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THE GÜNTNER CUSTOMER MAGAZINE

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IN THE FOCUS

64 drainable GFW drycoolers with hinged fans and built-on GWS switch cabinets provide for smooth operations.

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Overview of topics

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Editorial

Dear Readers,

In all walks of life, technical and legal requirements are continually becoming stricter. This makes communication all the more important. Information regarding new products, product applications, operating experience and the implementation of regulations and standards is communicated within our organisation, as well as externally, to customers and intermediaries such as schools and specialist planners. Work conducted within associations and other institutions is also becoming more and more significant. In order to ensure a high standard of communication in all areas, the company Güntner has decided to further develop the Marketing department on a conceptual level. Our previous Head of Marketing, Mr Roland Handschuh, with all of his knowledge and experience, will in future be available for individual projects and communication with institutions and associations, as well as for training sessions. The network which has grown and been maintained for many years will thus be co-organised in a lively way. Since April, Mr Bernd Oehlerking is responsible for all customer-relevant issues. With more than 20 years of experience in refrigeration and air-conditioning engineering, Mr Oehlerking was formerly responsible for national marketing at Carrier in Germany and for international marketing at Airwell.

Roland Handschuh
Senior Marketing Expert

"I look forward to being able to pay due attention to my tasks as Senior Marketing Expert. From now on, I will mainly be attending to the supervision of individual projects, e.g. in-house development of software such as the Güntner Efficiency Calculator (GEC), the expansion of our knowledge transfer activities and communication with institutions and associations."

Bernd Oehlerking
Head of Product and Sales Marketing

"For Güntner, communication with the customers is a key strategic task which has a major influence on the success of the company. As an innovative technology company with considerable depth of know-how, it is particularly important for us to use such communication in order to build on our status as a market leader. To this end, we will be doing more to communicate our brand positioning in a clear, authentic, exciting and eye-catching manner."

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Güntner‘s corporate citizenship

A temporary home

Güntner is financing an apartment in Ronald McDonald House, Bad Oeynhausen.

A study conducted by the Argo Institute at the University of Groningen (NL) has shown that the healing process of sick children is considerably faster if the children continue to be looked after by their families when in hospital. For the parents, in addition to the psychological strain, this is often a financial challenge, because this usually involves longer stays.

For this reason, in 2001 the Ronald McDonald Foundation built a parents’ house for the relatives of young patients at the Heart and Diabetes Centre North Rhine-Westphalia, so that the relatives could find a home away from home, which offers them a place of retreat and a chance to exchange with others in similar situations. With an appeal for donations in the local press, the required sum was raised in three months; Güntner also helped by making a donation.

Frank Gehry, internationally renowned architect and winner of numerous prizes, was enthused by the project and donated the design of the house, which represents his vision of a temporary home.

The guesthouse at Bad Oeynhausen now has 12 apartments which are financed by sponsors. Each year, around 180 families find a temporary home in the parents’ house. The Güntner apartment has offered families a home since 2002, because it is also important to take on social responsibility, especially in difficult times.

A meeting place for affected families

Event calendar

Upcoming trade fairs and events

Event	Country	City	Dates
Energie Froid Snefcca	France	Lyon	29/09/2010 to 30/09/2010
Chillventa	Germany	Nuremberg	13/10/2010 to 15/10/2010
Energie Froid Snefcca	France	Metz	24/11/2010 to 25/11/2010
KGH Congress	Serbia	Belgrade	02/12/2010 to 03/12/2010

