

ACCU ELECTRIC MOTORS INC

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- ✓ 24 hour rush turnaround / technical support service
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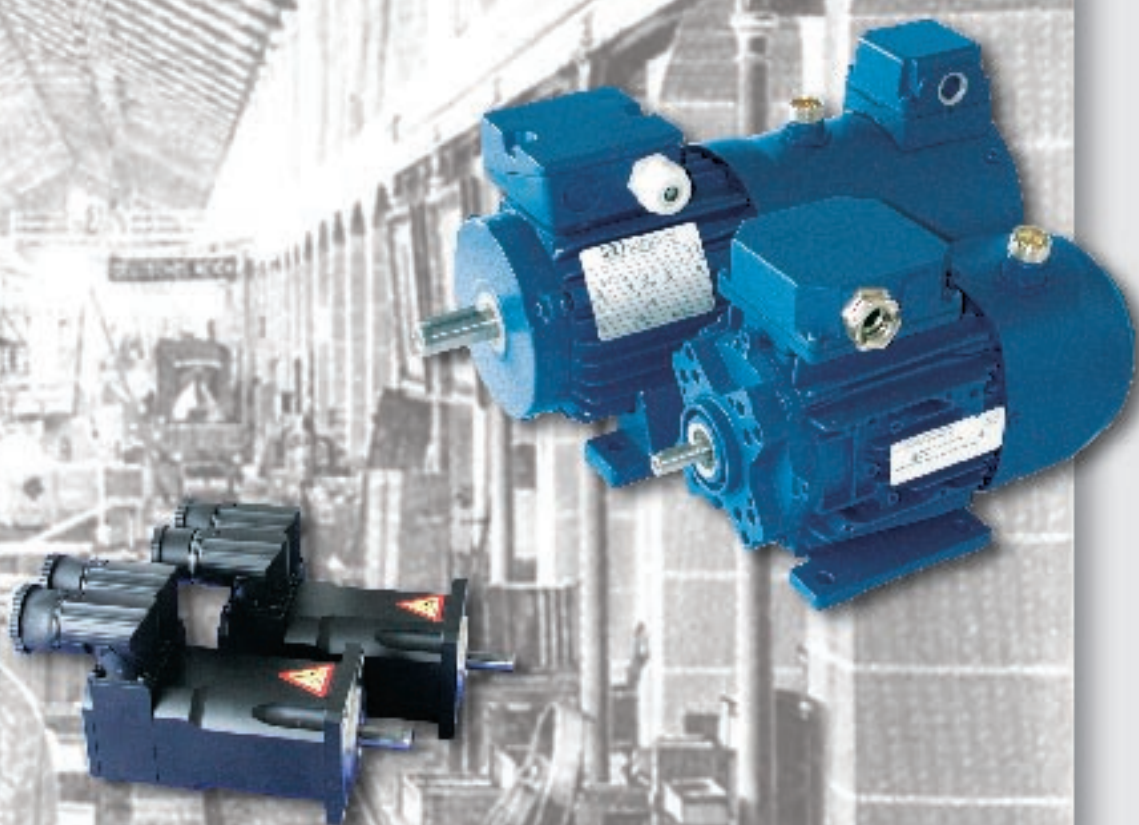
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Servicing USA and Canada



COMBIVERT MOTORS

KEB

System assembly

A smooth interaction of motor and drive is necessary for high-quality, precise machine functions. KEB offer the COMBIVERT F5-Multi inverter / servo drive with the option of factory pre-setting motor data.

Complementing this KEB are able to offer both synchronous and asynchronous motor / gearbox solutions offering a variety of encoder / resolver feedback options. Gearbox options are:

- helical inline,
- shaft mounted,
- planetary
- helical worm,
- helical bevel

Optionally available with brake.

Complete solutions are therefore available for the various demands of modern machine and plant engineering. For ease of set up pre-assembled leads offer ready to connect systems.



The following pages describe the current program of closed loop synchronous and asynchronous motors.

SYNCHRONOUS MOTORS

Ideal drives for dynamic applications with low inertia and high pulse moment.

Equipped with resolvers or high-resolution SinCos encoders. Hiperface or EnDat types are also an option.

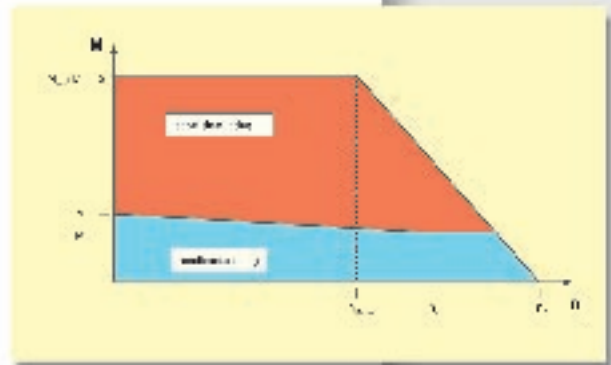
Two motor designs having up to 400 % overload capacity are available.

BASE LINE 0.2... 115 Nm

- smooth surfaces
- rear connection

DYNAMIC LINE 0.2... 70 Nm

- ripped surface with high thermal reserves
- lateral connections

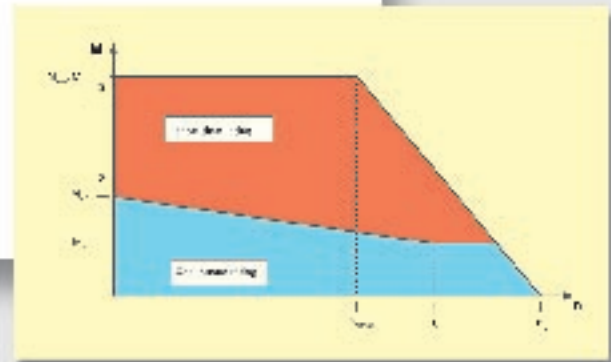


ASYNCHRONOUS SERVO MOTORS

Favoured when high inertias are to be controlled by the motor shaft. In conjunction with the KEB COMBIVERT F5-Multi and incremental or high resolution SinCos encoder feedback the motors offer a high torque ratings event at low speeds.

With the gearbox assemblies KEB COMBIGEAR the speed and torque can be ideally optimised to the requirements of the machine.

TORQUE LINE 0.12... 75 kW



BASE LINE Synchronous Servo Motors SM.200

Brushless three phase AC motors with resolver feedback for classic servo applications in all areas of machine and plant engineering. Built with NdFeB permanent magnets in the rotor and 2-pole hollow shaft resolvers the motors have encoder plugs on the B-side and are optionally available with holding brake.

Features

- Smooth housing
- Flange dimension acc. to IEC-norm fitting j6 accuracy acc. to DIN 42955 tolerances acc. to R
- Balance quality acc. to DIN ISO 2373
- Isolation class F acc. to DIN 57530
- Construction type IM B5 acc. to DIN 42950
- Shaft with keyway
- Protection type IP 64
- Integrated resolver on the B-side
- High durability due to brushless technology
- rotatable female connectors

Options

- Holding brake
- Special flanges
- Shafts without keyway
- Radial shaft seal
- Shaft end A-side precisely machined for oil assembly, tolerance k5
- Tropical isolation
- High resolving Hiperface or EnDat encoder
- Gearbox mounting



37 mm



55 mm



88 mm



105 mm



142 mm



190 mm



240 mm

| motor size | M _N [Nm] | M ₀ [Nm] | M _{max} [Nm] | n _N [rpm] |
|------------|---------------------|---------------------|-----------------------|----------------------|
| 11.* | 0.09 | 0.1 | 0.4 | 6,000 |
| 12.* | 0.18 | 0.2 | 0.8 | 6,000 |
| 21. | 0.19 | 0.2 | 0.8 | 4,500 |
| 22. | 0.36 | 0.4 | 1.6 | 4,500 |
| 23. | 0.55 | 0.6 | 2.4 | 4,500 |
| 24. | 0.72 | 0.8 | 3.2 | 4,500 |
| 31. | 0.6 | 0.65 | 2.6 | 3,000 |
| 32. | 1.15 | 1.3 | 5.2 | 3,000 |
| 35. | 1.6 | 1.9 | 7.6 | 3,000 |
| 33. | 2.15 | 2.5 | 10.0 | 3,000 |
| 34. | 2.5 | 3 | 12.0 | 3,000 |
| 41. | 2.3 | 2.6 | 10.4 | 3,000 |
| 42. | 4.6 | 5.3 | 21.2 | 3,000 |
| 43. | 6.4 | 7.5 | 30.0 | 3,000 |
| 44. | 8.5 | 9.5 | 38.0 | 3,000 |
| 51. | 5.6 | 6.6 | 19.8 | 3,000 |
| 52. | 8.5 | 10.5 | 31.5 | 3,000 |
| 53. | 10.7 | 13.5 | 40.5 | 3,000 |
| 54. | 14.5 | 17 | 51.0 | 3,000 |
| 55. | 17.5 | 22 | 66.0 | 3,000 |
| 61. | 10.0 | 13.5 | 40.5 | 3,000 |
| 62. | 14.0 | 19 | 57.0 | 3,000 |
| 63. | 16.0 | 22 | 66.0 | 3,000 |
| 64. | 24.0 | 29 | 101.5 | 3,000 |
| 71. | 20.0 | 26 | 78.0 | 3,000 |
| 72. | 23.0 | 32 | 96.0 | 3,000 |
| 73. | 26.0 | 40 | 120.0 | 3,000 |
| 81. | 30.0 | 40 | 120.0 | 3,000 |
| 82. | 50.0 | 68 | 204.0 | 3,000 |
| 83. | 70.0 | 93 | 279.0 | 2,000 |
| 84. | 85.0 | 115 | 345.0 | 2,000 |

