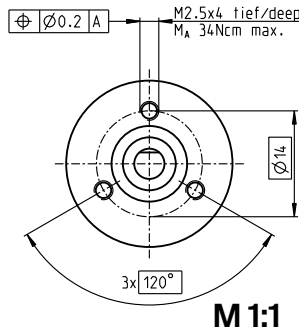
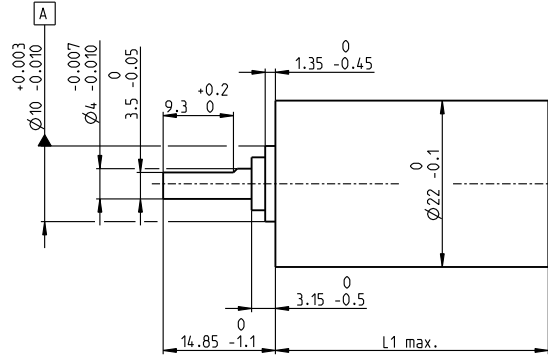


Planetary Gearhead GP 22 C $\varnothing 22$ mm, 0.5–2.0 Nm

Ceramic Version



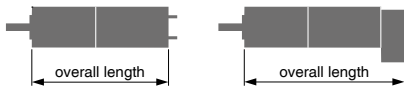
Technical Data

| | |
|--|---------------------------|
| Planetary Gearhead | straight teeth |
| Output shaft | stainless steel, hardened |
| Bearing at output | ball bearing |
| Radial play, 10 mm from flange | max. 0.2 mm |
| Axial play | max. 0.2 mm |
| Max. axial load (dynamic) | 100 N |
| Max. force for press fits | 100 N |
| Direction of rotation, drive to output | = |
| Max. continuous input speed | 8000 rpm |
| Recommended temperature range | -40...+100°C |
| Number of stages | 1 2 3 4 5 |
| Max. radial load, 10 mm from flange | 30 N 50 N 55 N 55 N 55 N |

