



# SANGALLI SERVOMOTORI



## **Precision Planetary Gearboxes**

*Advanced Gearbox Solution*



# INDEX

## PLANETARY GEARBOX

### SPL Series



#### STANDARD PRECISION GEARBOX

|                          |      |         |
|--------------------------|------|---------|
| <b>SPL Series</b>        | Pag. | 4       |
| SPL040 [stage 1 - 2 - 3] | Pag. | 5 - 6   |
| SPL060 [stage 1 - 2 - 3] | Pag. | 7 - 8   |
| SPL080 [stage 1 - 2 - 3] | Pag. | 9 - 10  |
| SPL120 [stage 1 - 2 - 3] | Pag. | 11 - 12 |
| SPL160 [stage 1 - 2 - 3] | Pag. | 13 - 14 |
| SPL205 [stage 1 - 2 - 3] | Pag. | 15 - 16 |
| SPL235 [stage 1 - 2 - 3] | Pag. | 17 - 18 |
| SPL Dimensions           | Pag. | 19      |

### SVL Series



#### STANDARD PRECISION GEARBOX 90°

|                          |      |         |
|--------------------------|------|---------|
| <b>SVL Series</b>        | Pag. | 20      |
| SVL060 [stage 1 - 2 - 3] | Pag. | 21 - 22 |
| SVL080 [stage 1 - 2 - 3] | Pag. | 23 - 24 |
| SVL120 [stage 1 - 2 - 3] | Pag. | 25 - 26 |
| SVL160 [stage 1 - 2 - 3] | Pag. | 27 - 28 |
| SVL Dimensions           | Pag. | 29      |

|  |      |    |
|--|------|----|
| <b>Motor and Gearbox configuration table</b> | Pag. | 45 |
|--|------|----|

|   |      |    |
|---|------|----|
| <b>Order code example - Comparison Series</b> | Pag. | 46 |
|---|------|----|

### KPG Series



#### HIGH PRECISION GEARBOX

|                      |      |    |
|----------------------|------|----|
| <b>KPG Series</b>    | Pag. | 30 |
| KPG070 [stage 1 - 2] | Pag. | 31 |
| KPG090 [stage 1 - 2] | Pag. | 32 |
| KPG120 [stage 1 - 2] | Pag. | 33 |
| KPG160 [stage 1 - 2] | Pag. | 34 |
| KPG205 [stage 1 - 2] | Pag. | 35 |
| KPG Dimensions       | Pag. | 36 |

### KVG Series



#### HIGH PRECISION GEARBOX 90°

|                      |      |    |
|----------------------|------|----|
| <b>KVG Series</b>    | Pag. | 37 |
| KVG070 [stage 1 - 2] | Pag. | 38 |
| KVG090 [stage 1 - 2] | Pag. | 39 |
| KVG120 [stage 1 - 2] | Pag. | 40 |
| KVG160 [stage 1 - 2] | Pag. | 41 |
| KVG205 [stage 1 - 2] | Pag. | 42 |
| KVG Dimensions       | Pag. | 43 |

# SPL Series

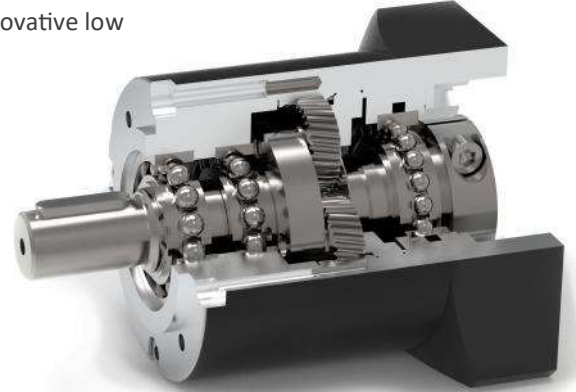
## Standard Precision Gearbox



### SPL is our highly successful high precision gearbox series

The SPL is our super value gearbox option with an unequalled price-to-performance level. Boasting an exceptionally lightweight yet incredibly robust design, this unit is ideally suited to handle even the most demanding production environments, thanks to its innovative low-friction bearing system and optimized lubrication.

Quite simply, a high-performance powerhouse offered at a compelling and consumer-friendly price point.



### Key Features:

- Economy Series,
- Coaxial gearbox configuration,
- Helical gear system,
- Low-friction deep groove ball bearings,
- Round-style output flange,
- Expansive gear ratio range spanning  $i=3$  up to  $i=512$ ,
- Uni-directional rotation,
- Powerful cantilever planetary carrier



### Helical Gear System Technology

Thanks to the tooth to tooth compact ratio more than 60%.

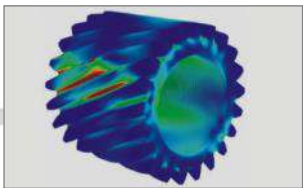
The helical gearing and full needle bearing bring the benefits including higher torque capacity, smooth and lower noise running, decreased backlash and higher efficiency.



### The Powerful Cantilever Planetary Carrier

The powerful cantilever planetary carrier provide great mechanical support for planetary gears, thus the complete gearbox can reach high level stability.

Synthetic grease lubrication allows maintenance free for gearbox whole service life.



### Gear Grinding and Heat Treatment Technology

The global leading gear grinding technology brings the great improvement for the tooth profile optimization, with the high level carburizing and quenching heat treatment technology to reach high precision and gear harden performance.



### Dynamic Balance Clamping and Sealing System

For the gearbox input dynamic balance damping design with perfect concentricity to decrease backlash and increase gearbox operation stability. The ultra sealing system offers grease leakage protection and support gearbox to reach IP65.

### SPL040 1-stage

|                               |             |                   | 1-stage |       |       |     |       |     |     |  |  |
|-------------------------------|-------------|-------------------|---------|-------|-------|-----|-------|-----|-----|--|--|
| Ratio                         | i           |                   | 3       | 4     | 5     | 7   | 8     | 9   | 10  |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 13      | 17    | 17    | —   | 12    | —   | —   |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 26      | 34    | 34    | —   | 24    | —   | —   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 23.4    | 30.6  | 30.6  | —   | 21.6  | —   | —   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 26      | 34    | 34    | —   | 24    | —   | —   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000    |       |       |     |       |     |     |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 8000    |       |       |     |       |     |     |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.022   | 0.019 | 0.017 | —   | 0.017 | —   | —   |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 12    |       |       |     |       |     |     |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 0.7     | 0.7   | 0.7   | 0.7 | 0.7   | 0.7 | 0.7 |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 385     |       |       |     |       |     |     |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 250     |       |       |     |       |     |     |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 30      |       |       |     |       |     |     |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.031   | 0.022 | 0.019 | —   | 0.017 | —   | —   |  |  |
| Weight                        | $m_G$       | kg                | 0.4     |       |       |     |       |     |     |  |  |

### SPL040 2-stage

|                               |             |                   | 2-stage |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 12      | 15    | 16    | 20    | 25    | 32    | 40    | 64    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 16      | 16    | 16    | 17    | 17    | 17    | 17    | 13    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 32      | 32    | 32    | 34    | 34    | 34    | 34    | 26    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 28.8    | 28.8  | 28.8  | 30.6  | 30.6  | 30.6  | 30.6  | 23.4  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 32      | 32    | 32    | 34    | 34    | 34    | 34    | 26    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000    |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 8000    |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.019   | 0.017 | 0.019 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 15    |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 0.7     | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   |
| Maximum Radial Load           | $F_r$       | N                 | 385     |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 250     |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 30      |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.031   | 0.029 | 0.023 | 0.022 | 0.019 | 0.019 | 0.017 | 0.016 |
| Weight                        | $m_G$       | kg                | 0.5     |       |       |       |       |       |       |       |

### SPL040 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 17        | 17    | 17    | 17    | 17    | 17    | 17    | 13    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 34        | 34    | 34    | 34    | 34    | 34    | 34    | 26    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 30.6      | 30.6  | 30.6  | 30.6  | 30.6  | 30.6  | 30.6  | 23.4  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 34        | 34    | 34    | 34    | 34    | 34    | 34    | 26    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 8000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.017     | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 | 0.017 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 17$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 0.7       | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   | 0.7   |
| Maximum Radial Load           | $F_r$       | N                 | 385       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 250       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 30        |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.029     | 0.019 | 0.019 | 0.029 | 0.016 | 0.016 | 0.016 | 0.016 |
| Weight                        | $m_G$       | kg                | 0.6       |       |       |       |       |       |       |       |

### SPL060 1-stage

|                               |             | 1-stage           |          |       |       |       |       |       |      |  |  |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|------|--|--|
| Ratio                         | i           |                   | 3        | 4     | 5     | 7     | 8     | 9     | 10   |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 28       | 36    | 37    | 37    | 32    | 30    | 25   |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 56       | 72    | 74    | 74    | 64    | 60    | 50   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 50.4     | 64.8  | 66.6  | 66.6  | 57.6  | 54    | 45   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 56       | 72    | 74    | 74    | 64    | 60    | 50   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000     |       |       |       |       |       |      |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |       |       |       |      |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.24     | 0.2   | 0.17  | 0.15  | 0.15  | 0.15  | 0.15 |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |       |       |       |       |       |      |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5      | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5  |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 430      |       |       |       |       |       |      |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 320      |       |       |       |       |       |      |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 80       |       |       |       |       |       |      |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.135    | 0.093 | 0.078 | 0.069 | 0.065 | 0.065 | 0.65 |  |  |
| Weight                        | $m_G$       | kg                | 1        |       |       |       |       |       |      |  |  |

### SPL060 2-stage

|                               |             | 2-stage           |           |       |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 30        | 31    | 42    | 42    | 42    | 42    | 42    | 33    |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 60        | 62    | 84    | 84    | 84    | 84    | 84    | 66    |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 54        | 55.8  | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 59.4  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 60        | 62    | 84    | 84    | 84    | 84    | 84    | 66    |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.2       | 0.17  | 0.2   | 0.17  | 0.17  | 0.15  | 0.15  | 0.15  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5       | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   |  |
| Maximum Radial Load           | $F_r$       | N                 | 430       |       |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 320       |       |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 80        |       |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.105     | 0.095 | 0.088 | 0.075 | 0.075 | 0.064 | 0.064 | 0.064 |  |
| Weight                        | $m_G$       | kg                | 1.2       |       |       |       |       |       |       |       |  |



### SPL060 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 42        | 42    | 42    | 42    | 42    | 42    | 42    | 33    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 84        | 84    | 84    | 84    | 84    | 84    | 84    | 66    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 75.6      | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 59.4  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 84        | 84    | 84    | 84    | 84    | 84    | 84    | 66    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.17      | 0.17  | 0.17  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5       | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   |
| Maximum Radial Load           | $F_r$       | N                 | 430       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 320       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 80        |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.075     | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 |
| Weight                        | $m_G$       | kg                | 1.4       |       |       |       |       |       |       |       |



### SPL080 1-stage

|                               |             | 1-stage           |          |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3        | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 75       | 90    | 95    | 82    | 80    | 78    | 65    |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 150      | 180   | 190   | 164   | 160   | 156   | 130   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 135      | 162   | 171   | 147.6 | 144   | 140.4 | 117   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 150      | 180   | 190   | 164   | 160   | 156   | 130   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.38     | 0.36  | 0.31  | 0.25  | 0.25  | 0.25  | 0.25  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4        | 4     | 4     | 4     | 4     | 4     | 4     |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 640      |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 420      |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 200      |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.770    | 0.520 | 0.450 | 0.400 | 0.390 | 0.390 | 0.390 |  |  |
| Weight                        | $m_G$       | kg                | 2        |       |       |       |       |       |       |  |  |

### SPL080 2-stage

|                               |             | 2-stage           |           |       |       |       |       |       |       |      |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64   |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 80        | 90    | 90    | 90    | 90    | 90    | 90    | 80   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 160       | 180   | 180   | 180   | 180   | 180   | 180   | 160  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 144       | 162   | 162   | 162   | 162   | 162   | 162   | 144  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 160       | 180   | 180   | 180   | 180   | 180   | 180   | 160  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |      |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |      |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.36      | 0.31  | 0.36  | 0.31  | 0.31  | 0.25  | 0.25  | 0.25 |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |      |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4         | 4     | 4     | 4     | 4     | 4     | 4     | 4    |  |
| Maximum Radial Load           | $F_r$       | N                 | 640       |       |       |       |       |       |       |      |  |
| Maximum Axial Load            | $F_a$       | N                 | 420       |       |       |       |       |       |       |      |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 200       |       |       |       |       |       |       |      |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.670     | 0.510 | 0.500 | 0.440 | 0.440 | 0.390 | 0.390 | 0.39 |  |
| Weight                        | $m_G$       | kg                | 2.8       |       |       |       |       |       |       |      |  |



### SPL080 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 95        | 95    | 95    | 95    | 95    | 95    | 95    | 82    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 190       | 190   | 190   | 190   | 190   | 190   | 190   | 164   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 171       | 171   | 171   | 171   | 171   | 171   | 171   | 147.6 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 190       | 190   | 190   | 190   | 190   | 190   | 190   | 164   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.31      | 0.31  | 0.31  | 0.25  | 0.25  | 0.25  | 0.25  | 0.25  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4         | 4     | 4     | 4     | 4     | 4     | 4     | 4     |
| Maximum Radial Load           | $F_r$       | N                 | 640       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 420       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 200       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.500     | 0.440 | 0.700 | 0.390 | 0.390 | 0.390 | 0.390 | 0.390 |
| Weight                        | $m_G$       | kg                | 3.5       |       |       |       |       |       |       |       |

### SPL120 1-stage

|                               |             | 1-stage           |          |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3        | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 190      | 240   | 245   | 235   | 210   | 200   | 196   |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 380      | 480   | 490   | 470   | 420   | 400   | 392   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 342      | 432   | 441   | 423   | 378   | 360   | 352.8 |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 380      | 480   | 490   | 470   | 420   | 400   | 392   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1        | 0.95  | 0.85  | 0.78  | 0.78  | 0.78  | 0.78  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10       | 10    | 10    | 10    | 10    | 10    | 10    |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 2070     |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 970      |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 400      |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 2.630    | 1.790 | 1.530 | 1.400 | 1.320 | 1.320 | 1.320 |  |  |
| Weight                        | $m_G$       | kg                | 6.5      |       |       |       |       |       |       |  |  |

