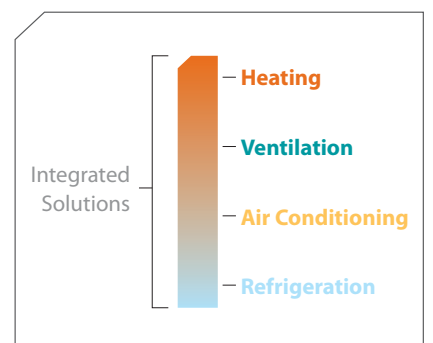
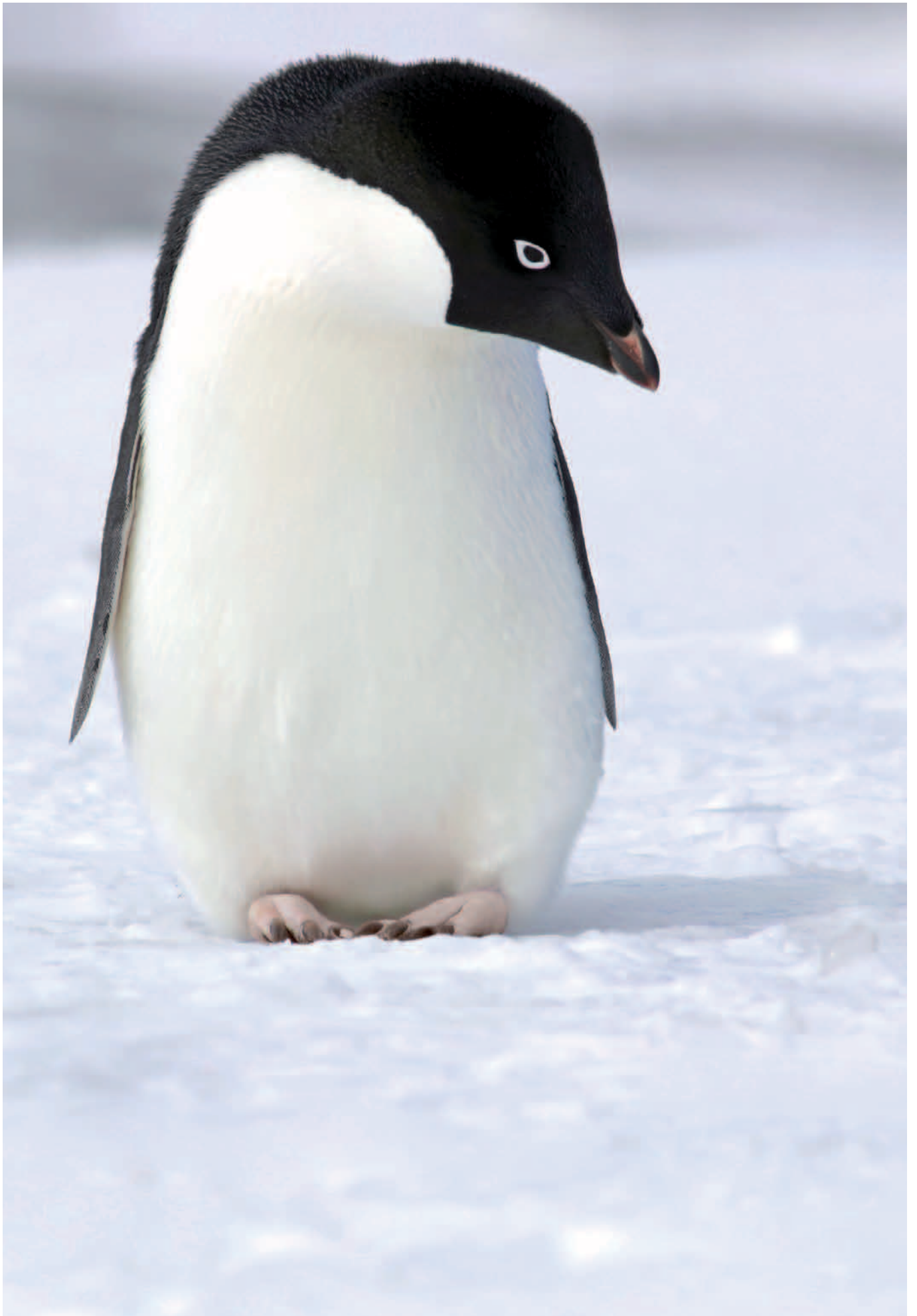




Refrigeration in focus

Integrated solutions for commercial and industrial applications





Who's focusing on your refrigeration needs?