gear

| Gearhead Data | Part Numbers | | | | | | | | | | |
|---|----------------------|-------------|-----------|--------------|---------------|----------------|-----------------|-----------------|------------------|------------------|---------------|
| | 143971 | 143974 | 143980 | 143986 | 143990 | 143996 | 144002 | 144004 | 144011 | 144017 | 144023 |
| 1 Reduction | 3.8:1 | 14:1 | 53:1 | 104:1 | 198:1 | 370:1 | 590:1 | 742:1 | 1386:1 | 1996:1 | 3189:1 |
| 2 Absolute reduction | 15/4 | 225/16 | 3375/64 | 87723/645 | 50625/256 | 10556001/28561 | 59049/100 | 759375/1024 | 158340015/114244 | 285012027/142805 | 1594323/500 |
| 3 Max. motor shaft diameter | mm 4 | 4 | 4 | 3.2 | 4 | 3.2 | 4 | 4 | 3.2 | 3.2 | 4 |
| Part Numbers | 143972 | 143975 | 143981 | 143987 | 143991 | 143997 | 144003 | 144006 | 144012 | 144018 | 144024 |
| 1 Reduction | 4.4:1 | 16:1 | 62:1 | 109:1 | 231:1 | 389:1 | 690:1 | 867:1 | 1460:1 | 2102:1 | 3728:1 |
| 2 Absolute reduction | 57/13 | 85/62 | 12825/208 | 2187/20 | 192375/832 | 263169/676 | 1121931/1625 | 2885625/3328 | 3947535/2704 | 7105563/3380 | 30292137/8125 |
| 3 Max. motor shaft diameter | mm 3.2 | 3.2 | 3.2 | 4 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Part Numbers | 143973 | 143976 | 143982 | 143988 | 143992 | 143998 | 144005 | 144007 | 144013 | 144019 | 144025 |
| 1 Reduction | 5.4:1 | 19:1 | 72:1 | 128:1 | 270:1 | 410:1 | 850:1 | 1014:1 | 1538:1 | 2214:1 | 4592:1 |
| 2 Absolute reduction | 27/5 | 3249/169 | 48735/676 | 41553/325 | 731025/2704 | 6561/16 | 531441/625 | 10965375/10816 | 98415/64 | 177147/80 | 14348907/3125 |
| 3 Max. motor shaft diameter | mm 2.5 | 3.2 | 3.2 | 3.2 | 4 | 2.5 | 3.2 | 4 | 4 | 4 | 2.5 |
| Part Numbers | 143977 | 143983 | 143989 | 143993 | 143999 | 144008 | 144014 | 144020 | | | |
| 1 Reduction | 20:1 | 76:1 | 157:1 | 285:1 | 455:1 | 1068:1 | 1621:1 | 2458:1 | | | |
| 2 Absolute reduction | 81/4 | 1215/16 | 19683/125 | 18225/64 | 5000211/10985 | 273375/256 | 601692057/31293 | 139005697/54925 | | | |
| 3 Max. motor shaft diameter | mm 4 | 4 | 2.5 | 4 | 3.2 | 4 | 3.2 | 3.2 | | | |
| Part Numbers | 143978 | 143984 | | 143994 | 144000 | 144009 | 144015 | 144021 | | | |
| 1 Reduction | 24:1 | 84:1 | | 316:1 | 479:1 | 1185:1 | 1707:1 | 2589:1 | | | |
| 2 Absolute reduction | 1539/65 | 185193/2197 | | 2777895/8788 | 124659/260 | 41668425/35152 | 15000633/6788 | 3365793/300 | | | |
| 3 Max. motor shaft diameter | mm 3.2 | 3.2 | | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | | | |
| Part Numbers | 143979 | 143985 | | 143995 | 144001 | 144010 | 144016 | 144022 | | | |
| 1 Reduction | 29:1 | 89:1 | | 333:1 | 561:1 | 1249:1 | 1798:1 | 3027:1 | | | |
| 2 Absolute reduction | 729/25 | 4617/52 | | 69255/208 | 2368521/4225 | 1038825/632 | 373977/208 | 63950067/21125 | | | |
| 3 Max. motor shaft diameter | mm 2.5 | 3.2 | | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | | | |
| 4 Number of stages | 1 | 2 | 3 | 4 | 4 | 5 | 5 | 5 | | | |
| 5 Max. continuous torque | Nm 0.5 | 0.6 | 1.2 | 1.2 | 1.8 | 1.8 | 2.0 | 2.0 | | | |
| 6 Max. intermittent torque at gear output | Nm 0.8 | 0.9 | 1.9 | 1.9 | 2.7 | 2.7 | 3.0 | 3.0 | | | |
| 7 Max. efficiency | % 84 | 70 | 59 | 59 | 49 | 49 | 42 | 42 | | | |
| 8 Weight | g 42 | 55 | 68 | 68 | 81 | 81 | 81 | 94 | | | |
| 9 Average backlash no load | ° 1.0 | 1.2 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | | | |
| 10 Mass inertia | gcm ² 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | | | |
| 11 Gearhead length L1* | mm 25.4 | 32.2 | 39.0 | 39.0 | 45.8 | 45.8 | 45.8 | 52.6 | | | |

*L1 is -2.8 mm for calculating the overall length

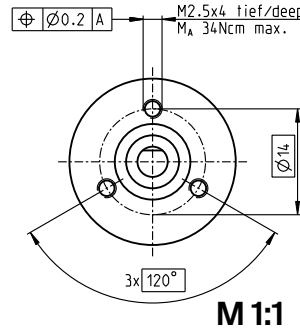
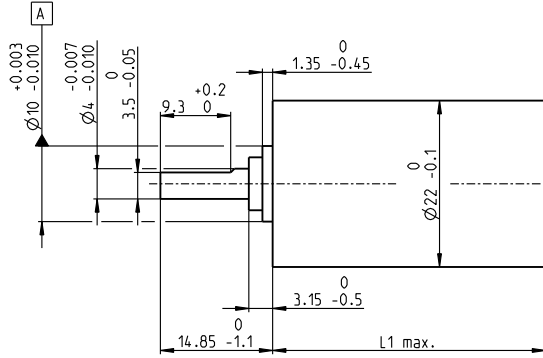


