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BSNews

MECHANICAL & ELECTRICAL BUILDING SERVICES

FEBRUARY 2003

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Insurance Mayhem — An Tanaiste's View

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With its shimmering blue, bladder-like body, the umbrella-shaped Portuguese man-of-war glides gracefully into the wind. And hidden below the water, the highly-poisonous tentacles of the jellyfish can reach as far down as 50 metres towards the ocean floor in order to ensnare the creatures prey. Without using any muscle strength whatsoever, the animal can travel as fast as ten kilometres an hour, a record for the jellyfish species.

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Readership Data

Irish Building Services News (formerly Irish H&V News) is Ireland's only Building Services magazine providing coverage of heating, ventilating, air conditioning, refrigeration, sanitaryware, plumbing, maintenance and environmental industries. It is the only publication catering exclusively for these industries and its circulation includes members of the following:-

Chartered Institution of Building Services Engineers (CIBSE); The Mechanical Engineering & Building Services Contractors' Association (MEBSCA); The Association of Consulting Engineers of Ireland (ACEI); The Mechanical Engineering Contractors' Association; The Institute of Domestic Heating Engineers (IDHE); The Registered Heating Contractors Association; The Maintenance, Energy & Environmental Technology Association (MEETA) which incorporates energy managers and maintenance managers; The Energy Conservation & District Heating Association; The Institute of Plumbing; The Irish Home Builders Association (IHBA); Builders Merchants/Trade Supply Outlets; Irish Property & Facilities Managers Association.

In addition, Irish Building Services News circulates to independent building services contractors and key executives in industry. Government, Semi-State and local authority bodies. Essentially, our circulation is virtually saturation coverage of all those with an interest and/or involvement in the industry.

'Review My Insurance Costs & Cover? ... I Can't Even Get A Quote'

So said one installer BSNews spoke with recently. In doing so he articulated the situation facing many companies, and those in contracting in particular. Moreover, these firms are long-standing and well-established, not new ventures being set up for the first time. They never had any difficulty getting employers' and public liability cover before.

However, when it came to their most recent premium renewals, the situation had changed dramatically. A common experience for most was notification of premium renewal, at very short notice, at what can only be described as exorbitant premium increases.

These vary from anything between 30% and 40% at the lower end of the scale, right up to hundreds at the top end. There is no time to shop around. Not that that matters any more. Shopping around yields the same results. Essentially, it would appear as if the insurance companies simply don't want to know a whole sector of the construction industry.

The result is catastrophic. A minority have simply shut up shop. Others have cut back and made sacrifices elsewhere so that they can pay the premium, despite knowing that it does not make good business sense.

Worse still, there are those who are still trading despite having no employers' and public liability cover.

Who is to blame for this fiasco ... the insurance companies ... the Government ... the nation's greedy compensation culture ... or the Courts who make ridiculous awards? The reality is that all of the aforementioned share some responsibility, though it is only the Government who can enforce any effective changes (see page 47). Not that it will do so without prompting. It is up to the entire building services sector to galvanise itself and initiate a pro-active campaign aimed at bringing about this change. The situation in relation to insurance is critical ... something needs to be done before it becomes terminal.

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Want To Know About Heat Exchangers? ... Ask A Duck, Says Wilo!



Ducks feet work on the same principle as a heat reclamation system. Pictured is a duck ... and a heat reclamation system using Wilo pumps

Why do ducks' feet not freeze solid onto ice? The answer is simple: because they naturally have ice-cold feet – at least in winter. The internal body temperature of a mallard duck fluctuates from 40 to 42 degrees. Towards the end of the feet – and this is the trick – the body temperature continues to fall consistently, to 24 degrees at the top of the leg, and to eight degrees at the ankle joint. At the very bottom of the limb, where the foot comes into contact with the ice, the temperature is zero degrees.

The bio-technical explanation: the duck's body works as a heat-exchanger using the counter-flow principle. The blood flowing down to the feet transfers the major part of its warmth to the blood flowing back up from the feet. A fine network of capillaries, in conjunction with a complex valve action, provides the required control, so that any required temperature can be set at the end and bottom of the foot. This bears close comparison to heat-exchangers used in heating systems.

This efficient solution worked out by nature also has its application in heat recovery systems: before the heat is vented wastefully to the outside world, the hot water is cooled down step by step, and the heat recovered fed back into the heating circuit.

For details of this, and other nature-driven leads Wilo is exploring to develop building products of the future, contact: Tony Cusack, Wilo Engineering. Tel: 061 - 410 963; email: sales@wilo.ie.

COMPLETE Expands to Southern Regions

The maintenance and management of buildings and facilities where business and services are provided is an ever-increasing burden. Crisis breakdowns in plumbing, heating, electrical installations, air-conditioning, electrical systems — or in the fabric of a building — almost inevitably leads to disruption and loss of production and revenue. This is the background against which COMPLETE developed a "one-stop shop" with the expertise, people, communications and technology to provide professional facilities maintenance and management services. Having established a reputation for reliability and service in the Dublin region, COMPLETE has now expanded into the Munster region, with particular focus on Cork and Waterford. To facilitate COMPLETE's new southern service, James Kennedy, who brings to the business a wealth of experience in

industry and business at local, national and multi-national level, has been appointed a director. "My previous experience of running complex and extremely highly-regulated plants and facilities subject to intense scrutiny by the US Food and Drug Administration gave me a very clear understanding of the need to keep everything running smoothly, for having an efficient programme of preventive maintenance in place, as well as a 'rapid response' resource to deal instantly with emergencies," says James Kennedy. "Letting COMPLETE deal with these headaches is not only efficient and productive, it is also extremely cost-effective. The COMPLETE service is essentially a 'people' business and we emphasise reliability, responsibility and commitment," says Ruairi O'Neill, Managing Director of COMPLETE. Contact: Ruairi O'Neill, COMPLETE. Tel: 1-800-624 682.



Ian Callaghan, Fleet Manager, EP Mooney, delivering new vehicles to Ruairi O'Neill, Managing Director, COMPLETE, at the company's new southern office.



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'Pressure Measurement in the Water Industry' — Gems Sensors' Seminar

Pressure Measurement in the Water Industry is the title of a seminar to be presented by Manotherm and Gems Sensors at the forthcoming Water & Waste exhibition at the RDS. Date is Thursday, 27 March, and the time 10.20am to 11.10am.

Manotherm is the exclusive distributor in the Republic of Ireland for Gems Sensors and the joint presentation will include a review of performance-based applications (including level measurement), common problems, and techniques used within the water industry.

Solutions will be provided which will be of interest, not only to instrument engineers and supervisors, but also to buyers and operation directors, as significant cost reductions can also be realised.

Contact: Bob Gilbert, Noel Walsh, Robert Gilbert, Manotherm.

Tel: 01 - 452 2355; email: manotherm@eircom.net

Hitachi President Named Chairman of Key Industry Body

Mr Nakayama, President and Director of Hitachi Air Conditioning Systems Ltd (Japan), has been named Chairman of the Japanese Air Conditioning and Refrigeration Association (JRAIA). Mr Nakayama's term will run for 18 months until 10 June 2004. JRAIA was established in 1949 and aims to promote and improve production, distribution

and consumption of air conditioning and refrigeration products to contribute to the development of the industry. All Japanese air conditioning manufacturers, including many global brand names, are members or associate members of JRAIA and it is with great pride that Mr Nakayama takes up the position of Chairman.

AC To Feature Strongly at ISH 2003



Bathrooms will also feature prominently at ISH and pictured above is one of the many innovative wash basin designs which will be unveiled

The reintegration of air-conditioning and ventilation technology into ISH is running smoothly (see Air Movement feature, page 10). With four months still to go before ISH opens its doors, registrations have already been received from more than 180 exhibitors.

Visitors will find air-conditioning and ventilation technology under the name Aircontec on a total of 17,000 sq m of exhibition space in Halls 5.1 and 6.2.

The integration of this segment fits perfectly into the reorientation of the ISH as it changes from the trade fair for Sanitation and Heating to the trade fair for Building and Energy Technology, The Bathroom Experience. This new name emphasises the growing significance of the systems concept at ISH.

This development is the result of a process of change in relation to the energy consumption of

buildings, whereby the focus is no longer on individual components, such as heating and ventilation plant, but on the overall energy balance. Thus, the complete energy system comprising heating, ventilation and air-conditioning now has an important role to play alongside thermal insulation.

The importance of Aircontec to the ISH will be underscored by two special shows. For the first time at Aircontec, the "Marketplace for Room Air Conditioning Equipment" will feature the latest trends in the field of room air-conditioning equipment. This will be located in Hall 5.1.

The bulk of home-ventilation exhibitors will be located in Hall 6.2. The home-ventilation segment stays with the ISH the whole time and will also be part of Aircontec at the forthcoming ISH. The "Home Ventilation" special show is one of the highlights of the fair.

Details:
www.ish.messefrankfurt.com

Our Lady's Hospital Gets Free Cooling Courtesy of Rink AC

In celebrating 20 years of successful and profitable trading this year, Rink Air Conditioning wanted to give something back and so choose to present two 450kW chillers free of charge to the Children's Medical & Research Foundation.

The chillers — which were delivered in November of last year — are intended for the new theatre development at Our Lady's Hospital for Sick Children. Work on the project is now well underway with the official opening scheduled for August 2003. When on stream the new operating wing will house seven operating theatres, in addition to a HSSD room.

In addition to Rink, the professional team on the project included Cullen Payne, architects; Joe Byrne of VMRA consulting engineers; John Gillick of mechanical contractors Rotary; and main contractors Rhattigan. Contact: Brian McDonagh, Rink Air Conditioning. Tel: 01 - 456 9469.



Right: The chillers presented by Rink AC to Our Lady's Hospital for Sick Children being delivered to site.



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Gypsum Industries & Moy Isover Regs Guide



Gypsum Industries and Moy Isover have published a technical guidance brochure on how to comply with the new revised thermal

requirements of the Irish Building Regulations 2002, which come into effect on 1 January 2003.

Houses constructed to the new standard will

deliver reduced costs in terms of heating space and water. Savings of 23%-33% will be possible, depending on the size of the dwelling. The brochure provides specific information for wall, roof and floor construction. Within the brochure there is a full package of specific construction details which, in conjunction with the use of Gyproc and Moy products, will meet the new revised Part L requirements, thus providing more cost-effective solutions.

The Technical Guidance Brochure was launched recently by Pat the Cope Gallagher TD, Minister of State at the Department of the

Environment and Local Government. Speaking at the launch Minister Gallagher congratulated Gypsum Industries and Moy Isover on their initiative in rapidly gearing up to meet the requirements of the new regulations. "I consider this a model for collaboration by Irish business firms in meeting common challenges and objectives", he said. Copies of the brochure are available from both companies.

Gypsum Industries.
Tel: 01- 629 8400;
email:
technical.sales@bpb.com

Moy Isover.
Tel: 052 - 66100;
email:
dgrace@moyisover.ie

Workshop for large Industry on Waste Treatment and Reduction



Roche Ireland Ltd in Clarecastle, Co Clare recently played host to a major national workshop for large industry on the treatment and reduction of industrial waste. The workshop — facilitated by Sustainable Energy Ireland — was attended by some of the largest industrial users of energy in Ireland. Pictured at the workshop were (from left): Ken Macken, Regional Manager for Licensing and Control, Environmental Protection Agency; Orla Thornton, Sustainable Energy Ireland; and Sean Atkinson, Facilities Manager, Roche Ireland Ltd.

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Mitsubishi Electric Mr Slim in Stainless Steel



Mitsubishi Electric Mr Slim stainless steel suspended ceiling unit

Mitsubishi Electric has introduced an innovative addition to the Mr Slim range in the style of the new PCA Series stainless steel suspended ceiling unit which offers new levels of hygiene for air conditioning units. The external casing is made of durable stainless steel that is resistant to oil so that even grimy dirt and stains can be easily removed to keep the unit clean at all times.

The oil mist filter offers 1.5 times more filtration efficiency compared to conventional types and this helps to reduce the amount of oily smoke entering into the air conditioner. The washable grease filter is removable for hassle-free cleaning and can be easily removed by sliding out the handle towards you.

The adoption of a fan casing that can be separated into different sections allows for easy fan cleaning. The drain pan can also be cleaned easily on-site as the pipe connector can be quickly removed.

The rear panel has a knockout opening that can be used to bring fresh air into the unit. This helps to improve ventilation in the kitchen for more comfort in kitchen or food preparation area.

This unit has been specifically designed for the hotel and catering sector and has a vast number of uses from kitchens, sandwich bars, and fast food restaurants, and all types of food preparation areas.

Contact: Michael Sheehan, Mitsubishi Electric.

Tel: 01 - 419 8800;

email: michael.sheehan@meir.mee.com.

For

Clean Air

et al.: BS News

Warm Air

Cold Air

Contact

Walkair

Panasonic



Daldrop Ireland

Cleanroom Systems



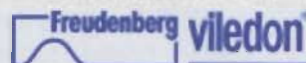
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Chillers/Rooftop Units/FCU



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The significance of Aircontec — the international trade fair for air conditioning and ventilation technology which is part of the ISH 2003 to be held in Frankfurt from 25 to 29 March 2003 — will be underscored by no less than three special shows.

To be held for the first time at Aircontec, the "Marketplace for Room Air conditioning Equipment" will examine the trends in this field. Located in the traditional air conditioning Hall 5.1, it is aimed at building equipment planners, plant manufacturers and heating and ventilation companies. Another highlight will be the "Home Ventilation" special show, which examines the effects of the German Energy Saving Law (EnergieEinsparverordnung - EnEV) on the quality of room air and shows the different central and decentral home ventilation systems that can be used to improve it.

Both events will be supported by the Building Climate Institute (Fachinstitut Gebäude Klima e.V. - FGK). Parallel to this, the "Decentral Air-conditioning" congress will look at the possibilities and potential of decentral air conditioning in modern offices and existing and new buildings.

The air-conditioning and ventilation segment sees the ISH as being the ideal presentation platform because developments over recent years have revealed a growing demand for

Aircontec At ISH 2003

interdisciplinary solutions comprising heating, water heating, ventilation and air-conditioning.

Ways in which buildings can be intelligently networked will be shown at the "Smarthouse" of the German Sanitation, Heating and Air Conditioning Association (Zentralverband Sanitär, Heizung, Klima - ZVSHK) for the second time at ISH. Here, the focus is on the remote monitoring and control of building technology, which can result in more benefits, quality and comfort for the user.

The transformation of the ISH 2003 from a components to a systems fair is most clearly illustrated by the change in the name from heating technology to building and energy technology. In Halls 8 to 10 and the Galleria, exhibitors will present system solutions for heating and watering heating, measuring and controlling and regenerative energy. outLOOK, the trade-fair event in the Galleria, will focus on the "Energy Performance of Buildings"

This development is the result of a process of change in relation to the energy consumption of buildings whereby the focus is no longer on individual components, such as heating and ventilation plant, but on the overall energy balance. Thus, the

complete energy system comprising heating, ventilation and air-conditioning now has an important role to play alongside thermal insulation.

Room air-conditioners have established a solid position for themselves in many current application areas such as large hotel complexes and office buildings equipped with the latest "multisplit" technology. The wide range of room air-conditioners available, which includes everything from simple portable models to VRF-controlled multisplit systems, allows configuring solutions for a wide variety of application areas and meeting individual users' needs in the case of both new buildings and renovation of existing buildings.

Numerous practical examples demonstrate that split and multisplit systems have been highly successfully employed in more and more types of buildings. Even applications that necessitate breaking the 100-kW barrier have become standard these days. For example, 10 ceiling air-conditioners and six wall-mounted air-conditioners with a cooling capacity of 73 kW and a heating capacity of 78 kW were installed in the Heidelberg Cancer Research Centre

In addition to their demand-controlled

cooling and dehumidification functions, current models are able to duct ambient air from outdoors through their indoor units, allow individually thermostating every room involved, and come equipped with indoor units that have been optimised for quiet operation.