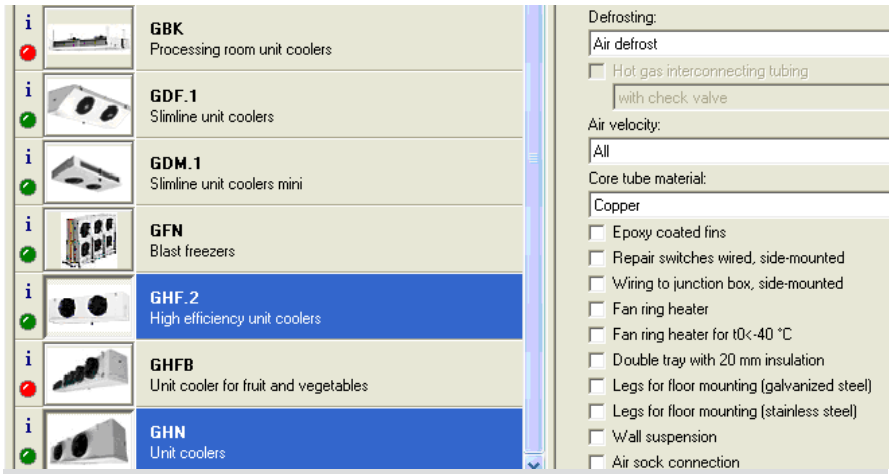
GPC news

Quick and reliable design work

Güntner is continually working on enhancements to the selection software GPC.

A customer satisfaction survey conducted by Güntner shows that users of our Güntner Product Calculator (GPC) consistently rate it as very good. This result gives us further incentive to continue striving to enhance the software.

The GPC now already has numerous functions which assist you with the details when dimensioning the optimal unit for your application. For instance, the traffic light and storage symbols help you to find the right unit quickly and easily.



The traffic light symbol helps to speed up the selection process

Traffic light symbol

The colour of the traffic light gives you important information on how suitable a series of units is for your chosen application, already at the start of design work. The colour red indicates that the unit is unsuitable for the chosen application. Yellow represents limitations with regard to the selected series. A click on the traffic light symbol displays a list of the specific reasons why a unit is unsuitable, or of limited suitability. If the colour is green, the unit can be used for the chosen application without reservations.

Upon pre-selection of the accessories, the traffic light provides information as to which series have the selected accessories. The result list then also shows you the price, including accessories, which quickly and reliably helps you to find the most economical complete solution.

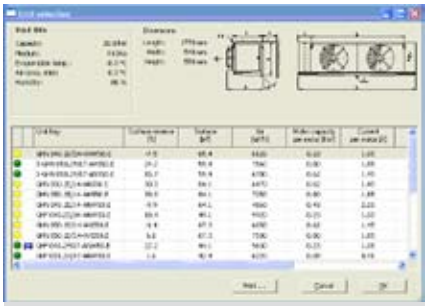
Storage symbol

For series which are frequently requested, Güntner keeps standard units in storage, so as to allow delivery times to be kept as short as possible. These series are marked with a shelf symbol and colour-coded.

A blue shelf symbol indicates that units in the selected series are in storage, although in a version of not exactly the same design (possibly with different defrost mode). If the cursor is placed over the storage symbol, information appears which specifies how the unit differs from the selected variant.

A green storage symbol means that the unit with the selected design is in storage.

The units in storage have such short delivery times because they are sold off the shelf, i.e. without further modification.


The storage symbol provides information about availability

Selected models in the evaporator series GDF/GDM and GHF, as well as in the condenser series GVM and GVH/GVV, are available as units in storage. In the series GVH/GVV, this applies to units up to around 150 kW.

An update for the current GPC version will be available in autumn. The new revised version is planned for the end of the year.

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News

High performance, low space requirement

The new drycooler offers a wide range of varieties for all applications.

Since June, Güntner offers an impressive new addition to its drycooler range: the V-coil drycooler GFD is a completely new development and offers numerous advantages for applications.

Eight basis models enable dimensioning of the right unit for every application. This is made possible by high flexibility regarding the fin and tube geometries and the large range of heat exchanger coil varieties. The proven Güntner floating coil system relieves the fluid-carrying core tubes and thus protects them against leakage. On just four supports, the GFD provides high stability, while also allowing savings to be made on site, as regards the substructure.

