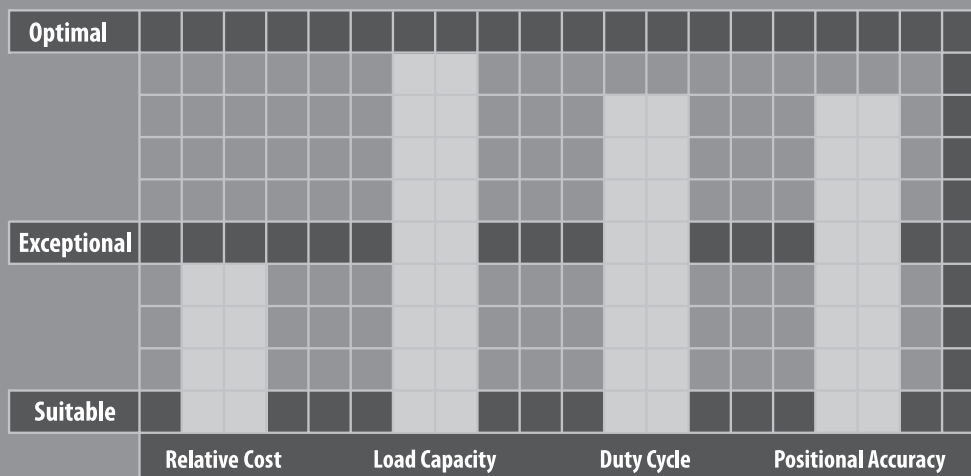


TWINGEAR SERIES

TwinGear harnesses the power of two with its hypoid primary stage and helical secondary stage. This gear train redefines power, compactness and precision, setting benchmarks in the industry. High torsional stiffness and backlash <6 arc-minutes and make it a contender in dynamic motion control applications. With ratios spanning from 15-75:1 and maximum acceleration torque as high as 11,250Nm, TwinGear can be applied confidently across a myriad of applications.

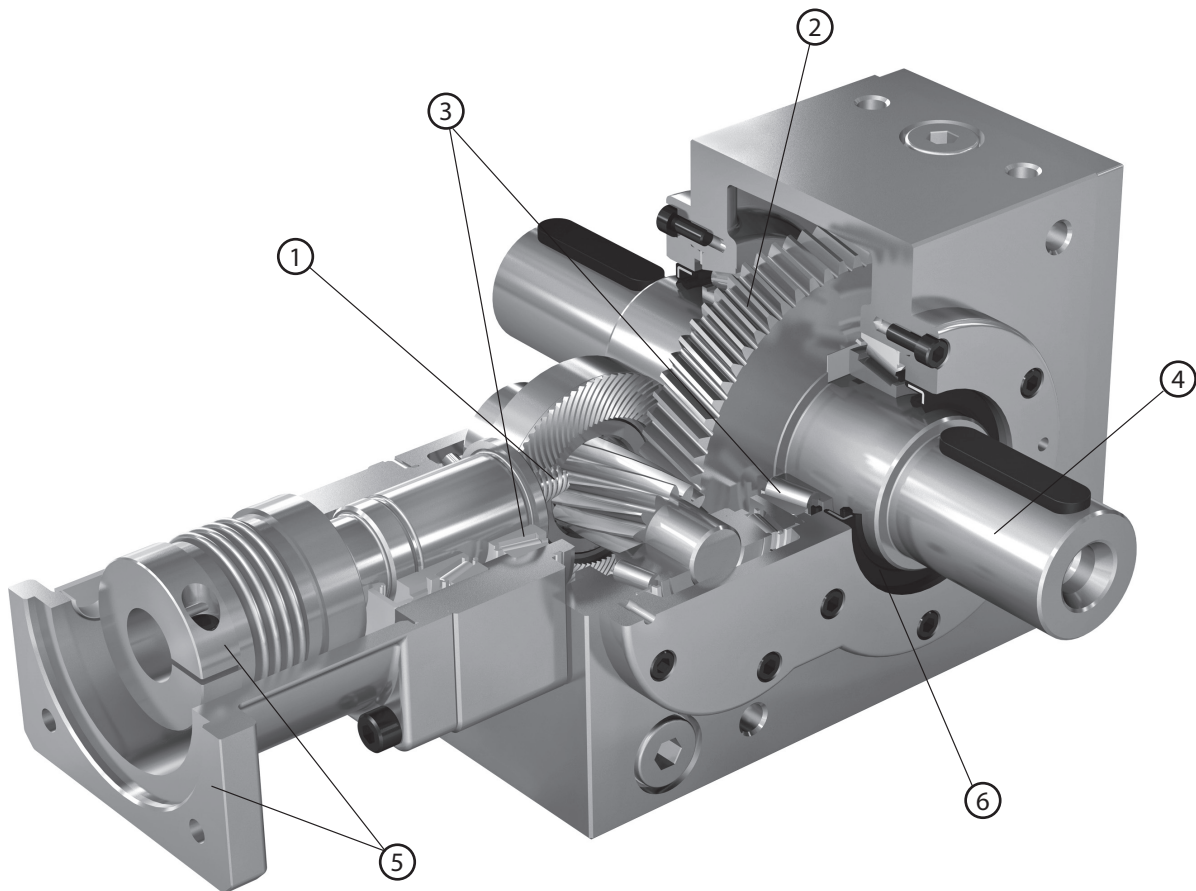
Our customers demanded a more compact helical bevel design and we answered. TwinGear can fit in the narrowest space envelopes. Solid shaft, dual shaft, hollow shaft and shrink disc mounting interfaces provide the ultimate flexibility for machine designers. Rated up to 8,000rpm, this product outperforms in high speed, continuous duty applications while staying quiet and cool.



