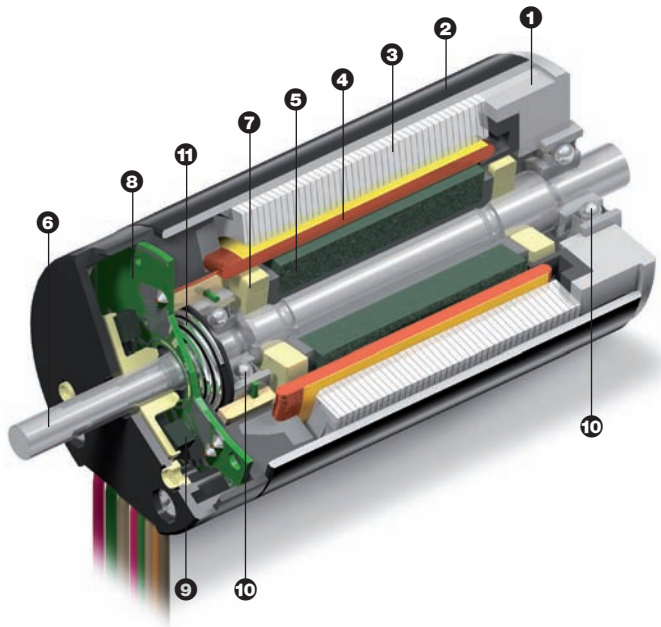
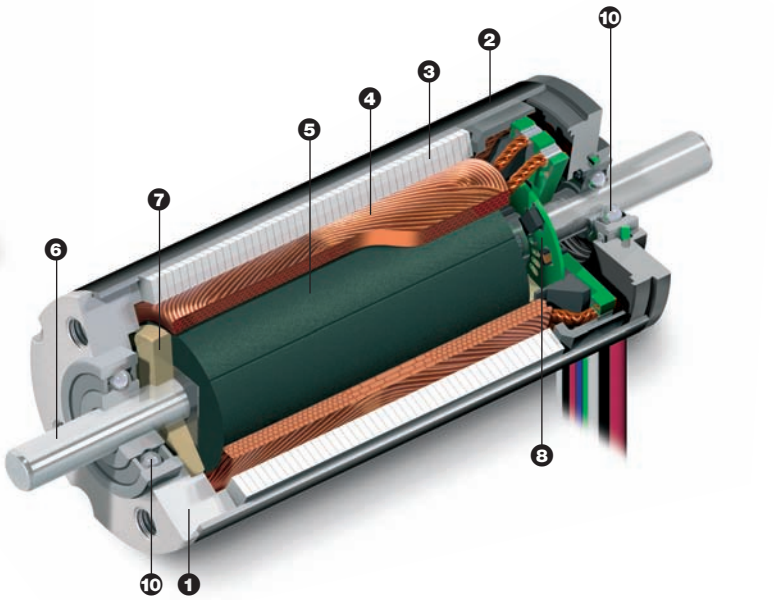



**Sinusoidal commutation**
The high resolution signals from the encoder or resolver are used for generating sine-shape motor currents in the electronics. The currents through the three motor windings are related to the rotor position and are shifted at each phase by 120 degrees (sinusoidal commutation). This results in the very smooth, precise running of the motor and, in a very precise, high quality control.

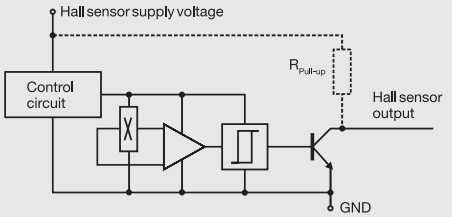
**Properties of sinusoidal commutation**
- More expensive electronics
- No torque ripple
- Very smooth running, even at very low speeds
- Approx. 5% more continuous torque compared to block commutation

**Possible applications**
- Highly dynamic servo drives
- Positioning tasks

## Hall sensor circuit

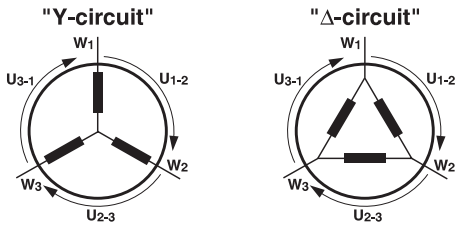
The open collector output of Hall sensors does not normally have its own pull-up resistance, as this is integral in maxon controllers. Any exceptions are specifically mentioned in the relevant motor data sheets.

Wiring diagram for Hall sensors



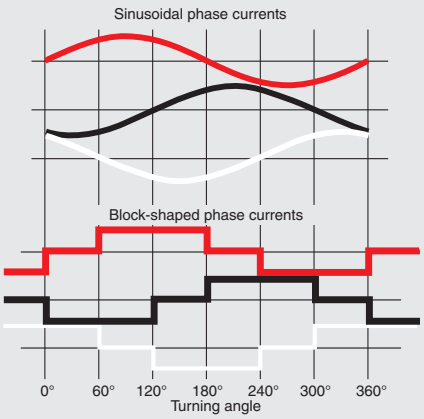

## Winding arrangement

The maxon rhombic winding is divided into three partial windings, each shifted by 120°. The partial windings can be connected in two different manners - "Y" or "Δ". This changes the speed and torque inversely proportional by the factor $\sqrt{3}$.
However, the winding arrangement does not play a decisive role in the selection of the motor. It is important that the motor-specific parameters (speed and torque constants) are line with requirements.




The maximum permissible winding temperature is 125°C or 155°C depending on motor type.

Currents in sine and block commutation




**Legend**
❶ Star point
❷ Time delay 30°
❸ Zero crossing of EMF

For further explanations, please see page 137 or "The selection of high-precision microdrives" by Dr. Urs Kafader.