



MSS Series

Square output flange
Straight type gearbox, Standard



MAS Series

Square output flange
Right-angle type gearbox, Standard

MSS / MAS

- Best-in-class backlash
- High output torque
- Low noise level
- High efficiency
- Maintenance free
- Balanced motor pinion
- Gear ratios available from 3:1 up to 200:1
- No need to replace lubrication to expand the lifespan

| | | MSS | | | | | |
|-------|------------|-----|-----|-----|-----|-----|-----|
| Stage | Gear ratio | 045 | 060 | 090 | 115 | 142 | 180 |
| 1A | 3~10 | ○ | ○ | ○ | ○ | ○ | ○ |
| 2B | 15~100 | ⊗ | ○ | ○ | ○ | ○ | ○ |
| 2A | 15~100 | ○ | ○ | ○ | ○ | ○ | ○ |
| 1M/2M | 3~100 | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ | ⊗ |

| | | MAS | | | | | |
|-------|------------|-----|-----|-----|-----|-----|-----|
| Stage | Gear ratio | 045 | 060 | 090 | 115 | 142 | 180 |
| 1A | 3~10 | ○ | ○ | ○ | ○ | ○ | ○ |
| | 14, 20 | ⊗ | ○ | ○ | ○ | ○ | ○ |
| 2B | 15, 20 | ⊗ | ⊗ | ⊗ | ⊗ | - | - |
| | 25~100 | ⊗ | ○ | ○ | ○ | ○ | ○ |
| | 120~200 | ⊗ | ⊗ | ○ | ○ | ○ | ○ |
| 2A | 15, 20 | ○ | ⊗ | ⊗ | ⊗ | - | - |
| | 25~100 | ○ | ○ | ○ | ○ | ○ | ○ |
| | 120~200 | ⊗ | ○ | ○ | ○ | ○ | ○ |
| 1M/2M | 3~200 | ⊗ | ⊗ | ⊗ | ⊗ | - | - |

○ : Standard, △: Custom made, ⊗ : Contact sales person.

