

Explanation of maxon gear and screw drive terminology

Dimensional drawings

Presentation of the views according to the projection method E (ISO). All dimensions in [mm].

Mounting in plastic

Screwed connections on motors with plastic flanges require special attention.

M_A Max. tightening torque [Ncm]

A torque screwdriver may be adjusted to this value.

L Active thread depth [mm]

The relation of the thread depth to the thread diameter must be at least 2:1. The screw-in depth must be less than the usable length of the thread!

Gearhead data

Values are based on an ambient temperature of around 25°C (known as cold data).

Key Data (GPX)

Maximum values identified as key data represent the maximum for all stages/reductions.

Technical data

Max. continuous/intermittent* input speed

It is based on service life considerations. If this value is greatly exceeded, the service life can be shortened, the gear heats up more and more noise is generated.

Temperature range

The temperature range may be extended for some gears to -40°C and +100°C, but in extremely low temperatures, much greater power consumption must be expected. Special lubrication can be supplied on request, even for other temperature ranges.

Radial play

The radial play test value depends heavily on the mounting, measuring point and adjoining force. For this reason, the clearance of the measuring point to the flange is always given. Measurement is always carried out under a test force that is smaller than the maximum radial load.

Max. permissible radial load

Is stated in a specific distance from the gear flange. If it is not specified in stages, radial load is based on a reference speed of 1,000 rpm on the gear drive shaft.

Axial play

The value for the axial play of a gear is determined between the two axial end positions of the

output shaft. This measurement is determined by the type of bearings and may be zero for preloaded ball bearings and low axial forces. Minimum play is required for any kind of friction bearings otherwise they will jam.

Max. axial load (dynamic)

Corresponds to the permissible axial load of the drive shaft without damaging the gear. Below the given load, axial play can be kept.

Max. permissible pressing force

Corresponds to the force with which, for example, a coupling element may be mounted to the gear drive shaft.

1 Reduction ratio

The reduction indicates the ratio by which the speed of the gear output shaft is smaller than the motor speed.

2 Absolute reduction ratio

Provides the reduction as an exact ratio of two natural numbers.

3 Max. motor shaft diameter [mm]

The max. motor shaft diameter is based on the motor pinion's internal diameter.

4 Number of stages

States the number of gear stages engaged in series.

5 Max. continuous torque [Nm]

The continuous torque provides the maximum load permanently applied to the output shaft. If it is exceeded, the service life is significantly shortened.

6 Intermittent* torque [Nm]

The intermittent torque is the value that may be applied to the gears for a short period without causing damage.

7 Efficiency [%]

The specified efficiency is a maximum value that is valid for maximum continuous torque. The efficiency is greatly reduced with very small loads (see diagram). The efficiency is stage-dependent, but is unaffected by the motor speed.

8 Weight [g]

9 Median gear backlash unloaded [°]

Gear backlash is the turning angle of the gear output shaft which, when the input shaft is blocked, the gear output shaft covers when it is turned from one end position to the opposite position. The end positions depend on the torque

applied to the output shaft. It should be noted that if the gear output shaft is blocked, based on the reversed reduction ratio, the motor shaft will turn through a much greater angle from stop to stop.

10 Mass inertia [gcm²]

The gear moment of inertia is given at the motor shaft. It is required in order to calculate the additional torque needed for acceleration of the gear components in the case of highly dynamic drives. Variations may arise depending on how lubrication is distributed.

11 Gear length L1 [mm]

L1 describes the gear length down to the motor's axial mount area (reference C in motors).

12 Direction of rotation

The Direction of rotation of our planetary gears is always the same as that of the motor shaft. With spur gears, it depends on the number of stages. With even numbers (i.e. 2, 4, 6, 8), the Direction of rotation is the same, but the opposite if the numbers are odd.

13 Max. transmittable power (continuous) [W]

This value gives the maximum constant output available on the output shaft. If it is exceeded, the service life is considerably shortened.

14 Max. transmittable power (intermittent*) [W]

This value gives the maximum intermittent output available on the output shaft. This range may be used intermittently and repeatedly.

15 Max. overload torque

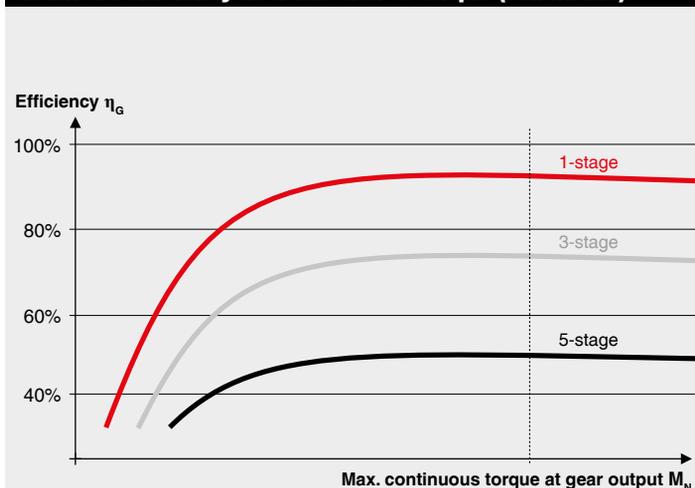
The maximal permitted torque that can be applied for a short period of time (a few seconds) without destroying the gear. It can be considered as break free torque, for example, to overcome static friction of a mechanically jammed drive.

*intermittent

Short-term operation is defined as follows:

- during 1 second
 - during max. 10 % of the operating cycle
- If these values are exceeded, a reduced service life must be expected.

Gearhead efficiency as a function of torque (schematic)



Gear play measurement