The GFD is delivered ready for use, so it is not necessary to install individual components on site. For transport and positioning, each unit requires only two crane lugs; these can be moved, so that transport by crane can also be realised easily without a lifting beam. Despite their impressive size, the units can be transported via truck.

In addition, the new GFD provides air-side separating plates as standard, for optimal fan control. From the combination of materials, to performance, to compliance with noise control requirements, through to pre-wiring of the controller in the factory, the new GFD ticks all the boxes.

Numerous options and comprehensive accessories are available, and of course the device is also Eurovent certified. In short: a well-thought-out systematic solution for any application!

If you would like to know more about our new GFD drycooler, send a request for our info brochure to info@guentner.de or visit our website www.guenter.de!

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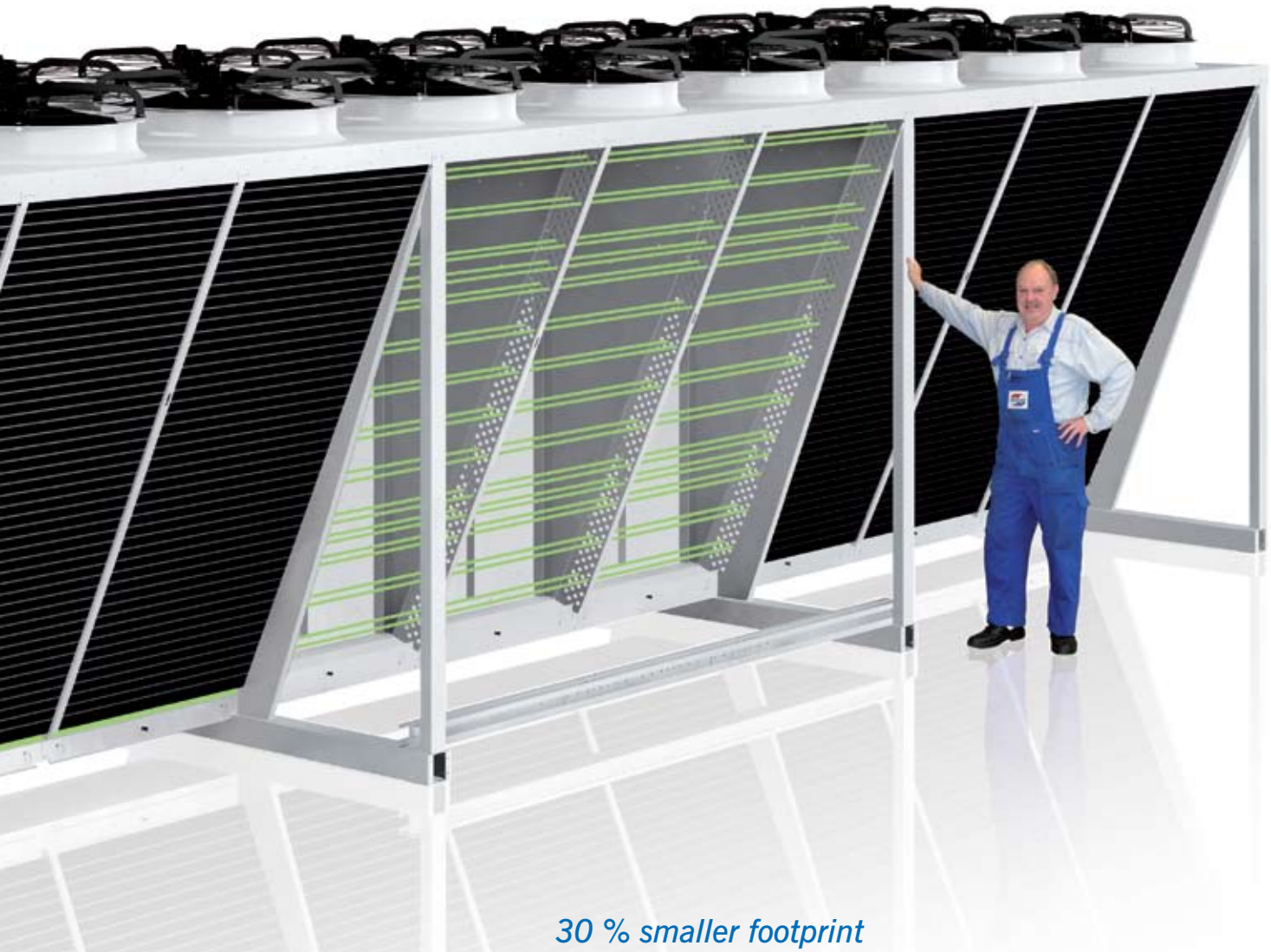
40 % more power

