# SUMMARY

Chapter **Contents**



Revisions
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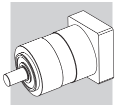
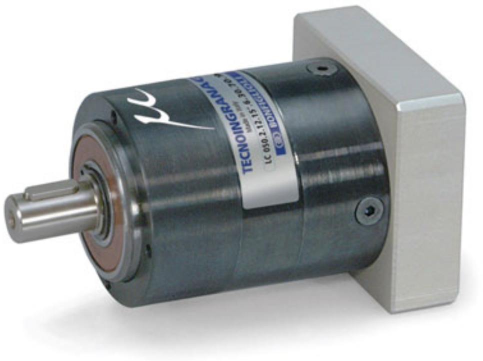


# 1 GENERAL INFORMATION

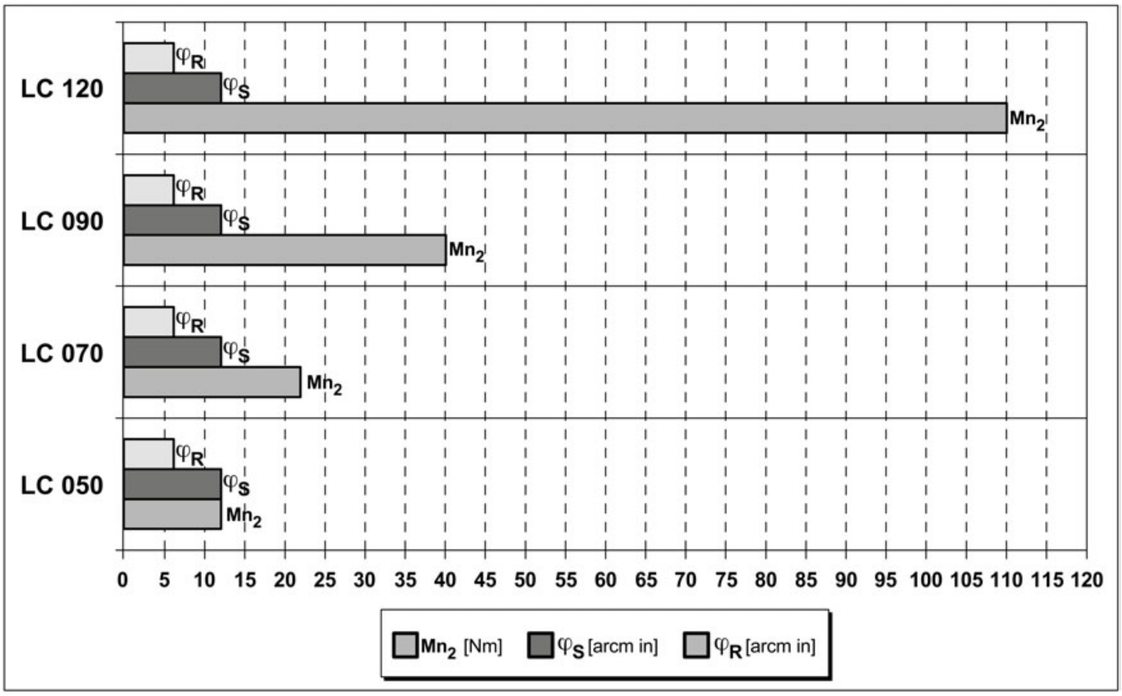
## 1.1 SYMBOLS AND UNITS OF MEASUREMENT

| | | |
|---|---|---|
| $A_n$ | [N] | The **admissible thrust force** can be applied axially to the shaft under study along with the admissible radial force.<br>The catalogue value is calculated for an output speed $n_2$ = 100 min$^{-1}$ |
| $C_t$ | [Nm/arcmin] | **Torsional stiffness** |
| i | - | **Gear ratio** is expressed as the relationship of the input speed to the output speed:<br>$$i = \frac{n_1}{n_2}$$ |
| I | - | **Intermittence** is defined as the relationship of the operating time to the cycle time |
| $f_c$ | - | **Cycle factor**. An adjusting factor that is to be accounted for when selecting gear unit operating under continuous duty S1 |
| $f_Z$ | - | **Service factor** |
| $M_{a2}$ | [Nm] | **Maximum acceleration torque** acceptable for a duty with **I** < 60% |
| $M_{n2}$ | [Nm] | **Nominal output torque** |
| $M_{p2}$ | [Nm] | **Emergency stop torque**. The value cannot apply more than 1000 times over the entire life of the gear unit and should not recur in normal operating conditions |
| $M_r$ | [Nm] | **Reversibility torque**. Minimum torque that is to be applied to output shaft to drive the unit back |
| J | [Kgcm$^2$] | **Mass moment of inertia** of the gear unit |
| $L_{10}$ | [h] | **Average service life of bearings** |
| $n_1$ | [min$^{-1}$] | **Nominal input speed** (continuous duty S1). It is the reference speed for duties with intermittence I ⩾ 60% and/or operating time ⩾ 20 min |
| $n_{1max}$ | [min$^{-1}$] | **Maximum momentary input speed.** The speed the unit can be driven at occasionally and in non-repetitive conditions.<br>For cyclic duty, type S5, it cannot be applied continuously for more than 30 seconds |
| $R_n$ | [N] | The **admissible radial force** must be equal to, or greater than, the radial force actually applying onto the shaft.<br>Catalogue value is based on output speed $n_2$ = 100 min$^{-1}$ |
| $T_c$ | [°C] | **Housing temperature**. Under no circumstances it should exceed 90 °C |
| $\varphi_S$ | [arcmin] | **Standard backlash** is calculated in static conditions and with the application of a torque equal to 2% of the nominal torque for the gear unit |
| $\varphi_R$ | [arcmin] | **Reduced backlash** is calculated in static conditions and with the application of a torque equal to 2% of the nominal torque for the gear unit |
| η | [%] | **Dynamic efficiency** is calculated through the relationship of output torque to torque applied to input shaft under nominal conditions:<br>$$\eta_d = \frac{M_2}{M_1 \times i} \times 100$$ |
| Z | - | **Number** of accelerations/switches per hour |