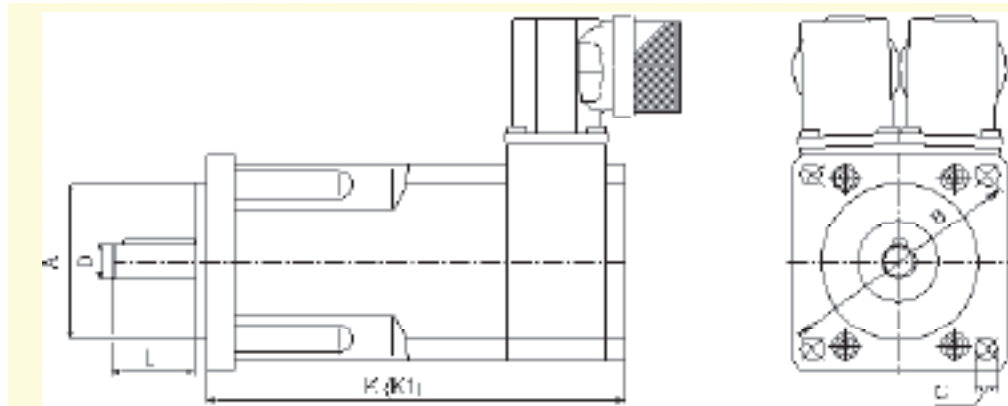
* Motor without thermo contact, connection to open motors



| n _{max} [rpm] | J _L [kgcm ²] | 200V | | | | 400V | | | |
|---------------------------|----------------------------------------|----------------------------|----------------------------|------------------------------|-------------------------------|----------------------------|----------------------------|------------------------------|-------------------------------|
| | | I _{0/200V} [A] | I _{N/200V} [A] | I _{max/200V} [A] | recommended amplifier size | I _{0/400V} [A] | I _{N/400V} [A] | I _{max/400V} [A] | recommended amplifier size |
| 12,000 | 0.06 | 0.6 | 0.6 | 2.5 | 05. | | | | |
| 12,000 | 0.08 | 0.93 | 0.9 | 4.2 | 05. | | | | |
| 8,000 | 0.06 | 0.6 | 0.6 | 2.5 | 05. | 0.4 | 0.5 | 1.9 | 07. |
| 6,000 | 0.08 | 0.9 | 0.9 | 3.9 | 05. | 0.5 | 0.5 | 2.3 | 07. |
| 6,000 | 0.11 | 1.2 | 1.1 | 5.0 | 05. | 0.7 | 0.7 | 3.1 | 07. |
| 6,000 | 0.13 | 1.5 | 1.5 | 6.5 | 05. | 0.9 | 0.9 | 3.6 | 07. |
| 4,000 | 0.39 | 1.1 | 1.0 | 4.6 | 05. | 0.7 | 0.6 | 2.8 | 07. |
| 4,000 | 0.65 | 1.7 | 1.6 | 7.2 | 05. | 1.0 | 1.0 | 4.3 | 07. |
| 4,000 | 0.92 | | | | | 1.4 | 1.3 | 6.1 | 07. |
| 4,000 | 1.2 | 3.0 | 2.7 | 13.0 | 07. | 1.8 | 1.6 | 7.7 | 07. |
| 4,000 | 1.5 | | | | | 2.1 | 1.8 | 9.0 | 07. |
| 4,000 | 1.9 | 3.1 | 3.0 | 18.9 | 07. | 1.9 | 1.9 | 11.6 | 07. |
| 4,000 | 2.65 | 6.5 | 5.9 | 39.5 | 10. | 4.1 | 3.8 | 25.1 | 10. |
| 4,000 | 4.15 | | | | | 4.8 | 4.4 | 29.4 | 12. |
| 4,000 | 6.05 | | | | | 6.4 | 6.0 | 38.3 | 12. |
| 4,000 | 6.05 | | | | | 4.7 | 4.2 | 23.4 | 12. |
| 4,000 | 9.3 | | | | | 7.2 | 6.2 | 35.9 | 12. |
| 4,000 | 10.6 | | | | | 9.2 | 7.7 | 45.7 | 13. |
| 4,000 | 9.5 | | | | | 10.6 | 9.3 | 52.8 | 14. |
| 3,600 | 11.7 | | | | | 12.8 | 10.5 | 63.7 | 14. |
| 4,000 | 10.8 | | | | | 10.6 | 8.4 | 53.0 | 13. |
| 4,000 | 15.7 | | | | | 13.4 | 10.8 | 66.8 | 14. |
| 4,000 | 18.8 | | | | | 15.0 | 11.8 | 74.8 | 14. |
| 3,800 | 29.5 | | | | | 17.2 | 14.7 | 84.0 | 16. |
| 4,000 | 67 | | | | | 16.9 | 14.1 | 65.9 | 15. |
| 4,000 | 81 | | | | | 21.3 | 16.8 | 82.9 | 16. |
| 3,800 | 101 | | | | | 23.9 | 17.3 | 93.0 | 16. |
| 3,500 | 76.1 | | | | | 21.8 | 17.8 | 85.0 | 16. |
| 3,400 | 113.6 | | | | | 35.8 | 27.8 | 139.4 | 18. |
| 2,200 | 152.6 | | | | | 33.1 | 26.0 | 129.0 | 19. |
| 2,200 | 190.1 | | | | | 42.1 | 32.4 | 164.3 | 19. |

BASE LINE Synchronous Servo Motors SM.200

Dimensions



| Motor size | A | B | C | D | K | L | m | | K1 | | data permanent magnet brake | | | | | | |
|------------|-----|-----|------|----|-----|----|------------|------------|------------------|----------------------------------|-----------------------------|----------------|----------------|------------|------------|------|-------|
| | | | | | | | motor [kg] | brake [kg] | M_{brake} [Nm] | J_{brake} [kgcm ²] | n_{max} [rpm] | $U_{nom.}$ [V] | $I_{nom.}$ [A] | t_1 [ms] | t_2 [ms] | type | |
| 11. | 25 | 32 | M3x7 | 6 | 83 | 16 | 0.8 | 0.14 | 113 | 0.4 | 0.032 | 10,000 | 24 | 0.33 | 6 | 10 | 01.P1 |
| 12. | 25 | 32 | M3x7 | 6 | 98 | | 0.8 | 0.14 | 128 | 0.4 | 0.032 | 10,000 | 24 | 0.33 | 6 | 10 | 01.P1 |
| 21. | 40 | 63 | 5.8 | 9 | 106 | 24 | 0.9 | 0.18 | 139 | 2 | 0.068 | 10,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| 22. | 40 | 63 | 5.8 | 9 | 121 | | 1.1 | 0.18 | 154 | 2 | 0.068 | 10,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| 23. | 40 | 63 | 5.8 | 9 | 136 | | 1.25 | 0.18 | 169 | 2 | 0.068 | 10,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| 24. | 40 | 63 | 5.8 | 9 | 151 | | 1.45 | 0.18 | 184 | 2 | 0.068 | 10,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| 31. | 80 | 100 | 7 | 14 | 115 | 30 | 1.9 | 0.35 | 148 | 4.5 | 0.18 | 10,000 | 24 | 0.5 | 7 | 35 | 05.P1 |
| 32. | 80 | 100 | 7 | 14 | 133 | | 2.3 | 0.35 | 166 | 4.5 | 0.18 | 10,000 | 24 | 0.5 | 7 | 35 | 05.P1 |
| 33. | 80 | 100 | 7 | 14 | 169 | | 2.5 | 0.35 | 202 | 4.5 | 0.18 | 10,000 | 24 | 0.5 | 7 | 35 | 05.P1 |
| 34. | 80 | 100 | 7 | 14 | 187 | | 3.3 | 0.35 | 220 | 4.5 | 0.18 | 10,000 | 24 | 0.5 | 7 | 35 | 05.P1 |
| 35. | 80 | 100 | 7 | 14 | 151 | | 4.0 | 0.35 | 184 | 4.5 | 0.18 | 10,000 | 24 | 0.5 | 7 | 35 | 05.P1 |
| 41. | 95 | 115 | 9 | 19 | 155 | 40 | 4.5 | 0.52 | 187 | 9 | 0.54 | 10,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| 42. | 95 | 115 | 9 | 19 | 185 | | 5.7 | 0.52 | 217 | 9 | 0.54 | 10,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| 43. | 95 | 115 | 9 | 19 | 230 | | 7.6 | 0.52 | 262 | 9 | 0.54 | 10,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| 44. | 95 | 115 | 9 | 19 | 286 | | 8.7 | 0.52 | 318 | 9 | 0.54 | 10,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| 51. | 130 | 165 | 12 | 24 | 186 | 50 | 8.0 | 1.0 | 229 | 18 | 1.66 | 10,000 | 24 | 0.83 | 10 | 50 | 07.P1 |
| 52. | 130 | 165 | 12 | 24 | 220 | | 9.8 | 1.0 | 263 | 18 | 1.66 | 10,000 | 24 | 0.83 | 10 | 50 | 07.P1 |
| 53. | 130 | 165 | 12 | 24 | 237 | | 11.2 | 1.0 | 280 | 18 | 1.66 | 10,000 | 24 | 0.83 | 10 | 50 | 07.P1 |
| 54. | 130 | 165 | 12 | 24 | 230 | | 14.0 | 1.0 | 314 | 18 | 1.66 | 10,000 | 24 | 0.83 | 10 | 50 | 07.P1 |
| 55. | 130 | 165 | 12 | 24 | 286 | | 17.0 | 1.0 | 348 | 18 | 1.66 | 10,000 | 24 | 0.83 | 10 | 50 | 07.P1 |
| 61. | 180 | 215 | 13 | 24 | 192 | 50 | 11.9 | 1.95 | 238 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 62. | 180 | 215 | 13 | 24 | 226 | | 18.3 | 1.95 | 272 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 63. | 180 | 215 | 13 | 24 | 243 | | 21.5 | 1.95 | 289 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 64. | 180 | 215 | 13 | 24 | 311 | | 27.5 | 1.95 | 357 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 71. | 180 | 215 | 15 | 28 | 240 | 58 | 28.0 | 1.95 | 284 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 72. | 180 | 215 | 15 | 28 | 263 | | 32.5 | 1.95 | 307 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 73. | 180 | 215 | 15 | 28 | 298 | | 40.0 | 1.95 | 342 | 36 | 5.9 | 10,000 | 24 | 1.09 | 22 | 90 | 08.P1 |
| 81. | 230 | 265 | 14.5 | 38 | 311 | 80 | 43.0 | 5.35 | 379 | 145 | 39 | 8,000 | 24 | 2.1 | 65 | 190 | 10.P1 |
| 82. | 230 | 265 | 14.5 | 38 | 379 | | 54.0 | 5.35 | 447 | 145 | 39 | 8,000 | 24 | 2.1 | 65 | 190 | 10.P1 |
| 83. | 230 | 265 | 14.5 | 42 | 447 | | 74.0 | 5.35 | 515 | 145 | 39 | 8,000 | 24 | 2.1 | 65 | 190 | 10.P1 |
| 84. | 230 | 265 | 14.5 | 42 | 515 | | 93.0 | 5.35 | 583 | 145 | 39 | 8,000 | 24 | 2.1 | 65 | 190 | 10.P1 |