20 % less power consumption

20 % higher fan efficiency



30 % smaller footprint

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Report

Güntner drycoolers for expansion of Peiner Träger GmbH steelworks

64 drainable GFW drycoolers with hinged fans and built-on GWS switch cabinets provide for smooth operations.

Every new order has its own special requirements regarding the selection and dimensioning of refrigeration components. Technical knowledge, and of course experience, are always necessary in order to be able to advise the customer appropriately. Thus, with close cooperation between Güntner and Peiner Träger GmbH, an individual solution was found which precisely meets the requirements of the application.

In "Project PTG 2010 – Steelworks", Peiner Träger GmbH planned to expand the existing electric steelworks in Peine. For expansion of the steelworks, the existing production line, comprising an electric arc furnace and a pan furnace, was to be supplemented by another production line, for which another electric arc furnace and two pan furnaces were planned. Due to the different temperature requirements of the respective cooling water circuits, the recooling of the smelting furnace had to be realised by means of three separate cooling water systems. For two of these cooling water systems, Güntner manufactured 64 GFW drycooler units, with a total capacity of 113 MW. Alongside delivery of the units, the scope of services provided by Güntner also included assembly, all electrical installation work and the commissioning of the units.

Güntner delivered a total of 64 drycoolers for this installation

At the time of order placement, the steel structure of the pump house, on which the drycooler units were to be installed, had already been designed. Thus, the footprint was predefined and limited from the very start. The space-saving design of the GFW drycoolers ensured that the units could be installed on the pump house's predefined roof surface at a height of 21 m.

By means of a crane, the units were placed on a balcony beside the pump house roof. From there, they were conveyed to their respective final positions with pushed trolleys. For easy and time-saving cleaning and maintenance, the drycoolers are equipped with hinged fans.

The GWS switch cabinets, made from stainless steel at the customer's request, ensure energy-optimised control and low-noise operation. The units can be controlled with up to 12 different power levels. It is planned that the entire cooling system will be operated in an energy-optimised night mode, which enables considerable energy savings to be made.

Although the exterior conditions were largely predefined at the start of the project, an individual solution was developed with close cooperation between Peiner Träger GmbH and Güntner. The water supply and distribution construction management team in charge of technical planning and construction of the recooling systems for the Peiner Träger project PTG 2010 was visibly impressed by Güntner: high levels of professional competence and manufacturing competence, precise solution proposals covering all details, as well as good cooperation with Güntner staff and their personal dedication to this project were all received very positively by Peiner Träger. The result is a successful project for Peiner Träger and for Güntner.

The hinged fans make cleaning easier

Switch cabinets adapted according to customer specifications

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Report

Germany's most modern bakery in Bergkirchen

As of February 2010, bakery products are produced in Bergkirchen for 1,100 REWE, TOOM and PENNY outlets.

Glocken Bakery was taken over by the REWE Group in 1986.

The company Glockenbrot Bäckerei GmbH & Co. oHG produces bakery products at the bakery Backwerk Süd (in the district of Dachau, near Munich) for outlets all throughout Southern Germany. This involves processing 100 tonnes of flour every day.

But it is not only the manufacturing technology which meets the highest of standards. Already during planning, environmental protection aspects and a well-thought-out energy concept were central concerns. For instance, the use of district heating and heat recovery reduces energy consumption by 40 % compared to conventional systems.