At the forefront of this segment of the air-conditioning market are VRF systems. This rather new technology is allowing the air conditioning and ventilation industry to penetrate further application areas. These systems may be integrated into building services management systems using an installation bus, via an interface on the microcomputer on their outdoor unit. A special feature of their compactly designed indoor units is that all are equipped with electronic injection valves, and many are equipped with a variable volume flow control. Their built-in heat pumps keep their operating costs extremely low. They offer flexible, adaptable solutions that may be harmonically blended into the architecture of both new buildings and existing buildings undergoing renovation. The outdoor units of their cooling sections may be installed outdoors, or even in an underground parking structure, which also greatly simplifies designing the layouts of entire systems.

Contact:
www.messefrankfurt.com

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Mitsubishi Electric — Versatile & Flexible But Totally Controlled

Always to the forefront in pioneering new market developments, Mitsubishi Electric has once again set new industry standards with its latest air conditioning introductions. The 2003 RD2 Series OA processing units for City Multi; the Loosnay Series; and Mr Slim ranges incorporate technology breakthroughs which provide user benefits previously not possible. All manner of air conditioning solutions can be devised and successfully installed, irrespective of the application. Moreover,

the new G50 centralised controller for City Multi and Mr Slim means that, however complex the installation, total control is maintained at all times.

The G50 controller is claimed to be the first ever air conditioning control system to successfully use internet technology. By using Internet Explorer as its local or remote software, it gives instant access to all control functions from a PC. Even when off-site the system can be monitored from another PC, or even have a malfunction alarm sent to a mobile 'phone. The G50 will connect to almost any network of computers and can control up to 50 indoor air conditioning units.

The RD2 Series OA processing units for City Multi comprises forced air ventilation, heat recovery, heating and cooling, and air purification. This total air conditioning system keeps indoor air fresh and comfortable all year round, and keeps it free of contaminants which in turn prevents ailments such as sick-building syndrome.

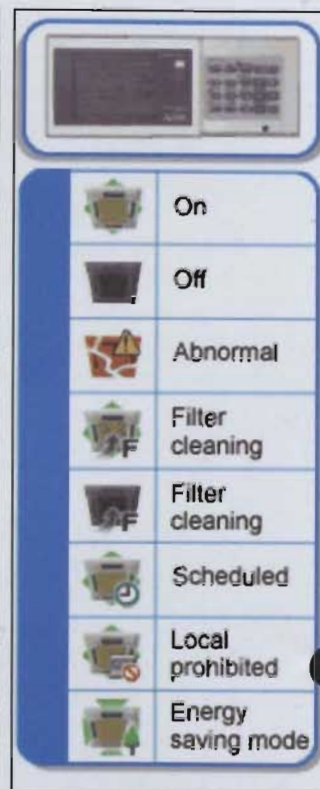
Inside the OA processing unit is a Loosnay Core, a heat-exchange unit that

transfers heat efficiently while cutting ventilation load by as much as 70%. When the load is light it provides main air conditioning and when the load is heavy it provides supplemental air conditioning.

The new Mr Slim SLH units are the perfect size for 2-by-2 ceilings. While slim, attractive, and weighing just 15kg (SLH-1AR), they are extremely powerful. Easy to install, they are ideal for restaurants, cafes, bars and retail outlets, especially given their 31dB whisper-quiet operation.

Servicing and maintenance is also easy with filter replacement reduced in frequency because of the 2500-hour long-life filters.

For situations where air conditioning on its own is not enough, Mitsubishi Electric has developed the Loosnay range of energy recovery ventilators. They operate by simultaneously expelling stale air and pumping in vital fresh air to maintain optimum health and comfort. Moreover, sensible and latent heat are both fully recovered, thereby saving energy and, by extension, reducing the overall operating costs of the system.



The new G50 controller from Mitsubishi Electric is claimed to be the first air conditioning control system to successfully use internet technology

A free-cooling function is also available to help reduce costs and improve efficiency, while improved sound attenuation makes the Loosnay units quiet enough even for meeting rooms.

The integrated system design makes installation and system management simple and there is a wide range of models to choose from as no two buildings' requirements have precisely the same needs.

Contact: Mike Sheehan, Mitsubishi Electric.

Tel: 01 - 419 8800;

Fax: 419 8890;

email: michael.sheehan@meir.mee.com



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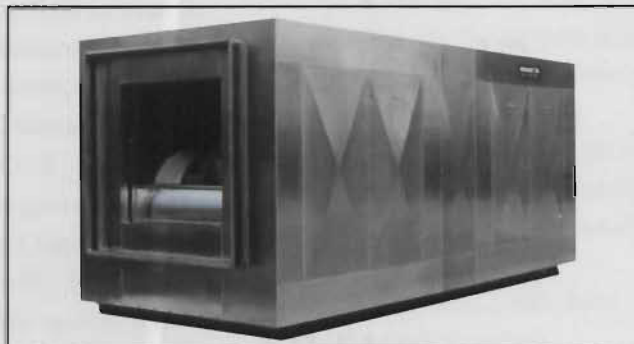
Tel: 01 - 851 2333 Fax: 01 - 831 8724
Email: tmarren@marrenengineering.com

Comfort Is Mark's Business

Coolea-based Mark Eire has always enjoyed significant market success, not just on the home front but also in the international marketplace. Driven by a never-ending quest for product innovation and performance excellence, vast resources are put into research and development every year. This means exciting new and technologically-advanced products are continuously coming on stream. The R&D team is currently working on a new heat exchanger concept, details of which will be announced in the coming months.

Mark Eire employs 70 people using state-of-the-art production equipment and modern manufacturing techniques and practices. Over the last two years alone €1.2 million has been invested in new plant. A typical example is the CWC computer-

controlled punch which loads itself, punches out the die cuts, stacks the finished article, gets rid



Mark Calflo air heater

of the scrap, and all without human intervention or assistance. It is frequently left running overnight to facilitate production runs the next day.

Where necessary, output can be easily increased by the addition of an extra shift. At present something like 60% of production is for the export market with the remaining 40% going to Ireland.



Mark GC Rooftop air handling unit

The Mark product range is extensive and includes air handling units complemented by a unique range of heaters and other ancillary products. Given that this is the air movement and air quality feature, herewith are brief details of the various options offered by the company.



Mark GS gas-fired suspended unit air heater

spray booths, welding halls, machines factories the plastics industry, etc. The fully modulating burner makes an optimum balance of required heat and ventilation possible;

Mark GS Units — The Mark GS gas-fired suspended unit air heater is an all 'round product, ideally suited to industrial applications. Available in suspended balanced flue room-sealed or conventional type (18kW to 104kW from 20.4kW to 95.8kW), in either axial or centrifugal fan models for free blowing or ducted systems;

Mark Tanner — This is an indirect water, steam or thermal oil fuelled heater, incorporating low-pressure hot water unit air heaters from 8kW to 87kW. Optional accessories include fresh air or recirculation components.

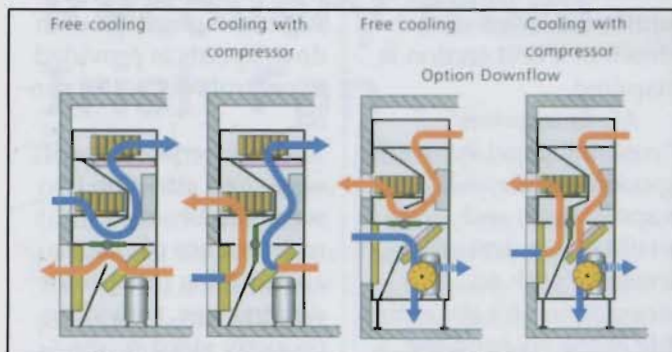
Contact: Mike O'Donoghue, Mark Eire. Tel: 026 45334; Fax: 026 45383; email: sales@markeire.com. Website: www.mark.nl

Mark Rooftop — The Mark rooftop air handling units incorporate centrifugal fan and heat exchangers, filters, dampers, attenuators, supply and extract fans ranging from 18kW to 95.8kW single module units, up to multiple arrangements in excess of 415kW;

Mark Ventilation — Mark's ventilation range includes purpose-made extraction or input units manufactured to specific requirements. Ancillary components such as filters, dampers, attenuators, etc may also be incorporated;

Mark Calfo — The Mark Calfo make-up air heater is suitable for applications where large quantities of polluted air are extracted such as

Stulz Wall, Tel & Split Units from Walkair



Walkair Ltd and Stulz GmbH, the German manufacturer of precision air conditioning units, have recently launched a new range of complete air conditioning solutions designed specifically for telecom cabins, base stations, switching centres and other demanding applications.

Clients are now also demanding more and more technical features from their a/c units, such as advanced alarm management; free cooling; emergency ventilation; monitoring of humidity levels; intelligent sound management; intelligent refrigerant pressure management; as well as ease of installation.

Stulz has developed a number of models to meet these demands, including Wall Air, Tel Air and Split Air. Both Wall and Tel Air are complete packaged units which require no external refrigerant pipework, and can easily be installed by any competent fitter and electrician, although commissioning should always be carried out by a precision air conditioning engineer trained on Stulz equipment.

The Wall Air Units are suitable for outdoor

application, with no space required in the space to be conditioned. Cooling capacities range from 3.8 to 20.8 kw. Air is supplied and returned via two openings cut into the cabin wall.

The Tel Air Units are installed within the conditioned space. Cooling capacities range from 3.8 to 11.1 kw.

The Split Air Units comprise internal and external matched units. Cooling capacities range from 3.8 to 11.1kw.

All units are designed for 24/365 operation. Features include:—

- C1010 microprocessor control;
- Free cooling;
- Proportional and enthalpy control of air damper to give free cooling;
- Nine volt-free individual and programmable alarm contacts;
- Intelligent pressure management of refrigerant circuit;
- Intelligent noise management
- DC battery-powered emergency ventilation.

Contact: Vincent

Mahony, Walkair.

Tel: 01 - 456 8070;

Fax: 01 - 456 8098;

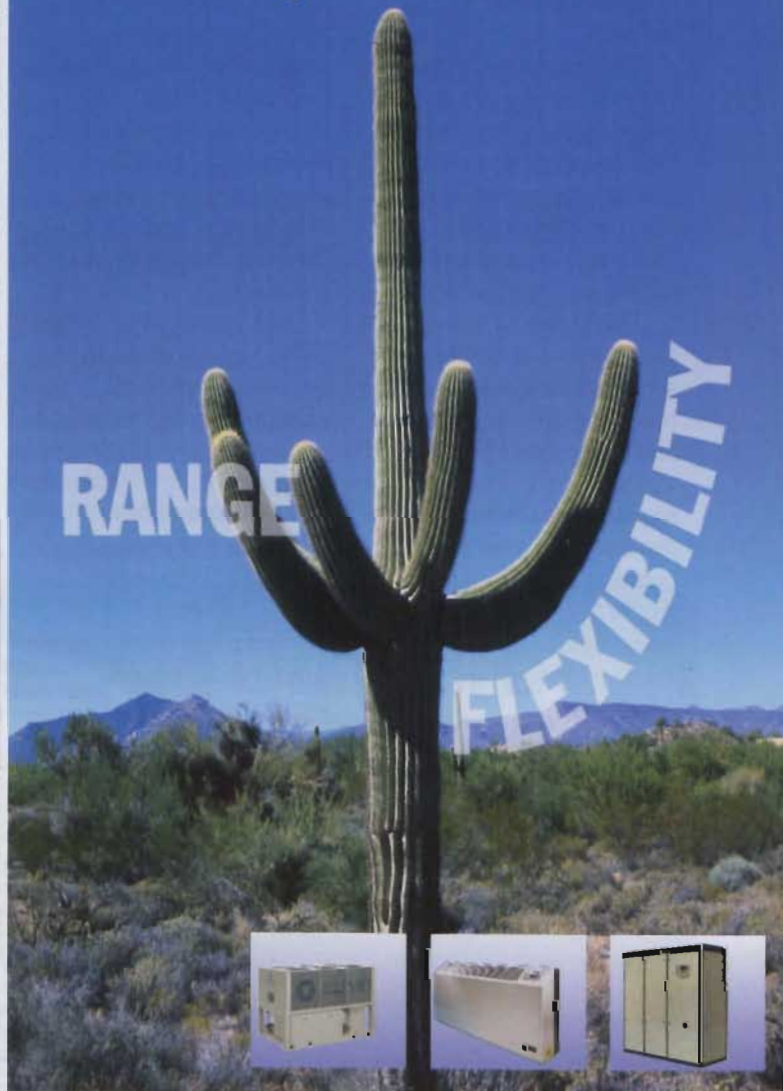
email: sales@walkair.ie

WHAT DOES IT TAKE TO BEAT THE HEAT?

QUALITY

RANGE

FLEXIBILITY



One of the most comprehensive quality ranges available.

From 1kW to 1600kW.

To find out more call:

aergonomics

Unit 21, Western Industrial Estate,
Naas Road, Dublin 12.

Tel: 01 - 458 4830 Fax: 01 - 460 5790

Mobile: 087 639 4163

email: aergonomics@ireland.com



Air Enterprises – Quality, Customised AHU Systems

Now that the operational and management structures are fully in place (see *BSNews* December 2002), Air Enterprises Europe Ltd's Irish office has commenced its sales and marketing drive in earnest.

The objective for the coming 12 months is to grow market penetration by focussing on specific market segments, while also developing the "Strategic Accounts" sector.

The range of products is extensive, as is the scope of the diverse air handling solutions which can be devised to suit virtually any requirement. Many of the product features and benefits are inherent to all Air Enterprises units, while optional features are available when specified.

For instance, Air Enterprises' unit construction is all-aluminum, including casing, structural base

and floor plate, equipment flashing, etc. The welded structural base and floor is designed to be self-supporting, is fully insulated, and provided with a true-sealed continuous vapour barrier covered with metal sheeting for protection during rigging and installation.

Roof mounted units incorporate roof membrane or sealing attachment and counter flashing means to provide a watertight installation.

Fan isolators or other bolted or attached items are bolted to an all aluminum structural component welded to the base pan.

Air Enterprises provides a minimum 25mm (1") diameter maintenance drain in every unit section. Active drains (cooling coil locations, outside air intakes, etc) are larger and recommended to be trapped for active water removal. Maintenance or "cleanout" drains are

offered in all remaining locations, and are capped until maintenance wash down of a unit section is required.

Air Enterprises' "custom" panel system is guaranteed air and vapour tight, and maintains its leakage integrity with no degradation for the entire life of the air-handling unit. This also results in operational costs savings by not allowing expensive conditioned air to be lost through leaks in the housing.

Air Enterprises' structural unit casing, as designed for standard application, is capable of withstanding positive or negative pressures in excess of 3600pascal (15"wg).

Integral to Air Enterprises' panel system construction is a unique internal structural extruded mullion system. The mullions, with legs extending inward, provide support and secure attachment points at each system component without penetrating or welding to the unit casing. Access doors or removable service panels are provided with a unique air seal design comprising two continuous separate gasket seals around the entire periphery, bevelled at a 45° angle to assure a true perpendicular, tight, non-shearing compression fit.

Outdoor units incorporate a roofing membrane with a standard 10-year extended material warranty. All roof units incorporate a minimum per cm slope to maintain

positive water runoff, with no standing seams. A guttering system with downspouts is provided to control roof water runoff.

Air Enterprises pays very close attention to serviceability and maintenance of custom air handling units at the design stage, providing properly-sized access areas between every component, removable access panels for equipment service, and maintenance drains in every section. Special service features can also be provided.

Air Enterprises does not manufacture any of its own components (fans, coils, dampers, etc) and, as such, can integrate any appropriate market-available component into an air handling unit design.

Through the use of properly zoned damper arrangements, air stream proximity, and mixing air velocities, Air Enterprises can offer destratification of any and all patterns of mixing air streams.

Sound control is confidently designed and attained through the use of Air Enterprises' standard and customised sound control devices.