## 1.2 FEATURES OF LC SERIES

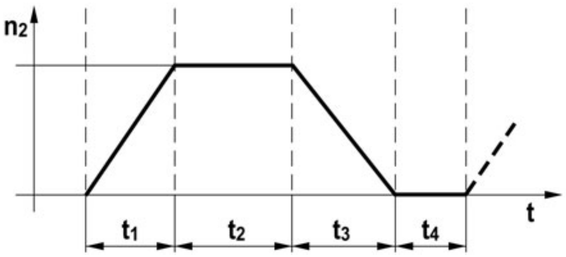



- Available with either standard or reduced backlash
- Rigid ball bearings, suitably rated for an average service life of 20,000 hours under nominal operating conditions
- Units are factory charged with synthetic grease of viscosity ISO VG220 suitable for operation in any mounting position and at ambient temperature in the 0°C…40°C range.
  In the absence of contamination lubricant does not require periodical changes.
- Degree of protection IP64
- Noise level $L_P \leqslant 70$ dB(A) – $n_1 = 3000$ min$^{-1}$
- Numerous input configurations
- Ratio i = 10 available for single-reduction units (i = 9 for frame size 050 alone)



## 1.3 SELECTING THE GEAR UNIT

- Determine intermittence **I** :




$$I\,[\%] = \frac{t_1 + t_2 + t_3}{t_1 + t_2 + t_3 + t_4}$$

$t_1$ = starting time
$t_2$ = operating time at constant speed
$t_3$ = stopping time
$t_4$ = rest time

1) Determine the applicable duty for the application:

| | **Z** ⩽ 1000 | **Z** > 1000 |
|---|---|---|
| I < 60% | S5 | S1 |
| I ⩾ 60% | S1 | S1 |

**S5** **cyclic duty**

2) Search the gear unit for which the condition is verified:

$$M_{a2} \geq M_{1max} \times i \times \eta$$

**S1** **continuous duty**

2) Determine service factor $f_z$:

| **Z** | $f_Z$ |
|---|---|
| Z ⩽ 1000 | 1.00 |
| 1000 < Z ⩽ 1500 | 1.25 |
| 1500 < Z ⩽ 2000 | 1.50 |
| 2000 < Z ⩽ 2500 | 1.75 |
| 2500 < Z ⩽ 3000 | 2.00 |
| Z > 3000 | Contact us |

3) Determine cycle factor $f_c$:

| **I** | 20%...60% | 80% | 100% |
|---|---|---|---|
| $f_c$ | 1.0 | 1.2 | 1.4 |

4) Search the gear unit for which the condition is verified:

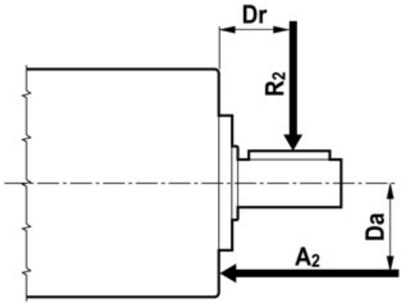
$$M_{n2} \geq M_{1max} \times i \times \eta \times f_z \times f_c$$

$M_{1max}$ = Maximum acceleration torque of motor

⚠ Under no circumstances the maximum speed [$n_{1max}$] permitted for the gear unit should be exceeded. Should the surface temperature exceed 90°C it is recommended that speed is reduced, or an auxiliary cooling system is provided.

## 1.4 SERVICE LIFE OF BEARINGS

Service life of main bearings can be calculated through the equations where actual radial and axial forces are accounted for.

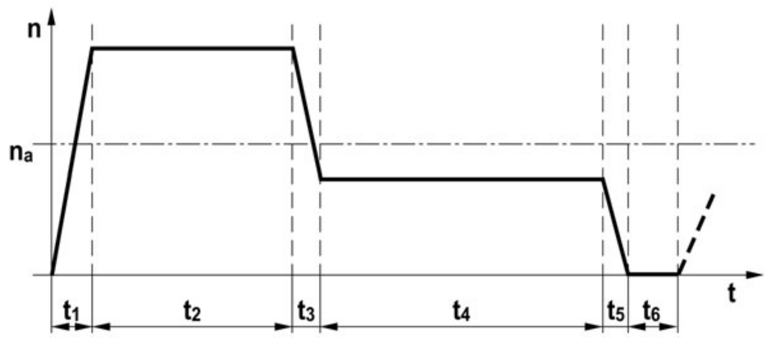



| | | |
|---|---|---|
| **$A_2$** [N] | Offset axial force |
| **$R_2$** [N] | Radial force |
| **Da** [mm] | Distance of axial force from shaft centre |
| **Dr** [mm] | Distance of radial force from mounting flange |

**SERVICE LIFE CALCULATION FOR RIGID BALL BEARINGS**

$$F_{eq} = \frac{A_2 \times D_a + R_2 \times (D_r + b)}{a}$$

$$n_a = \frac{n_1 \times t_1 + n_2 \times t_2 + \dots + n_5 \times t_5}{t_1 + t_2 + t_3 + t_4 + t_5 + t_6}$$




$$L_{10}(h) = \frac{16666}{n_a} \times \left( \frac{c}{F_{eq}} \right)^3$$

| Load location factor | 050 | 070 | 090 | 120 |
|---|---|---|---|---|
| **a** | 13.5 | 17.8 | 18.1 | 23.6 |
| **b** | 16 | 20.3 | 20.6 | 27.6 |
| **c** | 7650 | 15900 | 16800 | 35000 |

**$F_{eq}$** [N] = equivalent force resulting from radial and axial forces applying simultaneously

**$n_a$** [$min^{-1}$] = mean output speed

**$L_{10}(h)$** = theoretical service life of bearings

Calculate **$e = A_2/F_{eq}$**, and check that condition **$e \leqslant 0.19$** is verified.

If **$e > 0.19$** contact our Technical Service.

