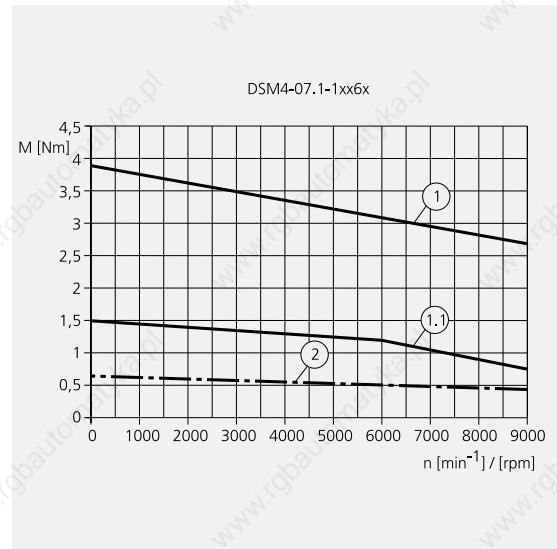
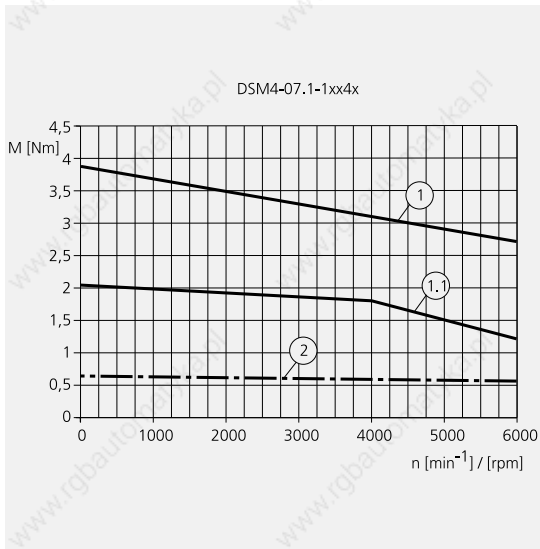
- 1 Motor peak torque
- 2 Continuous torque
- 1.1 Peak torque with TLX x32
- 1.3 Peak torque with TLX x34
- 1.5 Peak torque with TLX x36
- 1.7 Peak torque with TLX x38



- 1 Motor peak torque
- 2 Continuous torque
- 1.1 Peak torque with TLX x32
- 1.3 Peak torque with TLX x34
- 1.5 Peak torque with TLX x36
- 1.7 Peak torque with TLX x38

AC synchronous servomotors - High Performance

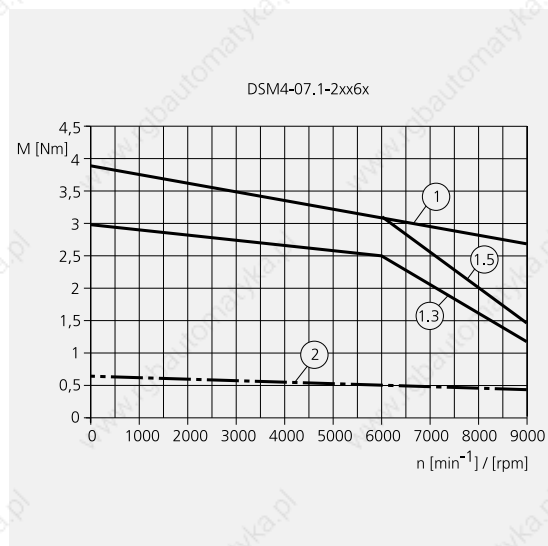
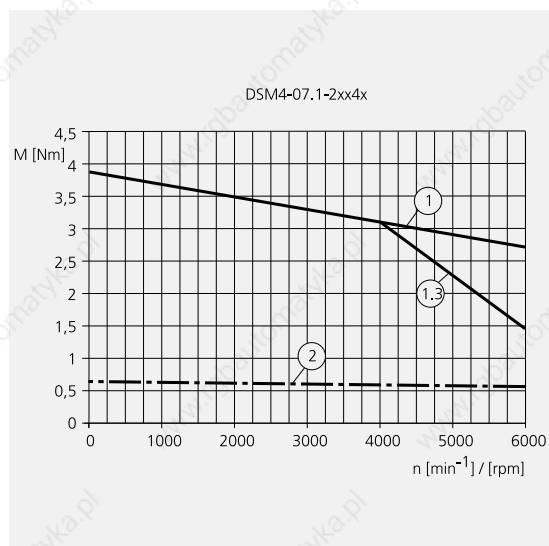
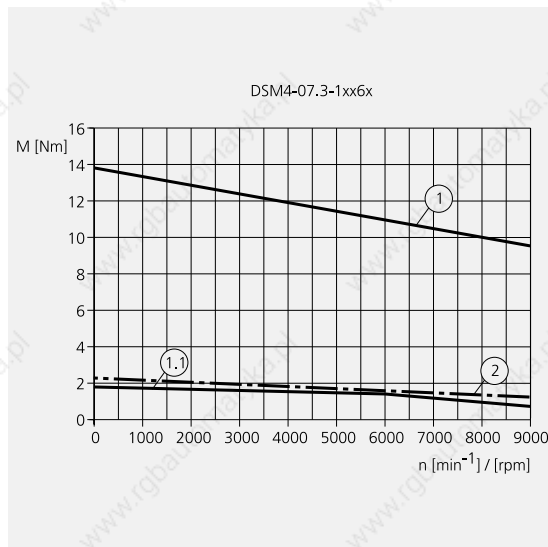
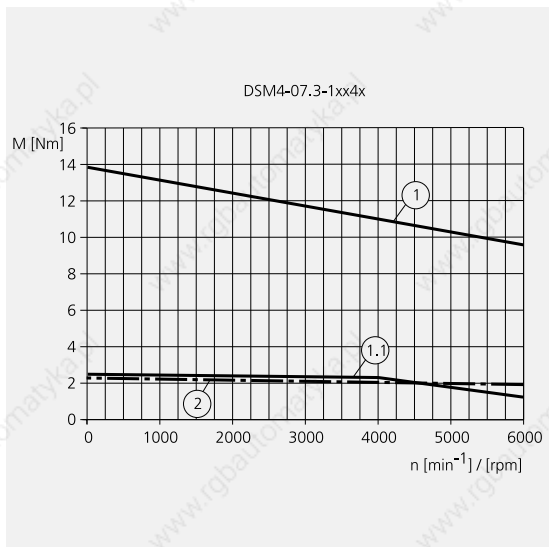
Characteristic curves



- 1 Motor peak torque
- 2 Continuous torque
- 1.1 Peak torque with TLX x32
- 1.3 Peak torque with TLX x34
- 1.5 Peak torque with TLX x36
- 1.7 Peak torque with TLX x38

Characteristic curves

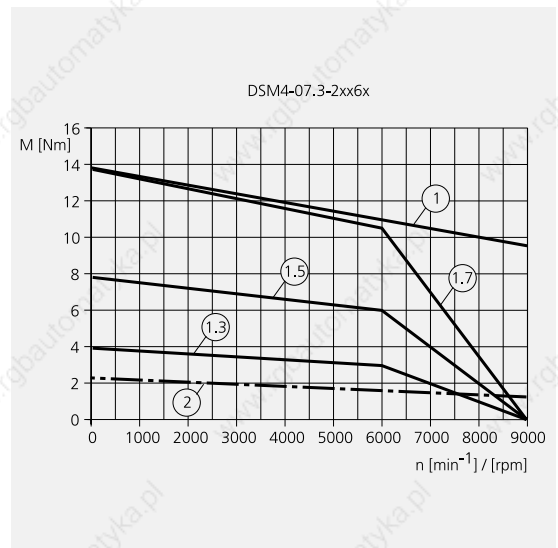
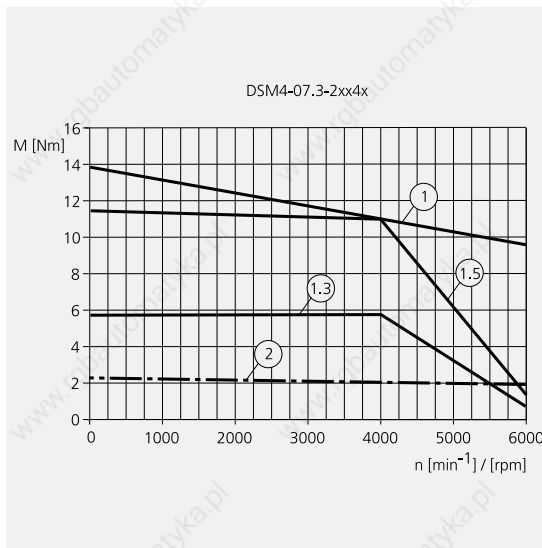
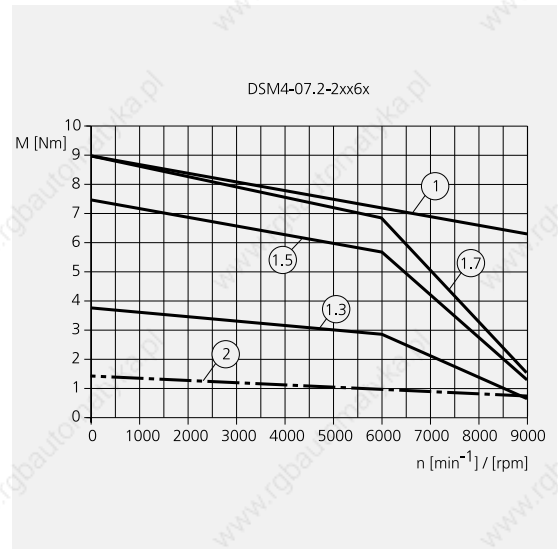
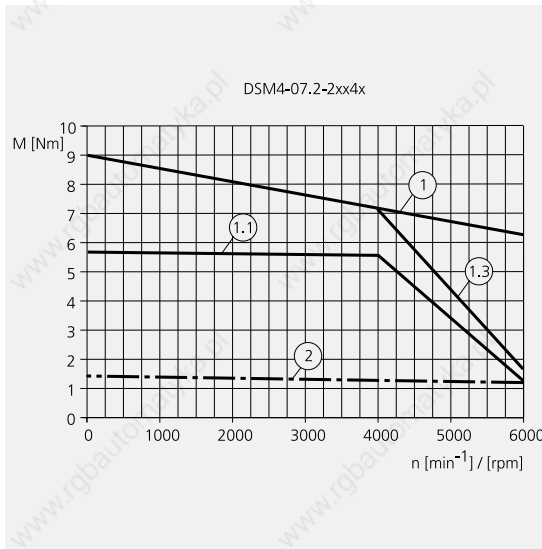
AC synchronous servomotors - High Performance