Accordingly, from the very beginning, there was also an emphasis on achieving the most positive energy balance possible with regard to the refrigeration system. The refrigeration system was planned and realised by Jan Schulte from the company Schiessl, together with the contracted refrigeration engineering company Peters from Meerbusch.

GGHN drycoolers in cold storage rooms

It was decided that a NH_3/CO_2 cascade system was to be used in order to cover normal refrigeration and freezing requirements, whereby the coolant Temper -20 and ice water are also cooled by means of the NH_3 compound. The cold brine serves the purpose of supplying the Güntner GGHN drycoolers in the pre-cooling rooms; it is cooled in the system by plate heat exchangers with a capacity of 700 kW.

The Güntner CXGHN evaporators used in the deep-freeze rooms have an integrated warm brine defrosting system. The decision to use warm brine defrosting aids the energy efficiency of the refrigeration system, as it contributes to the utilisation of waste heat and saves the additional costs of defrosting deep-freeze evaporators and air coolers in the normal cooling circuit, which electric defrosting, for example, would entail. Heat which is not used for defrosting is dissipated by means of a Güntner GFH drycooler with a thermal capacity of 100 kW.

The warm brine for defrosting is generated with an oil cooler. The system includes six defrosting coils (each 22 kW); in total, there are 16 defrosting points to be loaded. For defrosting in the deep-freeze area, Temper -40 cold brine is used.

The ammonia condenser AGVH has eight step-controlled and two frequency-controlled fans. From the set minimum condensing temperature Tcmin = 32 °C, the fans are operated with a combination of stepless and stepped control.

"Our concept has consistently proven itself," says Jan Schulte. "The system runs without problems and the components are also of the right quality."

CO_2 evaporators in the deep-freeze room

NH_3/CO_2 machine assembly within the container

AGVH NH_3 condenser

Report

EDEKA Ladenburg: thoroughly efficient

The refrigeration system for this grocery market was conceived with a clear focus on lifecycle costs and energy efficiency.

In grocery retail, new refrigeration systems are required for two reasons: firstly, of course, new branches open. Secondly, existing shops are expanded and the enlargement of the sales floor area means that the refrigeration system concept has to be revised or replaced. At the Ladenburg EDEKA branch, the old premises had become too small and for the new building, a new refrigeration system also had to be designed.

The new branch was opened at the start of 2010.

For the new branch concept, there was already an emphasis on sustainability and energy efficiency during planning of the building. The new location on the edge of the township of Ladenburg, with a sales floor area of 1,600 m^2, provides enough space to present the approximately 20,000 articles optimally and to establish a customer-friendly atmosphere.

Energy savings from the refrigeration units to the condenser.

In order to save energy, Epta Cosmos ECO refrigeration units were used in the new shop's deep-freeze department. These units are equipped with sliding glass covers, EC fans and electronic expansion valves. Although the refrigerated shelving is implemented in the form of open refrigerated sales cabinets, very good energy efficiency was also achieved here by means of the new Zero° technology, which enables optimal product temperature with an evaporation temperature of 0 °C. In addition, an evaporation temperature of 0 °C means that no ice forms at the evaporator, so these refrigeration units do not require any defrosting phase at all. Another positive aspect is the use of energy-saving fans and electronic expansion valves. But actual efficiency is only achieved if all components in the circuit are coordinated with each other in an energy-optimised way.


Zero° technology ensures temperature quality in the refrigeration units.

Use of coolant and system control

The centrepiece of the supermarket refrigeration installation is the cascaded combination refrigeration system with the coolant CO_2 for deep freezing and R134a for normal refrigeration. The natural coolant CO_2 enables highly efficient operation as regards deep freezing, whereby supercritical operation is prevented by the cascade circuit. The coolant R134a has only a third of the global warming potential of R404A (which was previously the most commonly used coolant) and also has material properties which enable optimal utilisation of heat recovery. The refrigeration system's heat recovery is used to heat service water and is also used for building heating. Thus, the heat can be recovered almost completely.