Legend:

K (K1) with resolver

t_1 release time $I_{nom.}$ rated current
 t_2 engagement time $U_{nom.}$ nominal voltage
 (+6% / -10 %)

Connection Technology BASE- and DYNAMIC LINE

Allocation of converted wiring and plugs

Connection Resolver

| Plug contact no. | description | conductor coloring |
|------------------|-------------|--------------------|
| 1 | SIN_LO | red |
| 2 | COS_LO | pink |
| 5 | SIN_REF_LO | yellow |
| 7 | SIN-REF | green |
| 10 | SIN | blue |
| 11 | COS | grey |

contacts 3, 4, 6, 8, 9 and 12 are not assigned.



Connection SIN/COS-encoder

| Plug contact no. | description | conductor coloring |
|------------------|-------------|--------------------|
| 1 | A (+) | green |
| 2 | A (-) | yellow |
| 3 | R (+) | grey |
| 4 | D (-) | purple |
| 5 | C (+) | white |
| 6 | C (-) | brown |
| 7 | GND | white/green |
| 10 | + 5 V | grey/pink |
| 11 | B (+) | blue |
| 12 | B (-) | red |
| 13 | R (-) | pink |
| 14 | D (+) | black |

contacts 8, 9, 15, 16 and 17 are not assigned.



Connection Hiperface-encoder

| Plug contact no. | description | conductor coloring |
|------------------|-------------|--------------------|
| 4 | REFSIN | red |
| 5 | REFCOS | yellow |
| 6 | DATA (+) | grey |
| 7 | DATA (-) | pink |
| 8 | SIN (+) | blue |
| 9 | COS (+) | green |
| 10 | + 12 V | brown |
| 11 | GND | white |

contacts 1 - 3 and 12 are not assigned.



Connection EnDat-encoder

| Plug contact no. | description | conductor coloring |
|------------------|-------------|--------------------|
| 7 | + 5 V | brown |
| 8 | Takt (+) | black |
| 9 | Takt (-) | purple |
| 10 | GND | white |
| 12 | B (+) | blue |
| 13 | B (-) | red |
| 14 | Data (+) | grey |
| 15 | A (+) | green |
| 16 | A (-) | yellow |
| 17 | Data (-) | pink |

contacts 1 - 6 and 11 are not assigned.



Connection performance plug

| plug contact no. | description | cable/conductor. no. |
|------------------|-------------|----------------------|
| 1 | U | 1 |
| 4 | V | 2 |
| 3 | W | 3 |
| 2 | PE | green/yellow |
| A | brake (+) | 5 |
| B | brake (-) | 6 |
| C | PTC-contact | 7 |
| D | PTC-contact | 8 |



Converted wiring for

resolver

00.F5.0C1- 1 _ _ _

Sin/Cos

00.S4.209-0 _ _ _

Hiperface

00.S4.809-0 _ _ _

EnDat

00.F5.0C1- 4 _ _ _

performance connection

cross section part-no.

1,5 mm² 00.S4.019-0 _ _ _

2,5 mm² 00.S4.119-0 _ _ _

4 mm² 00.S4.219-0 _ _ _

available standard length:

2 m, 3 m, 5 m,

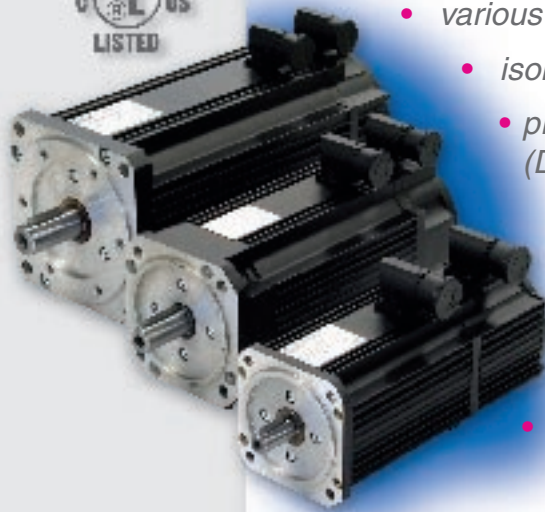
7 m, 10 m, 15 m,

20 m, 30 m, 50 m



DYNAMIC LINE Synchronous Servo Motors SM.000

are permanently excited, electronically commutated synchronous motors for applications with high demands on quality and positioning accuracy. Offering compact construction, size and weight. The 6 pole motors have NdFeB permanent magnets (high remanence and field strength) and 3 phase winding for sine wave commutation.



- various nominal speeds
- isolation class F
- protection type IP65 (DIN EN 60034-5)
- flange mounted motor and resolver/encoder connections for
 - resolver or
 - high resolution Hiperface, Endat or SSI encoder

Features:

- Thermal winding protection with sensor to 145 DegC
- Shaft with keyway
- Vibration R according to DIN VDE 0530-14
- Half spine balancing according to DIN ISO 8821 with keyway
- Flange accuracy grade R according to DIN 42955
- Radial grooved bearings with high temperature resistant grease and lifetime lubrication
- Ambient temperature from -20 ... +40 DegC
- Evaluation data dimensioned for operation mode S1
- Usage above 1000 M with no loss of performance

Options

- Holding brake
- Gear mounting
- Special shafts
- forced cooling

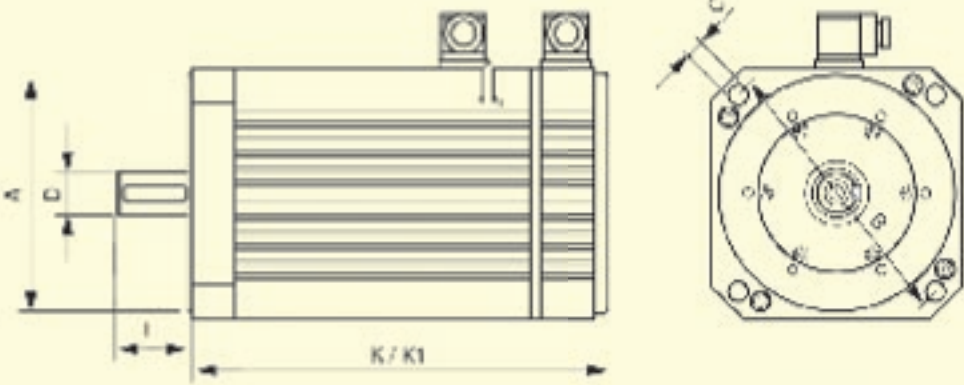
| motor size | M_N [Nm] | M_0 [Nm] | |
|-------------------------------------------------------------------------------------------------|------------|------------|-----------|
|  55 mm | A1.SM | 0.32 | 0.34 |
| | A2.SM | 0.48 | 0.5 |
| | A3.SM | 0.6 | 0.65 |
| | A4.SM | 0.8 | 1.0 |
|  70 mm | B1.SM | 0.6 | 0.65 |
| | B2.SM | 1.3 | 1.5 |
| | B3.SM | 2.0 | 2.3 |
|  92 mm | C1.SM | 0.8 | 0.95 |
| | C2.SM | 2.4 | 2.7 |
| | C3.SM | 3.9 | 4.5 |
| | C4.SM | 5.0 | 6.0 |
|  110 mm | D1.SM | 3.7/5.5 | 4.2/6.2 |
| | D2.SM | 6.1/8.7 | 7.0/10.5 |
| | D3.SM | 8.4/12.2 | 10.0/14.5 |
| | D4.SM | 9.9/15.6 | 12/18.0 |
|  140 mm | E1.SM | 7.0/11.2 | 8.5/12.9 |
| | E2.SM | 12.2/18.7 | 14/21.5 |
| | E3.SM | 16.5/26.0 | 19/30 |
| | E4.SM | 21.4/33.0 | 27/42 |
|  190 mm | F1.SM | 22.5/35.4 | 25/39 |
| | F2.SM | 42.0/64.0 | 50/75 |
| | F3.SM | 61.0/92.8 | 70/110 |

