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BS News May/June

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bs news

building services news

May/June 2010

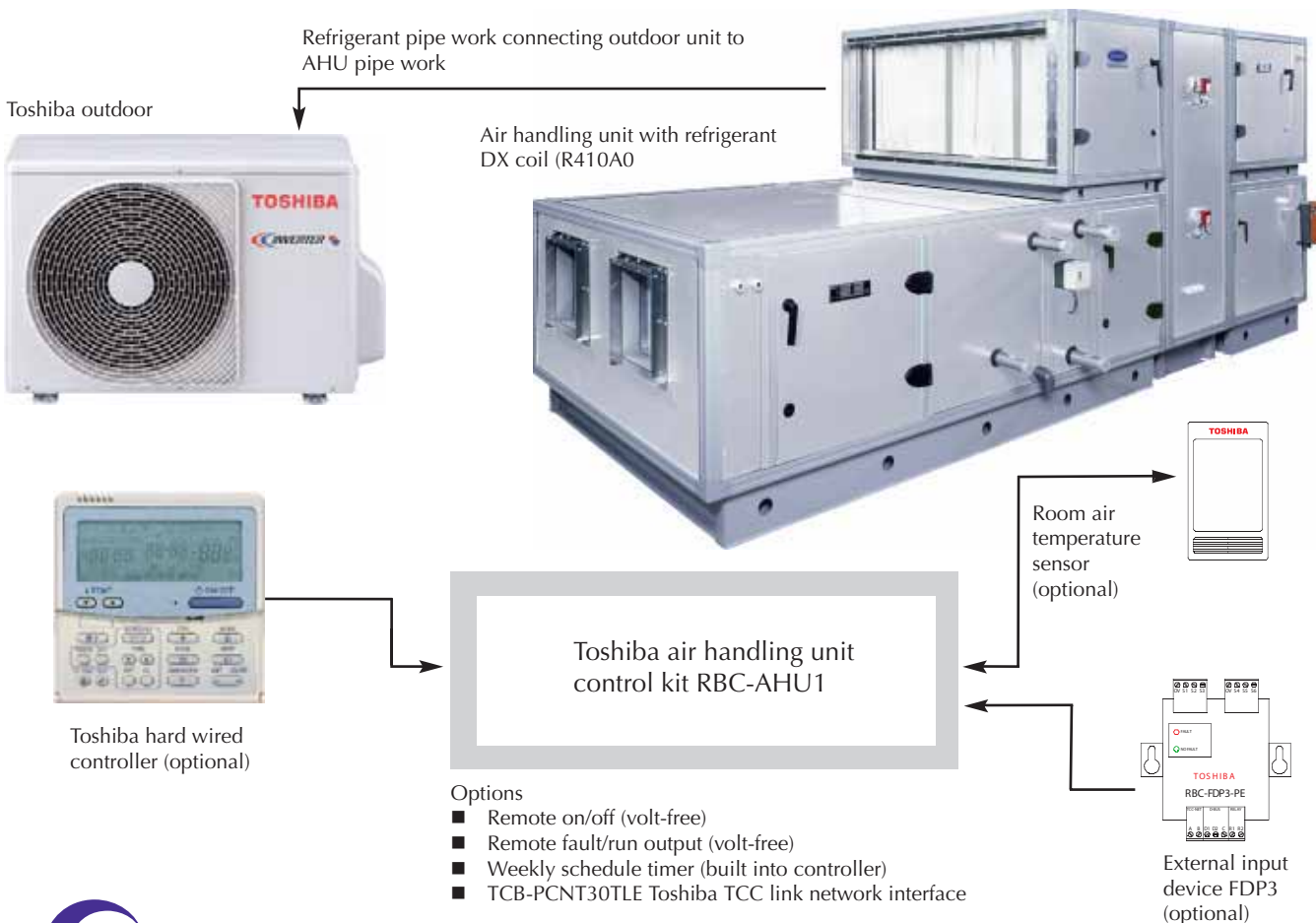
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TOSHIBA AIRCONDITIONING

Advancing the **eco**-evolution

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opinion

Gas safety time-bomb

While the registration of gas installers was a welcome initiative originally supported by legitimate heating contractors, a great many are now so disillusioned with the scheme that they are threatening to withdraw from it.

Despite early complaints about the charges involved, these have long since paled into insignificance in the face of very serious concerns about what lies at the heart of the matter – consumer safety. It is now generally accepted throughout the industry that there are licensed gas installers operating in the field who have little or no knowledge or experience.

Quite a number of industry figureheads consider that the criteria surrounding eligibility for REGII membership, and more especially the criteria and control mechanisms for gaining admittance to GID training courses which lead to REGII membership, are flawed. Even as we go to press the infamous Bórd Gáis Letter of Introduction is still sufficient to gain entry to a 10-week GID course run by Fás or private training organisations.

This is a ticking time-bomb on two fronts. One is the anger and frustration of gas installers who are now considering withdrawing from the registration scheme; two is the very real danger of a gas explosion caused by an incorrectly-installed gas heating system.

Thankfully, as yet neither of the aforementioned consequences have unfolded. However, it is incumbent on those managing and administering the scheme to act now so that they don't. ■

News and Products

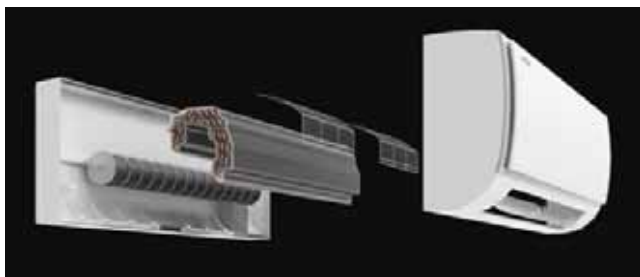
Hitachi enhances summit range

Hitachi Europe has enhanced its Summit range of wall-mounted air conditioners by introducing new cost-effective units with greater energy efficiency capabilities.

The indoor and outdoor units (RAS/RAC 50FH7, RAS/RAC 60YH7 and RAS/RAC 70YH7) for domestic and commercial applications replace the existing models to increase energy efficiency by 23%. Incorporating innovative DC PAM inverter technology on their compressors and fans, the units also offer super-low noise levels and improved air quality.

They come come with a wireless remote controller and there are also two other wired control options available – a simplified wired controller (SPX RCK3) and a wired remote controller with seven-day timer that includes freeze protection (SPX WKT1). They are H-LINK compatible, when using a PSC-6RAD adaptor. They are supported by a three-year warranty.

Contact: Fergus Daly, Sales Manager, Hitachi Ireland. Tel: 01 – 216 4406; Mobile: 087 – 277 9405; email: fergus.daly@hitachi-eu.com



A model from the new Hitachi Summit range.

New NSAI Plumbing & Solar Codes

The National Standards Authority of Ireland (NSAI) has issued two key building services codes of practice for public consultation for a three-month period – from 28 May to 27 August 2010.

The NSAI Code of Practice for Building Services, SR 50, will become as important to the domestic plumbing, heating and solar panel market, as IS 813 is to the domestic gas industry.

SR 50 Part 1 addresses requirements for the domestic plumbing and heating industry and was drafted by members of the NSAI Building Services Standards Committee. Part 2 focuses on solar panels and was initially drafted by NSAI Agrément, SEAI and the Department of the Environment.

Both parts of SR 50 will cover requirements for the design, implementation and commissioning for new and retro-fit domestic plumbing and heating, and for solar panels.

NSAI Code of Practice for Building Services, SR 50 is available to download from www.n sai.ie under their “comment on draft standards” section. Once all comments have been collated, it is envisaged that the Code of Practice will be published this coming Autumn.

Mitsubishi Electric ‘R22 Replace’ technology

Mitsubishi Electric has introduced its second-generation R410A City Multi Replace models which offer an 80% increase in COP, halve the install time, and cut installation costs by up to 40% when replacing a 10-year-old R22 air conditioning system. These new units join the existing splits Replace line-up and complete the product range with 100% of the City Multi, Mr Slim and M Series models now available with R410A.

The new City Multi YJM Replace model is a modular system which comes in both heat pump and standard-size small module (22 – 100kW), and heat recovery in the standard larger model (22 – 33kW). All currently-available City Multi indoor units can be used with the Replace model and there is also the potential to upgrade the R22 systems of other manufacturers.

Once installed, the City Multi Replace system will perform automatic refrigerant charging, ensuring the optimal amount of R410A refrigerant is used. Following this, the system performs an automatic flushing of the mineral oil while operating in either heating or cooling modes.

The system saves on installation time by using Mitsubishi Electric’s unique, patented flushing operation which takes less than two hours and involves sending an R410A gas/liquid mix through the R22 pipes to collect any residual R22 refrigerant mineral oil.

Many elements of the existing system can be used including all piping, control wiring and power wiring, as well as circuit breakers. This allows installation time to be reduced dramatically and makes for substantial cost savings on materials, installation and waste.

Contact: Paul Sexton, Mitsubishi Electric. Tel: 01 – 419 8800; email: paul.sexton@meir.mee.com



R410A City Multi Replace system from Mitsubishi Electric.



The future of commercial heating is changing dramatically. Rising fuel costs and the need to reduce carbon emissions are driving the demand for renewable technology.

As heating accounts for over half of a typical building's total energy use, it is the obvious area to target. Mitsubishi Electric has therefore pioneered a range of commercial **'heating only'** systems using heat pump technology to meet the challenges of commercial heating for today, tomorrow and beyond.

Ideal for use in new build or refurbishment, our advanced heat pump systems are recognised as renewable technology and provide a simple, cost-effective means of meeting tough renewable energy targets.

- Achieves renewable energy targets
- Reduces CO₂ and running costs
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- Works in conjunction with other systems
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- Eligible for Renewable Heating Incentive (RHI)



Tel: 01 – 419 8800
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www.mitsubishielectric.ie



News and Products

Nuaire now direct from manufacturer

Traditionally, Nuaire products have been distributed throughout Ireland via a network of appointed dealers but now, with the expansion of the Lisburn office, the entire portfolio of commercial and domestic fans is available direct.

Over the last 12 months Nuaire conducted an extensive review of its marketing strategy for Ireland. It engaged with customers all over the country and, having



Nuaire Ireland team – Thomas Fynes with Ryan Gregg, Chris Schoffield, Paul Cassin, Conor Hickey, Steve Martin, Alison McCormick and Michael Kane.

considered their views, decided that a direct operation was the only way to deliver the expected quality products, at a competitive price, supported by a great service.

“You can now buy our

complete range of commercial and domestic fans directly from Nuaire”, says Ireland Manager Michael Kane. “We have expanded our Lisburn office and now have people on the ground calling to consultants, mechanical and electrical contractors, developers and housing associations, to talk about our extensive product range and how it can deliver solutions for their clients.

“Whether it is large industrial air handling units for commercial applications, or small positive-input fans that will improve the living environment for housing association tenants, we have a suitable product in our extensive portfolio.”

Nuaire – The air of true innovators.

Contact: Nuaire, Republic of Ireland customers.

Tel: 048 – 9267 0363

email: info@nuaire.ie;

www.nuaire.ie;

Nuaire, Northern Ireland customers.

Tel: 028 – 9267 0363;

email: info@nuaire.co.uk;

www.nuaire.co.uk

New transmitter from Manotherm

The Series RH/RHL

transmitter from Manotherm offers high accuracy, long-term stability and reliable operation. It is designed for monitoring and controlling humidity, or humidity and temperature, in building energy management systems, HVAC, commercial, residential, clean rooms, museums, climate chambers and other space-monitoring applications.

It comprises a 2-wire transmitter with a 4-20mA loop powered output or 0 to 10 VDC output. The state-of-the-art sensor recovers from 100% saturation and is calibration-free. A variety of mounting configurations are available including wall mount, duct mount, and outside air (OSA) models.

The combined humidity/temperature version provides dual 4-20 mA or 0 to 10 VDC output signals to control both humidity and temperature with one sensor, which reduces installation costs. The duct mount version is also available with an optional alpha-numeric LCD to provide local indication of humidity and temperature simultaneously.

Applications include room temperature/humidity monitoring; supply air humidity/temperature monitoring; exhaust air humidity/ /monitoring; and outside air humidity/ temperature monitoring.

Contact: Bob Gilbert, Robert Gilbert or Conor Stead, Manotherm. Tel: 01 – 452 2355; email: info@manotherm.ie

Hevac reinforces technical sales support

Hevac Ltd has appointed David Doherty to the position of Technical Sales Manager. David has many years experience in the building services sector in Ireland, and more recently in the UK. He has worked on both consultancy and the contracting side of the business and managed projects from design, coordination and procurement through to commissioning and handover.

David’s experience has been across the commercial, residential and industrial sectors.

A building services engineering student of DIT and Glasgow Caledonian University, David is a registered CEng engineer with CIBSE and Engineers Ireland. He holds a primary honours degree in building services engineering, complemented with a Masters in Business Administration from Dublin City University.

Hevac Director, Karl Carrick commented: “This appointment re-affirms our commitment to strengthening still further the technical support and advice we provide across the entire spectrum of our extensive product portfolio. By continuing to up-skill the expertise within the company, consultants, contractors and architects are assured of the highest-quality service.”

Contact: Karl Carrick, Hevac. Tel: 01 – 419 1919;

email: kcarrick@hevac.ie



News and Products

Daikin Conveni-pack range expanded

Daikin Europe NV has expanded its Conveni-pack range for convenience shops with the new AC 17 that boasts higher heating and refrigeration capacity; R-410A refrigerant for more efficient refrigeration and lower environmental impact; greater compatibility with indoor units; and longer piping lengths.

Conveni-pack results in reduced energy consumption and CO2



emissions, low noise levels, and a very compact footprint. It also incorporates a sophisticated control system, inverter technology, and the ability

to use heat recovered from refrigerated showcases and coldrooms to heat the building. This can result in energy savings of up to 50% compared to

traditional systems. Conveni-pack consists of one or more inverter-driven outdoor units and a system controller. Its modular and scalable design, and very low noise levels, makes it suitable for a large range of applications. Larger installations can be supported via multiple outdoor units in a variety of configurations (blocks, rows, or distributed throughout the building).

Contact: Liam Kirwan, Daikin Ireland.
Tel: 01 – 642 3430;
email: kirwan.l@daikin.ie

Looking at the future

CAREL



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heaterSteam



compactSteam

Isothermal humidifiers 1-900 kg/h

• gaSteam	45 - 180	kg/h
• humiSteam	1 - 130	kg/h
• heaterSteam	2 - 60	kg/h
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WTS

Reverse Osmosis Water Treatment System

90 - 1200 l/h



humiFog



mc multizone



humiDisk

Adiabatic humidifiers 1-5000 kg/h

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• humiFog Large	500 - 5000	kg/h
• mc multizone	60 - 230	kg/h
• humiDisk	1 - 6.5	kg/h

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News and Products

New AHU interface unit from GT Phelan

Toshiba air conditioning has introduced a new AHU interface which allows connection of the energy-efficient digital inverter (DI) and super digital inverter (SDI) outdoor units onto an AHU or over-door curtain. As the interface is designed around the standard DI and SDI indoor PCB, it is possible to use all of the DI/SDI controls options, including digital and analogue interfacing.