### SPL120 2-stage

|                               |             | 2-stage           |           |       |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210       | 210   | 220   | 230   | 255   | 255   | 250   | 210   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 420       | 420   | 440   | 460   | 510   | 510   | 500   | 420   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378       | 378   | 396   | 414   | 459   | 459   | 450   | 378   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420       | 420   | 440   | 460   | 510   | 510   | 500   | 420   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.95      | 0.85  | 0.95  | 0.85  | 0.85  | 0.78  | 0.78  | 0.78  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10        | 10    | 10    | 10    | 10    | 10    | 10    | 10    |  |
| Maximum Radial Load           | $F_r$       | N                 | 2070      |       |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 970       |       |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 400       |       |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 1.630     | 1.670 | 1.750 | 1.530 | 1.490 | 1.320 | 1.320 | 1.320 |  |
| Weight                        | $m_G$       | kg                | 9.5       |       |       |       |       |       |       |       |  |

### SPL120 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 255       | 255   | 255   | 255   | 255   | 255   | 255   | 210   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 510       | 510   | 510   | 510   | 510   | 510   | 510   | 420   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 459       | 459   | 459   | 459   | 459   | 459   | 459   | 378   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 510       | 510   | 510   | 510   | 510   | 510   | 510   | 420   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.85      | 0.85  | 0.85  | 0.78  | 0.78  | 0.78  | 0.78  | 0.78  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10        | 10    | 10    | 10    | 10    | 10    | 10    | 10    |
| Maximum Radial Load           | $F_r$       | N                 | 2070      |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 970       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 400       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 1.530     | 1.490 | 2.570 | 1.300 | 1.300 | 1.300 | 1.300 | 1.300 |
| Weight                        | $m_G$       | kg                | 11        |       |       |       |       |       |       |       |

### SPL160 1-stage

|                               |             | 1-stage           |          |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 3        | 4     | 5     | 7     | 8     | 9     | 10    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 440      | 544   | 585   | 480   | 450   | 415   | 400   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 880      | 1088  | 1170  | 960   | 900   | 830   | 800   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 792      | 979.2 | 1053  | 864   | 810   | 747   | 720   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 880      | 1088  | 1170  | 960   | 900   | 830   | 800   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.55     | 2.45  | 2.3   | 2.2   | 2.2   | 2.2   | 2.2   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7     | 28.7  | 28.7  | 28.7  | 28.7  | 28.7  | 28.7  |
| Maximum Radial Load           | $F_r$       | N                 | 7300     |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 6400     |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 850      |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.100   | 7.750 | 6.000 | 5.100 | 3.740 | 3.620 | 3.620 |
| Weight                        | $m_G$       | kg                | 15.5     |       |       |       |       |       |       |

### SPL160 2-stage

|                               |             | 2-stage           |           |       |       |        |        |        |        |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|--------|--------|--------|--------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20     | 25     | 32     | 40     | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 450       | 450   | 450   | 564    | 608    | 608    | 608    | 450   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 900       | 900   | 900   | 1128   | 1216   | 1216   | 1216   | 900   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 810       | 810   | 810   | 1015.2 | 1094.4 | 1094.4 | 1094.4 | 810   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 900       | 900   | 900   | 1128   | 1216   | 1216   | 1216   | 900   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |        |        |        |        |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |        |        |        |        |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.45      | 2.3   | 2.45  | 2.3    | 2.3    | 2.2    | 2.2    | 2.2   |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |        |        |        |        |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7      | 28.7  | 28.7  | 28.7   | 28.7   | 28.7   | 28.7   | 28.7  |  |
| Maximum Radial Load           | $F_r$       | N                 | 7300      |       |       |        |        |        |        |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 6400      |       |       |        |        |        |        |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 850       |       |       |        |        |        |        |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 10.100    | 8.100 | 7.470 | 6.650  | 5.810  | 6.340  | 5.360  | 4.080 |  |
| Weight                        | $m_G$       | kg                | 28        |       |       |        |        |        |        |       |  |

### SPL160 3-stage

|                               |             | 3-stage           |           |       |       |       |        |        |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|--------|--------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200    | 256    | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 580       | 580   | 580   | 580   | 608    | 608    | 580   | 450   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1160      | 1160  | 1160  | 1160  | 1216   | 1216   | 1160  | 900   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1044      | 1044  | 1044  | 1044  | 1094.4 | 1094.4 | 1044  | 810   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1160      | 1160  | 1160  | 1160  | 1216   | 1216   | 1160  | 900   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |        |        |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |        |        |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.3       | 2.3   | 2.3   | 2.2   | 2.2    | 2.2    | 2.2   | 2.2   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |        |        |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7      | 28.7  | 28.7  | 28.7  | 28.7   | 28.7   | 28.7  | 28.7  |
| Maximum Radial Load           | $F_r$       | N                 | 7300      |       |       |       |        |        |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 6400      |       |       |       |        |        |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 850       |       |       |       |        |        |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 7.400     | 7.300 | 7.300 | 6.500 | 6.500  | 6.500  | 6.500 | 6.500 |
| Weight                        | $m_G$       | kg                | 30.5      |       |       |       |        |        |       |       |

### SPL205 1-stage

|                               |             | 1-stage           |          |        |        |        |        |        |        |  |  |
|-------------------------------|-------------|-------------------|----------|--------|--------|--------|--------|--------|--------|--|--|
| Ratio                         | i           |                   | 3        | 4      | 5      | 7      | 8      | 9      | 10     |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 600      | 1050   | 1000   | 800    | 800    | 710    | 710    |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1200     | 2100   | 2000   | 1600   | 1600   | 1420   | 1420   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1080     | 1890   | 1800   | 1440   | 1440   | 1278   | 1278   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1200     | 2100   | 2000   | 1600   | 1600   | 1420   | 1420   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2000     |        |        |        |        |        |        |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000     |        |        |        |        |        |        |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.5      | 3.3    | 3.15   | 3      | 3      | 3      | 3      |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |        |        |        |        |        |        |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120      | 120    | 120    | 120    | 120    | 120    | 120    |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 12000    |        |        |        |        |        |        |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 6800     |        |        |        |        |        |        |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 1280     |        |        |        |        |        |        |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 28.980   | 23.670 | 22.750 | 22.480 | 22.590 | 22.590 | 22.550 |  |  |
| Weight                        | $m_G$       | kg                | 31       |        |        |        |        |        |        |  |  |

### SPL205 2-stage

|                               |             | 2-stage           |           |        |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-----------|--------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 12        | 15     | 16    | 20    | 25    | 32    | 40    | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 650       | 650    | 800   | 1000  | 1000  | 1050  | 1000  | 800   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1300      | 1300   | 1600  | 2000  | 2000  | 2100  | 2000  | 1600  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1170      | 1170   | 1440  | 1800  | 1800  | 1890  | 1800  | 1440  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1300      | 1300   | 1600  | 2000  | 2000  | 2100  | 2000  | 1600  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2000      |        |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000      |        |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.45      | 2.3    | 2.45  | 2.3   | 2.3   | 2.2   | 2.2   | 2.2   |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |        |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120       | 120    | 120   | 120   | 120   | 120   | 120   | 120   |  |
| Maximum Radial Load           | $F_r$       | N                 | 12000     |        |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 6800      |        |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 1280      |        |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 18.980    | 16.980 | 7.540 | 7.420 | 7.540 | 7.140 | 7.140 | 7.540 |  |
| Weight                        | $m_G$       | kg                | 39        |        |       |       |       |       |       |       |  |

### SPL205 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 1000      | 1000  | 1000  | 1000  | 1000  | 1000  | 1000  | 800   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 2000      | 2000  | 2000  | 2000  | 2000  | 2000  | 2000  | 1600  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1800      | 1800  | 1800  | 1800  | 1800  | 1800  | 1800  | 1440  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 2000      | 2000  | 2000  | 2000  | 2000  | 2000  | 2000  | 1600  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.3       | 2.3   | 2.3   | 2.2   | 2.2   | 2.2   | 2.2   | 2.2   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120       | 120   | 120   | 120   | 120   | 120   | 120   | 120   |
| Maximum Radial Load           | $F_r$       | N                 | 12000     |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 6800      |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 1280      |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 7.540     | 7.420 | 7.420 | 7.140 | 7.140 | 7.140 | 7.140 | 7.140 |
| Weight                        | $m_G$       | kg                | 48        |       |       |       |       |       |       |       |



### SPL235 1-stage

|                               |             | 1-stage           |          |        |        |        |        |        |        |
|-------------------------------|-------------|-------------------|----------|--------|--------|--------|--------|--------|--------|
| Ratio                         | i           |                   | 3        | 4      | 5      | 7      | 8      | 9      | 10     |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 1000     | 1600   | 1850   | 1550   | 1350   | 1300   | 1300   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 2000     | 3200   | 3700   | 3100   | 2700   | 2600   | 2600   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1800     | 2880   | 3330   | 2790   | 2430   | 2340   | 2340   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 2000     | 3200   | 3700   | 3100   | 2700   | 2600   | 2600   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 1500     |        |        |        |        |        |        |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 3000     |        |        |        |        |        |        |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 5.2      | 5      | 4.85   | 4.67   | 4.67   | 4.67   | 4.67   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 8$ |        |        |        |        |        |        |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 200      | 200    | 200    | 200    | 200    | 200    | 200    |
| Maximum Radial Load           | $F_r$       | N                 | 14000    |        |        |        |        |        |        |
| Maximum Axial Load            | $F_a$       | N                 | 7800     |        |        |        |        |        |        |
| Max. Tilting Moment           | $M_k$       | Nm                | 2350     |        |        |        |        |        |        |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 69.610   | 54.370 | 53.270 | 50.840 | 50.840 | 50.840 | 50.560 |
| Weight                        | $m_G$       | kg                | 53       |        |        |        |        |        |        |

### SPL235 2-stage

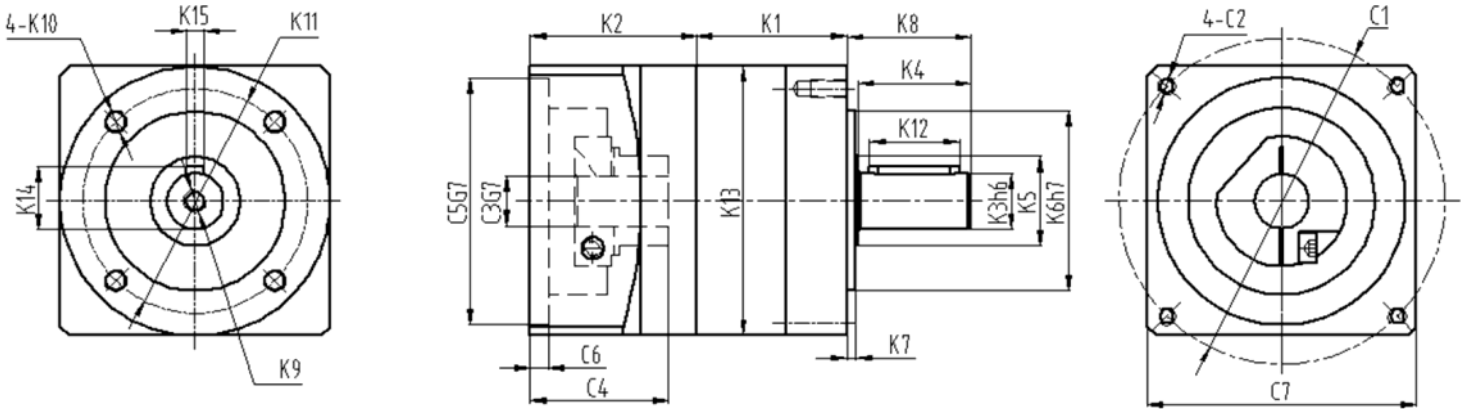
|                               |             | 2-stage           |           |        |        |        |        |        |        |        |  |
|-------------------------------|-------------|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|--|
| Ratio                         | i           |                   | 12        | 15     | 16     | 20     | 25     | 32     | 40     | 64     |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 1000      | 1000   | 1100   | 1850   | 1850   | 1800   | 1850   | 1350   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 2000      | 2000   | 2200   | 3700   | 3700   | 3600   | 3700   | 2700   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1800      | 1800   | 1980   | 3330   | 3330   | 3240   | 3330   | 2430   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 2000      | 2000   | 2200   | 3700   | 3700   | 3600   | 3700   | 2700   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 1500      |        |        |        |        |        |        |        |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 3000      |        |        |        |        |        |        |        |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.3       | 3.15   | 3.3    | 3.15   | 3.15   | 3      | 3      | 3      |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |        |        |        |        |        |        |        |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 200       | 200    | 200    | 200    | 200    | 200    | 200    | 200    |  |
| Maximum Radial Load           | $F_r$       | N                 | 14000     |        |        |        |        |        |        |        |  |
| Maximum Axial Load            | $F_a$       | N                 | 7800      |        |        |        |        |        |        |        |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 2350      |        |        |        |        |        |        |        |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 59.610    | 48.610 | 23.670 | 22.750 | 22.750 | 22.590 | 22.590 | 22.590 |  |
| Weight                        | $m_G$       | kg                | 66        |        |        |        |        |        |        |        |  |



### SPL235 3-stage

|                               |             |                   | 3-stage   |        |        |        |        |        |        |        |
|-------------------------------|-------------|-------------------|-----------|--------|--------|--------|--------|--------|--------|--------|
| Ratio                         | i           |                   | 80        | 100    | 125    | 160    | 200    | 256    | 320    | 512    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 1850      | 1850   | 1850   | 1850   | 1850   | 1850   | 1850   | 1350   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 3700      | 3700   | 3700   | 3700   | 3700   | 3700   | 3700   | 2700   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 3330      | 3330   | 3330   | 3330   | 3330   | 3330   | 3330   | 2430   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 3700      | 3700   | 3700   | 3700   | 3700   | 3700   | 3700   | 2700   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 1500      |        |        |        |        |        |        |        |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 3000      |        |        |        |        |        |        |        |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.3       | 2.3    | 2.3    | 2.2    | 2.2    | 2.2    | 2.2    | 2.2    |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |        |        |        |        |        |        |        |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 200       | 200    | 200    | 200    | 200    | 200    | 200    | 200    |
| Maximum Radial Load           | $F_r$       | N                 | 14000     |        |        |        |        |        |        |        |
| Maximum Axial Load            | $F_a$       | N                 | 7800      |        |        |        |        |        |        |        |
| Max. Tilting Moment           | $M_k$       | Nm                | 2350      |        |        |        |        |        |        |        |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 22.750    | 22.590 | 22.750 | 22.750 | 22.750 | 22.750 | 22.750 | 22.590 |
| Weight                        | $m_G$       | kg                | 75        |        |        |        |        |        |        |        |