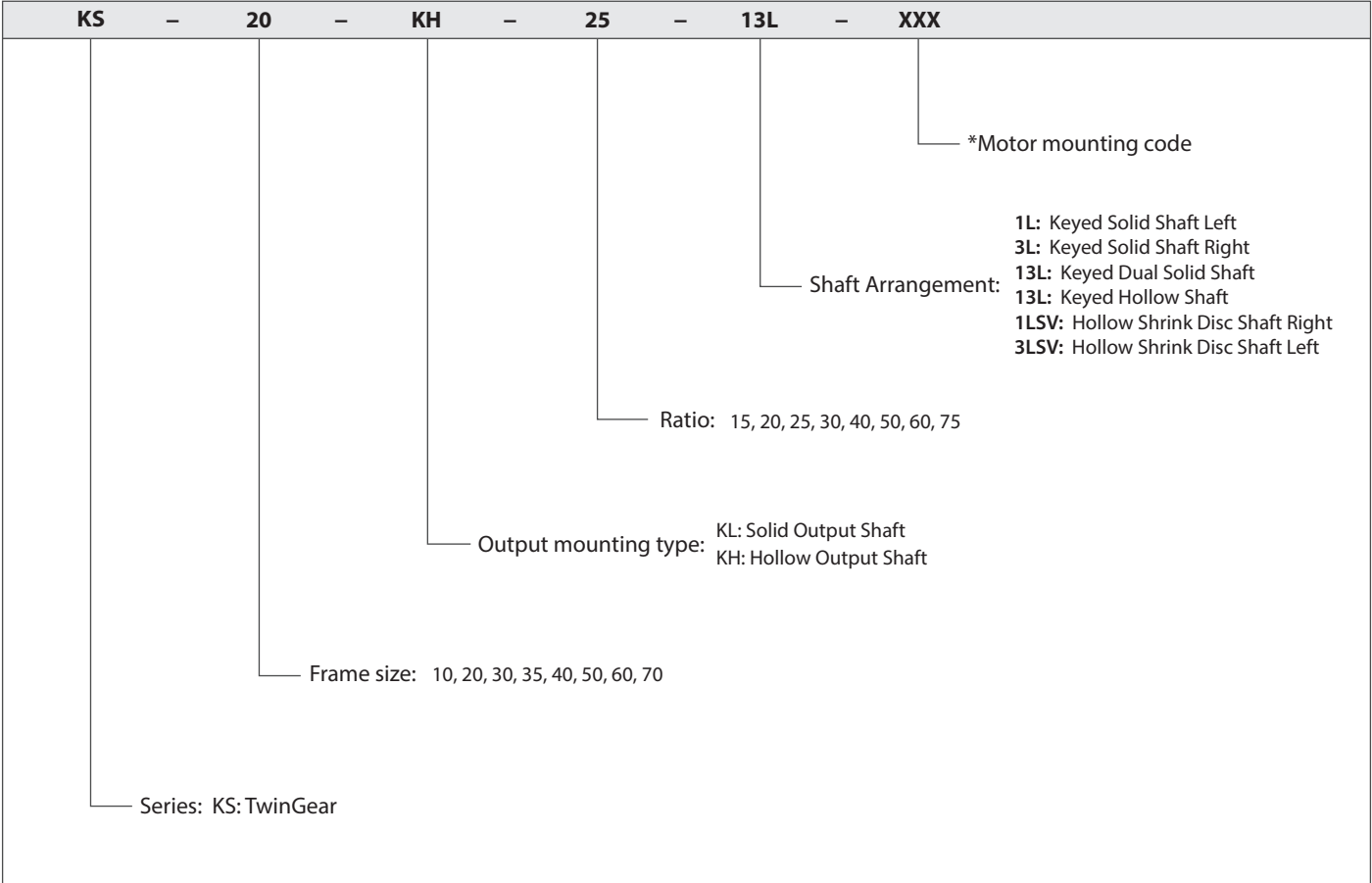


TWINGEAR SERIES

- High performing helical-bevel two-stage gearbox with maximum acceleration torque as high as 11,250Nm
- Low backlash (<4 arc-min) with exceptional torsional rigidity
- 8 Frame sizes and 8 ratios available, up to 75:1
- Suitable for high input speeds up to 8,000 rpm
- Extremely compact design to fit into challenging space envelopes
- Assembled in Germany



- ① Hypoid primary stage with optimized contact pattern for uniform load distribution, low noise and high transmission accuracy
- ② Helical secondary stage for high torque generation
- ③ Tapered roller bearings at input and output for high radial and axial load capacity
- ④ Four output mounting styles for maximum flexibility: Keyed solid shaft, keyed dual shaft, keyed hollow shaft and hollow shrink disc
- ⑤ Simple, low inertia connection to various servo motors using adapter flange and stiff zero backlash coupling
- ⑥ Output seal allows for IP64 protection



* Motor mounting code varies depending on the motor. Contact us to configure the code.

| Frame Size | Unit | Note | 10 | 20 | 30 | 35 | 40 | 50 | 60 | 70 |
|-------------------------------|------------------|------|----------------------------------|------|-------|-------|-------|-------|-------|-------|
| Ratio | i | | 15 / 20 / 25 / 30 | | | | | | | |
| Nominal Output Torque | T2N [Nm] | *1 | 150 | 250 | 480 | 950 | 1750 | 3200 | 5000 | 7500 |
| Maximum Acceleration Torque | T2B [Nm] | *2 | 225 | 375 | 720 | 1425 | 2625 | 4800 | 7500 | 11250 |
| Emergency Stop Torque | T2Not [Nm] | *3 | 300 | 500 | 960 | 1900 | 3500 | 6400 | 10000 | 15000 |
| Nominal Input Speed | n1N [rpm] | *4 | 2400 | 2400 | 2000 | 1600 | 1300 | 900 | 800 | 700 |
| Maximum Input Speed | n1max [rpm] | *5 | 8000 | 7000 | 6000 | 5000 | 4000 | 4000 | 3500 | 3500 |
| Maximum Radial Load | F2Rmax [N] | *6 | 4900 | 7200 | 10000 | 15000 | 18000 | 25000 | 30000 | 35000 |
| Maximum Axial Load | F2Amax [N] | *7 | 2450 | 3600 | 5000 | 7500 | 9000 | 12500 | 15000 | 17500 |
| Efficiency | h [%] | *8 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 |
| Torsional Rigidity | Ct21 [Nm/arcmin] | *9 | 10 | 16 | 34 | 75 | 150 | 377 | 473 | 726 |
| Maximum Torsional Backlash | jt [arcmin] | *10 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 5 | ≤ 5 | ≤ 4 | ≤ 4 | ≤ 4 |
| Noise Level | LpA [dB(A)] | *11 | < 69 | < 69 | < 71 | < 71 | < 73 | < 73 | < 75 | < 75 |
| Ambient Temperature | [°C] | - | -10 to 90 | | | | | | | |
| Permitted Housing Temperature | [°C] | - | 90 | | | | | | | |
| Protection Class | - | - | IP64 | | | | | | | |
| Lubrication | - | - | Synthetic Oil [ISO VG-Class 150] | | | | | | | |
| Service Life | SL [h] | *12 | 30,000 | | | | | | | |
| Weight | m [kg] | - | 10 | 16 | 27 | 52 | 75 | 115 | 190 | 300 |