- 1 Motor peak torque
- 2 Continuous torque
- 1.1 Peak torque with TLX x32
- 1.3 Peak torque with TLX x34
- 1.5 Peak torque with TLX x36
- 1.7 Peak torque with TLX x38

AC synchronous servomotors - High Performance

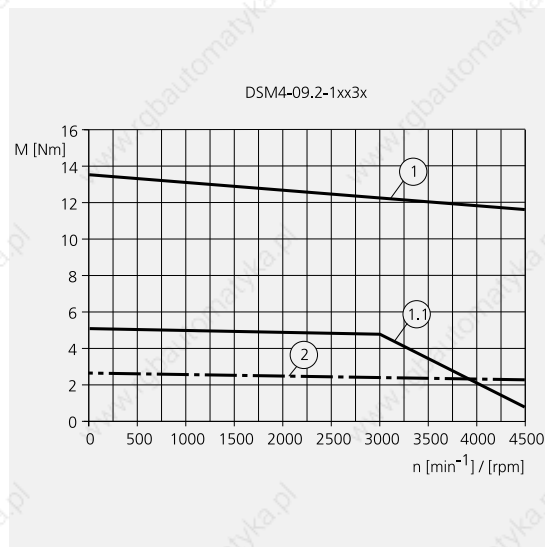
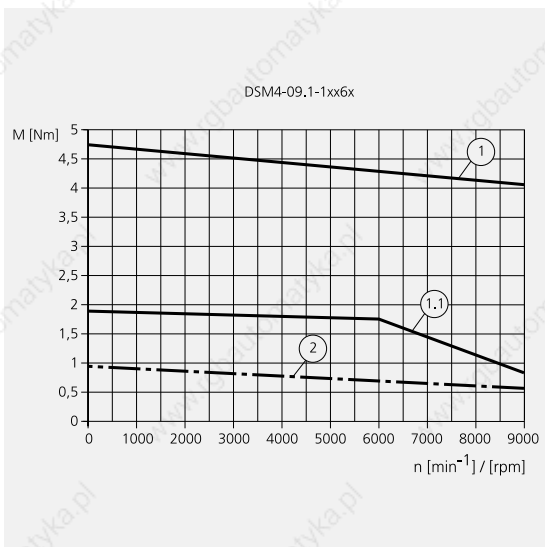
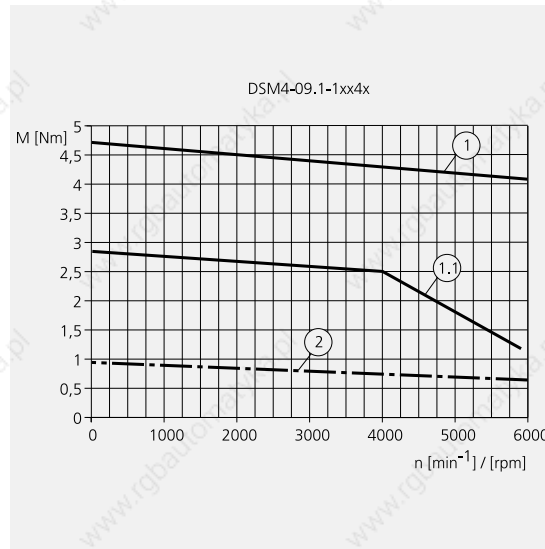
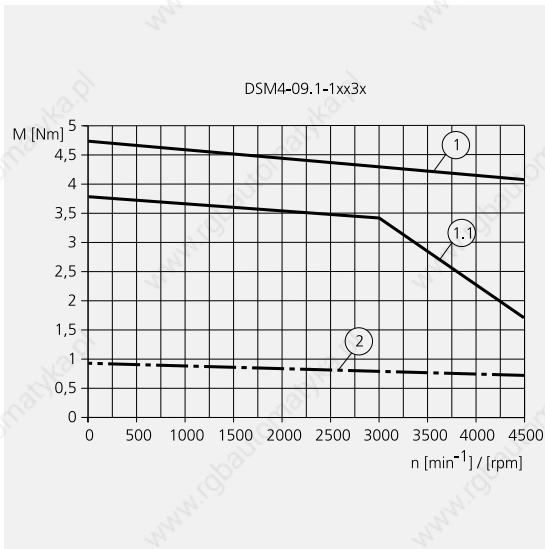
Characteristic curves



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Characteristic curves

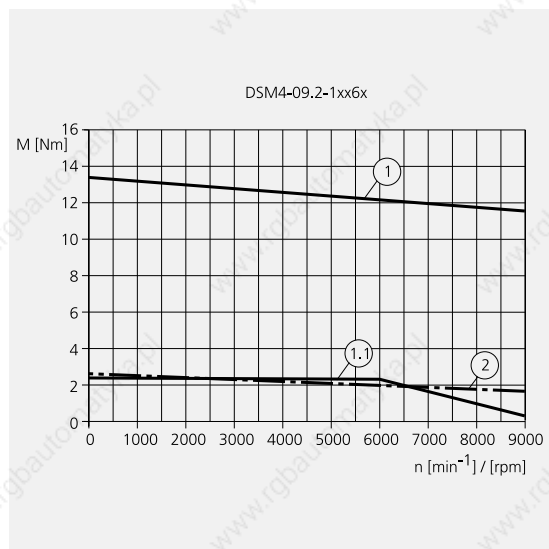
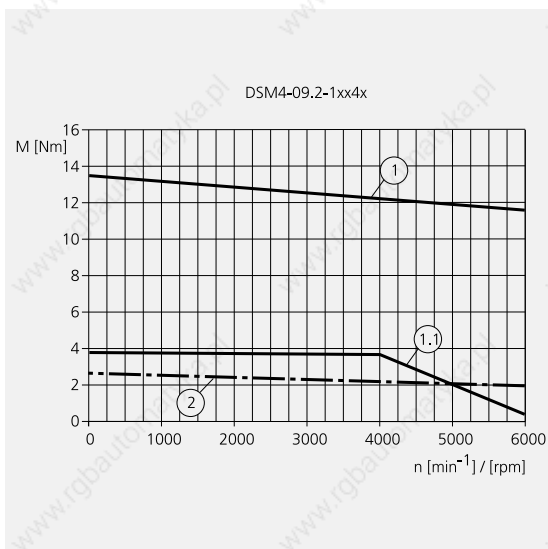
AC synchronous servomotors - High Performance



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AC synchronous servomotors - High Performance

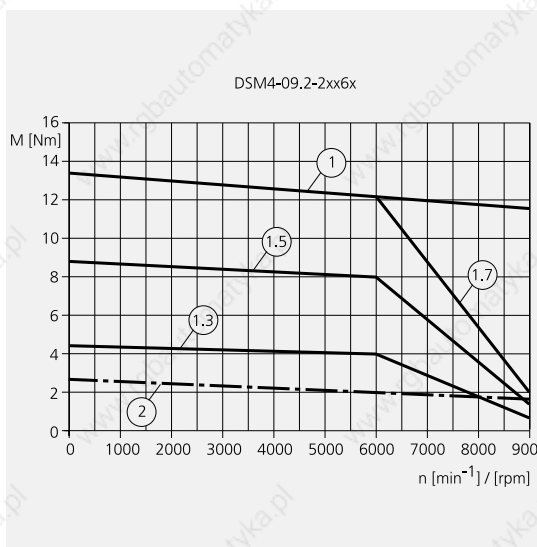
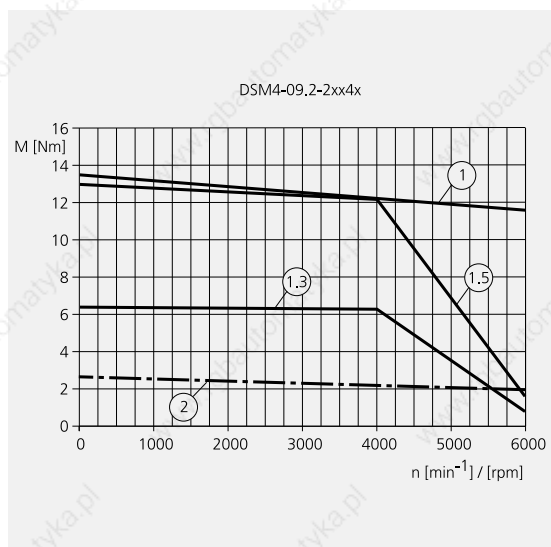
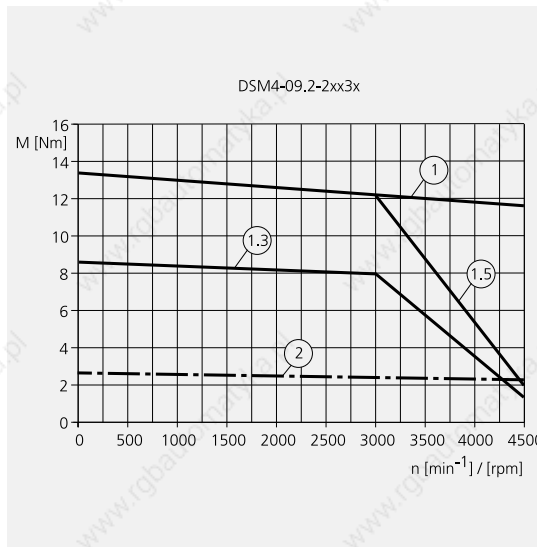
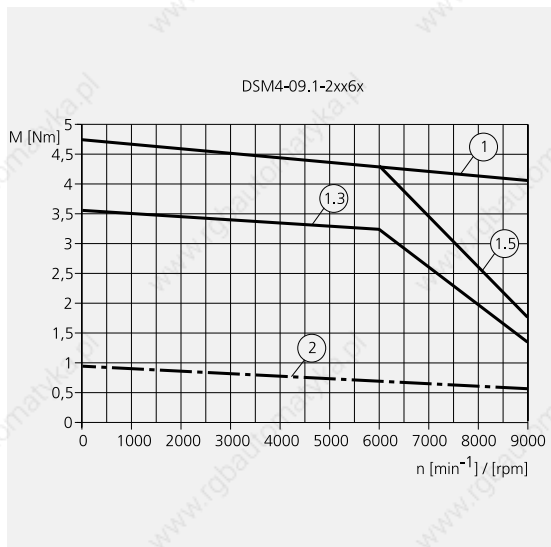
Characteristic curves