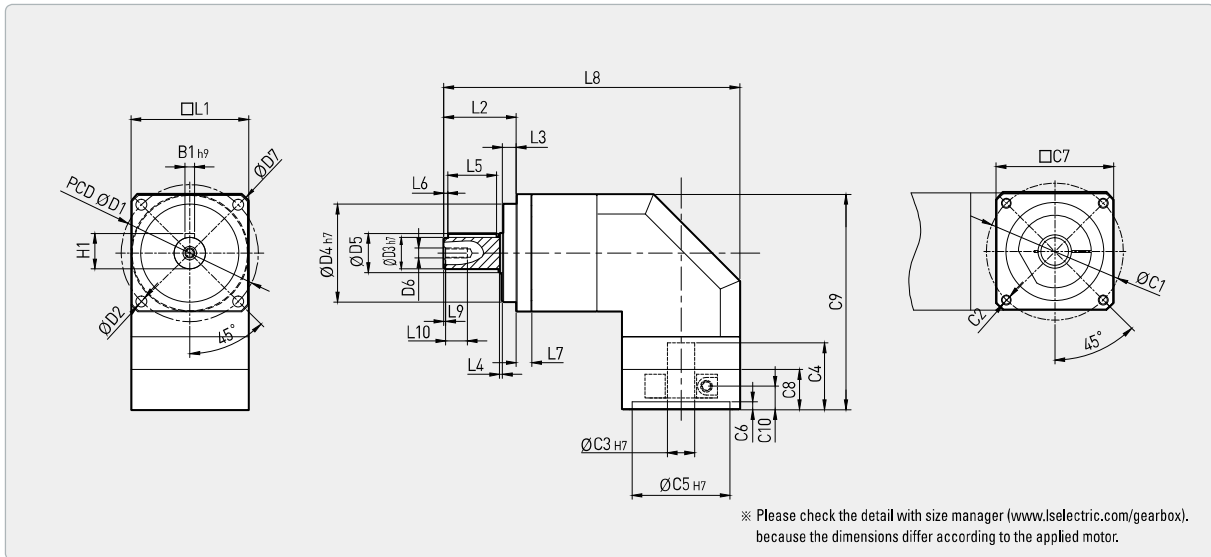


| Division | Stage | Gear ratio | 045 | 060 | 090 | 115 | 142 | 180 |
|--------------------------------|-------|------------|--|--------|-------|--------|--------|--------|
| Nominal Output Torque (Nm) | 1 | 3 | 20 | 57 | 148 | 272 | 484 | 897 |
| | | 4 | 18 | 51 | 143 | 295 | 549 | 1,060 |
| | | 5 | 19 | 54 | 160 | 332 | 634 | 1,195 |
| | | 6 | 18 | 50 | 151 | 311 | 592 | 1,109 |
| | | 7 | 17 | 48 | 145 | 305 | 562 | 1,104 |
| | | 8 | 16 | 44 | 132 | 279 | 527 | 1,035 |
| | | 9 | 14 | 42 | 123 | 254 | 483 | 947 |
| | | 10 | 14 | 42 | 121 | 262 | 500 | 980 |
| | | 14 | - | 44 | 145 | 305 | 562 | 1,104 |
| | | 15 | 14 | - | - | - | - | - |
| | 20 | 14 | 42 | 121 | 262 | 500 | 980 | |
| | 2 | 25 | 19 | 54 | 160 | 332 | 634 | 1,195 |
| | | 30 | 18 | 50 | 151 | 311 | 592 | 1,109 |
| | | 35 | 17 | 48 | 145 | 305 | 562 | 1,104 |
| | | 40 | 16 | 44 | 132 | 279 | 527 | 1,035 |
| | | 45 | 14 | 42 | 123 | 254 | 483 | 947 |
| | | 50 | 19 | 54 | 160 | 332 | 634 | 1,195 |
| | | 60 | 18 | 50 | 151 | 311 | 592 | 1,109 |
| | | 70 | 17 | 48 | 145 | 305 | 562 | 1,104 |
| | | 80 | 16 | 44 | 132 | 279 | 527 | 1,035 |
| 90 | | 14 | 42 | 123 | 254 | 483 | 947 | |
| 100 | 14 | 42 | 121 | 262 | 500 | 980 | | |
| 120 | - | - | 151 | 311 | 592 | 1,109 | | |
| 140 | - | - | 145 | 305 | 562 | 1,104 | | |
| 160 | - | - | 132 | 279 | 527 | 1,035 | | |
| 180 | - | - | 123 | 254 | 483 | 947 | | |
| 200 | - | - | 121 | 262 | 500 | 980 | | |
| Emergency Stop Torque (Nm) | - | - | 3 times nominal output torque | | | | | |
| Nominal Input Speed (rpm) | - | - | 5,000 | 5,000 | 4,000 | 4,000 | 3,000 | 3,000 |
| Max. Input Speed (rpm) | - | - | 10,000 | 10,000 | 8,000 | 8,000 | 6,000 | 6,000 |
| Torsional Rigidity (Nm/Arcmin) | - | - | 3 | 7 | 14 | 26 | 55 | 143 |
| Max. Radial Load (N) | - | - | 750 | 1,280 | 3,200 | 6,800 | 9,300 | 15,100 |
| Max. Axial Load (N) | - | - | 390 | 690 | 1,600 | 3,400 | 4,500 | 7,500 |
| Backlash (Arcmin) | S | 1 | ≤ 8 | ≤ 8 | ≤ 8 | ≤ 8 | ≤ 8 | ≤ 8 |
| | | 2 | ≤ 11 | ≤ 11 | ≤ 11 | ≤ 11 | ≤ 11 | ≤ 11 |
| Service Life (Hrs) | - | - | 20,000 (10,000 under continuous operation) | | | | | |
| Efficiency (%) | 1 | - | ≥ 95 | | | | | |
| | 2 | - | ≥ 92 | | | | | |
| Weight (kg) | 1A | - | ≤ 0.9 | ≤ 1.5 | ≤ 6.0 | ≤ 12.0 | ≤ 24.0 | ≤ 51.0 |
| | 2A | - | ≤ 1.2 | ≤ 2.0 | ≤ 7.5 | ≤ 13.5 | ≤ 26.0 | ≤ 54.0 |
| | 2B | - | - | ≤ 1.9 | ≤ 7.3 | ≤ 12.8 | ≤ 25.0 | ≤ 53.0 |
| Operating Temp (°C) | 1,2 | - | -10 ~ 90 | | | | | |
| Lubrication | - | - | Grease (VIGO Grease RE #0) | | | | | |
| Degree of Gearbox Protection | - | - | IP65 | | | | | |
| Noise (dB) | - | - | ≤ 58 | ≤ 60 | ≤ 63 | ≤ 66 | ≤ 69 | ≤ 72 |
| Inertia (kgcm ²) | 1A | 3~10 | 0.09 | 0.36 | 2.27 | 6.88 | 23.50 | 69.2 |
| | | 14, 20 | - | 0.08 | 1.89 | 6.23 | 21.75 | 66.3 |
| | | 15, 20 | - | - | - | - | - | - |
| | 2B | 25~100 | - | 0.09 | 0.36 | 2.27 | 6.88 | 23.5 |
| | | 120~200 | - | - | 0.32 | 1.89 | 6.23 | 21.75 |
| | 2A | 15, 20 | 0.09 | - | - | - | - | - |
| 25~100 | | 0.09 | 0.36 | 2.27 | 6.88 | 23.50 | 69.2 | |
| 120~200 | - | - | 1.89 | 6.23 | 21.75 | 66.3 | | |

(1) Considering safety factors, nominal output torque is calculated. (2) Max. output torque is equivalent to 60% of the emergency stop torque.