# SPL Series | Dimensions



| Model      | SPL040 |      |      | SPL060 |      |    | SPL080 |    |     | SPL120 |       |       | SPL160 |       |       | SPL205 |     |     | SPL235 |     |     |
|------------|--------|------|------|--------|------|----|--------|----|-----|--------|-------|-------|--------|-------|-------|--------|-----|-----|--------|-----|-----|
| Stage      | 1      | 2    | 3    | 1      | 2    | 3  | 1      | 2  | 3   | 1      | 2     | 3     | 1      | 2     | 3     | 1      | 2   | 3   | 1      | 2   | 3   |
| <b>K1</b>  | 38,5   | 51,5 | 63,5 | 50,9   | 66,5 | 82 | 70     | 92 | 114 | 67     | 108,8 | 150,6 | 87,5   | 148,5 | 209,5 | 89     | 142 | 203 | 101    | 170 | 223 |
| <b>K3</b>  | Φ10    |      |      | Φ14    |      |    | Φ20    |    |     | Φ25    |       |       | Φ40    |       |       | Φ55    |     |     | Φ75    |     |     |
| <b>K4</b>  | 23     |      |      | 30     |      |    | 36     |    |     | 50     |       |       | 80     |       |       | 82     |     |     | 105    |     |     |
| <b>K5</b>  | Φ12    |      |      | Φ17    |      |    | Φ25    |    |     | Φ40    |       |       | Φ50    |       |       | Φ60    |     |     | Φ85    |     |     |
| <b>K6</b>  | Φ26    |      |      | Φ40    |      |    | Φ60    |    |     | Φ80    |       |       | Φ130   |       |       | Φ160   |     |     | Φ180   |     |     |
| <b>K7</b>  | 2      |      |      | 3      |      |    | 3      |    |     | 4      |       |       | 5      |       |       | 15     |     |     | 30     |     |     |
| <b>K8</b>  | 26     |      |      | 35     |      |    | 40     |    |     | 55     |       |       | 87     |       |       | 105    |     |     | 138    |     |     |
| <b>K9</b>  | M3X8   |      |      | M5X12  |      |    | M6X16  |    |     | M10X22 |       |       | M12X25 |       |       | M20X40 |     |     | M20X40 |     |     |
| <b>K10</b> | M4X6   |      |      | M5X10  |      |    | M6X12  |    |     | M10X20 |       |       | M12X20 |       |       | M12X22 |     |     | M16X25 |     |     |
| <b>K11</b> | Φ34    |      |      | Φ52    |      |    | Φ70    |    |     | Φ100   |       |       | Φ145   |       |       | Φ184   |     |     | Φ210   |     |     |
| <b>K12</b> | 16     |      |      | 22     |      |    | 28     |    |     | 40     |       |       | 70     |       |       | 70     |     |     | 90     |     |     |
| <b>K13</b> | Φ40    |      |      | Φ60    |      |    | Φ80    |    |     | Φ120   |       |       | Φ160   |       |       | Φ205   |     |     | Φ235   |     |     |
| <b>K14</b> | 11,2   |      |      | 16     |      |    | 22,5   |    |     | 28     |       |       | 43     |       |       | 59     |     |     | 79,5   |     |     |
| <b>K15</b> | 3      |      |      | 5      |      |    | 6      |    |     | 8      |       |       | 12     |       |       | 16     |     |     | 20     |     |     |

| Gearbox Size | 40     |        |        |        | 60     |        |        |        | 80     |        |        |        |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Motor Series | DSM5.0 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.4 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.4 |
| <b>C1</b>    | Φ46    | Φ63    | Φ90    | Φ100   | Φ70    | Φ90    | Φ100   | Φ130   | Φ70    | Φ90    | Φ100   | Φ130   |
| <b>C2</b>    | M4X10  | M5X12  | M6x15  | M6x15  | M5x12  | M6x15  | M6x15  | M8X20  | M5x12  | M6x15  | M6x15  | M8X20  |
| <b>C3</b>    | Φ8     | Φ11    | Φ14    | Φ14    | Φ14    | Φ14    | Φ14    | Φ19    | Φ14    | Φ14    | Φ14    | Φ19    |
| <b>C4</b>    | 26,1   | 31,5   | 31,5   | 31,5   | 41,6   | 41,6   | 41,6   | 51,6   | 41,6   | 41,6   | 41,6   | 51,6   |
| <b>C5</b>    | Φ30    | Φ40    | Φ70    | Φ80    | Φ50    | Φ70    | Φ80    | Φ110   | Φ50    | Φ70    | Φ80    | Φ110   |
| <b>C6</b>    | 6      | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    |
| <b>C7</b>    | 45     | 60     | 85     | 85     | 80     | 80     | 90     | 120    | 80     | 80     | 90     | 120    |
| <b>K2</b>    | 24,3   | 24,3   | 30,5   | 30,5   | 30,5   | 37     | 37     | 37     | 30,5   | 37     | 37     | 37     |

| Gearbox Size | 120    |        |        |        | 160    |        |        |        | 205    |        |        |        | 235 |  |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--|
| Motor Series | DSM7.3 | DSM5.3 | DSM5.4 | DSM5.5 | DSM5.4 | DSM5.5 | DSM5.6 | DSM5.5 | DSM5.6 | DSM5.7 | DSM5.6 | DSM5.7 |     |  |
| <b>C1</b>    | Φ90    | Φ100   | Φ130   | Φ165   | Φ130   | Φ165   | Φ215   | Φ165   | Φ215   | Φ300   | Φ215   | Φ300   |     |  |
| <b>C2</b>    | M6x15  | M6x15  | M8X20  | M10x22 | M8X20  | M10x22 | M12X25 | M10x22 | M12X25 | M16X25 | M12X25 | M16X25 |     |  |
| <b>C3</b>    | Φ19    | Φ19    | Φ19    | Φ24    | Φ24    | Φ24    | Φ38    | Φ32    | Φ38    | Φ48    | Φ38    | Φ48    |     |  |
| <b>C4</b>    | 51,3   | 51,3   | 51,3   | 61,3   | 67     | 67     | 82     | 77     | 82     | 87     | 116    | 116    |     |  |
| <b>C5</b>    | Φ70    | Φ80    | Φ110   | Φ130   | Φ110   | Φ130   | Φ180   | Φ130   | Φ180   | Φ250   | Φ180   | Φ250   |     |  |
| <b>C6</b>    | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      |     |  |
| <b>C7</b>    | 120    | 120    | 120    | 142    | Φ162   | 175    | 190    | 175    | 190    | 260    | 190    | 260    |     |  |
| <b>K2</b>    | 64     | 64     | 64     | 74     | 86     | 86     | 101    | 89     | 94     | 99     | 118,5  | 118,5  |     |  |

# SVL Series

## Standard Precision Gearbox - 90°



### SVL is our highly successful high precision gearbox 90° series

The SVL consistently delivers the benefits of the Economy line. With its compact yet robust design, it is ideally tailored for dynamic systems with multiple axes. Our right-angle gearbox is lubricated for its entire lifespan, effortless to install, and delivers an unparalleled balance between price and performance.



### Key Features

- Economy Line,
- Right-angle gearbox,
- Helical gear system,
- Bevel gear in a right-angle configuration,
- Low-friction deep groove ball bearings,
- Circular output flange,
- Wide range of high gear ratios from  $i=3$  to  $i=512$ ,
- Bidirectional rotation capability,
- Planetary carrier designed in a disc format



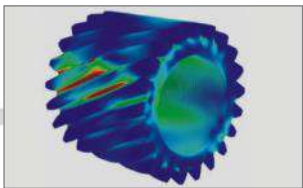
### Helical Gear System Technology

Thanks to the tooth to tooth compact ratio more than 60%. The helical gearing and full needle bearing bring the benefits including higher torque capacity, smooth and lower noise running, decreased backlash and higher efficiency.



### The Powerful Cantilever Planetary Carrier

The powerful cantilever planetary carrier provide great mechanical support for planetary gears, thus the complete gearbox can reach high level stability. Synthetic grease lubrication allows maintenance free for gearbox whole service life.



### Gear Grinding and Heat Treatment Technology

The global leading gear grinding technology brings the great improvement for the tooth profile optimization, with the high level carburizing and quenching heat treatment technology to reach high precision and gear harden performance.



### Dynamic Balance Clamping and Sealing System

For the gearbox input dynamic balance damping design with perfect concentricity to decrease backlash and increase gearbox operation stability. The ultra sealing system offers grease leakage protection and support gearbox to reach IP65.

### SVL060 1-stage

| 1-stage                       |             |                   |           |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3         | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 28        | 36    | 37    | 37    | 32    | 30    | 25    |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 56        | 72    | 74    | 74    | 64    | 60    | 50    |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 50.4      | 64.8  | 66.6  | 66.6  | 57.6  | 54    | 45    |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 56        | 72    | 74    | 74    | 64    | 60    | 50    |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.24      | 0.2   | 0.17  | 0.15  | 0.15  | 0.15  | 0.15  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5       | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 430       |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 320       |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 80        |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.135     | 0.093 | 0.078 | 0.069 | 0.065 | 0.065 | 0.065 |  |  |
| Weight                        | $m_G$       | kg                | 2.3       |       |       |       |       |       |       |  |  |

### SVL060 2-stage

| 2-stage                       |             |                   |           |       |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 30        | 31    | 42    | 42    | 42    | 42    | 42    | 33    |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 60        | 62    | 84    | 84    | 84    | 84    | 84    | 66    |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 54        | 55.8  | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 59.4  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 60        | 62    | 84    | 84    | 84    | 84    | 84    | 66    |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.2       | 0.17  | 0.2   | 0.17  | 0.17  | 0.15  | 0.15  | 0.15  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5       | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   |  |
| Maximum Radial Load           | $F_r$       | N                 | 430       |       |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 320       |       |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 80        |       |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.105     | 0.095 | 0.088 | 0.075 | 0.075 | 0.064 | 0.064 | 0.064 |  |
| Weight                        | $m_G$       | kg                | 2.8       |       |       |       |       |       |       |       |  |

### SVL060 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 42        | 42    | 42    | 42    | 42    | 42    | 42    | 33    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 84        | 84    | 84    | 84    | 84    | 84    | 84    | 66    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 75.6      | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 75.6  | 59.4  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 84        | 84    | 84    | 84    | 84    | 84    | 84    | 66    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.17      | 0.17  | 0.17  | 0.15  | 0.15  | 0.15  | 0.15  | 0.15  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 15$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 2.5       | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   | 2.5   |
| Maximum Radial Load           | $F_r$       | N                 | 430       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 320       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 80        |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.075     | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 | 0.064 |
| Weight                        | $m_G$       | kg                | 3.4       |       |       |       |       |       |       |       |

### SVL080 1-stage

|                               |             | 1-stage           |           |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3         | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 75        | 90    | 95    | 82    | 80    | 78    | 65    |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 150       | 180   | 190   | 164   | 160   | 156   | 130   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 135       | 162   | 171   | 147.6 | 144   | 140.4 | 117   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 150       | 180   | 190   | 164   | 160   | 156   | 130   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.38      | 0.36  | 0.31  | 0.25  | 0.25  | 0.25  | 0.25  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4         | 4     | 4     | 4     | 4     | 4     | 4     |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 640       |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 420       |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 200       |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.770     | 0.520 | 0.450 | 0.400 | 0.390 | 0.390 | 0.390 |  |  |
| Weight                        | $m_G$       | kg                | 5.4       |       |       |       |       |       |       |  |  |

### SVL080 2-stage

|                               |             | 2-stage           |           |       |       |       |       |       |       |      |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64   |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 80        | 90    | 90    | 90    | 90    | 90    | 90    | 80   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 160       | 180   | 180   | 180   | 180   | 180   | 180   | 160  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 144       | 162   | 162   | 162   | 162   | 162   | 162   | 144  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 160       | 180   | 180   | 180   | 180   | 180   | 180   | 160  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |      |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |      |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.36      | 0.31  | 0.36  | 0.31  | 0.31  | 0.25  | 0.25  | 0.25 |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |      |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4         | 4     | 4     | 4     | 4     | 4     | 4     | 4    |  |
| Maximum Radial Load           | $F_r$       | N                 | 640       |       |       |       |       |       |       |      |  |
| Maximum Axial Load            | $F_a$       | N                 | 420       |       |       |       |       |       |       |      |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 200       |       |       |       |       |       |       |      |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.670     | 0.510 | 0.500 | 0.440 | 0.440 | 0.390 | 0.390 | 0.39 |  |
| Weight                        | $m_G$       | kg                | 6.8       |       |       |       |       |       |       |      |  |

### SVL080 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 95        | 95    | 95    | 95    | 95    | 95    | 95    | 82    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 190       | 190   | 190   | 190   | 190   | 190   | 190   | 164   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 171       | 171   | 171   | 171   | 171   | 171   | 171   | 147.6 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 190       | 190   | 190   | 190   | 190   | 190   | 190   | 164   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.31      | 0.31  | 0.31  | 0.25  | 0.25  | 0.25  | 0.25  | 0.25  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 15$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 4         | 4     | 4     | 4     | 4     | 4     | 4     | 4     |
| Maximum Radial Load           | $F_r$       | N                 | 640       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 420       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 200       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.500     | 0.440 | 0.700 | 0.390 | 0.390 | 0.390 | 0.390 | 0.390 |
| Weight                        | $m_G$       | kg                | 8         |       |       |       |       |       |       |       |



