

Cryogenic Motors

Frequently Asked Questions

What is the lower temperature limit of the cryogenic motors?

Empire Magnetics has designed and built cryogenic motors for operation at 4° K. There is no reason to think they will not operate at 0° K, they just have not been tested at this temperature.

At what temperature should a cryogenic motor be considered?

A cryogenic motor should be considered anytime the operating temperature is less than -40° C (the limit for Empire Magnetics' extended temperature motors).

How will my cryogenic motor operate at room temperature?

Empire Magnetics cryogenic motors can be expected to operate normally at room temperature. However moisture contamination of the lubrication needs to be avoided.

Should the torque output of the motor be de-rated for a cryogenic application?

Yes, the torque output should be de-rated by 30% for a cryogenic application. The reasons are as follows: 1) it is necessary to use a different magnet type to withstand the temperature range, and 2) it is necessary to open the air gap to avoid mechanical problems as a result of thermal distortion.

What is the maximum rate of temperature change?

The maximum rate of temperature change for the cryogenic motors is 10° C per minute. Faster temperature changes can result in damage to the adhesive bonds.

Is cable available for the cryogenic motors?

Yes, Empire Magnetics can provide a Teflon cable for cryogenic applications but please note that this cable is subject to cracking if flexed when cold.

Is my cryogenic motor vacuum compatible?

Yes, the cryogenic motors are built and processed according to the laboratory grade (VX) specifications.

Can you provide flexible cables at cryogenic temperatures?

We have not yet discovered a suitable technology to provide flexible cables in these conditions.