2|13

Customer newsletter of ABB drives and motors in the UK

# energise

# The year of the package deal

**A new term** is set to become the buzzword for many industries. It's not original, it's not clever but it could be the most powerful term in decades. That term is "packages". It has been coined by ABB to define the bringing together of drives and controls products to relieve customers from the burden of trying to work out their own matched combinations.

## Not just products

However, it is more than just bundling products together. It is about matching technologies to meet the energy efficiency demands of a plant, or meeting the restricted space in a panel or manufacturing unit, or reducing noise or harmonics – all while providing easy procurement and support.

While the idea is not new, the opportunity to extend this to a broader range of products most certainly is. ABB is one of the few companies in the world to make low voltage AC drives and low voltage AC motors. As such ABB has been offering the perfectly designed, tested and approved motor-drive combination for any demanding process for many years.

## Cutting timescales

Another example is the compact PLC and drive package that helps cut design and commissioning time. A starter package containing an AC500-eCo PLC and an ABB machinery drive, ACS355, is available for testing and application programming. Providing PLC, AC drives and accessories as a package simplifies ordering and provides quick deliveries.

The ready-made programming, using the function block library, enables quick start-up and reduces total programming time.

ABB's new IE4 synchronous reluctance motor and drive packages (see photo) deliver ultra-high efficiency and reliability via a full range of pre-selected packages from 11 to 315 kW.

The cool running rotor keeps the motor bearing temperature very low thus increasing bearing system reliability.

IE4 SynRM motor winding temperature rise is well below class B. These factors take motor reliability to an unprecedented level, keeping the process running without interruptions.

For the first time, you don't need to guess the combined energy consumption of the motor and drive for a given output power.

The SynRM motor and drive package efficiency is measured to verify the increased energy efficiency.


Power and productivity for a better world™

- **New ABB Drives and Motors catalogue is biggest ever**
  The latest edition of the ABB Drives and Motors Catalogue is now available. This bumper 92-page catalogue provides end-users, system integrators, machine builders and original equipment manufacturers (OEMs) with a comprehensive guide to the most extensive drives, motors and motion control products offering from any manufacturer.
- **New motion control catalogue**
  The latest ABB motion control catalogue is the ideal source for machine builders, OEMs and system integrators looking to bring together high quality products into a complete system.

  The catalogue shows ABB's complete range of motion control products, including machinery drives, micro drives, motion control drives, PLCs, HMIs and software, all of which can be seamlessly integrated to achieve a system with exceptional performance, efficiency and reliability.

**For a free hard copy of either or both catalogues email energy@gb.abb.com or call Brochureline 0800 783 7491 to download a PDF of either catalogue go to www.abb.co.uk/energy**

- **Lunch and learn training**
  ABB has compiled a series of training courses covering electrical, automation and instrumentation for the water and wastewater industry. Each course will address one or more industry hot topics e.g. managing leakage; optimising pump, fan and blower performances; complying with MCERTs; energy efficiency.
- **Award winner**
  ABB wins the EEF National Green and Growth Award 2012 following its success in winning the EEF North West Region Green and Growth Award. The awards recognise ABB's technical ingenuity in persuading customers to adopt energy saving measures for motor-driven processes and developing an energy appraisal app that helps reduce electricity bills.

# University of Greenwich cuts energy bill by £10,000

**The University of Greenwich** is set to save £10,000 on its air handling costs across its three campuses following the installation of ABB variable-speed drives (VSDs) at a number of its buildings. Additional savings from further projects could cut running costs by another £4,000.

**Six campus buildings have benefited from VSDs on their AHUs.**

As part of a plan to reduce its carbon emissions, David Blackman, Building Services Engineer in the University's Building Services department asked ABB Drives Alliance member Mid Kent Electrical (MKE) to investigate the potential for using VSDs on air handling units (AHUs) in buildings on the Medway, Greenwich and Avery Hill campuses.