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Characteristic curves

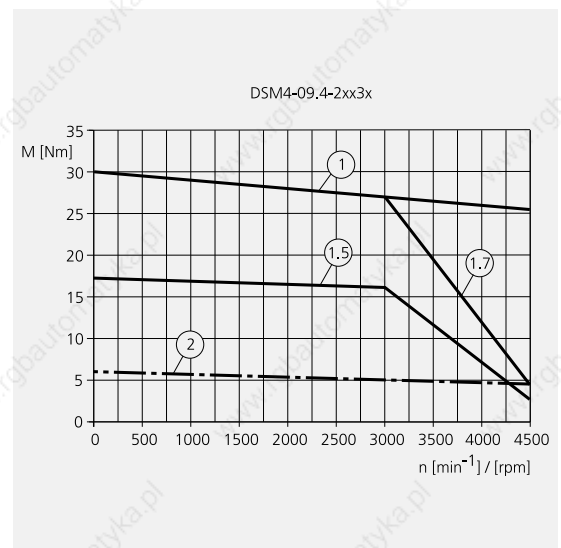
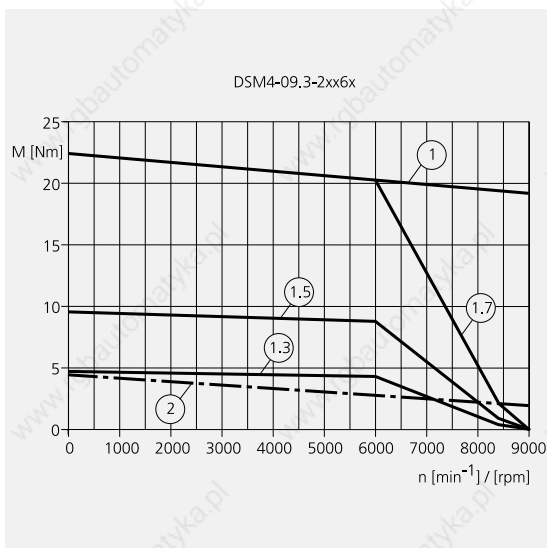
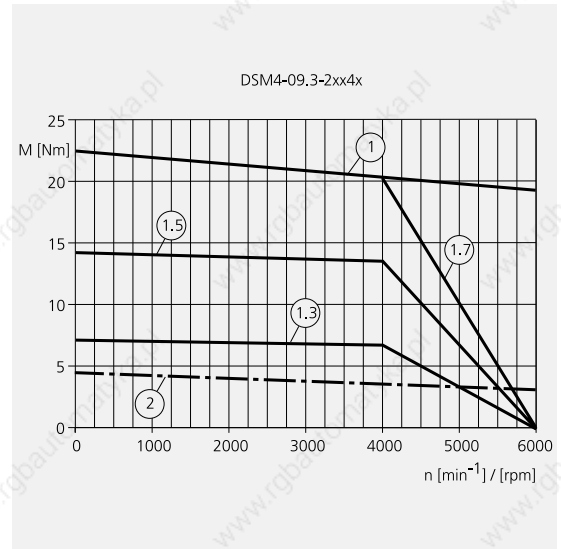
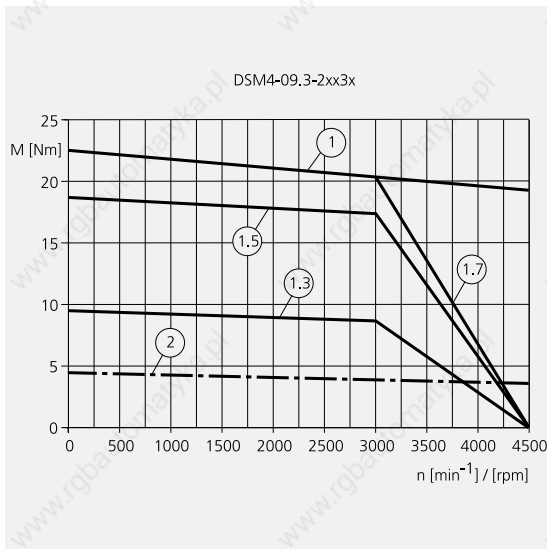
AC synchronous servomotors - High Performance



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AC synchronous servomotors - High Performance

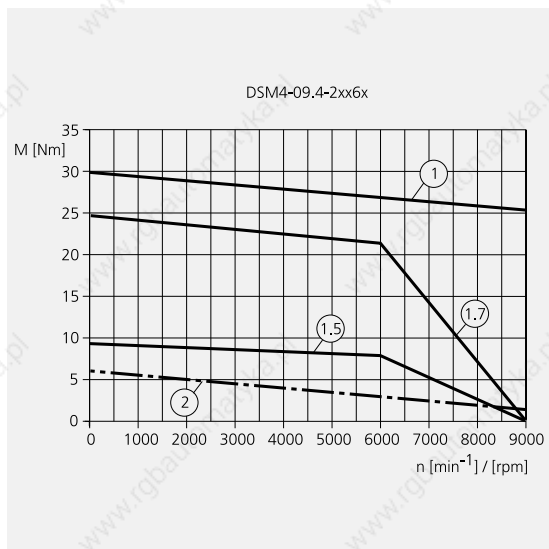
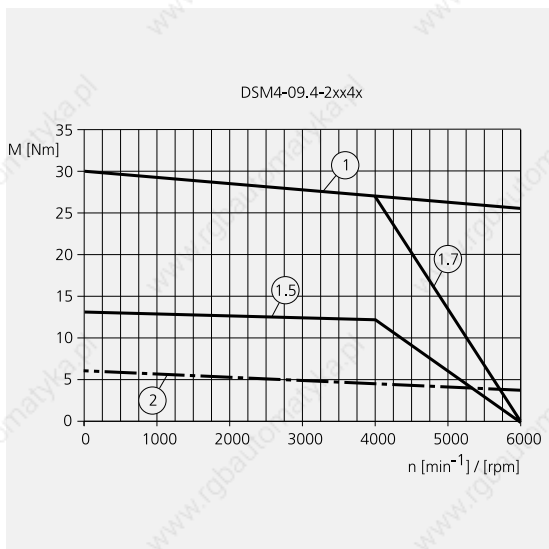
Characteristic curves



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Characteristic curves

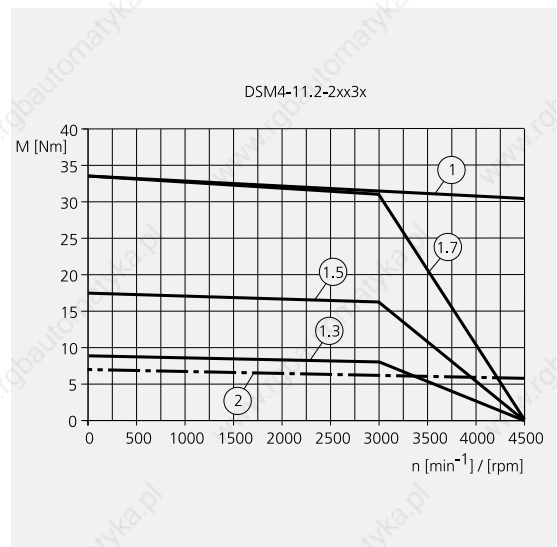
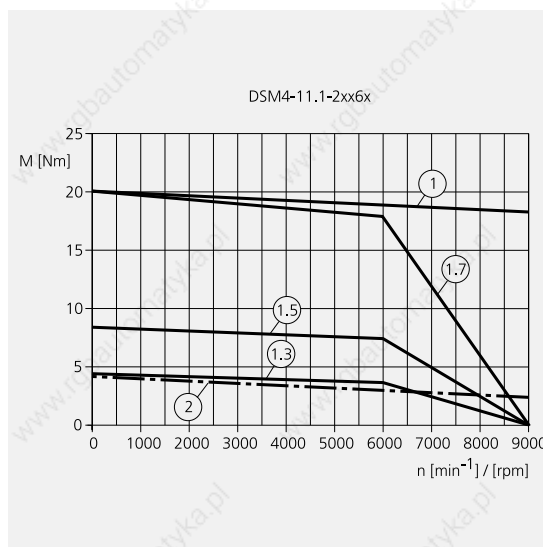
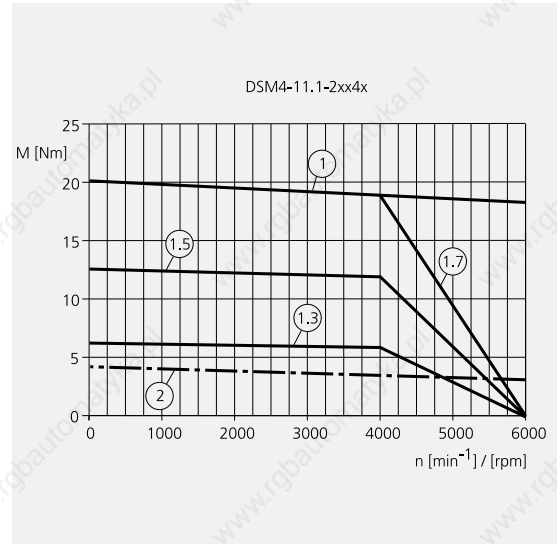
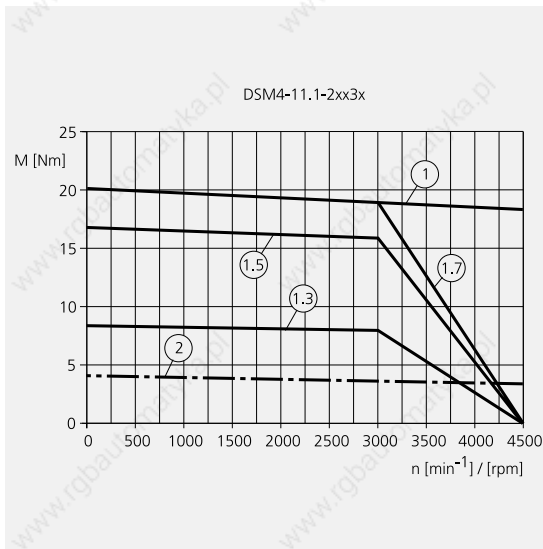
AC synchronous servomotors - High Performance