Energy efficiency... Running costs... Noise levels... Carbon emissions... Global warming potential... Few people who open a refrigeration cabinet ever think about the multiple challenges and issues surrounding refrigeration in today's demanding market.

At Daikin we think about it all the time. It's why we have developed - and continue to develop - the most advanced refrigeration solutions for all kinds of medium temperature (10°C to -20°C) and low temperature (-20°C to -45°C) applications to power cold rooms, freezers, chilled and frozen food cabinets.

Our refrigeration condensing units and heat recovery solutions are at the heart of refrigeration systems for all kinds of stores, restaurants, hotels and food production environments. So, we're totally focused on optimising efficiency, versatility and controllability for our customers.

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Award recognition

Highly Commended | RAC Cooling Awards 2011

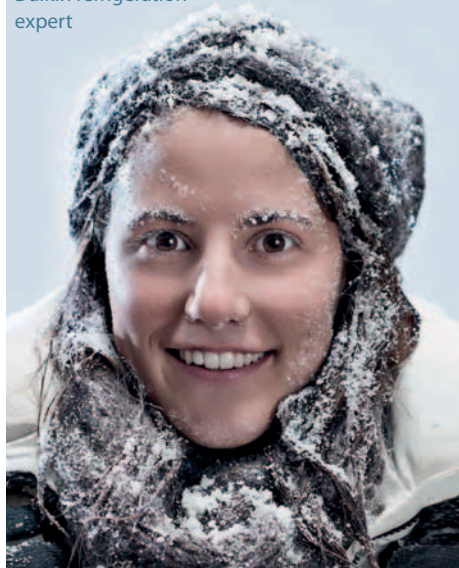
'Refrigeration Innovation of the Year' for Daikin ZEAS

Trust us: we understand refrigeration

Rob,
Daikin refrigeration
expert



Marion,
Daikin refrigeration
expert



Patrick,
Daikin refrigeration
expert



As shoppers adapt to cope with diminished household budgets, the popularity of frozen food is growing year on year by 6.1%, with the frozen meat and poultry sector growing by 13.2%, according to data from Kantar Worldpanel in March 2012.

Meanwhile, chilled foods remain popular within convenience stores for customers on the go. So efficient and reliable refrigeration and freezer units are crucial to retailers' profitability.

Daikin Airconditioning UK Ltd (Daikin UK) offers a flexible range of refrigeration solutions, that have the versatility and wide temperature range to incorporate many different combinations of cabinets, freezers and cold rooms.

Every system is designed to be totally reliable and highly efficient, powered by a condensing unit that has an extremely small footprint and low sound levels.

"Retail food outlets in the UK are responsible for around 3% of total electrical energy consumption and 1% of total greenhouse gas (GHG) emissions, with major retail food outlets alone responsible for around four million tonnes (Mt) of CO₂ annually.

A large proportion of these emissions can be attributed to refrigeration and, therefore, improving the efficiency and reducing emissions from refrigeration units could provide significant carbon savings."

Refrigeration Roadmap, Carbon Trust, March 2010

At Daikin, we look at the entire Life Cycle Climate Performance of an air conditioning unit, based on its energy consumption over the lifetime of the system, as well as the global warming equivalent of any direct refrigerant emissions. This gives a much more accurate picture of the true global warming impact of a unit throughout its lifetime.

The choice of refrigerant is a key factor in the drive to maximise energy efficiency and minimise the global warming potential of the latest refrigeration systems.

At Daikin, we assess the use of refrigerants based on five key factors: ozone depletion potential; global warming potential; energy efficiency; affordability; and of course safety. That's why we currently use R410a in our refrigeration systems - because it is highly energy efficient and has low global warming potential.