Single Stage

Drawing of Planetary Gearbox



| Dimension | MAS0451A | MAS0601A | MAS0901A | MAS1151A | MAS1421A | MAS1801A |
|-----------|-----------|-----------|------------|-------------|-------------|-------------|
| D1 | 50 | 70 | 100 | 130 | 165 | 215 |
| D2 | 3.5 | 5.5 | 6.8 | 8.7 | 11 | 13 |
| D3 h7 | 13 | 16 | 22 | 32 | 40 | 55 |
| D4 h7 | 35 | 50 | 80 | 110 | 130 | 160 |
| D5 | 15 | 20 | 30 | 39.5 | 60 | 75 |
| D6 | M4 X 0.7P | M5 X 0.8P | M8 X 1.25P | M12 X 1.75P | M16 X 2.0P | M20 X 2.5P |
| D7 | 58 | 80 | 116 | 152 | 185 | 240 |
| L1 | 45 | 60 | 90 | 115 | 142 | 180 |
| L2 | 26.5 | 37 | 48 | 64 | 97 | 105 |
| L3 | 5.5 | 7 | 10 | 12 | 15 | 20 |
| L4 | 1 | 1.5 | 1.5 | 2 | 3 | 3 |
| L5 | 15 | 25 | 32 | 40 | 65 | 70 |
| L6 | 2 | 2 | 3 | 5 | 5 | 6 |
| L7 | 6.5 | 8 | 11 | 12 | 19 | 18 |
| * L8 | 114 | 151.2 | 203 | 270 | 333 | 375.5 |
| L9 | 1.5 | 1.5 | 1.5 | 2 | 2 | 2 |
| L10 | 9.5 | 10.5 | 13.5 | 18 | 34 | 42 |
| * C1 | 46 | 70 | 90 | 145 | 200 | 200 |
| * C2 | M4 X 0.7P | M5 X 0.8P | M6 X 1.0P | M8 X 1.25P | M12 X 1.75P | M12 X 1.75P |
| * C3 H7 | 8 (14) | 14 (19) | 19 (24) | 24 (35) | 35 (42) | 42 (55) |
| * C4 | 26.5 | 34 | 43.1 | 62 | 82 | 86 |
| * C5 H7 | 30 | 50 | 70 | 110 | 114.3 | 114.3 |
| * C6 | 4 | 4 | 6 | 7 | 7 | 7 |
| * C7 | 45 | 60 | 90 | 132 | 180 | 180 |
| * C8 | 17 | 20.5 | 23.5 | 42 | 47 | 47 |
| * C9 | 83 | 110 | 152 | 200 | 240 | 288 |
| * C10 | 10 | 12 | 13.4 | 28 | 29.5 | 28.5 |
| B1 h9 | 5 | 5 | 6 | 10 | 12 | 16 |
| H1 | 15 | 18 | 24.5 | 35 | 43 | 59 |

(1) C1-C10 is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in www.lselectric.com/gearbox.

(2) In XYY, YY means fit tolerance (KS B 0401).