Basic control and configuration can be achieved by connecting the AMT32 wall controller and, for time control, using the AMS41 controller. The interface is supplied as standard with auxiliary contacts offering

remote enable, controller lock, system operation and fault-indication contacts.

Air handling unit applications with DX heating and cooling are

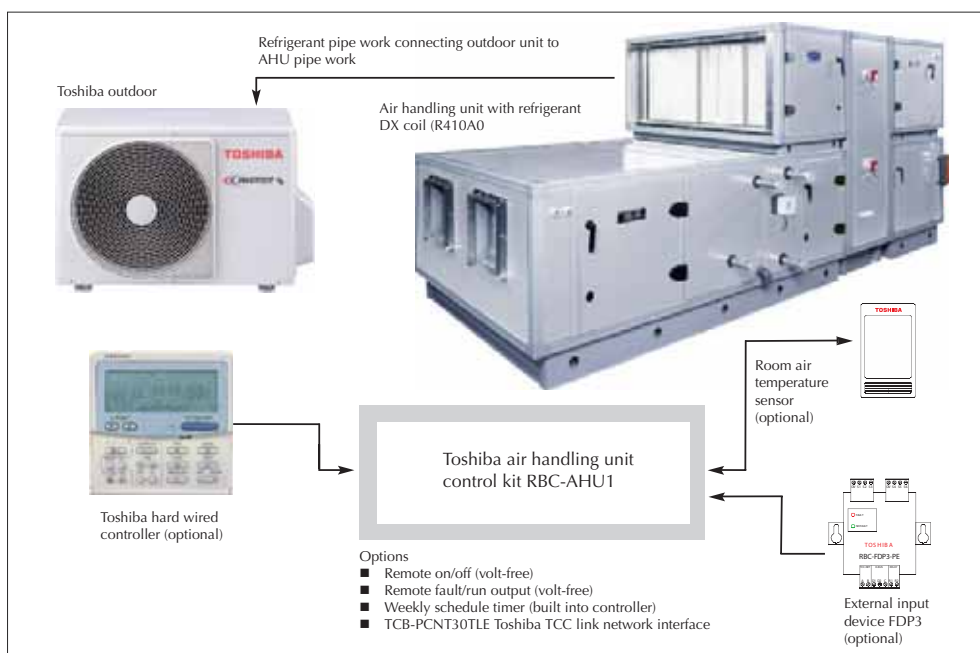
easily dealt with and, with no additional valves or mechanical components required, the installation is made very simple indeed.

The Toshiba range of outdoor units produce

cooling up to 27kW and heating up to 31.5kW (minimum air on temperature for heating requirement is +18°C).

Contact: Derek Phelan, GT Phelan.

Tel: 01 – 286 4377; email: info@gtphelan.ie



Trapp's kitman will shelve and rack it

Dick Redmond, Giovanni Trappatoni's kitman, has set up a new storage solutions venture called Superior Racking Ltd with two of his former colleagues.



Between them the three – Dick, James McEvoy and Alan Byrne – have over 50 years experience in the storage solutions sector and can now offer an unrivalled service. Superior Racking sells all types of pallet racking and shelving, new and second hand, with Stow Racking being the main brand.

The company also supplies and installs mezzanine floors, office and industrial partitioning, conveyors, storage bins, industrial cages, and special shelving for hanging garments.

All are thoroughly familiar with the entire product range but, on a day-to-day basis, Dick handles sales (when not looking after Trapp's kit!), James oversees the installations, while Alan looks after warehousing and logistics. The company is based at Unit 24, Tolka Valley Business Park, Ballyboggan

Road, Glasnevin, Dublin, 11. No matter what your storage requirements, Dick and the lads have a solution.

Contact: Dick Redmond, Superior Racking. Tel: 087 – 207 6518; email: dick@superior-racking.com; www.superior-racking.com

Photo shows Giovanni Trappatoni with Dick Redmond, who is a director of the newly-established Superior Racking.

C&L expands

C&L Industrial has appointed Noel Furlong as representative to further develop a local sales and service presence in Co Laois.

C&L Industrial specialises in the sale, installation and service of a range of quality industrial products, including Boge compressors and Thermobile waste oil heaters and hot water boilers.



Noel will be responsible for managing the delivery of C&L Industrial's comprehensive sales and service portfolio to Co Laois, and the wider Leinster province.

Contact: www.candl.ie; Tel: 091 - 773422.

News and Products

KNX Ireland to spearhead controls integration

A press briefing was held at Engineers Ireland in Clyde Road, Dublin 4 recently to mark the establishment of KNX Ireland. The KNX standard has been adopted by many international controls manufacturers who together provide a vast array of KNX-certified products.

Choosing from this pool of interoperable technology, integrators and contractors can build entire control solutions by bringing together a variety of off-the-shelf

components which are truly interoperable. These products have all been thoroughly tested and certified to be KNX compliant and all operate seamlessly together, programmed by the integrator using one common software tool. Because they all "speak the same language", they can operate together across the same network, resulting in less cabling and higher functionality.

KNX-compliant products are available for the control

of lighting, HVAC, intruder alarms, audio visual systems, household appliances and energy

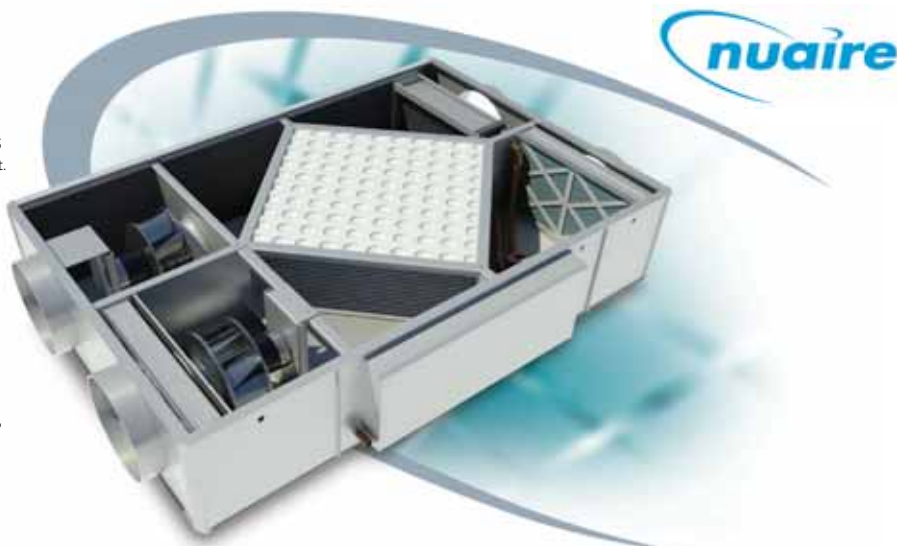
management. KNX is the world's only open standard for home and building control and is compliant with EN50090, EN13321-1 and ISO/IEC 14553.

Distribution Design and the 4th Edition ETCI Rules



Pictured at the CIBSE lecture in DIT Kevin St on "Distribution Design in the context of the New 4th Edition ETCI Rules" were speakers Keith Sunderland, Martin Barrett and Kevin Kelly with the then CIBSE Chairman Tony McKinley.

XBOXER S2-S5 low profile unit.



"The new XBOXER S2-S5. Quiet in class!"

Suddenly, it's extremely quiet in class. With the new heat recovery XBOXER S2-S5 from Nuair, that is.

At Nuair we are always providing leading edge technology and that's why we've spent time on our low noise S2-S5 ensuring it is the quietest unit ever. For optimum energy-efficiency, the XBOXER's tamper-proof Ecosmart control panel uses a range of sensors to activate the system only when the room is occupied. Other units such as our 'Classaire' classroom unit also meets BB93 with low SFP. Why not arrange to visit our all-new purpose built mock classroom to see the units in action now?



The supremely quiet new XBOXER S2-S5 from Nuair. It's best in class.

Nuair. The air of true innovators.



Call your local Nuair office on (ROI): 048 926 70363, (UK): 028 926 70363, contact our Nuair Technical Manager Steve Martin on 086 0448355 or visit www.nuair.ie/schools Quote reference code BSN0610



News and Products



Mitsubishi Electric Zubadan offers enhanced performance

Mitsubishi Electric has introduced a new series of outdoor units for both the City Multi and Mr Slim air conditioning systems. Called Zubadan, the new range provides excellent heating performance, even at outside ambient temperatures as low as -25°C .

The new models incorporate flash-injection technology which delivers full capacity down to -15°C and improved capacity heating down to -25°C . The time and frequency that these models run in defrost mode is also reduced, with start-up times to achieve full heating capacity being reduced by up to 50% when compared to standard (non-Zubadan) models.

Four new models are available in the new City Multi Zubadan heat pump range (PUHY-HP) offering capacities from 22.4kW to 56kW. These offer up to 40% improvement in heating capacities over standard models at low ambient temperatures. The units have pipe runs of up to 300 metres and can connect up to 43 indoor units to offer increased flexibility of design. With energy-saving inverter-driven outdoor compressors, the units are extremely energy efficient and have very low starting currents.

Four new models are available in the Mr Slim range – two single-phase units (7.1kW and 10.0kW) and two 3-phase models (10.0kW and 12.5kW). All have the ability to connect to the new PKA wall-mounted units, the PEAD concealed ducted models, and the latest PLA ceiling cassette models for both single and twin split systems.

The City Multi Zubadan range is ideal for medium to large commercial applications where maintaining heating performance and comfort is essential, even at extremely low ambient conditions. The Mr Slim Zubadan models are more suited to small to medium-sized applications.

Contact: Paul Sexton, Mitsubishi Electric. Tel: 01 – 419 8800;
email: paul.sexton@meir.mee.com

How to design and install copper systems

The UK Copper Board's "Copper Pipework Compendium" CD is now available to all installers and apprentices. It includes a wealth of educational material on how to install and design copper pipework systems, as well as more technical information for the experienced plumber.

In addition to the detailed pages on *Copper Tube in Building and the Guide to Bending & Pipework Installation*, there are pdfs of the very popular *Installation Tips* publication and a series of webcasts – narrated PowerPoints – which show step-by-step approaches to pipe-sizing for water and gas services.

The CD forms part of a Copper Club pack, which is available to all plumbers and students who complete the online registration form available on the UK Copper Board website – www.ukcopperboard.co.uk.

PM Group wins major Balkan projects

PM Group's international consultancy division has won EU-funded consultancy projects worth €10 million in the Balkan Region.

PM Group competed against some of Europe's leading consultancy companies in countries such as Belarus, Bosnia Herzegovina, Croatia, Kosovo, Macedonia, Moldova and Serbia to win the high-profile contracts.

Projects include waste governance in Moldova and Belarus; environmental and economic sector projects in Bosnia; competition and state aid in Croatia; SME Development in Kosovo; strengthening of Macedonia's Civil Service Agency on behalf of the European Commission; and environmental and municipal projects in Serbia.

In addition to these successes in the Balkan Region, PM Group has begun work in Brussels with the European Commission to assist in effectively coordinating activities with other donors (World Bank, European Bank for Reconstruction and Development, European Investment Bank etc) in the Western Balkan region and Turkey.



Alan Duggan takes the chair

Alan Duggan, a long-standing servant of CIBSE in Ireland, was elected Chairman of CIBSE Republic of Ireland Region at the recent AGM. Alan has held various officer and committee roles over the years and has “shadowed” his predecessor, Tony McKinly, for the last 12 months to ensure that the policies and objectives he pursues continue on the same development theme.

In assuming office his first action was to congratulate and thank Tony McKinley for the sterling work he did throughout his tenure in office. He also acknowledged the massive contribution of the officers and committee and, in doing so, formally welcomed on board the new committee members. These include Declan Kissane, Rodney Phelan, Jim Rogers, David Doherty and Damien Flynn.

He also thanked Derek Mowlds and Gary McKeown who have taken on the respective roles of Vice-Chairman and Social Secretary for the coming 12 months.

Margaret Dolan was also singled out for special mention. Margaret has served the CIBSE Republic of Ireland Region in virtually every capacity, culminating in a stint as Chairman a couple of years ago. She continues to make a significant contribution but is, as yet, the only female on committee. So, let’s see some other female engineers lend her support!

The CIBSE recently published its Key Issues Statement which embodies two main themes – Delivering a Working, Low-carbon Built Environment; and Delivering Effective Low-carbon Engineers. These objectives demonstrate the Institute’s commitment to delivering energy-efficient, sustainable, building services in Ireland and to promoting best practice across all the building services disciplines. Key focal points in trying to realise these objectives will be an emphasis on:

- Refurbishment of existing buildings;
- Achieving legislative compliance;
- The importance of real, measured energy performance data;
- Building operational engineering;
- Realistic, clear objectives;
- Skills for the future;
- Design team collaboration;
- Engineering excellence.

The coming year’s PD programme will reflect these objectives, especially at the Dublin and region-based technical evenings, and will also carry through to joint activities with fellow-institutions in the broader construction sector.

“The aforementioned themes and issues must be taken on board at a time of unprecedented turmoil where many of our members find themselves unemployed, on short time, or working longer hours for less pay”, says Alan. “However, while necessity may be the mother, adversity is probably the father of invention. We must rise to meet the challenges together as alone we will surely be left in the wilderness. We must look for new areas and ways to update and market our skills, being mindful that others are seeking opportunities within our field of expertise. We must be ahead of the game.” ■



Tony McKinley, immediate Past-Chairman, having handed the chain of office over to the new incumbent, Alan Duggan.



Some of the attendance – including officers and committee members – at the recent CIBSE Republic of Ireland Region AGM.

Designing Building Services



Pat Swords BE CEng FIChemE CEnv MIEMA, is a Fellow of the Institute of Chemical Engineers and a Chartered Environmentalist, and is PM Group's principal process and environment, health and safety consultant. Since graduation from University College Dublin in 1986 Pat has worked in developing the high technology manufacturing industry in Ireland. His work experience has also included projects in over a dozen other countries throughout Europe and North America. Since 1999 he has worked extensively on EU Technical Aid Projects in Central and Eastern Europe helping to implement EU Industrial Pollution Control and Control of Major Accident Hazards legislation.

Classification of hazardous areas

This article provides guidance on the subject of “Area Classification”, and the steps involved in identifying and dealing with the key issues which need to be addressed.