| Frame Size | Unit | Note | 10 | 20 | 30 | 35 | 40 | 50 | 60 | 70 |
|-------------------------------|------------------|------|----------------------------------|------|-------|-------|-------|-------|-------|-------|
| Ratio | i | | 40 / 50 | | | | | | | |
| Nominal Output Torque | T2N [Nm] | *1 | 110 | 200 | 360 | 700 | 1300 | 3200 | 5000 | 7500 |
| Maximum Acceleration Torque | T2B [Nm] | *2 | 165 | 300 | 540 | 1050 | 1950 | 4800 | 7500 | 11250 |
| Emergency Stop Torque | T2Not [Nm] | *3 | 220 | 400 | 720 | 1400 | 2600 | 6400 | 10000 | 15000 |
| Nominal Input Speed | n1N [rpm] | *4 | 3700 | 3700 | 3100 | 2500 | 2100 | 1400 | 1300 | 1200 |
| Maximum Input Speed | n1max [rpm] | *5 | 8000 | 7000 | 6000 | 5000 | 4000 | 4000 | 3500 | 3500 |
| Maximum Radial Load | F2Rmax [N] | *6 | 4900 | 7200 | 10000 | 15000 | 18000 | 25000 | 30000 | 35000 |
| Maximum Axial Load | F2Amax [N] | *7 | 2450 | 3600 | 5000 | 7500 | 9000 | 12500 | 15000 | 17500 |
| Efficiency | h [%] | *8 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 | > 92 |
| Torsional Rigidity | Ct21 [Nm/arcmin] | *9 | 10 | 16 | 34 | 75 | 150 | 377 | 473 | 726 |
| Maximum Torsional Backlash | jt [arcmin] | *10 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 5 | ≤ 5 | ≤ 4 | ≤ 4 | ≤ 4 |
| Noise Level | LpA [dB(A)] | *11 | < 69 | < 69 | < 71 | < 71 | < 73 | < 73 | < 75 | < 75 |
| Ambient Temperature | [°C] | - | -10 to 90 | | | | | | | |
| Permitted Housing Temperature | [°C] | - | 90 | | | | | | | |
| Protection Class | - | - | IP64 | | | | | | | |
| Lubrication | - | - | Synthetic Oil [ISO VG-Class 150] | | | | | | | |
| Service Life | SL [h] | *12 | 30,000 | | | | | | | |
| Weight | m [kg] | - | 10 | 16 | 27 | 52 | 75 | 115 | 190 | 300 |

| Frame Size | Unit | Note | 10 | 20 | 30 | 35 | 40 | 50 | 60 | 70 |
|-------------------------------|------------------|------|----------------------------------|------|-------|-------|-------|-------|-------|-------|
| Ratio | i | | 60 / 75 | | | | | | | |
| Nominal Output Torque | T2N [Nm] | *1 | 75 | 125 | 250 | 475 | 900 | 2550 | 4050 | 5100 |
| Maximum Acceleration Torque | T2B [Nm] | *2 | 110 | 185 | 375 | 710 | 1350 | 3825 | 6075 | 7650 |
| Emergency Stop Torque | T2Not [Nm] | *3 | 150 | 250 | 500 | 950 | 1800 | 5100 | 8100 | 10200 |
| Nominal Input Speed | n1N [rpm] | *4 | 4500 | 4500 | 3900 | 3300 | 2700 | 1900 | 1600 | 1500 |
| Maximum Input Speed | n1max [rpm] | *5 | 8000 | 7000 | 6000 | 5000 | 4000 | 4000 | 3500 | 3500 |
| Maximum Radial Load | F2Rmax [N] | *6 | 4900 | 7200 | 10000 | 15000 | 18000 | 25000 | 30000 | 35000 |
| Maximum Axial Load | F2Amax [N] | *7 | 2450 | 3600 | 5000 | 7500 | 9000 | 12500 | 15000 | 17500 |
| Efficiency | h [%] | *8 | > 90 | > 90 | > 90 | > 90 | > 90 | > 90 | > 90 | > 90 |
| Torsional Rigidity | Ct21 [Nm/arcmin] | *9 | 10 | 16 | 34 | 75 | 150 | 377 | 473 | 726 |
| Maximum Torsional Backlash | jt [arcmin] | *10 | ≤ 6 | ≤ 6 | ≤ 6 | ≤ 5 | ≤ 5 | ≤ 4 | ≤ 4 | ≤ 4 |
| Noise Level | LpA [dB(A)] | *11 | < 67 | < 67 | < 69 | < 69 | < 71 | < 71 | < 73 | < 73 |
| Ambient Temperature | [°C] | - | -10 to 90 | | | | | | | |
| Permitted Housing Temperature | [°C] | - | 90 | | | | | | | |
| Protection Class | - | - | IP64 | | | | | | | |
| Lubrication | - | - | Synthetic Oil [ISO VG-Class 150] | | | | | | | |
| Service Life | SL [h] | *12 | 30,000 | | | | | | | |
| Weight | m [kg] | - | 10 | 16 | 27 | 52 | 75 | 115 | 190 | 300 |

*1) At nominal input speed, service life is 30,000 hours

*2) The maximum torque when starting or stopping operation. Permitted 1,000 cycles/hour.

*3) The maximum torque allowed under a stress situation. Permitted 1,000 times during service life.

*4) Average input speed at nominal torque. Maintain housing temperature below 90°C

*5) The maximum intermittent input speed

*6) Maximum radial load gearbox can accept. Measured at center of output shaft at 400rpm

*7) Maximum axial load gearbox can accept. Measured at center of output shaft at 400rpm

*8) The efficiency at full load

*9) At nominal output torque. Does not include lost motion.

*10) Measured at output, 2% load and max 10Nm.