Air Enterprises can also factory install piping, controls and electrical components to particular specifications, thereby reducing costs and installation times.

Contact: Pat Byrne/Cathy Ryan, Air Enterprises Europe Ltd.

Tel: 01 - 429 3195;

Fax: 01 - 429 2014;

email:

pbyrne@airenterprises.com

cryan@airenterprises.com



Integral casing mullions provide component mounting within the unit without penetrating the casing. Air quality, and air and vapour leakage integrity, are not compromised.

Dynair Heat Recovery from Irish Fan

The heat recovery units of the Dynair REC series (four series with range of nominal air flow from 100 to 3500 cubic metres per hour) were planned and realised to solve the problem of the high consumption of energy, typically of all the plants which use outside air. Thanks to the presence of the heat exchanger it is possible to recover the 50% of the energy which would otherwise be lost with the expulsion of the spoiled air.

The REC units integrate to the additional systems of ventilation and

conditioning and they can work both in the summer and winter seasons. They are particularly suitable for ceiling installations and ducting, allowing the withdrawal and the introduction of the air directly in the environment.

The casing structure is manufactured with panels in aluznik simple or double shell with thermal and acoustic insulation in polythylene and polyester with a thickness of 10mm (MOD. 600-1200) and 20mm (MOD. 2000-

3500).

The inlet side filter housing panel can be easily replaced for installation. All the components are accessible and can be easily removed from the bottom.

The fan selection is complete of double-inlet, forward-bladed centrifugal, fan-mounted on anti-vibration supports. The electric motor is directly coupled to the fan and it is single-phase 230V/50Hz 3-speed connected to the power module on the machine board (REC 600 1-speed).

Heat recovery is of the static type with crossed-flow high-efficiency. The plates are in aluminium with the flows kept separated by suitable sealing. A

condensate collection housing in stainless steel with draining pipe is installed under the recovery unit.

The filters are of the cell type with pleated panel septum removable from the bottom and reusable, with filtering media in synthetic fibre glass (efficiency 85% EU3).

Accessories include:—

- battery of hot water (Without REC 600);
- Electric battery;
- Speed changeover (Without REC 600);
- Speed regulator (Only REC 600).

A double panelling version is available on request.

Contact: Billy Wright, Irish Fan Distributors.

Tel: 051 - 852 404;

Fax: 051 - 873 440;

email:

bwright@irishfandist.com



Fans





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fantech@eircom.net www.fantechventilation.com



Fläkt Woods (Ireland) is one of the world's leading building services suppliers, providing an extensive range of solutions in indoor climate, refrigeration, building management systems, discreet control systems, and service and maintenance. The product portfolio is extensive and designed to meet all air handling and air movement requirements.

As specialist HVAC contractors with ownership of the most technically-advanced research facilities available, Fläkt Woods offers a complete range of air-treatment systems and in-house building services capabilities. Any HVAC product or design can be demonstrated and proved in its laboratories prior to build.

A focus on engineering excellence — coupled with quality and value-added solutions — has given Fläkt Woods (Ireland) market-leading status in the following industry categories:—
— Air conditioning and

Fläkt Woods Combined Strength



Fläkt air handling unit from Fläkt Woods Ireland

ventilation;
— Design build;
— Mechanical and electrical services;
— Commissioning and validation;
— Climate control and pressurisation;
— Testing and certification;
— Service and maintenance.

Fläkt has developed and manufactured

equipment for air handling in industrial processes, ventilation and air conditioning for more than 118 years. The Fläkt brand has always been associated with a high level of customer service on a global basis, and the portfolio carries a comprehensive range of high-quality products for the air handling industry, including both fans and air handling units. With advanced design and manufacturing expertise, Fläkt can provide excellent global back up combined with the latest technology skills.

The Woods brand is associated with excellence in fan development, manufacturing and component supply. Woods fans offer reliability coupled with excellent product performance. With a wide international base and strong local customer support, Woods can provide an excellent product with a strong

global back-up service.

Combined, the group offers a broad range of air handling equipment for HVAC, industrial process applications, and the air movement industry. Their coming together has strengthened their product offering and expertise. This in turn means that they are capable of offering clients an improved product and service offering.

The Fläkt Woods (Ireland) portfolio incorporates an extensive range of ventilation and air handling equipment which includes the following: —

- Air Handling Units;
- Air Terminal Devices
- Ducts;
- HVAC and Industrial Fans;
- Displacement Ventilation;
- Chilled Beams;
- VAV Boxes;
- Fan Coil & Cassette Units;
- Active Systems;
- Dirivent (Warehousing) Systems.

Fläkt Woods accreditation to the quality standard ISO 9001:2000 confirms its dedication to providing high-quality products and services to the highest international standards. Nationwide after-sales service and maintenance on all HVAC products and systems is provided from the Dublin and Cork bases, with engineers offering immediate cost-effective, customer-focused, solutions on a 24-hour call-out basis.

Contact: Fläkt Woods (Ireland) Ltd.
Tel: 01 - 463 4600;
Web:
www.flaktwoods.com



An example from the extensive Woods fan range now available from Fläkt Woods

FÖHN

Oil or gas-fired high output cabinet
air heaters 30-415 kW

mark®

et al.: BS News

ECOFAN

Recirculation/ventilation
destratification unit

Mark Éire BV, Coolea, Macroom, Co Cork.

Tel: 026 - 45334; Fax: 026 - 45383

INFRA LINE

Suspended flexible radiant
heating system 50-100 kW

INFRA

Suspended radiant heaters
12-32,4 kW

TANNER

Indirect hot water, steam or thermal oil
fueled air heater from 7.5-87 kW

ECOFAN

Reduces by recirculation the temperature
difference between the roof and the floor

ROOFTOP

Direct gas-fired air heater, with atmospheric
burner and centrifugal fan; 20-370 kW,
bigger capacities are available on request

CALFLO

Direct gas-fired make up air heater,
with a fully modulating burner
with 100% efficiency; 71-996 kW

INFRA AQUA

Flat radiant panels for ceiling suspension;
capacities are available on request

ECOFAN

Reduces by recirculation the
temperature difference between
the roof and the floor

GS

Direct gas-fired air heater with
atmospheric burner and axial fan;
20,4-95,8 kW

GC

Direct gas-fired air heater with
atmospheric burner and centrifugal fan;
20,4-95,8 kW

G

Direct gas-fired duct heatexchanger
module with atmospheric burner;
20,4-95,8 kW

PIPE BENDER

The pipe bending machines bends
everything up to 4" both manually or
electrically operated machines available

Trane AC — Systems Solution Provider



The entire central plant system in this large-scale shopping centre was carried out using Trane equipment

Trane are not just a chiller manufacturer, but offer the complete chilled water system solution.

Chillers range from scroll chillers between 33kW and 203kW, and from 200kW up to 6000 kW encompassing screw compressor chillers, centrifugal compressor chillers, and absorption chillers.

These chillers can be air cooled or water cooled, with remote condensers, with centrifugal fans for ducting ... are you beginning to see the choice which leads to the solution which is right for your application?

For terminal units there is the fan coil range. Trane invented

the very first fan coil and still has one of the most comprehensive ranges of fan coils from a single supplier.

Especially developed for the European market, the 217mm deep, quiet HFO units are horizontal ducted fan coil units with integral plenums, a choice of heat control options, 2-pipe or 4-pipe, and in a range of capacities from 2-7kW.

The Unitrane has cabinet or chassis versions, a range of accessories and control options, and is available in capacities from 4kW to 15kW, cassette models, with their slim fascia and elegant styling, provide a new option in fan coil

installations.

As an alternative to fan coils for the indoor air supply, Trane offers a complete range of air handling units from 2 m³/s to 30 m³/s. The CLCP is the standard horizontal air handling unit. Built in 170mm modules, it can be customised off-the-shelf to suit individual requirements.

There is also the Mini-Atom unit which is a small semi-customisable air handling unit package.

For a packaged solution, Trane offers rooftop units. Available as cooling only, heat pump or Dx cooling and gas fired heating in a range of capacities from 8-144kW, these units have applications in retail, restaurants, shopping centres, conference halls and manufacturing.

Trane also offers a range of close control

units. These units are specifically for applications where the predominant heat source is from hi-tech equipment.

The Jupiter and Mercury ranges are available as DX or chilled water units in a range of capacities from 6-130 kW

When it comes to understanding building and comfort needs, no one has more experience than Trane. Building services professionals want systems that add value to facilities for years to come, in fact for decades to come. That is why Trane is a "Systems Solution Provider", not just an air conditioning manufacturer.

Contact: Maria Furlong, Trane Ireland Ltd.

Tel: 01- 460 6030;

Fax: 01 - 460 6039;

e-mail Maria_Furlong@trane.com



Trane ducted system installed in a retail clothing store

The Unico System[®]

et al.: BS News

The Alternative to Radiators, Under Floor Heating and Split Systems

Imagine the feeling of warmth from your head to your toe With the Unico System your entire room is the same temperature, floor to ceiling wall to wall no matter where you walk. No more hanging on to radiators to get warm, no more cold spots, no more drafts. With the Unico System you get superior comfort without radiators, without underfloor heating or split systems.



Unico System Ireland Offices, Mullingar, Co Westmeath

History

The Unico System has been manufactured in the USA for over 20 years and is used extensively throughout the States in varying climates — from the extreme cold of Alaska to the humid heat of Florida. Since 2001 The Unico System is distributed throughout Ireland by Unico System Ireland.

There are numerous Unico System installations throughout Ireland. Business owners and home owners are enjoying the superior comfort offered by The Unico System. The Unico System can be found in offices, custom homes, historic, remodelled and extended properties.

Some Unico System installations include:—

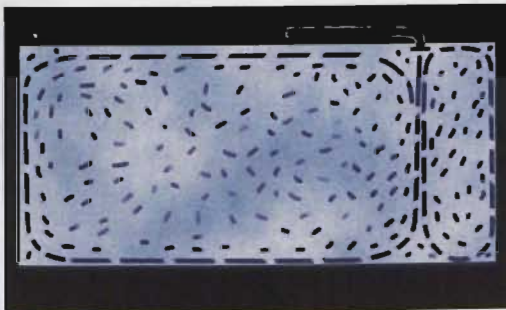
SMC, Finglas — Modus Media, Clonsaugh — Bord Na Mona — Two Way Freight, Dublin — Melbourne Motors, Cork — SC Jebb, Lisburn — AJ Plumbing Supplies, Newry — Patterson Pumps, Mullingar, as well as numerous residential installations throughout Ireland.

How It Works

The Unico System uses a principle called aspiration, eliminating drafts and keeping temperatures even and comfortable from floor to ceiling.

A jet of air enters the room through a small outlet. The air below the jet is depressed. The room air is pulled over to the incoming jet of air. In effect, air is gently pulled towards the outlet.

A great advantage of this method is that it will not make a difference where in a room the outlets are located. Multiple outlets can be grouped together if required.



Aspiration eliminates drafts

Quiet



Sound attenuated tubing fits into the tightest spaces

The Unico System sound attenuated tubing is specially designed to fit into the tightest of spaces. The sound attenuator tubing acts as a silencer to eliminate any air noise from the system. The tubing can run between partition walls and between floor joists.

Why you should use The Unico System

For new or existing offices and homes, The Unico System is the answer for high performance heating and/or air conditioning.

The Unico System **requires little or no remodelling** so you can maintain the architectural integrity of your building.

The Unico System is **quiet and barely audible** due to the flexible mini-ducts that are expertly designed to absorb sound and provide quiet air flow through small, subtle outlets.

There are **no drafts or breezes** from a Unico System — no complaints from customers or employees often associated with cassettes and wall mount systems.

There are large operating **cost savings** as The Unico System can heat using a gas or oil boiler versus using day rate electricity for heating.

Typically one Unico System can cover up to 2500 sq ft of office for both heating and cooling. Fewer systems cover a larger area compared to split systems leading to **lower installed cost**.

For further details contact Eamon Fidgeon on 044 84881 or 087 2231015

DISTRIBUTED BY:

Unico System Ireland

7B Lough Sheever Corporate Park
Mullingar

Co Westmeath, Ireland

Telephone: 00 353 44 84881

Facsimile: 00 353 44 84882

Mobile: 00 353 87 2231015

www.unicosystemireland.com

e-mail: info@unicosystemireland.com



Central supervision

Integration of all Liebert Hiross HPAC units

Log On To Total Control

Core Air Conditioning has a long-standing partnership with Liebert Hiross and together they have introduced many industry firsts to the building services sector in Ireland.

The latest such innovation is the Hirovent IP, a new supervision system which allows monitoring of Liebert Hiross HPAC, chillers, Liebert UPS and remote monitoring of third-party devices over a modem, LAN or internet connection.

It allows connection to all current Liebert Hiross equipment, Liebert Level 5/15 controls installed in existing applications, and remote monitoring of third-party devices using the DGP (Data Gathered Panel) box.

Core Air Conditioning can provide upgrades to existing sites, or of course undertake new installations.

But don't just take our word for it ... see for yourself.

Log on to a live demonstration installation at a site located in Padua, near Venice, Italy.

<http://.hirovisor.connectivity.it/hvwebinterface.htm>

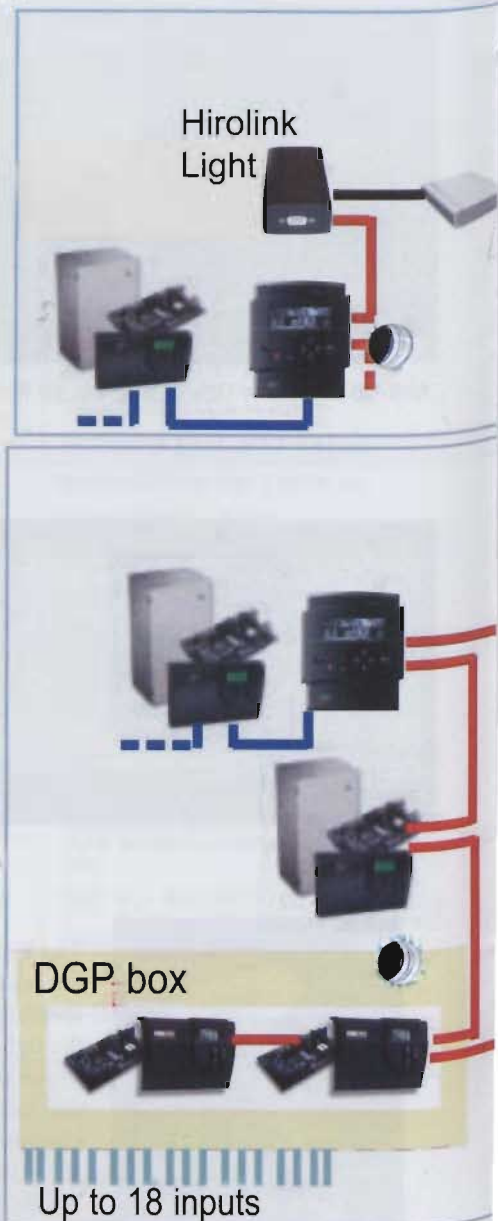
A Hirolink (Light or Classic) can interface up to 32 units.
(unit = 1 Microface or 1 Hirolink IGMnet, or 1 Hirolink ESP2)

Up to 8 units with Microface for each Hiromatic

1 Hirolink IGMnet for each UPS (or also for each HPAC unit with Level 5/15 controls)

Microface E with special software (A1M kit or Evolution software) can be directly connected into Hironet