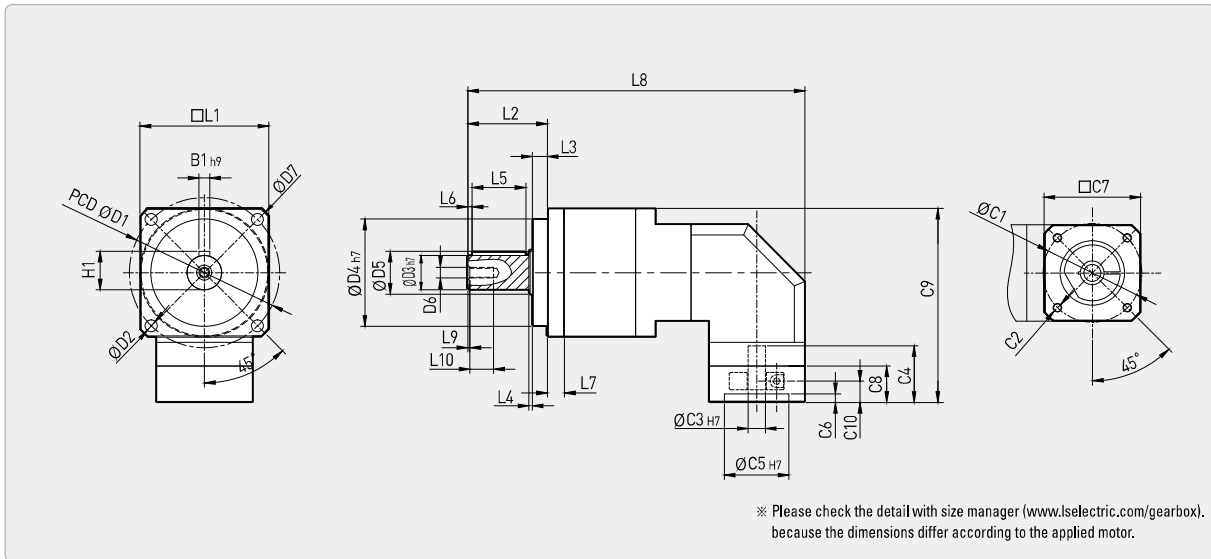
(3) (is M Type-made to order.



MAS Series

Double Stage B Type

Drawing of Planetary Gearbox



| Dimension | MAS0602B | MAS0902B | MAS1152B | MAS1422B | MAS1802B |
|-----------|-----------|------------|-------------|------------|-------------|
| D1 | 70 | 100 | 130 | 165 | 215 |
| D2 | 5.5 | 6.8 | 8.7 | 11 | 13 |
| D3 h7 | 16 | 22 | 32 | 40 | 55 |
| D4 h7 | 50 | 80 | 110 | 130 | 160 |
| D5 | 20 | 30 | 39.5 | 60 | 75 |
| D6 | M5 X 0.8P | M8 X 1.25P | M12 X 1.75P | M16 X 2.0P | M20 X 2.5P |
| D7 | 80 | 116 | 152 | 185 | 240 |
| L1 | 60 | 90 | 115 | 142 | 180 |
| L2 | 37 | 48 | 64 | 97 | 105 |
| L3 | 7 | 10 | 12 | 15 | 20 |
| L4 | 1.5 | 1.5 | 2 | 3 | 3 |
| L5 | 25 | 32 | 40 | 65 | 70 |
| L6 | 2 | 3 | 5 | 5 | 6 |
| L7 | 8 | 11 | 12 | 19 | 18 |
| * L8 | 157 | 205.7 | 275.5 | 367.5 | 441.5 |
| L9 | 1.5 | 1.5 | 2 | 2 | 2 |
| L10 | 10.5 | 13.5 | 18 | 34 | 42 |
| * C1 | 46 | 70 | 90 | 145 | 200 |
| * C2 | M4 X 0.7P | M5 X 0.8P | M6 X 1.0P | M8 X 1.25P | M12 X 1.75P |
| * C3 H7 | 8 (14) | 14 (19) | 19 (24) | 24 (35) | 35 (42) |
| * C4 | 26.5 | 34 | 43.1 | 62 | 82 |
| * C5 H7 | 30 | 50 | 70 | 110 | 114.3 |
| * C6 | 4 | 4 | 6 | 7 | 7 |
| * C7 | 45 | 60 | 90 | 132 | 180 |
| * C8 | 17 | 20.5 | 23.5 | 42 | 47 |
| * C9 | 90.5 | 125 | 164.5 | 213.5 | 259 |
| * C10 | 10 | 12 | 13.4 | 28 | 29.5 |
| B1 h9 | 5 | 6 | 10 | 12 | 16 |
| H1 | 18 | 24.5 | 35 | 43 | 59 |

