

# EMS

ENGINEERING MAINTENANCE SOLUTIONS

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35-39

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## In the next Issue: October

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- Compressed Air
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### Denso Tape Protection at Cambridge Pumping Station

The pumping station at Kennet on the Cambridge/Suffolk border performs a key function on the Environmental Agency's major Ely Ouse to Essex Water Transfer system which takes raw water from Blackdyke in Norfolk to Great Sampford in Essex.

Design consultants for a project to refurbish the pipeline part of the system were Black & Veatch Ltd.

The construction of this project was carried out by main contractors Jackson Civil Engineering for refurbishment of the anode bed of the cathodic protection system for the main pipework, with specialist sub-contractor Cathodic Protection Co Ltd of Grantham. During works at Kennett PS it was observed that two VJ couplings and associated pipework within a chamber were suffering from surface corrosion due to deterioration of the original protection system.

Sub-contractors Jack Tighe Ltd wire brushed all chamber pipe and coupling surfaces and ensured they were dry and free from contaminants. In this project, after stabilising the surface with a paint primer, Winn & Coales (Denso) Ltd's conventional protection system was then applied, starting with Denso Paste and then application of Denso Mastic on bolt heads, nuts, flanges and other projections to give an overall smooth external profile. This was then wrapped with Denso Tape in a spiral wrap using 55% overlap. The tape extended along 150mm of the protected barrel of the pipe on each side of the joint and fittings. In a report to the Environment Agency Black & Veatch stated: "The works were carried out to a high standard."

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### ESAB'S WARRIOR™ TECH HELMET NOW AVAILABLE WITH NEW AIR PURIFYING RESPIRATOR

ESAB, a world leader in welding and cutting technologies, now offers a Powered Air Purifying Respirator (PAPR) for its Warrior™ Tech 9-13 Auto-Darkening welding helmet, part of its comprehensive line of personal protection equipment.

The Warrior Tech helmet with ESAB's Eco Air PAPR is a full-face respiratory system designed to provide the highest safety and comfort for the welder. Manufactured and tested to meet stringent EN12941 standards, the helmet with PAPR provides a high protection rating of

TH2P and uses a high performance P3 main filter to remove particulate matter.

PAPRs operate by filtering air through a battery powered unit, which is then supplied into the breathing zone inside the helmet. ESAB's Eco Air PAPR delivers the maximum fresh air flow and offers protection against dangerous welding fume particles. Air movement over the face and head also keep the welder cool and comfortable.

The Eco Air PAPR is lightweight and low profile to be easy to manage. It provides a comfort pad to help reduce welder fatigue and muscle strain over time. This unit also includes audible and vibrating alarms that notify the user of low battery or restricted airflow. The Warrior Tech helmet prepared for PAPR is fully assembled and ready to attach to the Eco Air PAPR unit, which comes complete and set up for immediate use.



For more information, visit [www.esab.co.uk](http://www.esab.co.uk), email [info@esab.co.uk](mailto:info@esab.co.uk), or call 0800 389 3152. Follow ESAB UK on Facebook.

## Northern Manufacturing & Electronics 2014

Northern Manufacturing & Electronics, the North's top industrial technology show, returns to EventCity, Manchester.

The two-day event will take place on October 1st and 2nd and promises to be the biggest yet.

Northern Manufacturing & Electronics is the largest exhibition serving the manufacturing and engineering industries in the North of the UK, including Scotland, Wales and Northern Ireland. The show hosts over 250 exhibitors and boasts a comprehensive range of seminars and demonstrations alongside an incredible selection of engineering suppliers and service providers. Coupled with its accessible location, this gives visitors an opportunity to solve many production and service issues in one day.

The event organisers are expecting a 20% increase in exhibitors for 2014, and once again the show promises to be the landmark event for manufacturing and engineering across the region. Situated at EventCity, Manchester, it is easy to access by rail and road and will host some of industry's most recognised names including Olympus, Faro, Nikon, Cupio Yestech, Scaglia Indeva, Trumpf, Renishaw, Bernstein, Mecwash, SSI Schaefer, Kableschep Metool, Henkel Loctite and many more. New companies exhibiting in 2014 include

Pacer International, Midas, Plate & Locate and K Lacey Cables.

As well as the variety of exhibitors on display, the show will host a number of seminars covering topics such as CE Marking and Lean Manufacturing. There are also sessions covering more general business, such as developing negotiation skills, and looking at the latest developments in areas such as 3D Printing and advanced manufacturing. The seminars are a great opportunity for visitors to learn about industry news, events, changes to laws and ways to improve negotiation skills and commercial acumen. A full list of sessions and free registration can be found at [www.industrynorth.co.uk](http://www.industrynorth.co.uk)

Amongst the new products making their UK debut at the show, Sliding Systems will launch its new ULTIO range of 'C' section telescopic slides, which are designed for heavy duty applications and for 'fit and forget'. Itron UK launches a new range of TFT displays for industrial applications; LEMO introduces a new range of miniature connectors designed for harsh environments.



Entry to Northern Manufacturing & Electronics 2014 is completely free to visitors. EventCity offers 3000 free car parking spaces next to the venue and very easy access by road, rail or air. To register online for tickets simply visit [www.industrynorth.co.uk](http://www.industrynorth.co.uk) or call 01784 880 890. Visitors can follow all the latest news from the show via the LinkedIn group or on its blog page at <http://blog.industrynorth.co.uk>, or by following @industrycouk and the hashtag #northmanf on Twitter. Videos from 2013 on the show's YouTube channel UKIndustry will give you an even better flavour of what to expect.

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## Winn & Coales Coating Protects Power Station Header Boxes

Universal Heat Transfer Ltd (UHT) of Atherston, Warwicks, are heat exchange and transfer specialists in supplying equipment and services to industry.

One of their latest projects involved the manufacture of header boxes and channel heads for the refurbishment of four hydrogen coolers for a power station generator cooling system.



UHT's customer specified Winn & Coales (Denso) Ltd's Archco-Rigidon 403D to give "fit and forget" corrosion protection of the carbon steel substrate from the coolant inside the header boxes for a minimum of ten years. Winn & Coales checked the specification for both suitability of Archco-Rigidon 403D and also for the method of application, given that the coating had to be applied in normal engineering workshop conditions. UHT say that the coating arrived in a timely manner, which was appreciated due to the tight deadlines they had to meet.

The glass flake vinyl ester Archco-Rigidon coating was inspected by UHT's customer's Quality Assurance consultants and found to be more than adequate in terms of finish and film thickness, including Holiday detection readings, to provide the required protection.

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## Fluke Power Quality Seminars programme for 2014

Fluke, the global leader in portable electronic test and measurement technology, is offering a series of free Power Quality Seminars as part of its programme of seminars for 2014 throughout the UK and Ireland.

Designed to help Facility Managers, Maintenance Engineers, Energy Consultants and Power Engineers to save money on energy bills and increase machinery lifetime, the seminars are one element of the Fluke Academy programme which can be seen at <http://www.flukeacademy.shuttlepod.org/> UK-seminars

The seminars covering Power Quality explain how users of Fluke equipment can set up a load study, how they can measure the power quality from the power utility and how to detect disturbances in their facilities, thus learning how to save money and improve machinery lifetime.

### Each seminar will cover:

- An introduction to Power Quality principles
- Flicker, transients, Volts, Amps and Hertz
- Load studies
- Energy consumption in facilities, offices and homes
- How to measure unbalance, harmonics, interharmonics
- Mains signalling, voltage dips and swells

Other seminars in the Fluke Academy programme cover thermography; troubleshooting motors and drives to minimise plant downtime; and reducing energy costs.



The Fluke Academy web page also provides access to webinars and webcasts that provide online training to obtain the maximum benefit in the application of thermal imagers, power quality meters and portable oscilloscopes, as well as highlighting training courses with partner institutions.

Information about all Fluke products can be obtained via the Fluke web site at: [www.fluke.co.uk](http://www.fluke.co.uk).

# ISO (International Organisation for Standardisation) Air Quality Standards

There are three main standards currently in use which directly relate to the purity of the compressed air quality and testing requirements for industry.

ISO 8573-1-2010 CLASS	SOLID PARTICULATE			Mass Concentration mg/m <sup>3</sup>	WATER		OIL Total Oil Aerosol/Liquid/Vapour mg/3
	Max Number of Particles per m <sup>3</sup>				Vapour Pressure Dew point	Liquid g/m <sup>3</sup>	
	0.1 - 0.5micron	0.5 - 1 micron	1 - 6 micron				
0	Specified by the equipment manufacturer / supplier and greater than class 1						
1	≤ 20,000	≤ 400	≤ 10	/	≤ -70°C	/	0.01
2	≤ 400,000	≤ 6,000	≤ 100	/	≤ -40°C	/	0.1
3	/	≤ 90,000	≤ 1,000	/	≤ -20°C	/	1
4	/	/	≤ 10,000	/	≤ +3°C	/	5
5	/	/	≤ 100,000	/	≤ +7°C	/	/
6	/	/	/	≤ 5	≤ +10°C	/	/
7	/	/	/	5-10	/	≤ 0.5	/
8	/	/	/	/	/	0.5-5	/
9	/	/	/	/	/	5-10	/
X	/	/	/	≥ 10	/	≥ 10	≥ 10

These are:

## ISO8573 Series / ISO12500 Series / ISO7183

The most commonly used standard is the ISO8573 Series and in particular ISO8573-1:2010.

### The compressed air quality standard ISO8573 –

Consists of nine separate parts;

Part 1 Compressed air – Contaminants and purity classes

Parts 2 – 9 specifying the methods of testing for a range of contaminants.