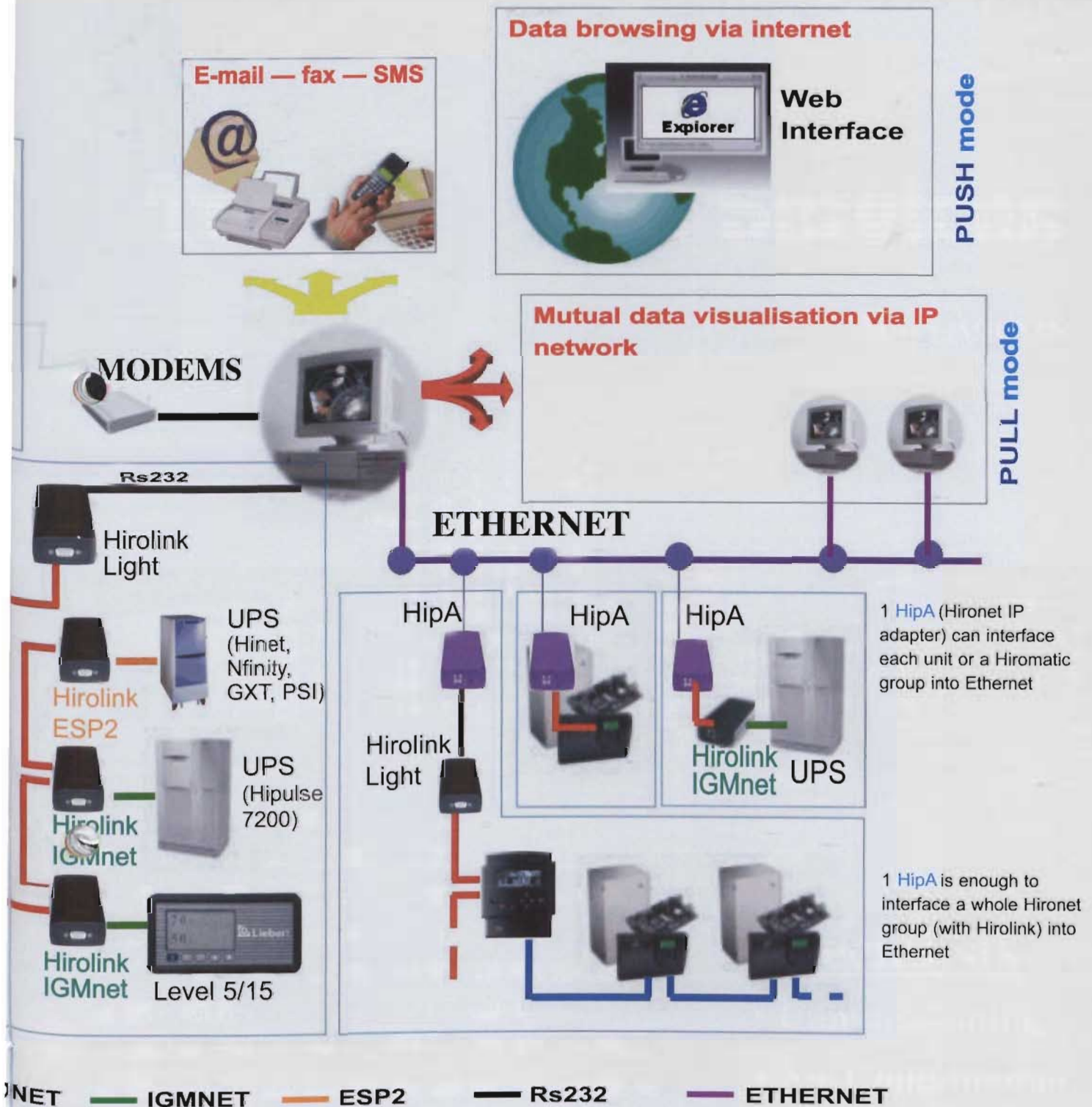
The DGP box can transmit data from third-party devices. 9 to 18 inputs available



— HIROBUS — HIROSS

on & telemaintenance despite distances!

, Liebert UPS units and HPAC units with Level 5 or Level 15 and some third-party devices.



AIR CONDITIONING LTD

Published by ARROW@TU Dublin, 2003

Unit A6, Centre Point Business Park, Oak Road,
Clondalkin, Dublin 22

Tel: 01 - 409 8912; Fax: 01 - 409 8916;
email: info@coreac.com; Web: www.coreac.com

Clivet Puts New Spin on Chillers

Clivet has brought innovation to the chiller market with the introduction of its new SPINchiller which optimises operating efficiency, via smart control of multiple compressors. This revolutionary new technology for chiller operation is based on the premise that for the majority of a chiller's operating time there are wide variations in daily and seasonal load that could be catered for in a more energy-efficient way.

The SPINchiller has a self-equalising capability which utilises multiple small scroll compressors and intelligent stepped control to closely match system load at all times. For instance, the largest chiller in the current range — which provides outputs up to 771kW — has no less than six compressors and therefore six steps.

The first compressor will operate alone until it reaches full capacity when the second will switch in and run in tandem until both reach full capacity when the third will switch in and so on. In this way redundant capacity is built in, minimising the risk of complete chiller failure.

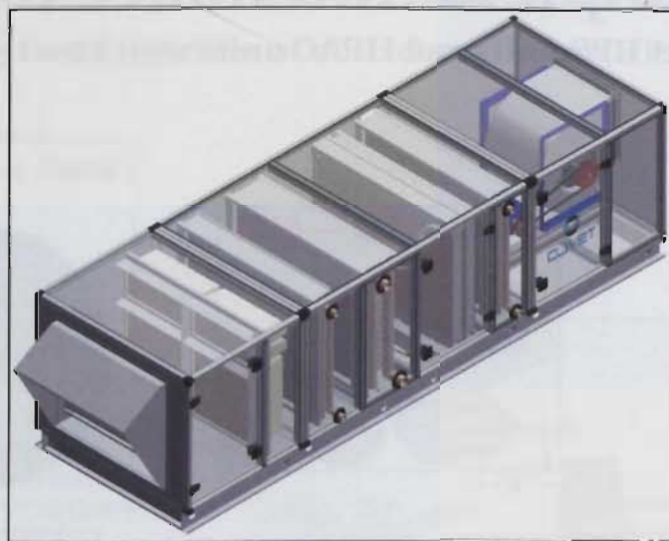
The smart control can sense the danger of a trip due to high head pressure caused by excessive

ambients or high internal loads, and will switch off one of the compressors with a resulting drop of pressure in the system.

The SPINchiller concept ensures the most efficient use of energy, significantly so at part load, saving up to 38% in energy consumption over other standard systems, and being almost twice as efficient when loads are below 50%. It also reduces the number of on/off cycles and, because of the multiple compressor design, dramatically reduces starting currents. This, together with compressor start up being sequenced to protect against uneven wear, extends the life of components, thereby increasing reliability.

The reduction in cycling resulting from the capability SPINchiller has to modulate its output seamlessly to the demand on the system also means that no storage tank is required. Performance and energy usage is further optimised because the compressors are activated according to the heat exchange surface area available. Operation of the fans is also matched to the load conditions which effectively minimises noise levels under part-load conditions.

Modular construction allows utmost flexibility in system design and the readily-accessible



The new Zephair air handling unit available from Aergonomics

compressor housing facilitates easy component replacement and low cost maintenance.

SPINchiller units and other Clivet equipment such as air handling units and fan coils can interface with the Clivettalk facility, which provides intelligent system management and control.

Also new from Aergonomics is the Clivet Zephair series of high specification air handling units. Comprising 19 sizes providing airflows ranging from 1000 to 100000 m³/h, models are even more adaptable to specification requirements by the inclusion of multi-options with regard to materials, components, sizing and configuration.

The Zephair selection and sizing software operates in the windows environment and provides a user-friendly interface in which components can be selected and positioned graphically with the aid of symbols and icons.

The main criteria

applied in the development of the Zephair series were effective performance and durability, while observing environmental considerations such as efficient operation and recyclable component materials.

Various options are available to match specification requirements, especially in respect of filtration, while heat recovery, free-cooling and humidification can all be facilitated. Gas heat exchangers, plate heat exchangers or rotary heat exchangers can be supplied. Low silhouette models can be configured with a minimum height giving a lower visual impact, which may be required for external installations. Equally, these units can be assembled with the smallest possible footprint for indoor installation where space for plant is limited.

Contact: Ken Monaghan, Aergonomics Ltd.
 Tel: 01 - 458 4830;
 email: aergonomics@ireland.com



Tony Harmon Services

MAIN AGENTS

 **MITSUBISHI ELECTRIC**
AIR CONDITIONING SYSTEMS

Specialists

- Commissioning
- Air Conditioning
- Plant Maintenance
for Heating &
Ventilation systems

THE QUALITY IS IN THE PEOPLE



Tony Harmon,
Managing Director

Tony Harmon Services Ltd is synonymous throughout Ireland with high-quality plant maintenance, air conditioning and heating services.

The nature of the service Tony Harmon

Services Ltd provides is very much personalised and directly related to the ever-changing face of the building services industry. As it continues to grow, it still remains totally dedicated to providing a quality, value-for-money, individually-tailored service.

Initially, Tony Harmon Services Ltd concentrated on service and maintenance. However, recent years have seen it expand into product supply and project management. In effect, there are now two distinct operating divisions to the business:-

- (1) Sales;
- (2) Service & Maintenance.

Obviously, there is a considerable amount of cross-over between both. The complementary strengths of each are harnessed where

appropriate to best suit clients' requirements.

"To date we have enjoyed considerable success and have an excellent team ethic with all personnel totally committed to serving the customers' needs", says Managing Director, Tony Harmon.

"Our success has been due to dedicated relationships and for that we thank our customers and suppliers. Together we have established a genuine trading partnership whereby we all work in unison towards the one single objective, namely client satisfaction.

"We will continue to deliver to the exacting standards already set, and will endeavour to devise ever-more inventive solutions to meet the ongoing and anticipated future requirements of our clients."

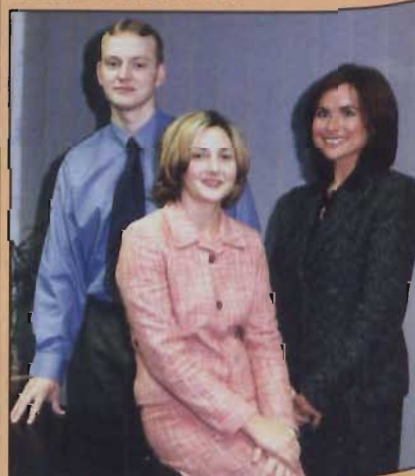
Tony Harmon Services Ltd has developed the business over the years to suit the wide-ranging needs of its extensive customer base. The objective is to understand customers' requirements, and to identify and execute the most appropriate and cost-effective solutions.



Marie Keely,
Director, Financial



Michael Byrne,
General Manager



Matt Bailie, Technical Sales Manager with Ashleigh Myles and Rita Cantley, Administration

Now celebrating 25 years in business, Tony was instrumental in introducing large-scale air conditioning and refrigeration technology to this country, and is now recognised as one of the foremost experts in the industry.

The fact that Tony trades as Tony Harmon Services Ltd underscores the key strengths of the service provided. It is in fact a major player in



The award-winning Filles Bar, Leopardstown Racecourse, Foxrock

the air conditioning industry, employing fully-qualified engineers, technical sales, support personnel and administrative staff.

General Manager Michael Byrne heads up the Sales, Service & Maintenance Divisions. He has been with the company since its formation and is widely known and respected throughout the country. His initiative and drive have resulted in tremendous growth for the company, especially in recent years.

He is much sought after

for his technical expertise, especially when it comes to troubleshooting. Michael's expertise in preventative maintenance and modifications to all mechanical, electrical, heating and air-conditioning equipment in commercial and industrial applications is unrivaled.

All engineers are highly-qualified and experienced, their combined skills — coupled with the company's ongoing education programme — ensure that all makes of

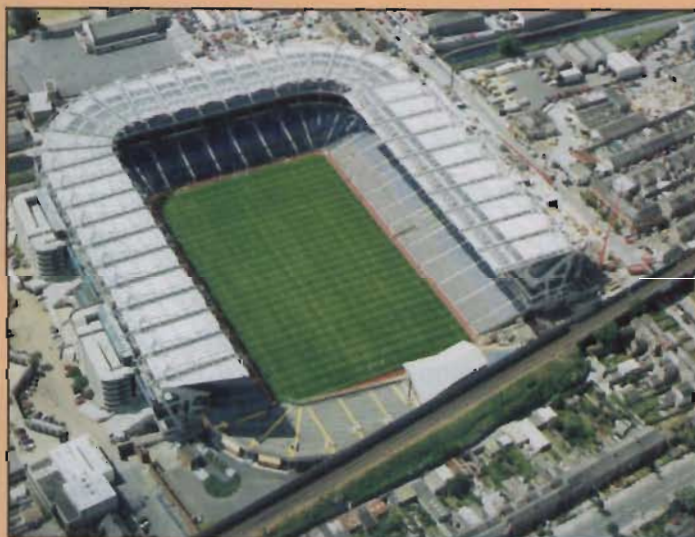
air conditioning services plant and equipment can be dealt with efficiently.

While the company operates to carefully devised management and operational procedures, nothing is set in stone. Common sense and flexibility come into play where a situation does not conform to the norm.

On the equipment supply side, Michael works closely with Technical Sales Manager Matt Bailie. Matt, who has several years experience in

They work very closely with contractors and clients, first identifying what the requirements are and then devising a tailor-made solution to satisfy that need. Appropriate assistance is provided with design and product selection, along with full project management right through to installation and commissioning. Thereafter, a full care and maintenance package is provided.

Additionally, Tony Harmon Services Ltd are



Croke Park, where Tony Harmon Services Ltd installed the new Mitsubishi Electric VRF systems

air conditioning systems, has proved to be an invaluable asset to the company. Over the last three years he has further developed this side of the business. He has designed and installed several major air conditioning systems to the highest technical standards with proven results.

Both Michael and Matt are available at all times to provide full technical support in all areas of air conditioning systems.

main agents for Mitsubishi Electric air conditioning systems.

Tony Harmon Services Ltd is very firmly focused on the growth and development of the company. The infrastructure to achieve that objective is securely in place; the personnel to implement it are in place; the will and determination is such that the entire staff is fully supportive of that objective.



Millenium Park — In one of the first installations of its type in the country, a new type Mitsubishi Electric VRF system was installed by Tony Harmon Services Ltd

Always at Your ...

Service

Tony Harmon Services provides a 2-hour call-out service within the Dublin area and a 24-hour standby service, 365 days of the year. Engineers are in constant contact with the office, while clients can contact the engineers directly on their mobile phones. This makes for an immediate response to any service requirement.

Tony Harmon Services used Mitsubishi Electric City Multi for the Eircom project in O'Connell Street, Dublin.



Maintenance

Typical plant items include:—

- AHU plant profiles
- Air conditioning systems
- Heating and ventilation systems
- Plant and grill balancing
- General electrical services
- Electrical control systems & panels

AIB, Blanchardstown



Tony Harmon Services Ltd.

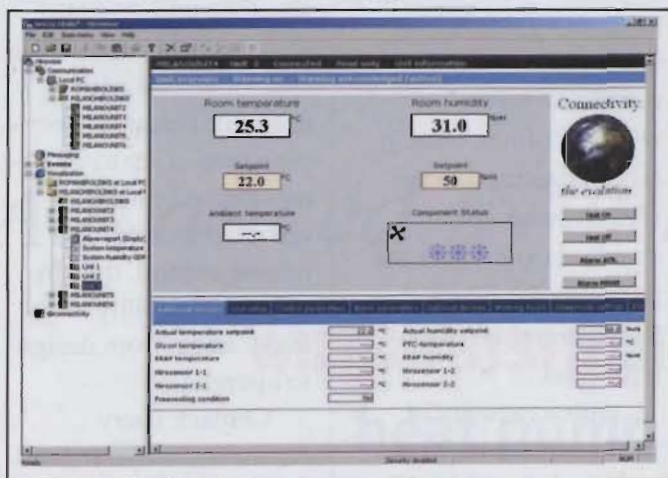
1 Watergate, Old Bawn Road, Tallaght, Dublin 24.