*11) Measured at 1,500 rpm input at partial load

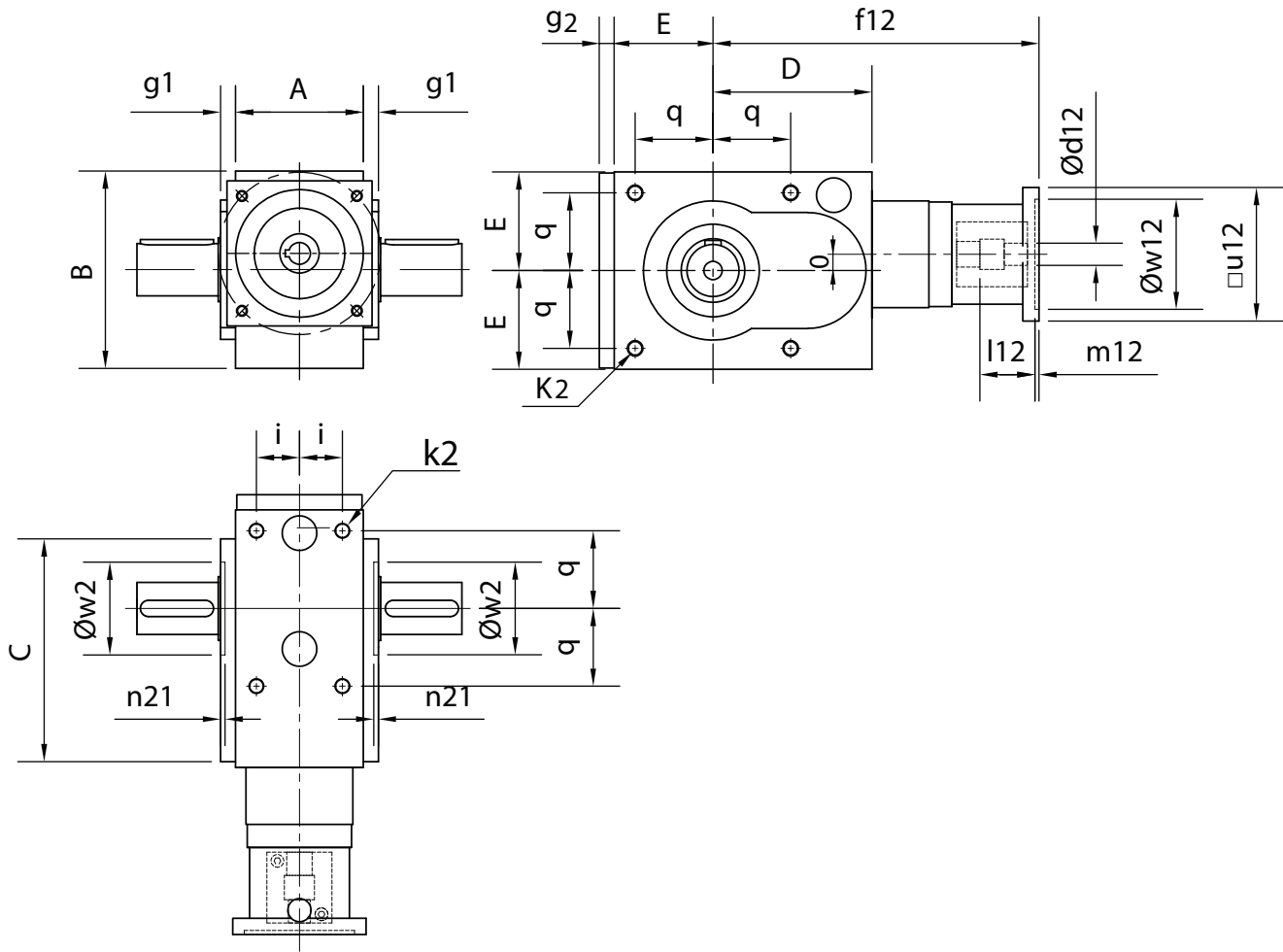
*12) Based on S5 duty cycle <60% and <20 minute run time.

Moment of inertia I_1 [kgcm²]

| Ratio | Frame Size | | | | | | | |
|-------|------------|------|------|------|------|------|-------|-----|
| | 10 | 20 | 30 | 35 | 40 | 50 | 60 | 70 |
| 15:1 | 0.676 | 2.64 | 5.56 | 9.86 | 26.2 | 57.3 | 100.8 | 185 |
| 20:1 | 0.605 | 2.41 | 5.23 | 8.98 | 22.1 | 50.2 | 90.1 | 151 |
| 25:1 | 0.579 | 2.34 | 5.05 | 8.53 | 20.9 | 45.4 | 73.0 | 133 |
| 30:1 | 0.577 | 2.34 | 5.10 | 8.45 | 21.5 | 44.0 | 70.2 | 132 |
| 40:1 | 0.557 | 2.29 | 4.88 | 8.12 | 20.5 | 41.2 | 64.3 | 118 |
| 50:1 | 0.547 | 2.26 | 4.83 | 7.96 | 20.0 | 39.8 | 60.8 | 111 |
| 60:1 | 0.542 | 2.27 | 4.79 | 7.87 | 19.1 | 38.9 | 58.7 | 107 |
| 75:1 | 0.537 | 2.24 | 4.77 | 7.79 | 18.9 | 38.3 | 57.1 | 104 |

Units and Symbols

| | | |
|-----------------------------------|--------|-------------------|
| Maximum Motor Acceleration Torque | T1BMot | Nm |
| Nominal Output Torque | T2N | Nm |
| Maximum Acceleration Torque | T2B | Nm |
| Emergency Stop Torque | T2Not | Nm |
| Nominal Input Speed | n1N | rpm |
| Maximum Input Speed | n1max | rpm |
| Maximum Input Radial Load | F1Rmax | N |
| Maximum Output Radial Load | F2Rmax | N |
| Maximum Input Axial Load | F1Amax | N |
| Maximum Output Axial Load | F2Amax | N |
| Mass Moment of Inertia | I1 | kgcm ² |
| Efficiency at Full Load | η | % |
| Torsional Rigidity | Ct21 | Nm/arc-min |
| Maximum Torsional Backlash | jt | arc-min |
| Noise Level | LpA | dB(A) |
| Service Life | Lh | h |
| Run time | RT | min |
| Duty cycle | DC | % |
| Ambient Temperature | ta | °C |
| Thermal Performance Limit | Ptherm | kW |
| Performance | P | kW |
| Weight | m | kg |



Base Dimensions

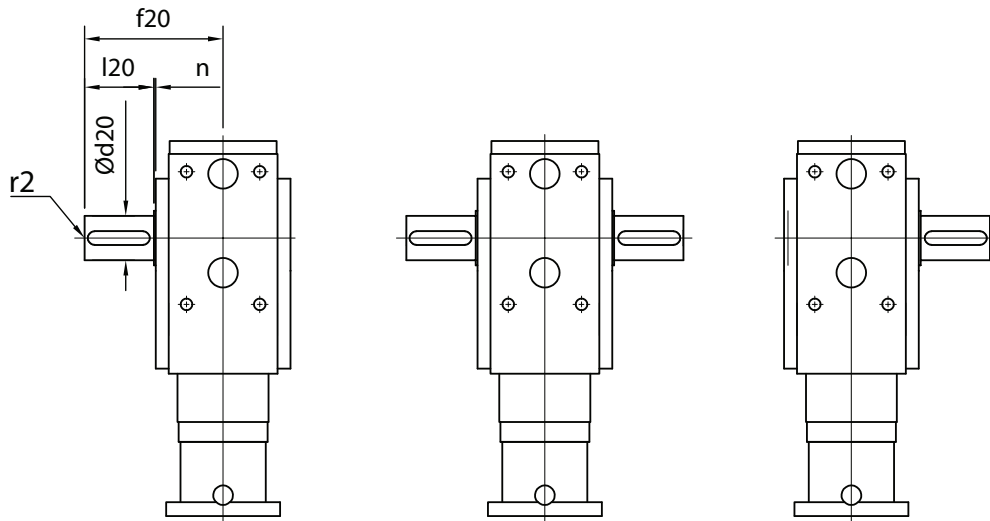
| Frame Size | A | B | C | D | E | g1 | g2 | o | k2 | q | i | w2H7 | n21 |
|------------|-----|-----|-------|------|-----|------|------|-----|-----|-----|----|------|-----|
| 10 | 75 | 110 | 147.5 | 92.5 | 55 | 10.5 | 10.5 | 7.5 | M8 | 44 | 28 | 55 | 4 |
| 20 | 90 | 140 | 180 | 110 | 70 | 13 | 13 | 9 | M10 | 55 | 30 | 63 | 4 |
| 30 | 110 | 170 | 222 | 137 | 85 | 13 | 13 | 14 | M12 | 67 | 37 | 80 | 4 |
| 35 | 140 | 210 | 275 | 170 | 105 | 16 | 16 | 18 | M16 | 85 | 50 | 95 | 6 |
| 40 | 170 | 240 | 322 | 202 | 120 | 16 | 16 | 23 | M16 | 95 | 60 | 110 | 6 |
| 50 | 210 | 280 | 383 | 243 | 140 | 16 | 23 | 32 | M16 | 110 | 75 | 120 | 6 |
| 60 | 240 | 360 | 475 | 295 | 180 | 18 | 25 | 38 | M20 | 140 | 80 | 130 | 8 |
| 70 | 280 | 450 | 585 | 360 | 225 | 18 | 25 | 42 | M20 | 175 | 90 | 160 | 10 |