MKE looked at the AHUs across several buildings and recorded motor and fan data.

The results were extrapolated to produce estimated savings for the motors on the campus. It was estimated that following the installation of VSDs on the fan applications they would save some £10,472 a year in running costs, as well as reducing carbon emissions by over 57 metric tonnes per annum.

**To find out more call 07000 DRIVES (07000 374837) or visit www.abb.co.uk/energy**

# Power station saves £350,000 on oil costs

**Aberthaw Power Station** in Wales is saving £350,000 a year on its oil costs following the installation of ABB variable-speed drives (VSDs).

The 1,600 MW coal-fired power station, operated by RWE npower, uses fans to blow oil into the boilers at two rates – a high flow rate to light the coal and a low flow rate to sustain and support the burn. Previously, the fans were driven by direct-on-line motors, which made it difficult to get the correct oil flow rate - too much air and the flame will blow out, while too little air could cause potentially dangerous combustion conditions.

As part of an energy saving drive, as well as a plan to improve the power station's environmental credentials, Kevin Smyth, Assistant Electrical Engineer at the power station, looked at using VSDs to control the combustion air flow. "Only the ABB drive had the required robustness we needed," says Smyth. "We needed a drive with an IP66 enclosure to withstand the dust and the threat of water ingress. We also needed a drive with high heat dissipation, as the drives need to operate in an ambient temperature of 30 degrees centigrade."

ABB Drives Alliance member, APDS of Bristol, recommended 7.5 kW ABB standard drives, resulting in 32 being installed.

**Aberthaw Power Station improves its environmental credentials with VSDs .**

"With the drives, we can run the motors at either of two speeds," says Smyth. "50 Hz corresponds to the high or normal flow rate, which is used for lighting the boiler. The 35 Hz speed is used to maintain a flow rate that sustains the burn."

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# More savings for Tata Steel

**Tata Steel's** casting plant in Rotherham is to save £250,000 a year following the installation of ABB variable-speed drives (VSDs) on its fume extraction system.

The project was carried out at Tata Steel's Aldwarke Bloom Caster complex in Rotherham, South Yorkshire. ABB system integrator Drives and Automation Ltd replaced existing fixed speed direct-on-line motors in the plant with low voltage motors, controlled by four ABB low harmonic VSDs, two at 400 kW and two at 570 kW.

The extraction plant is used to remove fumes from the two casting machines and two ladle arc furnaces. The original installation used four 3.3 kV motors, two as primary extraction motors, with two providing additional extraction as required. Ben Holroyde, Planning Project Engineer for the Aldwarke Bloom Caster, says: "Due to motor limitations the fans were restricted to four starts per hour, as additional starts would risk damaging the windings. This meant that the motors would be forced to run-on for 15 minutes even if demand for extraction was reduced, wasting a lot of energy."

In addition to the motor 'run-on' issues, several of the motors suffered multiple failures. "Each failure took up to six weeks to rectify," says Holroyde, "during which we had to cut back our production to ensure that we were within environmental limits of fume and dust levels."

The company aimed to save in the region of £240,000 a year on energy costs for the extraction plant by more closely matching the speed of the motors to the dust extraction demand. Holroyde adds: "We are well on target to achieve the projected savings of £250,000 with a payback time of three years, so we are very pleased with the outcome of the project."

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**£250,000 per year energy savings for Tata Steel casting plant.**

# Baking a better biscuit with an ABB drive

**Fox's Biscuits** of Batley, West Yorkshire, is well known for its high quality biscuits.

An ABB standard drive has helped them to improve product quality, reduce wastage and increase their ability to develop new products.

Initially, the company was interested in investigating the potential for saving energy on its ten dough mixers, each of which is driven by an 18.5 kW slip-ring motor. ABB Drives Alliance member Halcyon Drives investigated the benefits of using an ABB induction motor, driven by an ABB standard drive and compared this against one of the slip-ring motor driven mixers.