The way in which the system is controlled represents another efficiency factor. In order for the output to be optimally adapted to suit the respective requirements, a compressor with a frequency converter is provided for each pressure stage. All electronic controllers in the system are interconnected and linked to a remote maintenance centre via remote data transmission. The remote maintenance and monitoring of operating parameters guarantees that the whole system runs reliably, deviations which could cause faults can be counteracted in good time and, last but not least, energy-efficient system operation is ensured on a permanent basis.

Energy efficiency as an overall concept

Attention was paid to energy efficiency in the cold storage rooms as well. For instance, the evaporators used are from the Güntner GDF series, which includes EC fans as standard and enables particularly quick and easy cleaning. The units also have TÜV-HACCP certification, so they are precisely the right choice for hygienically sensitive areas such as those used for food storage.

For the R134a stage's heat dissipation, the new Güntner GVX condenser with microox® was selected. In comparison to tube-fin heat exchangers, this new technology significantly reduces the condenser's fill volume, in this case by more than 50 %: from 122 to 59 litres. This reduction has a positive effect on the total fill volume and the refrigeration system's TEWI rating. The unit has special flaps which allow thorough cleaning to be conducted quickly.

The fans are controlled by means of Güntner Motor Management (GMM), here in slave mode. This has the advantage that, compared to AC fans, the power consumption of the EC fans is 56 % lower. In addition, the GMM has special functions such as bypass operation, so as to improve operational reliability. Moreover, the GMM also has a clear text display to convey messages and information, e.g. present consumption levels. These can be forwarded via bus connections and analysed.

The GVX condensers have EC fans.

Know-how

AC versus EC motor technology

Everyone is talking about EC technology – but what are its real benefits?

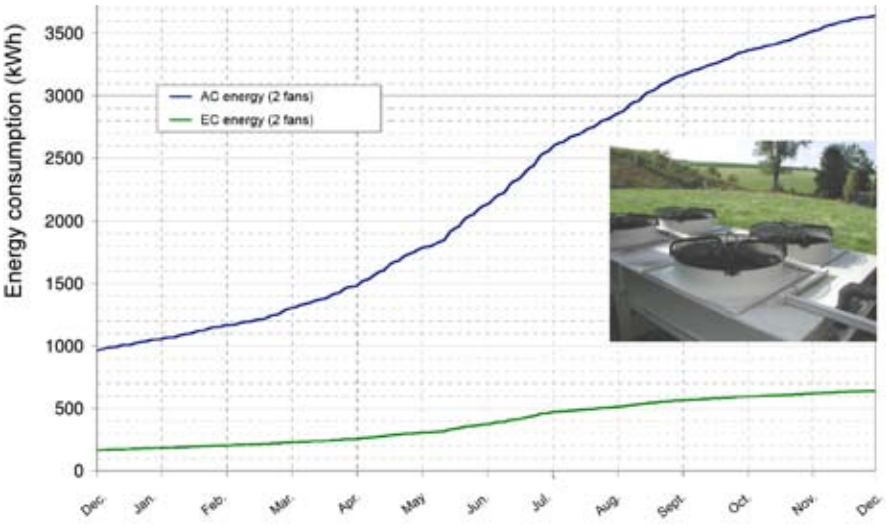
EC motor technology is now the state of the art for fans and most customers now demand that it be used in new installations, in view of the possible energy savings.

But how much can really be saved? Is it worthwhile converting an existing air-cooled condenser from AC to EC fans? In order to be able to answer these questions more precisely, an extensive series of comparison measurements pertaining to a Güntner condenser was initiated in 2006 in a long-term joint project conducted by the companies ebm-papst in Mulfingen, Mayer Kältetechnik GmbH in Kupferzell, Rock GmbH in Kirchberg and Güntner in Fürstenfeldbruck.