■ with forced cooling

| M_{max} [Nm] | n_N [rpm] | n_{max} [rpm] | J_L [kgcm ²] | 1/3 ph. 230 V (180... 260 V) | | | | 3 ph. 400 V (305... 500 V) | | | |
|-------------------|----------------|--------------------|-------------------------------|------------------------------|-------------------|-----------------------|----------------------------------|----------------------------|-------------------|-----------------------|----------------------------------|
| | | | | $I_0/200V$ [A] | $I_N/200V$ [A] | $I_{max}/200V$ [A] | ** recommended amplifier size | $I_0/400V$ [A] | $I_N/400V$ [A] | $I_{max}/400V$ [A] | ** recommended amplifier size |
| 1.7 | 6,000 | 9,000 | 0.17 | 1.2 | 1.0 | 7.1 | 05. | 0.85 | 0.8 | 5.0 | 07. |
| 2.5 | 6,000 | 9,000 | 0.24 | 1.5 | 1.5 | 9.0 | 05. | 1.0 | 0.9 | 6.0 | 07. |
| 3.2 | 6,000 | 9,000 | 0.31 | 2.0 | 2.0 | 10.8 | 07. | 1.2 | 1.1 | 6.5 | 07. |
| 5.0 | 6,000 | 9,000 | 0.45 | 3.2 | 2.9 | 17.0 | 07. | 1.6 | 1.4 | 8.5 | 07. |
| 3.1 | 4,000 | 9,000 | 0.22 | 1.9 | 2.0 | 11.4 | 07. | 0.9 | 0.9 | 5.4 | 07. |
| 3.1 | 6,000 | 9,000 | 0.22 | 2.6 | 2.5 | 15.6 | 07. | 1.3 | 1.2 | 7.8 | 07. |
| 7.2 | 4,000 | 9,000 | 0.36 | 3.2 | 2.9 | 19.2 | 07. | 1.6 | 1.4 | 9.6 | 07. |
| 7.2 | 6,000 | 9,000 | 0.36 | 5.0 | 4.4 | 30.0 | 09. | 2.4 | 2.1 | 14.4 | 09. |
| 11.0 | 4,000 | 9,000 | 0.57 | 5.5 | 4.7 | 33.0 | 10. | 2.4 | 2.0 | 14.4 | 07. |
| 11.0 | 6,000 | 9,000 | 0.57 | 7.7 | 6.6 | 46.2 | 12. | 3.5 | 3.0 | 21.0 | 09. |
| 4.3 | 3,000 | 6,000 | 1.2 | 1.5 | 1.4 | 7.5 | 05. | 0.8 | 0.75 | 4.0 | 07. |
| 4.3 | 4,000 | 6,000 | 1.2 | 2.0 | 1.8 | 10.0 | 05. | 1.1 | 0.9 | 5.4 | 07. |
| | 6,000 | 6,000 | 1.2 | 3.0 | 2.4 | 15.0 | 07. | 1.6 | 1.3 | 8.0 | 07. |
| | 3,000 | 6,000 | 2.7 | 3.2 | 3.0 | 16.0 | 07. | 1.9 | 1.8 | 9.4 | 07. |
| 12.2 | 4,000 | 6,000 | 2.7 | 4.3 | 3.6 | 21.5 | 09. | 2.5 | 2.1 | 12.4 | 09. |
| | 6,000 | 6,000 | 2.7 | 6.5 | 5.3 | 32.5 | 10. | 3.7 | 3.0 | 18.5 | 09. |
| | 3,000 | 6,000 | 4.2 | 5.1 | 4.6 | 25.5 | 09. | 2.9 | 2.7 | 14.5 | 09. |
| 20.3 | 4,000 | 6,000 | 4.2 | 6.7 | 5.5 | 33.4 | 10. | 3.8 | 3.1 | 19.0 | 09. |
| | 6,000 | 6,000 | 4.2 | 9.9 | 6.7 | 49.5 | 10. | 5.6 | 3.8 | 27.9 | 10. |
| | 3,000 | 6,000 | 5.4 | 7.1 | 6.3 | 35.5 | 10. | 4.2 | 3.7 | 21.0 | 10. |
| 27.0 | 4,000 | 6,000 | 5.4 | 9.1 | 7.3 | 45.5 | 12. | 5.5 | 4.4 | 27.5 | 12. |
| | 6,000 | 6,000 | 5.4 | 13.7 | 7.9 | 68.4 | 12. | 7.8 | 4.5 | 39.0 | 12. |
| 18.9 | 3,000 | 6,000 | 4.8 | 5.3/- | 4.9/- | 25.4/- | 09. | 3.0/4.1 | 2.8/4.2 | 14.4 | 09./12. |
| | 4,000 | 6,000 | 4.8 | 7.0/- | 6.1/- | 33.6/- | 10. | 4.0/5.4 | 3.5/5.0 | 19.2 | 10./12. |
| | 6,000 | 6,000 | 4.8 | 10.2/- | 8.2/- | 48.9/- | 12. | 6.0/8.1 | 4.8/6.7 | 28.8 | 12./13. |
| | 3,000 | 6,000 | 7.4 | 8.5/- | 8.1/- | 40.8/- | 12. | 4.8/6.8 | 4.5/6.4 | 23.0 | 12./13. |
| 31.5 | 4,000 | 6,000 | 7.4 | 11.6/- | 10.5/- | 55.7/- | 12. | 6.4/9.2 | 5.8/8.4 | 30.7 | 12./14. |
| | 6,000 | 6,000 | 7.4 | 16.0/- | 9.6/- | 76.8/- | 12. | 9.9/14.2 | 5.9/11.7 | 47.5 | 13./15. |
| | 3,000 | 6,000 | 9.8 | 12.4/- | 10.9/- | 59.5/- | 12. | 7.2/10.4 | 6.3/9.2 | 34.5 | 12./14. |
| 45.0 | 4,000 | 6,000 | 9.8 | 17.0/- | 13.5/- | 81.6/- | 13. | 9.7/14.1 | 7.7/12.2 | 46.5 | 13./15. |
| | 6,000 | 6,000 | 9.8 | 22.6/- | 12.7/- | 108.0/- | 13. | 13.6/19.7 | 7.6/16.0 | 65.3 | 14./16. |
| 54.0 | 3,000 | 6,000 | 12.7 | 14.2/- | 12.2/- | 68.1/- | 13. | 8.5/12.3 | 7.3/11.5 | 40.8 | 13./15. |
| | 4,000 | 6,000 | 12.7 | 18.2/- | 13.5/- | 87.3/- | 13. | 11.6/16.8 | 8.6/14.7 | 55.7 | 13./16. |
| 42 | 2,000 | 4,000 | 12.3 | 5.3/- | 4.4/- | 28/- | 09. | 3.1/4.7 | 2.6/4.2 | 16 | 09./12. |
| | 3,000 | 4,000 | 12.3 | 8.0/- | 6.4/- | 42/- | 10. | 4.7/7.1 | 3.8/5.9 | 25 | 10./12. |
| | 4,000 | 4,000 | 12.3 | 10.7/- | 6.9/- | 57/- | 12. | 6.2/9.3 | 4.0/7.2 | 33 | 12./13. |
| | 2,000 | 4,000 | 19.5 | 8.6/- | 7.5/- | 46/- | 12. | 4.7/6.5 | 4.1/6.3 | 25 | 10./12. |
| 70 | 3,000 | 4,000 | 19.5 | 13.3/- | 10.4/- | 71/- | 12. | 7.5/9.7 | 5.8/9.1 | 40 | 12./14. |
| | 4,000 | 4,000 | 19.5 | 17.8/- | 9.7/- | 94/- | 13. | 10.0/12.7 | 5.4/11.1 | 53 | 13./15. |
| | 2,000 | 4,000 | 26.7 | 11.7/- | 10.6/- | 56/- | 12. | 6.8/10.7 | 6.1/9.6 | 33 | 12./14. |
| 85 | 3,000 | 4,000 | 26.7 | 17.6/- | 14.0/- | 84/- | 13. | 10.3/16.3 | 8.3/13.4 | 49 | 13./15. |
| | 4,000 | 4,000 | 26.7 | 21.9/- | 10.4/- | 105/- | 13. | 13.5/21.3 | 6.4/15.9 | 65 | 14./16. |
| 121 | 2,000 | 3,000 | 36.0 | 16.5/- | 13.0/- | 79/- | 12. | 9.9/12.7 | 7.8/12.1 | 47 | 13./15. |
| | 3,000 | 3,000 | 36.0 | 23.2/- | 13.3/- | 111/- | 13. | 14.4/18.5 | 8.3/16.8 | 69 | 14./16. |
| 88 | 1,500 | 4,000 | 84.0 | | | | | 8.2/12.3 | 7.5/11.8 | 29 | 13./15. |
| | 2,000 | 4,000 | 84.0 | | | | | 11.1/16.6 | 9.7/15.8 | 39 | 14./16. |
| | 3,000 | 4,000 | 84.0 | | | | | 17.0/25.4 | 13.8/21.9 | 60 | 15./17. |
| | 4,000 | 4,000 | 84.0 | | | | | 22.2/33.2 | 14.8/25.5 | 78 | 16./18. |
| 175 | 1,500 | 4,000 | 147 | | | | | 17.0/25.5 | 14.5/22.1 | 60 | 16./17. |
| | 2,000 | 4,000 | 147 | | | | | 22.3/33.5 | 17.2/28.5 | 78 | 16./19. |
| | 3,000 | 4,000 | 147 | | | | | 32.2/48.3 | 20.6/38.7 | 113 | 17./20. |
| 245 | 1,500 | 4,000 | 210 | | | | | 23.1/34.8 | 20.9/31.8 | 81 | 17./19. |
| | 2,000 | 4,000 | 210 | | | | | 30.8/46.0 | 23.7/41.1 | 108 | 17./20. |
| | 3,000 | 4,000 | 210 | | | | | 46.2/69.0 | 22.9/56.0 | 162 | 17./22. |