Paul Mayman, Area Engineering Manager for Fox's Biscuits, says: "Although the initial reason for the project was energy saving, it soon became clear that the drive gives us a lot of other important advantages. One of these is the flexibility to run at different speeds. Previously, the mixers might overmix, leading to staining where the fruit ingredients are crushed. This helps us maintain a high quality product and avoids wasting a 400 kg batch of dough."

The ability of the drive to change the speed of the mixer also allows the company to be more innovative. "With the drive controlled mixer, we can experiment by using different speeds throughout the mix, from as low as two rpm to 50 or 60 rpm, depending on the recipe."

In addition to the process quality improvements, the drive has reduced energy use by 30 percent.

**Improved product quality for Fox's Biscuits using an ABB standard drive.**


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# Vehicle parts maker saves £24,000 a year with ABB drives

**TI Automotive** of Flint in North Wales, a manufacturer of plastic automotive fuel tanks, is saving £24,000 a year on its energy bill following the installation of ABB variable-speed drives (VSDs).

The company asked ABB Drives Alliance member Central Group to recommend where energy could be saved.

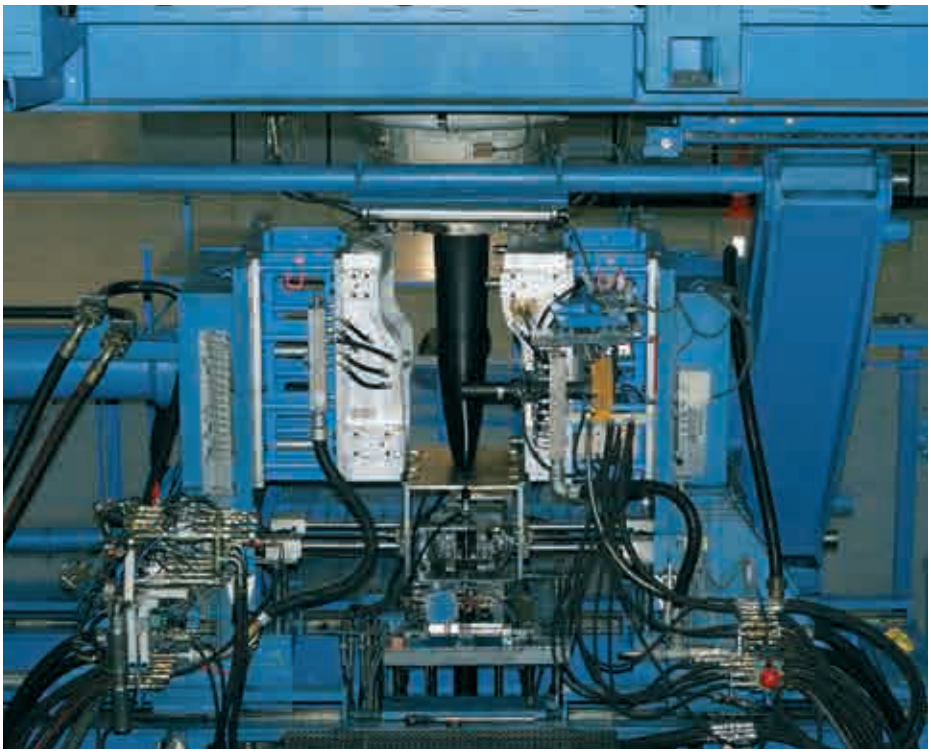
The plant uses compressed air for blow moulding. Central Group installed a 75 kW ABB standard drive on the air compressor, which previously had been a fixed speed unit. Running the motor at half speed, the ABB standard drive reduced consumption by around 35 percent.

Another application is the chilled water pumps. An 11 kW ABB standard drive on the three pumps produced a 30 percent saving.

Mike Tennant, Preventive Maintenance Engineer for the plant, says: "As well as the energy savings, we are also getting a more consistent air pressure.