ISO8573-1:2010  
SPECIFIES THE AMOUNT OF CONTAMINATION ALLOWABLE IN EACH CUBIC METRE OF COMPRESSED AIR

ISO8573-2:2007  
SPECIFIES THE TEST METHOD FOR OIL AEROSOL CONTENT

ISO8573-3:1999  
SPECIFIES THE TEST METHOD FOR THE MEASUREMENT OF HUMIDITY

ISO8573-4:2001  
SPECIFIES THE TEST METHOD FOR SOLID PARTICLE CONTENT

ISO8573-5:2001  
SPECIFIES THE TEST METHOD FOR OIL VAPOUR AND ORGANIC SOLVENT CONTENT

ISO8573-6:2003  
SPECIFIES THE TEST METHOD FOR GASEOUS CONTAMINANT CONTENT

ISO8573-7:2003  
SPECIFIES THE TEST METHOD FOR VIABLE MICROBIOLOGICAL CONTAMINANT CONTENT

ISO8573-8:2004  
SPECIFIES THE TEST FOR SOLID PARTICLE CONTENT BY MASS CONCENTRATION

ISO8573-9:2004  
SPECIFIES THE TEST METHOD FOR LIQUID WATER CONTENT

Above: Fig 1

### Air quality (purity) in accordance with ISO8573-1:2010

ISO8573-1 is the primary document used from the ISO8573 series as it is this document which specifies the amount of contamination allowed in each cubic metre of compressed air.

ISO8573-1 lists the main contaminants as Solid Particulate, Water and Oil.  
The purity levels for each contaminant can be found in the table FIG 1.

Compressed air purity levels are shown within ISO 8573.1 in table form.

The horizontal headings show the three major contaminants of solid particulate, water and oil.

The vertical headings show "purity classes" identified by a number.

Alongside each purity class, is a maximum permissible amount of contamination per cubic metre.

When specifying purity classes, a different purity class should be selected for each contaminant and is written as shown in the following example :

ISO 8573.1 : 2010 Class 1.2.1

The first number refers to purity level class 1 for solid particulate,  
The second number refers to purity level class 2 for water  
The third number refers to purity level class 1 for oil.

### Selecting an air purity class of 1.2.1 would specify the following air quality.

#### Class 1 Particulate

No more than 100 particles in the 0.1 - 0.5 micron size range allowed in each cubic metre of compressed air.  
No more than 1 particle in the 0.5 - 1 micron size range allowed in each cubic metre of compressed air.

No particles in the 1 - 5 micron size range allowed in each cubic metre of compressed air.

#### Class 2 Water

No liquid water allowed. Pressure dewpoint of -40°C or better.

#### Class 1 Oil

Not more than 0.01mg of oil allowed in each cubic metre of compressed air.  
This refers to a combined level for both oil aerosol and oil vapour.

The quality of air required throughout a typical compressed air system can vary.

The extensive range of filtration equipment available from BEKO Technologies allows the end user to specify the quality of air for every application, from a general purpose ring main filtration, through to critical clean dry air systems for medical or instrumentation purposes.

Allowing equipment to be matched to any system requirement

### ISO8573-1:2010 Class zero

#### Class 0 does not mean zero contamination

Class 0 requires the equipment manufacturer and the end user to agree contamination levels as part of a written scheme / specification

The agreed contamination levels for a Class 0 specification should be within the measurement capabilities of the test equipment and test methods as shown in ISO8573 Part 2 to Part 9

The agreed Class 0 specification must be written on all documentation to be in accordance with the standard

Stating Class 0 without an agreed specification will mean it is not in accordance with the standard

A compressor delivering air to Class 0 will be dependent upon what is drawn into the compressor air intake and will still require purification equipment in both the compressor room and at the point of use for the Class 0 to be maintained at the point of use

Air for critical applications such as instrumentation/ food / breathing air / medical air typically will require air to Class 2.2.1 or Class 2.1.1

Class 0 air purity is best achieved at the point of use to minimise cost.

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# Is Oil Analysis The Key To More Machine Uptime?

**If 80% of all hydraulic failures on machinery can be traced back to contaminated oil, why do maintenance engineers place their faith in component monitoring? Chris Gray, Filtration Product Manager at Bosch Rexroth, explains why oil sampling is the key to greater machine uptime.**

Preventive maintenance and component monitoring are two of the big buzzwords being used more and more across British manufacturing.

This continues to puzzle me, particularly in relation to hydraulics, because figures suggest that only 20% of unplanned downtime can be identified through component monitoring. In fact, 80% of all hydraulic failures on machinery can be traced back to contaminated oil.

The truth of the matter is that oil analysis has the capability to prevent expensive repairs, minimise downtime, detect early damage to components, optimise filtration systems and even provide environmental relief through the minimisation of wasted oil.

Surely then, oil analysis is a more reliable option as part of a modern day programme. The truth of the matter is that oil analysis has the capability to prevent expensive repairs, minimise downtime, detect early damage to components, optimise filtration systems and even provide environmental relief through the minimisation of wasted oil.

There are three types of contamination which can be identified by oil analysis. The first is solid particles, such as dirt and dust particles which can cause jamming; influence control behavior, prematurely wear components leading to failure and a reduction in machine availability.

The second type of contamination is liquid contamination which are in the main water and fluid mixtures. This type of contamination can cause corrosion and wear, along with impairment of viscosity and even cause a chemical reaction with the fluid which can impact lubricating properties. In addition, the effectiveness of machine filters can be reduced along with filter service life. Again, all of these issues can lead to reduced machine availability.

Finally, gaseous contamination, such as air, can have a number of serious consequences. Foaming in the

oil sequences; inaccurate response of valves; energy loss; damage to pumps; chemical reactions with the fluid and oxidation, can all result in a reduction in machine availability.

Contamination can find its way into a machine's oil supply in a number of ways. Built-in contamination is a product of the component manufacturing process. Foundry sand or dust and residues from welding, metal chips, shot blasted materials, paint particles, preservatives and cleaning residues can all find their way into the oil and create machine problems.

External contamination occurs from the ambient air once the hydraulics are operational within a manufacturing environment. Ambient air, via piston rods, labyrinth seals and vents, can have an adverse effect on oil and reduce its operational effectiveness.

Lastly, generated contamination will also impact machine oil. Metal wear through abrasion or erosion of components can cause seal abrasion, chemical corrosion and oxidation residues which all occur when mixing oil with insoluble substances.

A typical contaminant would be silica, a hard airborne particulate, which can get between the working surfaces or clearances on machinery components, such as a pump or cylinder. Once contamination has occurred it will circulate between the two components, gradually wearing away the surfaces. As the surface abrasions get bigger, leakage occurs leading to component failure, such as valve stitching.

These hydraulic failures are directly attributable to oil contamination, via components such as cylinder rods. What's more, once in place, there is often a chain reaction of particles. One particle rubbing against another breaks off and splits into two. Two particles split to become four and four become eight. Often, the solution is simple, such as the installation of offline filter units.

The problem for many maintenance teams is time and resource. While oil analysis can be incredibly



effective as part of a preventive maintenance programme, it does take valuable time which takes engineers away from more critical, problems which they encounter every day. All-too-often, no oil analysis is undertaken or the schedule falls by the wayside as more critical issues take priority.

Oil analysis, such as the Bosch Rexroth oil analysis service, can identify how much particulate is potentially affecting the smooth running of a machine. What's more, a recognised industry standard is now in place, ISO 4406, which measures 100 millilitres of oil and gives a particulate reading.

Only regular oil analysis can prevent build-up of particulates and ensure the machine stays available 100 per cent of the time. Cleanliness of the oil is crucial and is a far superior method of identifying potential problems than component monitoring and offers the opportunity to identify appropriate levels of filtration and, if necessary, upgrade.

Ideally, machines should be sampled on at least a quarterly basis and levels of contamination should be plotted on a graph. Only in this way is it possible to identify problems before they become critical.

Oil sampling does come with a small cost but if a company has 100 machines working intensely, a simple low cost oil analysis, costing as little as £15, has the potential to prevent a costly component fault or stoppage which far outstrips the sampling cost. When you consider that the cost of replacing an average sized pump is approximately £5,000 the financial argument really begins to stack up.

Monitoring oil cleanliness is therefore the most important factor to prevent failures and should become a must in any modern maintenance and servicing regime.

To learn more, please visit:  
[www.boschrexroth.com](http://www.boschrexroth.com)

# How Does Your Maintenance Organization Use Time?

## By Christer Idhammar

We all know that in a reactive maintenance organization 60 – 70 % of crafts people’s time is wasted on finding out what to do, finding parts and materials, etc.

As part of your business case you should know where your maintenance organization spends its maintenance hours. This absolutely does not mean that you do any time studies. Instead you divide where time is used in three categories:

- Corrective maintenance
- Preventive maintenance
- Continuous improvement

Corrective maintenance is all maintenance done to correct a failure or a break down. It can be done in four different ways:

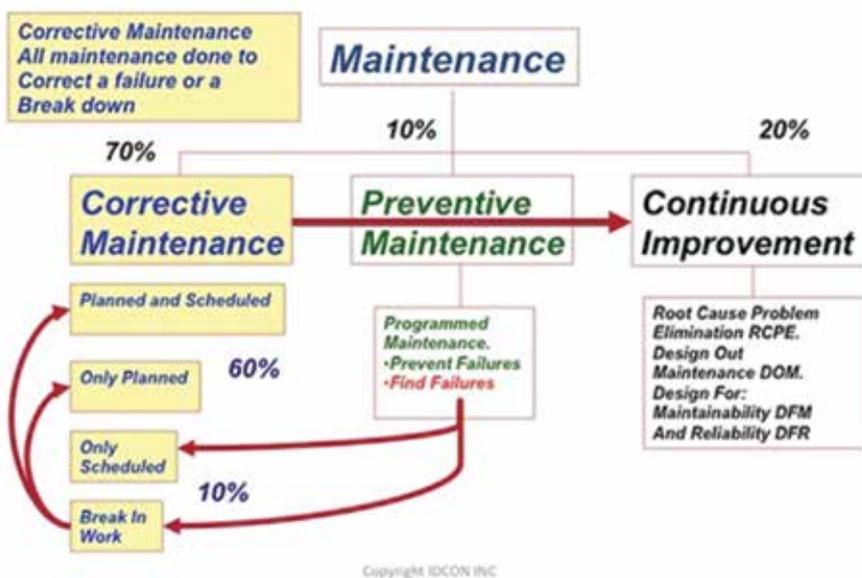
- Planned and Scheduled
- Only Planned.
- Only Scheduled
- Break in work in schedules

Number 1 and 2 is where you like to spend most time. The fact is that most organizations spend the majority of their time for weekly and daily maintenance in number 3 and 4. During shut downs the situation is better but if you spend more than 5% of your time on number 3 and 4 during a shut down you need to improve on this.