## 1.5 ORDERING CODE

**LC 090 2 70 15' 14 30 60 75 —**

- **—** (optional variant): **TH**: MOTOR WITH THREADED HOLES
- **75**: PCD OF MOTOR ADAPTER HOLES
- **60**: PILOT DIAMETRE OF MOTOR ADAPTER
- **30**: MOTOR SHAFT LENGHT
- **14**: MOTOR SHAFT DIAMETER

| | LC 050 | LC 070 | LC 090 | LC 120 |
|---|---|---|---|---|
| **D** | 6 - 6.35<br>7 - 8<br>9 - 9.52<br>11 - 12<br>12.7 - 14 | 6 - 6.35<br>7 - 8<br>9 - 9.52<br>11 - 12<br>12.7 - 14 | 9 - 9.52<br>11 - 12<br>12.7 - 14<br>15.875 - 16<br>19 | 12.7 - 14<br>15.875 - 16<br>19 - 22<br>24 - 28<br>32 |

- **15'**: BACKLASH

| | 1-stage | 2-stage |
|---|---|---|
| Standard | **12'** | **15'** |
| Reduced | **6'** | **8'** |

- **70**: GEAR RATIO
- **2**: REDUCTIONS
  **1**, **2**
- **090**: FRAME SIZE
  **050**, **070**, **090**, **120**
- **LC**: SERIES
  **LC**

Optional variant (grey shading)

# 2 TECHNICAL SPECIFICATIONS

## 2.1 LC 050

| LC 050 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i | $M_{n2}$ [Nm] | $M_{a2}$ [Nm] | $M_{p2}$ [Nm] | $M_r$ [Nm] | $n_1$ [$min^{-1}$] | $n_{1max}$ [$min^{-1}$] | $\varphi_S$ [arcmin] | $\varphi_R$ [arcmin] | $C_t$ [Nm/arcmin] | $R_{n2}$ [N] | $A_{n2}$ [N] | η % |
| **LC 050 1_ 3** | 10 | 16 | 28 | 0.3 | 3300 | 4000 | 12' | 6' | 0.9 | 500 | 600 | 97 |
| **LC 050 1_ 4** | 12 | 20 | 30 | 0.3 | 3500 | 5000 | 12' | 6' | 0.9 | 500 | 600 | 97 |
| **LC 050 1_ 5** | 12 | 20 | 30 | 0.3 | 3500 | 5000 | 12' | 6' | 0.9 | 500 | 600 | 97 |
| **LC 050 1_ 7** | 12 | 20 | 30 | 0.3 | 3700 | 5000 | 12' | 6' | 0.9 | 500 | 600 | 97 |
| **LC 050 1_ 9** | 10 | 16 | 28 | 0.3 | 4000 | 6000 | 12' | 6' | 0.9 | 500 | 600 | 97 |
| **LC 050 2_ 12** | 12 | 20 | 30 | 0.5 | 3300 | 4000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 15** | 12 | 20 | 30 | 0.5 | 3300 | 4000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 16** | 12 | 20 | 30 | 0.5 | 3500 | 5000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 20** | 12 | 20 | 30 | 0.5 | 3500 | 5000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 25** | 12 | 20 | 30 | 0.5 | 3500 | 5000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 28** | 12 | 20 | 30 | 0.5 | 3700 | 5000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 35** | 12 | 20 | 30 | 0.5 | 3700 | 5000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 36** | 12 | 20 | 30 | 0.5 | 4000 | 6000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 45** | 12 | 20 | 30 | 0.5 | 4000 | 6000 | 15' | 8' | 0.75 | 500 | 600 | 94 |
| **LC 050 2_ 81** | 10 | 16 | 28 | 0.5 | 4000 | 6000 | 15' | 8' | 0.75 | 500 | 600 | 94 |

## 2.2 LC 070

| LC 070 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i | $M_{n2}$ [Nm] | $M_{a2}$ [Nm] | $M_{p2}$ [Nm] | $M_r$ [Nm] | $n_1$ [$min^{-1}$] | $n_{1max}$ [$min^{-1}$] | $\varphi_S$ [arcmin] | $\varphi_R$ [arcmin] | $C_t$ [Nm/arcmin] | $R_{n2}$ [N] | $A_{n2}$ [N] | η % |
| **LC 070 1_ 3** | 18 | 30 | 60 | 0.4 | 3300 | 4000 | 12' | 6' | 3 | 1300 | 1400 | 97 |
| **LC 070 1_ 4** | 25 | 35 | 70 | 0.4 | 3500 | 5000 | 12' | 6' | 3 | 1300 | 1400 | 97 |
| **LC 070 1_ 5** | 25 | 35 | 70 | 0.4 | 3500 | 5000 | 12' | 6' | 3 | 1300 | 1400 | 97 |
| **LC 070 1_ 7** | 25 | 35 | 70 | 0.4 | 3700 | 5000 | 12' | 6' | 3 | 1300 | 1400 | 97 |
| **LC 070 1_ 10** | 18 | 30 | 60 | 0.4 | 4000 | 6000 | 12' | 6' | 3 | 1300 | 1400 | 97 |
| **LC 070 2_ 9** | 18 | 30 | 60 | 0.6 | 3300 | 4000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 12** | 25 | 35 | 70 | 0.6 | 3300 | 4000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 15** | 25 | 35 | 70 | 0.6 | 3300 | 4000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 16** | 25 | 35 | 70 | 0.6 | 3500 | 5000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 20** | 25 | 35 | 70 | 0.6 | 3500 | 5000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 25** | 25 | 35 | 70 | 0.6 | 3500 | 5000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 28** | 25 | 35 | 70 | 0.6 | 3700 | 5000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 30** | 18 | 30 | 60 | 0.6 | 4000 | 6000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 35** | 25 | 35 | 70 | 0.6 | 3700 | 5000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 40** | 25 | 35 | 70 | 0.6 | 4000 | 6000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 50** | 25 | 35 | 70 | 0.6 | 4000 | 6000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 70** | 25 | 35 | 70 | 0.6 | 4000 | 6000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |
| **LC 070 2_ 100** | 18 | 30 | 60 | 0.6 | 4000 | 6000 | 15' | 8' | 2.5 | 1300 | 1400 | 94 |