"With the chilled water pumps, switching in another moulder meant the water pressure would drop. The variable-speed drive evens out these pressure demands using a pressure transducer to keep the water pressure in a tight range."

The third application was the granulator, which chops up waste HDPE for reuse. Also running 24 hours a day, the granulator is only actually working for 10 seconds out of each minute. Central Group installed a hire drive on one of the two granulators for a week. The 132 kW ABB industrial drive detects the torque demand, ramping the torque up when the machine is chopping material.



**TI Automotive makes compressor and pump energy savings using VSDs.**

Running at the same fixed speed, the ABB industrial drive reduced the granulator motor's power consumption by 65 percent.

Overall, the plant is saving around £2,000 a month on its energy bill, some 10 percent of its total energy spend. "We are very pleased with the energy reductions we are seeing," says Tennant. "We are looking at other applications where ABB variable-speed drives can save us more energy."

**To find out more call**
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**or visit www.abb.co.uk/energy**

# Plastic recycling company to save £50,000

**Regain Polymers** of Castleford, West Yorkshire, is set to save nearly £50,000 a year on energy costs following the fitting of an ABB industrial drive to one of its plastic extruders.

Regain recycle around 50,000 tonnes a year using seven extruder lines. As part of its programme to cut energy use and carbon emissions, it had identified one of its extruder lines as a prime candidate for improvement. This was based on a 400 kW DC motor and the company wanted to convert it to AC operation. As well as the expected energy savings, the conversion to AC would eliminate the need to replace the DC brushes every three months, saving £2,500 a year.

Regain Polymers asked ABB Drives Alliance member Quantum Controls to investigate. They established that the daytime electricity costs for the DC motor were £424.

**Converting DC motor to AC operation saves energy and maintenance costs.**

Quantum fitted a 400 kW ABB AC 4-pole squirrel cage motor and variable-speed drive, cutting energy costs to £260 a day, a saving of around £163 based on a 24-hour a day production. With 300 days total production a year, this gives a total annual saving of £49,000. This provides an energy reduction of nearly 870,000 kWh per year, as well as saving over 488 tonnes of $CO_2$.

The AC motor runs at the same speed as the previous DC motor, with savings coming from the improved torque ratio and efficiency of the AC drive and motor.

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# ACS880 offers maximum energy saving

**The latest ABB industrial drives,** the ACS880 series, are designed for maximum energy saving and productivity. The built-in energy calculator brings you closer to reality, showing actual energy used and its value in real money, together with saved kWh and MWh and $CO_2$ reduction, helping the user fine tune processes to ensure optimum energy use. The energy optimiser function also ensures the maximum torque per ampere, reducing energy drawn from the supply.

Tracking the energy use of the process is made easier with the drive's new control panel design, featuring an intuitive, high contrast and high-resolution control display enabling easy navigation. Many flexible data visualisations including bar charts, histograms and trend graphs help users to analyse processes. The messages are customisable for specific terminology for applications.

Built on a common architecture, the ACS880 series offers a lower cost of ownership - less training is required as all drive ranges are similar, while it also offers lower maintenance costs and reduced spares stock as the same parts can be used across the range.

The new architecture enables the ACS880 to control virtually any type of AC motor, in either open loop or closed loop through its high precision 4th generation motor control platform, direct torque control (DTC). The architecture also allows the drive to interface across all major fieldbus protocols as well as remote monitoring solutions.

The first available drive in the series is a wall-mounted single drive compatible with a wide range of applications in industries such as oil and gas, mining, metals, chemicals, cement, power plants, material handling, pulp and paper, sawmills and marine.

An integrated USB port allows easy connection to the Drive composer PC tool, which offers fast and harmonised start-up, commissioning and monitoring. The free 'Entry' version provides start-up and maintenance capabilities while the professional version of the tool provides additional features such as custom parameter windows, control diagrams of the drive's configuration, basic parameter programming and safety settings. The control diagrams save users from browsing long lists of parameters and help to set the drive's logic quickly and easily.