Preventive maintenance (PM) is all maintenance done to prevent failures or to discover failures before they develop to a break down. If your PM has the right content and is executed right your organization shall not be in a reactive mode.

Continuous improvement is work done to do Root Cause Problem Elimination (RCPE). In a reactive organization this is close to zero maintenance hours even if organization has a process and people have been trained.

### GREAT Organization



We also know that the solution to this situation is to become more proactive and in control. This can be done by better condition monitoring, planning of work and scheduling of work combined with an efficient store including an accurate bill of materials.

Best organizations I have worked with have very little wasted time because of good leadership and an efficient work management process. More importantly they have higher reliability and faster production throughput and consequently lower manufacturing costs. They see lower costs as an outcome of higher reliability and faster production throughput.

Less efficient organizations are more shortsighted and put an emphasis to stay within the maintenance budget rather than doing what is necessary to deliver stable and reliable quality production output.

Maintenance managers are often driven to stay within budget to the extent that reliability suffers. As a maintenance manager you need to have a three to five years plan covering:

- How good your organization is today.
- How good it can become.
- How you are going to close this gap.
- How much it will cost.
- How much savings in reliability and costs will be generated.

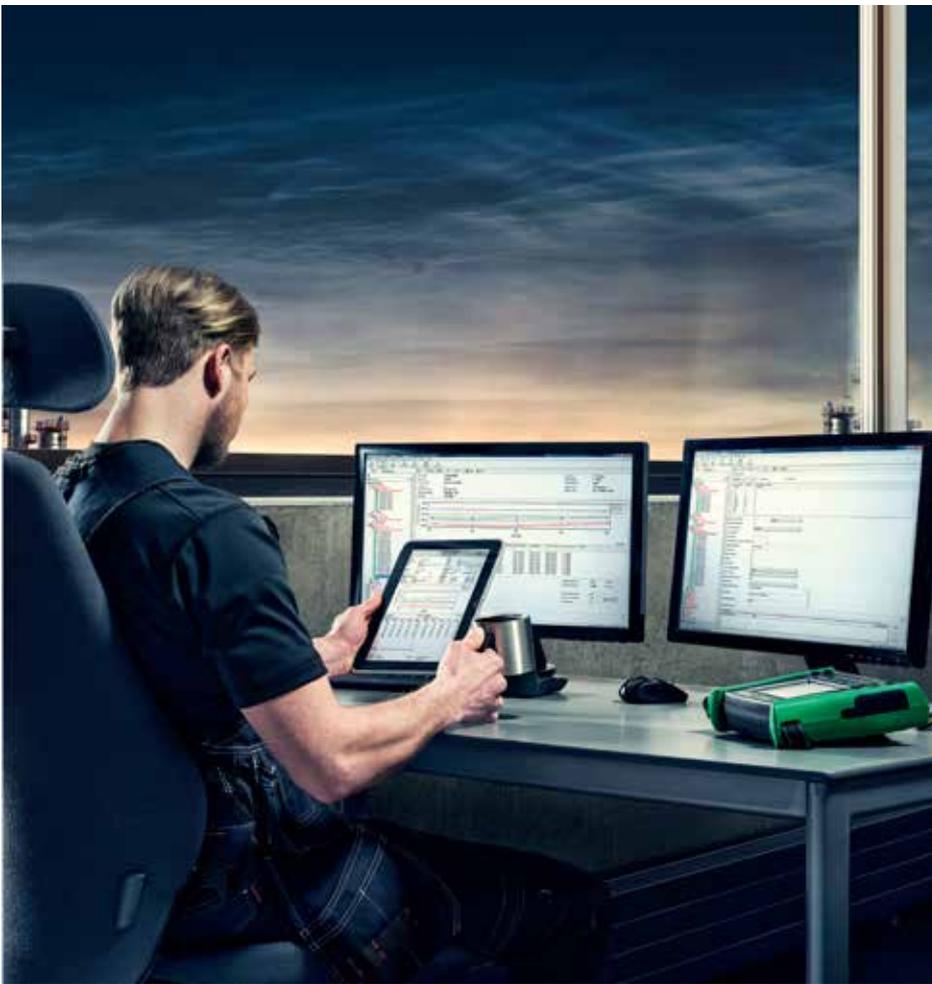
All the above must be supported with a strong business case so you can sell it to decision makers. Remember, most of this is common sense so do not over complicate it and the good thing is that it is not a question of much capital money, if any, it is a matter of doing better with what you already have.



Christer Idhammar  
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 Vice President  
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# An Efficient Calibration Process Is Automated And Paperless

Every plant has a process on site for performing and managing calibrations, but there can be many different types of calibration processes and they vary in terms of quality, efficiency and productiveness.



The calibration process starts from the planning and scheduling of the calibration work and includes performing of calibrations as well as documentation of results. An efficient calibration process saves time, automates procedures, is cost-efficient and assures that the results are reliable. The best-in-class calibration processes are integrated, automated and paperless. This is the key message in Beamex's global "Calibrations under Control" marketing campaign. Jan-Henrik Svensson, VP Marketing & Sales of Beamex Group explains, "We are not just

offering a product or even a set of products and services – what we are actually offering is a new process of performing and managing calibrations in a way that provides efficiency and quality improvements as well as cost-savings".

Beamex ICS, the integrated calibration solution, which constitutes the heart of this marketing campaign, is unique compared to any other calibration system due to its seamless communication between calibrators and calibration

software, the possibility to integrate it into a maintenance management system (ERP/CMMS), the multifunctional calibrators that can perform automated calibrations fast and efficiently as well as the calibration software that allows smart analysis and management of all calibration data.

## Improved Workflow

With paper-based systems, paper records that need approval have to be routed to several individuals, which is time-consuming. With Integrated calibration solutions the workflow improves dramatically. There will be less waiting time, as those individuals who need to sign off records or calibration documents can share or access electronic records simultaneously from a central database. The cost and time associated with printing copies of paper documents is also eliminated, as well as the cost of filing and storing those paper records.

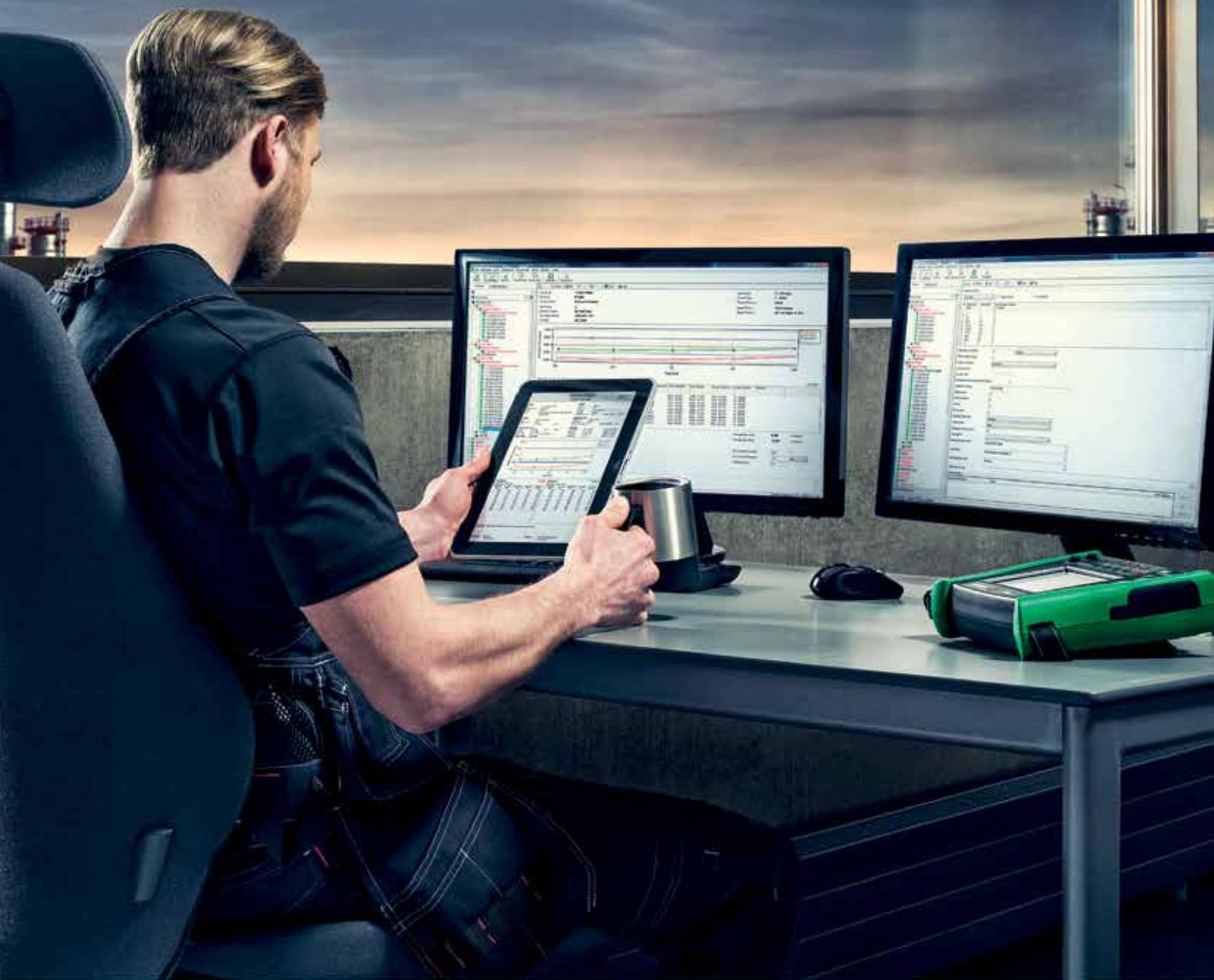
Just as important, electronic records enable easier analysis of data, particularly calibration results. Historical trending becomes easier, faster and more reliable, which again has cost reduction benefits to the business. Calibration intervals can be optimised. For example, those instruments that are performing better than expected may well justify a reduction in their calibration frequency.

When a plant is being audited, calibration software facilitates both the preparation and the audit itself. Locating records and verifying that the system works becomes effortless when compared to traditional paper-based record keeping. Paperless calibration systems improve plant efficiencies because the entire calibration process is now streamlined and automated. Costly production downtime due to unforeseen instrument failures will also be reduced.