## 2.3 LC 090

| LC 090 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i | $M_{n2}$ [Nm] | $M_{a2}$ [Nm] | $M_{p2}$ [Nm] | $M_r$ [Nm] | $n_1$ [min$^{-1}$] | $n_{1max}$ [min$^{-1}$] | $\varphi_S$ [arcmin] | $\varphi_R$ [arcmin] | $C_t$ [Nm/arcmin] | $R_{n2}$ [N] | $A_{n2}$ [N] | $\eta$ % |
| **LC 090 1_ 3** | 37 | 70 | 150 | 0.5 | 2900 | 3500 | 12' | 6' | 7 | 2200 | 1900 | 97 |
| **LC 090 1_ 4** | 43 | 80 | 160 | 0.5 | 3100 | 4500 | 12' | 6' | 7 | 2200 | 1900 | 97 |
| **LC 090 1_ 5** | 43 | 80 | 160 | 0.5 | 3200 | 4500 | 12' | 6' | 7 | 2200 | 1900 | 97 |
| **LC 090 1_ 7** | 43 | 80 | 160 | 0.5 | 3500 | 4500 | 12' | 6' | 7 | 2200 | 1900 | 97 |
| **LC 090 1_ 10** | 37 | 70 | 150 | 0.5 | 4000 | 6000 | 12' | 6' | 7 | 2200 | 1900 | 97 |
| **LC 090 2_ 9** | 37 | 70 | 150 | 0.8 | 2900 | 3500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 12** | 43 | 80 | 160 | 0.8 | 2900 | 3500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 15** | 43 | 80 | 160 | 0.8 | 2900 | 3500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 16** | 43 | 80 | 160 | 0.8 | 3100 | 4500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 20** | 43 | 80 | 160 | 0.8 | 3200 | 4500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 25** | 43 | 80 | 160 | 0.8 | 3200 | 4500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 28** | 43 | 80 | 160 | 0.8 | 3500 | 4500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 30** | 37 | 70 | 150 | 0.8 | 4000 | 6000 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 35** | 43 | 80 | 160 | 0.8 | 3500 | 4500 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 40** | 43 | 80 | 160 | 0.8 | 4000 | 6000 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 50** | 43 | 80 | 160 | 0.8 | 4000 | 6000 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 70** | 43 | 80 | 160 | 0.8 | 4000 | 6000 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |
| **LC 090 2_ 100** | 37 | 70 | 150 | 0.8 | 4000 | 6000 | 15' | 8' | 5.9 | 2200 | 1900 | 94 |

## 2.4 LC 120

| LC 120 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| i | $M_{n2}$ [Nm] | $M_{a2}$ [Nm] | $M_{p2}$ [Nm] | $M_r$ [Nm] | $n_1$ [min$^{-1}$] | $n_{1max}$ [min$^{-1}$] | $\varphi_S$ [arcmin] | $\varphi_R$ [arcmin] | $C_t$ [Nm/arcmin] | $R_{n2}$ [N] | $A_{n2}$ [N] | $\eta$ % |
| **LC 120 1_ 3** | 95 | 160 | 300 | 0.9 | 2500 | 3500 | 12' | 6' | 22 | 3500 | 3000 | 97 |
| **LC 120 1_ 4** | 110 | 190 | 360 | 0.9 | 2800 | 4500 | 12' | 6' | 22 | 3500 | 3000 | 97 |
| **LC 120 1_ 5** | 110 | 190 | 360 | 0.9 | 3000 | 4500 | 12' | 6' | 22 | 3500 | 3000 | 97 |
| **LC 120 1_ 7** | 110 | 190 | 360 | 0.9 | 3000 | 4500 | 12' | 6' | 22 | 3500 | 3000 | 97 |
| **LC 120 1_ 10** | 95 | 160 | 300 | 0.9 | 3500 | 5000 | 12' | 6' | 22 | 3500 | 3000 | 97 |
| **LC 120 2_ 9** | 95 | 160 | 300 | 2.5 | 2500 | 3500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 12** | 110 | 190 | 360 | 2.5 | 2500 | 3500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 15** | 110 | 190 | 360 | 2.5 | 2500 | 3500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 16** | 110 | 190 | 360 | 2.5 | 2800 | 4500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 20** | 110 | 190 | 360 | 2.5 | 3000 | 4500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 25** | 110 | 190 | 360 | 2.5 | 3000 | 4500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 28** | 110 | 190 | 360 | 2.5 | 3000 | 4500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 30** | 95 | 160 | 300 | 2.5 | 3500 | 5000 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 35** | 110 | 190 | 360 | 2.5 | 3000 | 4500 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 40** | 110 | 190 | 360 | 2.5 | 3500 | 5000 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 50** | 110 | 190 | 360 | 2.5 | 3500 | 5000 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 70** | 110 | 190 | 360 | 2.5 | 3500 | 5000 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |
| **LC 120 2_ 100** | 95 | 160 | 300 | 2.5 | 3500 | 5000 | 15' | 8' | 20.5 | 3500 | 3000 | 94 |

## *2.5 MASS MOMENT OF INERTIA*

### *2.5.1 LC 050*

| LC 050 | | |
|---|---|---|
| | **J** [kgcm$^2$] | |
| **i** | D = Ø6...Ø9.52 | D = Ø11...Ø14 |
| **LC 050 1_ 3** | 0.06 | 0.08 |
| **LC 050 1_ 4** | 0.05 | 0.06 |
| **LC 050 1_ 5** | 0.04 | 0.06 |
| **LC 050 1_ 7** | 0.03 | 0.05 |
| **LC 050 1_ 9** | 0.03 | 0.05 |
| **LC 050 2_ 12** | 0.06 | 0.08 |
| **LC 050 2_ 15** | 0.06 | 0.08 |
| **LC 050 2_ 16** | 0.05 | 0.06 |
| **LC 050 2_ 20** | 0.04 | 0.06 |
| **LC 050 2_ 25** | 0.04 | 0.06 |
| **LC 050 2_ 28** | 0.03 | 0.05 |
| **LC 050 2_ 35** | 0.03 | 0.05 |
| **LC 050 2_ 36** | 0.03 | 0.05 |
| **LC 050 2_ 45** | 0.03 | 0.05 |
| **LC 050 2_ 81** | 0.03 | 0.05 |

### *2.5.2 LC 070*

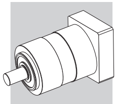
| LC 070 | | |
|---|---|---|
| | **J** [kgcm$^2$] | |
| **i** | D = Ø6...Ø9.52 | D = Ø11...Ø14 |
| **LC 070 1_ 3** | 0.10 | 0.12 |
| **LC 070 1_ 4** | 0.06 | 0.08 |
| **LC 070 1_ 5** | 0.05 | 0.07 |
| **LC 070 1_ 7** | 0.04 | 0.06 |
| **LC 070 1_ 10** | 0.03 | 0.05 |
| **LC 070 2_ 9** | 0.10 | 0.12 |
| **LC 070 2_ 12** | 0.10 | 0.11 |
| **LC 070 2_ 15** | 0.09 | 0.11 |
| **LC 070 2_ 16** | 0.06 | 0.08 |
| **LC 070 2_ 20** | 0.05 | 0.07 |
| **LC 070 2_ 25** | 0.05 | 0.06 |
| **LC 070 2_ 28** | 0.04 | 0.06 |
| **LC 070 2_ 30** | 0.03 | 0.05 |
| **LC 070 2_ 35** | 0.04 | 0.06 |
| **LC 070 2_ 40** | 0.03 | 0.05 |
| **LC 070 2_ 50** | 0.03 | 0.05 |
| **LC 070 2_ 70** | 0.03 | 0.05 |
| **LC 070 2_ 100** | 0.03 | 0.05 |