However, we are also investigating the future use of other refrigerant options such as R32, propane (R290) and CO₂ (R744). Each one has its own advantages and disadvantages. But you can be assured that Daikin will only launch a new product range when we are completely satisfied that the refrigerant we use meets all the necessary criteria.

We're always thinking about efficiency

At Daikin, we're always thinking of new ways to make refrigeration more energy efficient. From heat recovery solutions such as CVP to packaged refrigeration condensers like ZEAS, Daikin has the answers to all kinds of refrigeration challenges.



Daikin offers a comprehensive portfolio of proven products for a wide range of applications. These innovative solutions make Daikin a perfect partner from the very start.

The most efficient solution to your needs

Daikin CVP refrigeration solutions are ideal for low and medium temperature applications in convenience stores, restaurants, catering, food production and retail environments.

Our ZEAS refrigeration condensing units have a small footprint and utilise R-410A refrigerant, which requires less piping, for maximum flexibility and energy efficiency.

Extremely quiet operation is guaranteed. And because they are factory tested and fully packaged, ZEAS condensing units are quick, easy and cost effective to install too. So they offer a rapid return on investment - and that's something that everyone appreciates.

Take a closer look at our innovative and integrated refrigeration solutions and you'll understand why Daikin can deliver the most efficient and versatile answers to your needs.



ZEAS condensing units

ZEAS is a packaged condensing unit that's ideal in restricted spaces and sensitive locations where low noise levels are an important consideration.

With a COP of up to 3.0 and a temperature range from 10°C to -45°C, ZEAS is designed especially for applications with fluctuating loads and high energy requirements such as supermarkets, restaurants, petrol station forecourts and food processing plants.

The ZEAS range spans seven sizes and multiple combinations (5-20HP), for mid-temperature applications from 10°C to -20°C, as well as low temperature applications down to -45°C.

Yet despite its compact size and extremely quiet operation, a single ZEAS 5HP unit can power up to 3 standard chilled cabinets for dairy and beer/wines/spirits. So it's ideal for convenience stores and garages, plus many kinds of restaurants, catering operations and food production environments.

Superior efficiency and control

The ZEAS system is based on Daikin's highly successful VRV technology, which is renowned for its energy efficiency and controllability. The inverter adjusts the power used to suit the actual requirement, gradually increasing its output based on the refrigeration capacity needed. So there are no voltage peaks and energy consumption is therefore 30% lower than a traditional on/off system.

Inverter control also shortens system start-up time, so that the required temperature is reached more quickly and temperature fluctuations are avoided. Then as soon as that temperature is reached, the inverter ensures that it is constantly maintained.

The unit is also equipped with an economiser function, which provides significant improvements in the ratio of refrigeration capacity to power consumption, when compared with standard systems. These advanced features ensure that ZEAS operates extremely efficiently, helping to reduce energy consumption and carbon emissions.

Low global warming potential

ZEAS condensing units use R-410A refrigerant, which has a lower global warming potential than R-404A and zero ozone depletion potential. This refrigerant has around 50% less environmental impact than R404.

R-410A also has a larger heat transportation capacity than R404A and R134a, so the refrigerant can be delivered via more compact components and smaller piping sizes. In a like for like comparison, piping costs were reduced by over 50%. But despite the lower installation costs, ZEAS still delivers the same capacity as systems using standard sized components and piping.



Quiet operation

With a specially designed sound absorbent casing, the units have a programmable night mode offering reduced noise levels. They use scroll compressors, which are much quieter than traditional compressors, and inverter controls reduce overall noise levels too. The inverter driven fans also have optimised blades and grills to reduce turbulence and noise even further.

The ZEAS range:

Features

- > Various models available in single, double or triple compressor systems (from 5 to 20 HP)
- > R410A refrigerant for minimal environmental impact and maximum energy efficiency
- > Flexible: VRV® (Variable Refrigerant Volume) technology for wide application range

Benefits

- > Fully equipped, factory tested and pre-programmed for quick and easy installation and commissioning
- > Market leading efficiencies: high COP of up to 3.0 delivers a rapid return on investment
- > Energy efficient: DC inverter scroll compressor with economiser function for efficient and reliable performance
- > Reduced CO₂ emissions: thanks to high energy efficiency and inverter control
- > Small footprint: allowing flexible design and larger capacities even in small spaces
- > Dramatically cuts installation time and cost for end users
- > Minimal noise: low operating sound level, ideal for residential areas
- > Longer lifetime: strong anticorrosion housing for long life, even in harsh environmental conditions.