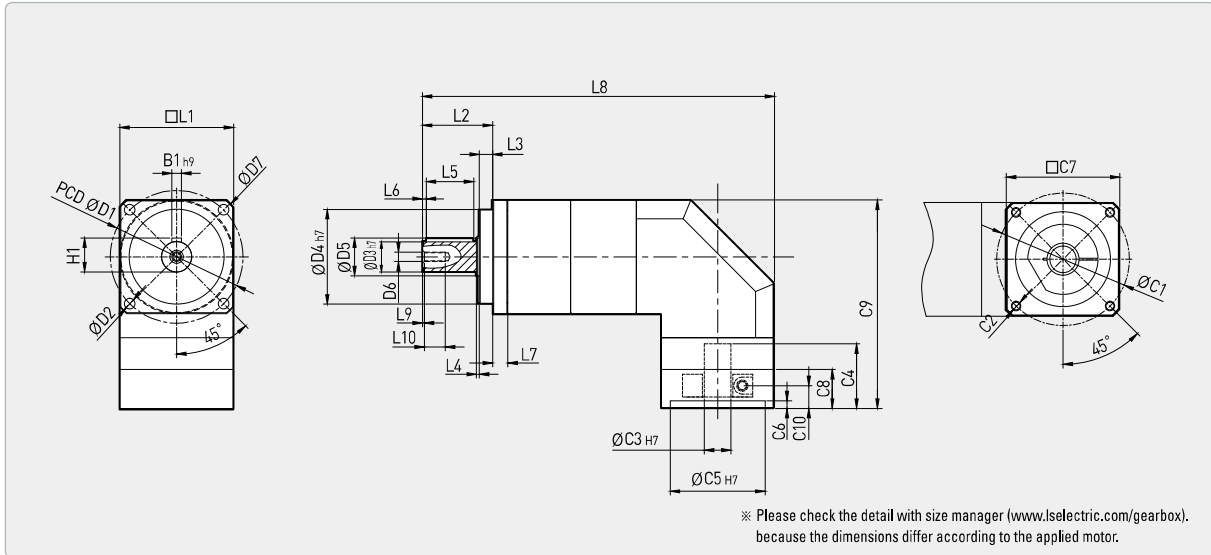
(1) C(C1-C10) is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in www.lselectric.com/gearbox.

(2) In XYY, YY means fit tolerance (KS B 0401).

(3) () is M Type-made to order.

Double Stage A Type

Drawing of Planetary Gearbox



MAS Series

| Dimension | MAS0452A | MAS0602A | MAS0902A | MAS1152A | MAS1422A | MAS1802A |
|-----------|-----------|-----------|------------|-------------|-------------|-------------|
| D1 | 50 | 70 | 100 | 130 | 165 | 215 |
| D2 | 3.5 | 5.5 | 6.8 | 8.7 | 11 | 13 |
| D3 h7 | 13 | 16 | 22 | 32 | 40 | 55 |
| D4 h7 | 35 | 50 | 80 | 110 | 130 | 160 |
| D5 | 15 | 20 | 30 | 39.5 | 60 | 75 |
| D6 | M4 X 0.7P | M5 X 0.8P | M8 X 1.25P | M12 X 1.75P | M16 X 2.0P | M20 X 2.5P |
| D7 | 58 | 80 | 116 | 152 | 185 | 240 |
| L1 | 45 | 60 | 90 | 115 | 142 | 180 |
| L2 | 26.5 | 37 | 48 | 64 | 97 | 105 |
| L3 | 5.5 | 7 | 10 | 12 | 15 | 20 |
| L4 | 1 | 1.5 | 1.5 | 2 | 3 | 3 |
| L5 | 15 | 25 | 32 | 40 | 65 | 70 |
| L6 | 2 | 2 | 3 | 5 | 5 | 6 |
| L7 | 6.5 | 8 | 11 | 12 | 19 | 18 |
| * L8 | 143 | 185.7 | 247 | 295.5 | 392.5 | 441.5 |
| L9 | 1.5 | 1.5 | 1.5 | 2 | 2 | 2 |
| L10 | 9.5 | 10.5 | 13.5 | 18 | 34 | 42 |
| * C1 | 46 | 70 | 90 | 145 | 200 | 200 |
| * C2 | M4 X 0.7P | M5 X 0.8P | M6 X 1.0P | M8 X 1.25P | M12 X 1.75P | M12 X 1.75P |
| * C3 H7 | 8 (14) | 14 (19) | 19 (24) | 24 (35) | 35 (42) | 42 (55) |
| * C4 | 26.5 | 34 | 43.1 | 62 | 82 | 82 |
| * C5 H7 | 30 | 50 | 70 | 110 | 114.3 | 114.3 |
| * C6 | 4 | 4 | 6 | 7 | 7 | 7 |
| * C7 | 45 | 60 | 90 | 132 | 180 | 180 |
| * C8 | 17 | 20.5 | 23.5 | 42 | 47 | 47 |
| * C9 | 83 | 110 | 152 | 184.4 | 232 | 259 |
| * C10 | 10 | 12 | 13.4 | 28 | 29.5 | 28.5 |
| B1 h9 | 5 | 5 | 6 | 10 | 12 | 16 |
| H1 | 15 | 18 | 24.5 | 35 | 43 | 59 |

(1) C1-C10 is dimension for input shaft parts. Dimensions differ by motor types and makers. Find CAD file for exact dimensions of gearbox in www.lselectric.com/gearbox.

(2) In XYY, YY means fit tolerance (KS B 0401).

(3) (is M Type-made to order.