### SVL120 1-stage

|                               |             | 1-stage           |           |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3         | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 190       | 240   | 245   | 235   | 210   | 200   | 196   |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 380       | 480   | 490   | 470   | 420   | 400   | 392   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 342       | 432   | 441   | 423   | 378   | 360   | 352.8 |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 380       | 480   | 490   | 470   | 420   | 400   | 392   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1         | 0.95  | 0.85  | 0.78  | 0.78  | 0.78  | 0.78  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10        | 10    | 10    | 10    | 10    | 10    | 10    |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 2070      |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 970       |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 400       |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 2.630     | 1.790 | 1.530 | 1.400 | 1.320 | 1.320 | 1.320 |  |  |
| Weight                        | $m_G$       | kg                | 12        |       |       |       |       |       |       |  |  |

### SVL120 2-stage

|                               |             | 2-stage           |           |       |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20    | 25    | 32    | 40    | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210       | 210   | 220   | 230   | 255   | 255   | 250   | 210   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 420       | 420   | 440   | 460   | 510   | 510   | 500   | 420   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378       | 378   | 396   | 414   | 459   | 459   | 450   | 378   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420       | 420   | 440   | 460   | 510   | 510   | 500   | 420   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.95      | 0.85  | 0.95  | 0.85  | 0.85  | 0.78  | 0.78  | 0.78  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10        | 10    | 10    | 10    | 10    | 10    | 10    | 10    |  |
| Maximum Radial Load           | $F_r$       | N                 | 2070      |       |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 970       |       |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 400       |       |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 1.630     | 1.670 | 1.750 | 1.530 | 1.490 | 1.320 | 1.320 | 1.320 |  |
| Weight                        | $m_G$       | kg                | 15        |       |       |       |       |       |       |       |  |



### SVL120 3-stage

|                               |             |                   | 3-stage   |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200   | 256   | 320   | 512   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 255       | 255   | 255   | 255   | 255   | 255   | 255   | 210   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 510       | 510   | 510   | 510   | 510   | 510   | 510   | 420   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 459       | 459   | 459   | 459   | 459   | 459   | 459   | 378   |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 510       | 510   | 510   | 510   | 510   | 510   | 510   | 420   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.85      | 0.85  | 0.85  | 0.78  | 0.78  | 0.78  | 0.78  | 0.78  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 15$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 10        | 10    | 10    | 10    | 10    | 10    | 10    | 10    |
| Maximum Radial Load           | $F_r$       | N                 | 2070      |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 970       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 400       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 1.530     | 1.490 | 2.570 | 1.300 | 1.300 | 1.300 | 1.300 | 1.300 |
| Weight                        | $m_G$       | kg                | 18        |       |       |       |       |       |       |       |

### SVL160 1-stage

|                               |             | 1-stage           |           |       |       |       |       |       |       |  |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|-------|-------|-------|--|--|
| Ratio                         | i           |                   | 3         | 4     | 5     | 7     | 8     | 9     | 10    |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 440       | 544   | 585   | 480   | 450   | 415   | 400   |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 880       | 1088  | 1170  | 960   | 900   | 830   | 800   |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 792       | 979.2 | 1053  | 864   | 810   | 747   | 720   |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 880       | 1088  | 1170  | 960   | 900   | 830   | 800   |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |       |       |       |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |       |       |       |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.55      | 2.45  | 2.3   | 2.2   | 2.2   | 2.2   | 2.2   |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 10$ |       |       |       |       |       |       |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7      | 28.7  | 28.7  | 28.7  | 28.7  | 28.7  | 28.7  |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 7300      |       |       |       |       |       |       |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 6400      |       |       |       |       |       |       |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 850       |       |       |       |       |       |       |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.100    | 7.750 | 6.000 | 5.100 | 3.740 | 3.620 | 3.620 |  |  |
| Weight                        | $m_G$       | kg                | 23        |       |       |       |       |       |       |  |  |

### SVL160 2-stage

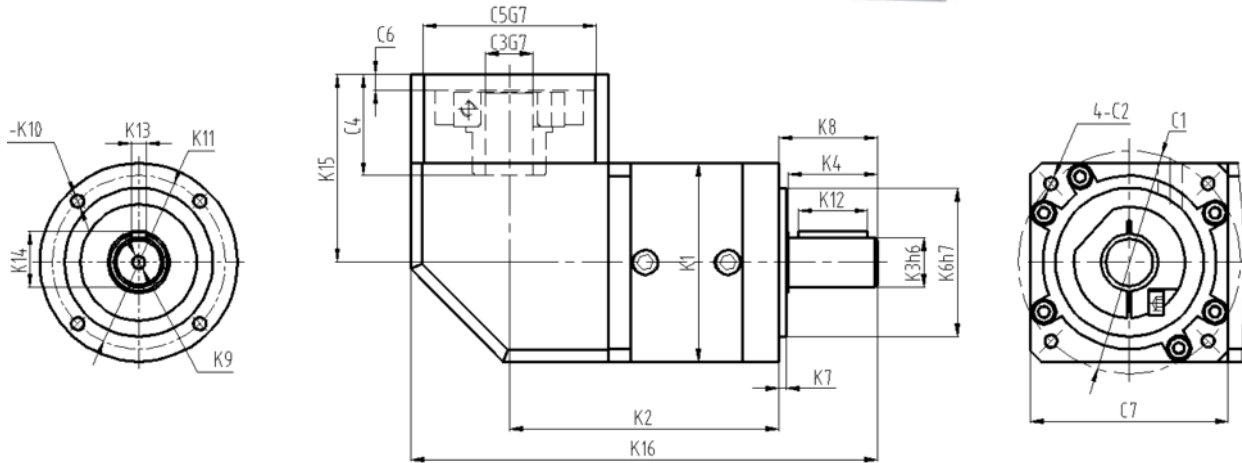
|                               |             | 2-stage           |           |       |       |        |        |        |        |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|--------|--------|--------|--------|-------|--|
| Ratio                         | i           |                   | 12        | 15    | 16    | 20     | 25     | 32     | 40     | 64    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 450       | 450   | 450   | 564    | 608    | 608    | 608    | 450   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 900       | 900   | 900   | 1128   | 1216   | 1216   | 1216   | 900   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 810       | 810   | 810   | 1015.2 | 1094.4 | 1094.4 | 1094.4 | 810   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 900       | 900   | 900   | 1128   | 1216   | 1216   | 1216   | 900   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |        |        |        |        |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |        |        |        |        |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.45      | 2.3   | 2.45  | 2.3    | 2.3    | 2.2    | 2.2    | 2.2   |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 12$ |       |       |        |        |        |        |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7      | 28.7  | 28.7  | 28.7   | 28.7   | 28.7   | 28.7   | 28.7  |  |
| Maximum Radial Load           | $F_r$       | N                 | 7300      |       |       |        |        |        |        |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 6400      |       |       |        |        |        |        |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 850       |       |       |        |        |        |        |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 10.100    | 8.100 | 7.470 | 6.650  | 5.810  | 6.340  | 5.360  | 4.080 |  |
| Weight                        | $m_G$       | kg                | 31        |       |       |        |        |        |        |       |  |



### SVL160 3-stage

|                               |             | 3-stage           |           |       |       |       |        |        |       |       |  |
|-------------------------------|-------------|-------------------|-----------|-------|-------|-------|--------|--------|-------|-------|--|
| Ratio                         | i           |                   | 80        | 100   | 125   | 160   | 200    | 256    | 320   | 512   |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 580       | 580   | 580   | 580   | 608    | 608    | 580   | 450   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1160      | 1160  | 1160  | 1160  | 1216   | 1216   | 1160  | 900   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1044      | 1044  | 1044  | 1044  | 1094.4 | 1094.4 | 1044  | 810   |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1160      | 1160  | 1160  | 1160  | 1216   | 1216   | 1160  | 900   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000      |       |       |       |        |        |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000      |       |       |       |        |        |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.3       | 2.3   | 2.3   | 2.2   | 2.2    | 2.2    | 2.2   | 2.2   |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 15$ |       |       |       |        |        |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 28.7      | 28.7  | 28.7  | 28.7  | 28.7   | 28.7   | 28.7  | 28.7  |  |
| Maximum Radial Load           | $F_r$       | N                 | 7300      |       |       |       |        |        |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 6400      |       |       |       |        |        |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 850       |       |       |       |        |        |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 7.400     | 7.300 | 7.300 | 6.500 | 6.500  | 6.500  | 6.500 | 6.500 |  |
| Weight                        | $m_G$       | kg                | 40        |       |       |       |        |        |       |       |  |

# SVL Series | Dimensions



| Model | SPL040 |       |     | SPL060 |     |     | SPL080 |       |       | SPL120 |     |     |
|-------|--------|-------|-----|--------|-----|-----|--------|-------|-------|--------|-----|-----|
| Stage | 1      | 2     | 3   | 1      | 2   | 3   | 1      | 2     | 3     | 1      | 2   | 3   |
| K1    | Φ60    |       |     | Φ80    |     |     | Φ120   |       |       | Φ160   |     |     |
| K2    | 86,9   | 102,5 | 118 | 109    | 131 | 163 | 154    | 195,8 | 237,6 | 187    | 197 | 258 |
| K3    | Φ14    |       |     | Φ20    |     |     | Φ32    |       |       | Φ40    |     |     |
| K4    | 30     |       |     | 36     |     |     | 50     |       |       | 80     |     |     |
| K5    | Φ17    |       |     | Φ25    |     |     | Φ40    |       |       | Φ50    |     |     |
| K6    | Φ40    |       |     | Φ60    |     |     | Φ90    |       |       | Φ130   |     |     |
| K7    | 3      |       |     | 3      |     |     | 12     |       |       | 5      |     |     |
| K8    | 35     |       |     | 40     |     |     | 65     |       |       | 87     |     |     |
| K9    | M5X12  |       |     | M6X16  |     |     | M10X22 |       |       | M12X25 |     |     |
| K10   | M5X10  |       |     | M6X12  |     |     | M8X15  |       |       | M12X20 |     |     |
| K11   | Φ52    |       |     | Φ70    |     |     | Φ108   |       |       | Φ145   |     |     |
| K12   | 22     |       |     | 28     |     |     | 40     |       |       | 70     |     |     |
| K13   | 5      |       |     | 6      |     |     | 10     |       |       | 12     |     |     |
| K14   | 16     |       |     | 22,5   |     |     | 35     |       |       | 43     |     |     |
| K15   | 89,5   |       |     | 76     |     |     | 140    |       |       | 249    |     |     |
| K16   | 151,9  |       |     | 243    |     |     | 274    |       |       | 400    |     |     |

| Gearbox Size | 60     |        |        |        | 80     |        |        |  |
|--------------|--------|--------|--------|--------|--------|--------|--------|--|
| Motor Series | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.4 |  |
| C1           | Φ63    | Φ90    | Φ100   | Φ70    | Φ90    | Φ100   | Φ130   |  |
| C2           | M5X12  | M6x15  | M6x15  | M5x12  | M6x15  | M6x15  | M8X20  |  |
| C3           | Φ11    | Φ14    | Φ14    | Φ14    | Φ14    | Φ14    | Φ19    |  |
| C4           | 32,1   | 32,1   | 42,1   | 41,6   | 41,6   | 41,6   | 51,6   |  |
| C5           | Φ40    | Φ70    | Φ80    | Φ50    | Φ70    | Φ80    | Φ110   |  |
| C6           | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    |  |
| C7           | 65     | 65     | 85     | 85     | 85     | 85     | 120    |  |

| Gearbox Size | 120    |        |        |        | 160    |        |        |  |
|--------------|--------|--------|--------|--------|--------|--------|--------|--|
| Motor Series | DSM7.3 | DSM5.3 | DSM5.4 | DSM5.5 | DSM5.4 | DSM5.5 | DSM5.6 |  |
| C1           | Φ90    | Φ100   | Φ130   | Φ165   | Φ130   | Φ165   | Φ215   |  |
| C2           | M6x15  | M6x15  | M8X20  | M10x22 | M8X20  | M10x22 | M12X25 |  |
| C3           | Φ19    | Φ19    | Φ19    | Φ24    | Φ24    | Φ24    | Φ38    |  |
| C4           | 51,3   | 51,3   | 51,3   | 61,3   | 51,3   | 67     | 82     |  |
| C5           | Φ70    | Φ80    | Φ110   | Φ130   | Φ110   | Φ130   | Φ180   |  |
| C6           | 8      | 8      | 8      | 8      | 8      | 8      | 8      |  |
| C7           | 120    | 120    | 120    | 142    | 120    | 142    | 190    |  |

# KPG Series

## High Precision Gearbox

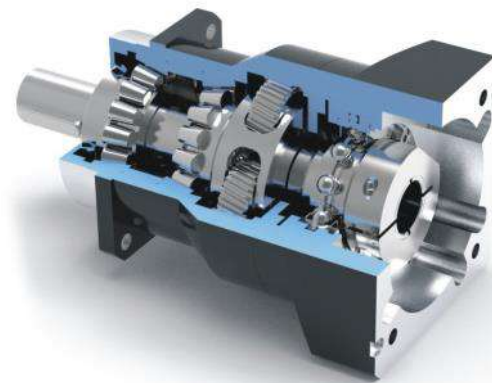
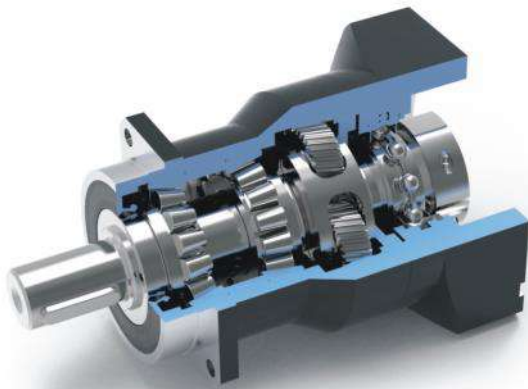


### KPG is our highly successful high precision gearbox series

Our high-precision straight-tooth planetary gearbox is engineered to deliver exceptional power and torque. The KPG model incorporates preloaded tapered roller bearings, while the precision engineered seal ensures optimal performance, even in environments exposed to dust and water spray.

#### Key features:

- Precision Line,
- Coaxial gearbox,
- Helical gear configuration,
- Preloaded tapered roller bearings,
- Rotary shaft seal,
- Square-shaped output flange,
- Extended centering collar,
- Bidirectional rotation capability,
- Planetary carrier designed with a cage structure.