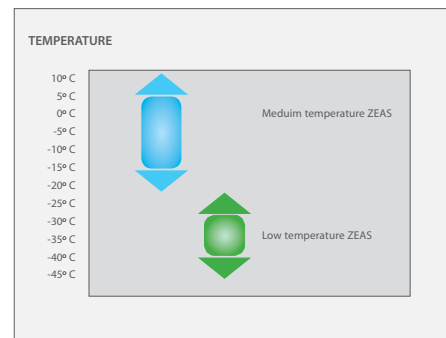
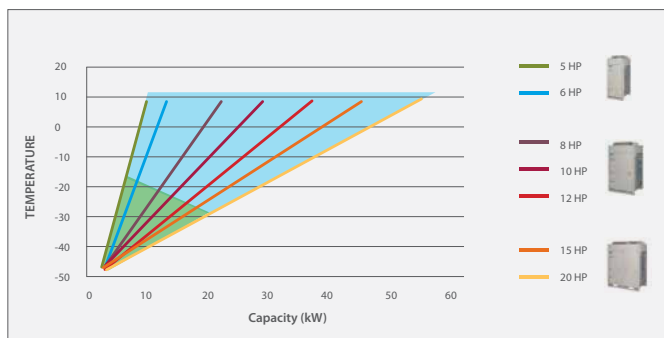


Illustration only. See technical data for exact specification

CVP heat recovery solutions

CVP combines heating, air conditioning, refrigeration and freezing in one compact yet revolutionary system, so separate air-conditioning and refrigeration condensing units are not required.



This unique solution recovers up to 100% of the heat extracted from the refrigerated showcases and uses it for heating and air curtains. Combined heating, cooling and refrigeration solutions can cut energy costs by as much as 57%.

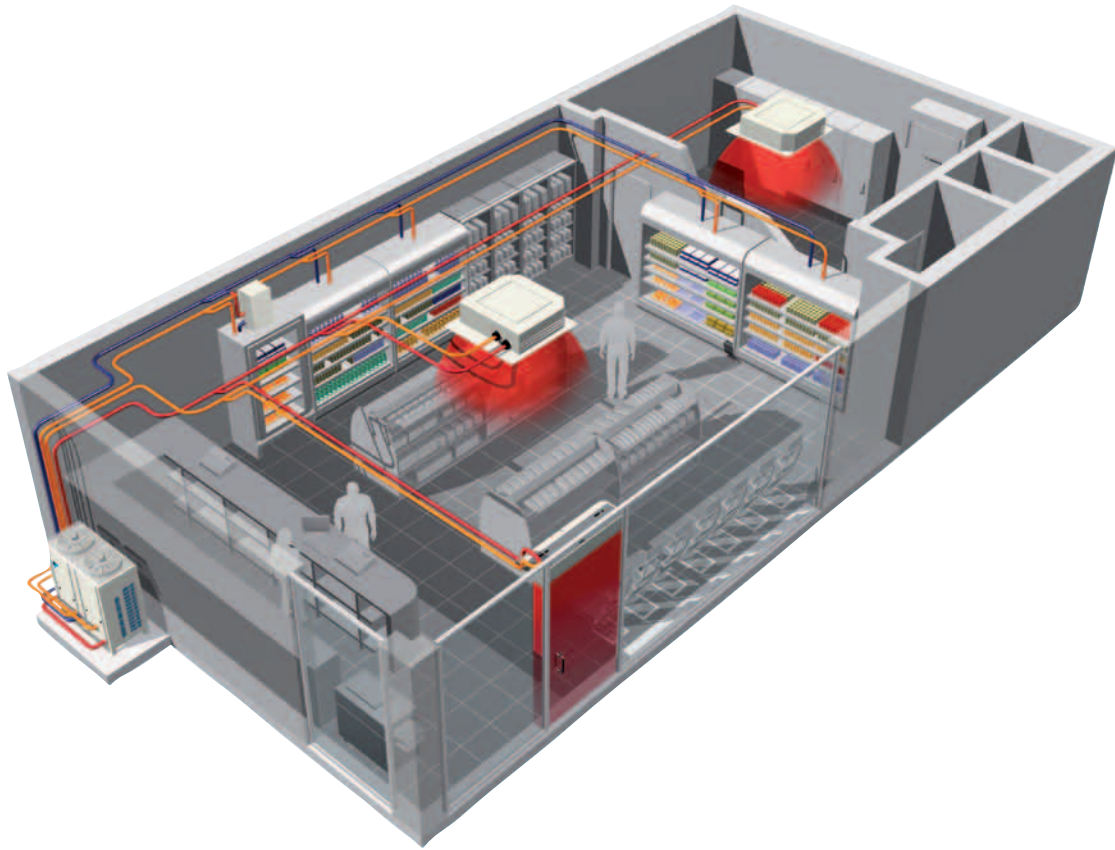
Designing flexibility into the system so the temperature can be controlled, zone by zone, is important in maintaining the ideal conditions for customers and staff. Equally important is the ability to recover the significant amount of waste heat generated by refrigeration cabinets, as this free heat can be re-used to cut the cost of running door air curtains, heating and hot water.