## 2.5.3 LC 090

| LC 090 | | |
|---|---|---|
| | **J** [kgcm$^2$] | |
| **i** | D = Ø8...Ø12.7 | D = Ø14...Ø19 |
| **LC 090 1_ 3** | 0.56 | 0.65 |
| **LC 090 1_ 4** | 0.37 | 0.46 |
| **LC 090 1_ 5** | 0.30 | 0.39 |
| **LC 090 1_ 7** | 0.24 | 0.33 |
| **LC 090 1_ 10** | 0.20 | 0.29 |
| **LC 090 2_ 9** | 0.51 | 0.60 |
| **LC 090 2_ 12** | 0.49 | 0.58 |
| **LC 090 2_ 15** | 0.48 | 0.57 |
| **LC 090 2_ 16** | 0.33 | 0.42 |
| **LC 090 2_ 20** | 0.28 | 0.37 |
| **LC 090 2_ 25** | 0.27 | 0.36 |
| **LC 090 2_ 28** | 0.23 | 0.32 |
| **LC 090 2_ 30** | 0.20 | 0.29 |
| **LC 090 2_ 35** | 0.23 | 0.31 |
| **LC 090 2_ 40** | 0.20 | 0.29 |
| **LC 090 2_ 50** | 0.20 | 0.29 |
| **LC 090 2_ 70** | 0.20 | 0.29 |
| **LC 090 2_ 100** | 0.20 | 0.29 |

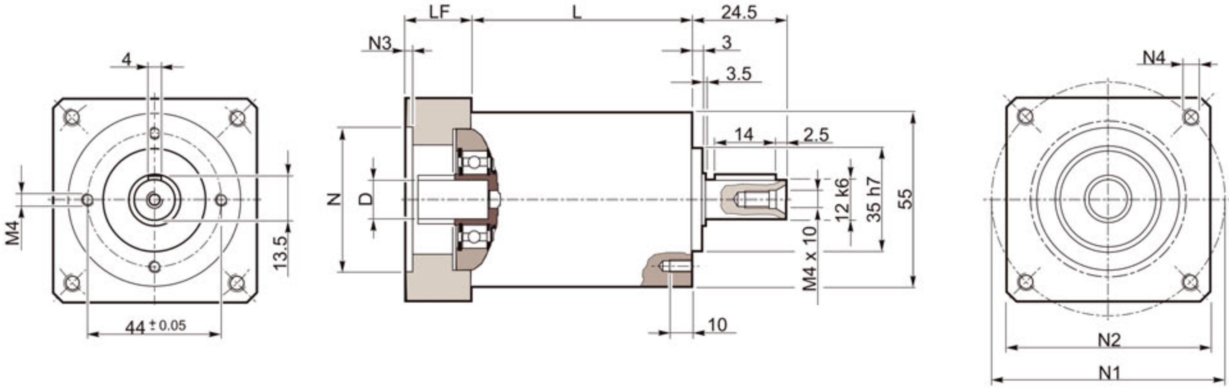
## 2.5.4 LC 120

| LC 120 | | | | |
|---|---|---|---|---|
| | **J** [kgcm$^2$] | | | |
| **i** | D = Ø11...Ø12.7 | D = Ø14...Ø19 | D = Ø22...Ø24 | D = Ø28...Ø32 |
| **LC 120 1_ 3** | 1.8 | 1.9 | 2.3 | 2.7 |
| **LC 120 1_ 4** | 1.0 | 1.1 | 1.5 | 1.9 |
| **LC 120 1_ 5** | 0.74 | 0.81 | 1.3 | 1.6 |
| **LC 120 1_ 7** | 0.48 | 0.56 | 1.0 | 1.4 |
| **LC 120 1_ 10** | 0.34 | 0.41 | 0.86 | 1.2 |
| **LC 120 2_ 9** | 1.7 | 1.8 | 2.2 | 2.6 |
| **LC 120 2_ 12** | 1.6 | 1.7 | 2.1 | 2.5 |
| **LC 120 2_ 15** | 1.6 | 1.6 | 2.1 | 2.4 |
| **LC 120 2_ 16** | 0.92 | 0.99 | 1.4 | 1.8 |
| **LC 120 2_ 20** | 0.90 | 0.97 | 1.4 | 1.8 |
| **LC 120 2_ 25** | 0.66 | 0.73 | 1.2 | 1.5 |
| **LC 120 2_ 28** | 0.45 | 0.52 | 0.97 | 1.3 |
| **LC 120 2_ 30** | 0.33 | 0.40 | 0.85 | 1.2 |
| **LC 120 2_ 35** | 0.44 | 0.52 | 0.96 | 1.3 |
| **LC 120 2_ 40** | 0.32 | 0.40 | 0.84 | 1.2 |
| **LC 120 2_ 50** | 0.32 | 0.39 | 0.84 | 1.2 |
| **LC 120 2_ 70** | 0.31 | 0.39 | 0.83 | 1.2 |
| **LC 120 2_ 100** | 0.31 | 0.39 | 0.83 | 1.2 |