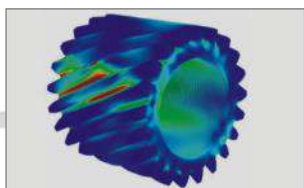
#### Master Cage Spindle Planetary Carrier

The patented Master CageSpindle integrated planetary carrier support planetary gearbox to increase constructional strength running stability and rigidity significantly. Synthetic greaselubrication allows maintenance free tor gearbox whole service lite.



#### Super Gear Grinding and Heat Treatment Technology

The global leading gear grinding technology brings the great improvement for the tooth profile optimization, with the high level carburizing and quenching heat treatment technology to reach high precision and gear harden performance.



#### Helical Gear System Technology

Thanks to the tooth to tooth compact ratio more than 60%. The helical gearing and full needle bearing bring the benefits including higher torque capacity, smooth and lower noise running, decreased backlash and higher efficiency.



#### Dynamic Balance Clamping and Sealing System

For the gearbox input dynamic balance clamping design with perfect concentricity to decrease backlash and increase gearbox operation stability. The ultra sealing system offers grease leakage protection and support gearbox to reach IP65.

### KPG070 1-stage

|                               |             | 1-stage           |       |       |       |       |       |       |       |  |
|-------------------------------|-------------|-------------------|-------|-------|-------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 3     | 4     | 5     | 7     | 8     | 9     | 10    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 46    | 52    | 55    | 50    | 45    | 42    | 42    |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 138   | 156   | 165   | 150   | 135   | 126   | 126   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 82.8  | 93.6  | 99    | 90    | 81    | 75.6  | 75.6  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 92    | 104   | 110   | 100   | 90    | 84    | 84    |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000  |       |       |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000  |       |       |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.3   | 0.27  | 0.25  | 0.25  | 0.25  | 0.25  | 0.25  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 5   |       |       |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 6.5-7 |       |       |       |       |       |       |  |
| Maximum Radial Load           | $F_r$       | N                 | 4300  |       |       |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 3900  |       |       |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 577.5 |       |       |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.160 | 0.140 | 0.130 | 0.130 | 0.130 | 0.130 | 0.130 |  |
| Weight                        | $m_G$       | kg                | 1.6   |       |       |       |       |       |       |  |

### KPG070 2-stage

|                               |             | 2-stage           |       |       |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 12    | 15    | 16    | 20    | 24    | 32    | 40    | 64    | 100   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 56    | 56    | 52    | 55    | 55    | 52    | 55    | 36    | 33    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 168   | 168   | 156   | 165   | 165   | 156   | 165   | 108   | 99    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 100.8 | 100.8 | 93.6  | 99    | 99    | 93.6  | 99    | 64.8  | 59.4  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 112   | 112   | 104   | 110   | 110   | 104   | 110   | 72    | 66    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 4000  |       |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000  |       |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.3   | 0.27  | 0.3   | 0.27  | 0.27  | 0.3   | 0.25  | 0.25  | 0.25  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 7   |       |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 6.6-7 |       |       |       |       |       |       |       |       |
| Maximum Radial Load           | $F_r$       | N                 | 4300  |       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 3900  |       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 577.5 |       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.127 | 0.127 | 0.120 | 0.075 | 0.075 | 0.064 | 0.064 | 0.075 | 0.064 |
| Weight                        | $m_G$       | kg                | 1.9   |       |       |       |       |       |       |       |       |



### KPG090 1-stage

|                               |             | 1-stage           |          |      |      |      |      |      |      |  |  |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|--|--|
| Ratio                         | i           |                   | 3        | 4    | 5    | 7    | 8    | 9    | 10   |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 125      | 145  | 155  | 135  | 115  | 105  | 105  |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 375      | 435  | 465  | 405  | 345  | 315  | 315  |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 225      | 261  | 279  | 243  | 207  | 189  | 189  |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 250      | 290  | 310  | 270  | 230  | 210  | 210  |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.46     | 0.41 | 0.39 | 0.35 | 0.35 | 0.35 | 0.35 |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 5$ |      |      |      |      |      |      |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 12-14    |      |      |      |      |      |      |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 7000     |      |      |      |      |      |      |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 6300     |      |      |      |      |      |      |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 700      |      |      |      |      |      |      |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.61     | 0.48 | 0.47 | 0.47 | 0.45 | 0.44 | 0.44 |  |  |
| Weight                        | $m_G$       | kg                | 3.5      |      |      |      |      |      |      |  |  |

### KPG090 2-stage

|                               |             | 2-stage           |          |      |      |      |      |      |      |       |       |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|-------|-------|
| Ratio                         | i           |                   | 12       | 15   | 16   | 20   | 24   | 32   | 40   | 64    | 100   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 125      | 125  | 145  | 145  | 155  | 145  | 155  | 92    | 84    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 375      | 375  | 435  | 435  | 465  | 435  | 465  | 276   | 252   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 225      | 225  | 261  | 261  | 279  | 261  | 279  | 165.6 | 151.2 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 250      | 250  | 290  | 290  | 310  | 290  | 310  | 184   | 168   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.46     | 0.41 | 0.46 | 0.41 | 0.41 | 0.35 | 0.35 | 0.35  | 0.35  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |      |      |      |      |      |      |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 13-14    |      |      |      |      |      |      |       |       |
| Maximum Radial Load           | $F_r$       | N                 | 7000     |      |      |      |      |      |      |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 6300     |      |      |      |      |      |      |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 700      |      |      |      |      |      |      |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.44     | 0.44 | 0.43 | 0.44 | 0.44 | 0.39 | 0.39 | 0.39  | 0.44  |
| Weight                        | $m_G$       | kg                | 3.8      |      |      |      |      |      |      |       |       |



### KPG120 1-stage

|                               |             | 1-stage           |          |      |      |      |      |      |      |  |  |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|--|--|
| Ratio                         | i           |                   | 3        | 4    | 5    | 7    | 8    | 9    | 10   |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210      | 300  | 320  | 290  | 255  | 220  | 220  |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 630      | 900  | 960  | 870  | 765  | 660  | 660  |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378      | 540  | 576  | 522  | 459  | 396  | 396  |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420      | 600  | 640  | 580  | 510  | 440  | 440  |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1.05     | 0.95 | 0.91 | 0.88 | 0.88 | 0.88 | 0.88 |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 5$ |      |      |      |      |      |      |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 22-26    |      |      |      |      |      |      |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 10000    |      |      |      |      |      |      |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 9000     |      |      |      |      |      |      |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 938      |      |      |      |      |      |      |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 3.25     | 2.74 | 2.71 | 2.62 | 2.62 | 2.62 | 2.57 |  |  |
| Weight                        | $m_G$       | kg                | 8.1      |      |      |      |      |      |      |  |  |

### KPG120 2-stage

|                               |             | 2-stage           |          |      |      |      |      |      |      |       |       |  |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|-------|-------|--|
| Ratio                         | i           |                   | 12       | 15   | 16   | 20   | 24   | 32   | 40   | 64    | 100   |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210      | 310  | 300  | 300  | 320  | 305  | 320  | 204   | 176   |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 630      | 930  | 900  | 900  | 960  | 915  | 960  | 612   | 528   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378      | 558  | 540  | 540  | 576  | 549  | 576  | 367.2 | 316.8 |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420      | 620  | 600  | 600  | 640  | 610  | 640  | 408   | 352   |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1.05     | 0.95 | 1.05 | 0.95 | 0.95 | 0.88 | 0.88 | 0.88  | 0.88  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |      |      |      |      |      |      |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 23-26    |      |      |      |      |      |      |       |       |  |
| Maximum Radial Load           | $F_r$       | N                 | 10000    |      |      |      |      |      |      |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 9000     |      |      |      |      |      |      |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 938      |      |      |      |      |      |      |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 2.56     | 2.58 | 1.75 | 1.5  | 1.49 | 1.3  | 1.3  | 1.5   | 1.45  |  |
| Weight                        | $m_G$       | kg                | 9        |      |      |      |      |      |      |       |       |  |

### KPG160 1-stage

|                               |             | 1-stage           |          |      |      |      |      |      |      |  |  |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|--|--|
| Ratio                         | i           |                   | 3        | 4    | 5    | 7    | 8    | 9    | 10   |  |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 350      | 550  | 650  | 540  | 510  | 440  | 440  |  |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1050     | 1650 | 1950 | 1620 | 1530 | 1320 | 1320 |  |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 630      | 990  | 1170 | 972  | 918  | 792  | 792  |  |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 700      | 1100 | 1300 | 1080 | 1020 | 880  | 880  |  |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |  |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |  |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.6      | 2.5  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  |  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 5$ |      |      |      |      |      |      |  |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 45-52    |      |      |      |      |      |      |  |  |
| Maximum Radial Load           | $F_r$       | N                 | 19000    |      |      |      |      |      |      |  |  |
| Maximum Axial Load            | $F_a$       | N                 | 17000    |      |      |      |      |      |      |  |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 1243.2   |      |      |      |      |      |      |  |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.31    | 7.54 | 7.42 | 7.25 | 7.14 | 7.14 | 7.14 |  |  |
| Weight                        | $m_G$       | kg                | 15.5     |      |      |      |      |      |      |  |  |

### KPG160 2-stage

|                               |             | 2-stage           |          |       |      |      |      |      |      |      |       |
|-------------------------------|-------------|-------------------|----------|-------|------|------|------|------|------|------|-------|
| Ratio                         | i           |                   | 12       | 15    | 16   | 20   | 24   | 32   | 40   | 63   | 100   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 500      | 500   | 550  | 650  | 650  | 550  | 550  | 510  | 352   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1500     | 1500  | 1650 | 1950 | 1950 | 1650 | 1650 | 1530 | 1056  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 900      | 900   | 990  | 1170 | 1170 | 990  | 990  | 918  | 633.6 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1000     | 1000  | 1100 | 1300 | 1300 | 1100 | 1100 | 1020 | 704   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |      |      |      |      |      |      |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |      |      |      |      |      |      |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.6      | 2.5   | 2.6  | 2.5  | 2.5  | 2.4  | 2.4  | 2.4  | 2.4   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |       |      |      |      |      |      |      |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 45-52    |       |      |      |      |      |      |      |       |
| Maximum Radial Load           | $F_r$       | N                 | 19000    |       |      |      |      |      |      |      |       |
| Maximum Axial Load            | $F_a$       | N                 | 17000    |       |      |      |      |      |      |      |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 1243.2   |       |      |      |      |      |      |      |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.35    | 12.35 | 7.47 | 6.65 | 5.81 | 6.34 | 4.08 | 7.5  | 7.3   |
| Weight                        | $m_G$       | kg                | 28       |       |      |      |      |      |      |      |       |

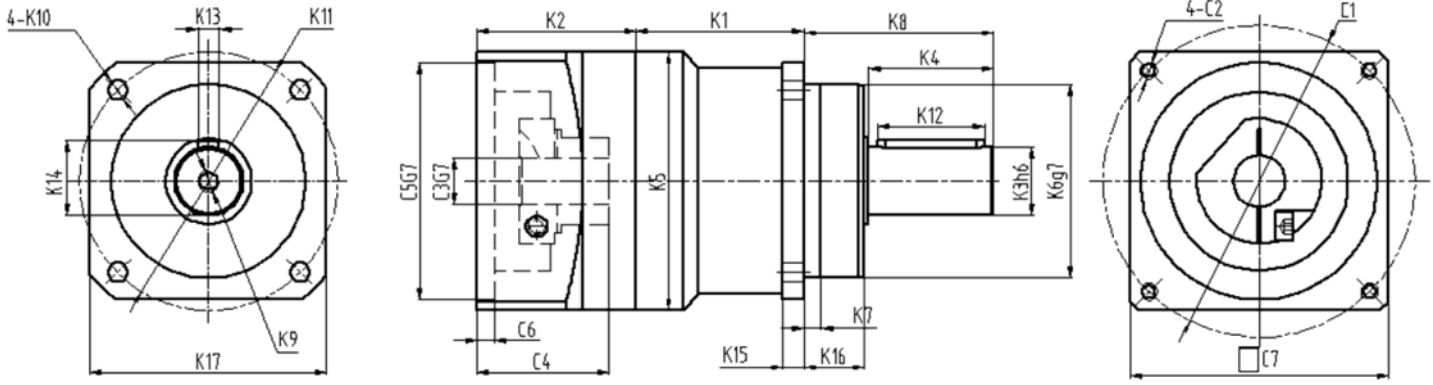
### KPG205 1-stage

|                               |             | 1-stage           |         |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|---------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 3       | 4     | 5     | 7     | 8     | 9     | 10    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 1250    | 1200  | 1000  | 1000  | 1000  | 910   | 910   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 3750    | 3600  | 3000  | 3000  | 3000  | 2730  | 2730  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 2250    | 2160  | 1800  | 1800  | 1800  | 1638  | 1638  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 2500    | 2400  | 2000  | 2000  | 2000  | 1820  | 1820  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2500    |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000    |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.5     | 3.4   | 3.2   | 3.2   | 3.2   | 3.2   | 3.2   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 5     |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120-138 |       |       |       |       |       |       |
| Maximum Radial Load           | $F_r$       | N                 | 24000   |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 22000   |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 1365    |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 28.98   | 23.67 | 22.75 | 22.48 | 22.59 | 22.59 | 22.55 |
| Weight                        | $m_G$       | kg                | 39      |       |       |       |       |       |       |

### KPG205 2-stage

|                               |             | 2-stage           |         |       |      |      |      |      |      |      |        |
|-------------------------------|-------------|-------------------|---------|-------|------|------|------|------|------|------|--------|
| Ratio                         | i           |                   | 12      | 15    | 16   | 20   | 24   | 32   | 40   | 63   | 100    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 650     | 650   | 1250 | 1200 | 1200 | 1250 | 1200 | 1000 | 728    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1950    | 1950  | 3750 | 3600 | 3600 | 3750 | 3600 | 3000 | 2184   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1170    | 1170  | 2250 | 2160 | 2160 | 2250 | 2160 | 1800 | 1310.4 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1300    | 1300  | 2500 | 2400 | 2400 | 2500 | 2400 | 2000 | 1456   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2500    |       |      |      |      |      |      |      |        |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000    |       |      |      |      |      |      |      |        |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 2.6     | 2.5   | 2.6  | 2.5  | 2.5  | 2.4  | 2.4  | 2.4  | 2.4    |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 7     |       |      |      |      |      |      |      |        |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 125-138 |       |      |      |      |      |      |      |        |
| Maximum Radial Load           | $F_r$       | N                 | 24000   |       |      |      |      |      |      |      |        |
| Maximum Axial Load            | $F_a$       | N                 | 22000   |       |      |      |      |      |      |      |        |
| Max. Tilting Moment           | $M_k$       | Nm                | 1365    |       |      |      |      |      |      |      |        |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.35   | 12.35 | 7.54 | 7.42 | 7.54 | 7.14 | 7.14 | 7.54 | 7.42   |
| Weight                        | $m_G$       | kg                | 40      |       |      |      |      |      |      |      |        |