Tel: 01-459 9688/451 3848/452 1497 Fax: 01-452 7696

Emergency (Mobile): 087-413 9406/086-259 1005/086-256 4289

Email: tharmon@iol.ie

Hirovisor — Total Reliability in Controls & Communication



Hirovisor sample screen display

Liebert HIROSS designs and realises different systems for local and remote supervision which, thanks to many years of experience in high performance air conditioning, grant system reliability and efficiency. A typical example is the Hirovisor IP supervision system which can be connected to the installation via local network or phone lines, as well as via Intranet or Internet.

Hirovisor IP is a flexible solution which can be implemented along with the necessities and the structures of the specific installations to be controlled. The supervision of Liebert HIROSS UPS units as well as basic monitoring of third-party devices is also possible.

Hirovisor IP represents a state-of-the-art technological solution. The system allows:

- To visualise the units' data, independently from their location;
- To safely interact with the units, varying the setpoint, the working parameters and alarms thresholds;
- To automatically manage the alarms with the forwarding of the information via fax, e-mail and SMS to configured recipients;
- To give access (reading as well as writing) to the system data via WEB (with connection from whatever post through any simple Internet browser) —

"Push" mode;

- To visualise the data of other installations connected to other Hirovisor IP posts, via LAN / WAN — "Pull" mode.

The supervision system Hirovisor IP is designed to be simple in use and is easily tailored to individual requirements. It has the following main characteristics:

- It's a 32-bit architecture application for Windows 2000, and the IP protocol;
- It visualises the units (equipped with Liebert HIROSS microprocessor controls — Microface, Hiromatic — or integrated via Hironet integrators — DGP box, Hirolink IGMnet, etc.) independently from their location (local or via Ethernet or remotely via modem, for which automatic connections can be programmed);
- Through its own Communication Server it gathers the information which is offered to the user via HTML pages. The

results are:

- Easy overview of the installations or of the specific connected units (the tree structure allows to visualise the hierarchy of the system controls through icons, to name them, to verify the presence of alarms through the change of the icon colour and the number of the indicated "events").
 - The units status and their settings:—
 - Temperature, humidity and setpoint, as sensed by the on board controls;
 - Components status through dynamic symbols;
 - A windows menu to visualise the system parameters.
 - Possible alarms (visual message and buzzer, as well as the recording into the database).
 - Possibility to modify the setpoints and the unit parameters.
- Contact: Austin McDermott/ Andrew McEvitt, Core Air Conditioning.
 Tel: 01 - 409 8912;
 Fax: 01 - 409 8916;
 email: info@coreac.com

Small Arrival Broadens Sanyo Family



The new Sanyo 600mm by 600mm mini-cassette, now available from Sanyo Ireland

Sanyo has expanded its range of room air conditioning with the release of the new 600 x 600mm Mini Cassette. Forming part of the 'SAP' room air conditioning range, it utilises the existing portfolio of outdoor condensing units. By offering both heat pump and cooling only versions with R407c refrigerant it meets all current environmental needs. However, by offering R22 heat pump compatibility, it can be retrospectively fitted onto an existing system.

Like all the units in the Sanyo 'SAP' range, the heat pump facility comes complete with

auto-changeover function and the cooling only is fitted with head pressure control. "We believe that omitting low ambient control on a cooling only unit in Ireland is a false economy", says Barry Hennessy, Sanyo Ireland Sales Manager, "as a single callout or icing up problem can erode any profit made on a small split system installation. Some manufacturers can't even offer it as an option, mainly due to their equipment being designed for installation in other parts of the world. We offer it as standard.

"Although the new cassette is part of the

SAP range, the quality is such that it can compete against many manufacturers commercial ranges", continued Barry. "As with any of our units, it is manufactured to the highest production standards and offers the flexibility for which the Sanyo brand is renowned".

With a capacity of 9000 to 18000 btu/hr (2.7 to 5.2kw), the "SAP-XR"

600 x 600mm range is an attractive and economically-viable alternative to standard wall mounted units. The cassette comes with drain lift pump, offers pipe runs of up to 20 meters, and can be operated by infrared remote control, thereby offering flexibility at every stage, from design to operation.

Contact: Barry Hennessy, Sanyo Ireland. Tel: 01 - 456 8910.

Huber & Ranner For Clean Rooms

Walkair is in the process of supplying 35 Huber & Ranner air handling units through Jacobs Engineering for the Genzyme Crystal Fill Finish Phase 2 project in Waterford.

These high specification units range in size from 1130 m³/hr to 57000 m³/hr and supply air to the Class A, B and D clean rooms. They are produced to ensure that the casing leakage complies with BS/DN/EN 1886. Two of the biggest units measuring, 2.8w x 2.3h x 18.72 long and 3.6w x 2.3h x 16.69 meters long were selected for factory

testing to this standard.

Huber & Ranner have designed these units to be particularly maintenance friendly. The fan sections are manufactured with sliding rails which allow easy removal of the fans and, units handling air quantities greater than 15000m³/hr approximately are supplied with extendable internal rails which slide out. This greatly facilitates motor removal.

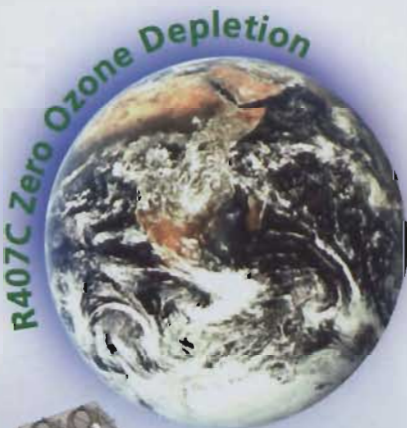
Contact: Tom Mc Donnell, Walkair Ltd. Tel: 01 - 456 8070; Fax: 01 - 456 8078; email:sales@walkair.ie

KXR-16

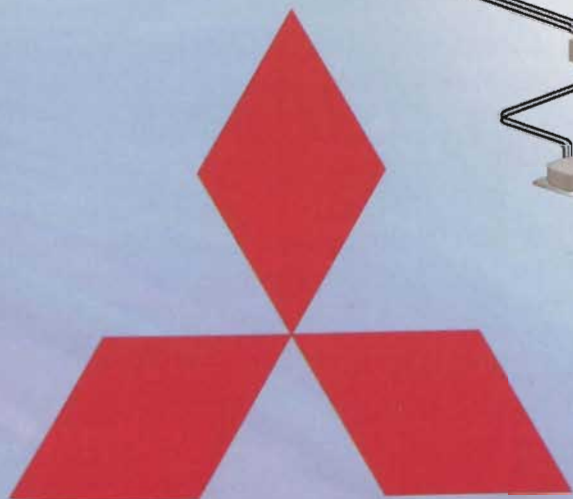
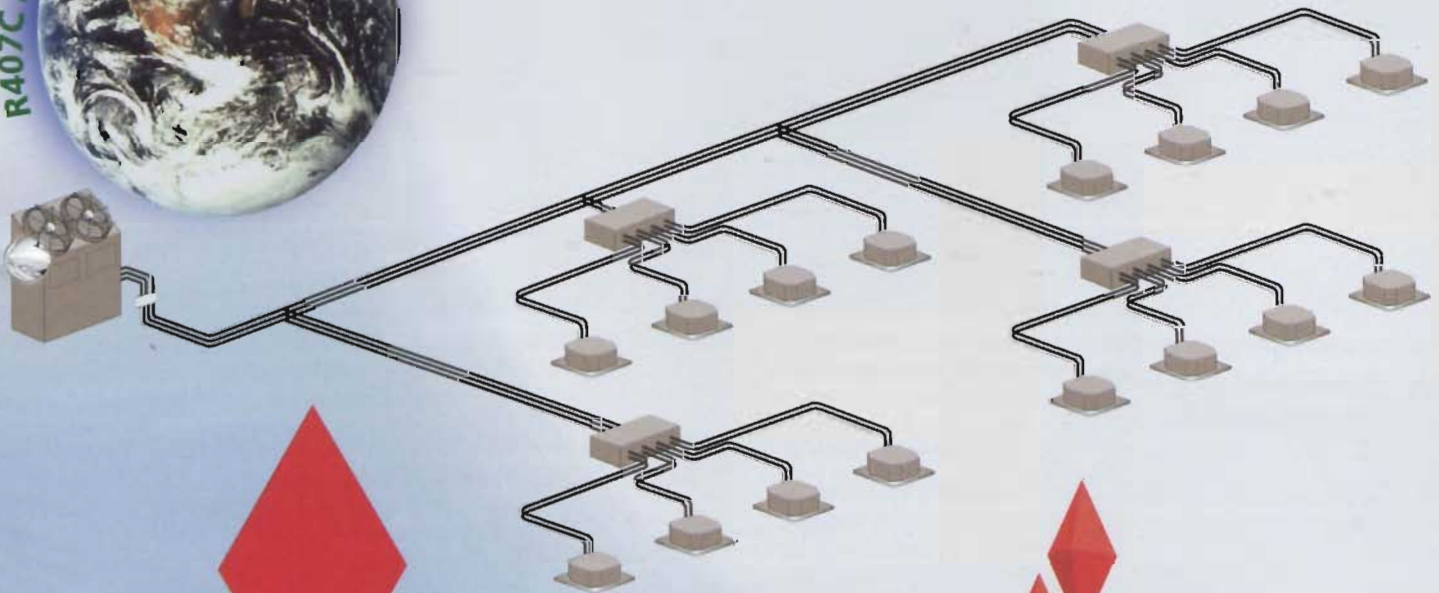
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INDOOR UNITS



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(Ireland) Ltd
www.3dair.co.uk

For information
call: Michael Clancy
Tel: 01 450 9433

The Unico System

The Alternative to Radiators, Underfloor Heating & Split Systems

The Unico System has been manufactured in the USA for over 20 years and is used extensively throughout the States in varying climates – from the extreme cold of Alaska to the humid heat of Florida.

Since its introduction to Ireland three years ago, many homes and businesses have enjoyed the superior comfort and energy savings of The Unico System. The Unico System flexible supply tubing is specially designed to fit into the tightest of spaces.

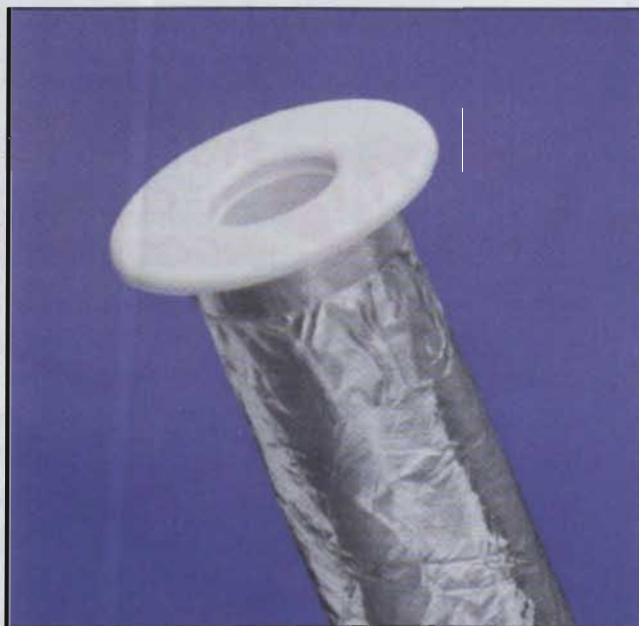
The Unico System is a mini-duct central heating and air conditioning system that utilises compact, modular air handlers. Using small (180mm) supply plenum that can run up to 30m in length and small flexible supply tubing (90mm) that can run up to 10m in length, any building can have The Unico System fitted. The supply tubing terminates with round plastic or wooden outlets — about the size of a CD — which can be painted or stained to match any décor. A 13-mm by 200-mm slotted

outlet is also available. The Unico System provides a better level of comfort than conventional HVAC systems or split systems. It's quieter and draft-free — because it works on the principle of aspiration instead of diffusion — and provides even

required. Any manufacturer's boiler or condensing unit may be used.

Air conditioning, ventilation and plumbing contractors are delighted with the speed and ease of installation.

Consultants, engineers and architects are



The Unico System flexible supply tubing is especially designed to fit into the tightest spaces

temperatures (with less than a 1.5°C variation) from ceiling to floor and wall to wall.

The Unico System is available as heating only (hot water coil and blower), air conditioning or heat pump (heat pump coil and blower), chilled water (chilled water coil and blower) or any combination as

specifying The Unico System as it sets new standards in performance and comfort. It gives greater flexibility in design as no radiators or under-floor heating are required. (You can combine a Unico System and under-floor heating if required). If you design it we can heat and cool it!

Main advantages of The Unico System:

- ☐ Zoning available — one to nine per system
- ☐ No radiators or under-floor heating
- ☐ No split systems
- ☐ Draft-free even temperatures
- ☐ Air filtration
- ☐ Fresh air if required (up to 100%)
- ☐ Use any manufacturers boiler or condensing unit
- ☐ Geothermal option
- ☐ Three outlet types, match any décor

Three different models:

- Model 1218 – 3.3kW to 5kW cooling, 3kW to 8.5kW heating
- Model 2436 – 7kW to 10kW cooling, 8kW to 17kW heating
- Model 4260 – 10kW to 17Kw cooling, 11kW to 25kW heating.

Full heat load calculations, design and layout and commissioning are performed for each job at no charge. Training courses are offered at regular intervals. Contact for full details: Eamon Fidgeon, Unico System Ireland. Tel: 044 84881. Web: www.unicosystemireland.com

Not all VRF systems are inverter.



Original Scroll Compression

- Scroll profiles separate to allow liquid refrigerant slugs to pass ensuring no damage
- Suction gas enters the scroll chamber not the sump ensuring no oil dilution
- Scroll tips utilise oil as the tip seal, not neoprene, to ensure reliability
- No thrust washers or springs required to force scroll tips to seal

Inverter Motor

- Unique stepless speed control, fully linear operation
- 30-115hz operation matching load requirements precisely
- High temperature motor design ensuring greater operating tolerance

Main Compressor Body

- Heavy steel construction acts as a noise muffler ensuring very quiet operation
- No oil pump required, differential gas pressure system utilised, resulting in greater reliability
- Compressor shell designed to act as effective oil separator
- Unique high-pressure design enables an oil less sump resulting in increased reliability



Hitachi believe that truly inspirational design leads to the most innovative and effective product technologies, and an integral underpinning of the design and manufacturing procedure, is our belief in the need to protect the global environment. Performance, cost and environmental responsibility are not mutually exclusive considerations but rather a powerful combination.

That's why we invest over 6% of our total global sales turnover directly into research and development, with almost 17,000 of our 330,000 employees focused exclusively on the development of technologically advanced products, you can be sure Hitachi Air Conditioning will continue to lead where others follow - Hitachi Inspiration.

Hitachi VRF technology has been designed to fulfil the parameters of good system design; occupant comfort, ease of installation, speed of response, the ability to cope with evolving building layouts, and of course environmental considerations.

For example the unique Hitachi Pressure Scroll Compressor, fitted in the Set Free VRF range, meets the design criteria we set our engineers: reliability, performance and energy efficiency. The result... a linear controlled inverter, high-pressure scroll compressor, constant lubrication through differential pressure control, robust construction and only 5 moving parts.

A truly inspired design.

To find out more about the Hitachi High Pressure Scroll Compressor and our range of Set Free VRF systems (Heat Pump: 5.8, 10, 12, 16, 20HP and Heat Recovery: 8, 10HP) please contact your local Hitachi distributor to receive a catalogue or arrange a visit.

As we say, not all VRF systems are inverter; indeed not all inverter systems are the same.

For more information visit our website at www.hitachiaircon.com



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Limerick: 061 316797
ardline@eircom.net

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HITACHI
Inspire the Next

'Panasonic — The Total AC Solution'

Panasonic has introduced a number of new models in each of its product ranges, offering a total air conditioning solution from residential to large building air conditioning.

