



SKF Dynamic Motor Analyzer - EXP4000

Integrated testing capabilities

The SKF Dynamic Motor Analyzer - EXP 4000 integrate a wide range of monitoring capabilities which meet high quality standards. Designed for in-service monitoring of power circuit issues, overall motor health, load, and performance, it gives the user a comprehensive look at overall motor integrity. This instrument was designed for remote monitoring from the Motor Control Center (MCC) or through the Baker EP connection. It is a non-hazardous, low voltage, battery operated unit, which makes it highly portable and durable for use in tight and rugged locations.

Continuous innovation

Continual design breakthroughs demonstrate our ongoing commitment to quality, reliability,

and competitive advantage. This instrument provides data on degradation of motor performance and the effects of overheating on motor operation. Survey plant wide efficiency, determine load mismatches, oscillating load and transient peak energy. Results are immediate, showing operating efficiencies, thereby allowing the user to determine the true cost of wasted energy.

Comprehensive analysis

The SKF Dynamic Motor Analyzer - EXP4000 perform seven major functions to enhance a P/PM program. They identify possible power circuit problems that degrade motor health, examine overall motor power conditions, monitor the load, observe motor performance plus estimating energy savings.

No other motor monitor provides such a wide variety of capabilities. It is programmed to supply information



on voltage level, voltage balance, harmonic and total distortion, rotor cage condition, motor efficiency, effective service factor, overcurrent, operating condition, torque ripple, load history among others. This wide range of tests allows exploration of the true condition of motor integrity and conditions related to motor performance.

Advanced data collection and organization

Once testing is completed, results can be saved and stored for each motor. This type of documentation is critical for any maintenance program. It allows the recalling of information for true trending capabilities. Test results are managed using standard MS Access relational database file formats. Reports can be quickly generated through the main print console, allowing operators visual confirmation of motor integrity.

The software and data transfer package enables the creation of multiple databases to organize collected data to specifications set by users. This eases communication channels by handling data in a manner that is useful, complete and accessible.

Test domains

Power quality

This domain identifies non-optimal power quality problems, which cause additional motor stress. Flag frequent problems with voltage level, voltage balance, harmonic

distortion, total distortion, power and harmonics tests. These consist of wrong settings on supply transformer's taps, poorly distributed single phase loads, overloading (saturating) supply transformers, excessive VFDs on low voltage busses, excessive non-harmonic frequencies on a VFD, missing line inductors on VFD applications and missing or open power factor correction capacitors.

Machine performance

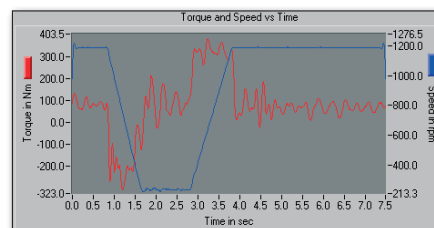
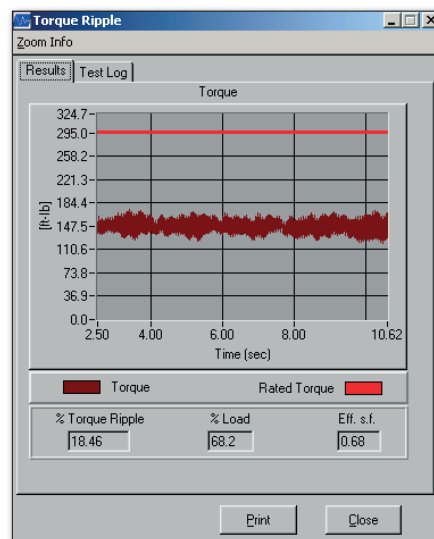
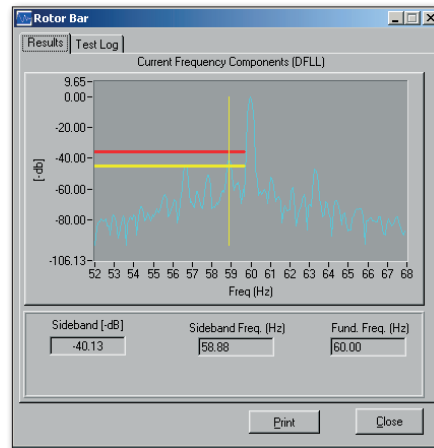
Conclusively evaluate the operation of the motor, identifying stressful operation and its source with this domain. It looks at Effective Service Factor, Load, Operation Condition, Efficiency, and calculates Payback Period. Commonly found problems include: thermal overloading of the motor, machine deterioration recognition among other items that are directly related to the motors health and the energy wasted with inefficiencies.

Current

These tests identify problems with the entire machine system such as overcurrent and current unbalance. These tests look at the health of the entire system and describe the problem as it relates to current.

Spectrum

This domain has the rotor bar test along with V/I spectrum, Demodulated Spectrum, and Harmonics. It shows current and voltage relationships with regards to frequency. Electrically it will find saturation problems, broken rotor



bars, excessive VFD drives on low voltage busses and mechanical problems.

Torque

The torque domain is a substantial breakthrough by Baker Instrument Company, an SKF Group Company. Torque Ripple and Torque Spectrum enable the user to find numerous problems quickly and accurately. It specializes in diagnosing mechanical issues, shows transient overloading, finds mechanical imbalances along with bearing problems, and cavitation, among others.