**recommended amplifier size F5-M/-S for M_{max} = approx. $2.5 \times M_N$

Dimensions



| Motor-size | A | B | C | D | K | L | m | K1 | data permanent magnet brake | | | | | | | | |
|------------|----------------------|-----|-----|----|-----|----|------|-------|-----------------------------|-------------------------------------|--------------------|-------------------|-------------------|---------------|---------------|------|-------|
| | | | | | | | | | M_{brake} [Nm] | J_{brake} [kgcm ²] | n_{max} [rpm] | $U_{nom.}$ [V] | $I_{nom.}$ [A] | t_1 [ms] | t_2 [ms] | type | |
| | all dimensions in mm | | | | | | | motor | brake | | | | | | | | |
| | | | | | | | [kg] | [kg] | | | | | | | | | |
| A1.SM | 40 | 63 | 5.8 | 9 | 121 | | 1.0 | 0.18 | 145 | 2 | 0.068 | 9,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| A2.SM | 40 | 63 | 5.8 | 9 | 133 | 20 | 1.2 | 0.18 | 157 | 2 | 0.068 | 9,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| A3.SM | 40 | 63 | 5.8 | 9 | 145 | | 1.4 | 0.18 | 169 | 2 | 0.068 | 9,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| A4.SM | 40 | 63 | 5.8 | 9 | 170 | | 1.8 | 0.18 | 194 | 2 | 0.068 | 9,000 | 24 | 0.46 | 6 | 25 | 03.P1 |
| B1.SM | 60 | 75 | 5.8 | 11 | 136 | | 1.5 | 0.30 | 164 | 2.5 | 0.18 | 9,000 | 24 | 0.50 | 7 | 35 | 05.P1 |
| B2.SM | 60 | 75 | 5.8 | 11 | 160 | 23 | 2.1 | 0.30 | 188 | 2.5 | 0.18 | 9,000 | 24 | 0.50 | 7 | 35 | 05.P1 |
| B3.SM | 60 | 75 | 5.8 | 11 | 196 | | 2.9 | 0.30 | 223 | 2.5 | 0.18 | 9,000 | 24 | 0.50 | 7 | 35 | 05.P1 |
| C1.SM | 80 | 100 | 7 | 14 | 156 | | 2.7 | 0.50 | 202 | 9 | 0.6 | 6,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| C2.SM | 80 | 100 | 7 | 14 | 180 | 30 | 3.9 | 0.50 | 226 | 9 | 0.6 | 6,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| C3.SM | 80 | 100 | 7 | 14 | 214 | | 5.2 | 0.50 | 260 | 9 | 0.6 | 6,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| C4.SM | 80 | 100 | 7 | 14 | 248 | | 6.6 | 0.50 | 294 | 9 | 0.6 | 6,000 | 24 | 0.75 | 7 | 40 | 06.P1 |
| D1.SM | 95 | 115 | 9 | 19 | 218 | | 6.3 | 0.78 | 226 | 11 | 2.3 | 6,000 | 24 | 0.84 | 22 | 90 | 08.P1 |
| D2.SM | 95 | 115 | 9 | 19 | 248 | 40 | 7.9 | 0.78 | 56 | 11 | 2.3 | 6,000 | 24 | 0.84 | 22 | 90 | 08.P1 |
| D3.SM | 95 | 115 | 9 | 19 | 278 | | 9.6 | 0.78 | 286 | 11 | 2.3 | 6,000 | 24 | 0.84 | 22 | 90 | 08.P1 |
| D4.SM | 95 | 115 | 9 | 19 | 308 | | 11.2 | 0.78 | 316 | 11 | 2.3 | 6,000 | 24 | 0.84 | 22 | 90 | 08.P1 |
| E1.SM | 130 | 165 | 11 | 24 | 231 | | 10.2 | 1.63 | 276 | 35 | 5.9 | 4,000 | 24 | 1.1 | 22 | 90 | 08.P1 |
| E2.SM | 130 | 165 | 11 | 24 | 261 | 50 | 12.3 | 1.63 | 306 | 35 | 5.9 | 4,000 | 24 | 1.1 | 22 | 90 | 08.P1 |
| E3.SM | 130 | 165 | 11 | 24 | 291 | | 15.5 | 1.63 | 336 | 35 | 5.9 | 4,000 | 24 | 1.1 | 22 | 90 | 08.P1 |
| E4.SM | 130 | 165 | 11 | 24 | 336 | | 20.4 | 1.63 | 381 | 35 | 5.9 | 3,000 | 24 | 1.1 | 22 | 90 | 08.P1 |
| F1.SM | 180 | 215 | 14 | 32 | 348 | | 30.5 | 3.80 | 348 | 85 | 17.6 | 4,000 | 24 | 1.5 | 25 | 140 | 09.P1 |
| F2.SM | 180 | 215 | 14 | 32 | 428 | 58 | 44.0 | 3.80 | 428 | 85 | 17.6 | 4,000 | 24 | 1.5 | 25 | 140 | 09.P1 |
| F3.SM | 180 | 215 | 14 | 32 | 508 | | 57.5 | 3.80 | 508 | 85 | 17.6 | 4,000 | 24 | 1.5 | 25 | 140 | 09.P1 |

Legend:

K (K1) with resolver

t_1 release time

t_2 engagement time

$I_{nom.}$ rated current
 $U_{nom.}$ nominal voltage
 (+ 6 % / - 10 %)

SERVOGEAR *Planetary gears SG.AL*

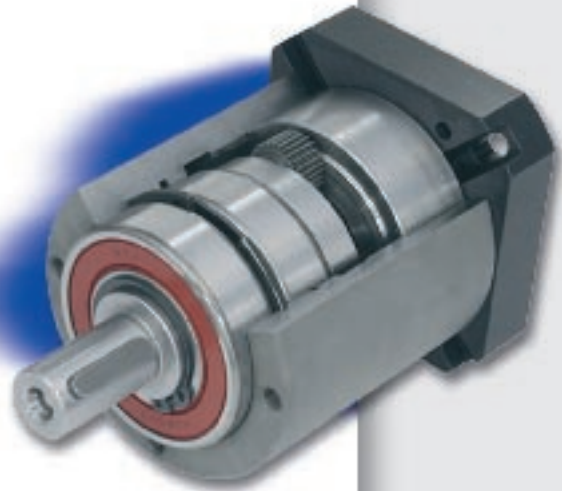
The value planetary type SG.AL provides designers with an economical, precision planetary gearbox that is perfect for today's stepper and emerging low cost servo motors.

The design incorporates single or two stages of planetary gearing to create four frames sizes with rated torque from 6 Nm up to 100 Nm. Standard backlash is 15 arc minutes with low backlash of 12 arc minutes.

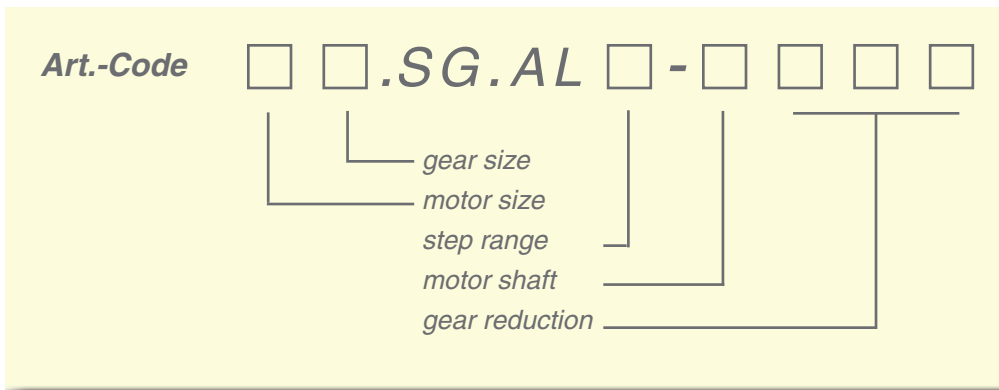
The AL reducer is available in eight standard ratios from 3:1 to 100:1. The cylindrical housing is supplied with either face mounted holes or a square NEMA flange making it a versatile gearbox for global installation.

- high reliability and overload safety
- large gear reduction range $i = 3 \dots 100$
- lifetime lubrication
- low running noise
- optimal efficiency > 95 %
- output shaft with feather key
- easy direct attachment of motor

for **BASE LINE** and **DYNAMIC LINE**



The economically efficient gearbox in compact design!