The microsite [beamex.com/calibrationsundercontrol](http://beamex.com/calibrationsundercontrol) explains the benefits of an automated and paperless calibration process as well as includes an online test for testing the efficiency of a plant's current calibration process.

BEAMEX is a leading, worldwide provider of calibration solutions that meet even the most demanding requirements of process instrumentation. For more information, visit [www.beamex.com](http://www.beamex.com).

# Calibrations under control



Beamex provides the equipment, software and services needed for an efficient calibration process. The calibration process starts from the planning and scheduling of the calibration work and includes performing of calibrations as well as documentation of results. An efficient calibration process saves time, automates procedures, is cost-efficient and assures that the results are reliable. The best-in-class calibration processes are integrated, automated and paperless. Learn more and test how advanced and efficient your existing calibration process is at: [www.beamex.com/calibrationsundercontrol](http://www.beamex.com/calibrationsundercontrol)

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# Forward Thinking Boiler House Control

Lost production due to unplanned boiler downtime is something we all fear.



Downtime on your daily operation can cost you thousands, and with the boiler being at the heart of many industry applications, one thing you don't need is the stress caused by a boiler breakdown. Modern burner and boiler controls include a wealth of information that aid boiler service people to identify what went wrong and when; greatly reducing the amount of time lost in getting a boiler back up to working condition. However, the Holy Grail would be a system that is able to predict these failures before they happen, allowing you to schedule your downtime or even to take preventative action whilst the boiler is still on-line.

'Unity' from Byworth Boilers is showing great promise in this area by utilising the normally discrete signals collected by individual components to form sophisticated, 'feed-forward' control loops, and to identify developing problems. An example of such a control considers the boiler pressure, flue gas temperature and the boiler firing-rate. Significant drift in the flue gas temperature can be an indication

of fouling of the heating surfaces or a problem with the burner, both of which cause unnecessary expenditure and, eventually, unplanned downtime.

## Improved Diagnostics

Explaining the thought processes that drove the innovation, the system developer, Mr Jason Atkinson of Byworth commented, 'Current integrated systems are simply not using the data they collect in an effective manner. With Unity, we've thought about how all of these discrete signals can be brought together and made to work in a user-friendly system that is far greater than the sum of its parts. What we're offering is a boiler house that makes intelligent decisions based on multiple pieces of information.'

## Technological Advantages

Unity readily integrates with PC, smartphone and tablet devices ensuring that on-call engineers are quickly notified of key events and are able to

remotely assess the boiler from anywhere with an internet connection, including over 3G mobile networks.

Stephen Fleming, Scottish Area Sales Manager for Byworth says "Unity has proven particularly popular with sites in remote locations. Where engineers have remote access, Unity has vastly improved the response time to maintenance issues such as low water events. As a result, this improved customer satisfaction has leading brands flocking to Unity's calling."

## Service – A long-term support

With year-round remote monitoring, Byworth are often aware of problems at the same time as the engineers on-site. With real-time and historic data readily available, Byworth personnel are able to track their customers' boiler houses from the head office in West Yorkshire and remotely diagnose and fix problems, whereas previously they would have had to attend site. Accurate diagnostics ensure that when they do attend site they arrive with the correct parts, significantly reducing down-time.

## Summary

Unity operators can view processed boiler house data and trends relating to numerous values including:

- Boiler and Manifold Pressures
- Boiler Water Levels and Conductivity
- Hotwell Levels and Temperature
- Blowdown Temperature
- Flue Temperature and Gas Analysis
- And many more

All alarms and tests conducted are logged and can be exported to a network printer if required; whilst a straightforward 'traffic light' warning system keeps users up-to-date with any changes in plant conditions and draws focus to areas requiring attention or adjustment. This comprehensive, 'joined up' approach to the management of multiple processes means Unity offers significantly less downtime than other control systems.

Byworth Boilers Limited, Parkwood Boiler Works, Parkwood Street, Keighley, West Yorkshire, BD21 4NW, UK  
t +44 (0)1535 665225  
f +44 (0)1535 680997  
w byworth.co.uk

# Bosch inside.

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# BABCOCK WANSON THERMAL FLUID HEATERS NOW AVAILABLE TO RENT

Industrial process heating specialist Babcock Wanson UK is pleased to announce a unique new Thermal Fluid Heating System rental service.



This new rental service, which can provide up to 900kW of energy to a process, will enable customers to trial a thermal fluid heater for a fixed time at a fixed rental price.

Babcock Wanson UK Managing Director Chris Horsley explains the thinking behind the new rental option: "For most organisations, changing to a new process heating solution is a major commitment and, once done, can't be easily changed. But what if you could try out that heater on your own premises, as part of your process development, without having to commit to using it permanently? It would enable you to test and prove the heat source to ensure it is suitable for your specific process."

Based on its market leading TPC400B Thermal Fluid Heaters, Babcock Wanson has developed a packaged 'plug and play' version that can be delivered to site and set up by Babcock Wanson's highly experienced engineers.

These portable heaters provide the same benefits as all Babcock Wanson Thermal Fluid Heaters, enabling customers to see first hand the energy saving benefits that come from a closed circuit, no-loss system. A typical energy saving when using a thermal fluid system can be as high as 20-50% when compared to the transfer of the same amount of heat using traditional steam boilers, especially for processes where the energy from the condensate cannot be easily recovered. Thermal fluid systems precisely match fuel input to plant energy requirements for high efficiency. With lower energy input demand comes lower total exhaust emissions, so there are also environmental benefits.

Babcock Wanson offers a complete range of products and services for boiler houses and other process heating needs, from steam boilers, thermal fluid heaters, rapid steam generators and hot water boilers to VOC and odour treatment by thermal oxidation, water treatment or process air heating solutions. The company aims to help optimise customer's energy production with high quality products and efficient service.

For more information, please contact Babcock Wanson on:  
020 8953 7111  
or [info@babcock-wanson.co.uk](mailto:info@babcock-wanson.co.uk)  
or go to [www.babcock-wanson.co.uk](http://www.babcock-wanson.co.uk)

## A FRESH VIEW ON BOILER HOUSE CONTROL

Unity is the intelligent system that monitors, controls and operates the different parts of your boiler house installation from one central point.

From water treatment, right through to the steam header, Unity gives you an unprecedented level of visibility and control in one easy to use interface.



Unity

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01535 665 225

Byworth Boilers  
Parkwood Boiler Works  
Parkwood Street  
Keighley  
West Yorkshire  
BD21 4NW

# BOSCH LAUNCHES NEW HEAT RECOVERY STEAM BOILER

One of the world's leading heating and hot water manufacturers, Bosch Commercial and Industrial Heating, has extended its range of industrial steam plant solutions with the addition of a new heat recovery system, designed to operate in conjunction with Combined Heat and Power (CHP) modules, as well as other industrial heating systems.

Bosch Commercial and Industrial Heating, said: "The new Heat Recovery Steam Boiler is a great addition to our already extensive product range which not only helps to reduce overall energy costs for commercial and industrial consumers, but provides an efficient generation of process heat. The simple design and advanced control technology used also ensure installation and operation remain easy and convenient.

"By introducing the new Heat Recovery Steam Boiler, Bosch can now offer an even more comprehensive and complete energy efficient system that can generate heat for industrial processes, hot water and space heating via peak load industrial steam boilers, hot water boilers and now a heat recovery steam boiler that supports the customer's on-site generation of electricity.



The new Heat Recovery Steam Boiler (HRSB) boasts the ability to generate between 400 and 4,100 kilogrammes of effective process steam per hour and provides an efficient way of converting accumulated heat in flue gases generated from combustion at a downstream CHP module. An

integrated flue bypass is provided for situations where process steam is not required; this ensures that CHP running hours are maximised, along with their associated efficiency and economic benefits.

Geoff Hobbs, Business Development Director at

If you would like further information on Bosch Commercial and Industrial Heating's new Heat Recovery Steam Boiler or it's extensive industrial boiler range, please call 0330 123 3004 or visit: [www.bosch-industrial.co.uk](http://www.bosch-industrial.co.uk).

# Riello launches CIBSE accredited gas booster CPD course

Riello has introduced a free CIBSE-accredited CPD course for consulting and in-house engineers, covering the specification, installation and maintenance of gas boosters for use with gas-fired burners in commercial and industrial applications.

The seminars will also cover the control of gas boosters, as well as the use of non-return valves and variable speed drives in gas booster installations.

The course begins by considering the performance requirements that may necessitate the use of gas boosters and explaining how they work in conjunction with combustion equipment. It goes on to explore the criteria for selection and the key factors for successful installation and control.



In the first instance, specifiers should register their interest by visiting: [www.rielloburners.co.uk/cpd](http://www.rielloburners.co.uk/cpd)  
 Emailing [cpd@rielloburners.co.uk](mailto:cpd@rielloburners.co.uk)  
 or calling +44 1480 432144.

## New Horizons

Having recently invested in a new state-of-the-art facility in the UK - including a plasma cutter, sub arc welding equipment and new lifting cranes - Fulton now has the capacity to manufacture pressure vessels for its horizontal and vertical steam boilers in Bristol. All this at a time when many companies are looking abroad for low-cost manufacturing solutions!

This increased capacity means Fulton can now supply pressure vessels and complete heat transfer solutions to its own customers and other Fulton companies in the US and China.

To buy British, call +44 (0)117 972 3322, email [sales@fulton.co.uk](mailto:sales@fulton.co.uk) or visit [fulton.co.uk](http://fulton.co.uk).



# Flash steam recovery trims Biomar's gas bill around 10%

**Biomar Grangemouth has sliced between 9 and 10% off its annual gas bill with the help of a system to recover energy from flash steam that would otherwise be lost to atmosphere.**



The aquaculture manufacturer says that the energy savings alone mean that the Flash Recovery Energy Management Equipment (FREME) engineered system from Spirax Sarco has paid for itself around 10 times in the four years since installation.

Biomar Grangemouth supplies over 100,000 tonnes of fish feed annually. The site uses around 7700 kg/h of steam in its production process, with its flat bed dryers alone using between 2500 and 4500 kg/hr. Before the arrival of the Spirax Sarco system, the flash steam from the returning dryer condensate was vented to atmosphere.

