

SKF's innovative designs bring increased reliability to neutron chopper systems

Benefits

- Higher reliability
- Compatible with previous systems
- Payload capacity of 45 kg
- Operation up to 600 Hz

Typical applications

- Disk, Fermi, T0 choppers



When leading neutron research facilities upgrade or construct new beam lines, maximizing performance and reliability of neutron instruments and chopper systems is critical. Achieving these goals is no easy task.

SKF offers unparalleled benefits to all chopper drive systems.

For low speed applications magnetic bearings bring a much higher reliability and ease of operation in vacuum environments compared to rolling element bearings. In high speed applications magnetic bearings will enable the heavier and faster payloads of tomorrow.

The benefits of using SKF's current magnetic bearing based drive systems for neutron choppers have been proven for over 14 years and now it is time for an upgrade. SKF magnetic bearings have set the standard for contact-free, oil-free reliability. By combining our global presence, leading industrial experience and technology platforms with input from world leaders at neutron facilities we created the most advanced neutron chopper drive. Our system is ready for heavier and faster payloads, delivering better phase locking and increased reliability.

The next generation

Reliability: The new chopper drive system is based on proven technology from other industries with demonstrated MTBF of over 500 000 hours.

Compatible with previous SKF neutron chopper systems: SKF designed the system so that all of the performance benefits fit into the exact same physical envelope.

Faster acceleration: A dramatic increase in motor torque means less waiting time to start the instrument or balance disks.

Higher capacity bearings: Optimized bearing capacity and stiffness to handle disks up to 45 kg. SKF is helping open the possibilities for new limits in disk geometry, speed, and mass.

Higher speeds: The drive system is designed to operate at speeds up to 600 Hz. Since the entire system is developed by our own engineering team, SKF can easily adapt to new power or speed requirements

Improved communications: The control system has Ethernet standard protocols to enable high speed communication over long distances.

Expanded timing signals: Additional timing signals are available to synchronize unlimited numbers of neutron choppers to master timing pulses or other chopper systems. New user definable signals add flexibility to timing control.

Latest technology: New electronics improve precision of phase control and parking capability.

Robust bearing control: SKF's world leading engineering team is dedicated to developing robust bearing control algorithms. The latest techniques improve control of highly gyroscopic, high speed or other challenging disk geometries.

Single rack mount controller: The G5 control system is housed in a single rack mount chassis and is compatible with all types of configurations regardless of: cable length, motor power, or chopper type. Spares management made easy.



Applying SKF knowledge engineering to neutron chopper systems

This new product incorporates the best features of previous designs with significant advancements that will benefit new instruments.



Motor spindle

- Magnetic bearing technology means no contact, no wear, and virtually no maintenance
- Demonstrated reliability
- Lubrication free, high speed rotation in vacuum
- No activated grease or oil
- Low vibration levels



Control system

- Fully integrated chopper control system (motor, bearings, condition monitoring, phase control)
- Operation between 2.5 Hz and 600 Hz
- Veto signal with software configurable window size
- Precise phase stability and parking
- Compact – 19 inch single rack mount controller
- Standard for all chopper types – spares can be shared across all choppers
- Each controller is easily customizable with a USB flash drive
- Easy to install and use, maintenance-free
- User friendly interfaces and remote diagnostics for easy technical assistance

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