Connections

This portion of the SKF Dynamic Motor Analyzer - EXP4000 software offers additional tools including phasor diagrams, three currents and voltages, harmonic bar charts, instantaneous voltage, frequency, symmetrical components and speed traces for dynamic Variable Frequency Drives (VFD) applications. Jointly, these tools assess bearing health, rotor unbalance and misalignment.

VFD monitoring (Optional)

Along with any three phase induction motor and generator, the SKF Dynamic Motor Analyzer - EXP4000 will monitor the activities of VFD applications and AC servo motors. These types of drives have always created problems for maintenance professionals and for the first time comprehensive diagnosis of motor problems are facilitated even under the most demanding VFD operation.

Continuous monitoring

The continuous monitoring software (CM4000) enables the user to monitor 41 data points real time. This real time and continuous data gathering capability will give immediate impact in finding intermittent problems with motors such as electrical tripping. This user customized software enables the operator to collect

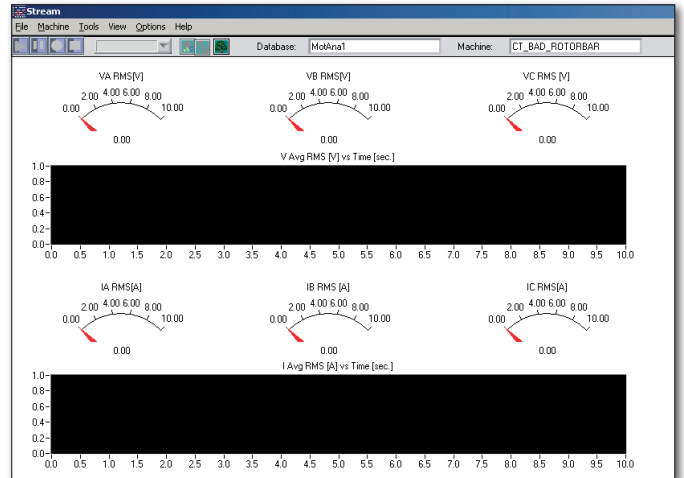
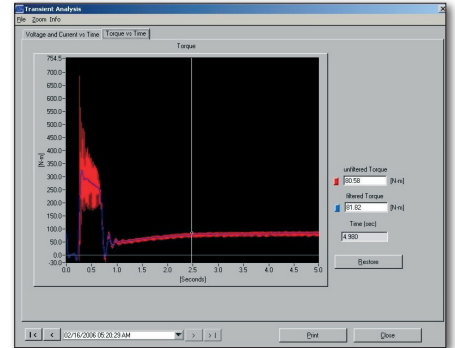
real time data on whatever is deemed the most important to their operation. This software will also act as a power analyzer to determine actual power quality.

Transient Analysis

The SKF Dynamic Motor Analyzer - EXP4000 also perform a transient analysis using the transient analysis tool. The traces are the rms currents and voltages of three phases. This data can be zoomed, panned, and the cursors allow reading of levels and time within the graphs. Along with this powerful analysis capability, start-up Torque versus Time can also be evaluated. These tools allow the user to visually see the amplitude of voltage, current and torque at startup, along with motor start-up time. Finally, as the startup process concludes, the final level voltage, current and torque are visualized

Efficiency

Efficiency assessment, pay-back period and Motor Master+ identify motors performing under par, and calculates the pay-back period if replaced by a new motor. The SKF Dynamic Motor Analyzer - EXP4000 exceeds the performance of other instrumentation in both accuracy of efficiency estimation and in ease of use for field environments.

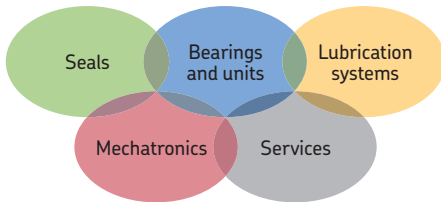


• **Technical specifications/Technical capabilities**

- Voltage Unbalance
- Voltage THD
- Current THD
- Harmonic Voltage Factor
- Impedance Imbalance
- Eccentricity
- Rotor Bar test
- Negative Sequence Impedance
- Speed calculation
- % Load & % Efficiency
- Spectrum Voltage
- Spectrum Current
- Current Level
- Effective Service Factor
- Power details
- Continuous acquisition
- O-Scope
- Auto Phasing
- Auto testing including timer function
- One button testing
- Bearing check
- Startup Transient Voltage
- Startup Current

Specifications

Input Power	110-250 VAC, 50/60 Hz integrated power supply
Maximum Rated Measurement/Testing Voltage	1,000 V AC, 500 V DC
Current Transformers (all portable)	0-10 A, 0-150 A, 1-1,000 A, 0-3,000 A
Connections – Amphenol military spec twist type	Power entry module (1) Portable voltage connection (1) Portable current connection (1) EP Port (1) Vibration sensor connection (1)
Computer specifications	40 GB – 4,200 r/min or better 512 MB installed ram – 2 GB upgradable Battery (up time) – 3 hours or better Software Platform: Microsoft Windows XP Professional or better USB 2.0
Weight	15 lbs
Industrial standards	NEMA MG-1 IEEE 519 EN61000-2-2 EN 61000-2-7 VDE 839-2-2 VDE 839 -2-2



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide.

These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems.

A global presence provides SKF customers uniform quality standards and universal product availability.

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Publication 6769 EN - February 2010

Printed in USA on environmentally friendly paper.