In premises with higher refrigeration requirements, indoor comfort can suffer, with ambient shop temperatures being unstable and often too hot or too cold. Conventional solutions to these problems - such as fitting additional heating or cooling - are neither cost effective nor energy efficient. CVP has been developed to meet these needs.

CVP saves budget retailer almost 35% running costs

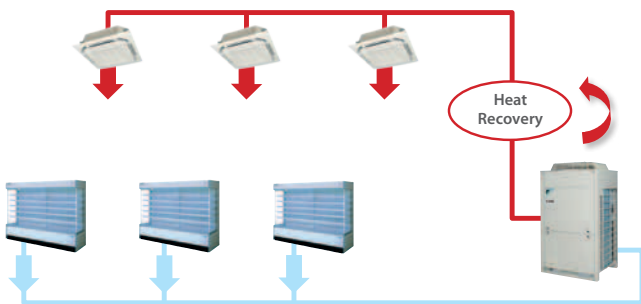
A well-known discount supermarket recently installed the CVP system at a store in North Yorkshire. This shop had the same 1000 m² of floor space and similar load requirements as another branch in Derbyshire, which used a large condensing unit for refrigeration and a separate gas boiler system for heating.

The energy consumption for both the shops was measured over a 15 month period and it was found that the shop utilising the CVP heat recovery system used 34.8% less energy than the one using conventional heating and refrigeration systems. The CVP systems also saved more than 7000kg of CO₂ compared with the traditional system over the same period.



CVP offers a uniquely integrated approach to refrigeration, air conditioning, heating and hot water generation, thus minimising total energy demand and reducing energy bills. Already, 2,000 of these systems are in operation, so CVP is a tried and trusted technology.

It is a versatile solution for medium and low temperature refrigeration, with integrated cooling, heating and heat recovery. The system recovers up to 100% of the heat extracted from refrigeration cases and re-uses it for indoor heating at no additional cost.



The system enables a demand-driven exchange of heat between refrigerators and freezers, air curtains and indoor air conditioning and heating units. Optimised controls, inverter technology and heat recovery mean that CVP can reduce annual energy consumption by as much as 57%. And this also means significantly lower carbon emissions.

This is hugely beneficial for retailers and caterers, who have a growing need to display fresh goods, prepared meals and chilled drinks, but are experiencing stricter environmental restrictions and rising energy costs, which need to be kept under control.

A completely flexible solution

CVP is ideal for small and medium sized shops and convenience stores, being a low noise system with a footprint 60% smaller than conventional refrigeration systems and reduced piping requirements, thus minimising the installation space required.

However, the system can also be easily expanded to meet the needs of larger spaces. Outdoor units can be grouped into blocks or rows, or distributed around the building to suit the constraints of the building.

One recent project involved developing an effective and efficient solution for a 500 sq.m supermarket with 12.5 m of freezer display cases and different temperature zones, utilising a combination of CVP and ZEAS units to deliver the freezing capacity.