# KPG Series | Dimensions



| Model | KPG070 |       | KPG090 |       | KPG120 |        | KPG160 |        | KPG205 |        |
|-------|--------|-------|--------|-------|--------|--------|--------|--------|--------|--------|
| Stage | 1      | 2     | 1      | 2     | 1      | 2      | 1      | 2      | 1      | 2      |
| K1    | 58     | 81,7  | 70,5   | 101,8 | 78     | 119,8  | 91     | 152    | 129    | 182    |
| K3    | Φ16    | Φ16   | Φ22    | Φ22   | Φ32    | Φ32    | Φ40    | Φ40    | Φ55    | Φ55    |
| K4    | 28     | 28    | 36     | 36    | 58     | 58     | 82     | 82     | 82     | 82     |
| K5    | Φ70    | Φ70   | Φ90    | Φ90   | Φ120   | Φ120   | Φ160   | Φ160   | Φ205   | Φ205   |
| K6    | Φ60    | Φ60   | Φ70    | Φ70   | Φ90    | Φ90    | Φ130   | Φ130   | Φ160   | Φ160   |
| K7    | 5      | 5     | 6      | 6     | 8      | 8      | 10     | 10     | 10     | 10     |
| K8    | 48     | 48    | 56     | 56    | 88     | 88     | 112    | 112    | 112    | 112    |
| K9    | M5X12  | M5X12 | M6X16  | M6X16 | M10X22 | M10X22 | M12X25 | M12X25 | M20X40 | M20X40 |
| K10   | Φ5.5   | Φ5.5  | Φ6.5   | Φ6.5  | Φ9     | Φ9     | Φ11    | Φ11    | Φ13    | Φ13    |
| K11   | 68     | 68    | Φ85    | Φ85   | Φ120   | Φ120   | Φ165   | Φ165   | Φ215   | Φ215   |
| K12   | 22     | 22    | 28     | 28    | 50     | 50     | 70     | 70     | 70     | 70     |
| K13   | 5      | 5     | 6      | 6     | 10     | 10     | 12     | 12     | 16     | 16     |
| K14   | 18     | 18    | 24,5   | 24,5  | 35     | 35     | 43     | 43     | 59     | 59     |
| K15   | 6      | 6     | 7      | 7     | 10     | 10     | 12     | 12     | 15     | 15     |
| K16   | 19     | 19    | 18     | 18    | 28     | 28     | 27     | 27     | 27     | 27     |
| K17   | 62     | 62    | 75     | 75    | 105    | 105    | 140    | 140    | 180    | 180    |

| Gearbox Size | 70     |        |        |        | 90     |        |        |  |
|--------------|--------|--------|--------|--------|--------|--------|--------|--|
| Motor Series | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.4 |  |
| C1           | Φ63    | Φ90    | Φ100   | Φ70    | Φ90    | Φ100   | Φ130   |  |
| C2           | M5X12  | M6x15  | M6x15  | M5x12  | M6x15  | M6x15  | M8X20  |  |
| C3           | Φ11    | Φ14    | Φ14    | Φ14    | Φ14    | Φ14    | Φ19    |  |
| C4           | 32,1   | 32,1   | 42,1   | 41,6   | 41,6   | 41,6   | 51,6   |  |
| C5           | Φ40    | Φ70    | Φ80    | Φ50    | Φ70    | Φ80    | Φ110   |  |
| C6           | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    |  |
| C7           | 70     | 70     | 85     | 89     | 89     | 89     | 120    |  |
| K2           | 39     | 39     | 49     | 48,5   | 48,5   | 48,5   | 58,4   |  |

| Gearbox Size | 120    |        |        |        | 160    |        |        | 205    |        |        |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Motor Series | DSM7.3 | DSM5.3 | DSM5.4 | DSM5.5 | DSM5.4 | DSM5.5 | DSM5.6 | DSM5.5 | DSM5.6 | DSM5.7 |
| C1           | Φ90    | Φ100   | Φ130   | Φ165   | Φ130   | Φ165   | Φ215   | Φ165   | Φ215   | Φ300   |
| C2           | M6x15  | M6x15  | M8X20  | M10x22 | M8X20  | M10x22 | M12X25 | M10x22 | M12X25 | M16X25 |
| C3           | Φ19    | Φ19    | Φ19    | Φ24    | Φ24    | Φ24    | Φ38    | Φ32    | Φ38    | Φ48    |
| C4           | 51,3   | 51,3   | 51,3   | 61,3   | 67     | 67     | 82     | 67     | 82     | 117    |
| C5           | Φ70    | Φ80    | Φ110   | Φ130   | Φ110   | Φ130   | Φ180   | Φ130   | Φ180   | Φ250   |
| C6           | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      |
| C7           | 120    | 120    | 120    | 142    | Φ162   | 175    | 190    | 175    | 190    | 260    |
| K2           | 64     | 64     | 64     | 74     | 86     | 86     | 101    | 86     | 101    | 129    |

# KVG Series

## High Precision Gearbox - 90°



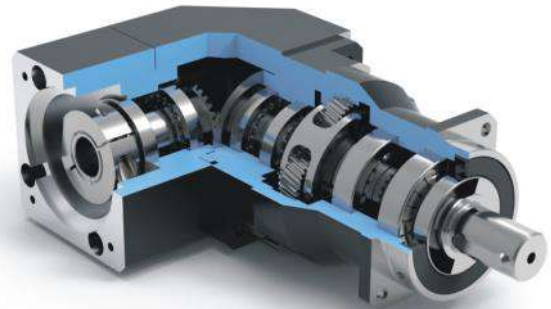
### KVG is our highly successful high precision gearbox series

Thanks to its bevel gearing, our KVG ensures impeccable synchronization. By minimizing vibrations, it operates with remarkable smoothness, precision, and quietness.

This right-angle precision gearbox is lubricated for its entire lifespan and can be mounted in various configurations.

### Key features:

- Precision Line,
- Right-angle gearbox,
- Helical gear,
- Bevel gear right angle stage,
- Preloaded tapered roller bearings,
- Rotary shaft seal,
- Square-shaped output flange,
- Extended centering collar,
- Opposite-direction rotation capability,
- Two-stage planetary carrier designed with a cage structure.



### Helical Gear System Technology

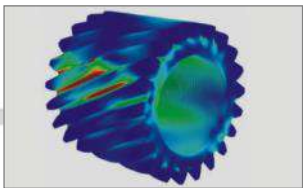
Thanks to the tooth to tooth compact ratio more than 60%.

The helical gearing and full needle bearing bring the benefits including higher torque capacity, smooth and lower noise running, decreased backlash and higher efficiency.



### Master CageSpindle Planetary Carrier

The patented Master CageSpindle integrated planetary carrier support planetary gearbox to increase constructional strength running stability and rigidity significantly. Synthetic grease lubrication allows maintenance free for gearbox whole service life.



### Super Gear Grinding and Heat Treatment Technology

The global leading gear grinding technology brings the great improvement for the tooth profile optimization, with the high level carburizing and quenching heat treatment technology to reach high precision and gear harden performance.



### Dynamic Balance Clamping and Sealing System

For the gearbox input dynamic balance clamping design with perfect concentricity to decrease backlash and increase gearbox operation stability. The ultra sealing system offers grease leakage protection and support gearbox to reach IP65.

### KVG070 1-stage

|                               |             | 1-stage           |          |       |       |      |       |       |       |       |  |
|-------------------------------|-------------|-------------------|----------|-------|-------|------|-------|-------|-------|-------|--|
| Ratio                         | i           |                   | 3        | 4     | 5     | 6    | 7     | 8     | 9     | 10    |  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 46       | 52    | 55    | 50   | 50    | 45    | 42    | 42    |  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 138      | 156   | 165   | 150  | 150   | 135   | 126   | 126   |  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 83       | 94    | 99    | 90   | 90    | 81    | 76    | 76    |  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 92       | 104   | 110   | 110  | 100   | 90    | 84    | 84    |  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |       |      |       |       |       |       |  |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |      |       |       |       |       |  |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.3      | 0.3   | 0.25  | 0.23 | 0.23  | 0.23  | 0.23  | 0.23  |  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |       |       |      |       |       |       |       |  |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 6.5-7    |       |       |      |       |       |       |       |  |
| Maximum Radial Load           | $F_r$       | N                 | 4300     |       |       |      |       |       |       |       |  |
| Maximum Axial Load            | $F_a$       | N                 | 3900     |       |       |      |       |       |       |       |  |
| Max. Tilting Moment           | $M_k$       | Nm                | 577.5    |       |       |      |       |       |       |       |  |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.16     | 0.093 | 0.078 | 0.07 | 0.069 | 0.065 | 0.065 | 0.065 |  |
| Weight                        | $m_G$       | kg                | 4.6      |       |       |      |       |       |       |       |  |

### KVG070 2-stage

|                               |             | 2-stage           |          |       |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 12       | 15    | 16    | 20    | 25    | 32    | 40    | 64    | 100   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 46       | 50    | 52    | 55    | 55    | 52    | 55    | 36    | 33    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 138      | 150   | 156   | 165   | 165   | 156   | 165   | 108   | 99    |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 83       | 90    | 94    | 99    | 99    | 94    | 99    | 65    | 59    |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 92       | 100   | 104   | 110   | 110   | 104   | 110   | 72    | 66    |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.3      | 0.26  | 0.3   | 0.26  | 0.23  | 0.23  | 0.23  | 0.23  | 0.23  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 9$ |       |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 6.6-7    |       |       |       |       |       |       |       |       |
| Maximum Radial Load           | $F_r$       | N                 | 4300     |       |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 3900     |       |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 577.5    |       |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.105    | 0.088 | 0.088 | 0.075 | 0.075 | 0.064 | 0.064 | 0.064 | 0.064 |
| Weight                        | $m_G$       | kg                | 7        |       |       |       |       |       |       |       |       |



### KVG090 1-stage

|                               |             | 1-stage           |       |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|-------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 3     | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 125   | 145  | 155  | 145  | 135  | 115  | 105  | 105  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 375   | 435  | 465  | 435  | 405  | 345  | 315  | 315  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 225   | 261  | 279  | 261  | 243  | 207  | 189  | 189  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 250   | 290  | 310  | 290  | 270  | 230  | 210  | 210  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000  |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000  |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.57  | 0.54 | 0.46 | 0.44 | 0.38 | 0.38 | 0.38 | 0.38 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 7   |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 12-14 |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 7000  |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 6300  |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 700   |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.61  | 0.52 | 0.45 | 0.42 | 0.40 | 0.39 | 0.39 | 0.39 |
| Weight                        | $m_G$       | kg                | 7.4   |      |      |      |      |      |      |      |

### KVG090 2-stage

|                               |             | 2-stage           |       |      |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|-------|------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 12    | 15   | 16   | 20   | 25   | 32   | 40   | 64   | 100  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 125   | 125  | 145  | 145  | 155  | 145  | 155  | 92   | 84   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 375   | 375  | 435  | 435  | 465  | 435  | 465  | 276  | 252  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 225   | 225  | 261  | 261  | 279  | 261  | 279  | 165  | 151  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 250   | 250  | 290  | 290  | 310  | 310  | 310  | 184  | 168  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000  |      |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000  |      |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 0.54  | 0.47 | 0.54 | 0.47 | 0.47 | 0.38 | 0.38 | 0.38 | 0.38 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | ≤ 9   |      |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 13-14 |      |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 7000  |      |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 6300  |      |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 700   |      |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 0.67  | 0.5  | 0.5  | 0.44 | 0.44 | 0.39 | 0.39 | 0.39 | 0.39 |
| Weight                        | $m_G$       | kg                | 9.8   |      |      |      |      |      |      |      |      |

### KVG120 1-stage

|                               |             | 1-stage           |          |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 3        | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210      | 300  | 320  | 300  | 290  | 255  | 220  | 220  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 630      | 900  | 960  | 900  | 870  | 765  | 660  | 660  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378      | 540  | 576  | 540  | 522  | 459  | 396  | 396  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420      | 600  | 640  | 600  | 580  | 510  | 440  | 440  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1.5      | 1.43 | 1.28 | 1.22 | 1.17 | 1.17 | 1.17 | 1.17 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 22-26    |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 10000    |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 9000     |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 938      |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 3.25     | 2.74 | 2.71 | 2.71 | 2.71 | 2.62 | 2.62 | 2.57 |
| Weight                        | $m_G$       | kg                | 12.1     |      |      |      |      |      |      |      |

### KVG120 2-stage

|                               |             | 2-stage           |          |      |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 12       | 15   | 16   | 20   | 25   | 32   | 40   | 64   | 100  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 210      | 300  | 300  | 300  | 320  | 305  | 320  | 204  | 176  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 630      | 900  | 900  | 900  | 960  | 915  | 960  | 612  | 528  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 378      | 540  | 540  | 540  | 576  | 549  | 576  | 367  | 317  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 420      | 600  | 600  | 600  | 640  | 610  | 640  | 408  | 352  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 1.43     | 1.28 | 1.43 | 1.28 | 1.28 | 1.17 | 1.17 | 1.17 | 1.17 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 9$ |      |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 23-26    |      |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 10000    |      |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 9000     |      |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 938      |      |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 2.56     | 2.58 | 1.75 | 1.5  | 1.49 | 1.3  | 1.3  | 1.5  | 1.45 |
| Weight                        | $m_G$       | kg                | 14       |      |      |      |      |      |      |      |      |



