Explanation of the pages 202 – 243

Dimensional drawings
On the enclosed DVD dimensional drawings (DXF-files) are available and are suitable for import to any CAD system. Presentation of the views according to the projection method E (ISO). All dimensions in [mm].

Mounting threads in plastic
Screwed connections on motors with plastic flanges require special attention.

M_A Max. tightening torque [Ncm]
A torque screwdrivermay 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).

Technical data

Recommended 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 pre-loaded ball bearings and low axial forces. Minimum play is required for any kind of friction bearings otherwise they will jam.

Max. permissible axial load
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.

Line 1 Reduction ratio
The reduction indicates the ratio by which the speed of the gear output shaft is smaller than the motor speed.

Line 2 Absolute reduction ratio
Provides the reduction as an exact ratio of two natural numbers.

Line 3 Max. motor shaft diameter [mm]
The max. motor shaft diameter is based on the motor pinion's root circle.

Line 4 Number of stages
States the number of gear stages engaged in series.

Line 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.

Line 6 Intermittent torque [Nm]
The intermittent torque is the value that may be applied to the gears for a short period without causing damage. It is defined as follows:
– during 1 second
– during max. 10 % of the life expectancy
If these values are exceeded, a reduced service life must be expected.

Line 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.

Line 8 Weight [g]

Line 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.

Line 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.

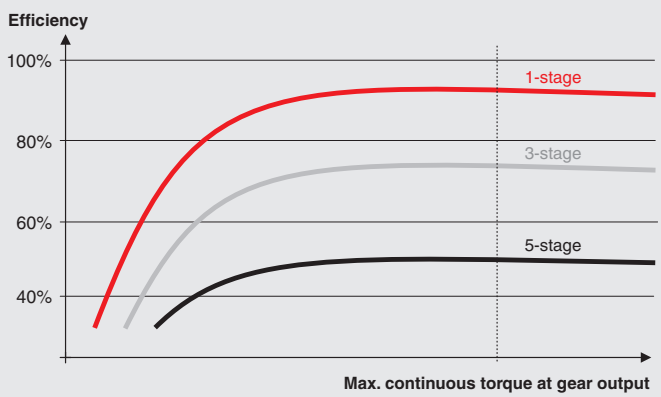
Line 11 Gear length L1 [mm]
L1 describes the gear length down to the motor's axial mount area (reference C in motors).

Line 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.

Line 13 max. transferable continuous performance [W]
This value gives the maximum constant output available on the output shaft. If it is exceeded, the service life is considerably shortened.

Line 14 max. transferable intermittent performance [W]
This value gives the maximum intermittent output available on the output shaft. This range may be used intermittently and repeatedly. It is defined as follows:
– during max. 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