The new drive will be available with a power range from 0.55 to 250 kW and voltage range from 380 to 500 V, with plans to extend to a wider voltage range. It is designed to control a wide range of applications such as extruders, cranes, winches, winders, conveyors, mixers, compressors, pumps and fans. The drive offers an extensive range of options including EMC filters, resolvers, encoders, I/O options and brake resistors. Integrated safety functions include safe torque-off (STO) as standard.

The drive is offered with IP21 enclosure class, while an IP55 class for dusty and wet environments is also available. The IP55 variant occupies the same physical footprint as the IP21 unit. The new ABB industrial drive series will grow to include multidrives, cabinet-built single drives and drive modules.

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**Wide range of safety features**
Safe torque-off is built-in as standard. An optional safety functions module provides extended safety functions, simplifying the configuration and reducing installation space.

**Energy efficiency**
The drive provides features such as an energy optimiser and energy efficiency information that help you monitor and save the energy used in the processes.

**Speed feedback interfaces**
Optional speed feedback modules support HTL, TTL and absolute encoders as well as resolver feedback.

**Intuitive human-machine interface**
Intuitive, high-contrast and high-resolution display enabling easy navigation.

**Communication with all major automation networks**
Fieldbus adapters enable connectivity with all major automation networks.

**Flexible product configurations**
Drives are built to order with a wide range of options such as EMC filters, braking options and different enclosure variants.

# Remote monitoring keeps motors healthy

**Motor users** can now get 24-hour monitoring of their motors' condition thanks to a service from ABB.

MACHsense-R provides remote monitoring of the condition of motors and generators using sensors that feed signals to a fixed data analysis unit (DAU) installed either on or near the motor or generator. Data is collected continuously and transmitted wirelessly to an ABB server, allowing faults to be identified and corrected much earlier than previously possible.

Faults that can be detected by MACHsense-R include rotor winding defects, installation problems such as unbalance and misalignment, bearing problems, operating parameters and cooler fouling. The findings can be integrated into preventive maintenance schedules. The customer can access the server via the internet to view the overall status of the motor or generator and information such as graphs showing trends.

**MACHsense-R is a remote condition monitoring solution for motors and generators.**

The service is based on a custom DAU that is installed on or close to the motor or generator. Sensors mounted on the motor or generator capture raw data (four channels of vibration data, five of temperature data) and feed it to the unit for processing.

Key condition parameters (KCPs) are generated for each different fault and it is these KCPs that are transmitted to the server. Each KCP is a measure of a typical fault. It provides a direct understanding of the fault, rather than merely reflecting the overall amplitudes of the signals.

Conventional remote or on-line condition monitoring systems transmit only raw data, which is input into a SCADA system. With ABB MACHsense-R it is the KCPs rather than the overall values that are monitored. If an alarm is triggered, the customer is given clear information on what fault has caused the alarm, removing the need to do a detailed analysis to identify the fault.

Customers can quickly access all information via the internet at any time, with the easy-to-use, web based tool providing all the available information on the health of the motor or generator.

# 8 MW high voltage flameproof motor

**ABB has launched** a high voltage flameproof induction motor that is certified up to IEC frame size 900 and rated up to 8 MW.

The new motor is designed for the chemical, oil and gas industries, offering low vibration levels that increase reliability for an extended lifetime, and reduced maintenance requirements for a lower cost of ownership. It is designed for fixed speed applications from 375 to 3,000 rpm and is especially suitable for driving pumps and compressors.

With the new motor, ABB's high voltage flameproof range extends from 160 kW to 8 MW. These motors deliver a number of benefits, including no purging is needed before starting, and no pressurisation system or inert gas is required. There is no thermal limitation for the 'te' time, and no need for a system test in variable-speed drive (VSD) applications – individual certification is not required.

Both ATEX and IECEx certifications are available.