"We decided to recover this wasted energy as part of a group wide policy to save energy and reduce

visible emissions," explains Christopher Strain, Engineering Manager at Biomar Grangemouth. "Spirax Sarco worked with Biomar to design, build and deliver a complete package flash steam recovery system. Close co-ordination between Spirax Sarco and our team ensured the system was delivered on time, on specification and on budget."

Condensate and flash steam from the dryers enter a flash recovery vessel, which separates them into two streams. Each stream then flows through its own dedicated plate heat exchanger, which transfers the energy in the flash steam and condensate to the boiler feedwater. The system is positioned on the high-pressure (downstream) side of the feed pump, so it safely raises the temperature of the pressurised

feedwater to around 130oC, rather than the 85oC typically achieved under the old regime.

The system was preassembled at Spirax Sarco's Cheltenham facility and supplied skid-mounted. It was installed and integrated with Biomar's existing systems during a single, normal maintenance shutdown. "The modular approach was helpful for the installation and the Spirax Sarco team was very supportive," says Mr Strain.

Biomar has experienced a range of benefits following the installation, including substantial energy and water savings, but there have also been improvements in the stability of the steam system, with less firing up and down in the boiler.

Mr Strain also cites reduced water treatment and boiler maintenance costs. The improved quality of the condensate minimises boiler contamination and corrosion, with a knock-on effect on maintenance costs and downtime. "Overall savings on water treatment fell by almost 40%. We have seen substantial savings in both direct and indirect costs on maintenance time and manpower and increased uptime on boiler performance," he confirms.

The Spirax Sarco system has also delivered on the other main goal of the project by eliminating unsightly plumes of steam from outside the building.

"Project management was integral to the service provided by Spirax Sarco and our contact Allan Stewart," says Mr Strain. "This was delivered in a professional manner and maintained with follow-up site visits to ensure the system was working at its optimum level and that every possible kilowatt of energy was being utilised."

For More Information:  
Spirax Sarco, Charlton House  
Cheltenham, Gloucestershire  
GL53 8ER, UK  
Visit: [www.SpiraxSarco.com/uk](http://www.SpiraxSarco.com/uk)  
Telephone: 01242 521361

## NO<sub>x</sub> class 5 Condensing Boilers for Refurbished Residential Care Home

The Avondale Mental Care home in Liverpool is a 50 bedded registered mental nursing home and was established in 1991 by charity Delphside.

The centre provides care, support and rehabilitation for adults with a wide range of mental health related issues.



When first built the centre was fitted with Atlantic Boiler's world-leading 'Optimagaz' and 'Condensagaz' E Series gas condensing boilers. The centre has just undergone a complete refurbishment and two of these long life boilers have been replaced by the latest technology.

Two VF 100kW pre-mix low NO<sub>x</sub> gas condensing boilers computer-controlled and programmed for continuous comfort and maximum economy. The advanced method of control allows the reduction in boilerplant and energy input. The changeover was designed by Rodney Environmental Consultants of Liverpool and carried out by J J Rhodes & Sons of Ainsdale.

The VF 100 boiler is wall-mounted, constructed entirely of austenitic stainless steel with a seasonal efficiency of 94%GCV throughout its modulating range of 25kW to 100kW. It is very quiet in operation and easy to lift into position. Up to four boilers can be erected and operated together.

Further information:  
Atlantic Boilers, Lancashire OL6 7TR  
t: 0161 621 5960 | e: info@atlanticboilers.com | www.atlanticboilers.com

### All CERTUSS Steam Generators are type tested according to European Pressure Equipment Guideline DGRL 97/23/EG.

CERTUSS offer seven construction groups within their range of fossil fuel Generators with outputs ranging from 80kg/hr to 2000kg/hr and operating pressures of up to 32 Bar G. To accompany the Generator, CERTUSS also offer their CVE Package Plant Module, where all of the associated ancillary items are pre-piped, pre-wired and factory tested.



Fuel types offered are Gas, Light Oil, LPG and Bio Fuel, with combination burners offered on all units from 500kg/hr upwards. Also available are a range of Electrical Steam Generators from 6kW to 120kW.

CERTUSS also offer a new "TC Model" with touch screen control and full modulation from 50-100% firing. The TC offers output ranges from 500-2000kg/hr and is compatible with many BMS interface provisions such as Profibus and Modbus etc.

The image above shows a photo of 2 x 500kg/hr SC Model Generators and Package Plant Module, with Duplex water softener on a 24 x 7 Duty/stand-by operation.

Certuss (UK) Ltd  
Tel: 01213275362 | Fax: 01213282934  
Email: sales@certuss.co.uk | Visit: www.certuss.co.uk



## MORE CHOICE BETTER SOLUTIONS



### Steam Generator

### Fire Tube and Hot Water Boilers





### Thermal Fluid Heater

If your process heating supplier has only one option, you only get one solution.

Babcock Wanson's range covers Steam Generators, Fire Tube Boilers, Thermal Fluid Heaters and Hot Water Boilers. We provide the process heating solution best suited to your needs, not a solution that fits a limited product range. That's because we believe

**More Choice = Better Solutions.**

Contact Babcock Wanson now for a better solution to your energy production.

---

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# Boiler Maintenance: Why Is It So Important?

Fulton's managing director Carl Knight looks at why regular maintenance of a steam boiler is so important.



In short, regular servicing and maintenance is essential to maintain the optimum operating efficiency and safety; and ensure long-term reliability.

However, a key issue that is often overlooked are the consequences of a boiler not being available due to maintenance or breakdown. Like any piece of equipment, steam boilers will be more reliable when serviced on a regular basis and fortunately a minimum level of annual maintenance is required due to the legal need to inspect a boiler every year. Hopefully this opportunity will be used to undertake all service tasks, but it should be borne in mind that, depending on the level of use, a boiler may require more regular maintenance tasks.

An easily overlooked yet important aspect of operating a steam boiler is the need to ensure good water quality. This, at minimum, requires a water softener and regular checks on its performance. Just

1mm of scale inside a boiler will increase your fuel bill by 7-10% due to the poor thermal conductivity of scale deposits. Unfortunately, scale will accumulate on the hottest parts of a boiler, so these parts will gain the thickest layer of scale, leading to localised overheating and permanent damage to the boiler.

Don't fall into the trap of thinking that regular blowdown will remove scale either because it won't! Blowdown will discharge loose particles and sludge, but cannot detach scale from inside the boiler. Of course, only servicing the boiler once a year may mean that scale accumulation will not be realised until it is too late, but regular servicing will pick up evidence of scale and enable you to remedy the situation before it is too late.

With properly managed maintenance your steam boiler should give excellent service for many years (we still service Fulton boilers that are more than 30

years old!). Even water quality, the most common cause of nuisance failures on steam boilers, shouldn't be a problem.

As well as a design and build service – and as a safeguard to end-users – many boiler manufacturers should be able to manage the installation and commissioning of its boilers and systems and provide regular servicing and maintenance contracts and training. There should also be proper after-sales support available, which should be backed by service technicians and/or service contractors offering national and international service support.

To ensure that boilers are correctly maintained and serviced, especially for sites operating a number of boilers, companies should also consider training for its service engineers and boiler operatives. Training also proves invaluable to employers, as operators handle more of their own maintenance and repair and avoid call-outs to 'boiler breakdowns' that require no more than the simple flick of a switch to resolve. Real examples like this prove that operator courses could potentially save the cost of many expensive and unwanted engineers' visits.

Hands-on training should be available on-site or at a training facility and include all aspects of service including product information, day-to-day operation, servicing and maintenance and be structured to the needs of individual's or companies. For example, if a boiler is to be serviced by a dedicated service company, its engineers can be trained. However if it is owner-maintained, and as no two boiler facilities are the same, many boiler manufacturers may prefer to run courses at customers' own facilities so that technicians and engineers learn on the equipment they will be monitoring day-to-day.

Explains Carl: "When you buy a steam boiler, commissioning should be included, as well as a provision for training site operatives on routine operating and maintenance procedures."

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Fax: 0117 972 3358  
E-mail: sales@fulton.co.uk  
Web: www.fulton.co.uk

# Installation Of New Boiler Completes Timothy Taylor's Brewery Development

Timothy Taylor's, the Keighley based brewer of award winning beers, has completed a £12 million investment programme with the installation of a new 10,000 kgs/hour boiler costing £1/2 million.

The expansion programme has included the building of new offices, the purchase and development of a transport depot, a £2.7 million extension to the brewery, a cold hop store and an effluent treatment plant.

In line with the company's policy to use, wherever possible, local suppliers both the boiler and the boiler house were built and installed by Keighley companies. The large industrial Yorkshireman 2 boiler was manufactured by Byworth Boilers in its nearby factory and has the benefit of being able to run on either natural gas or light oil. It also incorporates Byworth's highly efficient X-ID tubes and the overall efficiency is further enhanced by Unity, Byworth's unique boiler house management system.

Working in tandem with Byworth was family owned commercial construction company R N Wooler & Co Ltd who built the boiler house whilst the pipework and lagging was carried out by Watsons Building Services who are based in nearby Silsden.

In addition all the electrical work was completed by Brian Mitchell Electricians and the whole project was coordinated by Mike Regan Associates.

Commenting at the official switching on of the new boiler, by Managing Director Charles Dent, Second Brewer Andrew Leman said "Our existing boiler is now 16 years old and in today's terms is no longer cost efficient to run. It is also only just keeping up with peak demand and with call for our beers continuing to grow at a pace the need for a larger



more efficient boiler became pressing."

He added "Not only will we be able to make considerable savings on fuel but less Carbon Dioxide will be released into the environment. The existing boiler will be kept on standby to cover during servicing and maintenance."

For further information:

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W: <http://byworth.co.uk>

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INSIDE

**COMMERCIAL & INDUSTRIAL**

# TOUCH THE SCREEN AND FEEL THE POWER

Swindon based combustion equipment manufacturer, G P Burners, is now offering an optional touch screen interface.

The TSI5000 touch screen is available with all of the company's new PLC controlled burners and may be retrofitted to existing equipment with PLC controls.

It has been designed to simplify burner operation and assist engineers in maintenance and service regimes.

