

Motors and generators service and PC tools

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MotorAdvantage

MotorAdvantage aims to encourage industry to uncover the true cost of running electric motors. Research by ABB reveals that UK industry is failing to efficiently manage its motor inventory, thereby incurring millions of pounds of unnecessary downtime, repair and energy costs.

MotorAdvantage is aimed at companies operating a continuous process such as those found in food & beverage, chemical, oil & gas and pharmaceuticals. Such processes tend to have critical applications, whereby if a motor fails the cost to a company can be hundreds of pounds per hour in lost revenue. It is not just the loss of production but the potential loss of the company's customer.

How it works

There are three stages to MotorAdvantage:

1. Consultation

During the consultation process ABB examines the installed motor asset register for the plant and, working with the local engineers, identifies up to five critical applications that are running either continuously or for more than 4,000 hours per annum. They then determine some basic information about these motors such as:

- How old are the installed motors?
- How efficient are the installed motors?
- How many hours do they run per annum?
- Have they been rewound before?
- What spares holding do you have for critical plant?
- What is your repair/rewind policy for 'failed' motors?

ABB also engages with the plant's process engineers to determine the exact design criteria for the various processes. This gives ABB a clearer understanding of how the process is meant to operate and its critical design operating points, thereby ensuring that a properly dimensioned motor is selected should a replacement be deemed necessary.

2. The Appraisal

An ABB engineer, or one of ABB's Authorised Value Providers partners, visits the end-user to inspect the selected motors, get an understanding of the plant, the inventory of spare motors, energy and maintenance plans. It is not unusual to find that an old motor can be 1-5 percent lower in efficiency compared to a new premium efficiency variant. If that motor is running continuously then you can achieve a typical payback of between two to three years should you wish to take the decision to scrap the motor prior to failure.



If the motor is replaced at the point of failure then taking the rewind cost into the payback calculation, the new motor cost can be recovered in less than 12 months. Bear in mind that many rewound motors will only have a six month warranty of the repaired components whilst a new premium efficiency motor from ABB comes with a three year warranty.

3. Proving the savings – report and recommendations

Following the collection of the data, the findings are analysed and potential savings identified using dedicated software. The findings are methodically presented, with tables being created to help identify where savings are likely to arise. Among the data available includes an estimation of present energy usage; whether the application would benefit from variable-speed control; payback time if an investment is made in new motors; carbon dioxide emission reductions; along with many other key facts and analysis.

An action plan is prepared, usually comprising an Executive Summary and a detailed Engineer's Report, highlighting applications that can save the most. The figures will normally be translated into monthly savings, and there will be detailed recommendations for implementation.

Benefits

- In just half-a-day, an ABB engineer can assess up to five installed motors that could benefit from a motor management plan
- Examines the end-users current policy in the event of a motor failure and the financial impact on the company
- Identifies improvements to be made with regards to maintenance and stockholding
- Determines the energy use of the current installation

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DriveSize & MotSize

DriveSize

DriveSize is a software tool that helps users select an optimum motor, drive and transformer especially for applications where straightforward selection from a catalogue is not possible.



DriveSize can also compute current, network harmonics and create dimensioning documents based on actual load parameters. DriveSize is available to use online via the ABB website or can be downloaded for use on a PC. For system requirements see:

<http://new.abb.com/drives/software-tools/drivesize>

DriveSize contains a current version of the ABB motor and drives catalogue and allows users to import their own motor database. The default values make DriveSize simple to use with ample options for drive selection.

The software performs dimensioning based on the following input:

- Speed range and mechanical load with overloads
- Ambient temperature and altitude
- Required IP-class and allowed temperature rise
- Supply network characteristics
- Load type and duty cycle
- Optionally current requirements for inverter unit
- Optionally current requirements for inverter unit Optionally current
- Apparent power requirement for the transformer

The software enables you to:

- Calculate the network harmonics of individual drive or set of drives
- Obtain efficiency values
- See your selection in graphical or numeric form
- Select manually an optional unit from database
- Print reports in Excel
- Save the results into XML project files
- Import your own motor database

Benefit

- Select an optimal motor, frequency converter and transformer
- Dimensioning based on actual shaft load
- Documents dimensioning results, graphical and numerical presentation
- Network harmonic and power factor calculation
- Print and save the results

MotSize

MotSize is a selection tool that helps users to select an optimal direct-on-line (DOL) motor from the low voltage motors catalogue. Additionally, MotSize allows users to dimension motors for specific application requirements.

MotSize functions

The software performs dimensioning based on the following data:

- Ambient conditions
- Altitude
- Requirements for a temperature rise
- Supply network data
- Load type and duty cycle

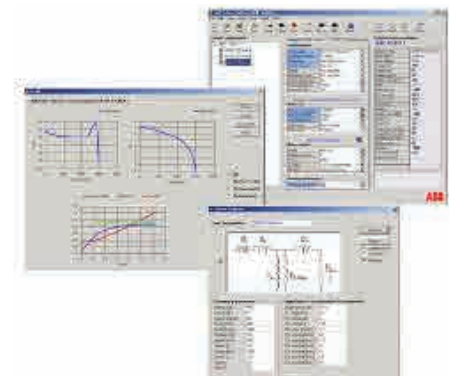
The following single-speed and/or two-speed motor types are included:

- General purpose motors:
 - Aluminium, cast iron, steel, open drip proof, brake
- Process performance motors:
 - Cast iron, aluminium
- Marine motors:
 - Aluminium, cast iron, steel, open drip proof
- Hazardous area motors:
 - Non-sparking aluminium, cast iron motors
 - Increased safety aluminium, cast iron motors
 - Flameproof cast iron motors
 - Dust ignition proof aluminium, cast iron motors

The software can handle imperial as well as metric units, all technical data is updated regularly.