This provided an end-to-end solution without complex planning and time consuming on-site installation, as everything was preassembled and energy-optimised at the factory.

Integrated refrigeration solutions



CASE STUDY - McColls convenience store

Whenever a new McColls convenience store opens up in a new neighbourhood, efficient refrigeration systems are crucial to its success. McColls' air conditioning and refrigeration systems are serviced and maintained by Cold Service Ltd, a Daikin D1 Installer.

At the McColls convenience store in Fareham, an outdoor unit was required for connection to eight refrigerated cabinets within the store. However, the surrounding residential area meant that noise was a particularly sensitive issue. The restricted outside space required an outdoor unit with a smaller footprint than normal, while still meeting exceptional energy efficiency levels.

Cold Service Ltd selected a ZEAS condensing unit to provide cooling to the cabinets.

ZEAS inverter controlled condensing units are ideal for medium and low temperature refrigeration applications. The model chosen was a 10HP medium temperature unit (LRMEQ10AY1) able to deliver temperatures from -20°C to +10°C.

With a capacity of 25kW, the ZEAS unit offers energy efficiency levels of up to 300%, (a COP of 3.0), yet it has a small footprint of just 930 x 765mm and very low sound emissions of just 59dBA at 1m, making it an ideal solution for premises in built up areas where energy efficiency is paramount.

Mark White, Design Manager for Cold Service said: "Energy efficiency was a high priority for our client and this, coupled with the residential nature of the surrounding area, led us to specify the Daikin ZEAS system. Its small footprint meant that it was the ideal fit for the restricted outside space.

"We are currently monitoring both the noise and the energy efficiency levels at the store. We have been extremely happy with the performance and ease of installation. We are looking forward to analysing data from the test results."

ZEAS is ideal for urban environments

Offering a complete solution for contractors, ZEAS is fully equipped, factory tested and pre-programmed for quick and easy installation and commissioning.

Nick May, Refrigeration Product Manager, Daikin UK says: "The 'plug and play' nature of the ZEAS condensing unit, combined with its energy efficiency, low noise levels and small footprint, makes it extremely attractive to installers and specifiers alike and perfect for this application."



CASE STUDY - Daikin keeps London ICEBAR cool

The ICEBAR BY ICEHOTEL at Heddon Street, London, is a cold sensory environment where the walls, bar, tables and even the cocktail glasses are hand crafted out of ice from the River Torne in Jukkasjärvi in Northern Sweden.

The initial requirement was for an additional cooling system to create a -5°C ambience in the bar area, in order to preserve the ice sculpture. Work began with the installation of a ZEAS inverter controlled condensing unit. However, after the consultant saw the energy saving potential of the ZEAS unit, the upgrade programme was extended to incorporate other areas including the restaurant, which required comfort cooling to 21°C.

The project included the ZEAS 20HP (LRMEQ20AY1) and 10HP (LRMEQ10AY1) medium temperature condensing units with the ability to deliver temperatures from -20°C to +10°C. These models have small footprints of just 1,240 x 765 mm and 930 x 765 mm respectively, both with very low sound emissions at 1m.

The installation, which provided an ideal solution for this application due to its high and fluctuating energy efficiency requirements, was carried out by A C Direct Ltd, of South

Woodford, London, a Daikin D1 installer who offers a high standard of installation and service.





CASE STUDY - Hospital in Kiel

Daikin sells these products throughout Europe, as this example shows, in which Martin Klix, Pschorn Kälte - und Klimatechnik recounts his experience of installing ZEAS at a hospital in Kiel.

What made you choose the ZEAS and two boosters for this project? Did you consider other comparable solutions?

A combination system could have been an alternative option. But the truth is: there aren't any directly comparable solutions! That is very clear to me, now that the system has been installed.

What were the key benefits?

"There were several – including low-noise operation with only 49 dBA, the indoor installation of the system and the booster technology. We managed to combine two freezer cells with medium-temperature refrigeration and only had to set up one system."

Were you satisfied with the installation of the ZEAS and the booster?

"The installation was extremely easy. I'm really impressed! Everything was perfect - no problems at all!"

Where do you see the potential for ZEAS in your business?

"I see it having a huge potential for us in the company. I was already planning to gradually expand our refrigeration business - and ZEAS clearly supports this decision."