The 15" monitor features a clear graphic display for maximum visibility and ease of operation. The interface can monitor up to four boilers or burners. A functional status screen allows the operator to control burner enable, shutdown and set point adjustment.

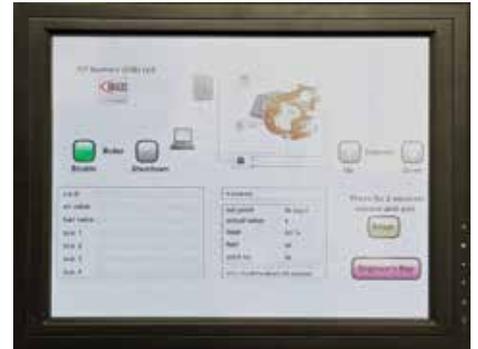
The TSI5000 incorporates embedded ACS450 software, which facilitates password protected access to the controller. User friendly, drop down menus allow engineers to programme and monitor a range of parameters, including fuel/air ratio

settings, boiler performance, trending data and fault diagnostics.

A new feature of the TSI500 is its ability to interface with a USB combustion analyser, allowing real time combustion parameters to be displayed on screen during burner set up. This allows the engineer to fine tune accurate air and fuel ratios for optimum burner efficiency, without leaving the unit, which significantly reduces set up time.

The TSI5000 may be remotely accessed via a PC, tablet or mobile phone. This facility aids remote fault diagnostics, meaning that fewer engineer site visits are required and the correct replacement components may be despatched to site for first time fix. The system also provides for a mobile phone alert of burner lockout.

The TSI5000 acts as a document store, providing a



single source for engineers to access manuals and service records. The interface is currently available for operation in English, Italian or Russian, with other languages available to order.

Please address reader enquiries to:  
 G P Burners (CIB) Limited, Unit 2D Hargreaves Road, Groundwell Industrial Estate, Swindon Wiltshire, SN25 5AZ, UK  
 Tel: + 44 (0) 1793 709050  
 Fax: + 44 (0) 1793 709060  
 Email: info@gpburners.co.uk  
 Web: www.gpburners.co.uk

# FAST AND EFFECTIVE IDENTIFICATION OF SOLAR CELL DEFECTS

**For maximum power generation, system life and the best return on investment every solar cell on a solar panel must be working.**

To provide this assurance industry is increasingly employing thermal imaging as its preferred method for locating defects.

Thermal imaging allows anomalies to be seen clearly and, unlike other methods, can be used to scan installed solar panels during normal operation. It is also a highly time efficient process as a large area can be scanned in minutes.

## Ambient and measurement conditions

A few guidelines need to be observed for this process. Fundamentally there must be sufficient energy from the sun to achieve good a thermal contrast for accurate thermographic measurement; a solar irradiance of 500W/m<sup>2</sup> or higher is needed and optimally, 700W/m<sup>2</sup>.

Ideally the sky should be clear as clouds reduce solar irradiance and produce interference through reflections. However, informative images can still be obtained with an overcast sky if the chosen camera has sufficient thermal sensitivity. Calm conditions are also desirable as airflow on the module's surface will cause convective cooling, reducing the thermal gradient. The cooler the air temperature the higher the potential thermal contrast, so early morning inspection is certainly the best option.

## Choosing the right camera

Handheld thermal imaging cameras typically have an uncooled microbolometer detector that is sensitive in the 8 – 14 µm waveband. However, glass is not transparent in this region. So when solar cells are inspected from the front, a thermal imaging camera sees the heat distribution on the glass surface but only indirectly the thermal performance of the underlying cells.

As a result, the temperature differences that can be measured and seen on the solar panel's glass surface are small. In order for these differences to be visible, the thermal imaging camera chosen needs a thermal sensitivity of <80mK. It should also allow manual adjustment of the level and span function to optimise visual contrast.

As the camera's histogram equalisation automatically adapts to the maximum and minimum measured temperatures, many small thermal anomalies will not be immediately visual. With manual correction of level and span however, clear contrast can be achieved.

Digital Detail Enhancement (DDE) is also an extremely helpful function in this regard as it automatically optimises image contrast in high dynamic range scenes. A thermal imaging camera with this ability is therefore particularly well suited to fast and accurate solar panel inspection.

Another feature that should be considered is Multi Spectral Dynamic Imaging - MSX technology. This technology takes detail from the visual image to improve the thermal image. It makes it easier for the operator to see the problem in even greater detail. Solar panel inspection with MSX is therefore quicker and more effective, reducing time and cost.

## On site considerations

The emissivity of a material is the relative ability of its surface to emit energy by radiation. It is therefore vital that this value is factored in to any thermal measurement and professional thermal imaging cameras will allow this to be pre-programmed.

As with all highly reflective material, the glass on a solar panel requires particular attention as any thermal image of its surface will also pick up the radiated temperature of surrounding objects including the camera and its operator! In the worst case, this results in false hotspots and measurement errors.

By adjusting the viewing angle these problems can be minimised or avoided and for this purpose a tripod will prove a useful accessory.



Image of FLIR P660 thermal imaging camera

## Image analysis

The shape and location of hotspots on the thermal image will indicate a variety of faults. If an entire module is warmer than usual interconnection problems should be suspected. When individual cells or strings of cells are abnormally hot or shown as a warmer patchwork pattern, the cause can usually be found either in defective bypass diodes, internal short circuits or a cell mismatch.

Shadowing and cracks in cells are evidenced by hotspots or polygonal patches in the thermal image. And the temperature rise of a cell or of part of a cell may indicate a defective cell or shadowing.

Thermal images obtained under load, no-load and short circuit condition should be compared. And if the front and rear faces of the module have both been inspected, these should be associated too, although temperatures obtained from the back may be higher as the cell is not covered by a glass surface.

It should also be emphasised that classification and assessment of the thermal anomalies require a sound understanding of solar technology, the system under inspection and additional electrical measurements.

For more information go to:

[www.flir.com](http://www.flir.com)

# CUTTING COSTS AND KEEPING SAFE ... they are no longer mutually exclusive

CTS – Combined Technical Solutions – carries out all aspects of work related to built environments including both reactive and planned preventative maintenance. Based in London, the company provides an excellent example of how the inclusion of thermal imaging windows reduces inspection costs and makes maintenance smarter, without increasing health and safety risks.

'Caution, keep this door closed' is a sign most maintenance engineers will encounter on electrical switchgear cabinets. This warning alerts them to the serious prospect of arc flash that has the potential to cause serious and even fatal burns. As a result there are two options.

The first option is to shut down the electrical system so that a team of electricians can remove the panel and inspect the components. The drawback is that this solution only allows faulty components, such as terminals, to be identified. As the system isn't under load there is no possibility of assessing, for example, the heat rise in a bus bar.

The second option is to leave the system under load; have the team of electricians suit up in full PPE and then remove the panel and inspect the components. While this option obviously allows the electricians to better assess what may be wrong, it also exposes them to extremely hazardous conditions that could cause an arc flash explosion resulting in severe or even fatal injuries.

It was for this type of regime that CTS had been engaged by a client in central London. Electrical inspection was undertaken during annual shut down and although the systems continued to work well as a result of its diligence, CTS recognised the potential pitfalls.

## Safe, live inspection

An increasingly preferable solution for many companies is predictive maintenance using thermal imaging and IRISS polymer infrared (IR) windows. These provide data collection points that keep the thermographer safe whilst allowing him or her to inspect the fully energised system, obtaining both

quantitative and qualitative information. And this is precisely the plan that CTS proposed to its client.

The choice of IRISS's polymer IR windows was based on suitability for the job and cost. Crystal windows were considered but dismissed for several reasons. Firstly they carry a significant risk of breakage, even an electrician slamming an enclosure can cause a crystal window to shatter. In contrast an IRISS window has an unconditional lifetime warranty against breakage. It is reinforced by an aluminium honeycomb grill and is resistant to moisture, humidity, vibration and high frequency noise.

Cost was another factor. Not only do IRISS windows outlive crystal alternatives they are also cheaper too. Additionally IRISS also offers custom solutions, where they configure their polymer IR windows to any shape or size, a capability that is not achievable with crystal technology. This means a window can be supplied, for example, that allows the inspection of a busbar or multiple components in a single pass of the camera.

The business case that CTS presented to its client, for installing twelve IRISS VPFR windows on switchgear cabinets, was compelling. The client would achieve the best of both worlds; substantially reduced risk of system failure and lower maintenance costs. As a result 12 windows were installed, a process that was completed by IRISS over a weekend.

"By installing IRISS windows we can now carry out inspection whilst the systems are live but in a safe and guarded condition," explained CTS Director, Kim Harris. "As the process is not intrusive it presents minimal risk to business operations and the health and safety of employees."



He continued: "And as we can now inspect these electrical systems during normal working hours, instead of during an electrical maintenance shut down, the cost to the client has also been reduced. The payback, in monetary sense, has been almost immediate. Also the new regime will allow us to inspect systems that were considered too risky as their incident energy calculations exceeded PPE ratings."

## EMSD strategy

Thermal imaging windows are just one piece in the jigsaw for safe and efficient electrical inspection however. IRISS is leading the field in expanding the scope of this technology by offering a range of complementary electrical maintenance safety devices (EMSD).

These EMSD provide highly valuable information on the health of the live system and include ultrasound ports for airborne ultrasound, external voltage detection ports and voltage tap off connections for motor current analysis.

The technology also allows the use of online monitoring systems to transmit data to the client via wired or wireless sensor technology. The latest addition to the IRISS range, Delta T Alert™, bridges the gap between electrical inspections by regularly recording and reporting critical temperatures within electro/mechanical enclosures.

For more information on how IRISS EMSD can help your facility go to [www.iriss.com](http://www.iriss.com).

# Free ACE VibroChecker app turns iPhone into vibration checker

ACE has developed a free app for the iPhone that measures vibration and then offers a reliable selection of vibration isolation products.