| maxon Modular System | | | | | | | | | | | |
|----------------------|---------|----------------|---------|--|------|------|------|------|------|------|------|
| + Motor | Page | + Sensor/Brake | Page | Overall length [mm] = Motor length + gearhead length + (sensor/brake) + assembly parts | | | | | | | |
| A-max 19 | 163/164 | | | 51.6 | 58.4 | 65.2 | 65.2 | 72.0 | 72.0 | 78.8 | 78.8 |
| A-max 19, 1.5 W | 164 | MR | 475/476 | 56.7 | 63.5 | 70.3 | 70.3 | 77.1 | 77.1 | 77.1 | 83.9 |
| A-max 19, 1.5 W | 164 | Enc 22 | 483 | 66.0 | 72.8 | 79.6 | 79.6 | 86.4 | 86.4 | 86.4 | 93.2 |
| A-max 19, 2.5 W | 165/166 | | | 54.2 | 61.0 | 67.8 | 67.8 | 74.6 | 74.6 | 81.4 | 81.4 |
| A-max 19, 2.5 W | 166 | MR | 475/476 | 58.5 | 65.3 | 72.1 | 72.1 | 78.9 | 78.9 | 85.7 | 85.7 |
| A-max 19, 2.5 W | 166 | Enc 22 | 483 | 68.6 | 75.4 | 82.2 | 82.2 | 89.0 | 89.0 | 95.8 | 95.8 |
| A-max 22 | 167-170 | | | 54.6 | 61.4 | 68.2 | 68.2 | 75.0 | 75.0 | 81.8 | 81.8 |
| A-max 22 | 168/170 | MR | 475/476 | 59.6 | 66.4 | 73.2 | 73.2 | 80.0 | 80.0 | 86.8 | 86.8 |
| A-max 22 | 168/170 | Enc 22 | 483 | 69.0 | 75.8 | 82.6 | 82.6 | 89.4 | 89.4 | 96.2 | 96.2 |

Planetary Gearhead GP 22 C Ø22 mm, 0.5–2.0 Nm

Ceramic Version

gear

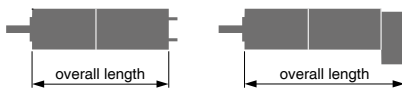


Technical Data

| | |
|--|---------------------------|
| Planetary Gearhead | straight teeth |
| Output shaft | stainless steel, hardened |
| Bearing at output | ball bearing |
| Radial play, 10 mm from flange | max. 0.2 mm |
| Axial play | max. 0.2 mm |
| Max. axial load (dynamic) | 100 N |
| Max. force for press fits | 100 N |
| Direction of rotation, drive to output | = |
| Max. continuous input speed | 8000 rpm |
| Recommended temperature range | -40...+100°C |
| Number of stages | 1 2 3 4 5 |
| Max. radial load, 10 mm from flange | 30 N 50 N 55 N 55 N 55 N |