### KVG160 1-stage

|                               |             | 1-stage           |          |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|----------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 3        | 4    | 5    | 6    | 7    | 8    | 9    | 10   |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 350      | 550  | 650  | 610  | 540  | 510  | 440  | 440  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1050     | 1650 | 1950 | 1830 | 1620 | 1530 | 1320 | 1320 |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 630      | 990  | 1170 | 1098 | 972  | 918  | 792  | 792  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 700      | 1100 | 1300 | 1220 | 1080 | 1020 | 880  | 880  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.83     | 3.68 | 3.45 | 3.30 | 3.30 | 3.30 | 3.30 | 3.30 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 45-52    |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 19000    |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 17000    |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 1243.2   |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.31    | 7.54 | 7.42 | 7.42 | 7.25 | 7.14 | 7.14 | 7.14 |
| Weight                        | $m_G$       | kg                | 25       |      |      |      |      |      |      |      |

### KVG160 2-stage

|                               |             | 2-stage           |          |       |      |      |      |      |      |      |      |
|-------------------------------|-------------|-------------------|----------|-------|------|------|------|------|------|------|------|
| Ratio                         | i           |                   | 12       | 15    | 16   | 20   | 25   | 32   | 40   | 64   | 100  |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 350      | 500   | 550  | 650  | 650  | 550  | 550  | 408  | 352  |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1050     | 1500  | 1650 | 1950 | 1950 | 1650 | 1650 | 1224 | 1056 |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 630      | 900   | 990  | 1170 | 1170 | 990  | 990  | 734  | 634  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 700      | 1000  | 1100 | 1300 | 1300 | 1100 | 1100 | 816  | 704  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 3000     |       |      |      |      |      |      |      |      |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 6000     |       |      |      |      |      |      |      |      |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.68     | 3.45  | 3.45 | 3.45 | 3.45 | 3.30 | 3.30 | 3.30 | 3.30 |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 9$ |       |      |      |      |      |      |      |      |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 45-52    |       |      |      |      |      |      |      |      |
| Maximum Radial Load           | $F_r$       | N                 | 19000    |       |      |      |      |      |      |      |      |
| Maximum Axial Load            | $F_a$       | N                 | 17000    |       |      |      |      |      |      |      |      |
| Max. Tilting Moment           | $M_k$       | Nm                | 1243.2   |       |      |      |      |      |      |      |      |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.35    | 12.35 | 7.47 | 6.65 | 5.81 | 6.34 | 4.08 | 7.50 | 7.30 |
| Weight                        | $m_G$       | kg                | 30       |       |      |      |      |      |      |      |      |

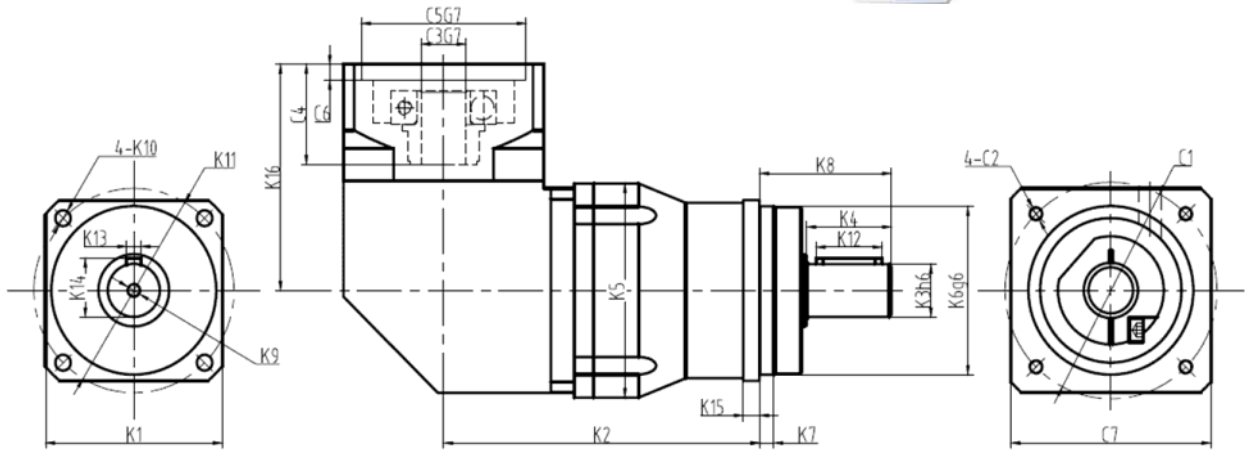
### KVG205 1-stage

| 1-stage                       |             |                   |          |       |       |       |       |       |       |       |
|-------------------------------|-------------|-------------------|----------|-------|-------|-------|-------|-------|-------|-------|
| Ratio                         | i           |                   | 3        | 4     | 5     | 6     | 7     | 8     | 9     | 10    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 650      | 1250  | 1200  | 1000  | 1000  | 1000  | 910   | 910   |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1950     | 3750  | 3600  | 3000  | 3000  | 3000  | 2730  | 2730  |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1170     | 2250  | 2160  | 1800  | 1800  | 1800  | 1638  | 1638  |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1300     | 2500  | 2400  | 2000  | 2000  | 2000  | 1820  | 1820  |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2500     |       |       |       |       |       |       |       |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000     |       |       |       |       |       |       |       |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 5.25     | 4.95  | 4.73  | 4.50  | 4.50  | 4.50  | 4.50  | 4.50  |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 7$ |       |       |       |       |       |       |       |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120-138  |       |       |       |       |       |       |       |
| Maximum Radial Load           | $F_r$       | N                 | 24000    |       |       |       |       |       |       |       |
| Maximum Axial Load            | $F_a$       | N                 | 22000    |       |       |       |       |       |       |       |
| Max. Tilting Moment           | $M_k$       | Nm                | 1365     |       |       |       |       |       |       |       |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 28.98    | 23.67 | 22.75 | 22.75 | 22.48 | 22.59 | 22.59 | 22.55 |
| Weight                        | $m_G$       | kg                | 49       |       |       |       |       |       |       |       |

### KVG205 2-stage

| 2-stage                       |             |                   |          |       |      |      |      |      |      |      |        |
|-------------------------------|-------------|-------------------|----------|-------|------|------|------|------|------|------|--------|
| Ratio                         | i           |                   | 12       | 15    | 16   | 20   | 25   | 32   | 40   | 64   | 100    |
| Nominal Output Torque         | $T_{2N}$    | Nm                | 650      | 850   | 1250 | 1250 | 1200 | 1250 | 1200 | 800  | 728    |
| Emergency Stop Torque         | $T_{2STOP}$ | Nm                | 1950     | 2550  | 3750 | 3750 | 3600 | 3750 | 3600 | 2400 | 2184   |
| Maximum Acceleration Torque   | $T_{2ACC}$  | Nm                | 1170     | 1530  | 2250 | 2250 | 2160 | 2250 | 2160 | 1440 | 1310.4 |
| Maximum Torque                | $T_{2MAX}$  | Nm                | 1300     | 1700  | 2500 | 2500 | 2400 | 2500 | 2400 | 1600 | 1456   |
| Permitted Average Input Speed | $N_{1N}$    | rpm               | 2500     |       |      |      |      |      |      |      |        |
| Maximum Input Speed           | $N_{1MAX}$  | rpm               | 4000     |       |      |      |      |      |      |      |        |
| Mean No Load Running Torque   | $T_{1NL}$   | Nm                | 3.68     | 3.45  | 3.45 | 3.45 | 3.45 | 3.30 | 3.30 | 3.30 | 3.30   |
| Maximum Torsional Backlash    | $j_t$       | arcmin            | $\leq 9$ |       |      |      |      |      |      |      |        |
| Torsional Rigidity            | $C_g$       | Nm/arcmin         | 120-138  |       |      |      |      |      |      |      |        |
| Maximum Radial Load           | $F_r$       | N                 | 24000    |       |      |      |      |      |      |      |        |
| Maximum Axial Load            | $F_a$       | N                 | 22000    |       |      |      |      |      |      |      |        |
| Max. Tilting Moment           | $M_k$       | Nm                | 1365     |       |      |      |      |      |      |      |        |
| Mass Moment of Inertia        | $J_1$       | kgcm <sup>2</sup> | 12.35    | 12.35 | 7.54 | 7.42 | 7.54 | 7.14 | 7.14 | 7.14 | 7.14   |
| Weight                        | $m_G$       | kg                | 55       |       |      |      |      |      |      |      |        |

# KVG Series | Dimensions

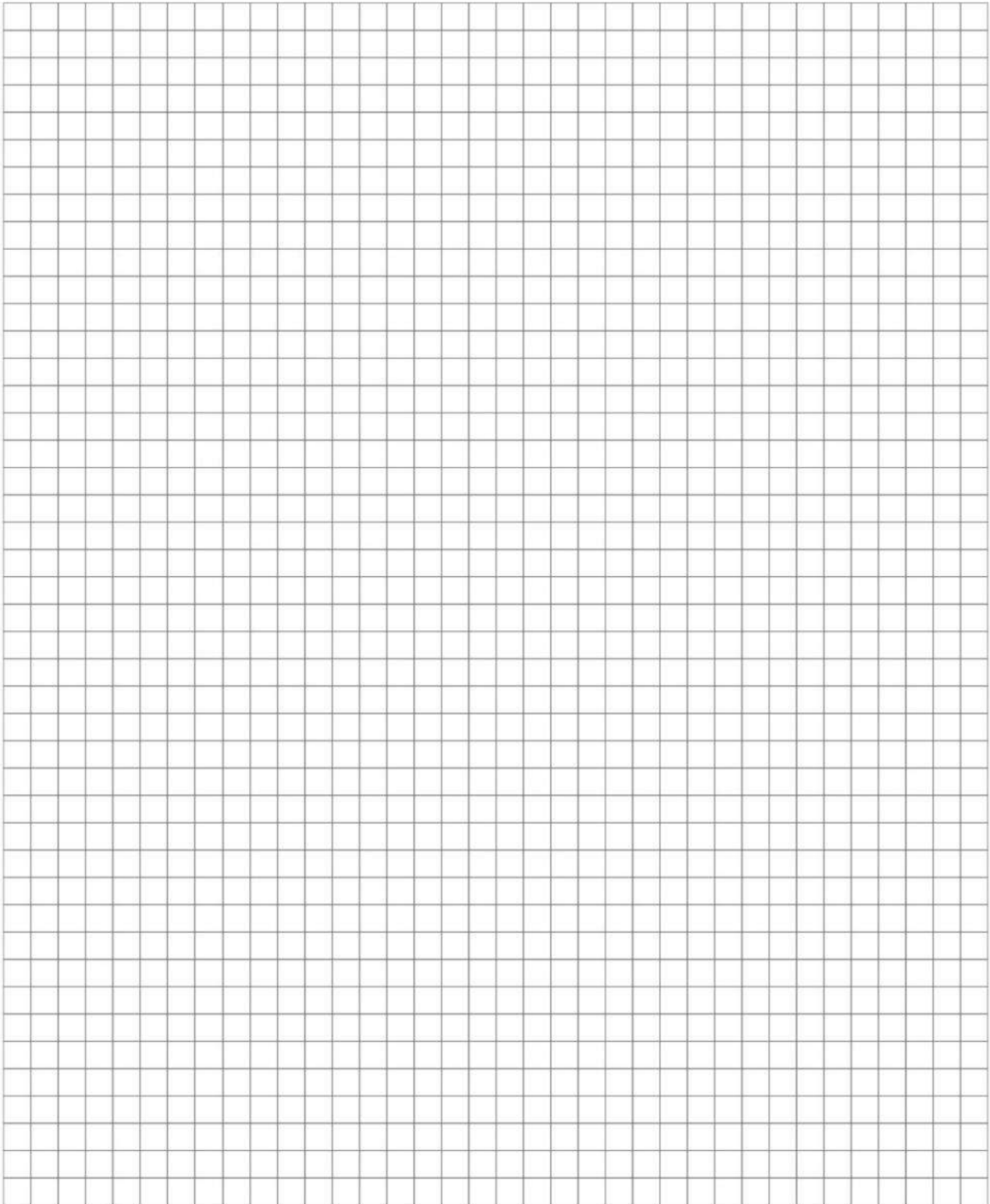


| Model                  | KPG070 |       | KPG090 |       | KPG120 |       | KPG160 |       | KPG205 |       |
|------------------------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
|                        | 1      | 2     | 1      | 2     | 1      | 2     | 1      | 2     | 1      | 2     |
| <b>K1</b>              | Φ60    |       | Φ75    |       | Φ105   |       | Φ140   |       | Φ180   |       |
| <b>K2</b>              | 112    | 135,7 | 134,2  | 165,5 | 173    | 214,8 | 200,5  | 261,5 | 244,5  | 291,5 |
| <b>K3</b>              | Φ16    |       | Φ22    |       | Φ32    |       | Φ40    |       | Φ55    |       |
| <b>K4</b>              | 28     |       | 36     |       | 58     |       | 82     |       | 82     |       |
| <b>K5</b>              | Φ70    |       | Φ90    |       | Φ120   |       | Φ160   |       | Φ205   |       |
| <b>K6</b>              | Φ60    |       | Φ70    |       | Φ90    |       | Φ130   |       | Φ160   |       |
| <b>K7</b>              | 5      |       | 6      |       | 8      |       | 10     |       | 12     |       |
| <b>K8</b>              | 48     |       | 56     |       | 88     |       | 112    |       | 112    |       |
| <b>K9</b>              | M5X12  |       | M6X16  |       | M10X22 |       | M12X25 |       | M20X40 |       |
| <b>K10</b>             | Φ5.5   |       | Φ6.5   |       | Φ9     |       | Φ114.3 |       | Φ13    |       |
| <b>K11</b>             | Φ68    |       | Φ85    |       | Φ120   |       | Φ165   |       | Φ215   |       |
| <b>K12</b>             | 22     |       | 32     |       | 50     |       | 65     |       | 65     |       |
| <b>K13</b>             | 5      |       | 6      |       | 10     |       | 12     |       | 16     |       |
| <b>K14</b>             | 18     |       | 24,5   |       | 35     |       | 43     |       | 59     |       |
| <b>K15<sup>1</sup></b> | 6      |       | 7      |       | 10     |       | 12     |       | 15     |       |
| <b>K16</b>             | 82,5   |       | 94     |       | 130    |       | 169    |       | 169    |       |

| Gearbox Size | 70           |        |        |        | 90     |        |        |        |
|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|
|              | Motor Series | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.2 | DSM7.3 | DSM5.3 | DSM5.4 |
| <b>C1</b>    | Φ63          | Φ90    | Φ100   | Φ70    | Φ90    | Φ100   | Φ130   |        |
| <b>C2</b>    | M5X12        | M6x15  | M6x15  | M5x12  | M6x15  | M6x15  | M8X20  |        |
| <b>C3</b>    | Φ11          | Φ14    | Φ14    | Φ14    | Φ14    | Φ14    | Φ19    |        |
| <b>C4</b>    | 32,1         | 32,1   | 42,1   | 41,6   | 41,6   | 41,6   | 51,6   |        |
| <b>C5</b>    | Φ40          | Φ70    | Φ80    | Φ50    | Φ70    | Φ80    | Φ110   |        |
| <b>C6</b>    | 6,5          | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    | 6,5    |        |
| <b>C7</b>    | 70           | 70     | 85     | 89     | 89     | 89     | 120    |        |