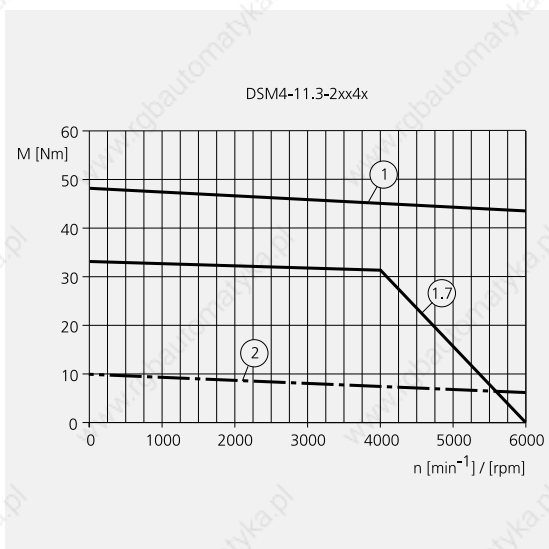
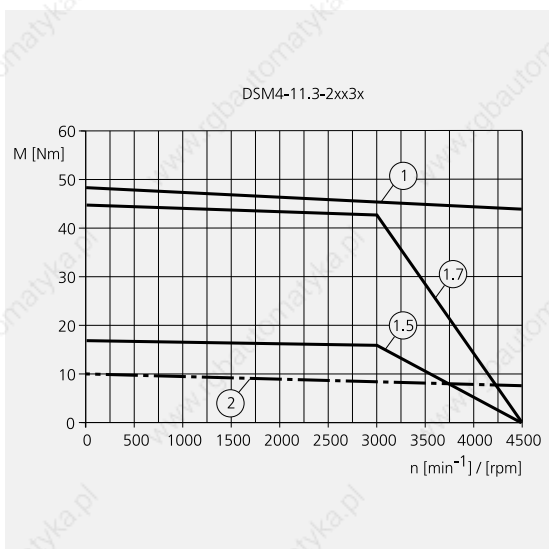
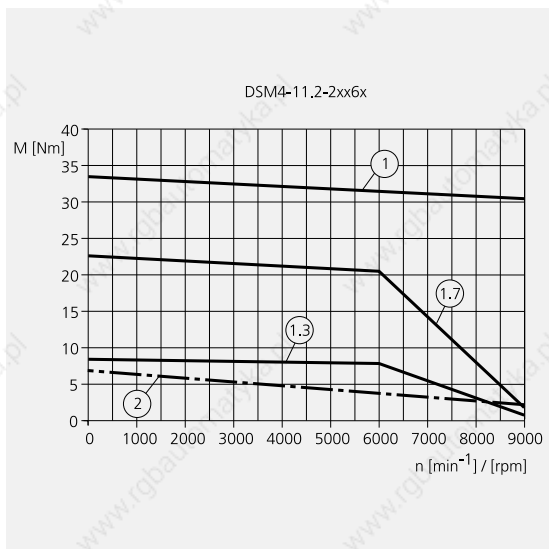
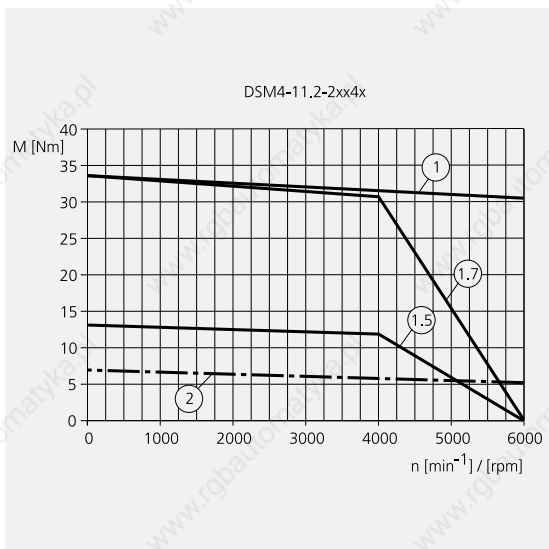
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AC synchronous servomotors - High Performance

Characteristic curves



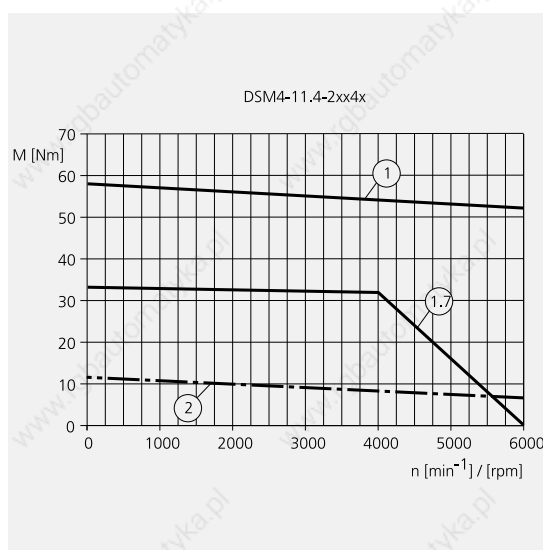
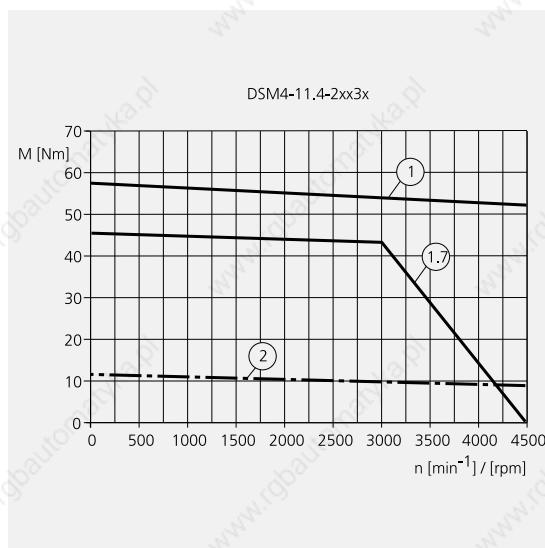
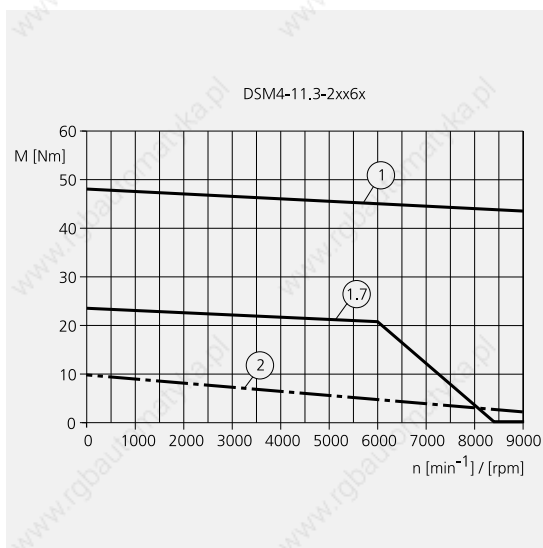
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AC synchronous servomotors - High Performance