The condenser was part of a commercial refrigeration system which was already in operation. The goal was to determine the potential savings of AC and EC fans running in parallel. For this purpose, two of the four motors were replaced with EC motors. All four motors were speed-controlled. The relevant data was gathered and stored separately for each pair of motors, minute by minute. This data was gathered over a period of four years, so as to enable better identification and relativisation of changes caused by seasonal fluctuations in load and outdoor temperature.

Initially, it was evident that the operator was cautiously sceptical as to whether simply replacing the fan motors would yield the hoped-for potential savings and whether the effort of making the measurements was worthwhile. After just half a year, the first evaluations showed a clear trend: analysis of the recordings revealed that the AC fans which remained in the condenser required more than four times as much power as the EC fans. This surprised the operator, especially as he saw that the motors had run for about the same amount of time.

Mr Rock (left) calculates the operating cost savings. Right: Mr Schneider.



Cumulative energy consumption in one year

The trend which had already been observed was confirmed by the full-year analysis: the measurements showed a total energy consumption at the end of the year amounting to ~3,500 kWh for the AC fan motors and just ~650 kWh for the EC fan motors, which is a ratio of more than 5:1.

These considerably lower operating costs when EC technology is used, both at full load and under partial load, quickly compensate for the somewhat higher investment costs.

If the purchasing costs are compared for a condenser with a condensing capacity of 100 kW, the additional costs of EC technology (steplessly controlled, with switch cabinet) are around 10 % higher than for AC technology (stepless phase angle control, with switch cabinet).

The measurements were continued for three more years under the same conditions. The result: the potential savings remained at the same level and thus show that replacing the fan motors at the condenser can also pay off for the operator. In the case described here, the replacement paid for itself within one year.

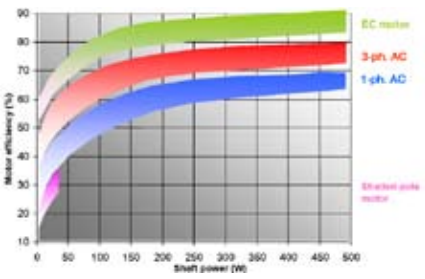
“I’m just quickly estimating how much I would save if I were to fit out all my units with EC technology…” says Mr Rock.

The upshot is that while the company Mayer Kältetechnik has been able to realise a multitude of new installations and conversions for the very rapidly expanding company Rock since the measurements began, with every order, Mr Rock also takes particular care to emphasise that EC fans are indeed ordered and installed.

Comparison of the two motor technologies – a quick low-down:

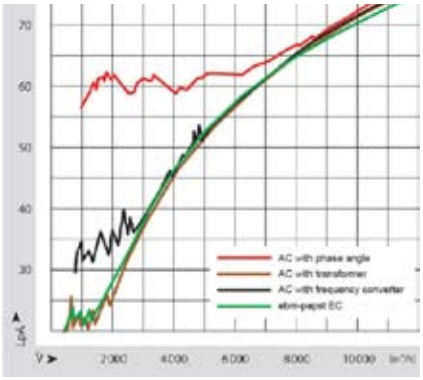
What are the differences between a standard asynchronous motor (AC motor for short) and an electronically commuted motor (EC motor for short)?

Efficiency: AC motors achieve efficiency ratings of between 25 and around 70 %, depending on the design. With EC motors, due to the permanent-magnet rotor and in conjunction with the intelligent electronics, efficiency ratings of up to 90 % are achieved.

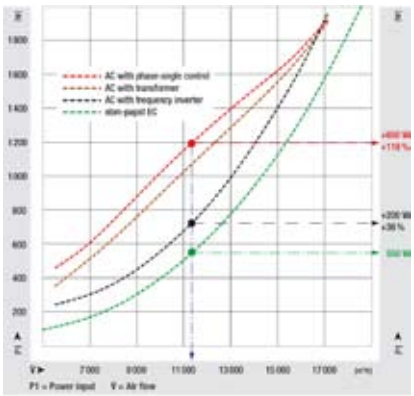


Dimensions: An EC motor has a significantly smaller housing and weighs less than a comparable AC motor (see figure below). One of the reasons for this is the lack of a copper coil in the rotor.