Motor Adapter Flange & Coupling Dimensions

| Frame Size | u12 x f12 (Motor Adapter) | | | $\varnothing d12$ x l12 (Coupling) | | |
|------------|---------------------------|---------|---------|------------------------------------|-------|--------|
| 10 | 55x184 | 75x194 | 90x197 | 9x23 | 11x26 | 14x33 |
| 20 | 75x232 | 90x232 | 90x244 | 11x26 | 14x33 | 19x43 |
| 30 | 90x281 | 115x281 | 115x291 | 14x33 | 19x43 | 24x53 |
| 35 | 115x337 | 140x352 | 140x362 | 19x43 | 24x53 | 32x63 |
| 40 | 140x395 | 190x400 | 190x415 | 24x53 | 32x63 | 38x83 |
| 50 | 190x481 | 190x490 | 260x490 | 32x63 | 38x83 | 48x115 |
| 60 | 190x558 | 260x568 | - | 32x63 | 38x83 | 48x115 |
| 70 | Contact us | | | Contact us | | |

*Above Motor Adapter Flange & Coupling Dimensions are for reference only and depend on motor dimensions. Contact us to configure adaptation for your specific motor.

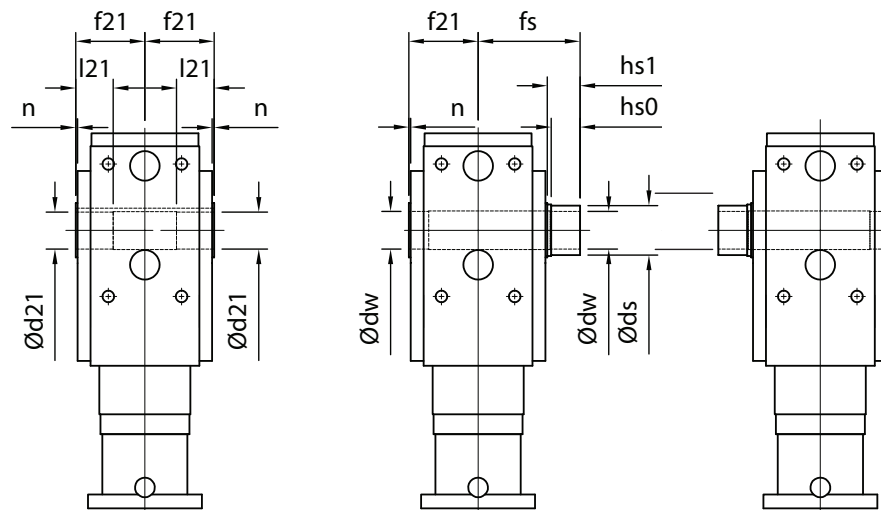
Keyed Solid Output Shaft



Shaft Arrangement 1L Shaft Arrangement 13L Shaft Arrangement 3L

| Frame Size | Ø d20 k6 | l20 | f20 | n | r2 | Key |
|------------|----------|-----|-----|---|-----|-----------|
| 10 | 30 | 50 | 100 | 2 | M10 | 8x7x45 |
| 20 | 35 | 55 | 115 | 2 | M12 | 10x8x45 |
| 30 | 45 | 70 | 140 | 2 | M16 | 14x9x63 |
| 35 | 55 | 85 | 174 | 3 | M20 | 16x10x80 |
| 40 | 65 | 110 | 214 | 3 | M20 | 18x11x100 |
| 50 | 80 | 130 | 254 | 3 | M20 | 22x14x100 |
| 60 | 90 | 160 | 301 | 3 | M24 | 25x14x140 |
| 70 | 100 | 180 | 341 | 3 | M24 | 28x16x160 |

Hollow Shaft: Keyed and Shrink Disc

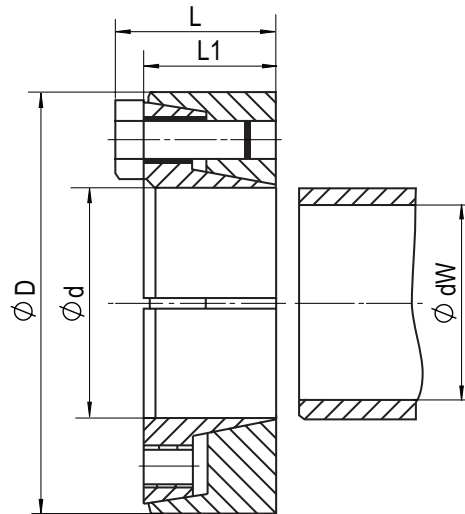


Shaft Arrangement 13L Shaft Arrangement 1LSV Shaft Arrangement 3LSV

| Frame Size | Ød21 H7 | l21 | f21 | n | Keyway | Ødw H7 | Øds F7 | hs0 | hs1 | fs |
|------------|---------|-----|-----|---|--------|--------|--------|------|------|-----|
| 10 | 25 | 40 | 50 | 2 | 8x7 | 25 | 30 | 22 | 25 | 77 |
| 20 | 28 | 28 | 60 | 2 | 8x7 | 30 | 36 | 25.5 | 28.5 | 90 |
| 30 | 38 | 38 | 70 | 2 | 10x8 | 40 | 50 | 29 | 33 | 104 |
| 35 | 45 | 45 | 89 | 3 | 14x9 | 50 | 62 | 31.5 | 37 | 126 |
| 40 | 55 | 55 | 104 | 3 | 16x10 | 60 | 68 | 31.5 | 35 | 141 |
| 50 | 65 | 65 | 124 | 3 | 18x11 | 70 | 80 | 34 | 41 | 165 |
| 60 | 75 | 75 | 141 | 3 | 20x12 | 75 | 95 | 46.5 | 51 | 195 |
| 70 | 90 | 90 | 161 | 3 | 25x14 | 90 | 110 | 52 | 60.5 | 225 |