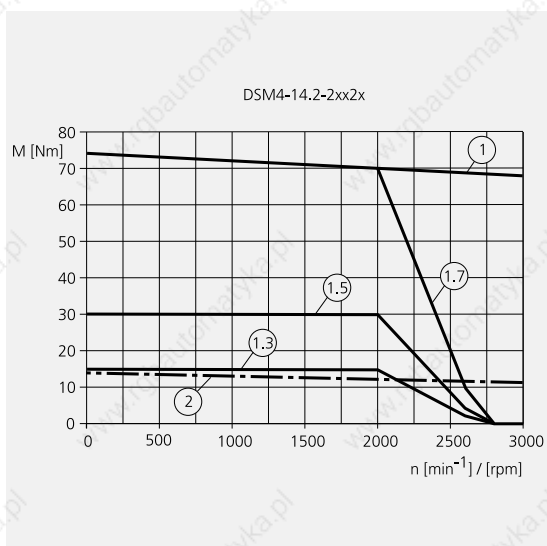
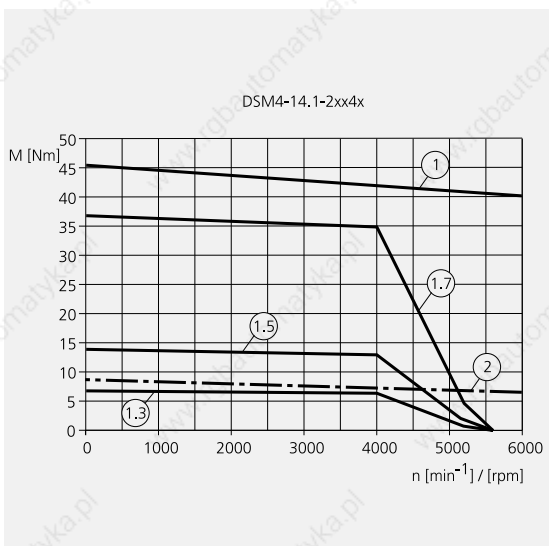
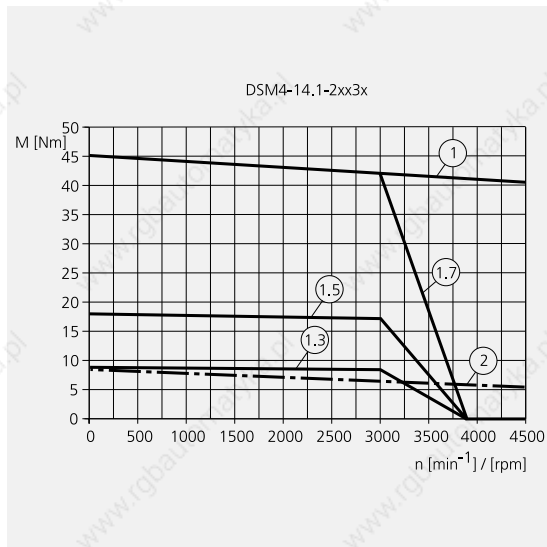
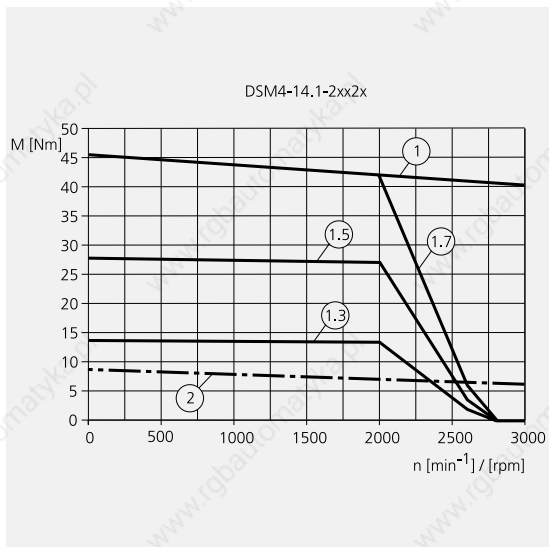
Characteristic curves



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Characteristic curves

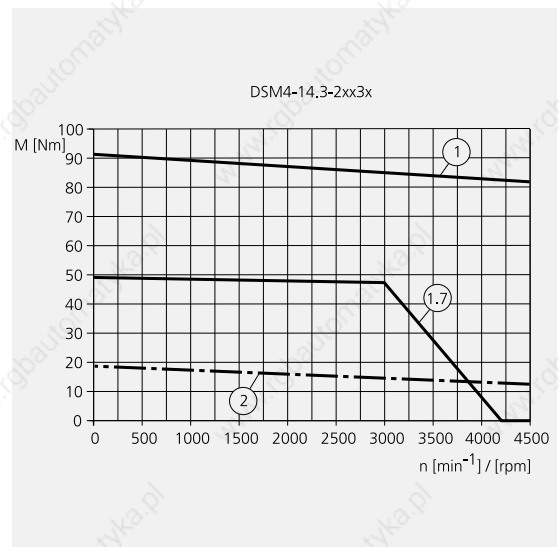
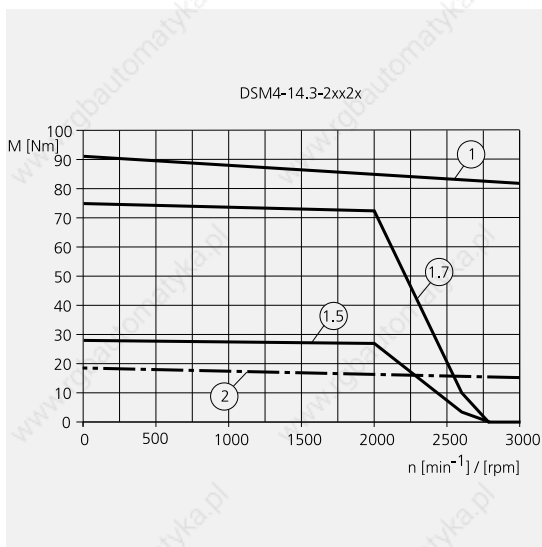
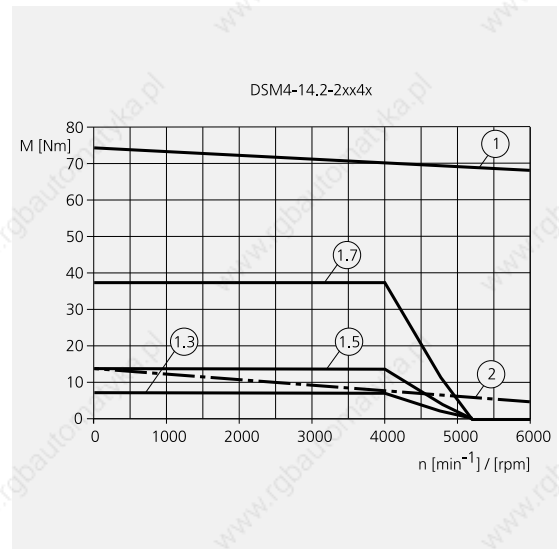
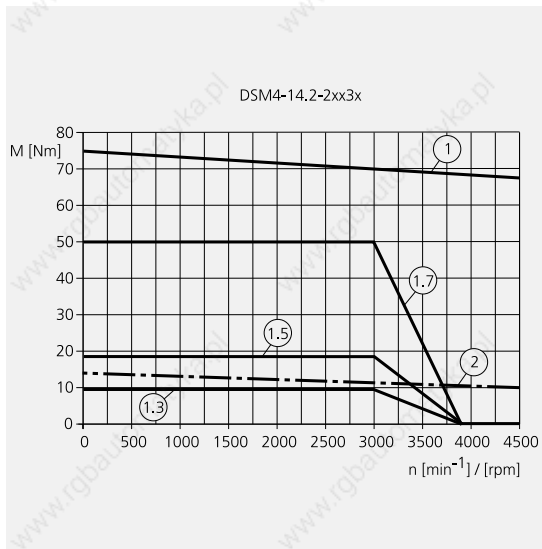
AC synchronous servomotors - High Performance



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AC synchronous servomotors - High Performance

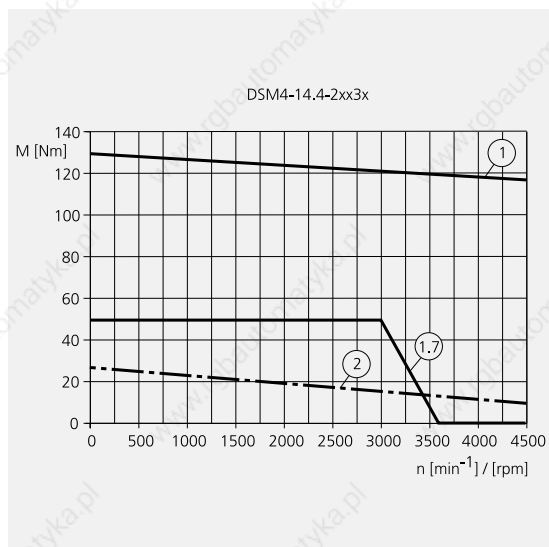
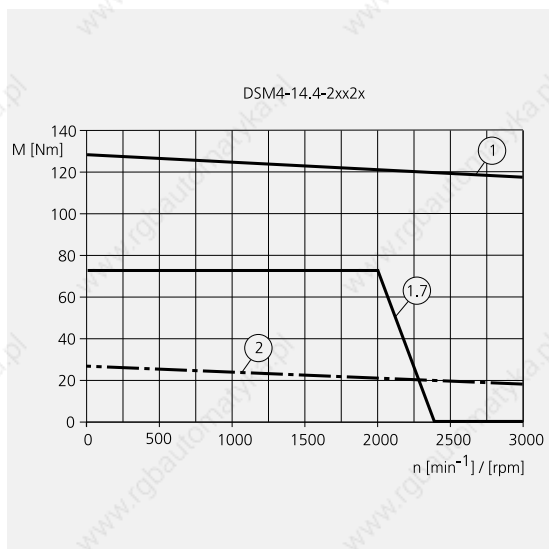
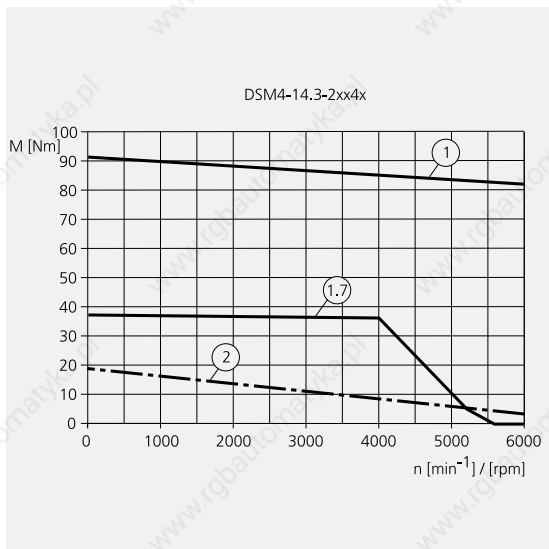
Characteristic curves