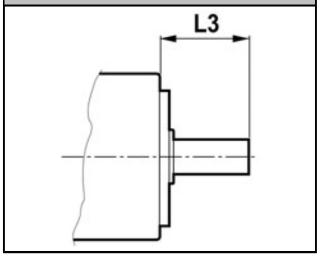


# 3 DIMENSIONS

## 3.1 LC 050



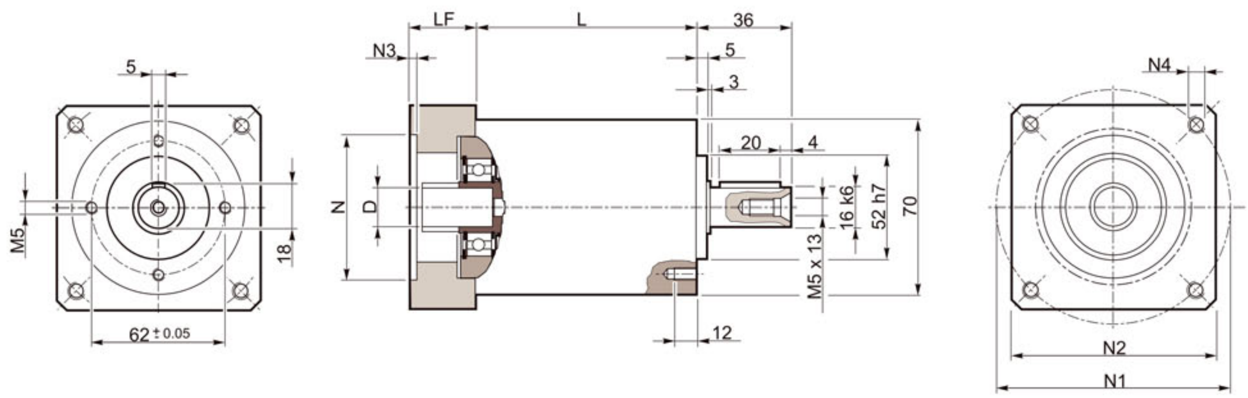

**MOTOR**



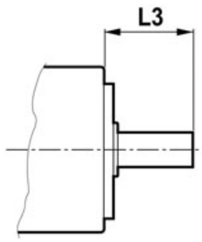

| | L | Kg |
|---|---|---|
| **LC 050 1** | 53 | 0.8 |
| **LC 050 2** | 66.8 | 1.0 |

| | D | N | N1 | N2 | N3 | N4 | LF | L3 |
|---|---|---|---|---|---|---|---|---|
| **LC 050_ 6...9 25 25...40 36...48** | ⩽ 9 mm | 25...40 | 36...48 | 55 | 4 | 4.5 | 25 | 25 |
| **LC 050_ 6...12 25 38.1 66.6** | ⩽ 12 mm | 38.1 | 66.6 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 050_ 6...12 25 40 63** | | 40 | 63 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 050_ 6...12 25 50 60** | | 50 | 60 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 050_ 6...12 25 60 75** | | 60 | 75 | 63 | 3 | M5x12 | 18 | 25 |
| **LC 050_ 6...14 30 50 65** | ⩽ 14 mm | 50 | 65 | 60 | 3 | M5x12 | 23 | 30 |
| **LC 050_ 6...14 30 50 70** | | 50 | 70 | 60 | 3 | M4x10 | 23 | 30 |
| **LC 050_ 6...14 30 60 75** | | 60 | 75 | 63 | 3 | M5x12 | 23 | 30 |
| **LC 050_ 6...14 30 60 90** | | 60 | 90 | 75 | 3 | M5x12 | 23 | 30 |
| **LC 050_ 6...14 30 70 85** | | 70 | 85 | 75 | 3 | M6x15 | 23 | 30 |
| **LC 050_ 6...14 30 70 90** | | 70 | 90 | 75 | 3 | M5x12 | 23 | 30 |
| **LC 050_ 6...14 32 73 98.4** | | 73 | 98.4 | 85 | 3 | M5x12 | 25 | 32 |
| **LC 050_ 6...14 30 80 100** | | 80 | 100 | 85 | 3 | M6x15 | 23 | 30 |

## *3.2 LC 070*



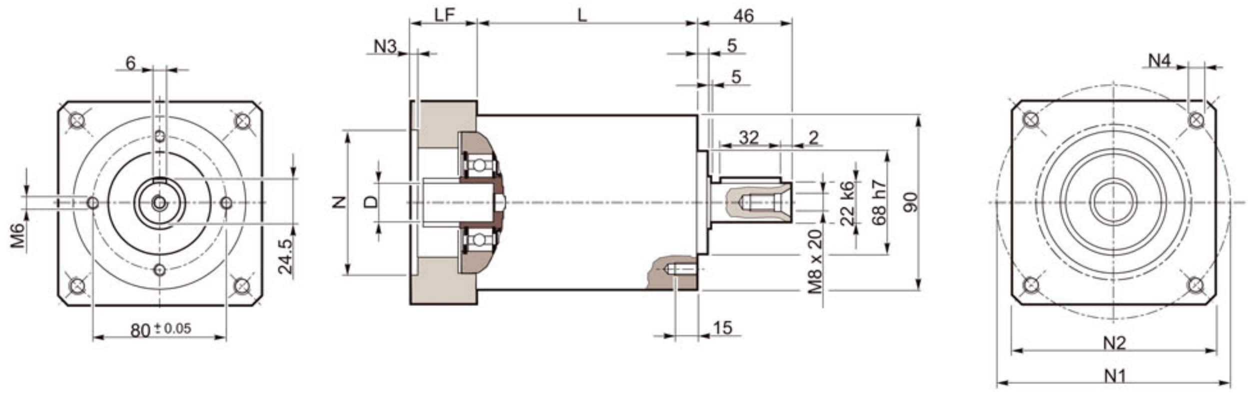

**MOTOR**



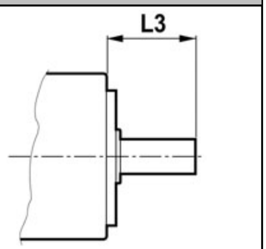

| | L | Kg |
|---|---|---|
| **LC 070 1** | 62 | 1.8 |
| **LC 070 2** | 78.7 | 2.1 |

| | D | N | N1 | N2 | N3 | N4 | LF | L3 |
|---|---|---|---|---|---|---|---|---|
| **LC 070_ 6...9 25 25...40 39...56** | ⩽ 9 mm | 25...40 | 39...56 | 65 | 4 | 4.5 | 25 | 25 |
| **LC 070_ 6...12 25 38.1 66.6** | ⩽ 12 mm | 38.1 | 66.6 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 070_ 6...12 25 40 63** | | 40 | 63 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 070_ 6...12 25 50 60** | | 50 | 60 | 60 | 3 | M4x10 | 18 | 25 |
| **LC 070_ 6...12 25 60 75** | | 60 | 75 | 63 | 3 | M5x12 | 18 | 25 |
| **LC 070_ 6...14 30 50 65** | ⩽ 14 mm | 50 | 65 | 60 | 3 | M5x12 | 23 | 30 |
| **LC 070_ 6...14 30 50 65 TH** | | 50 | 65 | 60 | 3 | 5 | 25 | 30 |
| **LC 070_ 6...14 30 50 70** | | 50 | 70 | 60 | 3 | M4x10 | 23 | 30 |
| **LC 070_ 6...14 30 60 75** | | 60 | 75 | 63 | 3 | M5x12 | 23 | 30 |
| **LC 070_ 6...14 30 60 90** | | 60 | 90 | 75 | 3 | M5x12 | 23 | 30 |
| **LC 070_ 6...14 30 70 85** | | 70 | 85 | 75 | 3 | M6x15 | 23 | 30 |
| **LC 070_ 6...14 30 70 90** | | 70 | 90 | 75 | 3 | M5x12 | 23 | 30 |
| **LC 070_ 6...14 32 73 98.4** | | 73 | 98.4 | 85 | 3 | M5x12 | 25 | 32 |
| **LC 070_ 6...14 30 80 100** | | 80 | 100 | 85 | 3 | M6x15 | 23 | 30 |