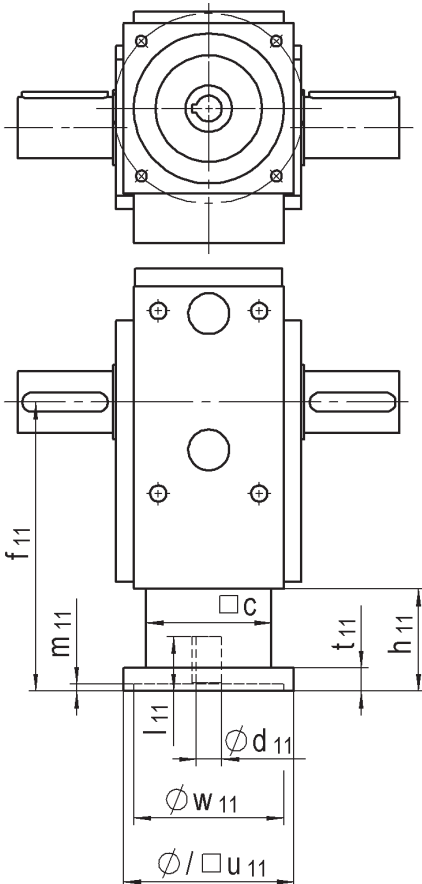
*1) Hollow output shaft arrangements 1LSV/3LSV include extended shrink disc shaft only. Shrink disc sold separately

Shrink Discs - For use with 1LSV/3LSV Hollow Shaft Configurations



| Frame Size | Shrink Disc Model | Ød | Ødw | ØD | L | L1 | Torque (Nm) | Screw Size | Mass (kg) |
|------------|-------------------|----|-----|-----|------|----|-------------|------------|-----------|
| 10 | KBS 19/1 - 30x60 | 30 | 25 | 60 | 24 | 20 | 352 | M6 | 0.3 |
| 20 | KBS 19/1 - 36x72 | 36 | 30 | 72 | 27.3 | 22 | 714 | M8 | 0.5 |
| 30 | KBS 19/1 - 50x90 | 50 | 40 | 90 | 31.3 | 26 | 1490 | M8 | 0.8 |
| 35 | KBS 19/1 - 62x110 | 62 | 50 | 110 | 34.3 | 29 | 2230 | M8 | 1.4 |
| 40 | KBS 19/1 - 68x115 | 68 | 60 | 115 | 34.3 | 29 | 3590 | M8 | 1.4 |
| 50 | KBS 19/1 - 80x145 | 80 | 70 | 145 | 37.4 | 31 | 5400 | M10 | 2.5 |
| 60 | Contact Us | - | - | - | - | - | - | - | - |
| 70 | Contact Us | - | - | - | - | - | - | - | - |

Keyed Input Shaft Option



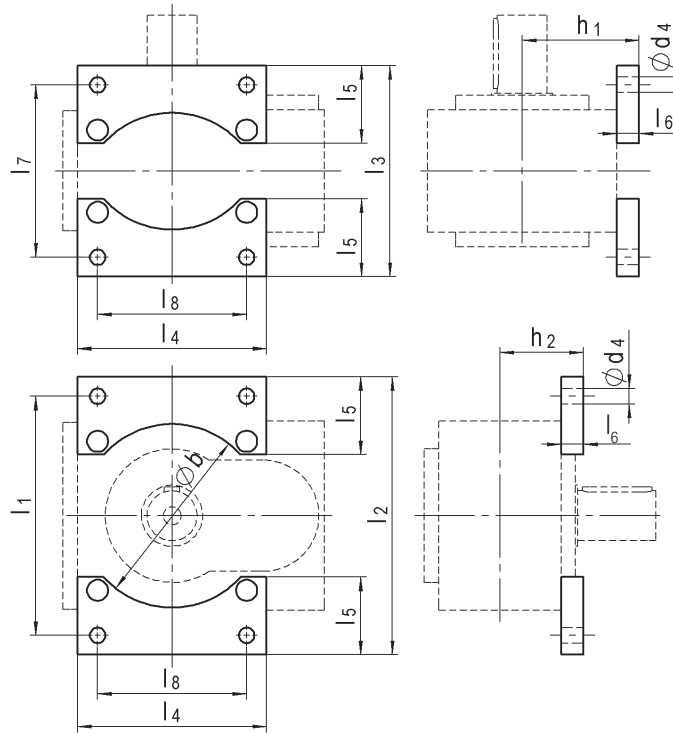
Motor Adapter Flange & Input Keyway Dimensions

| Frame Size | Ød11 x l11 | | | f11 | h11 | t11 | c | m1 |
|------------|------------|--------|--------|-----|------|-----|-----|----|
| 10 | 9x23 | 11x26 | 14x33 | 155 | 62.5 | 15 | 70 | 5 |
| 20 | 11x26 | 14x33 | 19x43 | 175 | 65 | 15 | 80 | 5 |
| 30 | 14x33 | 19x43 | 24x53 | 212 | 75 | 17 | 90 | 5 |
| 35 | 19x43 | 24x53 | 32x63 | 270 | 100 | 20 | 105 | 5 |
| 40 | 24x53 | 32x63 | 38x83 | 322 | 120 | 22 | 130 | 6 |
| 50 | 32x63 | 38x83 | 42x115 | 397 | 154 | 45 | 135 | 6 |
| 60 | 38x83 | 42x115 | 48x115 | 454 | 159 | 45 | 145 | 6 |
| 70 | 42x115 | 48x115 | 55x115 | 527 | 167 | 45 | 170 | 6 |

*Above Motor Adapter Flange & Input Keyway Dimensions are for reference only and depend on motor dimensions. Contact us to configure the appropriate adaptation for your specific motor

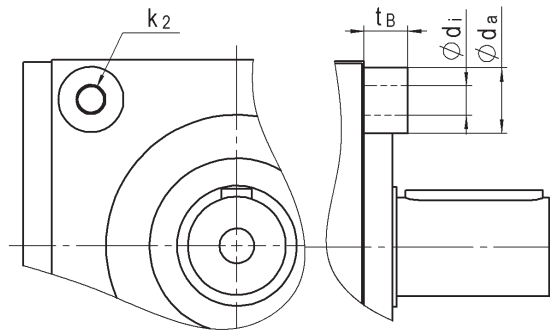
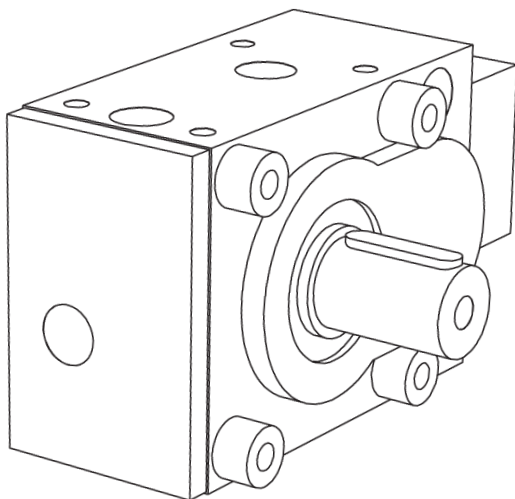
*In lieu of standard coupling mounting system