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Characteristic curves

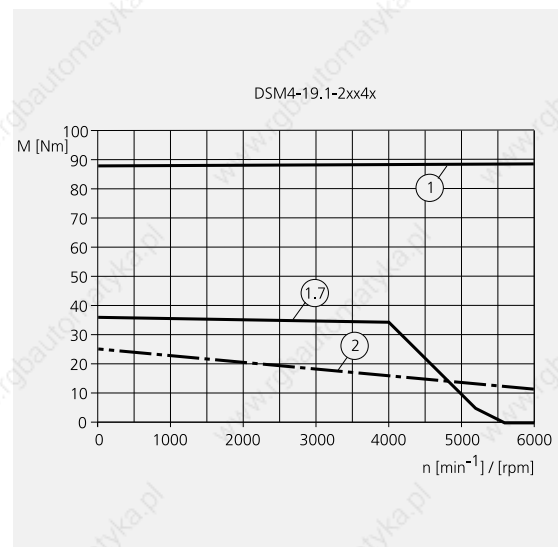
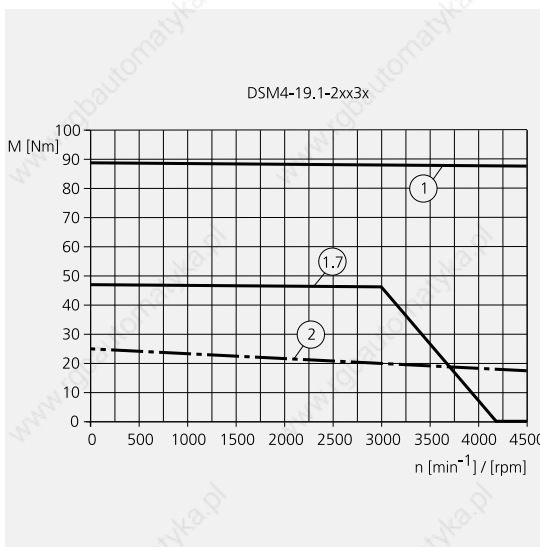
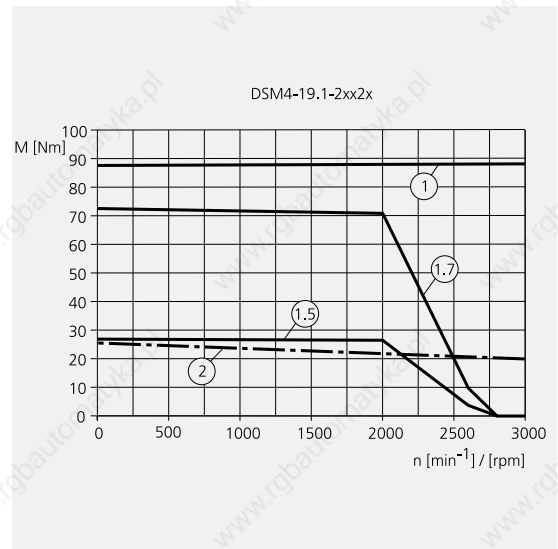
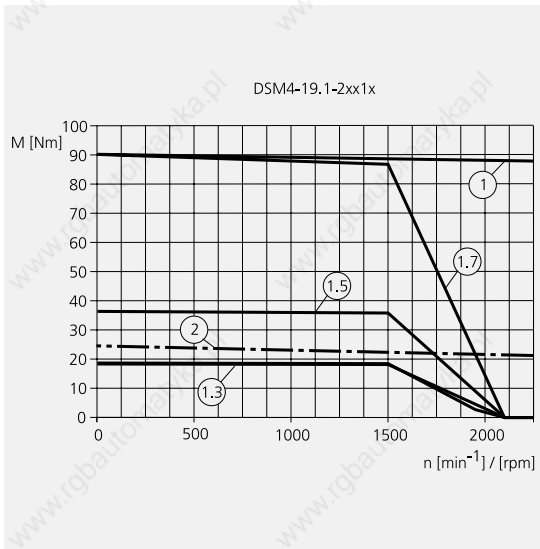
AC synchronous servomotors - High Performance



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AC synchronous servomotors - High Performance

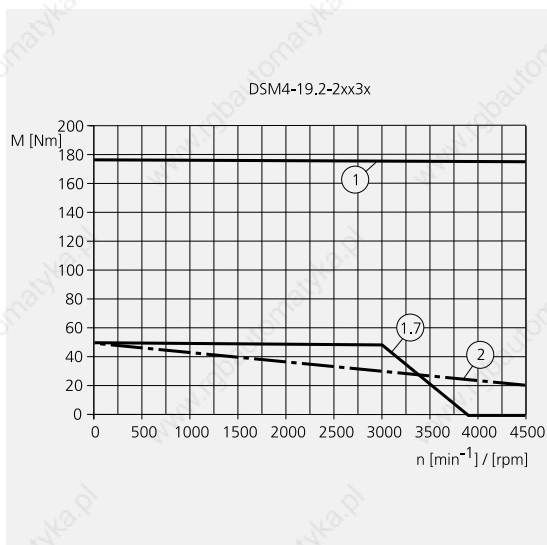
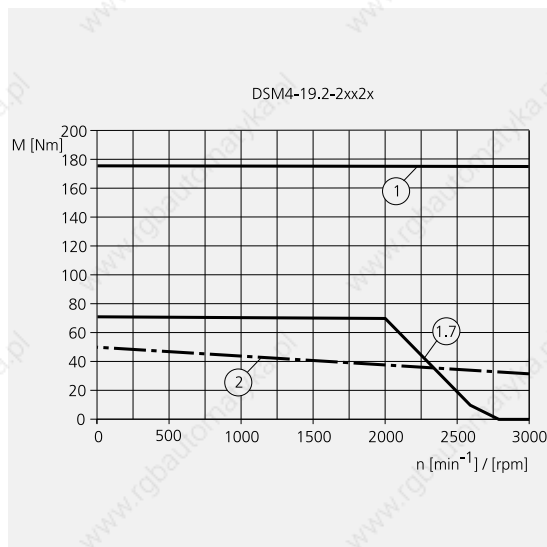
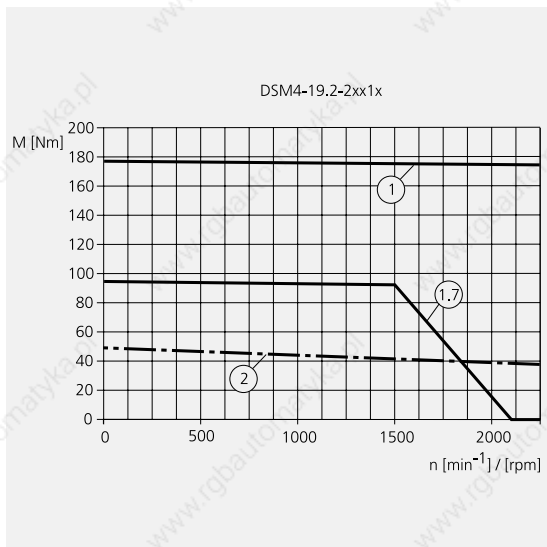
Characteristic curves



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Characteristic curves

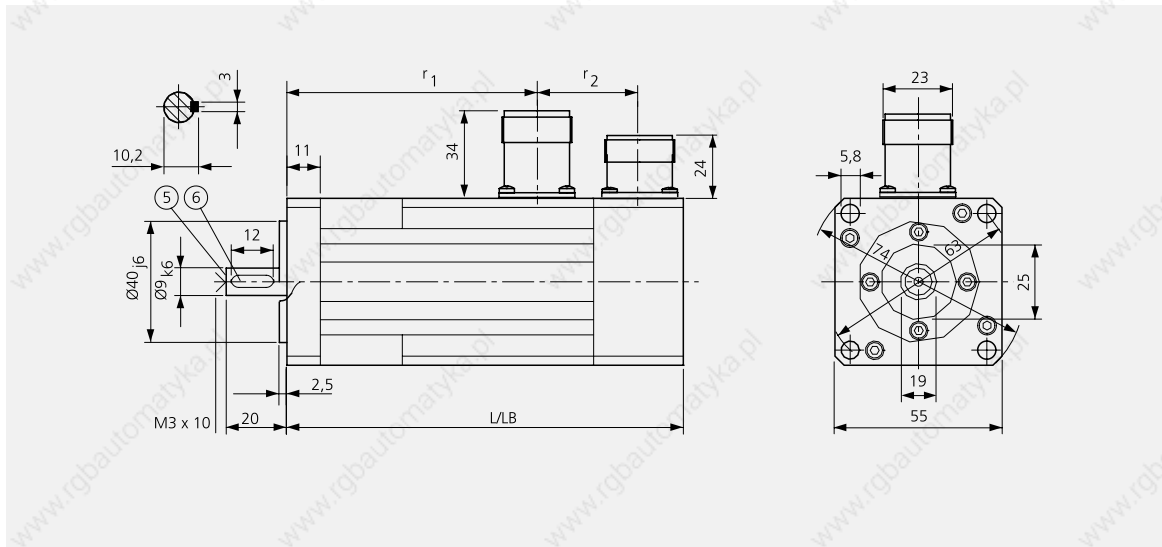
AC synchronous servomotors - High Performance