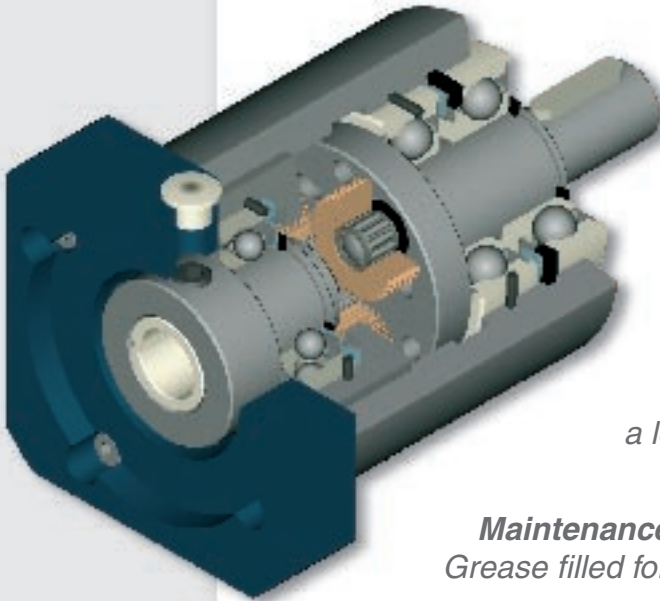


SERVOGEAR

Planetary gears SG.AL

One Piece Construction

Steel body with hardened, integral crown gear provides strength and precision in a small diameter



Universal Servo Interface

Flexible slotted bolt circle and oversized pilot equal easy motor installation and no adapters.

Interchangeability

Mechanically interchangeable with many of today's metric gearboxes or supplied with a NEMA flange.

Outstanding value

Precise, simple design offers good backlash at a low cost.

Maintenance Free Operation

Grease filled for life; never needs service

Output Bearing

Forward output bearing construction allows for higher bearing loads and serves as a pilot helping to provide a more economical package.

classification table

DYNAMIC LINE

| | flange | shaft | hole circle | recess |
|----------------|--------|--------|-------------|--------|
| A1 .. A4. SM. | 55 | 9 x20 | 63 | 40 |
| B1 .. B3. SM.0 | 70 | 11 x23 | 75 | 60 |
| C1 .. C4. SM.0 | 92 | 14x30 | 100 | 80 |
| D1 ..D4. SM.0 | 110 | 19x40 | 115 | 95 |
| E1 ..E4. SM.0 | 140 | 24x50 | 165 | 130 |

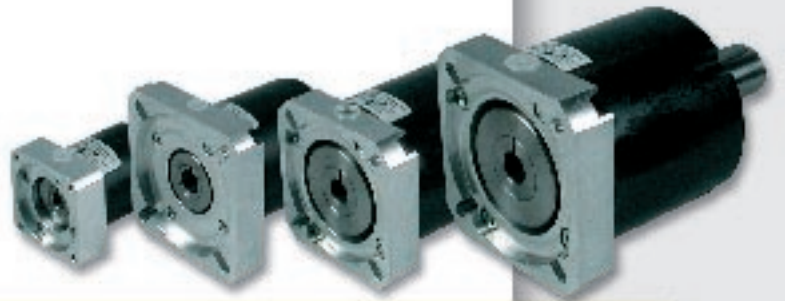
BASE LINE

| | flange | shaft | hole circle | recess |
|----------------|--------|-------|-------------|--------|
| 21 ...24. SM.0 | 55 | 9x24 | 63 | 40 |
| 31 ...35. SM.0 | 86 | 14x30 | 100 | 80 |
| 41 ...44. SM.0 | 102 | 19x40 | 115 | 95 |
| 51 ...55. SM.0 | 142 | 24x50 | 165 | 130 |

_1.SG.AL _2.SG.AL _3.SG.AL _4.SG.AL

| | | | |
|---|---|---|---|
| • | - | - | - |
| • | • | - | - |
| - | • | • | - |
| - | - | • | • |
| - | - | - | • |
| • | - | - | - |
| - | • | • | - |
| - | - | • | • |
| - | - | - | • |

Technical data



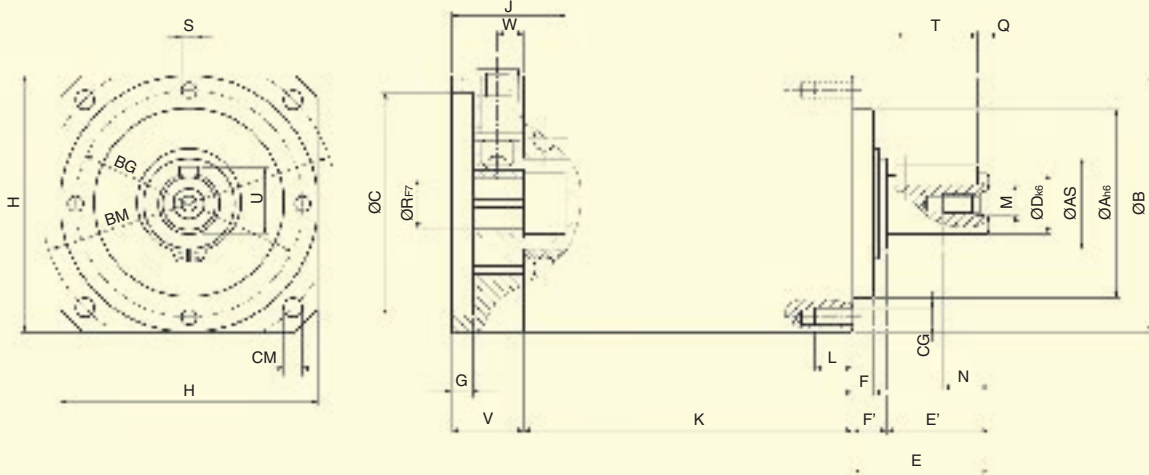
| | | | | _1.SG.AL | _2.SG.AL | _3.SG.AL | _4.SG.AL |
|-----------------------------------|---------------|-------------------|---------------------------|-----------|-----------------|----------|----------|
| Peak Output Torque ¹⁾ | T_{max} | Nm | 3/5/15/25/30/ 50 | 12 | 44 | 80 | 200 |
| | | | 10 / 100 | 11 | 40 | 74 | 180 |
| Rated Output Torque ²⁾ | $T_{nom.}$ | Nm | 3/5/15/25/30/ 50 | 6 | 22 | 40 | 100 |
| | | | 10 / 100 | 5.5 | 20 | 37 | 90 |
| ratio | i | | 1 stage | 5 / 10 | 3 / 5 / 10 | | |
| | | | 2 stage | 25/50/100 | 15/25/30/50/100 | | |
| backlash | j_t | arcmin | 1 stage | <=12 | | | |
| | | | 1 stage | <=15 | | | |
| torsional stiffness | C_t | Nm / arcmin | 3/5/15/25/30/ 50 | 0.9 | 3.3 | 9 | 24 |
| | | | 10 / 100 | 0.75 | 2.8 | 7.5 | 20.5 |
| continuous input speed | $n_{1 nom}$ | rpm | | 4000 | 3700 | 3400 | 2600 |
| maximum input speed | $n_{1 max.}$ | rpm | | 8000 | 6000 | 6000 | 4800 |
| maximum radial load ³⁾ | $Fr_{2 max.}$ | N | | 650 | 1450 | 2400 | 4600 |
| maximum axial load ³⁾ | $Fa_{2 max.}$ | N | | 700 | 1550 | 1900 | 4000 |
| efficiency | η | % | 1 stage | > 97 | | | |
| | | | 2 stage | > 95 | | | |
| input inertia | J_1 | kgcm ² | 1 stage | 0.060 | 0.29 | 1.73 | 5.5 |
| | | | 2 stage | 0.052 | 0.26 | 1.48 | 4.6 |
| weight | m | kg | 1 stage | 0.75 | 1.7 | 4.0 | 8.8 |
| | | | 2 stage | 0.92 | 2.1 | 4.9 | 10.9 |
| noise level | L_{PA} | dB (A) | measured $n_1 = 3000$ rpm | ≤ 69 | ≤ 70 | ≤ 72 | ≤ 74 |
| life | L_h | H | 20000 | | | | |
| lubrication | grease | | | | | | |
| orientation | any | | | | | | |

¹⁾ max. acceleration moment for cycle rating

²⁾ rated torque for continuous rating

³⁾ related to center output shaft at 100 min⁻¹

Dimensions



| Size [dimensions in mm] | | 1.SG.AL | 2.SG.AL | 3.SG.AL | 4.SG.AL | | | | |
|-----------------------------------|----|--------------------------|---------|---------|---------|-------|----|----|----|
| housing \varnothing | B | 50 | 70 | 90 | 120 | | | | |
| pilot \varnothing | A | h6 | 35 | 52 | 68 | 90 | | | |
| output shaft \varnothing | D | k6 | 12 | 16 | 22 | 32 | | | |
| mounting hole circle | BG | 44 | 62 | 80 | 108 | | | | |
| mounting holes | CG | 4x90° | M4 | M5 | M6 | M8 | | | |
| shoulder \varnothing | AS | 17 | 25 | 40 | 50 | | | | |
| shaft length from mount face | E | 24.5 | 36 | 46 | 70 | | | | |
| output shaft length | E' | 18 | 28 | 36 | 58 | | | | |
| pilot length | F | 4 | 5 | 5 | 6 | | | | |
| thickness | F' | 6.5 | 8 | 10 | 12 | | | | |
| thread depth | L | 8 | 10 | 12 | 16 | | | | |
| keyway length | T | 14 | 22 | 32 | 50 | | | | |
| keyway position | Q | 2 | 3 | 2 | 4 | | | | |
| height with key | U | 13.5 | 18 | 24.5 | 35 | | | | |
| key width | S | h9 | 4 | 5 | 6 | 10 | | | |
| thread size | M | M4 | M5 | M8 | M12 | | | | |
| thread depth | N | 8 | 12.5 | 19 | 28 | | | | |
| reducer body length | K | 1 stage | 48 | 70 | 84 | 103.5 | | | |
| | | 2 stage | 64 | 91 | 110 | 136 | | | |
| motor interface dimensions | | | | | | | | | |
| maximum motor pilot | C | | | | | | | | |
| hole circle for motor | BM | see classification table | | | | | | | |
| mounting holes | CM | | | | | | | | |
| max. \varnothing Motor shaft | R | 14 | 16 | 24 | 32 | | | | |
| min. wave length | J | 18 | 16.5 | 24 | 26 | | | | |
| min. square flange | H | 50 | 70 | 90 | 120 | | | | |
| maximum pilot length | G | 4 | 4 | 4 | 6 | | | | |
| position of access hole | W | 6 | 7 | 8 | 10 | | | | |
| flange thickness | V | 20 | 25 | 16.5 | 19.5 | 20 | 25 | 26 | 36 |