Material properties

The first step in area classification is the determination of the explosive properties for materials. Hereby it is necessary to differentiate between gas/vapour hazards, for which data is usually readily available, and dust hazards for which data is usually not.

For liquid/vapour hazards, the critical factor is the flashpoint of the liquid. If the client has an official Safety Data Sheet for the material, then the flashpoint will be usually found in the section on physical properties. Web-based databanks can also be consulted. If the material has been classified by the EU as a dangerous substance, then details will be available on the European Chemicals Bureau website.

For many materials a comprehensive Safety Data Sheet is available for download as a pdf file which contains a detailed section on physical properties. If the material has not been given a formal classification by the EU, then another useful and comprehensive source is the GESTIS (hazardous material information system) database of the German Safety

Association, available in English at the HVBG website.

Failing identification of the material properties in these “official” databases, manufacturers’ databases, such as

Merck-Chemicals International site or Sigmaaldrich, can be accessed. However, these are not subject to the same formal review process and should be used with great care.

Dust explosion properties are considerably more difficult to acquire. As the properties are highly-dependent on the particulate properties, they will vary from supplier to supplier. For orientation

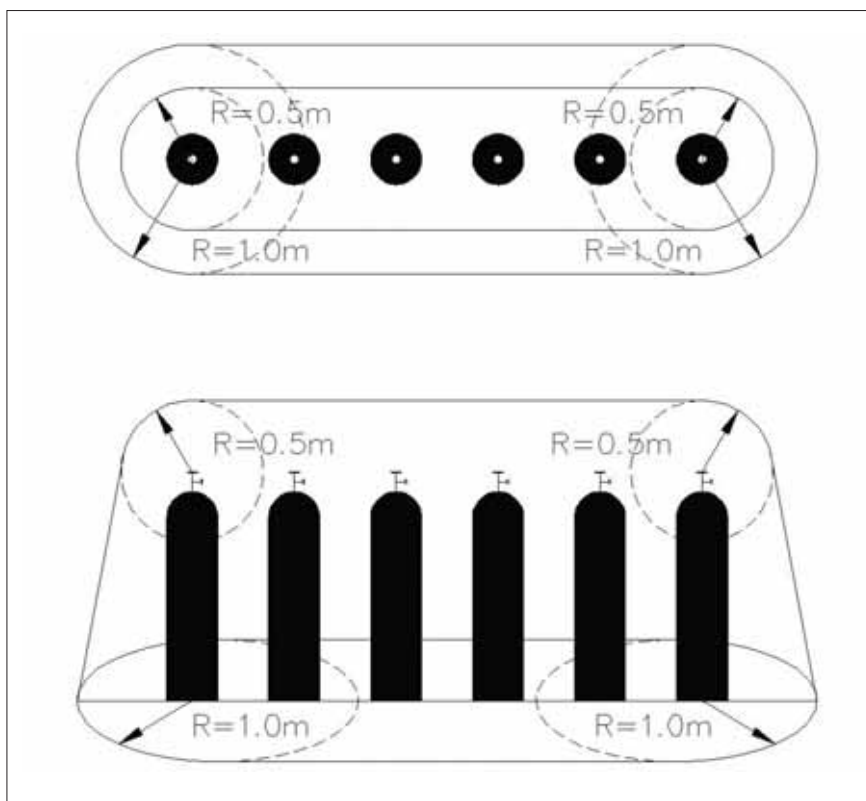


Figure 1 – Example of zoning of gas cylinders from German ExRL.

purposes, the German Safety Association has a dust-explosion database (GESTIS-DUST-EX) developed with the support of the EU Commission and available in English on the GESTIS website.

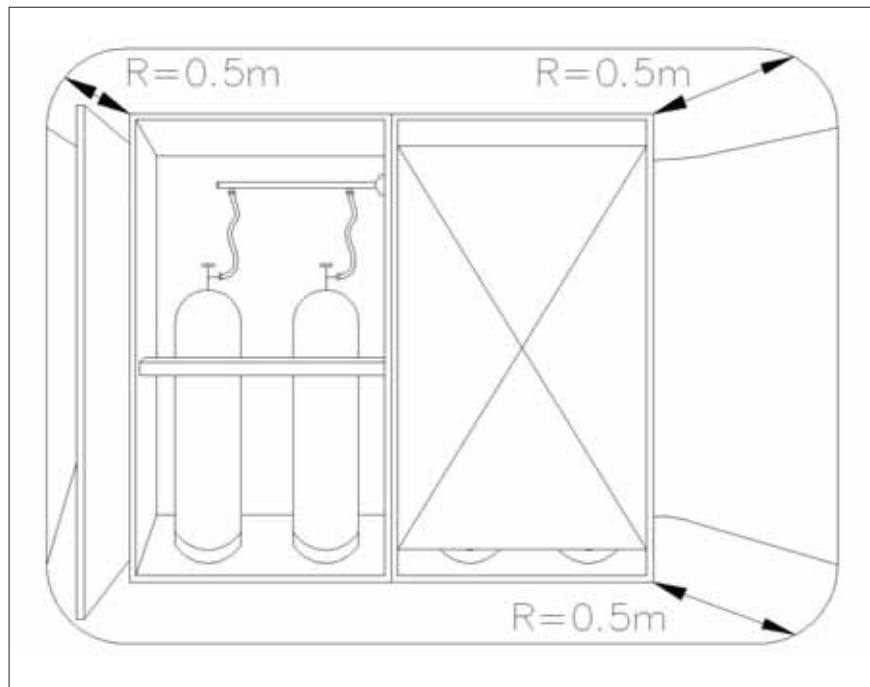
Under Section 16 of the 2005 Safety, Health & Welfare at Work Act, "Irish Statute Book", suppliers have a duty to provide adequate information for the safe use of material. For powders which are a potential dust hazard, this would include the relevant dust-explosion properties such as St Class and Minimum Ignition Energy. In reality, suppliers do not have a good record in providing this information, mainly because the testing is expensive, running to about €7,000 per compound.

Determining zones

The practice of area classification involves a knowledge of the behaviors of combustible dusts and flammable gases and liquids when they are released from containment. Sound engineering judgement based on the standards for hazardous area classification, EN 60079-10-1 for gas/vapour hazards and EN 60079-10-2 for dusts, give a limited number of examples of the shape and extent of zones, while various national and industrial codes exist to provide more detailed guidance. Indeed, EN 60079-10-1 states clearly that for detailed recommendations regarding the extent of hazardous areas in specific industries or applications, reference may be made to the codes relating to those industries or applications (Figure 1).

As a small nation Ireland does not have the resources to produce detailed technical guidance on hazardous area classification. Germany, in keeping with its status as having the largest industrial sector in the EU, has produced the most detailed technical guidance on hazardous area classification, namely:

- The German Ex-Regulations referred to as ExRL or BGR 104 and issued for over 30 years by the National Safety Association (Berufsgenossenschaft). Currently,



Example of gas storage cabinet zoning from German ExRL.

these are being adopted as a Government technical regulation, TRBS, as part of the implementation of the ATEX legislation (Betriebsicherungsverordnung). There are also the German Government's technical regulations on flammable liquids (TRbF) which contain sections on hazardous zoning for storage systems, filling systems, pipelines, petrol stations, etc (Figure 2).

In the UK, specific guidance has not been given by the authorities although the Institute of Petroleum Model Guide of Practice (Area Classification Code for Petroleum Installations, 2002) is referenced but is limited in scope to refinery and petrochemical facilities. EN 60079-10-1 has broader applicability and makes a clear direct link between the amounts of flammable vapour that may be released, the ventilation at that location, and the zone number.

The standard also contains a simplistic calculation for relating the size of the zone to the release-rate of gas or vapour but is not helpful for liquid releases, where the rate of vapourisation controls the size of the hazardous area.

Indeed, when using this equation, regard must be paid to the fact that:

- It is rare that a gas vapour release-

rate can be specified with certainty given complex operating scenarios and release modes;

Research by the UK authorities using computational fluid dynamics (CFD) modeling of low-pressure gas jets for area classification purposes (HSL/2005/11) has shown that for low-pressure releases the simple formula in EN60079-10-1 may be over-estimating the volume of the explosive atmosphere by two to three orders of magnitude.

Based on these uncertainties, there is limited benefit in completing detailed calculations which reflect with a limited accuracy the actual conditions. Instead, a better approach for determining the extent of the hazardous area is as recommended in the scope of EN 60079-10-1 and that is to make reference to the codes relating to the specific industry sector or application. If necessary, these can then be supplemented by gas or vapour dispersion characteristics, such as measurements or calculations and/or a study of the ventilation characteristics in relation to the flammable material release parameters so that the effectiveness of the ventilation can be evaluated.

Ultimately, the output of the hazardous area classification is an assessment of the likelihood that explosive

atmospheres will occur, and their persistence. Given the huge number of variables in this process, it cannot be seen as a precision tool. Under ATEX, the operator is responsible for the risk-assessment and documenting it in the explosion protection document. While examples of zone extent, such as in the codes already mentioned, provide a sound basis for the evaluation, they are not legally binding, even in their Member-State of origin such as Germany, as legally-binding national standards would hinder both adaptation to technical progress and free trade in equipment for use in explosive atmospheres between Member States.

Practical approach to hazardous area classification

One of the main failings of hazardous area classification is that an overly-conservative approach is taken which, when it comes to compliance, can lead to huge additional costs or, in some cases, the inability to achieve compliance. It is therefore highly-important that the definition of the zones

is correctly applied. In particular, there was a tendency in the past – when hazardous area classification was the preserve of electrical engineers – to classify large areas of production buildings as a high-risk Zone 1. This is a conservative approach reflecting the reality of the situation that most electrical equipment is, by default, Zone 1 compliant.

However, Zone 1 compliance is no longer a simple matter of electrical equipment. Electrostatic precautions now have to be taken in Zone 1 which severely restrict the extent of non-conductive materials, such as plastics. Furthermore, Zone 1 has to be separated from non-hazardous areas, such as a control room, by a double-door airlock arrangement, while for Zone 2 a simple self-closing door will suffice and there are no restrictions on non-conductive materials.

A further advantage of a high-classification plant which is classified as a low-risk Zone 2 is that a leak could occur in one area, but not in all areas, served by the same ventilation system.

Therefore, it is possible to demonstrate that the ventilation system can be classified as non-hazardous given the extent of the dilution available.

It is also necessary to critically examine the relationship between zoning and occupational hygiene limits. For most common gases and vapours, the lower explosion limits are over a hundred times higher than the Occupational Exposures Levels (OELS) for these compounds. Similarly for dusts, the relationship is shown in Figure 3.

By classifying large areas of industrial buildings as Zone 1, the hazardous area classification team are, in effect, stating that in normal operation, occasional concentrations are going to be several times the legal exposure limit. This is of course totally unacceptable and leads to only one of two conclusions (a) the plant is in such poor circumstances that it should be upgraded as soon as possible or (b) the zoning doesn't reflect actual conditions.

With regard to (b), in reality most companies complete some form of occupational monitoring, which invariably shows that the levels of exposure within the general plant are below the relevant occupational exposure levels. Unfortunately, this data is often overlooked by the hazardous area classification team in favour of a conservative approach.

The UK Health & Safety Executive (HSE) has classified this matter further – “The alternative of specifying the extent of zones more conservatively is not generally recommended, as it leads to more difficulties with equipment selection, and issues in respect of control over health effects from vapours assumed to be present. Where occupiers choose to define extensive areas as Zone 1, the practical consequences could lead to an over-complication of the practicality of implementation and considerable expense. A more practical approach could be achieved by a site inspection with the relevant production personnel so as to observe how the plant operates in reality. ■

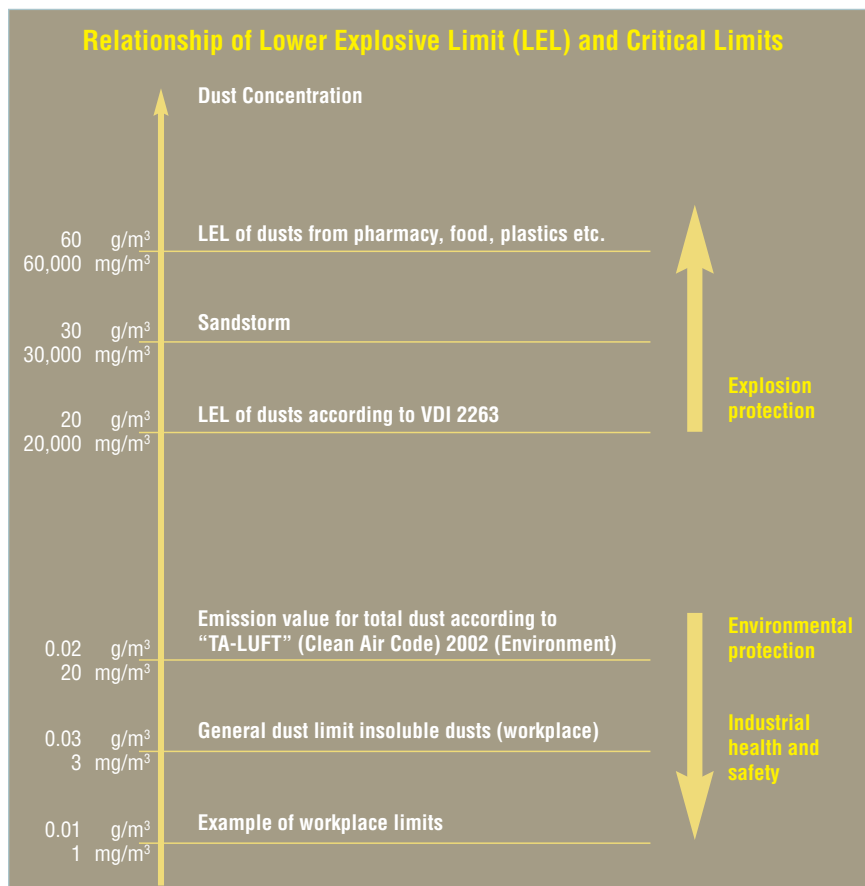


Figure 3 — Relationship between occupational hygiene limits and explosion limits.

Industry Training

Training critical to system performance

As part of the Baxi Group, Potterton Myson Ireland has nearly 40 years experience in providing heating and hot water solutions to the Irish market. Always at the forefront of technological development and innovation, Baxi Group has invested heavily in research and development to provide smarter, more energy-efficient heating systems. This includes a comprehensive range of boilers and a market-leading portfolio of low-carbon products, including heat pumps, biomass, BDR Thermea and micro CHP.