VibroChecker is a true innovation and gets the results you need in just three steps: The ACE app can perform ideal measurements when the iPhone is fully placed on the surface to be measured. Once the app has been started, four symbols appear on the display of the mobile phone. When the icon 'Measure Vibration' is pressed, a new window opens and the measurement can start. The result appears within 15 seconds. The resulting values are the starting point for step two, the calculation interface. The most important key data is then entered - machine weight, number of contact surfaces and the desired degree of isolation are defined using the interactive and intuitive fields. Finally, the program recommends a vibration isolation product from the ACE range, comprising extremely low-frequency isolating air spring elements, ready-to-mount rubber-metal isolators and the tried-and-tested insulation slabs. The low-frequency air spring elements PLM and PAL are suitable for isolation measuring tables, testing

equipment and high-performance machines. Ready-to-mount rubber-metal isolators are predominantly used for engines, compressors and in transfer systems. The SLAB range is mainly used for tooling and textile machinery for full-surface mounting or for the reliable use for individual, sensitive components, such as isolating elements, as impact buffers and universally for machines that require subsequent protection. What they all have in common is that by reducing vibration, they not only increase product quality and quantity, they also achieve a considerable degree of noise reduction. Edward Abbott, general manager of ACE in the UK said: "To achieve this successful application, the developers of the app had to take into account that an engineer or technician generally needs to know the lowest dominant frequency interfering with the environment in order to optimally select products for vibration isolation. "The algorithm of the app is designed to



accommodate a threshold of 50 Hz. This value also represents the upper limit for the VibroChecker, as the iPhone sensor only has a limited sampling rate and can currently only measure up to 50 Hz.

"This value is sufficient for a majority of applications to be measured for which we offer a solution. This app gives our customers a very useful but not an all-purpose measuring tool. When it comes to oscillations and vibrations in complex applications, we provide support with our highly skilled technicians and professional measuring kits."

**Download this free app from your iPhone app store – search VibroChecker**

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# Fluke's New Laser Shaft Alignment Tool Provides Fast, Actionable Answers

Fluke, the global leader in portable electronic test and measurement technology, has introduced an easy-to-use Laser Shaft Alignment tool that provides fast, accurate and actionable answers to keep plants up and running.



The new Fluke 830 performs the complicated alignment calculations automatically and provides the answers needed to quickly align a machine. This eliminates difficult calculations and guesswork associated with traditional alignment methods and reduces unnecessary replacement parts, repair time

and unplanned downtime.

The Fluke 830 Laser Shaft Alignment tool has been designed to simplify shaft alignment with an intuitive guided user interface and step-by-step machine set up process. All the user has to do is

set-up, measure and diagnose. The 4-level severity scale compares the machine to industry accepted machine tolerances and provides specific, actionable repair recommendations.

Unlike using the straight-edge method or dial indicators, the Fluke 830 performs the complicated alignment calculations, providing the answers needed to quickly align a machine and get the plant up and running again fast. An enhanced user interface provides easy to understand results that do not require extensive alignment knowledge and the unique "All-in-One" result screen shows both coupling results and feet corrections (vertical and horizontal) in real terms making it easy to take corrective action.

## The Fluke 830 Laser Shaft Alignment tool features:

- Single Laser Measurement Technology which reduces errors from backlash, resulting in better data accuracy
- Compass Measurement Mode which enables flexible, reliable and repeatable measurements using an activated electronic inclinometer
- Dynamic Machine Tolerance Check which provides continuous evaluation of alignment adjustments so the user knows when the machine is in the acceptable range, and,
- Unique Extend Mode which offers unlimited measurement ranges to handle gross misalignment scenarios.

Information about all Fluke products can be obtained via the Fluke web site at [www.fluke.co.uk](http://www.fluke.co.uk).

# Allianz Approves Shock Pulse Technology For Condition Monitoring Of Wind Turbines

German insurance company Allianz has approved online system Intellinova Compact with the SPM HD shock pulse measurement technology for condition monitoring of wind turbines.

Taking out insurance on wind turbines with leading insurance companies often requires the installation of approved or certified condition monitoring systems. In 2003, the Allianz Center for Technology (AZT, a technical services facility within the German insurance group Allianz) published an extensive report - laying down in detail the technical requirements for condition monitoring systems for wind turbines - which has since served as guidance for wind power operators and insurance companies.

Over the years, vibration-based measuring techniques have become well established for

monitoring the mechanical condition of wind turbines. Alongside vibration monitoring, shock pulse measurement is now also recognised as a reliable method for damage detection. After comprehensive investigation, AZT has concluded that the Intellinova Compact system with SPM HD meets the requirements stated in the 2003 report and has thus certified the system for variable and constant speed wind turbines with gearbox.

Continuous monitoring of drive train components in wind turbines with the Intellinova Compact system enables cost-optimised maintenance, with significant



reductions in unplanned downtime, increased performance and better cost efficiency. Robustly designed, Intellinova Compact is well suited for the challenging conditions of on and offshore wind farms.

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## Spectro's Q5800 fluid analysis system delivers full oil analysis right at the point of sampling

Exclusively distributed by Analysco in the UK and Ireland

Spectro Inc.'s new Q5800 Expeditionary Fluid Analysis System is aimed at critical asset owners in the military, mining, marine and off-shore industries. It is the latest in Spectro's new product development philosophy of offering immediate lab-quality information about oil and equipment condition without the need to wait for lab results and without the need to stock, use and dispose of any hazardous materials during the testing process.



The portable Q5800 provides the user with data on fluid chemistry (TAN/TBN water, soot, oxidation etc), kinematic viscosity, wear particle counts and wear particle chemistry (wear metal analysis). The complete unit is no bigger than a small suitcase, is battery powered, highly ruggedized and is comprised of four modules harnessed together to provide this unique platform, namely an infrared spectrometer for fluid chemistry, solvent-free kinematic viscometer, solvent free particle counter that is designed to handle the dirtiest and wettest samples and a miniaturised wear metal analyser using XRF technology.

The Spectro Q5800 is manufactured by Spectro Scientific (Chelmsford MA, USA) and distributed exclusively in the United Kingdom and Ireland by Analysco Ltd. For more information, contact Analysco on 01993 831792, e-mail [contact@analysco.co.uk](mailto:contact@analysco.co.uk) or visit <http://www.analysco.co.uk>

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# Innovative New Online Machine Tool Auction Launches To Manufacturing Industry

An innovative new service has launched, designed to help manufacturing businesses buy and sell CNC machinery with complete confidence and ease.



Paul Lee and John Edmeades, the innovative team behind new online site CNCOnlineAuctions.com

The CNCOnlineAuctions.com website is an easy-to-navigate online auction system for buying and selling CNC machine tools in the UK and Europe, with a location set up in the United States to cater for the global market.

The service and ownership is completely independent of any other business in the sector, such as machine tool dealers or OEM agencies.

The site has been developed by CNC industry specialists who recognised the need for a transparent auction process, whereby the costs could be split evenly between buyer and seller to provide a one-stop solution for both.

The system also takes care of the logistics too, as the entire process of moving the machine and getting it up and running safely at the buyer's site can be organised through the website.

Developed as a risk-free option for business, the process is supported by Assurance+ options to remove all the headaches and potential pitfalls for both buyers and sellers, including taking care of health and safety requirements too.

## How it works

The system is simple, and virtual online auctions complete on every day of the week. Buyers register online and upload images and information on the equipment for sale.

The following day a five day viewing period commences on all lots within the auction, during which time all potential buyers also have a chance to find out more or make an offer on the item.

This is followed by a 'live' period for bidding which lasts for four days. During this period all parties are kept informed and are alerted if they are outbid



to give them a chance to make a higher offer. Alternatively buyers can make a 'buy now' offer at any stage. The final and tenth day of the process concludes with "sale day".

**Benefits for both buyers and sellers**

The auction fee is split between both parties at 7.5% each making it a great way for sellers to recoup maximum value for unused assets in a transparent way.

For buyers there's an added option in terms of buying without risk, with a variety of Assurance+ benefits available to take care of all the practicalities such as decommissioning and removal from the old site, delivery to the new site, offloading and installation, function testing and training. Also available is a twelve month unforeseen breakdown protection option to add even more confidence in the machine's purchase and long term ownership.

Managing Director Paul Lee said; "This is designed as an online vehicle for buyers and sellers of CNC machine tools in managing the whole process of relocation, installation and re commission plus long

term confidence in ownership using the additional support of the Assurance+ package"

"It ensures for both buyer and seller that their asset value is maximised. For sellers that's as a successful sale of unused or sometimes even new machinery, or for buyers as a risk-free purchase of an item in a way which will ensure it provides a safe and productive return on investment."

He added; "What we have done is made the process as transparent and easy as possible, so all parties know what's due to happen when, and the process is managed and fully supported throughout."

To register an item for auction or visit auctions as a buyer visit:  
[www.cnconlineauctions.com](http://www.cnconlineauctions.com)  
 call 0333 202 0850  
 or email [info@cnconlineauctions.com](mailto:info@cnconlineauctions.com)

**More About CNC Online Auctions:**

CNConlineauctions.com has been founded by Paul Lee, who has decades of experience in the CNC machine tool industry, giving him a unique insight into some of the challenges faced by businesses running CNC machine tools.

During his career he has worked as an operational engineer, then service manager. He then worked for an OEM (Operational Equipment Manufacturer) as a field engineer and then in a business development role looking at customer care and service.

He was the original founding MD of CNC Machine Tools Ltd in 1990, before selling that in 2012 to focus on developing CNConlineauctions.com after recognising the need for a service based solution for businesses looking to buy and sell in the industry without risk and with complete financial transparency.

He is also supported at the top by John Edmeades as Operations Manager. John has a wealth of technical and service experience in the CNC machine tool sector and will be directly managing the support team.

# AxFlow To Distribute Industrial Sector APV Heat Exchangers

**AxFlow has announced that it has taken on the exclusive distribution of APV heat exchangers for industrial markets in the UK.**

APV heat transfer solutions for cooling, heating, condensing and evaporation of process fluids are used across a wide range of industries and AxFlow now becomes the prime source of distribution to the chemical, industrial, oil and gas and power sectors throughout the UK.

AxFlow has been involved in supplying industrial heat exchangers for several years, but the decision to take on the distribution of the APV Gasketed Plate range, Brazed Heated range and the APV Hybrid fully-welded, gasket-free product marks a

new departure for the company. Heading up the new operation is Geoff Mahoney, who has joined AxFlow from APV.

“APV has a very well established range of plate heat exchangers in the UK, and together with these AxFlow will be bringing new innovations to the market,” reports Geoff Mahoney. “These new innovations include plate type hanging, clamping and EasyClip systems.