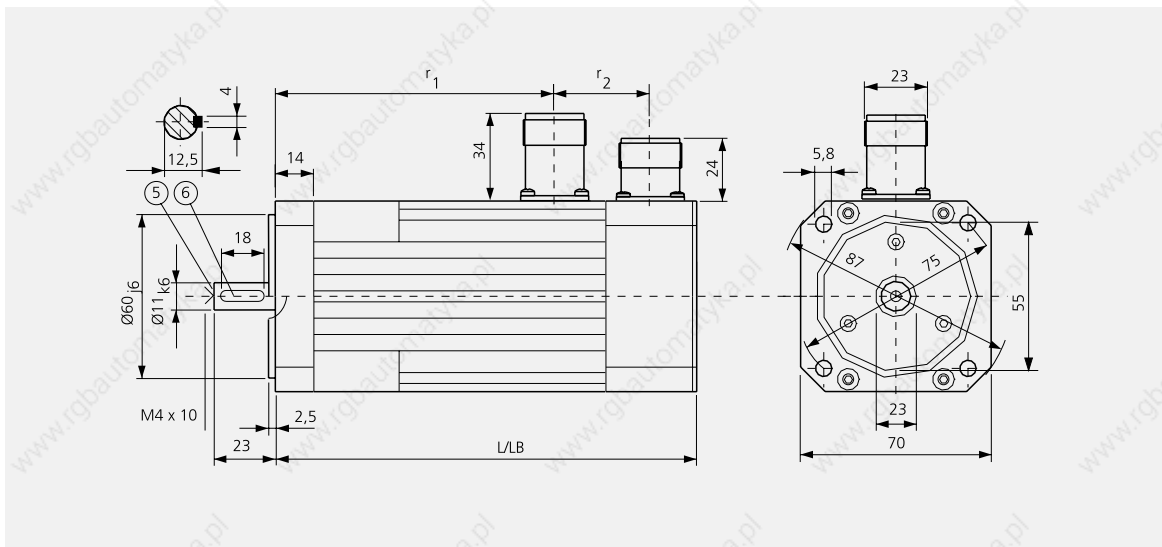
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AC synchronous servomotors - High Performance

Dimensional drawings



DSM 4-05 High Performance AC synchronous servomotor

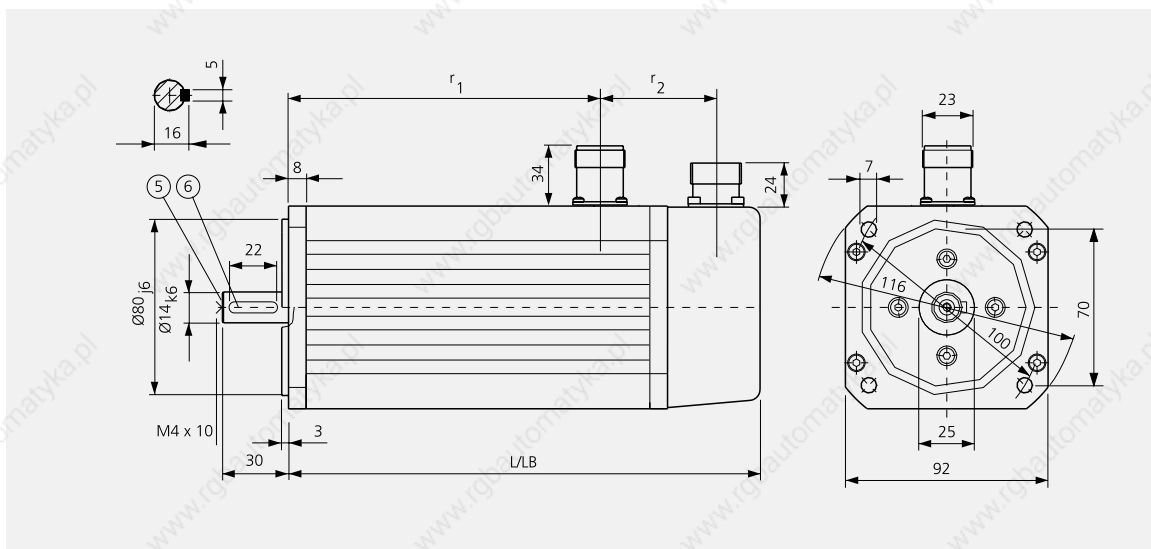


DSM 4-07 High Performance AC synchronous servomotor

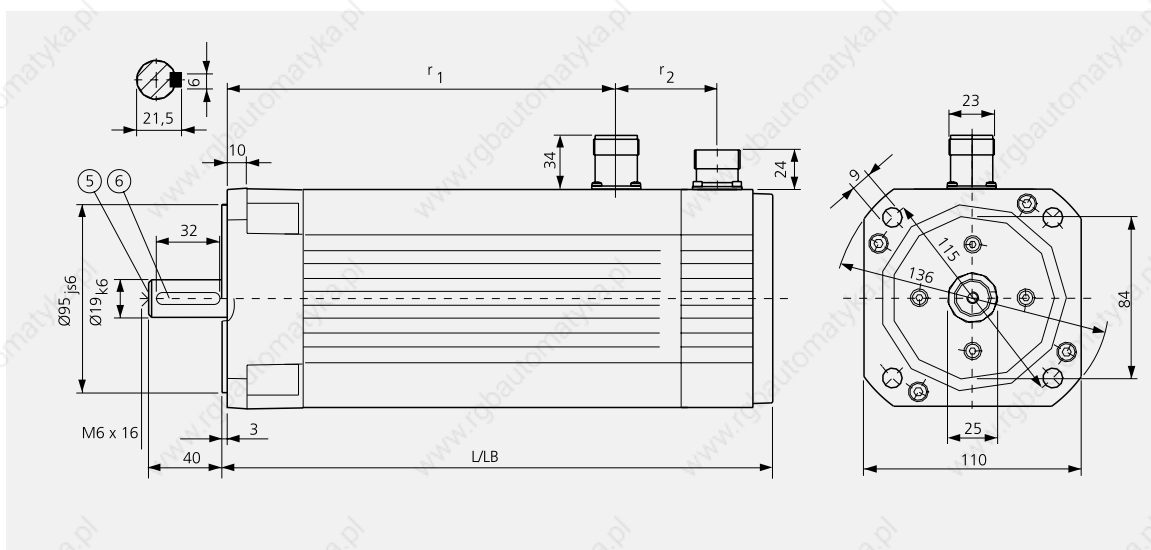
- 5 Centre hole
- 6 Featherkey

| | L = without brake (n. b.) | | LB = with brake (w. b.) | | r_1 (n. b.) | r_1 (w. b.) | r_2 | Measuring system | | | |
|------------|------------------------------|--------|----------------------------|--------|------------------|------------------|-------|------------------|--|----------|--|
| | SinCos® | | Resolver | | | | | SinCos® | | Resolver | |
| | | | | | | | | | | | |
| DSM 4-05.1 | - | 121 mm | - | 145 mm | 72 mm | 97 mm | - | 33 mm | | | |
| DSM 4-05.2 | - | 133 mm | - | 157 mm | 85 mm | 109 mm | - | 33 mm | | | |
| DSM 4-05.3 | - | 145 mm | - | 169 mm | 97 mm | 121 mm | - | 33 mm | | | |
| DSM 4-05.4 | - | 170 mm | - | 194 mm | 121 mm | 146 mm | - | 33 mm | | | |
| DSM 4-07.1 | 177 mm | 136 mm | 205 mm | 164 mm | 81 mm | 109 mm | 66 mm | 33 mm | | | |
| DSM 4-07.2 | 201 mm | 160 mm | 229 mm | 188 mm | 105 mm | 133 mm | 66 mm | 33 mm | | | |
| DSM 4-07.3 | 237 mm | 196 mm | 265 mm | 224 mm | 141 mm | 169 mm | 66 mm | 33 mm | | | |

Dimensional drawings AC synchronous servomotors - High Performance



DSM 4-09 High Performance AC synchronous servomotor



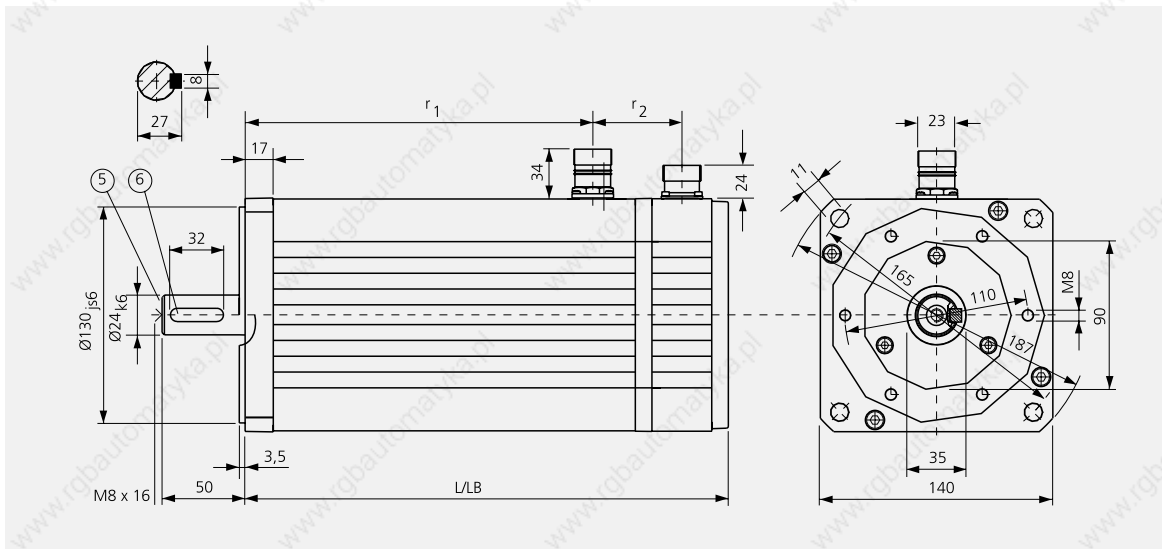
DSM 4-11 High Performance AC synchronous servomotor