However, with regulatory compliance becoming more onerous and products and systems becoming more sophisticated, the importance of installer training has become critical. Consequently, PMI takes training very seriously and has invested heavily in a state-of-the-art training facility at its headquarters in Whitestown Business Park, Dublin 24.

Here PMI runs a continuous programme offering first class training to individuals and organisations working within the H&V industry. It includes tailored courses designed for each market segment, such as installers, engineers, architects, etc.

Specific courses cover the following:

- Domestic gas appliances;
- Commercial boilers;
- Heating controls;
- Micro CHP;
- Gas fire installation.

Where necessary, more advanced commercial training can also be provided. CPD courses include:

- Modern boiler products;
- Hot water solutions
- The integration of solar thermal with direct-fired storage water heaters

The ultra-modern facility at Whitestown is purpose-designed to suit the industry's needs and includes fully-functional installations to ensure practical hands-on experience. Where appropriate this is complemented by powerpoint and theatre-style presentations, creating an open forum where ideas and concepts are discussed and debated in a workshop format. ■



Brian Dowling, PMI Training Instructor with installers John Brady, Noel Henry and Michael Reynolds.



Installers Michael Murray, Donal McNally and Paul Fox with Brian Dowling, PMI Training Instructor.

Market Segments Served by PMI

Key market segments catered for, and the brands represented, include:

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Baxi

■ Commercial Boilers
Potterton Commercial

■ Fires
Valor
Wonderfire

■ Water Heaters
Andrews Water heaters
Santon
Heatrae Sadia
Elsen

■ Renewables
Domestic
Commercial
SEI Products

■ Radiators
Myson

■ Pumps
Circulating Pumps



Dave Killalea, Carel with Zac Keane, Paragon Air Conditioning, and Ian Dennis, Gasco.



Vern and Brad from Advanced Chemicals with Simon Daly, Sauermann.

Gasco Open Day provides welcome boost

This year's annual Gasco Open Day proved particularly successful with something like 150 visitors attending throughout the course of the day. They were treated to a vast array of new products, systems and workwear from 16 market-leading suppliers who each had a stand manned by experts in their respective fields.

The mood was positive and uplifting with a strong emphasis on emerging market opportunities and areas of potential growth and profit. The mood was business-like and professional though, as is always the case with Gasco, it was presented in a very relaxed, friendly manner.

As is now customary, the proceedings kicked off at approximately 8.30am with magnificent freshly-made breakfast rolls, followed by a continuous b-b-q running for the remainder of the day. The mouth-watering menu had everything from burgers through to salmon steaks, and the fact that it was a beautiful day weather-wise added enormously to the occasion.

All in all the day generated a much-needed buzz and sense of optimism which has carried forward into the industry at large since then. ■



Neill Stewart, Yellow Jacket, with Des McGovern from Airconditioning and Maintenance.



Colin O'Connor, Artic Air with Sean Stenson, MSS.



Denis O'Neill and Colin McCreavy from BSE Airconditioning and Refrigeration, with Neil Stewart, Yellow Jacket.



Dave Killalea and Les Mason from Carel, with engineers Graham Jones, Derry Peacock and Declan Young from Masser Montgomerys.

Darmody and Kavanagh appointed Joint Chief Executives at Varming

The Board of Directors of Varming Consulting Engineers has announced the appointment of Gerry Darmody and James Kavanagh as Joint Chief Executives.

“As we are all aware, the current economic downturn poses great risks and challenges to our industry. Varming Consulting Engineers has been in existence since 1946 and has Irish offices in Dublin, Cork and Roscommon. In that time it has survived many economic downturns, aided in no small part by its tradition of strong leadership allied to close financial control. The appointment of Gerry and James to their new roles continues this tradition”, said Chairman John Purcell.

Gerry joined Varming Consulting Engineers in 1976. In 1992 he was appointed to the management team as Associate responsible for the management of a portfolio of projects, primarily in the healthcare and institutional Sectors. In 2005 he became a Director of the company.

“Our task”, says Gerry, “is to ensure that our clients continue to receive outstanding results by providing sound advice, supported by a tradition of excellence and inspired by a spirit of innovation”.

James joined Varming Consulting Engineers in 1990. In 2000 he too was appointed to the management team as Associate responsible for a portfolio of projects primarily in the educational and industrial sectors. In 2006 he became a Director of the company.

“Past successes and awards are confirmation of our ability to develop and adapt to new technologies”, says

James. “We as a company take pride in our past successes but the key to future success is an ongoing ability to constantly maintain and adapt to differing needs and constraints”.

Varming Consulting Engineers embraced the sustainable evolution early on and has a dedicated sustainable engineering group headed up by Director Jim Rogers. The core activities of the group are ongoing staff training, software analysis, presentation of specialist papers, external lectures, documentation creation, specialist advice and project support.

Varming Consulting Engineers are recognised throughout the industry as being pro-active, forward-looking and innovative leaders in building services consultancy services. Their project list has given exposure to various types of sustainable solutions which, together with the in-house training, has developed individuals with knowledge and understanding of sustainable solutions.

The appointment of Gerry and James to their new positions comes as the company gets ready to formally launch the Varming International Alliance. This consists of several Varming offices which are located in Ireland, the United Kingdom (in London and Edinburgh) and in Australia (in Sydney and Canberra).

The combined strength of the Varming International Alliance in terms of resources, specialist knowledge and expertise, together with a broad client base, encompasses a culture of progressive international experience and expertise. Recent developments arising from the Alliance has seen Varming International recently shortlisted for two major hospital projects in Denmark. ■

“Past successes and awards are confirmation of our ability to develop and adapt to new technologies”

*Gerry Darmody and James Kavanagh,
Joint Chief Executives, Varming
Consulting Engineers.*



BEMS and Controls

Sustainable aspects of Building Energy Management Systems

Studies have shown that even well-managed buildings waste a significant proportion of the energy they purchase and that, typically, businesses could cut their energy consumption by 25%. Good controls are therefore essential for the safe and efficient operation of modern buildings and a well designed and conscientiously operated controls system will cut greenhouse gas emissions that are driving climate change. PJ Ryan explains.

The Sustainable Energy Authority of Ireland (SEAI) states that “BEMS can be expected to save 20%, and occasionally more. Savings can be expected to recur year after year, leading to improved competitiveness in the market and therefore higher profits.”

Building Regulations Part L 2008 require specific measures in relation to controls and this approach is likely to increase with the expected revision to Part L later this year and with the re-cast of the Energy Performance of Buildings Directive (EPBD). Coupled with this

there is now a legal requirement on all buildings greater than 1000sq m, and occupied by a public body to produce a Display Energy Certificate (DEC) and to update this annually. Sub-metering the various parts of a building for “separable” energy uses will be a necessary step towards improving the DEC rating.

The recent publication of CIBSE’s proposed Energy Hierarchy¹ (Figure 1) demonstrates the importance of controls and BEMS in terms of energy saving. Energy Efficient Systems are placed



PJ Ryan is a Chartered Engineer with Varming Consulting Engineers. He is a member of the Varming Sustainable Engineering Group and is actively involved in both the design and sustainable aspects of a wide variety of building services projects. PJ is also a registered BREEAM, Non-Domestic BER and DEC Assessor.

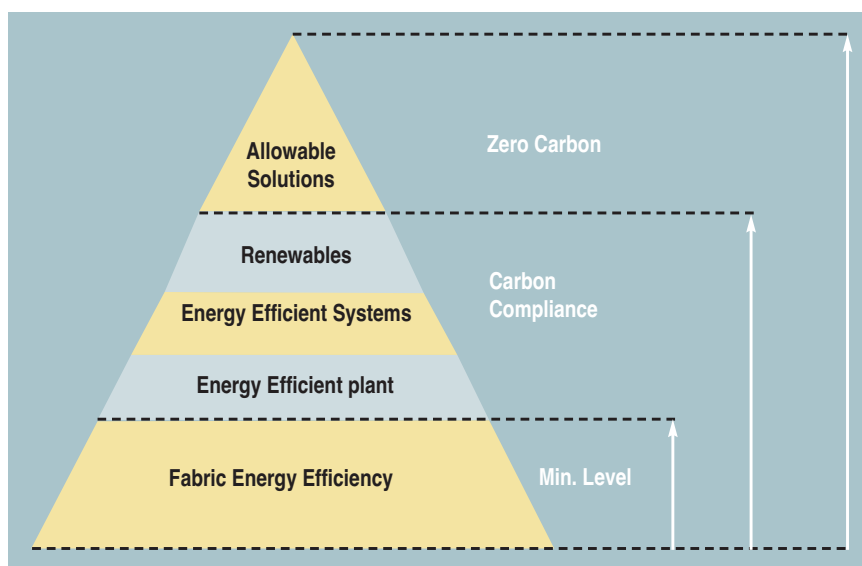


Figure 1

third in this hierarchy and are deemed more important than renewables. A building energy management system is fundamental to achieving these goals and is an essential step to be undertaken prior to the introduction of renewables.

According to CIBSE, “it is far too easy to install state-of-the-art, energy efficient kit, but then to connect it together in inappropriate ways, with inadequate controls and operator or occupant training, and lack of awareness and insufficient maintenance”.

What is a BEMS?

A building energy management system (BEMS) is simply a programmable control system used to provide automatic

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Programmable Room Thermostats



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TRV 2 Way



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Tackling the cost of discomfort

The cost of discomfort is not a common phrase in the building or energy manager's repertoire, but the concept is certainly something most would be familiar with. Here Ken Browne, Sales Engineer – Ireland, for valve manufacturer Tour & Andersson, explains what it is and the pre-emptive procedures to avoid it.

It is estimated that one in three buildings have problems with their indoor climate. For the building services or energy manager the efficiency and performance of the HVAC plant and equipment can be a constant headache.

This is because the indoor climate of a building is one of the first things that staff and visitors will notice. Comfortable working conditions are vital for a happy, productive workforce, yet all too often complaints arise from the fact that staff are either too hot or too cold. Associated with this, excess noise from the waterborne heating and cooling system can also cause disruption resulting in complaints.

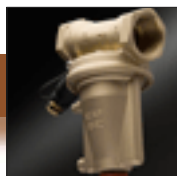
Staff who are too hot or too cold will invariably reach for the thermostat, but unless the system is designed and maintained correctly, this can place extra demand on both the boiler and the pump, resulting in an inefficient system that costs more to run. Fluctuations of just one degree above 20°C can increase heating costs by at least 8%, while one degree below 23°C can increase cooling costs by up to 15%. Room temperatures can swing, particularly at low and medium loads, even though the terminals have sophisticated controllers.

Because water will always find the easiest route, a system that is not properly designed and maintained may mean that some rooms in the building do not reach the set temperature until much later in the day, and some not at all. When starting up after a break, for example after the weekend or a night set-back, the design capacity cannot be transmitted across the whole system, although the rated capacity of the production units may be sufficient. The knock-on effect is that the thermostat is altered again, placing yet more demand that the system is not equipped to deal with.

For the energy or building manager, and the owner, the cost of heating and cooling the building can escalate, with inefficiencies in energy use amounting not only to cost but also to unnecessary carbon emissions, with further implications for an Energy Performance Certificate or Display Energy Certificate and other environmental legislative compliance measures.

Controllers work only when the design flow of the system prevails and the plant is working under design conditions. A well-balanced plant will operate to full capacity, recovering the set indoor climate quickly. If a plant starts up just 30 minutes quicker, 6% of the energy consumption per day can be saved. Often with existing buildings a solution sees additional pumps added to the system, altering the load, causing disruption and inconvenience for tenants with additional cost for the building owner.

However, by consulting with a specialist technical expert, a set of technical design criteria that allows for trouble-shooting when needed can remove the cost and instead result in a system that is controllable, efficient and cost-effective to run. The best means of regaining control to reduce running costs and eliminate the cost of discomfort is to ensure the system is balanced.



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Bearing in mind that 80% of new commercial buildings are subject to last-minute design changes, an adaptable and accommodating system is required to provide quicker and cost effective re-balancing and fault finding. Good hydronic balancing can actually cut the energy use of the system by up to 40%, equating to a considerable section of a building's overall energy cost.

When the flow of a waterborne system is altered with the introduction of a balancing valve, the pressure loss changes in the valve and pipeline. Following this, the differential pressure across other balancing valves also changes. The importance of balancing cannot really be overrated. By balancing, the flows in a plant – major distribution flows as well as small terminal flows – are methodically measured and adjusted to fit design conditions, accomplishing the right prerequisites for the plant to work properly. At the same time the plant is being checked for anomalies, which during operation otherwise might cause both discomfort and higher costs.

When working with a hydronic balancing specialist, they will seek to fulfil three important hydronic conditions so that the plant can reach its full potential and avoid failures. These are: – the design flows must be available at all terminals at full load; the differential pressure across control valves must not vary too much; and flows must be compatible at system interfaces.

In practice, the perception is that regular measuring and balancing of the system can be time-consuming and expensive, two elements the building services or energy manager will want to avoid. At this point it may seem that a “fit and forget” option is more preferable. However, even the best-designed systems must be balanced through

The support of a technical partner can help to successfully achieve a well-balanced system

regular manual measuring to ensure the cost of discomfort does not overload the system and create energy waste. In addition, software programmes such as TA Select 4 and balancing instruments such as the TA-SCOPE, or centralised commissioning modules such as the TA-HUB, substantially cut the time required to design systems that are controllable and can be easily measured. A technical partner will be able to suggest routes to achieving this.

Installing a variable flow system saves pump energy, particularly in cooling where pump energy is 6%-12% of a chiller's energy consumption in a cold water system. Where the flow is variable, the differential pressure in the system is also variable. This can affect the conditions for modulating control valves, wasting some 15%-20% of energy.

The challenge for the facilities manager is that if the differential pressure varies too much it is necessary to stabilise in order to prevent incorrect flow. Being able to keep differential pressure constant will improve control, ensuring a comfortable indoor climate with less noise, shorter start-up times, as well as reduced maintenance costs while providing an overall energy efficient operation. Installing devices such as differential pressure controllers or pressure-independent balancing and control valves (PIBCVs) will help eliminate this problem.

It is important for an organisation to get the best out of a waterborne heating and cooling system in order to ensure it runs with optimum cost efficiency, both



Ken Browne, Sales Engineer – Ireland, Tour & Andersson.

in terms of energy used and the onus placed on businesses for their carbon emissions. To do this the system needs to be controllable, but this can only be achieved when design flows prevail in the plant when necessary, without placing excess demand on the pump. The support of a technical partner can help to successfully achieve a well-balanced system; minimising energy waste and ensuring legislative compliance and the comfort of staff and visitors, driving out the cost of their discomfort.

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BEMS and Controls

control of building services and other energy-consuming plant. A BEMS differs from conventional control systems in a number of important ways, allowing:

- Integrated control of heating, ventilation, cooling and lighting systems;
- Networked control of complex heating and cooling strategies;
- Simple easy-to-use controls interface;
- Data logger and the integration with monitoring and targeting systems.

