

Standard specification no. 102

maxon gear/maxon screw drive

1. Basics

The standard specification describes tests and inspections that are performed on the finished gearhead and during the manufacturing process. To safeguard our high quality standard, we inspect materials, individual parts, assemblies, and the finished gearhead for conformity with specified dimensions and properties. The results are recorded statistically and can be viewed by the customer on request. Sampling plans in acc. with ISO 2859 and DIN/ISO 3951 are used (attribute inspection, follow-up inspection and variable inspection), as well as self-monitoring procedures of the manufacturing departments. This specification applies in all cases where no other specification has been agreed upon between the customer and maxon.

2. Data

2.1 Mechanical data as shown in the dimensional drawing: Assembly-dependent dimensions are sampled in acc. with the sampling schedule. This does not apply to form and position tolerances. The process uses standard measurement tools (electrical length measurement, micrometers, dial gauges, calipers, plug and thread gauges, etc.). The calibration of the measuring instruments follows the standards listed below:

- EN ISO 10012:2003 Measurement management systems – Requirements for measurement processes and measuring equipment
- EN ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories
- VDI/VDE/DGQ 2618 Test equipment monitoring

2.2 Noise

A subjective test is made for outliers within a batch. The motion inside a gearhead causes noise and vibration depending on speed. The noise and vibrations may vary in their frequency and intensity. The noise levels of an individual sample do not permit any conclusions about the noise or vibration level of a future delivery.

2.3 Service life

Service life tests are conducted according to unified, internal criteria as part of the product qualification. The service life of a gearhead primarily depends on the operating modes and ambient conditions. The great diversity of applications does not permit us to make a general statement of service life. The minimum expected service life for the relevant maxon gearheads is in reference to standard conditions.

- 25°C
- Normal room conditions
- Horizontal orientation of unit
- No axial or radial load on the output shaft

2.4 Environmental testing

Corrosion protection: Our products are tested based on DIN EN 60068-2-30 during product qualification.

Coating of the components: The finishing and coating processes are selected for best corrosion protection. Such layers are checked during product qualification, in accordance with the applicable standard.

3. Parameters that deviate from or supplement the data sheet can be determined and then become part of the systematically performed inspection, as customer specification. Inspection certificates are supplied, if agreed upon in advance.

Standard specification no. 103

maxon sensor

1. Basics

The standard specification describes tests and inspections that are performed on the finished combination of sensor and motor (in some cases also with gearhead), as well as during the manufacturing process. To safeguard our high quality standard, we inspect materials, individual parts, assemblies and the finished combination for conformity with the specified dimensions and properties. For sensor testing, it is necessary to keep in mind that the measuring signal inevitably contains the speed fluctuations of the motor and in some cases those of the gearhead.

The results are recorded statistically. Sampling plans in acc. with ISO 2859 and DIN / ISO 3951 are used (attribute inspection, follow-up inspection and variable inspection), as well as self-monitoring procedures of the manufacturing departments. This standard specification applies in all cases where no other specification has been agreed upon between the customer and maxon.

2. Data

2.1 Electrical data apply at temperatures between 22 and 25 °C. Data check within one minute of runtime or a minimum of three measuring revolutions.

The conditions during the sensor measurement are:

Operating voltage	Set value ±50 mV
Direction of rotation	cw = clockwise
Motor orientation	Horizontal
Operation	No load
Measuring speed	Set value ±40%

Every **incremental** encoder is tested while installed:

Current draw	Minimum/maximum value
Signal level	For encoders without a line driver ("single-ended output"): "Low" level: maximum value; "High" level: minimum value For encoders with a line driver ("differential output"): Controlling an RS422-compatible line receiver.
Signal integrity	Signals present Counts per turn (3-channel encoder) Single unique index pulse (if applicable)

Signal integrity

Angle information
For the angle information, one or several of the following characteristics are tested, depending on the technology: Phasing A to B, duty cycles of the incremental signals, cycle length, INL, DNL, minimum/maximum state length, jitter

Additional information: maxon testing devices have built-in glitch filters. Glitches on individual encoder signals are not recognized and are permissible.

Every **absolute** encoder is tested while installed:

Current draw	Minimum/maximum value
Signal integrity	CLK signals, data present Protocol in acc. with the specification (SSI, BiSS, coding) Counting direction of angle values: as listed in catalog

2.2 Mechanical data as shown in the dimensional drawing: Assembly-dependent dimensions are sampled in acc. with the sampling schedule. This does not apply to form and position tolerances. The process uses standard measurement tools (electrical length measurement, micrometers, dial gauges, calipers, plug and thread gauges, etc.). The calibration of the measuring instruments follows the standards listed below:

- EN ISO 10012:2003 Measurement management systems – Requirements for measurement processes and measuring equipment
- EN ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories
- VDI/VDE/DGQ 2618 Test equipment monitoring

2.3 Imbalance

The solid measure of the sensor (target, pole wheel) is mounted on the shaft and can cause additional imbalance.

2.4 Service life

The service life of sensors is usually not limited by wear but by the ambient conditions. These are highly diverse, so that no general statement regarding the service life can be made.

2.5 Environmental testing

Humidity: Sensors consist of electronic and, in some cases, optical components. Condensation has to be prevented or removed prior to startup, even when this is not explicitly stated. In the case of optical encoders, condensation and humidity can cause stains and thus lead to signal errors.

3. Parameters that deviate from or supplement the data sheet can be determined and then become part of the systematically performed inspection, as customer specification. Inspection certificates are supplied, if agreed upon in advance.