Further solutions for gearboxes



| motor type | | gear version | | | |
|-------------------|---------------------|---------------------|--------------|----------------------|---------------------|
| <i>BASE LINE</i> | <i>DYNAMIC LINE</i> | <i>helical</i> | <i>shaft</i> | <i>helical bevel</i> | <i>helical worm</i> |
| SM.200 | SM.000 | G | F | K | S |
| 21 ... 24 | A1 ... A4 | - | - | - | - |
| - | B1 ... B3 | • | • | • | • |
| 31 ... 33 | C1 ... C4 | • | • | • | • |
| 41 ... 43 | D1 ... D4 | • | • | • | • |
| 51 ... 53 | E1 ... E4 | • | • | • | • |
| 61 ... 72 | F1 ... F3 | • | • | • | • |

Selection and dimensioning of the gears acc. to PC-Programm
KEB-DRIVE!



TORQUE LINE

Asynchronous Servo Motors

The asynchronous servo motors type DK are especially designed for closed loop operation

KEB COMBIVERT F5-Multi

and serve as an economic alternative for demanding drive tasks throughout the whole speed range

Details:

- Motor frame B3 or B5
- Forced cooling IP 55
- Thermal winding protection via PTC thermistor
- Optional spring applied brake
- Incremental encoder 2.500 I/U / RS 422, 5 V DC, 12 pole plug

| Size | power [kW] | M_N [Nm] | M_0 [Nm] | M_{max} [Nm] | n_N [rpm] | n_{max} [rpm] | J_L [kgcm ²] | brake [Nm] |
|------|---------------|---------------|---------------|-------------------|----------------|--------------------|-------------------------------|---------------|
| 63 | 0.12 | 0.8 | 0.8 | 1.7 | 1400 | 3000 | 4.0 | 4 |
| 63 | 0.18 | 1.2 | 1.2 | 2.4 | 1405 | 3000 | 4.0 | 4 |
| 71 | 0.25 | 1.7 | 1.7 | 3.2 | 1385 | 3000 | 4.0 | 4 |
| 71 | 0.37 | 2.6 | 2.6 | 5.2 | 1370 | 3000 | 5.0 | 4 |
| 80 | 0.55 | 3.6 | 3.6 | 8.2 | 1400 | 3000 | 8.7 | 4/8 |
| 80 | 0.75 | 5.1 | 5.1 | 10.6 | 1400 | 3000 | 10.7 | 4/8 |
| 90 | 1.1 | 7.5 | 7.5 | 16.8 | 1410 | 3000 | 20.7 | 8/16 |
| 90 | 1.5 | 10.2 | 10.2 | 23.9 | 1400 | 3000 | 26.0 | 8/16 |
| 100 | 2.2 | 14.2 | 14.2 | 39.6 | 1420 | 3000 | 40.0 | 16/32 |
| 100 | 3.0 | 20.0 | 20.0 | 50.4 | 1435 | 3000 | 72.5 | 32/60 |
| 112 | 4.0 | 26.6 | 26.6 | 76.6 | 1435 | 3000 | 90.0 | 32/60 |
| 132 | 5.5 | 36.5 | 36.5 | 98.6 | 1440 | 3000 | 150 | 60/100 |
| 132 | 7.5 | 49.7 | 49.7 | 130 | 1440 | 3000 | 280 | 100/150 |
| 160 | 11 | 72.5 | 72.5 | 215 | 1450 | 3000 | 350 | 100/150 |
| 160 | 15 | 98.5 | 98.5 | 266 | 1465 | 3000 | 780 | 150/250 |
| 180 | 18.5 | 121 | 121 | 316 | 1460 | 3000 | 900 | 150/250 |
| 180 | 22 | 143 | 143 | 335 | 1465 | 3000 | 1380 | 250/400 |
| 200 | 30 | 195 | 195 | 421 | 1465 | 3000 | 1680 | 250/400 |
| 225 | 37 | 240 | 240 | 540 | 1470 | 3000 | 2750 | upon request |
| 225 | 45 | 292 | 292 | 657 | 1470 | 3000 | 3130 | upon request |
| 250 | 55 | 356 | 356 | 737 | 1475 | 3000 | 5250 | upon request |
| 280 | 75 | 484 | 484 | 958 | 1480 | 3000 | 9500 | upon request |

power > 90 kW upon request



eration with the
e speed range.



1/3 ph. 230 V (180... 260 V)

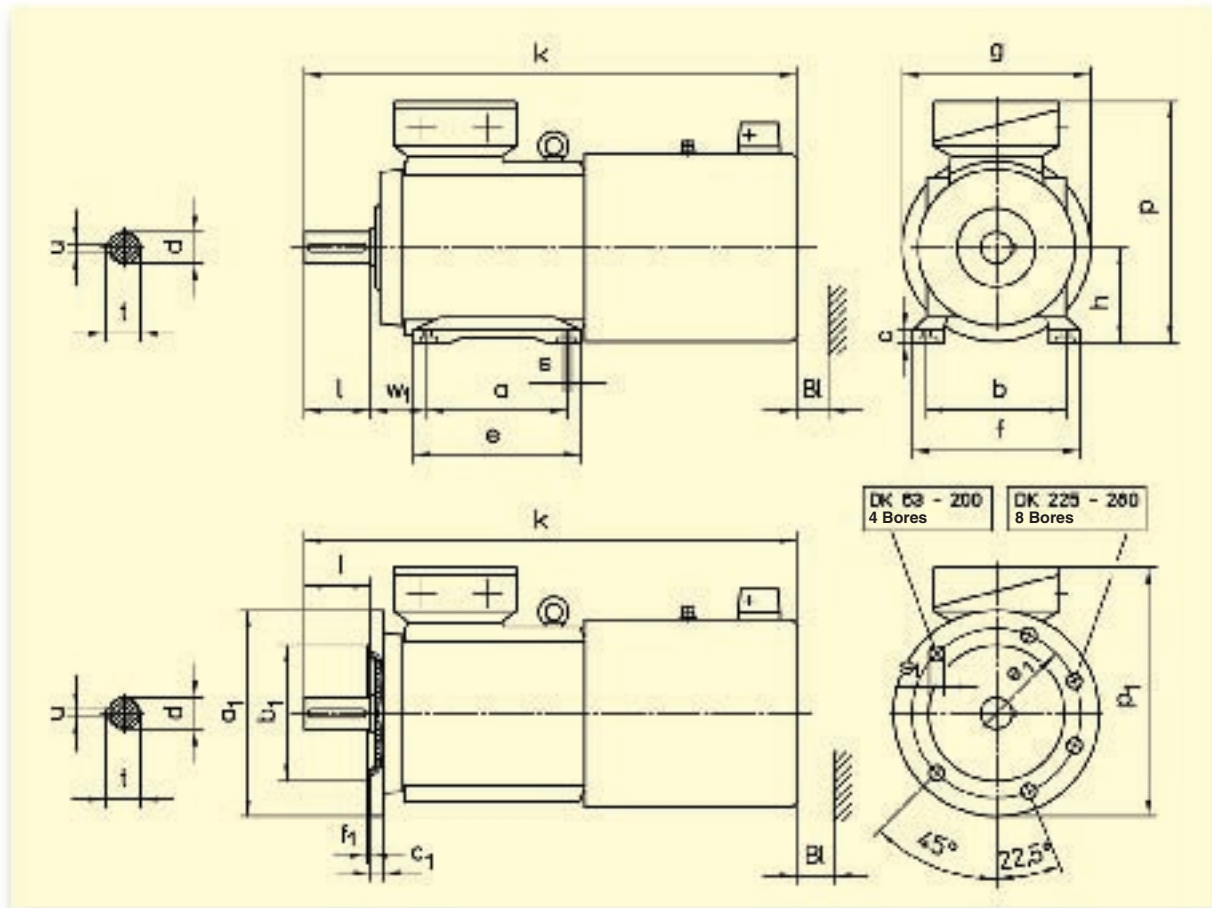
| N/200V [A] | I ₀ /200V [A] | max/200V [A] | ** recommended amplifier size |
|--------------|--------------------------|--------------|-------------------------------|
| 0.6 | 0.6 | 1.4 | 09.F5.M |
| 1.0 | 1.0 | 2.3 | 09.F5.M |
| 1.4 | 1.4 | 2.6 | 09.F5.M |
| 1.8 | 1.8 | 3.8 | 09.F5.M |
| 2.8 | 2.8 | 6.8 | 09.F5.M |
| 3.6 | 3.6 | 10.7 | 09.F5.M |
| 4.5 | 4.5 | 13.9 | 09.F5.M |
| 5.9 | 5.9 | 18 | 10.F5.M |
| 8.9 | 8.9 | 34.5 | 10.F5.M |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |
| upon request | | | |