The Building Multi system Urban Multi (UM) range meets building owner and designers needs with a wide product line-up and unique heat recovery and combination heat pump technology. New to this range is the KM2 series, a slim, wall-mounted type unit which can reduce installation area by 30%.

Panasonic has also introduced the new M1 series to the indoor unit line up of its Urban Split (US) range. This range is designed to meet professional building design needs. The 4-way under-ceiling multi-air zone air conditioner is ideal for use in buildings with no ceiling void and is capable of three different patterns of discharge direction, according to the installation place in the room. The M1 series is also available in the

Urban Multi (UM) range (with connection box).

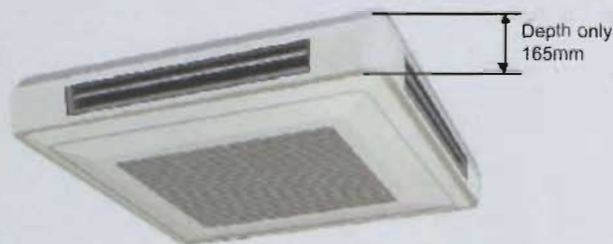
Later in the year a 2 x 2 cassette unit will be introduced to the Urban Split (US) range. This new compact cassette unit is ideal for smaller rooms with 2.5-6kW of power.

A new Urban Split (US) outdoor series will also be available this year. This R407C environment-friendly refrigerant heating and cooling CU-71 series is available for single-phase and 3-phase power supply types. This series benefits from a low starting current, which means reduced installation and running costs, as well as negating the need for an upgrade.

A re-designed range of controls for the new Urban Split (US) and Urban Multi (UM) series of air conditioners, making operation even easier, will be announced later in the year.

Panasonic's RAC series room air conditioners provide wall mounted and floor or ceiling type air conditioners with high energy efficiency and

Under ceiling 4 Way blow cassette
Model No: CS-M1HPK..71, 100, 125



Panasonic under-ceiling, 4-way, blow cassette from Walkair

low noise designed units for residential and light commercial use.

A complete new range using R410A refrigerant is available for 2003. Benefiting from many new features, this new range has an incredibly low indoor noise level, (26dB), plus the new Multi Inverter Split type can now offer four indoor units off one outdoor unit, with both heating and cooling capability.

The new RAC series also features Panasonic's Catechin air purifying filter and triple deodorizing filter, plus many now benefit from a new ion freshener feature. Today's homes and offices, which are often filled with high-tech equipment, tend to have a large amount of positive ions. An abundance of positive ions can make people feel unwell. The press of a button on

Panasonic's new air conditioners releases negative ions, making people feel energetic and revitalised.

Panasonic's FS flexi system series creates the ideal solution for residential air conditioning needs, with flexible common outdoor units and non-polar easy-to-wire control lines. Offering fast, flexible installation, this new series — using R407C refrigerant — is extremely versatile and can be used in many different ways and combinations.

Previously known as Large-Room Air Conditioners (L-RAC), both 4kW and 14kW modes have been added to the existing range to offer even greater flexibility of use.

Contact: Vincent Mahony, Walkair.
Tel: 01 - 456 8070;
Fax: 01 - 456 8098;
email: sales@walkair.ie

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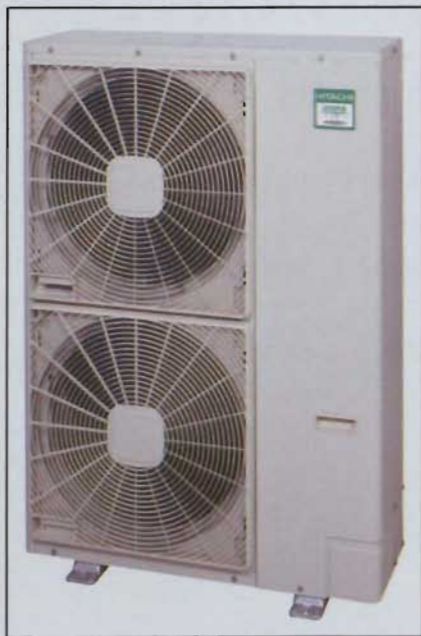
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Hitachi's DC Inverter Utopia Split System



Hitachi DC Inverter Utopia outdoor unit

The Hitachi DC Inverter Utopia range is claimed to be the quietest, most compact and to yield the highest efficiency among its direct competitors. Utopia units reduce running costs by minimising electrical consumption, thereby contributing to general lower carbon usage.

The following features illustrate Hitachi's reputation for innovation:—

- DC Inverter using PAM technology;
- DC Fan Motor is 40% more efficient compared to the standard AC motor; also air blasts are reduced by controlling the rotation speed (inverter control);
- DC Compressor is used in all models, greatly increasing the efficiency, particularly at low speed. Also electromagnetic noise has been significantly reduced by the

optimisation of the rotor (incorporating more powerful neodymium magnets);

- New Heat Exchanger Design: optimised fin design has reduced the airflow resistance by 20%. This results in a reduction in the fan speed required and the motor power input. Also, modifications to the heat exchanger path alignment have decreased the pressure loss helping to improve efficiency;
- Self-diagnosis function: This allows quick checking of the operating conditions of both the indoor and outdoor units, i.e. outdoor air temp, discharge gas temp, evaporating temp, condensing temp and many more. This ease of information has reduced the time required to commission and maintain the units.

The DC Inverter Utopia was developed with energy and efficiency concerns at the forefront of the design brief. All components of the design of the unit have energy efficiency in mind as the

market tends towards cost savings and environmental considerations. This includes:—

- Highest efficiency of their class among competitors, COP cooling= 3.73, heating=4.01 at full load conditions (these figures are further improved at partial load);
 - The system uses zero ozone depletion potential refrigerant R407C;
 - The use of inverter technology allows automatic capacity control for 25-100%, therefore the cooling and heating capacity matches the demand precisely;
 - The factory where the units are manufactured has achieved ISO 14001 accreditation;
 - Lowest sound level in their class among competitors;
 - Most compact of their class among competitors, therefore reducing the quantity of material in manufacturing, associated packaging and minimising visual impact.
- Hitachi understands the importance of ease of installation and maintenance. The outdoor unit is the most compact available on the market, enabling ease of installation in limited

spaces. Sizes are as follows:— 3hp = 850 x 850 x 315mm; 4hp = 850 x 850 x 315mm; 5hp = 1240 x 850 x 315mm. Features include:—

- Uniform width and depth of the units allows a uniform layout for multiple installations;
- Units can be installed with a minimum of 15mm separation;
- Unit design provides easy access to all major mechanical and electrical components, without the need to remove the top cover;
- All units are single phase;

Safety at Hitachi is always paramount, hence:—

- The factory where the units are manufactured has achieved ISO 14001 accreditation;
 - CE Marked;
 - CEN/JIS standards of manufacture;
 - Internal Hitachi design and testing standards achieved;
- With enviable cost-recovery figures, Hitachi units are:—

- Competitively priced within the market;
- When compared with a standard fixed-speed commercial split unit the extra cost of an inverter driven unit can be recovered within approximately two years;
- Up to 50% more efficient than a standard fixed-speed commercial split unit.

Contact: Ardline
Kilkenny: 056 - 21310;
Ardline, Co Cavan: 042 - 9665460;
Ardline, Limerick: 061 - 316797.

Web:
www.hitachiaircon.com



Hitachi DC Inverter Utopia ceiling unit



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MHI & 3D — Drawing on Over a Century of Experience

Mitsubishi Heavy Industries air conditioning systems have the highest reputation for top quality and long-term reliability. It's engineering history dates back to the 1870s and the culture of innovation and manufacturing excellence has led to many industry first over the years.

Today, a full range of systems is available, from small wall-mounted split systems of 1.8kW, to multi-splits and large ducted heat pump systems up to 28kW. Then there are the VRF inverter systems — the KX 2-pipe, the KXR 3-pipe, and the K-Max modular systems with capacities up to 126kW.

All are suitable for R22 and R407C refrigerants.

Taking the split systems first, the FD multi series is ideal for open-plan areas such as retail outlets, offices, fitness centres, etc. The twin, triple and quad systems — from 10kW to 28kW — are ideal where there is a requirement for large capacity



Mitsubishi Heavy Industries KX-2 R407C — zero ozone depletion

cooling/heating, but without the costs of multiple external units. The number of pipes entering the building is reduced, as is the number of external power supplies.

The application of twin, triple or quad ducted units can greatly reduce the costs of internal ducting, and overcome problems where the ceiling void has structural beams or other services restricting the space available for ductwork.

Ducted units also include a factory-fitted condensate pump, allowing the units to be installed close to the ceiling grid if necessary.

Turning to the KX-2 systems, these are used extensively in all types of commercial applications, including offices, hotels, restaurants, etc. The simple pipework configuration allows easy installation and discreet concealment of refrigerant and condensate piping.

With 2-pipe systems there are no refrigerant distribution boxes, as all connections are made using branch pipe kits. Cassette and ducted internal units have condensate lift pumps to overcome problems of routing of drain piping. This allows for installation in most locations without additional pump kits.

The outdoor unit is compact with a height of 1450mm with easy access for routine maintenance



Mitsubishi Heavy Industries KX-2 and KXR air conditioning and heat pump variable refrigerant inverter multi systems

from the front of the unit. Units can therefore be installed side by side while pipe connections can be made from the front, back, right or bottom. The newly-developed 570mm diameter sickle-bladed fan reduces the outdoor sound level to 59dB, and the increased air volume allows operation in ambient temperatures down to -15°C.

Generally speaking, the KXR 3-pipe system is more suitable than a 2-pipe system in buildings where there is no other form of heating. It provides flexible control with heating and cooling at any terminal unit simultaneously, with energy recovery between warm and cool areas. It is ideal where there is a mixed requirement for some areas to be cooled and others to be heated.

The KXR system has both individual and combined distribution controllers, the latter allowing several internal units to be connected, each having independent control, but reducing the number of pipe joints required on site, resulting in lower installation costs.

The K-MAX 2-pipe Super VRF system is for

very large commercial applications such as conference centres, dealing rooms, large retail stores, display showrooms, etc. It provides cooling or heating — not simultaneously — and offers considerable installation cost savings as there is far less refrigerant pipework from the outdoor units to inside the building. There are no refrigerant distribution boxes involved as all connections are made using low-cost branch pipe kits.

The outdoor units have a small footprint and all service access is from the front only, which is an advantage if space is restricted. It also minimises the cost of providing steel support decking where that is necessary.

The inverter units and constant speed (fixed-speed compressors) are piped together on site by the installer, with all controls integral within each unit.

Contact: Michael Clancy, 3D Air Sales (Ireland).
Tel: 01 - 450 9433;
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FläktWoods

Core Ac ... All About Partnerships

While relatively young in company terms — Core Air Conditioning was established in 1996 — the combined knowledge and experience of company personnel represents something like 120 years. Moreover, the diversity and all-embracing nature of this knowledge base and experience means that virtually all possible permutations are catered for. This is an invaluable resource and one which Managing Director Austin McDermott has effectively applied to the marketplace to carve out a significant market share of the air movement sector.

Quality of service coupled with quality products from brand-leading names — Carrier, Liebert Hiross, Haier and Puma — is the cornerstone upon which success to date has been achieved.

Core Air Conditioning is ultra-professional in its dealings with suppliers and clients alike, yet somehow manages to do so in a friendly, flexible manner. Structured systems do not mean

rigid practices. Indeed, Core's ability to adapt and change to devise the most appropriate solutions to suit individual situations is well known. The extensive scope of the product portfolio facilitates this approach. Individually, any one of the principals represented offers a myriad of air movement solutions. Taken together, they are a formidable armoury in satisfying clients' needs. Core Air Conditioning is all about partnerships ... the partnership between management and installers; the partnership with clients; and the partnership with suppliers. Effectively, Core Air Conditioning acts as the conduit through which the clients' needs are matched with the appropriate suppliers products to provide the most effective, energy-efficient, air movement solutions.

Brief details of its principal product ranges are as follows:—

Puma

Puma is a UK-based ventilation equipment specialist dealing in supply air, permanent extract and heat recovery units. It is a relatively small, dedicated company concentrating on packaged air handling for general ventilation applications where energy savings and environmental-friendly engineering design feature prominently. Airflow's range from 0.15 to 1.1 m³/Sec - 0 to 250 Pa ESP.

Carrier

From the time Willis Haviland Carrier invented the basics of modern air conditioning in 1902, Carrier has been the world leader in the manufacture and sale of heating, ventilating, air conditioning, hvac systems and products. Essentially, the history of air conditioning is a history of Carrier, Aquasmart being one of the latest innovative developments to set a new industry benchmark.

When the genius of Willis Haviland Carrier gave birth to modern air conditioning it forever changed the way we live, work and play. He enabled incredible improvements to health care, manufacturing processes, research, building capacities, food preservation, art and historical conservation, general productivity, indoor comfort and much more. He truly created a century of possibilities that is now embodied in the extensive and diverse Carrier portfolio of today. One hundred years later, these same attributes resonate in the 42,000 dedicated Carrier associates that span the globe, and are reflected in the fact that a Carrier unit is shipped every four seconds to all corners of the world.

Liebert Hiross

Liebert Hiross is synonymous with high-performance air conditioning systems. A typical example is the unique Hirovisor concept

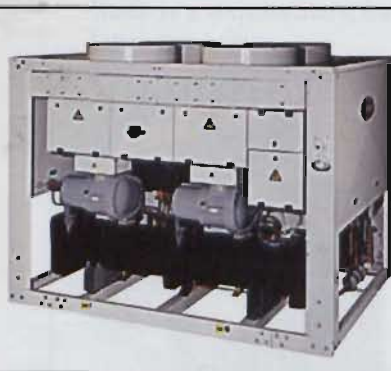
which allows the user visualise and manage one or more installation of Liebert Hiross air conditioning units, superchillers and UPs, from one central point, the PC, where the software applications run (see page 22-23).

Haier

Haier is the fifth largest manufacturer of consumer goods in the world. Based in Qingdao, China, last year it produced 5.8 million air conditioning units, enough to supply the entire European market nearly three times over. Its products are sold in over 90 countries with worldwide sales of approximately €7.2 billion in 2001.

New products are produced at a rate of 1.3 per day with an average of 2.5 patents per day being registered. In total it currently offers over 9200 products in 58 lines. All are manufactured to the most stringent quality control standards and comply with all relevant national and international certification and standards.

Core Air Conditioning has selected the most appropriate products for the Irish market from the vast range available, including the newly-expanded split range which now incorporates advanced multi systems, and a 2-pipe VRF system. Contact: Austin McDermott/Andrew McEvitt, Core Air Conditioning. Tel: 01 - 409 8912; Fax: 01 - 409 8916; email: info@coreac.com

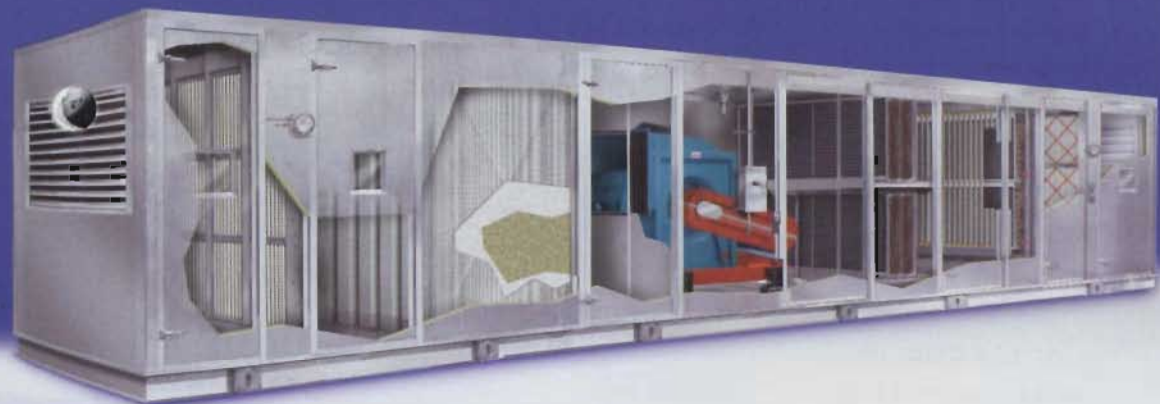


From the Carrier range which includes chillers, heat pumps, packaged rooftop units, minisplits, fan coil units, and controls.