Used to its fullest potential, a BEMS can offer not only system control, but also data acquisition facilities. The plant performance and energy consumption data recorded by the BEMS may be transferred to proprietary monitoring and targeting software. This can generate customised performance systems or usage reports, thus providing a powerful energy and maintenance management tool. This feature is what defines a BEMS over a traditional BMS (building management system).

A BEMS will accept inputs from and provide controlled outputs for a whole range of controllable plant, including lighting. These are useful stand-alone features but when combined with the control of other HVAC plant, significant energy savings can be made.

Lighting

For example, with the correct wiring arrangements, a BEMS can be used to provide zone or local control including:

- Daylight detection and automatic switching or dimming of all or individual banks of lights;
- Presence detection and automatic switching of all or individual banks of lights.

Heating and cooling

Achieving optimum comfort conditions throughout a building in summer and winter requires a flexible system with the

potential to control conditions in discrete zones. If appropriate zoning exists, a BEMS can implement energy efficient heating, cooling and ventilation strategies automatically:

- By measuring outside temperature conditions the BEMS can estimate the pre-heat time required and adjust on a daily basis the boiler start time to ensure that the building has reached temperature at the start of occupancy;
- A BEMS can control conditions within individual zones “intelligently”. For example, on a sunny winter’s day, the rooms on the south side will require less heating than those on the colder north side;
- Effective co-ordination of heating and cooling can be provided for individual zones by varying setpoints. This avoids simultaneous operation of heating and cooling systems;
- Maximum heating or cooling is only required for a small number of days each year. The BEMS can adjust boiler and chiller output temperatures to match actual demand on a continuous basis, thus saving energy.

Ventilation

Making the best use of natural ventilation reduces building energy costs. However, factors like humidity cannot be adequately controlled when relying on natural ventilation alone and some element of mechanical ventilation is required. Under these circumstances a BEMS may be used effectively to:

- Control ventilation fans (and their dampers), or even automated blinds and windows, in a co-ordinated manner that will maximise the benefits of natural ventilation and minimise the level of mechanical support required to maintain comfort conditions;

- Provide integrated support for active cooling systems by ensuring the best use of natural ventilation, by for example, pre-cooling a building at night.

Hardware

A BEMS is basically a networked direct digital control system, often with one or more permanent operator stations. A front-end PC, or user panel, is a user interface which is capable of a wide range of system functions, and it can be remotely located, for example at a company head office, where it can monitor a number of buildings. The terminal screen can display text or graphics of system performance and settings and enable the user to monitor system operation or change settings e.g. the temperature settings for a particular space or building. A BEMS is a very important tool for facilities management, either directly or from a remote location.

In very small building management systems every sensor, etc. can be linked directly to the main operating system. However, in larger buildings this requires extensive wiring throughout the building. In this case, sensors and actuators in a particular area are linked into outstations. These can act as just a data gathering panel to send information back to a central controller via a single data cable, or in larger systems via the local area network (LAN), which then sends the information to the operator terminal.

Commonly, the outstation is itself “intelligent”, and can process information, i.e. “distributed processing”. In this case the network merely allows interrogation of control data from around the system. Outstations incorporate the following components or modules: inputs, outputs, microprocessor, memory, RAM, Eprom with configurable strategy, modules, time-clock, power supply, ethernet card, local RS232 port for supervisor.



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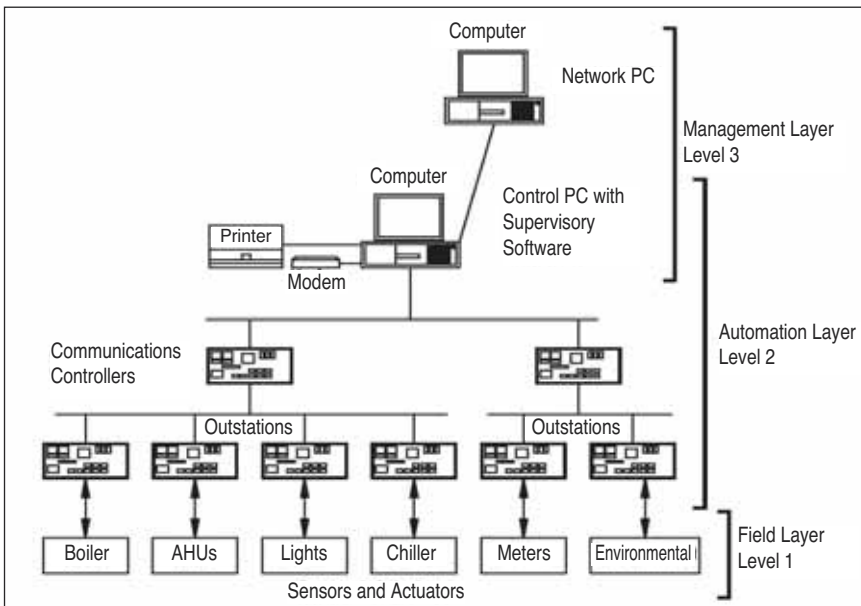


Figure 2

BEMS network and communications hardware

In accordance with the European Committee of Standardisations, communications within an intelligent building may be divided into three areas:

- (1) Level 1: Field level, covering sensor and actuators, lighting systems;
- (2) Level 2: Automation level, covering the outstation/ controllers;
- (3) Level 3: Management (i.e. supervisory) level.

Communications protocols include: Ethernet, BACnet, ARCNET, ModBus, LonWorks, KNX and Internet (Figure 2). In Figure 2 above. CIBSE Guide H provides a more detailed analysis of systems, networks and integration.²

Integrated Systems

A BEMS can be a fully integrated system (including security and fire alarm, maintenance, etc) and this offers considerable advantages to the building user.

Note that it is not possible for the BEMS to take the place of a fire alarm control system. See Figure 3 for examples of integration between systems.

Monitoring and targeting (M&T)s

“If you can’t measure it, you can’t manage it” – Peter Drucker.

It is becoming increasingly important to install a “monitoring and targeting” (M&T) system. Revisions to Part L will most likely drive this requirement in the future. The UK’s consultation on changes to the technical guidance for Part L issued in June 2009 proposes³:

- “At least 90% of the estimated annual energy consumption of each fuel”, within the “Part L Boundary” must be assigned “to the various end-use categories (heating, lighting, etc)” by main meters or sub-meters;
- The output of “any renewable energy system provided as part of the works” must be separately monitored;
- Metering provisions should “facilitate the benchmarking of energy performance” and new “buildings with a total useful floor area (TUFA) > 1000sq m” will require “automatic reading and data collection” facilities;
- Community heating systems should include “heat meters either at the time of installation” or make provision for their inclusion “at a later date without major pipework changes.” Additionally, “a heat meter should be installed to measure the heat energy supplied and to monitor the maximum heat demand, the maximum community heating flow rate and the return temperatures into the community heating network.”
- CHP systems must have, at minimum, “metering to measure hours run, electricity generated and fuel supplied to the CHP unit”;

Integrated systems	Features
Access and HVAC	Access control system informs the system of the number of occupants in an auditorium which adjusts ventilation rate accordingly
Security and CCTV	If a visitor is denied access, CCTV and PA systems are activated, allowing the supervisor to see and speak to the person and take appropriate action
Energy management and HVAC	The energy metering system reports that maximum demand limit may be exceeded, so that the HVAC controls may shed load
Lighting and security	Occupancy detectors in the lighting control system inform the security system of the position of occupants’ out-of-hours working.

Figure 3

Hitachi Air Source Heat Pumps

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EU recognition of heat pumps as a renewable energy source presents a major sales opportunity

Adaptable

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Flexible solution

For traditional radiators, under floor heating and domestic hot water

Easy to install

Preset engineer configurations make installation and commissioning simple

New builds

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Cheaper to install than ground-source heat pumps, Yutaki converts 1kW consumption into an impressive 4kW output making it economical for heating and domestic hot water. Not to mention reducing CO₂ emissions by up to 40%*.

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Apparently you can please all the people all the time.

*compared to traditional boiler-led systems



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- Metering of lighting “for new and existing buildings (to record the lighting energy consumption) should meet minimum standards” detailed in the consultation document.

Assuming Ireland will adopt similar strategies to the UK in this regard, it is worthwhile considering the effects of these possible future requirements in relation to specifying a BEMS or to upgrading an older BMS to incorporate energy management features. Another driver for M&T is improvement in DEC rating. Many public buildings and campuses achieve poor ratings and this is, in part, due to the absence of metering for “separable” energy uses as defined in CIBSE TM46 Energy Benchmarks⁴ (Figure 4). The current list of “separable” energy uses is also likely to increase over the coming years to include, for example, car park lighting.

Energy monitoring and targeting is defined by SEAI as the “collection, interpretation and reporting of energy use. Its role within energy management is to measure and maintain performance and to locate opportunities for reduced energy consumption and cost.”

Monitoring and targeting has two major functions:

- The control of current energy use, by monitoring consumption and comparing it against historical data and benchmarks for similar buildings;
- Improvements in the efficiency of energy usage by setting of future targets.

The benefits of energy monitoring and targeting include:

- Reducing the environmental impact of energy usage;
- Achieving energy consumption and cost savings, typically 7% - 12%.

The cost savings yardstick above can

DEC separables	Benchmark category
Regional server room	General office
Trading floor	General office
Bakery oven	Large food store
Sports floodlighting	Dry sports and leisure facility
Furnace, heat treatment or forming process	University campus Hospital (clinical or research) Laboratory or operating theatre Workshop
Blast chilling or freezing	Cold storage

Figure 4

be used to support decisions on the level of investment in metering.

Energy metering hardware consists of some, or all, of the following components:

- Meter module, which measures the desired quantity and converts the value to an electrical output, typically pulses; specialist pulse metering cards in outstations are becoming less common as these are being replaced by low-cost metering with Modbus or LonWorks bus outputs for connection to BEMS, and are able to measure most electrical circuits. There must be a real-time connection between the meter and the data logger. Hardwiring is the most common, being simple and reliable. Where meters are dispersed over a large site, it is possible to use a radio link between the meters and logger;
- Display module, which displays the present value of the rate of energy consumption, plus other derived quantities;
- Data logger, which accepts pulses from the meter, processes and stores data on energy consumption and transmits data on demand to the central computer containing the M&T software;
- Data transmission system, which connects one or more data loggers to the central computer;

- Computer containing the analysis software.

Data analysis and reporting

For a simple system, it may be sufficient to use a spreadsheet for data analysis. However, once there are several meters with half-hourly energy readings, it will almost certainly be better to employ a commercial software package for analysis.

Upgrading BMS to BEMS with full M&T

Most BMS suppliers offer upgrade routes to BEMS which can be carried out incrementally. Grants are available under the Accelerated Capital Allowances programme and these allow the upgrade cost to be written off against profits in the first year, assuming a minimum project expenditure of €5,000. ■

References

- (1) CIBSE Journal, April 2010, Fabric of success
- (2) CIBSE Guide H 2009 – Building Control Systems Chapter 4
- (3) Department of Communities & Local Government – Proposals for amending Part L & F of the Building Regulations – Consultation; Volume 2 June 2009
- (4) CIBSE TM46: 2008 – Energy Benchmarks, Table 1

BEMS and Controls

POTTERTON MYSON

Innovative Myson electronic controls

Today's electronic controls should be easy to understand and operate, they should also be straightforward to install and offer a full range of control for today's highly-efficient heating systems. Myson's new range of controls from Potterton Myson offers all of this, and includes useful and unique features. It is also compliant with the Revised Building Regulations – Part L, 2001/2002, and revisions for 2006.

The range is extensive and varied, and includes thermostats, motorised valves, programmers, and programmable room thermostats. All incorporate innovative design features

and advanced technologies, such as the Smart Start system in the new programmable room thermostat range.

The Smart Start system varies the start-up times to ensure that the building achieves temperature by the required time. It is continually learning the temperature rise requirement, delaying the start-up of the system, therefore saving energy during milder weather.

This new range is available in both hard-wired and radio frequency (RF) versions. Features common to both include:

- Smart Start technology

(saves fuel by delaying heating 'start up' on warm days);

- Easy to programme with three adjustable temperature settings;
- 2-in-1 programmable thermostat 24-hour or 7-day (installer set-up option);
- Backlit display with easy-to-follow instructions;
- One-hour high-temperature boost button;
- All 24-hour temperature settings shown on display;
- Volt-free 2-wire connection, ideal for combination boilers;
- Service required (installer set up option);
- Holiday override 1-99 days;
- Oil/gas boiler setting;
- Load compensation;
- Lockable keypad.

In addition to the above,

the remote includes wireless, radio frequency connection and stand.

Other innovative additions to Myson's electronic controls range are the MEP1c single-channel timeswitch and the MEP2c dual channel programmer. Features and benefits include:

- Can be set for 24-hour, 5/2-day or 7-day operation;
- Easy to read, backlit screen;
- Pre-set clock;
- Automatic summer/winter time change;
- Memory saver – programmer and clock will not require resetting in the event of power loss;
- Advance and up to three-hour extend features;
- Timeswitches are ideal for combination boilers and control of additional zones etc. (volt-free contacts);
- Suitable for fully-pumped or gravity heating systems;
- Independent timed programmer (MEP2c);
- Up to three timed periods per day;
- Ideal replacement product fits more backplates than any other programmer.

As always, Potterton Myson provides full product training across the entire range. The company runs a continuous education programme at its state-of-the-art facility in Dublin and installers are invited to participate in one, or more, of the many courses on offer.

Contact: Potterton Myson Ireland. Tel: 01 – 459 0870; email: post@potterton-myson.ie



The new Potterton Myson range includes thermostats, motorised valves, programmers, and programmable room thermostats.

BEMS and Controls

STANDARD CONTROL SYSTEMS

Quality always outlasts turbulent times

Standard Control Systems (Southern Control Systems Ltd) has been trading since 1984 and over that time has seen many highs and lows, and some extremely turbulent times. However, what is now being witnessed within the building services industry is unprecedented, writes Sean O'Toole.

With credit terms being stretched inexorably and contractors trying to insert "paid when paid" clauses into

contracts (which often transmute into "paid if paid" towards the latter stages of a project), there is severe pressure on the sub-contractor. Pity then the sub-sub-contractor – indeed, it seems that the more "subs" you have before your contract, the less secure you are.

Of course things are tight and margins, if indeed there are any, are wafer thin. However, there is nothing to be gained in the longer term by driving performing companies out of business.

Commitments made in these straightened times need to be honoured, and whatever cash there is in the system has to keep moving within the system. There is a need now, more than ever before, for heightened levels of honour and integrity.