| | Part Numbers | | | | | | | | | | |
|---|----------------------|----------|-------------|-----------|--------------|----------------|--------------|----------------|------------------|------------------|---------------|
| | 143971 | 143974 | 143980 | 143986 | 143990 | 143996 | 144002 | 144004 | 144011 | 144017 | 144023 |
| Gearhead Data | | | | | | | | | | | |
| 1 Reduction | 3.8:1 | 14:1 | 53:1 | 104:1 | 198:1 | 370:1 | 590:1 | 742:1 | 1386:1 | 1996:1 | 3189:1 |
| 2 Absolute reduction | 15/4 | 225/16 | 3375/64 | 87723/845 | 50625/256 | 10556001/28561 | 59049/100 | 759375/1024 | 158340015/114244 | 285012027/142805 | 1594323/500 |
| 3 Max. motor shaft diameter | mm 4 | 4 | 4 | 3.2 | 4 | 3.2 | 4 | 4 | 3.2 | 3.2 | 4 |
| Part Numbers | 143972 | 143975 | 143981 | 143987 | 143991 | 143997 | 144003 | 144006 | 144012 | 144018 | 144024 |
| 1 Reduction | 4.4:1 | 16:1 | 62:1 | 109:1 | 231:1 | 389:1 | 690:1 | 867:1 | 1460:1 | 2102:1 | 3728:1 |
| 2 Absolute reduction | 57/13 | 855/52 | 12825/208 | 2187/20 | 192375/632 | 263169/676 | 1121931/1625 | 2885625/3328 | 3947535/2704 | 7105565/3380 | 30292137/8125 |
| 3 Max. motor shaft diameter | mm 3.2 | 3.2 | 3.2 | 4 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Part Numbers | 143973 | 143976 | 143982 | 143988 | 143992 | 143998 | 144005 | 144007 | 144013 | 144019 | 144025 |
| 1 Reduction | 5.4:1 | 19:1 | 72:1 | 128:1 | 270:1 | 410:1 | 850:1 | 1014:1 | 1538:1 | 2214:1 | 4592:1 |
| 2 Absolute reduction | 27/5 | 3249/169 | 48735/676 | 41553/325 | 731025/2704 | 6561/16 | 531441/625 | 10965375/10816 | 98415/64 | 177147/80 | 14348907/3125 |
| 3 Max. motor shaft diameter | mm 2.5 | 3.2 | 3.2 | 3.2 | 3.2 | 4 | 2.5 | 3.2 | 4 | 4 | 2.5 |
| Part Numbers | 143977 | 143983 | 143989 | 143993 | 143999 | | 144008 | 144014 | 144020 | | |
| 1 Reduction | | 20:1 | 76:1 | 157:1 | 285:1 | 455:1 | | 1068:1 | 1621:1 | 2458:1 | |
| 2 Absolute reduction | | 81/4 | 1215/16 | 19683/125 | 18225/64 | 5000211/10985 | | 273375/256 | 601692057/371293 | 135005697/54925 | |
| 3 Max. motor shaft diameter | | mm 4 | 4 | 2.5 | 4 | 3.2 | | 4 | 3.2 | 3.2 | |
| Part Numbers | 143978 | 143984 | | 143994 | 144000 | | 144009 | 144015 | 144021 | | |
| 1 Reduction | | 24:1 | 84:1 | | 316:1 | 479:1 | | 1185:1 | 1707:1 | 2589:1 | |
| 2 Absolute reduction | | 1539/65 | 185193/2197 | | 2777895/8788 | 124659/260 | | 41668425/35152 | 15000633/8788 | 3365793/1300 | |
| 3 Max. motor shaft diameter | | mm 3.2 | 3.2 | | 3.2 | 3.2 | | 3.2 | 3.2 | 3.2 | |
| Part Numbers | 143979 | 143985 | | 143995 | 144001 | | 144010 | 144016 | 144022 | | |
| 1 Reduction | | 29:1 | 89:1 | | 333:1 | 561:1 | | 1249:1 | 1798:1 | 3027:1 | |
| 2 Absolute reduction | | 729/25 | 4617/52 | | 69255/208 | 2368521/4225 | | 1038825/832 | 373977/208 | 63950067/21125 | |
| 3 Max. motor shaft diameter | | mm 2.5 | 3.2 | | 3.2 | 3.2 | | 3.2 | 3.2 | 3.2 | |
| 4 Number of stages | 1 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 |
| 5 Max. continuous torque | Nm 0.5 | 0.6 | 1.2 | 1.2 | 1.8 | 1.8 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 |
| 6 Max. intermittent torque at gear output | Nm 0.8 | 0.9 | 1.9 | 1.9 | 2.7 | 2.7 | 2.7 | 3.0 | 3.0 | 3.0 | 3.0 |
| 7 Max. efficiency | % 84 | 70 | 59 | 59 | 49 | 49 | 49 | 42 | 42 | 42 | 42 |
| 8 Weight | g 42 | 55 | 68 | 68 | 81 | 81 | 81 | 94 | 94 | 94 | 94 |
| 9 Average backlash no load | ° 1.0 | 1.2 | 1.6 | 1.6 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 10 Mass inertia | gcm ² 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| 11 Gearhead length L1* | mm 25.4 | 32.2 | 39.0 | 39.0 | 45.8 | 45.8 | 45.8 | 52.6 | 52.6 | 52.6 | 52.6 |