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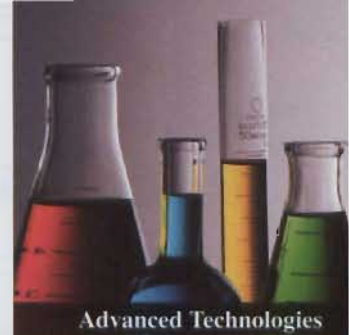
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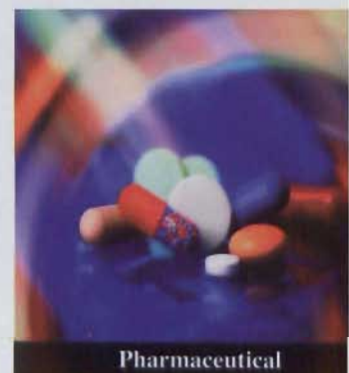
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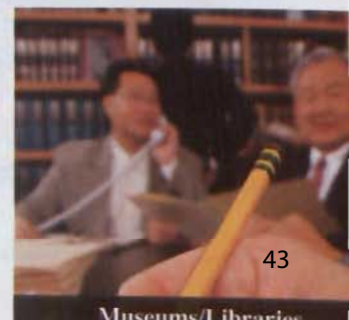
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Reconair Refocusses

At a time of much change and market uncertainty Reconair — one of a handful of companies responsible for introducing air conditioning to Ireland many years ago — has re-affirmed its commitment to core values and practices. Reconair's reputation was established on the quality of the service and maintenance packages provided, and the manner in which tailored programmes could be devised to suit individual requirements.

The company has now re-focussed on these core strengths and introduced an even more disciplined management and operational structure to ensure delivery of

quality-driven service and maintenance packages.

New, fully-qualified engineers have been employed to complement the long-standing experience and expertise of existing personnel. Moreover, a rigorous educational and training programme has been developed to guarantee that all engineers stay fully up-to-date with the latest advances across the entire building services spectrum.

It is this ability to deliver a total, all-embracing building services package which sets Reconair apart from its competitors. In addition to air conditioning and refrigeration engineers,

Reconair has a team of heating, plumbing, electrical and electronic specialists who between them provide total and comprehensive building services-related cover. The total package from Reconair incorporates close control air conditioning; comfort air conditioning; refrigeration; heating; electrical; and plumbing.

The quality of the services provided and the manner in which it is delivered never varies, be it a new, green-field installation or refurbishment project.

However, Reconair does not limit itself to service and maintenance, and continues to supply product and equipment where appropriate. The Denco Air Conditioning portfolio is a typical case in point, the Toscana DX and chilled water ranges being complemented by the Denco Escana DX and chilled water ranges.

Built to international close control air conditioning standards — and supported by BS EN ISO 9001 quality certification — the entire portfolio is designed to provide optimum performance while being energy-efficient and cost-effective to install and run.



Denco Toscana close control air conditioning unit from Reconair

Applications

Applications include computer rooms; coms rooms; operating theatres; and clean rooms.

Capacities

Toscana DX Air Conditioning Units — cooling capacities from 17kW to 42kW;

Toscana Chilled Water Systems — cooling capacities from 3kW to 42kW;

Escana DX Air Conditioning Units — cooling capacities from 22kW to 120kW;
Escana Chilled Water Systems — cooling capacities from 22kW to 120kW.

Contact: Mark Cooney, Reconair.
Tel: 01 - 842 5200;
Fax: 01 - 842 5880;
email: hvac@reconair.ie



Denco Escana close control air conditioning unit from Reconair

LISTEN... Quality is silence.

Listen hard. Do you hear the silence? With air conditioning units quieter than a whisper, and getting quieter every year, the sound of silence is often all that you hear.

LOOK... Quality is energy savings.

Look at your energy bill. See the difference. Multiple energy saving technologies in every system makes both economic and earth sense.

Attune Your Senses to Enhanced Quality

IMAGINE... Quality is environmentally-friendly.

Imagine a sustainable future. Our systems are designed to minimize environmental impact throughout their lifecycles.

FEEL... Quality is comfort.

Feel that wonderful air. It is a direct result of our years of pursuing the scientific secrets of absolute comfort and perfect air.

Home or office, large or small, our air conditioners deliver the air quality you desire

Air Conditioners



Ventilation Systems



New G50A CITY MULTI NEW CENTRALIZED CONTROLLER

First in the industry
With Web Server Functions!

Main Features

Web Server Function

Web server makes easy to monitor/operate even through remote access.

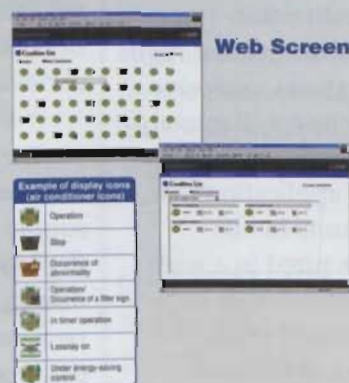
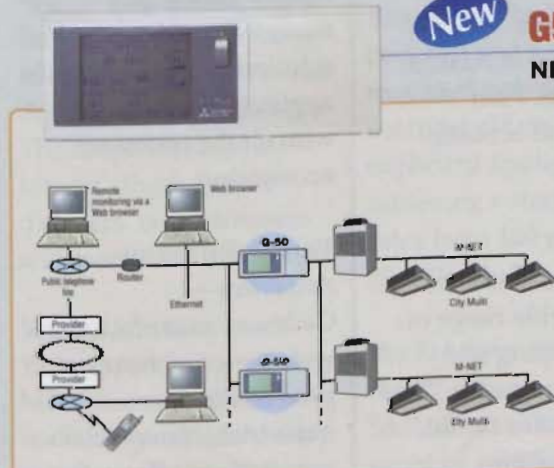
Auto Alarming

In case of emergency, necessary information shall be sent to mobile phone and/or personal computer by e-mail.

Continuous Improvement

Various software (function) shall be introduced gradually, and can be simply downloaded into G-50A.

Example: Energy monitoring
Yearly schedule
Demand control



<http://Global.MitsubishiElectric.com/air/>

 **MITSUBISHI
ELECTRIC**
Changes for the Better

VenTac — Air Management Made Simple

VenTac & Co Ltd was established in 1972 and began trading from a small office in Pembroke Row, Dublin. The company has expanded over the last 30 years and the group companies currently employ approximately 45 people, operating in the Irish, UK and US markets.

VenTac specialises in the supply, manufacture and distribution of ventilation products and together with other group companies such as AcTech and NCRL, operates from premises in Blessington, Co Wicklow. These consist of 40,000 ft of office, production and storage space on a site of approximately seven acres.

The VenTac product portfolio comprises some of the best-known brands in the industry such as Soler and Palau, Gehardt and Ventilatoren, Matthews and Yates, Waterloo, Actionair etc, with probably the largest stock range of ventilation products in the country. Here is a brief description of the group companies capabilities, product range and services.

AcTech —

AcTech offers an extensive range of noise control and anti-vibration products catering for the industrial, building, architectural and OEM sectors. It provides complete acoustic solutions including initial noise surveys, recommendations, design and installation for specific applications;

VenTac Acoustic Air Technology Ltd, (AAT) —

AAT manufactures galvanised steel, stainless steel and plastic attenuators to customer specifications offering guaranteed acoustic performances using data from acoustic tests carried out in the VenTac group's Noise Control Research Laboratory (NCRL) facility;

VenTac Alldays Peacock —

This industrial centrifugal fan range is designed and constructed to customer specification for applications such as high temperatures, corrosive and explosive/flammable atmospheres, marine and mining applications, etc. These units can be manufactured in a wide range of materials such as painted mild steel; stainless steel; brass; bronze; hasteloy; titanium etc;



VenTac premises, Blessington, Co Wicklow

VenTac Actionair Equipment —

The Actionair range of dampers includes smoke dampers, vent dampers, fire dampers, volume control dampers and shut-off dampers. These units are available with a wide range of accessories including actuators, installation frames, micro-switches, control panels etc, and can also be supplied in 430 and 316 stainless steel;

VenTac Bonotec —

Bonotec manufacture a range of high specification modular panels for the manufacture of AHU's, fan cabinets, filter cabinets and acoustic enclosures;

VenTac DEC —

DEC manufacture and supply a wide range of flexible ducting and ducting accessories. The range includes flexible ducting, flexible attenuators, semi-flexible ducting, disc valves, duct

tape, duct sealant, jubilee clips, smoke emitters etc;

VenTac Dust Control Products —

VenTac offers a wide range of dust control packages such as mobile dust collectors, fixed dust collectors, filter units, material handling fans, venturi and cyclones;

VenTac Fumex —

Fumex supply a range of local exhaust arms ranging from 50mm to 200mm diameter in lengths from 800mm to 500mm. They also supply various rail-mounted and hose reel solutions for local exhaust applications, together with all the necessary accessories;

VenTac Galloway Acoustics —

Galloway manufactures a wide range of acoustic products for industrial/commercial uses such as attenuators, acoustic doors, enclosures, acoustic

louvres, screens etc. These products can be manufactured in galvanised steel, stainless steel or plastic, and are designed and constructed to customers specification with guaranteed acoustic performance;

VenTac Gonal —
Gonal manufactures a range of extruded/injection moulded plastic ducts and fittings in both circular and flat rectangular profiles for airflows from 300 to 1000m cubed/hr;

VenTac Gebhardt GmbH —
The Gebhardt range of direct/belt-driven centrifugal fans is the industry's most widely-recognised name. The range includes single and double inlet centrifugal fans built to various specifications. These units can be used for cabinet, duct and roof mounting with a wide range of accessories;

VenTac Imp Klima —
Imp Klima offers a range of specialised air terminal devices and accessories. The range includes air towers, displacement diffusers, swirl diffusers and motorised diffusers;

VenTac Matthews and Yates (M&Y) —
M&Y manufactures a wide range of heavy-duty axis fans offering flow rates from 300 to 300,000m/hr. They are

available in high temperature, explosion/ flame proof and corrosion-resistant versions with a wide range of motors and accessories;

VenTac Mietzsch GmbH —
Mietzsch manufactures a wide range of industrial plastic fans. They are available in direct and belt-driven versions and can also be supplied with duty and standby motor arrangements (belt-driven fans only);

VenTac NCRL —
Noise Control and Research Laboratories Ltd offers a unique and vital role within the VenTac group of companies. Its new acoustic and aerodynamic test facility allows it to test and verify a comprehensive range of products to international standards for the acoustic and airflow technology sectors;

VenTac SEAT —
The SEAT range comprises direct-driven pedestal and roof-mounted polypropylene centrifugal fans to fume cupboard applications, achieving volume flow rates from 100 to 10,000m³ hr;

VenTac Soler and Palau (S&P) —
S&P offers an extensive range of ventilation products for the domestic, commercial and

industrial sectors. The range includes items such as plate and case axial fans, roof-mounted fans, inline fans, window fans, special application fans, etc;

VenTac Ventur —
Ventur manufactures a comprehensive range of side channel blowers, industrial centrifugal fans and wood chip extractors;

VenTac VIM —
The VIM range comprises domestic and commercial central ventilation and heat recovery systems with a wide range of accessories including filters, air valves, sound absorbers, air flow regulators, etc;

VenTac Waterloo —
Waterloo offers a comprehensive range of air terminal devices including supply air diffusers, extract, extract grilles, louvres and fan coil units;

VenTac Wozair —
The Wozair range comprises a wide range of heavy-duty stainless steel air terminal devices for the pharmaceutical, microelectronic, nuclear and off-shore industries.

Contact : Mark Moran,
VenTac Ltd.
Tel: 045 - 851500;
Fax: 045 - 851501;
email:mmoran@ventac.ie

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Biddle Fan Coil Units From Rink AC

Rink Air Conditioning Ltd has been appointed Biddle's distributor of fan coil units for Ireland, effective 1 January 2003.

As Andrew Saxon of Biddle explained: "For some time now we have been seeking a partner in the Republic of Ireland. Having met with Brian McDonagh of Rink we were impressed with their knowledge of the market and their enthusiasm for fan coils, which are complementary to their existing range of air conditioning products. We believe that over the next few years there is no doubt Rink will help us achieve the objective of expanding our fan coil business and enhance our reputation in the Republic of Ireland.

"Rink were particularly impressed with our state-of-the-art factory at Nuneaton and its ability to react quickly to the needs of customers. The current fan coil range

provides the quality of product which their customers will appreciate and, with some exciting development work coming to fruition later this year, we are confident we can help Rink reinforce their position as one of Ireland's leading suppliers of air conditioning products".

Biddle's fan coil range comprises three distinct products — Coolflow, Isotherm and Modulair — each of which has been developed to address specific segments of the market.

Coolflow is a traditional fan coil unit which has been proven over many years to offer a value-for-money solution on large scale developments. Although the vast majority of units sold are of a horizontal chassis configuration and installed with some ducting in the ceiling void, Coolflow is also

available in a vertical chassis configuration for wall mounted applications. With six sizes of unit Coolflow is able to meet the air volume, noise and duty requirements of most projects. Cooling duties are as great as 10kW and the units can be fitted with the control package to suit the job.

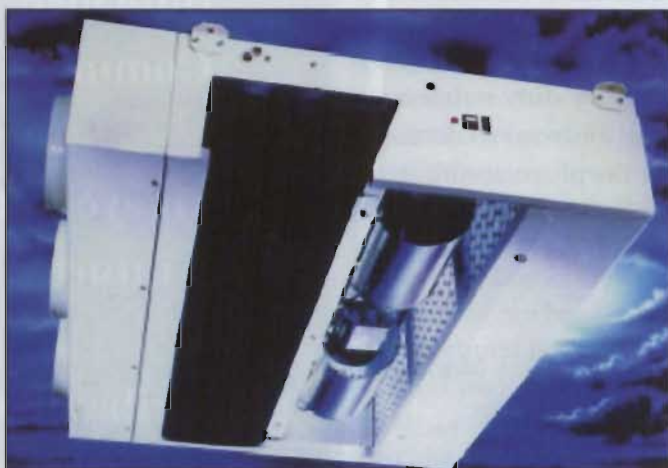
A few years ago comments from consultants, contractors and end-users prompted Biddle to develop Isotherm, a fan coil unit with some specific benefits compared to other units on the market. A common observation was that high-duty units were often too noisy and couldn't the duty/noise ratio be addressed to maintain duty but reduce noise. Isotherm tackles this issue by using relatively large individual direct-drive fans, with an expected life in excess of 40,000 running hours, and making extensive use of noise absorbent material. When fitting these fans with anti-vibration mountings in a rigidly-constructed sheet steel casing, which minimises distortion when the unit is suspended on site, a distinct performance improvement was achieved.

The drain tray within Isotherm is another important feature. The polymeric-based fire retardant tray extends over the coil headers to ensure all condensate is

caught, but is also easily removable to allow thorough cleaning.

Cleaning of filters in fan coil units has always been a time-consuming process, and as a consequence is often not undertaken. Using replaceable long-life cartridge type filters, as opposed to the loose filter media usually found in fan coils, easily accessible through 1/4 turn fasteners leads to savings on maintenance time and costs. Because the larger Isotherm units have a number of smaller filters rather than one massive filter, they can be withdrawn through a 600x600mm ceiling tile without any need to dismantle the grid.