Base Mounted Feet



| Frame Size | l1 | l2 | l3 | l4 | l5 | l6 | l7 | l8 | Øb | h1 | h2 | Ød4 |
|------------|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|------|-----|
| 10 | 146 | 168 | 136 | 110 | 50 | 17 | 114 | 88 | 108 | 72 | 54.4 | 9 |
| 20 | 178 | 208 | 158 | 140 | 60 | 20 | 128 | 110 | 135 | 90 | 65 | 11 |
| 30 | 215 | 250 | 190 | 170 | 70 | 20 | 155 | 134 | 165 | 105 | 75 | 14 |
| 35 | 265 | 310 | 240 | 210 | 90 | 25 | 195 | 170 | 205 | 130 | 95 | 18 |
| 40 | 295 | 345 | 275 | 240 | 100 | 30 | 225 | 190 | 235 | 150 | 115 | 18 |
| 50 | 335 | 385 | 315 | 280 | 100 | 30 | 265 | 220 | 275 | 170 | 135 | 18 |
| 60 | 430 | 480 | 360 | 360 | 125 | 30 | 310 | 280 | 350 | 210 | 150 | 22 |
| 70 | 520 | 580 | 410 | 450 | 140 | 30 | 350 | 350 | 440 | 255 | 170 | 22 |

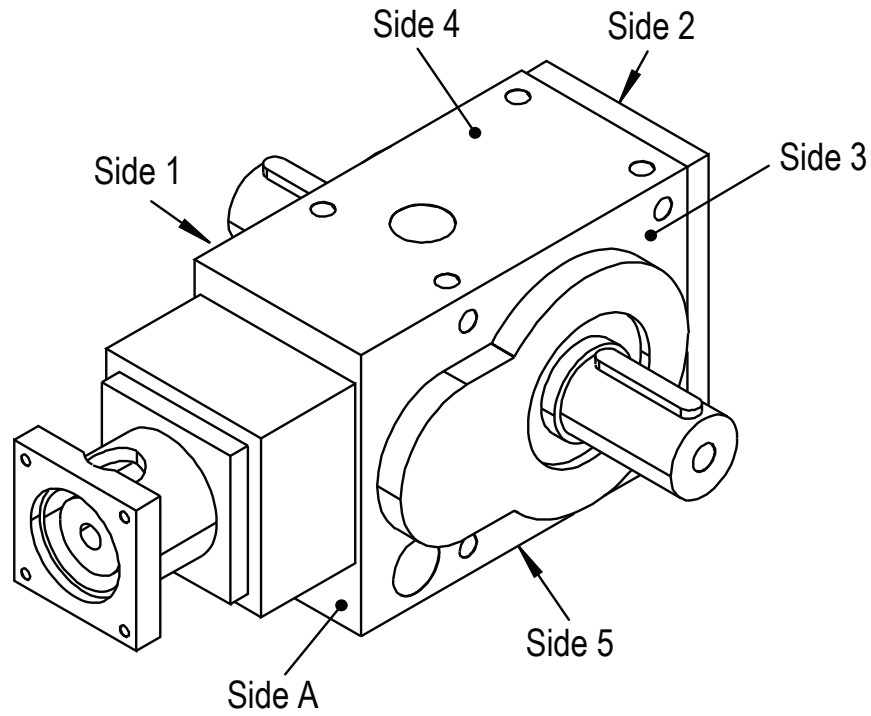
Space Sleeves for Tapped Holes



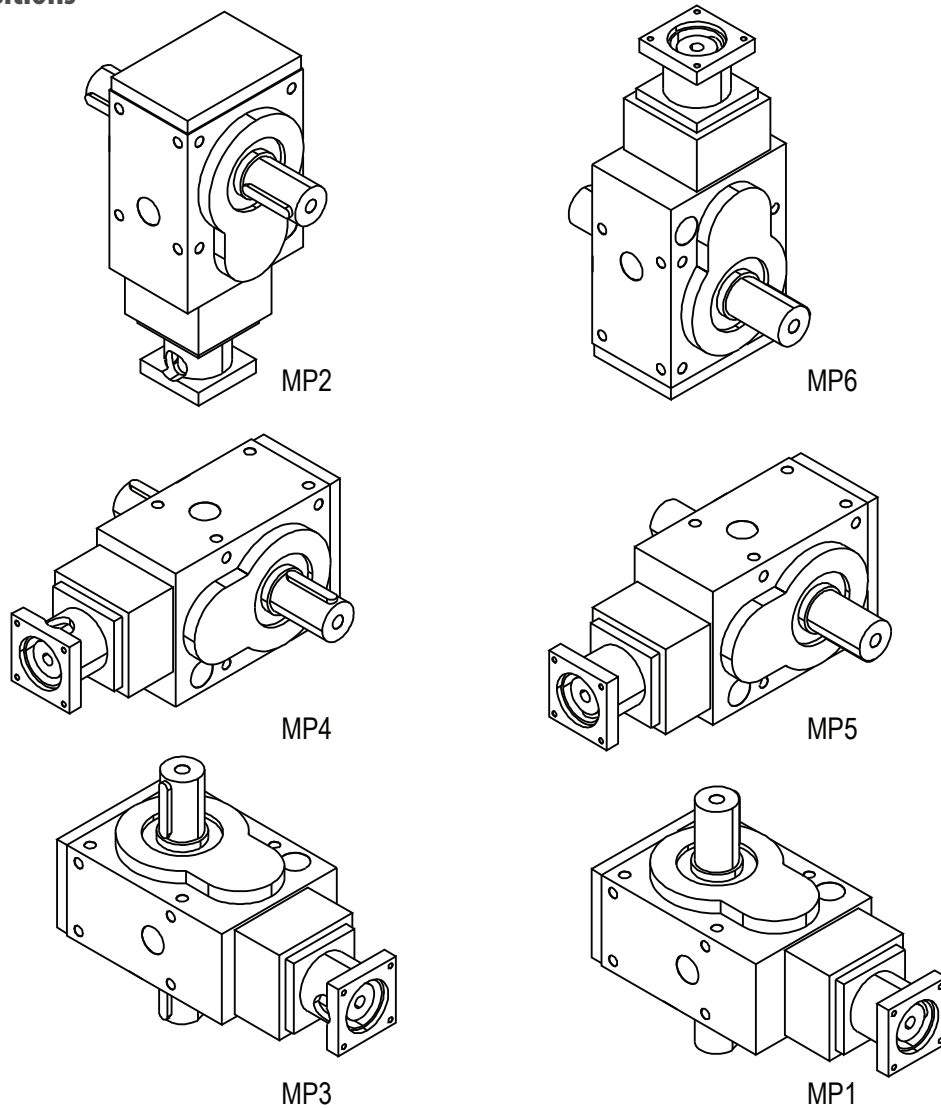
| Frame Size | k2 | di | da | tB |
|------------|-----|------|----|----|
| 10 | M8 | 9 | 20 | 15 |
| 20 | M10 | 11 | 25 | 20 |
| 30 | M12 | 13,5 | 30 | 20 |
| 35 | M16 | 17,5 | 35 | 25 |
| 40 | M16 | 17,5 | 35 | 25 |
| 50 | M16 | 17,5 | 35 | 25 |
| 60 | M20 | 22 | 45 | 30 |
| 70 | M20 | 22 | 45 | 30 |