## 3.3 LC 090



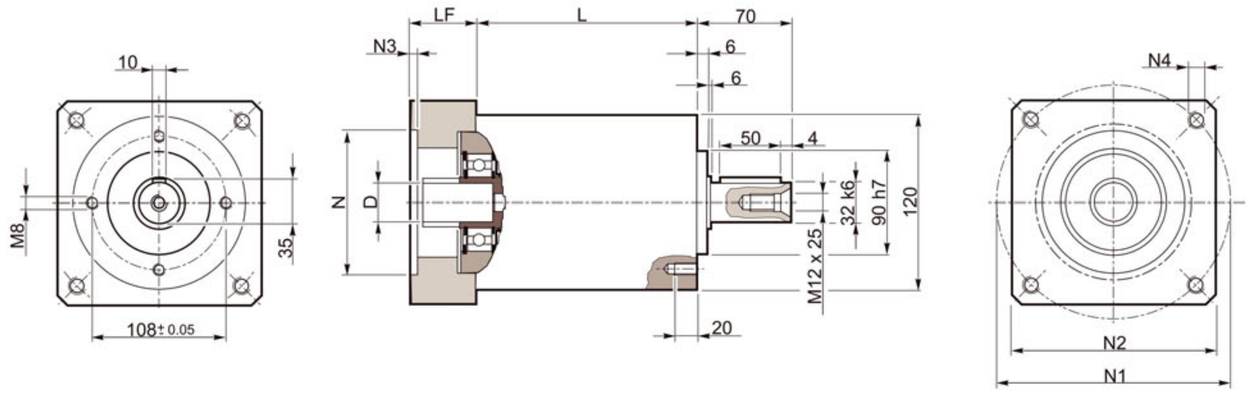

**MOTOR**



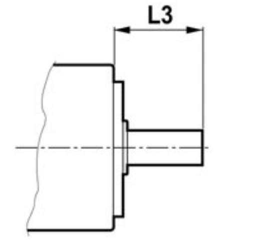

| | L | Kg |
|---|---|---|
| **LC 090 1** | 72.3 | 4 |
| **LC 090 2** | 98.8 | 5 |

| | D | N | N1 | N2 | N3 | N4 | LF | L3 |
|---|---|---|---|---|---|---|---|---|
| **LC 090_ 9...14 40 50 65** | ≤ 14 mm | 50 | 65 | 80 | 4 | M5x16 | 34 | 40 |
| **LC 090_ 9...14 40 50 65 TH** | | 50 | 65 | 80 | 4 | 5 | 34 | 40 |
| **LC 090_ 9...14 40 50 70** | | 50 | 70 | 80 | 4 | M4x10 | 34 | 40 |
| **LC 090_ 9...14 40 50 95** | | 50 | 95 | 80 | 4 | M6x20 | 34 | 40 |
| **LC 090_ 9...14 40 60 75** | | 60 | 75 | 65 | 4 | M5x16 | 34 | 40 |
| **LC 090_ 9...14 40 60 75 TH** | | 60 | 75 | 65 | 4 | 5 | 34 | 40 |
| **LC 090_ 9...14 40 73 98.4** | | 73 | 98.4 | 85 | 4 | M5x16 | 34 | 40 |
| **LC 090_ 9...14 40 78 63.5** | | 78 | 63.5 | 90 | - | Ø6.5 | 34 | 40 |
| **LC 090_ 9...16 40 60 90** | ≤ 16 mm | 60 | 90 | 80 | 4 | M5x16 | 34 | 40 |
| **LC 090_ 9...19 40 55.5 125.7** | ≤ 19 mm | 55.5 | 125.7 | 105 | 4 | M6x20 | 34 | 40 |
| **LC 090_ 9...19 40 70 85** | | 70 | 85 | 80 | 4 | M6x20 | 34 | 40 |
| **LC 090_ 9...19 40 70 85 TH** | | 70 | 85 | 80 | 4 | 6 | 34 | 40 |
| **LC 090_ 9...19 40 70 90** | | 70 | 90 | 80 | 4 | M5x16 | 34 | 40 |
| **LC 090_ 9...19 40 80 100** | | 80 | 100 | 90 | 4 | M6x16 | 34 | 40 |
| **LC 090_ 9...19 40 95 115** | | 95 | 115 | 100 | 4 | M8x20 | 34 | 40 |
| **LC 090_ 9...19 40 95 130** | | 95 | 130 | 115 | 4 | M8x20 | 34 | 40 |
| **LC 090_ 9...19 40 110 130** | | 110 | 130 | 115 | 4 | M8x20 | 34 | 40 |
| **LC 090_ 9...19 50 110 145** | | 110 | 145 | 120 | 6.5 | M8x20 | 44 | 50 |
| **LC 090_ 9...19 60 110 145** | | 110 | 145 | 120 | 6.5 | M8x20 | 54 | 60 |