As the construction industry contracts by up to 70%, there will of course be attrition. First among the victims will be companies who forget first principals – if you buy something for X, you should always try to sell it for at least X+1, not X-1. Furthermore, if someone agrees to pay you X+1, and then decides to settle his account by paying you X, or X-1, you need to pursue them for what is rightfully yours. Always remember what your dear granny told you: "if you work for nothing, you'll never be idle". If a company buys into the X-1 strategy, then quite simply they deserve the inevitable outcome. Conversely, if we all adhere to the X+1 strategy and the money keeps flowing, then we might just survive.

Like many others in the industry Standard Control Systems (SCS) has cut its overheads, seen margins squeezed and contract prices fall significantly. However, it will not compromise on quality and the overriding ethos within the business has, and always will be, to deliver a quality product for an agreed sum on an agreed date.

This strategy has helped it buck the downward trend, so much so that it recently took on two very experienced

controls engineers from TR Controls. It has also expanded into Northern Ireland where the appointment of Antrim man Gary Hamilton leaves it well placed to build on the success of winning the huge BMS project with Bombardier in Belfast (main contractor: Sisk).

The UK and mainland Europe also beckon and, not surprisingly, these are seen as the primary target areas for SCS's expansion plans in the coming years. This process has already commenced and the company is currently operating in Glasgow, Bradford, London and in several locations within Germany.

As SCS General Manager, Séan O'Toole says: "We have a highly-motivated and experienced workforce to whom we are deeply committed. We want to build on our successes of the past 26 years, operate in new markets, and deliver a broadened product range. But above all else, whatever we do and wherever we do it, we want to be professional in all our endeavours. Upon contract completion, we want to be paid within a reasonable time, we want to do likewise with all our suppliers, and we want to be confident that everyone in the supply chain has had a reasonably pleasant experience in doing business with us".

Contact: Sean O'Toole, Standard Control Systems. Tel: 01 – 429 1800; email: sotoole@standardcontrol.ie



*Sean O'Toole,
Director, Standard
Control Systems
(Southern Control
Systems Ltd).*

BEMS and Controls

HITACHI

CS Net Web accredited under the ACA scheme

With the recession affecting so many businesses across the globe, it is refreshing to see one market presenting such opportunity – the green technology sector. People are increasingly taking notice of the need to put long-term environmentally-friendly measures into place and, despite delays on a collective global agreement to tackle climate change, governments are continuously introducing new legislation mandating the use of renewable energy.

Worldwide investments in renewable energy increased from \$39.24 billion in 2001 to \$336.78 billion in 2009, a figure forecast to reach \$653.35 billion by 2015. It is critical that specifying consulting engineers, architects, contractors and end users are aware that they can benefit financially in a big way from legislation, and by purchasing the correct energy efficient equipment.

Here Fergus Daly, Sales Manager of Hitachi Ireland, highlights exactly how installers can benefit by taking advantage of Accelerated Capital Allowance (ACA) when specifying building energy management systems.

Taking advantage of ACA

If installers choose green technology that qualifies under the Accelerated Capital

Allowance (ACA) scheme, companies can write off 100% of the purchase value of the product against their profit in the year of purchase. Introduced under the Finance Act 2008 in October of that year, the ACA will run for an initial period of three years.



One of the scheme's technology categories covers building energy management systems (BEMS). These computer-based systems are designed to monitor and control building energy use with the aim of optimising energy efficiency and to meet specified efficiency standards.

For a BEMS to be listed under the ACA scheme it has to meet strict conditions. Buyers are not only able to get their money back, but are also guaranteed a product that leads the market in

energy efficiency. The compliance conditions include:

- Primary inputs to the system must include data on energy usage and/or environmental conditions;
- The system must have the capability to monitor and record operational data in sufficient details for the user to fully control energy use. In addition, the system must be able to export this data in a standard interchange file format;
- All components necessary to perform the energy-

saving function have to be included in the BEMS;

- The overall system must include an interface.

Central control

Hitachi Air Conditioning and Refrigeration Group's energy-saving management system and control for air conditioning units – CS Net Web – qualifies under the ACA scheme. The stand-alone controller allows users to monitor and control the energy consumption of the air conditioning system from anywhere with web access.

CS Net Web can manage up to 160 indoor units and up to 64 outdoor units when connected to the Hitachi H-LINK communication system. Single or multiple sites can be monitored from one central point and the user can easily ascertain the system performance at all times.

Flexible and user-friendly

The Hitachi control system is designed to give customers the flexibility to manage their air conditioning set-up in a tailored fashion, taking into account factors such as room size, number of people and climate. The optional touch-screen allows the customer intuitive control of up to four CS Net Web central controllers, and it can be mounted on either a wall or table. Different readings from the system can be accessed remotely, enabling fast and efficient maintenance and monitoring of the system. These parameters are stored on the internal memory for a finite period to aid maintenance.

The CS Net Web is also the only other central control system to offer cold draft protection. The controller has the ability to vary the off coil temperature of the indoor units individually. This function provides the user with the ability to simultaneously minimise energy waste and optimize comfort.

Contact: Fergus Daly, Sales Manager, Hitachi Ireland. Tel: 01 – 216 4406; Mobile: 087 – 277 9405; email: fergus.daly@hitachi.eu.com

BEMS and Controls

HONEYWELL

Installing energy-saving central heating control has never been easier

It has never been easier to install advanced energy-efficient central heating control. Honeywell Sundial

RF² packs are unique in being the only wireless products with the receiver built into the timer. Each pack

includes a wireless-enabled timer and a wireless thermostat – simply replace the timer and the thermostat works automatically, with no additional wiring. Packs for space heating and stored hot water also include a wireless cylinder thermostat

Installation is quick and easy, with no control cables to run, so no disruption during wiring and no damage to the décor.

The controls and large displays have been carefully designed to be very easy-to-use by people of all ages and abilities.

They feature TPI (Time Proportional and Integral) advanced energy-saving control, which provides more accurate temperature control than traditional home controls

and uniquely, also matches boiler firing to system load, so the boiler operates much more efficiently.

The packs provide an ideal solution to providing advanced energy saving control for the very high percentage of homes which lack the minimum controls required by Building Regulations in new systems, and the many more lacking even a thermostat. The packs also provide advanced energy-saving control for new heating systems.

Three pack types are available to match a heating system's exact needs.

- Pack 1 for space heating systems provides the traditional layout of a wireless-enabled timeswitch and a separate wireless room thermostat;
- Pack 2 for systems with space heating and stored hot water has a wireless-enabled programmer and a wireless room thermostat;
- Pack 3 for systems with space heating and stored hot water has a wireless-enabled programmer, wireless room thermostat and wireless cylinder thermostat.

The two-way RF communication used by Honeywell is extremely robust and reliable. A signal strength test feature allows the installer to site the system components where signal reception is strong.

Contact: Honeywell Home Controls.
Tel: 0044 - 1344 656511
email: literature@honeywell.com



Honeywell Sundial RF² packs are unique in being the only wireless products with the receiver built into the timer.

Air source or ground source ... that is the question

The current building regulations (SI 666 – 2006) require that any person “*who commissions the construction of a large new building*” must investigate the use of a heat pump as part of an overall alternative energy strategy.

Although consideration is often given to the use of geothermal heat pumps, very little thought goes into the possibility of using air to water heat pump technology. This is very strange, writes **Paul Schweppe** of Core Air Conditioning, when you consider that:

- A correctly-designed and installed air to water system can provide efficiencies

comparable to that of a ground source system;

- The costs associated with the installation of air to water heat pumps are a fraction of those associated with ground source
- The ROI on air to water heating solutions is closer to the designed life expectancy of a plant than a similarly-sized GSHP.

Carrier, who are acknowledged

experts in the provision of refrigeration-based solutions to the HVAC market, have long been aware of these realities and will only recommend the use of a ground source heat pump where the annual climate results in 10 consecutive days at, or below, -10°C.

Effect of climate on air source heat pumps

So, why do some building services engineers stick so resolutely to



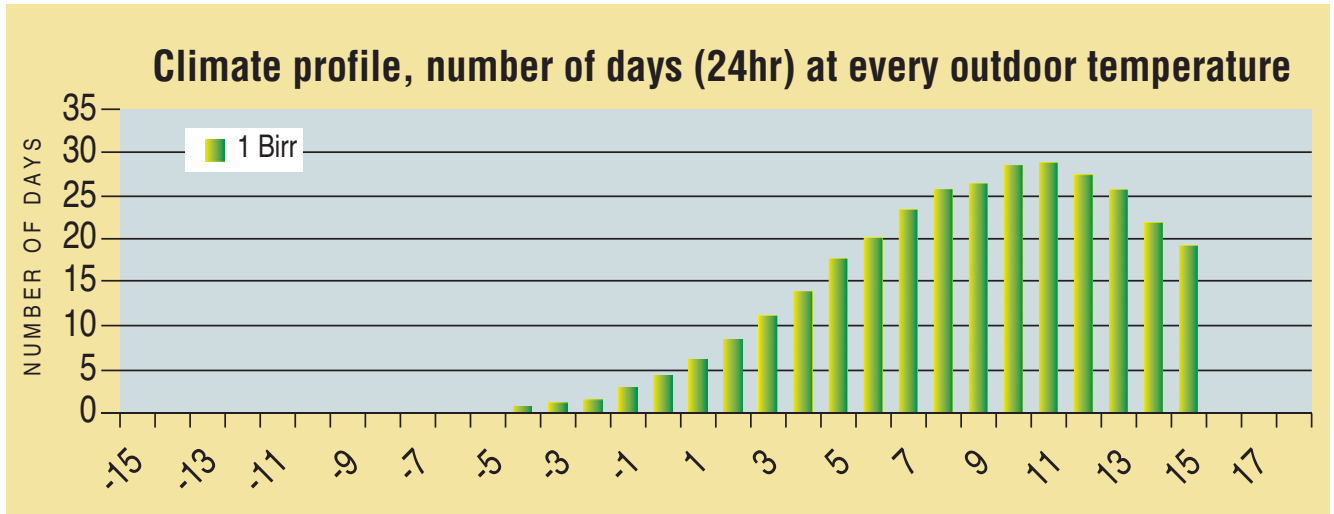


Figure 1.

ground source heat pumps? The main reason appears to be the belief that air source technology just can't cut it at the lower end of our climate scale. While the performance of an air to water heat pump is undoubtedly reduced at lower air temperatures it is, by no means, the full story.

Figure 1 shows the average air temperature expressed in degree days per annum and averaged over a 10-year period from 1999 to 2009. Here are some interesting observations:

- The number of degree days between the lowest temperature recorded (-5°C) and the no heating point (+15°C) averages out at 312 days/year;
- An air temperature of -3°C represents 1 degree day/year or 0.32% of the total heating period;
- The number of days between 7°C and 15°C is 225.48, or 72% of the heating period.

Clearly, the practice of evaluating an air source heat pump's performance at a single point of -3°C will not provide an accurate indication of its year-round potential.

Carrier estimates that a unit which delivers 65% of the heating need at -3°C could provide over

99% of the annual heating load (kW/hrs).

Use of weather compensation

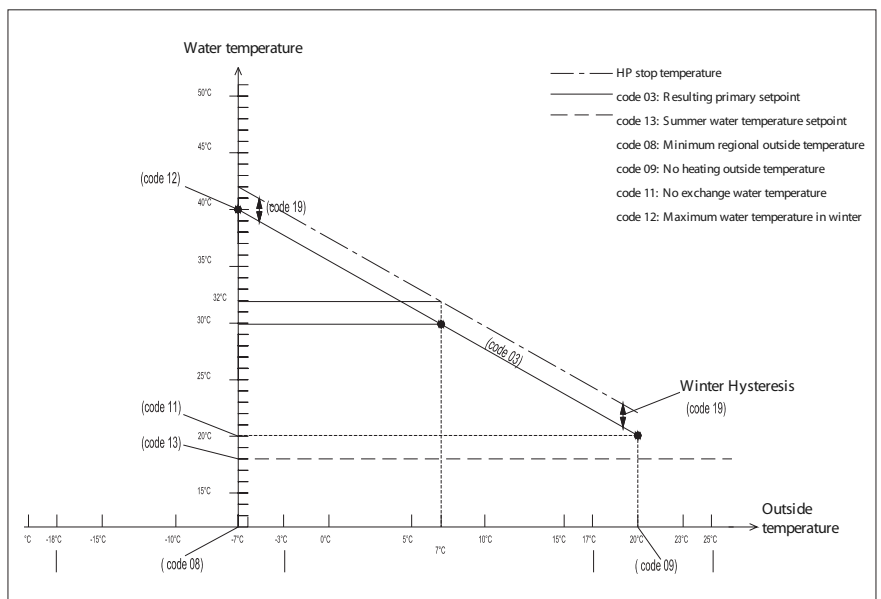
The well-established principle of weather compensation involves varying the output of the heating system in relation to outside ambient temperatures. Typically, this is achieved by mixing hot water from a primary loop into the cooler secondary loop connected to underfloor heating or radiators. However, many "typical" weather compensation controls are all but useless when it comes to optimising

efficiency on heat pumps as they have no control over the primary loop temperature.

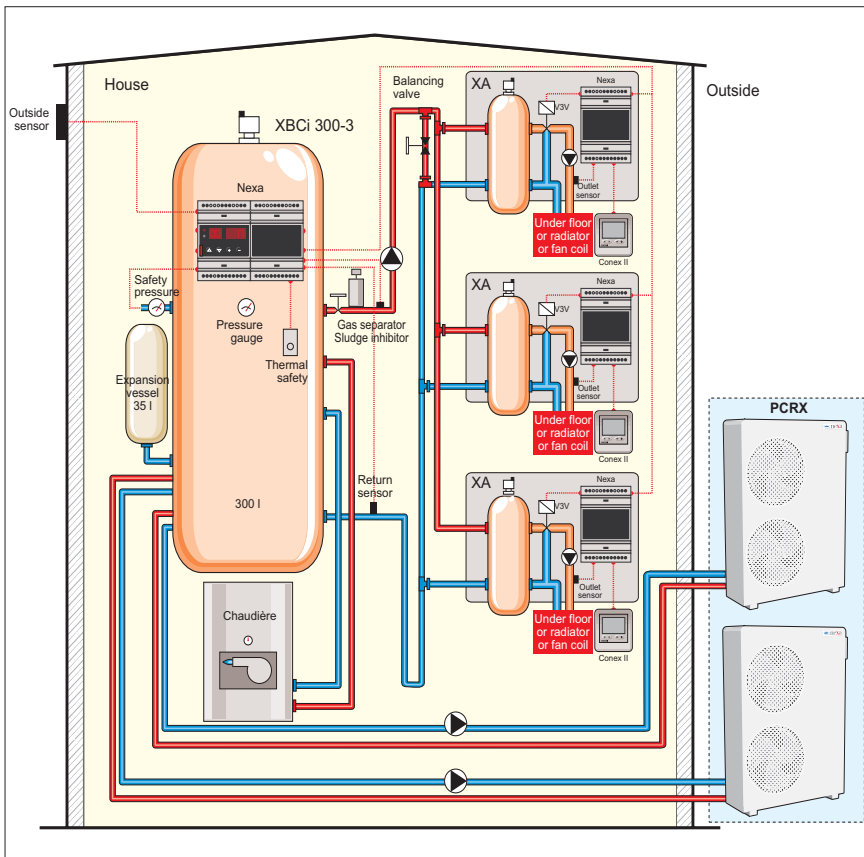
Data taken from the performance figures for a Carrier 30RQS039 (40kW nominal heating capacity) heat pump indicates that:

- At 0°C (dry-bulb) and LWT of 50°C, capacity is 35.4 kW/total input of 14.9 kW = **2.37 COP**;
- At 0°C (dry-bulb) LWT 30°C, capacity 35.8 kW/total input of 10.9 kW = **3.28 COP**

This clearly shows that, when measured against fixed ambient conditions, the output and



Weather compensation — for an outside temperature of 7°C, the calculated temperature (resulting setpoint) of the primary circuit will be 30°C; the water will be maintained between 30°C and 32°C due to the hysteresis.