CASE STUDY - Spar store and petrol station

Highly efficient Daikin refrigeration units were incorporated into a major project to rebuild and expand a Spar store and petrol filling station in Whitehaven, on behalf of Hills of Corby Hill Ltd, which runs 13 petrol filling stations and convenience stores throughout Cumbria.

The project had to meet exacting standards, delivering maximum levels of energy efficiency, without disturbing the neighbours. It was also important that the facility was able to continue trading during the extension and refurbishment programme.

The design team worked closely together with Daikin UK to ensure that a highly energy efficient and ultra quiet solution was found, which could fit into a tight space. Daikin UK supplied a CVP condensing unit to serve four large display cases (4.44kW) and one smaller display case (2.96kW), all with glass doors at -6°C evaporating temperature.

The CVP outdoor unit maximises energy efficiency as it recovers the rejected heat from the display cases and recycles it to supply heat and hot water for the shop. In this case, three recessed ceiling cassettes were specified. The outdoor unit was able to provide 20.72kW of refrigeration up to an ambient temperature of 35°C and provide up to 37.5kW of heat in winter or 13.51kW of cooling in summer.

A ZEAS condensing unit was also used in conjunction with the CVP unit. The ZEAS unit serves three display cases, all fitted with glass doors and with an evaporating temperature of -6°C, providing a total of 8.15kW refrigeration capacity up to an ambient temperature of 35°C.

The optimum refrigeration solution

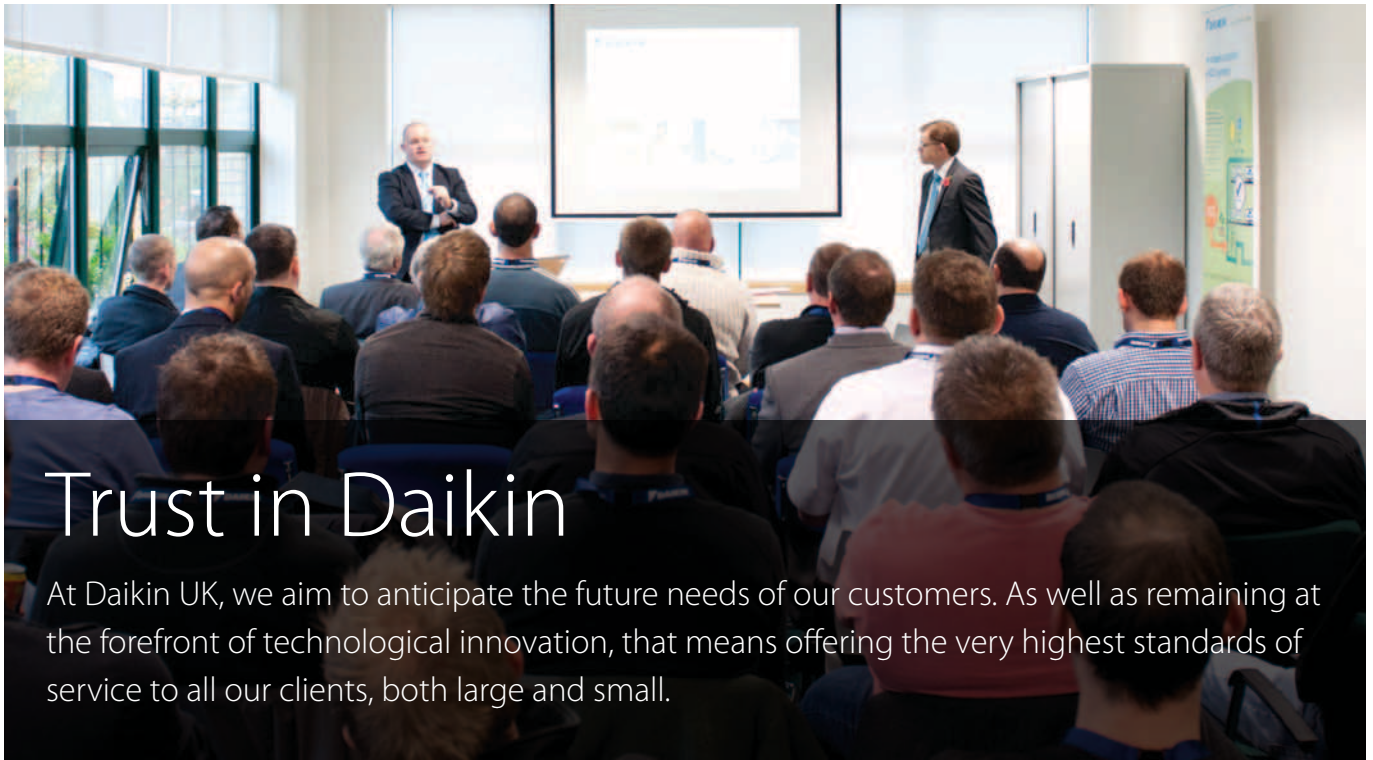
By combining CVP and ZEAS condensing units, the optimum refrigeration, heating and air conditioning solution can be provided for virtually any retail concept.