*Usable height of thread 1.5 x thread size

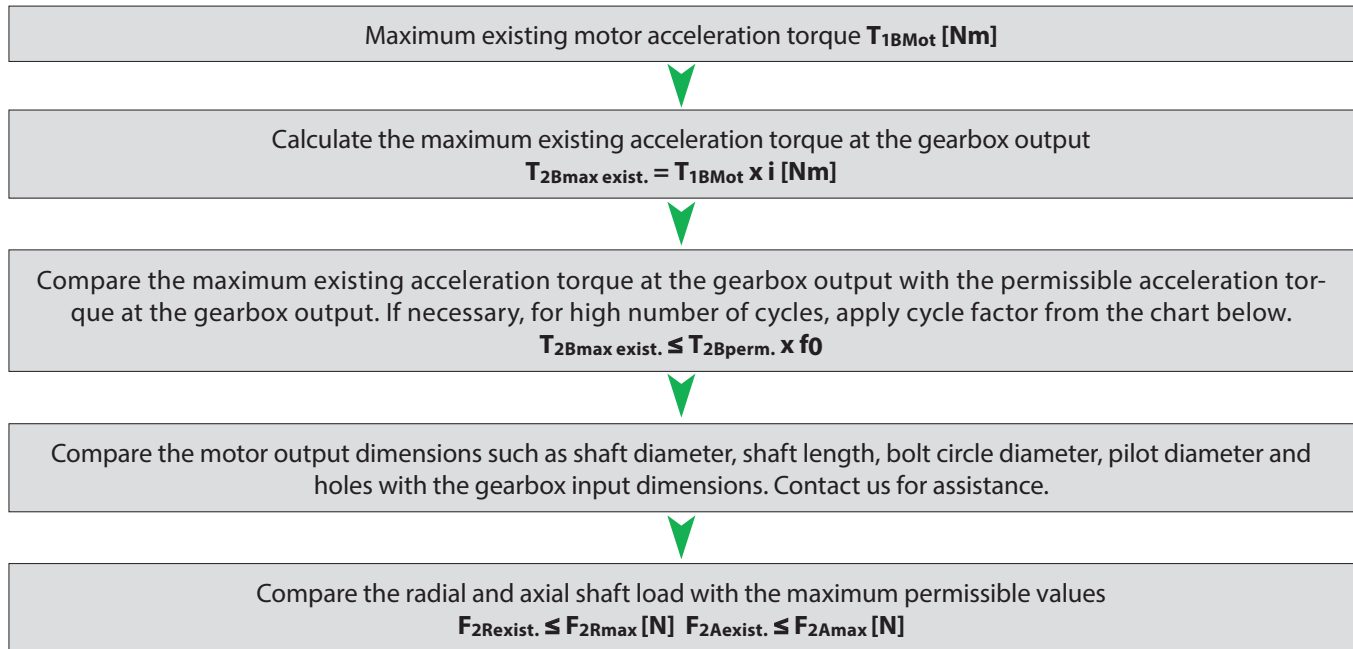
Side Definition



Mounting Positions



Gearbox Selection Procedure



*Above selection is based on S5 cyclical duty cycle [DC] of <60% and run time [RT] < 20 min. Contact us for sizing assistance for S1 continuous operation.

| Cycle Factor [f0] | <1,000 cycles/hour | 1,000-3,000 cycles/hour | 3,000-5,000 cycles/hour | 5,000-7,000 cycles/hour |
|-------------------|--------------------|-------------------------|-------------------------|-------------------------|
| <1 hours/day | 1.00 | 0.85 | 0.75 | 0.75 |
| <8 hours/day | 0.75 | 0.65 | 0.65 | 0.55 |
| <16 hours/day | 0.70 | 0.60 | 0.55 | 0.40 |
| <24 hours/day | 0.65 | 0.55 | 0.40 | 0.35 |

Gearbox Maintenance & Lubrication

Nidec Drive Technology Corporation TwinGear helical bevel gearboxes are supplied lubricated unless requested otherwise. For operating temperatures up to 80°C, we recommend the use of mineral hypoid gear oil API GL-4 to MIL-L-2105-A specification. For operating temperatures up to 95°C, we recommend the use of synthetic gear oils based on Poly-Alpha-Olefins (PAO) and for temperatures of up to 120°C, polyglycol-based synthetic gear oils to ISO VG-Class 150 (DIN 51519) or CLP DIN 51517 specification. In case of high temperatures, special seals must be specified.

The first oil change must be carried out after 500 operating hours. Draining the oil should take place immediately after the unit has been shut down, while the oil is still warm. Further oil changes are recommended every 5,000 operating hours and time intervals should not exceed 18 months. Oil drain plugs are fitted on all sides of the gearbox except the input side. Before re-filling, please ensure that all drain plugs have been inserted and tightened with the exception of the oil filling screw. In cases of doubt, please use new oil seals. When changing oil, we recommend that you fill the gear unit with the type of oil previously used. In particular, synthetic oils must not be mixed with mineral oils or other oil variants. When changing from mineral oil to synthetic oil, the gearbox must be rinsed thoroughly with the new oil type.

Upon request, gearboxes can be supplied with a lubricant indicator (oil sight glass, angular oil level indicator, oil dipstick). This requires details about mounting position and speed. Gearboxes without a lubricant indicator can be filled with the recommended average quantity of oil when speeds are low and the gearbox is installed pointing upwards. If the gearbox has a lubricant indicator, filling can be carried out precisely. The middle of the oil sight glass indicates the minimum fill level, whereas the maximum fill level is reached when an air bubble above the oil is still visible in the sight glass.

The condition of the gearbox, especially the leak tightness and the oil level must be checked regularly. Shaft seals which leak must be replaced to ensure operational safety. Please contact us for more detailed disassembly and lubrication instructions as well as lubricant options. Service kits with wear parts are available from our service department. Our products can also be sent back to the factory for inspection and lubrication.

Oil Quantities

| Frame Size | 10 | 20 | 30 | 35 | 40 | 50 | 60 | 70 |
|-------------------------------|-----|------|-----|-----|-----|-----|------|------|
| Average Oil Quantity (liters) | 0.3 | 0.6 | 1 | 1.9 | 3 | 5 | 9.5 | 21 |
| Maximum Oil Capacity (liters) | 0.4 | 0.75 | 1.5 | 2.7 | 4.5 | 6.5 | 13.5 | 32.5 |

* Oil quantity is dependent on ratio, speed, shaft arrangement and installation position.