Schematic illustrates how multi-zone systems function.

efficiency of an air to water heat pump will vary inversely to leaving-water-temperature i.e., the lower the LWT the higher the output and the higher the COP.

If we are to get the top performance out of a heat pump we need to use a weather compensator that reduces the leaving-water temperature to the minimum

possible without impacting comfort conditions. This is exactly how the Carrier system works.

Carrier System

The Carrier multi-zone solution can provide for up to 30 individual temperature-controlled, weather compensated zones connected to a central controller. This central

controller will, among other functions, start and stop the heat pumps, boilers and/or other back-up sources of thermal energy.

By using real time data and a version of “priority selection”, the Carrier system will ensure that the heat pump is always running at the lowest possible LWT for any give ambient temperature, thereby maximising energy efficiency without impacting on comfort conditions.

Now consider again the Carrier 30RQS039 heat pump:

- At 0°C (dry-bulb) and LWT of 50°C, capacity is 35.4 kW/total input of 14.9 kW = **2.37 COP**;
- At 7°C (dry-bulb) and LWT of 30°C, capacity is 42.8 kW/total input of 10.3 kW = **4.16 COP**

Clearly there is something to be gained here and it is certainly worth further investigation. The reality is that, when assessing the suitability of an air to water heat pump, consideration must be given to the factors that affect both efficiency (COP) and output (kW). These include:

- The local climate of the site and minimum/maximum temperatures at which we require heating;
- The degree/day profile of the site in heating mode;
- The minimum LWT required against ambient temperatures (through the use of proper, weather-compensated, temperature controls);
- Whether or not the unit will be expected to provide 100% of the heating load or is a back-up heat source provided;
- What is the ROI on an air source heat pump versus a ground source heat pump?

Contact: Paul Schweppe, Core Air Conditioning. Tel: 01 – 409 8912; email: paul@Coreac.com ■

If we are to get the top performance out of a heat pump we need to use a weather compensator that reduces the leaving water temperature to the minimum possible without impacting comfort conditions. This is exactly how the Carrier system works.

RACGS

Right: Second visitors' prize winner Robbie Burns, Fridge Spares, Cork with Derek Byrne, Fridge Spares (sponsor).



Results were as follows:

Overall Winner

John Ryan (15), 38pts

Class 1

First:

Ger Darcy (11), 35pts

Second:

Kevin Roden (15), 34pts

Class 2

First:

Liam Carroll (16), 35pts

Second:

Don Ryan (21), 32pts

Visitors

First:

Jack Donnelly (12), 31pts

Second:

Robbie Burns (21), 23pts

Front 9

Dave Kirwan (15), 20pts

Back 9

Jack Elstead (15), 18pts

Nearest the Pin

Don Ryan

Longest Drive

Vincent Barrett

Ryan triumphs at Bunclody

The weather was fantastic, the course was spectacular and the craic was mighty – that was the unanimous verdict on the Fridge Spares-sponsored outing to Bunclody Golf Club.

The near-perfect conditions made for excellent scoring with some close-fought battles, especially for the individual class prizes.

Derek Byrne from Fridge Spares was on hand throughout the day to pass out water and give encouragement. He also presented a wonderful array of prizes to the winners at the post-competition meal. ■



Above: Visitors' prize winner Jack Donnelly, Aer Rianta with Derek Byrne, Fridge Spares. Below: Longest drive winner Vincent Barrett, RDL and RACGS President with Derek Byrne, Fridge Spares.



Below right: Overall winner John Ryan, Ryan Chilling Group, with Derek Byrne, Fridge Spares.

Below: Nearest the pin winner Don Ryan, Ryan Chilling Group, with Derek Byrne, Fridge Spares.



Wiring Rules

This article concludes our three-part series which gave an insight into the National Rules for Electrical Installations (ETCI Rules) – 4th Edition ET101 (2008) by presenting the changes associated with Residual Current Devices (RCDs), installations in “special locations” and the logistics encompassing verification, testing and certification of electrical installations.

Residual Current Devices

The role of RCDs has been significantly enhanced in a number of contexts such as inclusion on certain circuits within bathrooms, as well as increased priority in construction installations and in agricultural and horticultural sites. Indeed, in non-standard installations

or where there are requirements for special installations or locations, there have been changes and new entries into the ETCI Rules.

Finally, and perhaps the area where the most significant changes have occurred, the whole process of verification, testing and certification of electrical installations has changed to be cognisant of the requirements pertaining to electrical safety as defined by the Commission for Energy Regulation (CER).

Residual Current Devices

RCDs are selected for protection in case of a fault (indirect contact) in accordance with 411.3 and for additional protection against direct contact in accordance with 416.1. Clause 531.2 expands on the requirements for RCDs and there is now a new annex, Annex 53A, summarising RCD requirements. This annex details information including RCD application; sources of energy utilised for device operation; the effects of dc components — prevalent with IT equipment — which can be embedded on the supply; issues governing selectivity of RCD operation; and causes of nuisance tripping. Some of the main changes relating to RCDs include:

- There is now a requirement for a dedicated RCD (30mA) to protect all circuits, i.e. (including LV luminaires) located within the zones of a bathroom with the

exception of Safety Extra Low Voltage (SELV) circuits;

- Construction and demolition site socket outlets rated in excess of 32A must be protected by an RCD with residual current sensitivity rating not in excess of 500mA. In addition to this requirement, the device must be of type A or B (depending on the dc component present);
- Agricultural and horticultural installation socket outlets rated in excess of 32A must be protected by an RCD with residual current sensitivity rated not in excess of 100mA. For all other (related) circuits requiring an RCD, the associated residual current sensitivities cannot exceed 300mA and, if selectivity might be an issue, time delay of RCD operation (upstream) may be implemented (Type S RCD).

See web-link to *Guide to the Selection & Use of Residual Current Devices ET214:2005 Edition 1 ET214* (www.etcie.ie/doc/ET214.pdf).

A major change introduced by National Rules for Electrical Installations (ETCI Rules) – 4th Edition concerns problems associated with “stiction”. Stiction is a colloquial term used to describe incidences where the inertia of the tripping mechanism results in delays or even in-action of the tripping mechanism, leading to – in some instances – fatal consequences. The maximum allowable tripping time for RCDs with $I\Delta N = 30\text{mA}$ is 300 seconds. In order to ensure the tripping mechanism is operating properly, regular activation of the device (mechanical) is required. In accordance with 531.2.2.2, RCDs shall be installed so that the test-device is easily accessible and beside a clearly-visible notice to the effect that the test-device should be operated regularly by the user. The label illustrated is available from ETCI free of charge (Figure 1).

Keith Sunderland is an electrical engineer and is currently engaged in research within the School of Electrical Engineering Systems at the Dublin Institute of Technology. His main research focus concerns the application of micro-generation technologies from the perspective of

network tolerance to issues including power quality and load side demand management. Formerly an

electrician with lamróid Éireann, he is currently lecturing in the Department of Electrical Services Engineering, DIT. He is a member of

Technical Council 2 (TC2) of The Electro-Technical Council of Ireland (ETCI) whose primary task is the publication of the National Rules for Electrical Installations in Ireland. He is also a committee member of the Chartered Institution of Building Services Engineers (CIBSE, Republic of Ireland Region).





Figure 1.

Special Situations

Part 7 (Requirements for special Installations or Locations) serves to supplement, enhance or modify the general requirements of other chapters within the ETCI Rules. The Fourth Edition of ET101 has introduced modifications on some of the existing inclusions in this section, as well as introducing new types of industrial/commercial applications (Figure 2). There have been changes in 701 (bathrooms) as outlined above in the discussion on RCDs, as well as in construction sites and agricultural and horticultural installations. Again in these installation types, the role of the RCD has been enhanced. In agricultural and horticultural installations, temperature marking of luminaires is required in areas considered high risk. Also, where high-density livestock rearing is prevalent, automatic life support systems are required.

Verification, Testing and Certification

The requirements when performing a visual inspection (as contained in Annex 61A) have been significantly expanded and indeed, the whole emphasis of inspection has been developed to engage “all the senses”.

Protect yourself from electric shock

Test your RCD trip switch

Press the test button then reset the switch

New inclusions in Part 7 (ET101: 2008)

- 702A *Fountains*
- 708 *Caravan Parks*
- 709 *Marinas*
- 710 *Medical Locations*
- 711 *Exhibitions, Shows and Fairs*
- 712 *Solar Photovoltaic power supply systems*
- 715 *ELV lighting installations*
- 717 *Mobile or transportable units*
- 721 *Caravans and Motor-caravans; Temporary installations for structures*
- 740 *Amusement devices (booths), fairgrounds and circuses*
- 753 *Floor and ceiling heating systems*

Figure 2.

- A factor has been applied to the values associated with earth fault loop impedance to be cognisant of thermal effects increasing the effective impedance of wiring systems; An erroneous connection can occur in the context of a ring circuit where one of the circuit conductors is inadvertently connected – in error – to an adjacent protective device fuse or MCB; or in the case where, for example, a nail in a wall “shorts” between two circuits. The test is

Pre-Connection Tests

- 613.2.1: Continuity of Protective/Bonding Conductors. Annex 61B
- 613.2.2: Continuity of all conductors of final ring circuits
- 613.3: **Insulation Resistance (in accordance with Table 61A)**
- 613.4: **Detection of erroneous connections between circuits**
- 613.6: Verification of conditions for automatic disconnection of supply including earthing and bonding
- 613.8: Polarity

Pre-Connection Tests

- 613.13: **Fault-loop impedance measurement**
- 613.14: Verification of operation of RCDs

implemented through measurement of insulation resistance. In the context of results associated with the measurement of insulation resistance, there have been changes. The values of minimum insulation resistance associated with all circuit categories have been doubled. For instance, circuits greater than extra low voltage (ELV) but less than or equal to 500 volts (including functional extra low voltage, FELV), have a minimum value of 1 Mega-Ohm ($1M\Omega$) – Figure 3.

Clause 613.13 relates to earth fault loop impedance measurement and the methodology for measurement outlined in Annex 61F and collated with respect to Tables 61C-1 and 61C-2. The main change is associated with the measured values. The “new” values permissible under this test have been reduced by 33% to take account of the thermal influence on the cables due to the fault current in the effected circuit. Up to now, these values were described as “cold values” with no adjustment in effect for heating affects from faults.

In relation to the requirements of Chapter 62, Periodic Inspection and Testing, a new Periodic Inspection Report Form has been included (an example being contained in Annex 62 A). Significant work has been invested into this report so that filling out the form is a transparent procedure with minimal opportunity for “personalising” or “interpretation”, where opinions are minimised and replaced with actual “black and white” entries. This obviously facilitates easier comparison of reports across the breadth of the sector.

There have been widespread changes associated with the process of certification. This area has been strongly influenced by the introduction of the new regulation paradigm and, as a consequence,

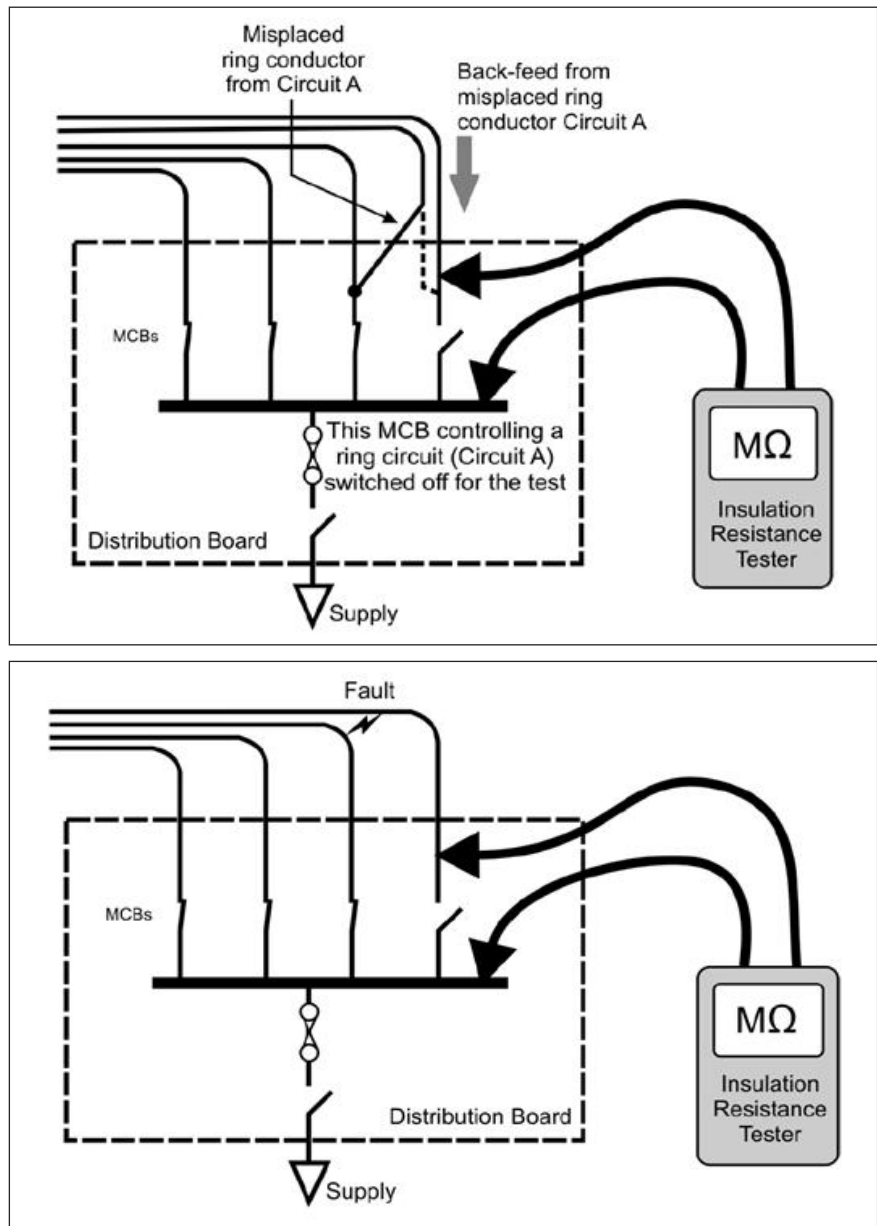


Figure 3 — Reference: Pg 156 ET101: 2008

there have been further developments since the publication of ET101:2008. The changes to the Certification process will be explicitly detailed in the 1st Amendment to ET101:2008, but one such change concerns the record of the post-connection tests, where it is mandatory for the electrical contractor to submit a copy of these results to the respective Safety Supervisory Body (SSB), eg, Register of Electrical Contractors of Ireland (RECI) or Electrical Contractors Safety and Standards Association (ECSSA).

