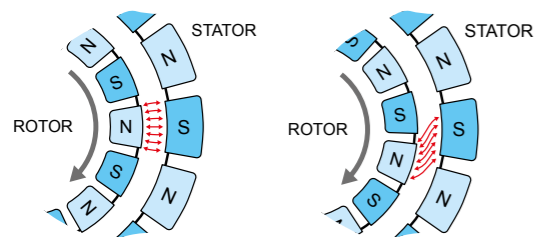


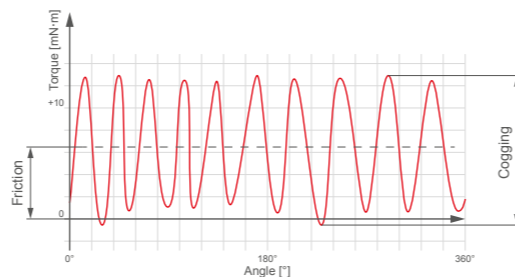


WHAT ABOUT COGGING TESTING ?

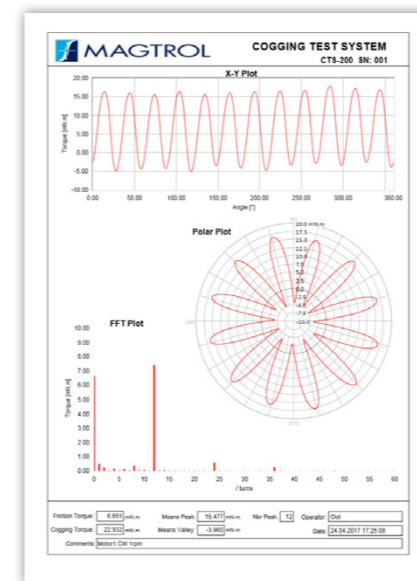
The drag torque or Detent Torque is an important parameter in permanent magnet (PM) motors, especially in a PM servo motor system. Detent Torque of PM motors is composed of Cogging Torque and Friction Torque. The Cogging Torque is generated by attraction/interaction of the magnetic poles to the teeth (steel structure) within an un-energized motor. It is one of the most important parameters of permanent magnet motors, which causes torque ripple, vibration and noise. Generally the cogging torque varies with rotor position and is defined by its peak to peak (p-p) value. Friction Torque is attributed to mechanical assembly issues, such as bearing resistance, assembly tolerance, or carbon-brush friction for brush PM dc (PMDc) motors. Friction Torque is commonly measured by its average value.



When the magnets are face-to-face (as left), the force is maximized. When the motor is running (as right), the moving magnetic elements will first have to free themselves from the residual magnetism before proceeding to the next step. This resistance to advancement is named cogging.



Example of typical curve for cogging. Friction is an average value calculated from 0 torque. Cogging value is calculated on the peak torque value.



Example of compiled report, it may use as certificate.

COGGING TEST SYSTEM

WITH THE CTS COGGING TEST SYSTEM, MAGTROL IS PROVIDING A STAND-ALONE TEST SYSTEM TO CONTROL AND MEASURE THESE IMPORTANT PARAMETERS.

FEATURES

- Measure of Detent Torque, Cogging Torque and Friction Torque
- Torque Detection < 200 mN·m
- Accuracy 0.1 % of rated torque
- Precise Angle Detection 5000 pulses/rev.
- Operating speed 1 to 10rpm
- Operating Direction CW / CCW
- USB Interface
- Executable Specific Cogging Test Software
- Peak Detection
- X-Y, Polar and FFT Graphs
- Multigraphs function with up to 5 curves comparison
- Data Acquisition and Storage in TXT (Export in CSV files possible)

The testing system includes a precision geared motor, 5000 pulses encoder, TM torque sensor and security clutches to avoid system overload by mishandling when not in use. The geared motor drives the MUT (Motor Under Test) at low speed of 1 to 10rpm, while acquiring its cogging torque related to angle position. The torque measurement covers a range up to 200 mN·m (depending on the selected torque sensor) with an accuracy of ± 0.2 mN·m (for TM 302 with 200 mN·m of nominal range). A executable software control the system realizing the measurement and data acquisition. It provides accurate peak-to-peak measurement of cogging torque and displays X-Y or polar graphs as well as FFT analysis. It allows the storage of the measured data enabling to compare performance graphs by overlaying up to 5 graphs. A cursor can be used to read accurate values from measurement points. Measured parameters can be saved under TXT. For better accuracy and function control, the software includes a 0 offset adjustment routine which check transducer signal over a complete turn (Test sample MUT not connected to the system).

As stand-alone system, the CTS only requires a 100-220VAC power. USB interface allows direct connection to the PC on which the software is installed. It is mounted on a PT-25 grooved base on which the MAGTROL AMF-1 motor fixture can be fitted.

Need specific Motor Testing ? Do not hesitate to challenge us !