## *3.4 LC 120*



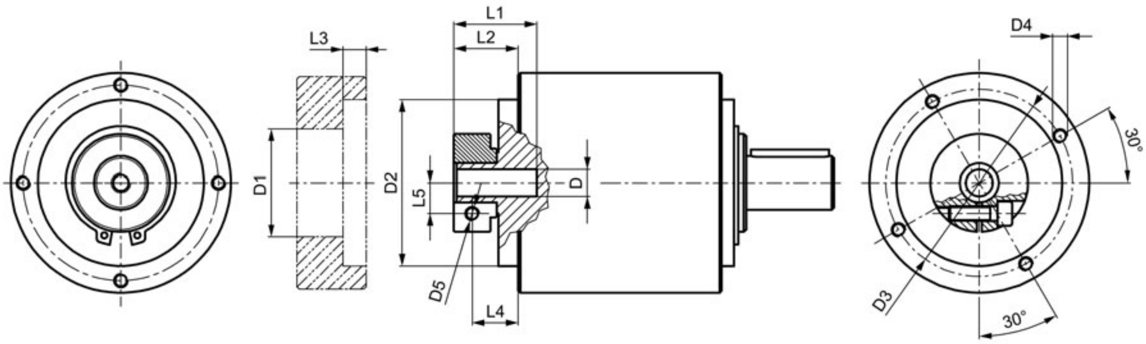

**MOTOR**




| | L | Kg |
|---|---|---|
| **LC 120 1** | 101.1 | 9 |
| **LC 120 2** | 133.6 | 11 |

| | D | N | N1 | N2 | N3 | N4 | LF | L3 |
|---|---|---|---|---|---|---|---|---|
| **LC 120_ 12.7...19 40 50 95** | ⩽ 19 mm | 50 | 95 | 100 | 5 | M6x14 | 28 | 40 |
| **LC 120_ 12.7...19 40 55.5 125.7** | | 55.5 | 125.7 | 105 | 5 | M6x16 | 28 | 40 |
| **LC 120_ 12.7...19 40 60 75** | | 60 | 75 | 100 | 5 | M5x14 | 28 | 40 |
| **LC 120_ 12.7...19 40 60 75 TH** | | 60 | 75 | 100 | 5 | 5 | 33 | 40 |
| **LC 120_ 12.7...19 40 70 85** | | 70 | 85 | 100 | 5 | M6x14 | 28 | 40 |
| **LC 120_ 12.7...19 40 70 85 TH** | | 70 | 85 | 100 | 5 | 6 | 33 | 40 |
| **LC 120_ 12.7...19 40 70 90** | | 70 | 90 | 100 | 5 | M5x12 | 28 | 40 |
| **LC 120_ 12.7...19 40 80 100** | | 80 | 100 | 100 | 5 | M6x16 | 28 | 40 |
| **LC 120_ 12.7...19 40 95 115** | | 95 | 115 | 100 | 5 | M8x18 | 28 | 40 |
| **LC 120_ 12.7...19 40 95 130** | | 95 | 130 | 115 | 5 | M8x18 | 28 | 40 |
| **LC 120_ 12.7...19 40 110 130** | | 110 | 130 | 115 | 5 | M8x18 | 28 | 40 |
| **LC 120_ 12.7...24 50 95 115** | ⩽ 24 mm | 95 | 115 | 100 | 5 | M8x18 | 38 | 50 |
| **LC 120_ 12.7...24 50 110 130** | | 110 | 130 | 115 | 6.5 | M8x20 | 38 | 50 |
| **LC 120_ 12.7...24 50 110 145** | | 110 | 145 | 120 | 6.5 | M8x20 | 38 | 50 |
| **LC 120_ 12.7...24 60 110 145** | | 110 | 145 | 120 | 6.5 | M8x20 | 48 | 60 |
| **LC 120_ 12.7...24 50 130 165** | | 130 | 165 | 140 | 6.5 | M10x20 | 38 | 50 |
| **LC 120_ 12.7...32 60 130 165** | ⩽ 32 mm | 130 | 165 | 140 | 6.5 | M10x25 | 48 | 60 |

## 3.5 GEAR UNIT WITHOUT MOTOR ADAPTOR




| | D | D1 | D2 | D3 | D4 | D5 | L1 | L2 | L3 +0.1 +0.2 | L4 | L5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **LC 050** | 6 - 6.35 - 7 | 32.5 | 50 | 42.5 | M4x8 | M4 | 21.7 | 13.2 | 3 | 8.2 | 8 |
| | 8 - 9 - 9.52 | 32.5 | 50 | 42.5 | M4x8 | M4 | 21.7 | 13.2 | 3 | 8.2 | 9 |
| | 11 - 12 - 12.7 | 35.5 | 50 | 42.5 | M4x8 | M4 | 22 | 13.5 | 3 | 8.5 | 11 |
| | 14 | 35.5 | 50 | 42.5 | M4x8 | M4 | 26.5 | 18 | 3 | 13 | 11.5 |
| **LC 070** | 6 - 6.35 - 7 | 32.5 | 50 | 42.5 | M4x8 | M4 | 21.7 | 13.2 | 3 | 8.2 | 8 |
| | 8 - 9 - 9.52 | 32.5 | 50 | 42.5 | M4x8 | M4 | 21.7 | 13.2 | 3 | 8.2 | 9 |
| | 11 - 12 - 12.7 | 35.5 | 50 | 42.5 | M4x8 | M4 | 22 | 13.5 | 3 | 8.5 | 11 |
| | 14 | 35.5 | 50 | 42.5 | M4x8 | M4 | 26.5 | 18 | 3 | 13 | 11.5 |
| **LC 090** | 8 - 9 - 9.52 | 38 | 68 | 76.5 | M6x10 | M6 | 34 | 26.8 | 9.5 | 18.8 | 10.5 |
| | 11 - 12 - 12.7 | 43 | 68 | 76.5 | M6x10 | M6 | 34 | 26.8 | 9.5 | 18.8 | 12.5 |
| | 14 - 15.875 - 16 - 17 | 48 | 68 | 76.5 | M6x10 | M6 | 34 | 26.8 | 9.5 | 18.8 | 14.5 |
| | 19 - 19.05 | 51 | 68 | 76.5 | M6x10 | M6 | 34 | 26.8 | 9.5 | 18.8 | 16.5 |
| **LC 120** | 12.7 | 43 | 90 | 98 | M6x15 | M6 | 33.5 | 20 | 7.6 | 12.5 | 12.5 |
| | 14 - 15.875 - 16 | 48 | 90 | 98 | M6x15 | M6 | 33.5 | 20 | 7.6 | 12.5 | 14.5 |
| | 19 | 51 | 90 | 98 | M6x15 | M6 | 33.5 | 20 | 7.6 | 12.5 | 16.5 |
| | 22 - 24 | 56.5 | 90 | 98 | M6x15 | M6 | 36.5 | 23 | 7.6 | 14 | 19 |
| | 28 | 67 | 90 | 98 | M6x15 | M8 | 36.5 | 23 | 7.6 | 14 | 22.5 |
| | 32 | 71 | 90 | 98 | M6x15 | M8 | 38 | 24.5 | 7.6 | 15.5 | 24.5 |

## INDEX OF REVISIONS R0

| DOCUMENT | SECTION | DESCRIPTION |
| --- | --- | --- |