3 ph. 400 V (305... 500 V)

| N/400V [A] | I ₀ /400V [A] | max/400V [A] | ** recommended amplifier size |
|------------|--------------------------|--------------|-------------------------------|
| 0.4 | 0.4 | 0.8 | 09.F5.M |
| 0.6 | 0.6 | 1.3 | 09.F5.M |
| 0.8 | 0.8 | 1.5 | 09.F5.M |
| 1.1 | 1.1 | 2.2 | 09.F5.M |
| 1.6 | 1.6 | 3.9 | 09.F5.M |
| 2.1 | 2.1 | 6.2 | 09.F5.M |
| 2.6 | 2.6 | 8.0 | 09.F5.M |
| 3.4 | 3.4 | 10.4 | 10.F5.M |
| 5.2 | 5.2 | 19.9 | 12.F5.M |
| 6.7 | 6.70 | 22.9 | 12.F5.M |
| 8.8 | 8.80 | 38.0 | 13.F5.M |
| 10.5 | 10.5 | 38.8 | 14.F5.M |
| 15.0 | 15.0 | 50.0 | 15.F5.M |
| 21.5 | 21.5 | 85.1 | 16.F5.M |
| 28.5 | 28.5 | 112.9 | 17.F5.M |
| 35.0 | 35.0 | 129.1 | 18.F5.M |
| 42.0 | 42.0 | 136.1 | 19.F5.M |
| 55.5 | 55.5 | 199.8 | 20.F5.M |
| 67.0 | 67.0 | 235.2 | 21.F5.M |
| 81.0 | 81.0 | 262.5 | 22.F5.M |
| 98.5 | 98.5 | 310.3 | 23.F5.M |
| 134 | 134 | 349.8 | 24.F5.M |

**recommended amplifier size F5-M for $M_{max} = \text{approx. } 2 \times M_N$

Dimensions



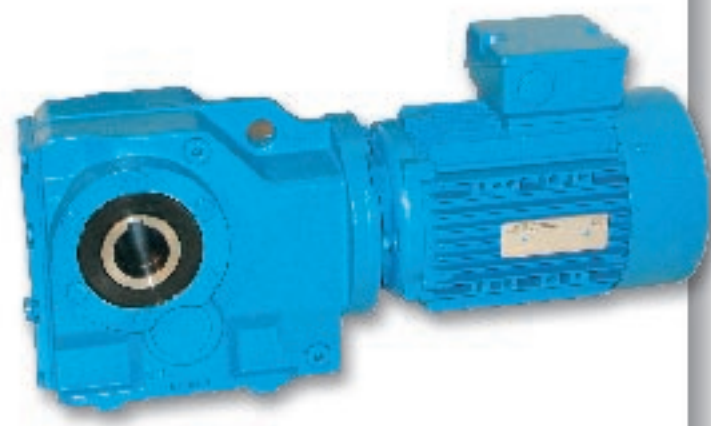
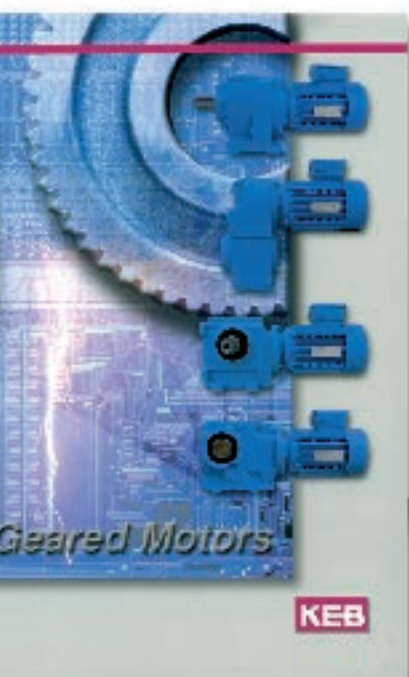
Industrial gear motors provide the adjustment of speed and torque. With the program KEB COMBIGEAR are complete assembly in the classic designs

- helical inline gear,
- helical bevel gear-,
- shaft-mounted- as well as
- helical worm gears

are available.

Main features of the series are the fine graduation of the possible ratios, the compact design and the sturdy housing out cast iron.

| motor size | P [kW] | a | b | C | e | f | w1 | d | l | u | h | p | g | s | t | k | kB | BI | a1 | b1 | c1 | e1 | f1 | s1 | p1 | |
|------------------------|--------|-----|-----|----|-----|-----|-----|----|-----|----|-----|-----|-----|----|------|------|-----|----|-----|-----|----|-----|-----|----|-----|--|
| [all dimensions in mm] | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | 0.12 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | 0.18 | 80 | 100 | 7 | 95 | 120 | 40 | 11 | 23 | 4 | 63 | 167 | 124 | 8 | 12.5 | 354 | 354 | 14 | 140 | 95 | 9 | 115 | 3 | 9 | 174 | |
| 71 | 0.25 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 71 | 0.37 | 90 | 112 | 11 | 116 | 138 | 45 | 14 | 30 | 5 | 71 | 175 | 124 | 8 | 16 | 328 | 328 | 14 | 160 | 110 | 9 | 130 | 3.5 | 9 | 184 | |
| 80 | 0.55 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | 0.75 | 100 | 125 | 12 | 125 | 168 | 50 | 19 | 40 | 6 | 80 | 191 | 139 | 10 | 21.5 | 384 | 384 | 16 | 200 | 130 | 10 | 165 | 3.5 | 11 | 211 | |
| 90 | 1.1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | 1.5 | 125 | 140 | 14 | 155 | 178 | 56 | 24 | 50 | 8 | 90 | 210 | 157 | 10 | 27 | 426 | 426 | 16 | 200 | 130 | 10 | 165 | 3.5 | 11 | 220 | |
| 100 | 2.2 | 140 | 160 | 15 | 175 | 192 | 63 | 28 | 60 | 8 | 100 | 227 | 177 | 12 | 31 | 502 | 502 | 18 | 250 | 180 | 11 | 215 | 4 | 14 | 252 | |
| 100 | 3 | 140 | 160 | 11 | 171 | 188 | 63 | 28 | 60 | 8 | 100 | 237 | 196 | 12 | 31 | 557 | 557 | 20 | 250 | 180 | 11 | 215 | 4 | 14 | 262 | |
| 112 | 4 | 140 | 190 | 18 | 180 | 224 | 70 | 28 | 60 | 8 | 112 | 249 | 196 | 12 | 31 | 591 | 591 | 20 | 250 | 180 | 11 | 215 | 4 | 14 | 328 | |
| 132 | 5.5 | 140 | 216 | 16 | 180 | 256 | 89 | 38 | 80 | 10 | 132 | 310 | 217 | 12 | 41 | 644 | 644 | 35 | 300 | 230 | 12 | 265 | 4 | 14 | 328 | |
| 132 | 7.5 | 178 | 216 | 16 | 218 | 256 | 89 | 38 | 80 | 10 | 132 | 332 | 258 | 12 | 41 | 701 | 701 | 35 | 300 | 230 | 12 | 265 | 4 | 14 | 350 | |
| 160 | 11 | 210 | 254 | 18 | 257 | 296 | 108 | 42 | 110 | 12 | 160 | 360 | 258 | 15 | 45 | 779 | 779 | 35 | 350 | 250 | 13 | 300 | 5 | 18 | 375 | |
| 160 | 15 | 254 | 254 | 18 | 301 | 296 | 108 | 42 | 110 | 12 | 160 | 402 | 313 | 15 | 45 | 853 | 853 | 35 | 350 | 250 | 13 | 300 | 5 | 18 | 417 | |
| 180 | 18.5 | 241 | 279 | 20 | 288 | 328 | 121 | 48 | 110 | 14 | 180 | 422 | 313 | 15 | 51.5 | 853 | 853 | 35 | 350 | 250 | 13 | 300 | 5 | 18 | 417 | |
| 180 | 22 | 279 | 279 | 20 | 326 | 328 | 121 | 48 | 110 | 14 | 180 | 441 | 351 | 15 | 51.5 | 969 | 969 | 35 | 350 | 250 | 13 | 300 | 5 | 18 | 436 | |
| 200 | 30 | 305 | 318 | 22 | 360 | 372 | 133 | 55 | 110 | 16 | 200 | 461 | 351 | 19 | 59 | 969 | 969 | 35 | 400 | 300 | 15 | 350 | 5 | 18 | 461 | |
| 225 | 37 | 286 | 356 | 25 | 343 | 413 | 149 | 60 | 140 | 18 | 225 | 525 | 390 | 19 | 64 | 972 | | 40 | 450 | 350 | 16 | 400 | 5 | 18 | 525 | |
| 225 | 45 | 311 | 356 | 25 | 368 | 413 | 149 | 60 | 140 | 18 | 225 | 525 | 390 | 19 | 64 | 1012 | | 40 | 450 | 350 | 16 | 400 | 5 | 18 | 525 | |
| 250 | 55 | 349 | 406 | 28 | 412 | 471 | 169 | 65 | 140 | 18 | 250 | 576 | 440 | 24 | 69 | 1101 | | 45 | 550 | 450 | 18 | 500 | 5 | 18 | 601 | |
| 280 | 75 | 368 | 457 | 32 | 431 | 522 | 190 | 75 | 140 | 20 | 280 | 668 | 490 | 24 | 79.5 | 1179 | | 50 | 550 | 450 | 18 | 500 | 5 | 18 | 663 | |



people in motion



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