The motors are intended for fixed speed applications from 333 rpm (18-poles) to 3,000 rpm (2-poles), with 20-pole motors also available. They can be VSD fed. Operating voltages are 3 to 11 kV, 50 Hz or 60 Hz. The motors are tube-cooled (IC511 or IC516) and can be supplied for either horizontal or vertical mounting.

**High voltage flameproof induction motor certified to IEC frame size 900 and rated up to 8 MW.**

# High power pump motor for harsh environments

**ABB has introduced** a high power 2-pole motor, rated up to 13.5 MW. Designed to suit harsh environments, the new motor is particularly suitable for driving water injection pumps on FPSOs (floating production, storage and offloading units) and main oil pipeline pumps, as well as other applications in chemical, oil & gas installations, water and wastewater treatment plants.

**New 2-pole motor completes ABB's high voltage modular induction range.**

The new motor can be operated with supplies from 6 to 13.8 kV and is initially aimed at fixed speed applications up to 3,000 rpm with direct-on-line connection. Variable-speed drive operation is possible, but the speed range is fixed on a case-by-case basis for each application. For use in explosive atmospheres, the available protection types are non-sparking (Ex n) and pressurised (Ex p).

ABB used FEM (finite element method) analysis to optimise air flows, and improved the ventilation for effective cooling. A new rotor bar construction was designed to ensure that the rotor will withstand all the stresses arising during start-up and running. The shaft is solid to provide the necessary rigidity.

With its low vibration levels, robust construction, low maintenance requirements and excellent reliability, the motor provides a very low overall cost of ownership.

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## Uploaded videos

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### First screw generator saves Yorkshire Water £127,000 per year

Revolutionary renewable energy method based on an Archimedes screw and an ABB motor and variable-speed drive is saving Yorkshire Water over £127,000 a year in electricity costs.
To view the video go to:- **http://bit.ly/10Ln2KK**

### The Village Bakery saves £20,000 a year with ABB drives

Improved speed control on one of its production lines is enabling The Village Bakery (Nutrition) to save £20,000 per year. The installation of an ABB general machinery drive has delivered a combination of cost savings.
To view the video go to:- **http://bit.ly/10LnE2W**

### ABB Energy Appraisal - Identify where you can save energy

With a half-day energy appraisal, an ABB engineer can identify applications where you can reduce energy consumption and lower costs with variable-speed drives and high efficiency motors.
To view the video go to:- **http://bit.ly/YGsjE4**

### Ricoh - putting colour into efficiency

Ricoh explain how ABB variable-speed drives and software helped them to save thousands in energy bills.
To view the video go to:- **http://bit.ly/ZvlRT0**

### Improve energy efficiency by controlling your motor with an ABB drive

Drives can improve energy efficiency by optimally controlling electric motors. A pump or a fan running at half the speed consumes only one-eighth of the energy compared to one running at full speed.
To view the video go to:- **http://bit.ly/YGsBLf**

### UK water company successfully trials IE4 SynRM package

The world’s first IE4 synchronous reluctance motor and drive package (SynRM) from ABB has replaced a 20-year old, 115 kW induction motor and ACS800 variable-speed drive at South Staffs Water in the UK.
To view the video go to:- **http://bit.ly/10spy5f**

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The closing date for entries is the 30th September 2013.

All answers can be found in the newsletter.

**Good luck.**

1. **How much saving is the vehicle parts manufacturer making a year?**
   A. £24,000
   B. £30,000
   C. £35,000
   D. £40,000

2. **Which Tata Steel plant is saving £250,000 a year?**
   A. Rotherham
   B. Stocksbridge
   C. Aldwarke
   D. Scunthorpe

3. **How many tonnes does Regain Polymers recycle a year?**
   A. 60,000
   B. 50,000
   C. 30,000
   D. 25,000

4. **How much oil costs is Aberthaw Power Station saving a year?**
   A. £95,000
   B. £150,000
   C. £250,000
   D. £350,000

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Company name: _____

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