Indeed, under the new regulatory system, a completion certificate will only be considered fully completed following the return of a copy to the relevant SSB with post-connection tests successfully completed and recorded. ■

The views expressed in this document represent a personal opinion and should not in any way be construed as a definitive interpretation of ET101:2008 or indeed of the ETCI itself. This is not a legal interpretation; in the event of a specific legal question, the reader should consult a practicing solicitor or a member of the Incorporated Law Society.

Haiti Disaster Appeal

Dervan's Session Aid goes coast-to-coast

When Brendan Dervan of Dervan Engineering conceived the idea of Session Aid in response to the Haiti earthquake disaster, little did he know that he would raise €15,000 for Trócaire, with 100% of all the money going directly to Haiti. But, like all really good ideas ... small beginnings sow the seeds of big things to come.

Apart from the day job, Brendan's principal "after-eight" pursuit is playing music with a bunch of fellow session musicians. They play at various functions and events but have a weekly residency at Faugh's Hurling Club in Templeogue. They play everything from trad to folk, country, blues, Beatles and Irish ballads.



Back Row: Shay McGlynn, fiddle; Brendan Dervan, tin whistle; Dave Bracken, travelling fan; Niall Tobin, mandolin; and Brendan Moran, guitar. **Middle row:** Aileen Dervan, Brendan's wife, fellow-director and "mammy" to the group; Pearce Power, bodhran; and Joe Gleeson, bass. **Seated:** Tom Nulty, guitar; Mick Dervan, roadie; and Sean Dervan, guitar.

When the Haiti disaster occurred Brendan got the idea of a fundraiser with a difference – a coast-to-coast musical marathon across Ireland playing at various venues, both outdoor and indoor, along the way. They called it simply Coast-to-Coast Session Aid.

They started on Bray Seafront

on the afternoon of 12 March, and then played Faugh's GAA Club that evening; Saturday saw them play beside the Joe Dolan statue in Mullingar at 12noon, the Market Square in Longford at 2pm, the Market Yard in Carrick-on-Shannon at 4pm, and the Mill Race Pub in Drumshambo at 10pm. They arrived in Sligo on Sunday for a live session at Toblegate Lane at 1pm, before concluding the marathon at 3pm with a gig and photo shoot in Rosses Point.

At the conclusion of the weekend Brendan and his fellow-musicians had raised €15,000 which has now been handed over to Trócaire to provide support for the Haiti earthquake victims. To date, Trócaire has:

- Distributed food to over 600,000 people;
- Supplied emergency shelter kits to over 60,000 people;
- Created child-friendly spaces in camps, and provided

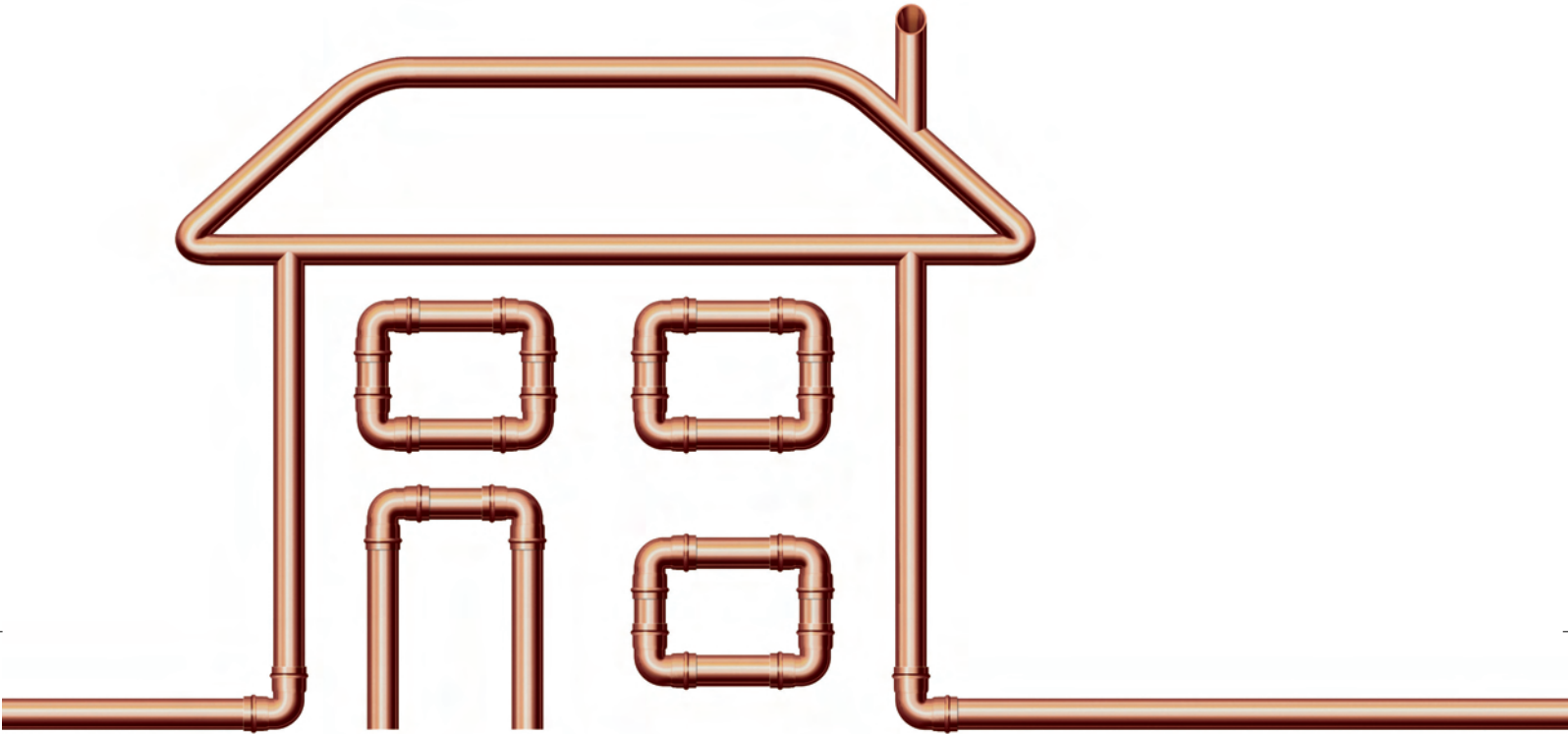
counselling services for children;

- Begun the construction of shelters made from wood and galvanized sheeting that will help to improve the living conditions and safety of families until permanent housing is constructed;
- Distributed medical supplies to over 10,000 people through health teams working in 10 camps;
- Established three functioning operating rooms, a laboratory, blood bank, and an x-ray room in St Francois de Sales Hospital, Port-au-Prince.

While the initial funds raised have already been handed over to Trócaire, contributions are still coming in and being accepted. If you want to support this worthy cause, contact Brendan directly at email: brendan@dervanengineering.ie ■



Jen Murphy, Trócaire, receiving the cheque from Brendan Dervan.

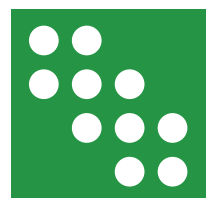


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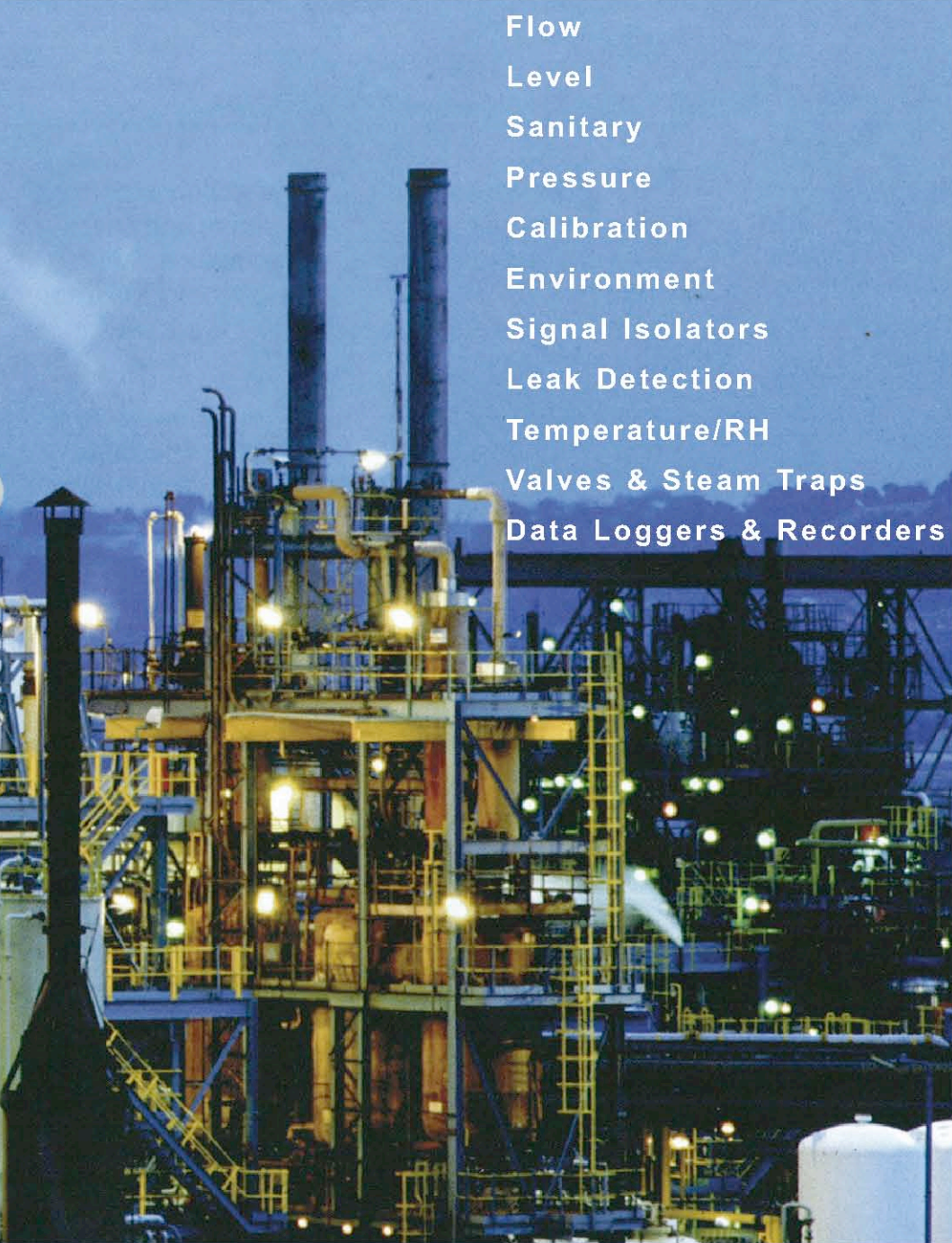
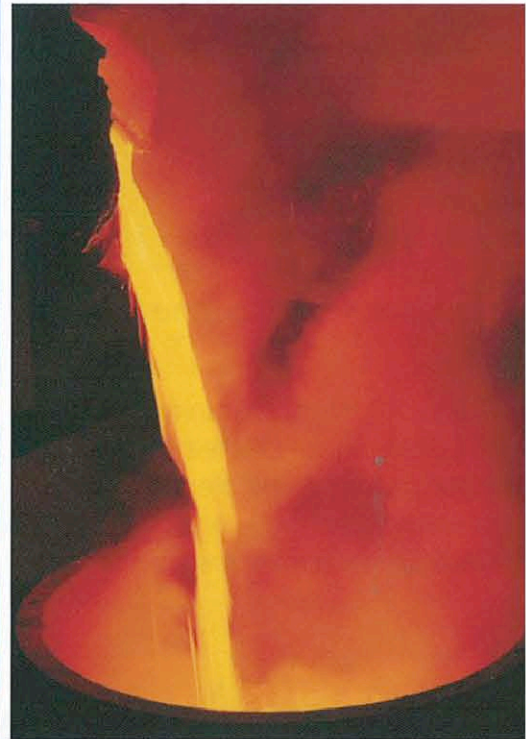
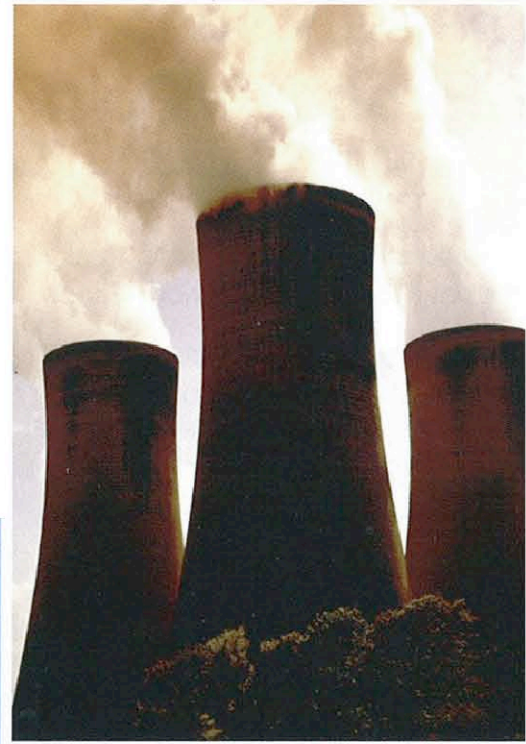


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