Kevin James, Director of Eiskalt (UK) Ltd, who installed the system, said: "As an accredited Daikin D1 Partner, Eiskalt is used to installing these products, which were perfect for this

project. As well as their proven energy efficiency, CVP and ZEAS have a small footprint and quiet operation, which was vital in this instance due to the close proximity of houses. The comments we received back have been superb and we are delighted with how well the condensing units work with our refrigeration cases."

Rob,
Daikin refrigeration
expert





Trust in Daikin

At Daikin UK, we aim to anticipate the future needs of our customers. As well as remaining at the forefront of technological innovation, that means offering the very highest standards of service to all our clients, both large and small.

Training for best practice

As part of Daikin UK's commitment to quality, we offer customised product training at our industry leading technology centres in Birmingham, Bristol, Glasgow, Manchester and Woking. These training courses are designed to raise standards, set industry benchmarks and help to develop both product and service expertise to support best practice in the industry.

Investment in skills

Daikin UK partners with specialist technical colleges - City of Bath College, College of North West London, Dudley College, West Suffolk College and PGL Training Exeter. We have also created the first HVAC Manufacturer Hub to be accredited by the National Skills Academy.

This investment in the very highest standards of skills training ensures that Daikin trained engineers have the necessary expertise to deliver the highly energy efficient systems on which our buildings and businesses will depend.

Application assistance

When it comes to system design, we can provide application design assistance and technical support at every stage. Dedicated software tools are available to help specifiers design the optimum solution. Daikin Specified Solutions Engineers are available to assist.

Dedicated sales advice

As part of our commitment to ongoing service and quality, Daikin offers pre-sales and after-sales support and advice at all regional offices. Our dedicated sales teams include our Corporate Clients division, which develops the best possible framework agreements for national operators, while our network of regional offices will provide local expertise, technical advice and design support for individual projects.

Specialist on-site support

Daikin UK has a team of expert engineers based at our regional offices nationwide, operating throughout the country to assure satisfaction for our customers. If you require additional support with installations, you can rely on a quick response from a highly qualified Daikin UK engineer.

Daikin product warranty

Daikin UK offer industry leading comprehensive warranties for extra peace of mind supported by our nationwide network of engineers.

Comprehensive service support

Daikin UK offers comprehensive service support for all refrigeration products:

- > Expert and experienced advice
- > Local fast response
- > Nationwide network of Daikin trained service engineers

Contact Details

Pre-sales enquiries

Please contact your local regional sales office

After sales technical support

0845 641 9200/2845 641 9277

Warranty 0845 641 9275

Training 0845 641 9260

Spares 0845 641 9230

Commissioning 0845 641 9229



Visit www.eca.gov.uk/etl and type 'Daikin' in the quick search box for details of the latest ECA qualifying Daikin units



Daikin Europe N.V. participates in the Eurovent Certification Programme for Air Conditioners (AC), Liquid Chilling Packages (LCP) and Fan Coil Units (FC); the certified data of certified models are listed in the Eurovent Directory. Multi units are Eurovent certified for combinations up to 2 indoor units. VRV products, Rooftops, FWB-J and FWD-units are not within the scope of the Eurovent Certification Programme.



Daikin units comply with the European regulations that guarantee the safety of the product.

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