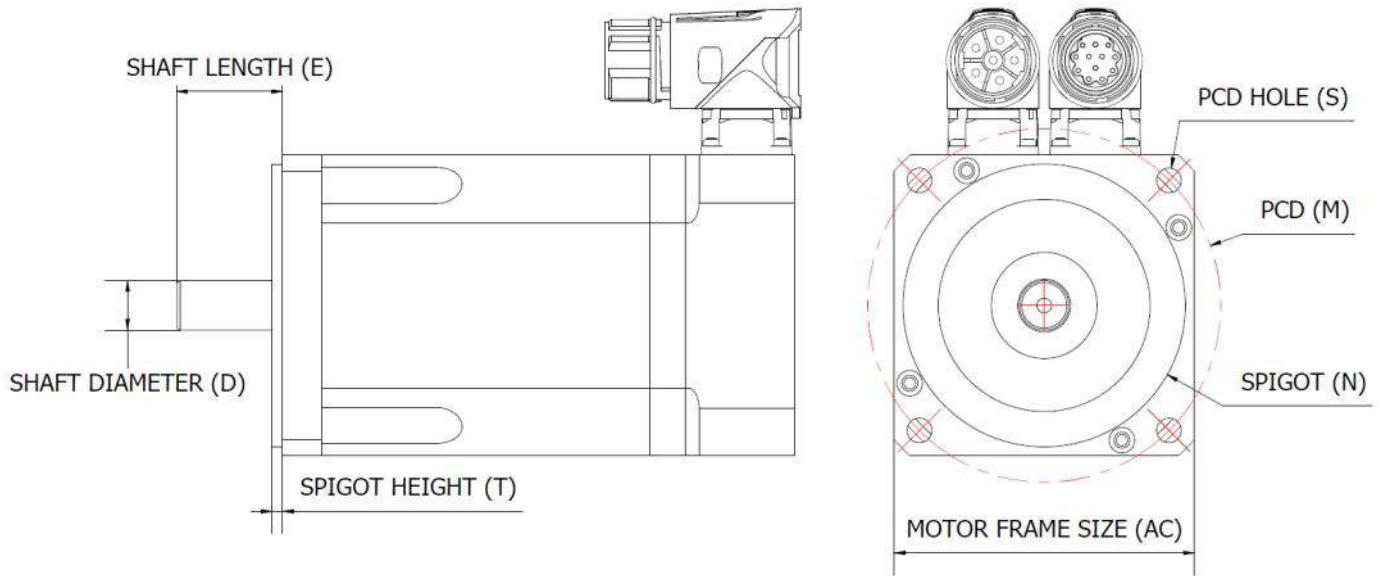
| Gearbox Size | 120          |        |        |        | 160    |        |        | 205    |        |        |
|--------------|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|              | Motor Series | DSM7.3 | DSM5.3 | DSM5.4 | DSM5.5 | DSM5.4 | DSM5.6 | DSM5.5 | DSM5.6 | DSM5.7 |
| <b>C1</b>    | Φ90          | Φ100   | Φ130   | Φ165   | Φ130   | Φ165   | Φ215   | Φ165   | Φ215   | Φ300   |
| <b>C2</b>    | M6x15        | M6x15  | M8X20  | M10x22 | M8X20  | M10x22 | M12X25 | M10x22 | M12X25 | M16X25 |
| <b>C3</b>    | Φ19          | Φ19    | Φ19    | Φ24    | Φ24    | Φ24    | Φ38    | Φ32    | Φ38    | Φ48    |
| <b>C4</b>    | 51,3         | 51,3   | 51,3   | 61,3   | 67     | 67     | 82     | 67     | 82     | 117    |
| <b>C5</b>    | Φ70          | Φ80    | Φ110   | Φ130   | Φ110   | Φ130   | Φ180   | Φ130   | Φ180   | Φ250   |
| <b>C6</b>    | 8            | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      | 8      |
| <b>C7</b>    | 120          | 120    | 120    | 142    | Φ162   | 175    | 190    | 175    | 190    | 260    |

## Technical Memo



# Motor and Gearbox

## Configuration table



| Motor Series | Shaft |    | Shaft |     |     |     |     |       | SPL/SVL Suitable Sizes | KPG/KVG Suitable Sizes |
|--------------|-------|----|-------|-----|-----|-----|-----|-------|------------------------|------------------------|
|              | D     | E  | AC    | N   | M   | T   | S   | MEC   |                        |                        |
| DSM5.0       | 8     | 25 | 40    | 30  | 46  | 2,5 | 4,3 | -     | 40-60                  | 70                     |
| DSM5.2       | 11    | 23 | 60    | 40  | 63  | 2,5 | 5,8 | -     | 60                     | 70                     |
|              | 14    | 30 | 60    | 50  | 70  | 3   | 5,5 | -     | 80                     | 90                     |
| DSM5.3       | 14    | 30 | 85    | 80  | 100 | 3   | 7   | 56B5  | 60-80                  | 70-90                  |
|              | 19    | 40 | 85    | 80  | 100 | 3   | 7   | 56B5  | 120                    | 120                    |
| DSM5.4       | 19    | 40 | 115   | 110 | 130 | 3,5 | 9   | 71B5  | 80-120                 | 90-120                 |
|              | 24    | 50 | 115   | 110 | 130 | 3,5 | 9   | 71B5  | 160                    | 160                    |
| DSM5.5       | 24    | 50 | 142   | 130 | 165 | 3,5 | 11  | 90B5  | 120-160                | 120-160                |
|              | 32    | 58 | 142   | 130 | 165 | 3,5 | 11  | 90B5  | 205                    | 205                    |
| DSM5.6       | 38    | 80 | 190   | 180 | 215 | 4   | 14  | 112B5 | 160-205                | 160-205                |
| DSM5.7       | 48    | 82 | 260   | 250 | 300 | 5   | 18  | 160B5 | 205-235                | 205-235                |
| DSM7.3       | 14    | 30 | 80    | 70  | 90  | 3   | 7   | -     | 60-80                  | 70-90                  |
|              | 19    | 40 | 80    | 70  | 90  | 3   | 7   | -     | 120                    | 120                    |

# For ALL Series

## Order code example



**KPG - 120 - 02 - 015 - S1 - P0 - 19x40—110/130/M8**

| 1      | 2    | 3      | 4     | 5            | 6         | 7           | 8          |
|--------|------|--------|-------|--------------|-----------|-------------|------------|
| Series | Size | Stages | Ratio | Output Shaft | Precision | Input Shaft | Flange     |
| KPG    | 120  | 02     | 015   | S1           | P0        | 19x40       | 110/130/M8 |



### 1 Gearbox Series

- SPL – Standard Precision
- SVL – Standard Precision 90°
- KPG – High Precision
- KVG – High Precision 90°



### 2 Gearbox Sizes

From 40 to 235 (check detailed tables for each series)



### 3 Gearbox stages

From 1 to 3 (check detailed tables for each series)



### 4 Gearbox Ratio

Up to 512 (check detailed tables for each series)



### 5 Output Shaft

S1 – with Key

#### Gearbox Precision

- P1 – Standard Backlash for KPG & KVG only
- P0 – Reduced Backlash for KPG & KVG only
- PU – Ultra Low Backlash for KPG & KVG only
- P2 – Standard Backlash for SPL & SVL only



### 7 Input Shaft

Diameter x Length of the motor shaft  
(check available motor combinations)



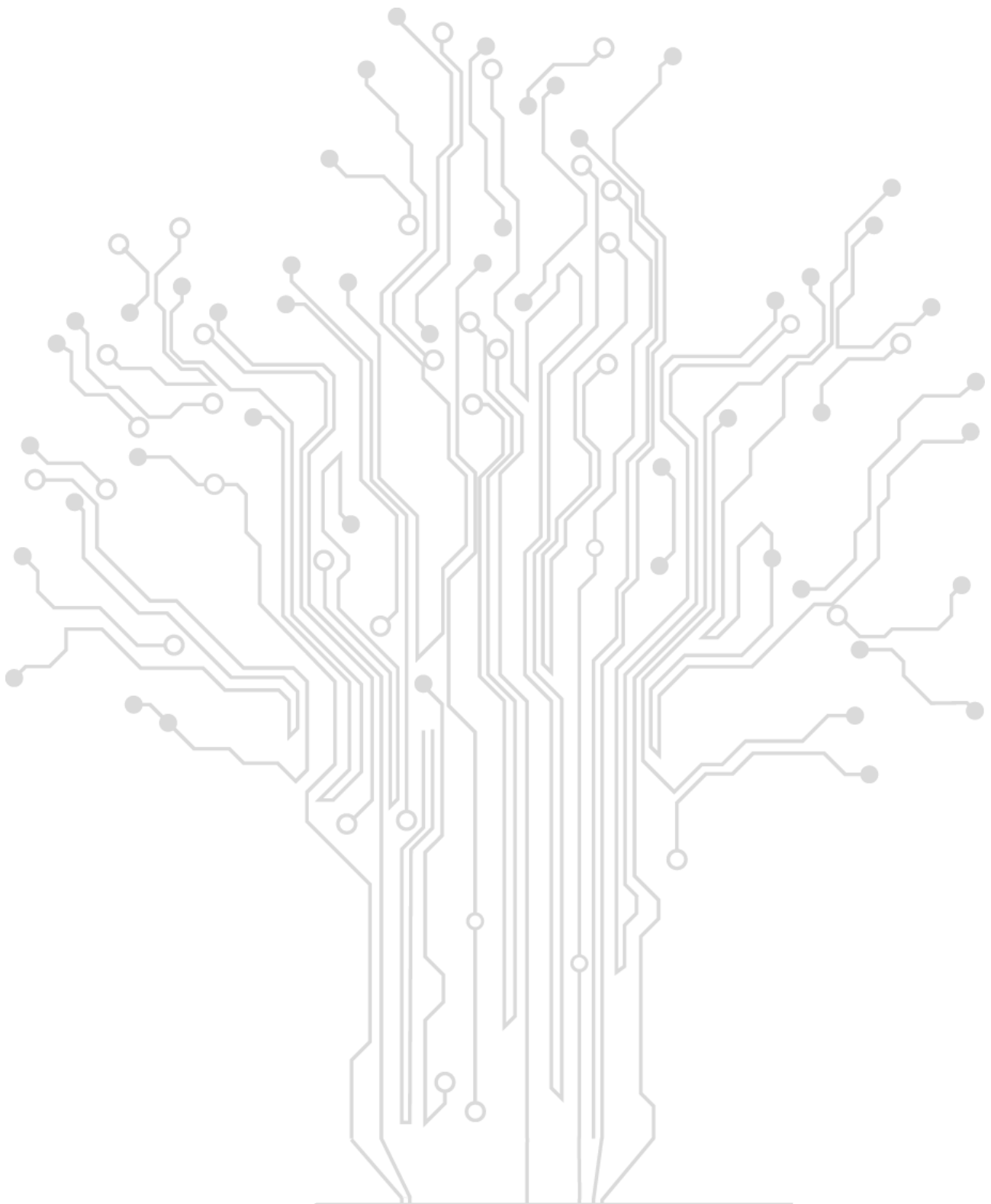
### 8 Gearbox Adaption Flange

Spigot/PCD/PCD threads dimensions

| Gearbox | Nominal output torque | Backlash | Bearing load | Protection class | Running noise | Input speeds | Torsional stiffness | Wide range of ratios |
|---------|-----------------------|----------|--------------|------------------|---------------|--------------|---------------------|----------------------|
| SPL     | ●●●●●                 | ●●●●●    | ●●●●●        | ●●●●●            | ●●●●●         | ●●●●●        | ●●●●●               | ●●●●●                |
| SVL     | ●●●●●                 | ●●●●●    | ●●●●●        | ●●●●●            | ●●●●●         | ●●●●●        | ●●●●●               | ●●●●●                |
| KPG     | ●●●●●                 | ●●●●●    | ●●●●●        | ●●●●●            | ●●●●●         | ●●●●●        | ●●●●●               | ●●●●●                |
| KVG     | ●●●●●                 | ●●●●●    | ●●●●●        | ●●●●●            | ●●●●●         | ●●●●●        | ●●●●●               | ●●●●●                |

| Technical details across the all range |    |       |  |
|--|----|-------|--|
| Operating Noise Level                  | L  | dB(A) | < 6x   |
| Efficiency at Full loading             | η  | %     | 9x   |
| Operating Temperature                  |    | °C    | -25 to +90   |
| Lubrication                            |    |       | Syntetic Lubrification Grease  |
| Mouting Position                       |    |       | Any Direction  |
| Protection Class                       |    |       | IP 65  |
| Service lifetime                       | Ln | h     | S5 Cycle Operation: 30,000 hrs (S1 continuous operation: 15,000 hrs) |





**SANGALLI SERVOMOTORI S.r.l.**

*Soggetta a direzione e coordinamento di ESAUTOMOTION SPA*

Via Federico Rossi, 5 - 20900 - Monza (Mb) ITALY

[WWW.SANGALLISERVOMOTORI.IT](http://WWW.SANGALLISERVOMOTORI.IT)