- 5 Centre hole
- 6 Featherkey

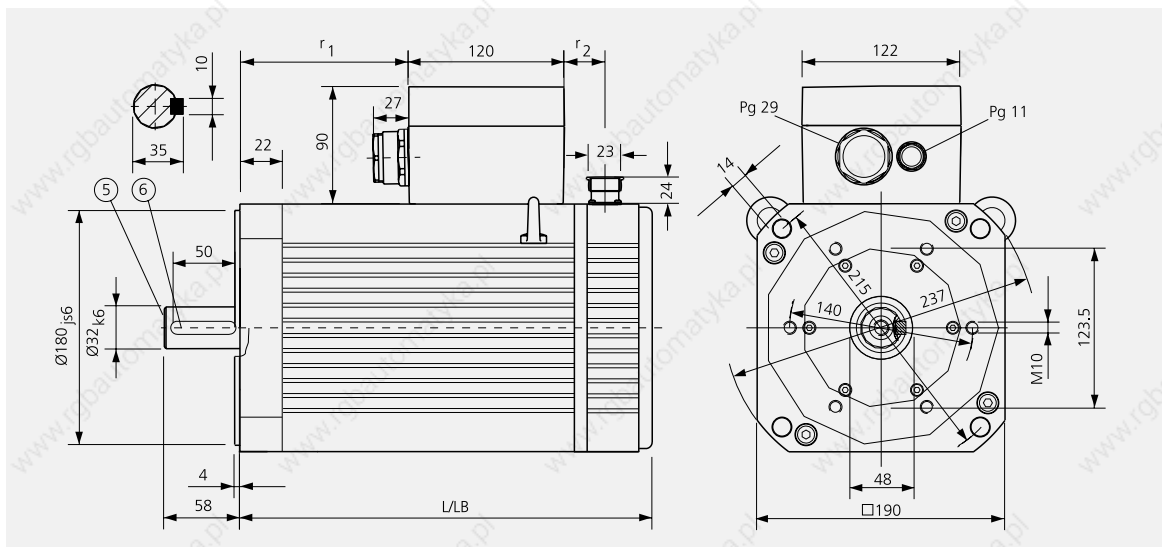
| | L = without brake (n. b.) | | LB = with brake (w. b.) | | r_1 (n. b.) | r_1 (w. b.) | r_2 | Measuring system | |
|------------|------------------------------|----------|----------------------------|----------|------------------|------------------|-------|------------------|----------|
| | SinCos® | Resolver | SinCos® | Resolver | | | | SinCos® | Resolver |
| DSM 4-09.1 | 163 mm | 156 mm | 199 mm | 192 mm | 85 mm | 121 mm | 51 mm | 51 mm | |
| DSM 4-09.2 | 187 mm | 180 mm | 233 mm | 226 mm | 109 mm | 155 mm | 51 mm | 51 mm | |
| DSM 4-09.3 | 221 mm | 214 mm | 267 mm | 260 mm | 143 mm | 189 mm | 51 mm | 51 mm | |
| DSM 4-09.4 | 255 mm | 248 mm | 301 mm | 294 mm | 177 mm | 223 mm | 51 mm | 51 mm | |
| DSM 4-11.1 | 255 mm | 218 mm | 263 mm | 226 mm | 138 mm | 145 mm | 82 mm | 52 mm | |
| DSM 4-11.2 | 285 mm | 248 mm | 293 mm | 256 mm | 168 mm | 175 mm | 82 mm | 52 mm | |
| DSM 4-11.3 | 315 mm | 278 mm | 323 mm | 286 mm | 198 mm | 205 mm | 82 mm | 52 mm | |
| DSM 4-11.4 | 345 mm | 308 mm | 353 mm | 316 mm | 228 mm | 235 mm | 82 mm | 52 mm | |

AC synchronous servomotors - High Performance

Dimensional drawings



DSM 4-14 High Performance AC synchronous servomotor



DSM 4-19 High Performance AC synchronous servomotor

- 5 Centre hole
- 6 Featherkey

| | L = without brake (n. b.) | | LB = with brake (w. b.) | | r ₁ (n. b.) | r ₁ (w. b.) | r ₂ | Measuring system | | | |
|------------|------------------------------|----------|----------------------------|----------|---------------------------|---------------------------|----------------|------------------|----------|----------|----------|
| | SinCos® | | Resolver | | | | | SinCos® | | Resolver | |
| | SinCos® | Resolver | SinCos® | Resolver | | | | SinCos® | Resolver | SinCos® | Resolver |
| DSM 4-14.1 | 238 mm | 231 mm | 283 mm | 276 mm | 150 mm | 195 mm | 54 mm | 55 mm | | | |
| DSM 4-14.2 | 268 mm | 261 mm | 313 mm | 306 mm | 180 mm | 225 mm | 54 mm | 55 mm | | | |
| DSM 4-14.3 | 298 mm | 291 mm | 343 mm | 336 mm | 210 mm | 255 mm | 54 mm | 55 mm | | | |
| DSM 4-14.4 | 343 mm | 336 mm | 388 mm | 381 mm | 255 mm | 300 mm | 54 mm | 55 mm | | | |
| DSM 4-19.1 | 355 mm | 348 mm | 355 mm | 348 mm | 163 mm | 163 mm | 31 mm | 31 mm | | | |
| DSM 4-19.2 | 435 mm | 428 mm | 435 mm | 428 mm | 243 mm | 243 mm | 31 mm | 31 mm | | | |

Holding brake

The holding brake is an electromagnetic spring-pressure brake for locking the motor axle after the motor current is shut off. In emergency situations, such as in a power failure or during an EMERGENCY STOP, it shuts down the drive, significantly contributing to overall safety. The motor axle must also be locked for weight-induced torque loads, e.g. in cases of vertical axes in manual mode.

Holding brake controller

The holding brake is controlled via the **Twin Line Holding Brake Controller**, which is available as an accessory.

Caution! Overloading may damage the holding brake! Avoid stationary load torques greater than 25 % of the motor holding torque when using vertical axes with the holding brake.

Technical data of the holding brake for DSM motors

| | | DSM 4-05 | DSM 4-07 | DSM 4-09 | DSM 4-11 | DSM 4-14 | DSM 4-19 |
|-------------------------|----------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| Holding torque | M_{Br} | 2.0 Nm | 2.5 Nm | 9.0 Nm | 11.0 Nm | 36.0 Nm | 85.0 Nm |
| Armature inertia | J_{Br} | 0.067 kgcm ² | 0.380 kgcm ² | 0.600 kgcm ² | 2.300 kgcm ² | 5.900 kgcm ² | 17.600 kgcm ² |
| Electrical pickup power | P_{Br} | 12 W | 12 W | 18 W | 21 W | 27 W | 36 W |
| Energise time | t_E | 25 ms | 7 ms | 15 ms | 20 ms | 35 ms | 60 ms |
| De-energise time | t_A | 15 ms | 5 ms | 7 ms | 35 ms | 50 ms | 70 ms |
| Weight | m_{Br} | 0.18 kg | 0.30 kg | 0.50 kg | 0.78 kg | 1.63 kg | 3.80 kg |

Measuring systems

The standard measuring system is the SinCos[®] (SRS) Singleturn. This measuring system is designed to provide optimum performance with our Twin Line family of controllers. You can use the HIPERFACE[®] interface between motor-measuring system and device for a self-initialisation of the motor and current-regulator parameters, considerably simplifying the start-up process.

The SinCos[®] (SRM) Multiturn and Resolver, 2-pin, are optionally available.

Technical data

| | SinCos [®] (SRS) Singleturn | SinCos [®] (SRM) Multiturn | Resolver, 2-pin |
|---|---|---|--|
| Resolution with TLx | 16384 incr. min ⁻¹ | 16384 incr. min ⁻¹ | 4096 incr. min ⁻¹ |
| Precision, integral nonlinearity | ± 45 angular seconds | ± 45 angular seconds | ± 360 angular seconds |
| Index pulse | – | – | – |
| Absolute position after activation within [min ⁻¹] with the precision | 1 ± 45 angular seconds | 4096 ± 45 angular seconds | 1 ± 360 angular seconds |
| Signal form | Sinusoidal/cosinusoidal 1024 cycles min ⁻¹ | Sinusoidal/cosinusoidal 1024 cycles min ⁻¹ | Sinusoidal/cosinusoidal 1 cycles min ⁻¹ |
| Measuring procedure | High-resolution, optical | High-resolution, optical | Inductive |
| Interface | HIPERFACE [®] | HIPERFACE [®] | – |
| Module required on slot 2, TLx | HIFA-C | HIFA-C | RESO-C |
| Working temperature range | –20 to +115 °C | –20 to +115 °C | –55 to +155 °C |

AC synchronous servomotors - High Performance

Type key

| | |
|---|--|
| Example | DSM 4 - X . X - X X X X - X X |
| Mounting dimensions (flange) 05 (55 mm) 07 (70 mm) 09 (90 mm) 11 (110 mm) 14 (140 mm) 19 (190 mm) | DSM 4 - X . X - X X X X - X X |
| Length 1, 2, 3 or 4 | DSM 4 - X . X - X X X X - X X |
| Voltage variant 1 = $U_N = 190$ V, for amplifier with intermediate circuit voltage 270 to 350 VDC 2 = $U_N = 330$ V, for amplifier with intermediate circuit voltage 510 to 690 VDC | DSM 4 - X . X - X X X X - X X |
| Holding brake 0 = without holding brake 2 = with holding brake | DSM 4 - X . X - X X X X - X X |
| Measuring system/interface IB = HIFA-C for SinCos® R9 = RESO-C for resolver, only for DSM 4-05X | DSM 4 - X . X - X X X X - X X |
| Rated speed 1 = 1500 rpm, all lengths 3 = 3000 rpm, all lengths 6 = 6000 rpm, not available for all lengths | DSM 4 - X . X - X X X X - X X 2 = 2000 rpm, all lengths 4 = 4000 rpm, not available for all lengths |
| Code for temperature sensors and mounting sockets NTC temperature sensor, connection via measuring-system connector, for devices of the Twin Line series TA = for size/flange: 05/07/19* mounting sockets, straight exit *except DSM4-19.x, motor connection only via terminal box 6N = for size/flange: 09/11/14 mounting sockets, straight exit 4E = for size/flange: 05/07/09/11/14 mounting sockets 90°, rotating | DSM 4 - X . X - X X X X - X X |
| Measuring system (in conjunction with measuring system/interface) G = SinCos® (SRS) Singleturn H = SinCos® (SRM) Multiturn Z = resolver 2 pin | DSM 4 - X . X - X X X X - X X |