We are also offering

and is fully cleanable. The versatility of the Hybrid is reflected by its ability to be used in almost any type of application, particularly where high temperatures and pressures are encountered.”

AxFlow will be offering the full range of available plates in sizes ranging from ¾” up to 20” port diameters and plate areas from 0.018 to 3.8m<sup>2</sup>.

The large and extensive plate and gasket materials are capable of withstanding corrosion and ensure processing efficiency.

Announcing the introduction of APV Heat Exchangers to its product portfolio, Managing Director Tony Peters said that this is a significant, yet logical move for the company as heat exchangers have long been made available for projects where requested. Now they are becoming a mainstream product range in their own right, supported by a dedicated product manager and sales support network. “We shall be concentrating on those sectors of industry where AxFlow already has a strong presence for its process pump technologies and APV heat exchangers are already widely used,” reports Tony Peters.

For further product details, contact:  
Malcolm Walker, AxFlow Ltd, Orion Park  
Northfield Avenue, London W13 9SJ  
Tel: 020 8579 2111  
Email: [info@axflow.co.uk](mailto:info@axflow.co.uk)  
[www.axflow.co.uk](http://www.axflow.co.uk)



the APV Hybrid fully-welded heat exchanger, a system that does not contain gaskets



## Plate Heat Exchangers



*Exclusively from*



AxFlow Limited are pleased to announce that they have been appointed as the exclusive UK Distributor of APV Industrial Plate Heat Exchangers.

This includes the full range of gasketed Plate Heat Exchangers, Brazed Heat Exchangers and the fully welded, fully cleanable, gasket free Hybrid range.

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## Hi-Line HPSA Dryers Fitted With New Controllers And Digital Dewpoint Display

The Hi-line range of HPSA (heatless pressure swing adsorption) desiccant dryers are now all equipped as standard with their new HDC-1 digital controller, providing a digital dewpoint display.

In addition the range of products has been extended to cover air flow capacities from 230 to 17,000 Nm<sup>3</sup>/h as well as accommodating operating pressures up to 40 bar, with standard units rated at 11 bar. All product upgrades have been incorporated without increasing unit prices, to ensure that they still represent excellent value for money combined with high performance and increased operating capacities.

All the dryer models are fitted with safety relief valves as standard, while generous desiccant beds save energy as the stand-by condition on dewpoint

control is significantly longer. Operation is simple owing to limited moving parts being utilised with positively driven ball valve action, with no shuttle valves incorporated.

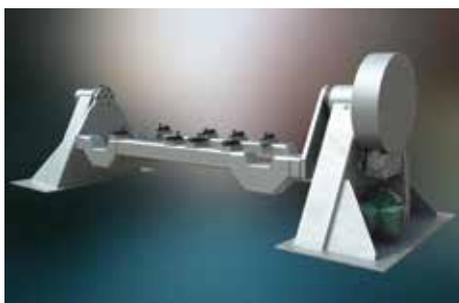
All models are built in Burton-on-Trent at the Hi-line production facility. The pressure valves are also of UK manufacture, and supplied with full vessel documentation and CE certification. The dryer products are skid mounted, incorporating both pre and after filtration, with all associated pipework being manufactured in stainless steel.



Further information is available from:  
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[www.hilineindustries.com](http://www.hilineindustries.com)

# Latest Benco Engine Stand For Loads Up To 25 Tonnes Supplied To Clarke Energy

The latest engine stand supplied to Clarke Energy in Liverpool is a Benco 25 unit, manufactured by The Brixworth Engineering Company Ltd and designed for the safe and effective powered manipulation of large engines or other heavy workpieces up to 25 tonnes in weight.



Above: Typical Benco 25 engine stand with the load support beam shown in the bottom dead centre position

Clarke Energy is a specialist in the engineering, installation and maintenance of gas-fuelled combined heat and power plants. Ensuring high standards of aftersales support is a key component of the company's offering, with an ethos that ensuring maximum equipment availability will deliver long-term customer satisfaction. This engine stand, developed from a unit with 20,000kg load capacity, can now accommodate a maximum torsional load of 80KNm, covering the extra stresses induced where the heavier load is rotated through a full 360° around the long axis. The benefits of this stand to Clarke Energy are that it ensures practical access to all sides of the engine block and speeds the overhaul time of large engines. This will help Clarke Energy to ensure speedy overhaul times and ultimately higher levels of customer satisfaction.

This Benco engine stand is used for modifications, repairs and personnel training associated with the large service exchange engines available from Clarke Energy. These include both GE's Jenbacher 620, a 20 cylinder V engine weighing approx

19,000kg, together with GE's larger Jenbacher 624 V engine which is a 24 cylinder unit with an approx deadweight of 24,000kg. Electrical control is provided for forward and reverse rotation, with the spindle remaining static when the controls are released.

The exchange engines can be at various stages of rebuild (i.e. crank shaft removed with cylinder heads still fitted and vice versa), leading to extreme out of balance load forces being generated. Engines can be optionally mounted on various beam length arrangements, or by utilising end plates, with both methods designed to adapt between individual loads and the twin flanges of an engine stand spindle. The drive motor for rotational movement can be combined with interlock systems to prevent unintentional movement, and the gear head arrangement can be supplied separately for use with customer special purpose jigs and fixtures. Due to the high gear ratio, the engine stand does not lend itself to manual load manipulations, but this could be made possible if required.



Above: The Benco 25 engine stand with the load support beam in the maximum raised position, providing easy access to any loads of up to 25 tonnes.



Above: The Benco 25 engine stand, as supplied to Clarke Energy, providing full 360° rotation about the horizontal beam, shown with a Jenbacher service exchange engine loaded for modifications and repairs.

Benco engine stands can be supplied for load applications from 760kg and include 1520kg, 2286kg and 7 tonnes in their standard range, which incorporates both floor mounting and mobile versions. These include both fixed and variable spindle heights to achieve optimum working conditions for engines and gearboxes utilised in road, rail and air transportation as well as generators, static engines and drive units for construction plant equipment. The stands are designed to minimise or eliminate entirely any non-productive handling procedures while still ensuring full compliance with current working practice and safety regulations. As well as minimising the dangers of personal injuries associated with manual handling of heavy loads, Benco stands can also save up to 50% of labour handling costs with loads being easily rotated or manipulated both horizontally and vertically.

Further information is available on request to:  
 The Brixworth Engineering Co Ltd, Creaton  
 Road, Brixworth, Northampton NN6 9BN  
 Telephone: 01604 880338  
 Fax: 01604 880252  
 e-mail: sales@benco.co.uk  
 www.benco.co.uk

# New Workshop Facility

Promat UK has expanded its High Performance Insulation (HPI) capabilities with the opening of a new specialist production workshop facility on the Wirral.

The HPI premises will allow Promat to continue offering a comprehensive range of bespoke, high performance insulation solutions to a wide range of customers.

The move comes 18 months after the company acquired HPI specialist PMR Precision, and the services previously supplied by PMR will now be provided from the new facility.



Peter Keenan, sales director for High Performance Insulation and Oil & Gas, says: "Our specialist multi-disciplinary team take the complex insulation problems which our customers have, and create highly-engineered bespoke solutions that can accommodate all types of complex size, shape and thermal requirements. We can design, machine or mould microporous rigid panel, flexible panel or block insulation for many types of application such as heaters, batteries, furnaces and temperature control instrumentation. We can provide whatever our customers require, and thanks to our new, larger facilities we can also deliver industry-leading levels of flexibility and responsiveness."

The new HPI Workshop premises add yet another facet to Promat's growing portfolio of fire protection and HPI products. They provide greater scope for the company to offer a wide range of services, including engineering designs, thermal calculations, customised CAD solutions, specialist fabrications, one-off trial samples and bespoke production runs.

"We now have separate engineering design offices, machine shop facilities, a production zone and a finishing zone," adds Keenan. "We also have access to the range of Promat insulation products and solutions which we can source from various Promat facilities around the world."

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# New SEAT S50: Powerful Protection from Hazardous Fumes

Powerful, energy saving and quiet, it's hard to ask for more from a fume extraction fan but the new SEAT S50 has all those attributes and more.

Designed for exhausting fumes from hazardous manufacturing processes, the S50 is the latest addition to SEAT's S Series and can support perilous processes such as PCB manufacturing, component washing and etching.



Fitted with a backward curved impeller, the S50 can produce a high pressure but with low noise and impressive efficiency. The fan's polypropylene construction makes it ideal for use in highly corrosive environments and chemical industry applications, safeguarding workers from potentially harmful gases. End users that require an externally fitted system can rest in the comfort that the UV treated polypropylene will be protected from the erratic British sunshine.

Supplied with an inverter as standard, users can also benefit from enhanced speed control and an easy stop/start function, importantly this also allows for energy savings as the user can set the system to perform in line with their actual ventilation needs.

Axair Fans, based in Staffordshire, are the exclusive UK distributor for the S50; available now on a short lead time. For more information contact one of their engineers today.

Axair Fans UK Ltd | 01782 349430 | [www.axair-fans.co.uk](http://www.axair-fans.co.uk)

# NEW THERMOGRAPHY COURSES CONFIRMED

Thermal imaging has become an essential method of detecting faults and averting failure in electro-mechanical systems.

It's also ideal for identifying the source of energy loss and spotting problems in the fabric of a building.

Vital to its effectiveness however is the user's understanding of the science behind the technology.

It is to provide those interested in deepening their knowledge of the subject that technology leader, FLIR Systems, has announced more Level 1 Thermography courses throughout the UK via its ITC Training Centre and approved partners.

ITC training is recognised for funding through the Department of Works & Pensions making courses accessible to anyone wishing to incorporate thermal imaging into their work routine.

The ITC five-day Level 1 courses are confirmed as follows:-

6th – 10th October - Aberdeen

20th – 24th October - Manchester

10th – 14th November - Nottingham

8th – 12th December - Kent



For further information on the venue, course

syllabus and availability visit:

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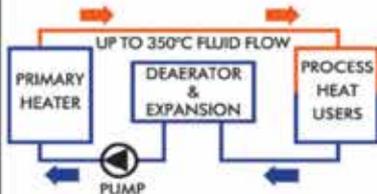
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