Modulair is a hybrid product, being a cross between a small air-handling unit and a large fan coil. It is able to deliver in excess of 0.5ltr/sec treated air and deal with external resistances as great as 400Pa. As the name suggests Modulair is modular in nature, with the components such as filters and attenuators selected to match the needs of the project. This gives a high degree of flexibility which often proves useful in "zoning" different areas or floors in large buildings.
Contact: Brian McDonagh, Rink Air Conditioning.
Tel: 01 - 456 9469;
Fax: 01 - 450 4314



Isotherm, a fan coil unit with some specific benefits compared to other units on the market

An Tanaiste on Insurance



The following are extracts from a reply by An Tanaiste's office to a concerned contractor who had written to her voicing his concerns about a particular insurance matter, and the situation in general.

"Dear Sir

"In the absence of An Tanaiste and Minister for Enterprise, Trade & Employment, Ms Mary Harney, TD, who is away at present, I wish to refer further to your letter regarding the high increase in your insurance premium. "The Tanaiste is very concerned about the difficulties that are being caused by high insurance premiums and, indeed, by the lack of availability of insurance cover in some cases. Many reasons, both domestic and international, have been put forward by the insurance industry for the current insurance problems.

"The key strategic concern to which the Tanaiste is giving priority is the cost and availability of liability insurance — specifically motor, employers' liability and

public liability insurance. Although this Department is responsible for the supervision of insurance companies here, EU law prevents Governments from intervening in relation to premium levels or the risks that insurers are prepared to underwrite. However, Governments are free to take appropriate action leading to cost reduction by the industry.

"Tackling the issues is a clear priority for the Government and for the Tanaiste personally. A comprehensive set of measures is contained in the *Agreed Programme for Government*, the underlying purpose of which is to bring about an improvement in the functioning of the insurance market and in the system itself. In this context, the Tanaiste has announced a comprehensive programme for the fundamental reform of the Irish insurance market which the Tanaiste believes has the capacity to be a real driver for change.

"The package of measures which the Tanaiste has announced includes:—

- The immediate establishment of a Personal Injuries Assessment Board (PIAB) on an interim basis;
- Priority drafting of legislation to establish the PIAB on a statutory footing;

- Publication of the Report of the PIAB Implementation Group;
- Publication of the Action Plan for the implementation of the recommendations of the Motor Insurance Advisory Board (MIAB). While MIAB was essentially concerned with motor insurance, the recommendations also relate to other forms of insurance and to public and employers' liability in particular. The Action Plan reflects this;
- The establishment of a Ministerial Committee, which will be chaired by the Tanaiste herself, to oversee the implementation of the recommendations of the MIAB.

"The Government is also taking action in a number of other areas to help tackle the high cost of insurance. These include:—

- Actions to improve road safety and driver behaviour;
- Drawing up of a set of guidelines on damages for use by the Courts;
- A requirement that claims be supported by sworn affidavits so as to create a liability for perjury in respect of fraudulent claims;
- A ban on 'no-foal-no-fee' advertising by solicitors.

"The *Agreed Programme for Government* contains a commitment to remove unwarranted constraints

on competition in all sectors of the economy. This Department, and the Competition Authority, have now agreed to undertake a study of competition in the provision of non-life insurance, specifically motor, employers' liability and public liability insurance business, including the factors inhibiting foreign insurers from entering the Irish market.

"The Tanaiste is committed to bringing about improvements in the functioning of the Irish insurance market and intends to drive implementation of the insurance reform programme across Government Departments and other bodies concerned. The Tanaiste believes that these measures, taken as a package, constitute a programme that is capable of delivering very real reform.

"The most crucial aspect of this programme will, however, be the response of the insurance industry itself. There is an obligation on the industry to ensure that reductions in insurance costs translate into significant reductions in premiums to consumers.

"The Tanaiste cannot intervene in individual cases. I would suggest that you contact Mr Frank Farrell at the Irish Insurance Federation (Tel: 01 - 676 1914) who may be able to suggest where an alternative quotation might be obtained".

*Yours sincerely,
Bridget Flynn
Private Secretary*



A Day in the Life of a Facilities Manager



Sasha Smith,
Facilities Manager,
Irish Estates.
Tel: 01 - 704 1400.

Sasha Smith has extensive experience in facilities both in Ireland and the UK.

Her experience covers a wide range of property types including hi-tech, telecommunications, professional services, banking and trading.

To give you a brief overview of what I do, I am responsible for 10 buildings with a floor area of approximately 300,000sq ft. These buildings vary from office buildings to manufacturing and even a consulate building. I am responsible for all the services including security; cleaning; postroom; relamping; maintenance of UPS; HVAC and many other services. This of course also includes coping with unexpected issues that arise such as lift breakdowns, floods and power outages.

Thankfully, such occurrences are infrequent but, because of the size of my portfolio, I can expect to have to deal with situations such as these in the course of a normal working week. Emergencies by their very nature need to be dealt with speedily and with lots of communication with the client.

What follows is a typical day in the life of a Facilities Manager responsible for the continuity of services in several buildings, but you should bear in mind that while all the above is going on, the phone still rings with a variety of requests thus making it a very varied and challenging role with no two days ever really being the same!

8.30am — On the DART to work; I receive a call on the mobile from security in a bank within the IFSC, to inform me that the access control system has gone down and that none of the employees are able to gain access to the their offices.

8.35am — Placed a call to the security maintenance company to request an engineer.

9.00am — Arrive at the bank, meet with the engineer and find the problem rectified, with employees now in their offices. I was surprised to find some of them slightly disappointed at this, as trips were already being planned to the local café; still we can't please everyone.

Hold short meeting with the building manager and the two tenants to explain what had caused the failure, which was a lack of power supply. I explain that another supply had been added to prevent an occurrence of this problem.

9.30am — I make my way to another company within the IFSC complex to meet with the supervisor for the cleaning contractor responsible for this building. Together we carry out a

cleaning audit/inspection of the whole building. This includes a full walk around all six floors of the building while completing a scorecard (one of those clip board people!).

10.30am — I then attend a meeting with one of the onsite Irish Estates Service Team. This team is made up of highly skilled electricians; plumbers; carpenters; painters and general operatives. Here it is my responsibility to forward on service requests I have received after 5pm the previous evening.

These requests can include anything from the need to replace lamps, to the moving of electrical floor boxes or office furniture. The Service Team then updates me with relevant issues such as outstanding snag lists that they would have compiled from the buildings within the complex.

I then issue purchase orders/instructions so that fixings or parts required can be purchased right away. I then make arrangements to carry out a walkthrough of all the buildings within my portfolio the following day.

11.00am — On the way back to my own office, I receive a call to inform me that a number of people are trapped in a lift of an IT company. I place a call to the lift company to request an

emergency call out. The lift engineer arrives swiftly, lets the employees out and gets to work finding the problem.

12.00pm — I finally arrive back in the office for a meeting with our accounts department regarding the finances for the forthcoming quarterly reports.

1.00pm — Lunch at last, but that does not stop the phone ringing — deal with a blocked urinal (not while I eat my cheese sambo!) and a tripped-out toaster.

2.00pm — I then head for the IFSC to meet with a Building Manager of a foreign financial company who wants us to arrange work that he needs done, including painting and upgrading the air conditioning system.

3.00pm — On the way back to my office I receive a call from a member of the on-site Service Team to inform me that the water heater in the plant room of one of the buildings has burst and flooded the room with four inches of water. Make my way to the building, pausing briefly only to collect my galoshes.

Arrive to find the team cleaning up the room with the aid of a wet-vac. The plumber explains to me that the heating element in the heater has rusted on the



inside causing the leak. He explains that he will be able to fit a new element the following day.

4.30pm — Return to the office to answer emails and carry out general administration tasks.

5.30pm — Carry out last duty of the day, to do list for tomorrow.

6.00pm — On the DART heading home (via the pub for a well earned drink!).

So, if I were asked what makes me do the job, I would have to say that I relish the challenge and the variety of issues and people that I encounter on a daily basis. If it appears that all we do all day long is to solve problems then that is pretty much the name of the game — providing facilities management solutions, fast!

Drive to Reduce Energy Costs and Emissions



Dermot Ahern, TD, Minister for Communications, Marine and Natural Resources with David Taylor, Chief Executive, Sustainable Energy Ireland, and Pat Noonan, GlaxoSmithKline



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Jim Dempsey, Project Engineer, Analog Devices BV, Raheen, Co Limerick



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Liam Marnane, Managing Director, Cadbury Ireland Ltd, Dublin



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Dr Joe Ryan, Utilities & Environmental Manager, Merck Sharpe & Dohme, Clonmel, Co Tipperary

Despite difficult global trading conditions, Irish companies must continue to strive to reduce their energy consumption levels. Industrial sector involvement is vital in securing a sustainable future for Ireland. That is according to Dermot Ahern TD, Minister for Communications, Marine and Natural Resources, who was speaking in Dublin at the launch of the Annual Report of the Large Industry Energy Network (LIEN) for 2001/2002.

Facilitated by Sustainable Energy Ireland, the Large Industry Energy Network (LIEN) is a voluntary networking initiative, aimed at reducing the energy usage and related emissions from large industry in Ireland. This Report brings together the results of 80 member companies in the LIEN.

The report records that the actions of LIEN members in 2001/2002 accounted for a reduction of 285GWh (gigawatt hours) from a "business

as usual scenario" which equates to a collective saving of €5 million or 120,000 tonnes of CO₂ in environmental terms. This represents an important contribution to Ireland's Kyoto target of limiting greenhouse gas emissions to 13% above 1990 levels by 2010. Ireland has already exceeded this target and is currently more than 29% above 1990 levels.

In total, the LIEN member companies represent over 40% of the total energy usage in the industrial sector in Ireland, equating to an annual energy spend of €300 million.

Speaking at the LIEN report launch, Minister Ahern said: "Each of the companies in the Large Industry Energy Network is to be congratulated on their initiative and their efforts to date. The continuing development of the LIEN is evidence of the partnership between government and industry in working to reduce energy consumption and energy-related emissions. Progress in this area is



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Brian Frahill, Utilities Manager, Pfizer Ireland Pharmaceuticals, Little Island, Co Cork

important, both at a national level and at the level of the individual enterprise. The partnership approach embodied in the LIEN represents the best means of ensuring that energy and emissions reduction objectives are achieved while protecting, and indeed enhancing, our industrial competitiveness."

David Taylor, Chief Executive, Sustainable Energy Ireland said: "Ireland faces a major challenge in meeting its commitments under the Kyoto Protocol. The contribution of targeted programmes such as the LIEN is an essential step in helping to achieve our national targets. At firm level, the benefits to be gained are set to increase for those who are committed to reducing their energy consumption levels against a backdrop of a proposed carbon tax and limits on greenhouse gas emissions."

The publication of the recent Report coincides with the official registration of seven new members to the Network.

The new members are drawn from a number of sectors and include — Analog Devices BV; Cadbury Ireland Ltd, Dublin; Cantrell & Cochrane (Ireland) Ltd, Dublin; GlaxoSmithKline, Dungarvan; Masonite Ireland; Merck Sharpe & Dohme; Pfizer Ireland Pharmaceuticals, Little Island.

The Large Industry Energy Network (LIEN) aims to reduce the energy usage and related emissions from the largest energy consuming sites in the country. Members are committed to reducing their energy intensity on an individual basis and recognise the benefits of collaborating with like-minded organisations on innovations and best practice in energy management.

Sustainable Energy Ireland was established on 1 May 2002 as an independent statutory authority charged with promoting and assisting the development of sustainable energy. Sustainable Energy Ireland is funded by the Irish Government under



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with David Ramsey, production Director, Cantrell & Cochrane (Ireland) Ltd, Dublin



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Pat Noonan, Engineering Manager OTC, GlaxoSmithKline, Dungarvan, Co Waterford



Minister for Communications, Marine and Natural Resources, Dermot Ahern, TD, with Paul Connolly, Facilities Operations Manager, Masonite Ireland, Carrick-on-Shannon, Co Leitrim

the National Development Plan 2000-2006 with programmes part-financed by the

European Union.
Contact: Sustainable Energy Ireland.
Web: www.sei.ie

Developments in the Irish Energy Sector

The large attendance at the recent CIBSE seminar on developments in the Irish energy sector underlined the interest within the building services in this subject. The probing question and answer session — coupled with the very incisive responses and subsequent debate — proved not only interesting, but extremely informative.

In recent years the Irish electricity and gas markets have undergone a complete transformation and downstream energy retailing now features both intense competition and considerable innovation. New technology is providing new ways of doing business, with the consumption of energy from renewable sources steadily increasing as a result of both policy action and private sector entrepreneurship.

The first session on the evening was entitled "Liberalisation of Ireland's Energy Markets". It dealt with current policies and future trends in the regulation of the energy marketplace.

Speaker was Ms. Keelin O'Brien, Manager Electricity Trading, Commission for Energy Regulation

Session two was called "Opportunities for Renewable Energy", the speaker being Tom Halpin, SEI Customer Awareness Division. Despite their large potential, only a fraction of Ireland's renewable resources have been tapped so far, according to Tom. He went on to outline the current status of — and prospects for renewable energy technologies in Ireland, and the role of SEI on policies and measures on sustainable energy.



Keelin O'Brien, Manager Electricity Trading, Commission for Energy Regulation with Brian Sterling, CIBSE Republic of Ireland Branch Chairman, and Tom Halpin, SEI Customer Awareness Division



Alex Foran with Alan Winter

Air Tightness Testing of Buildings

Despite the enormous development and advances in performances in the thermal insulation properties of all modern building materials to give a better overall fabric U-value, the infiltration load causes the majority of the overall heating demand that the building requires.

There is a perception that once the correct materials are used, then the energy consumption of the building should

be within the current guidelines. However, the effects of a poorly-constructed building on its energy demands are dramatic and, with the prospects of the imposition of carbon taxes in the not too distant future, it is a grave concern for many property owners. This seminar set out the procedures and requirements necessary to ensure handover of a properly-sealed building which would meet all the current energy

ratings.

Speaker was Tony Jamieson, Research Consultant, Training Solutions. Subjects covered included BSRIA Research Pre & Post Specification; Testing Procedures; and Current Energy Ratings of Buildings.

Those in attendance included end users, specifiers and engineers involved with HVAC systems, energy managers, and a cross-section of building services professionals.





**GALLOWAY
ACOUSTICS**

By



SETTING THE FUTURE STANDARDS ON SILENCE TESTING



Galloway Acoustics (a division of Galloway Group Ltd) has just completed the second stage in a comprehensive product development and test programme. The first stage involved Salford University being commissioned to test a new range of silencers to BS 4718 and ISO 7235. The complete test rig, the first of its kind to be UAES accredited for those test procedures, was designed, manufactured and installed by Galloway Acoustics. Static insertion loss, inlet and outlet regenerated air noise and pressure losses were measured to both standards. In the case of ISO 7235 the procedure requires static insertion loss to be reported in 1/2 octaves, thus providing Galloway Acoustics with useful insertion loss data for use with tonal noise problems. The second stage has involved the testing of several acoustic louvre designs including a 150mm deep option and a wide range of acoustic enclosures/screen panel systems. The third stage has just begun and includes further unique products soon to be available from Galloway.

Galloway Acoustics offer a comprehensive range of acoustic products including silencers, slimline louvres, enclosures, doors, (including fire-rated), vibration isolation equipment and acoustic materials, all designed and tested by a highly-qualified team of Technical Sales Engineers aided by hi-tech CAD and computer software programmes.

For further information please contact the Sales Office



Fitzwilliam House,

Industrial Estate, Blessington, Co Wicklow

Tel: 045 - 851 500; Fax: 045 - 851 501

Email: sales@ventac.com; sales@actech-group.com

Web: www.ventac.com; www.actech-group.com

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Manotherm Limited

4 Walkinstown Road, Dublin 12.

Tel: 01 - 452 2355/452 2229; Fax: 01 - 451 691

email: manotherm@eircom.net

'PRESSURE MEASUREMENT IN THE WATER INDUSTRY'

Gems Sensors/Manotherm Seminar at
Water & Waste Treatment Show

Venue: RDS, Dublin

Date: Thursday, 27 March 2003 Time: 10.20am