*for EC-max 16 L1 is -2.8 mm



| maxon Modular System | | | | | | | | | | | |
|-----------------------|------|----------------|------|--|-------|-------|-------|-------|-------|-------|-------|
| + Motor | Page | + Sensor/Brake | Page | Overall length [mm] = Motor length + gearhead length + (sensor/brake) + assembly parts | | | | | | | |
| EC-max 16, 8 W | 247 | | | 58.7 | 65.5 | 72.3 | 72.3 | 79.1 | 79.1 | 85.9 | 85.9 |
| EC-max 16, 8 W | 247 | MR | 477 | 66.0 | 72.8 | 79.6 | 79.6 | 86.4 | 86.4 | 93.2 | 93.2 |
| EC-max 22, 12 W | 248 | | | 57.5 | 64.3 | 71.1 | 71.1 | 77.9 | 77.9 | 84.7 | 84.7 |
| EC-max 22, 12 W | 248 | MR | 477 | 67.1 | 73.9 | 80.7 | 80.7 | 87.5 | 87.5 | 94.3 | 94.3 |
| EC-max 22, 12 W | 248 | AB 20 | 532 | 93.1 | 99.9 | 106.7 | 106.7 | 113.5 | 113.5 | 120.3 | 120.3 |
| EC-max 22, 25 W | 249 | | | 74.0 | 80.8 | 87.6 | 87.6 | 94.4 | 94.4 | 101.2 | 101.2 |
| EC-max 22, 25 W | 249 | MR | 477 | 83.6 | 90.4 | 97.2 | 97.2 | 104.0 | 104.0 | 110.8 | 110.8 |
| EC-max 22, 25 W | 249 | AB 20 | 532 | 109.6 | 116.4 | 123.2 | 123.2 | 130.0 | 130.0 | 136.8 | 136.8 |
| EC 20 flat, 3 W, A | 287 | | | 33.1 | 39.9 | 46.7 | 46.7 | 53.5 | 53.5 | 60.3 | 60.3 |
| EC 20 flat, 3 W, B | 287 | | | 32.5 | 39.3 | 46.1 | 46.1 | 52.9 | 52.9 | 59.7 | 59.7 |
| EC 20 flat, 5 W | 288 | | | 36.7 | 43.5 | 50.3 | 50.3 | 57.1 | 57.1 | 63.9 | 63.9 |
| EC 20 flat, IE, IP 00 | 289 | | | 39.7 | 46.5 | 53.3 | 53.3 | 60.1 | 60.1 | 66.9 | 66.9 |
| EC 20 flat, IE, IP 40 | 289 | | | 40.8 | 47.6 | 54.4 | 54.4 | 61.2 | 61.2 | 68.0 | 68.0 |
| EC 20 flat, IE, IP 00 | 290 | | | 43.7 | 50.5 | 57.3 | 57.3 | 64.1 | 64.1 | 70.9 | 70.9 |
| EC 20 flat, IE, IP 40 | 290 | | | 44.8 | 51.6 | 58.4 | 58.4 | 65.2 | 65.2 | 72.0 | 72.0 |
| EC 32 flat, 6 W | 291 | | | 39.8 | 46.6 | 53.4 | 53.4 | 60.2 | 60.2 | 67.0 | 67.0 |