The software also enables you to:

- Specify starting conditions
- Rest current, power, voltage and frequency
- Obtain rating data as well as data with partial load
- Choose the language for the printouts
- Print-out technical data sheets and graphs



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Optimizer, ABB MACHsense-P

Optimizer

ABB's Optimizer is an online tool that can quickly select the optimum motor for any minimum energy performance standard (MEPS) worldwide.

Motor users can select motors, compare running costs and get further documents about their motors and work out the cost of ownership.

Optimizer gives users eight drop down selection menus.

1. MEPS area (e.g. EU, United States)
2. Efficiency class (IE2, IE3 etc)
3. Frame material
4. Motor range
5. Voltage
6. Frequency
7. Speed
8. Power output



Once the required characteristics are selected, the tool presents a list of suitable motors. Selecting EU MEPS, IE3, dust ignition proof motors, 400 V, 50 Hz, all poles and outputs, returns a list of 49 suitable motors. They can be compared by running cost, payback periods, life cycle savings and reduction in greenhouse gas emission.

Optimizer automatically suggests, a higher efficiency motor and highlights savings realised by upgrading. Test reports, drawings, data sheets and other documents can be accessed quickly and easily for the selected motors. Documents can be opened on screen, saved or exported as a zip file.

Optimizer can be downloaded from the Apple store for iPad use by searching for 'ABB Optimizer'.

For more information about Optimizer call the ABB motors team on **07000 MOTORS**, that's **07000 668677**

ABB MACHsense-P

Regular health checks help to maintain maximum performance over entire life cycle

ABB MACHsense-P is a condition monitoring service that addresses the reliability of the complete shaft line, including the motor, gearbox and driven load (pump, fan or compressor). It identifies electrical and mechanical issues related to the rotor, bearings, gearbox and other components – problems which account for a major percentage of total failures.

Key benefits:

- Instant summary report, with a full report after detailed analysis
- Earlier warnings and more comprehensive diagnosis than conventional solutions
- Vibration and electrical measurements are processed in a single software platform to avoid false positives and negatives
- Advanced software delivers a high degree of accuracy
- Collection of vibration data over wider frequency range covers greater number of potential problems
- Testing is done with the motor in its operating condition, so no preparatory work is necessary
- Optimised cost of ownership

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ABB MACHsense-R and LEAP

ABB MACHsense-R

Continuous, remote monitoring with instant alarms and expert follow-up

ABB MACHsense-R continuously monitors key condition parameters specific to the type of motor being monitored. ABB MACHsense-R can identify nascent fault conditions at an earlier stage than conventional methods. Shaft line monitoring can be implemented with MACHsense-R.

Customers can access operating data and trend graphs via the internet. An alarm is triggered if a measured parameter exceeds set limits, giving the plant operator an early warning that maintenance is needed.

Key benefits:

- Motor or generator is constantly monitored during operation
- Model based analysis increases reliability of defect identification and quantifies defect severity
- Motor and generator design and construction taken into account for higher precision
- Multi-channel operation and fast data collection rates increase sensitivity
- On-board processing reduces volume of data transmitted to server for lower communication costs
- Authorised customers can quickly access motor or generator specific data on ABB's server
- Customers can receive regular reports on condition of their motors and generators
- Unplanned downtime is reduced, resulting in optimised cost of ownership

ABB LEAP

Life Expectancy Analysis Program (LEAP) for motors and generators

ABB Life Expectancy Analysis Program or ABB LEAP is a diagnostic tool for assessing the condition of the stator winding insulation in electric machines.

ABB LEAP goes further than conventional health monitoring programmes for rotating electrical machines, which typically use green, yellow and red LEDs, or similar to express the results. ABB has evolved this methodology to a new level: ABB LEAP analysis provides precise information on the remaining lifetime of the stator winding. Based on this, specific service actions can be planned well ahead. This method drastically reduces unplanned shutdowns caused by the failures due to factors such as thermal, electrical, ambient, or mechanical aging.



Key benefits:

- Optimises maintenance planning for electrical machines by moving from time based to condition based maintenance
- Supports efforts to extend machine lifetime, boosting return on investment (ROI)
- Facilitates decision making for short and long term maintenance and run-replace decisions
- Minimises unplanned downtime and reduces risk levels
- Provides information for lifecycle cost estimation

Condition monitoring solution for low voltage motors

ABB's smart sensor picks up data on vibration, temperature and other parameters and uses it to reduce motor downtime by up to 70 percent, extend lifetime by as much as 30 percent and lower energy use by up to 10 percent. The compact sensor that is attached to the frame of low voltage induction motors. No wiring is needed. Utilising Cloud based analytics, the smart sensor relays information about the motor's health, via a smartphone and over the internet, to a secure server. Historical information and trends are visible from a dedicated customer portal that provides status information on the entire population of motors that have been smart enabled.