Noise: At maximum speed, barely any difference can be identified. Under partial load, the EC motor has clear advantages over output-controlled AC motors, depending on the type of output control used (exception: transformer control).



Controllers: The control bandwidths are quite similar for both motors. However, the diagram clearly shows that with the same volume flow / same speed, the power consumption is significantly lower with the EC motor.



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Controls

LCMM – Low Capacity Motor Management for EC fans

Güntner Motor Management (GMM) offers a helpful additional function for fan control in the low capacity range.

During operation of condensers and drycoolers, situations repeatedly arise in which operators are faced with challenges: particularly in winter, it is often the case that only a low level of capacity is required of the units. Control in the minimum load range is particularly difficult to realise, due to the system-specific minimum speed of the EC fans.

All EC fans have a minimum speed; however, this differs from fan to fan and is between 9 and 15 % of the full load. Thus, because of this minimum speed, stepless reduction of fan speed in the heat exchanger's low capacity range is impossible.

The heat exchanger's minimum setting begins at this minimum speed. If, for instance, it is required that a heat exchanger be controlled within the bottom 5 % of the capacity range, this can only be achieved via gradual activation of fans.

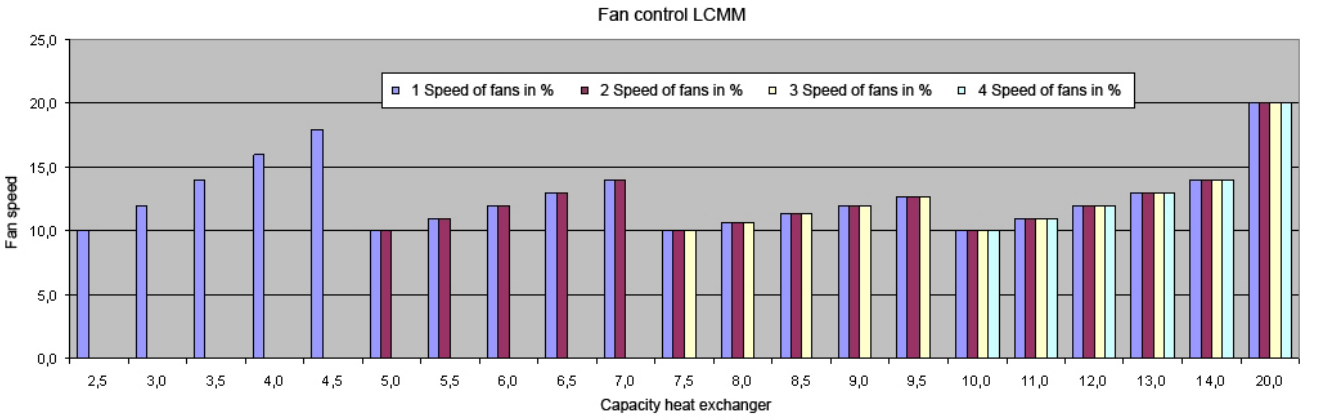
This is exactly what Low Capacity Motor Management achieves: in the low capacity range of the heat exchanger, individual EC fans are gradually activated, each at its minimum speed. For this to occur as smoothly as possible, the speed of the fans which are already running must be slightly increased before the next fan is activated. At the time of activation, the fans which are already running are then brought back down to their respective minimum speeds. On/off hysteresis prevents unnecessarily frequent activation and deactivation of the fans.

The calculation of how many fans have to run at what speed is made automatically. The EC controller knows how many EC fans are connected and relates this to the control value. A decision has to be made as to how many fans have to run at what speed, based on the minimum speed of each of the EC fans.

This function can be switched on or off in the GMM service menu as a special function and is available for internal or external control. For instance, the GMM in slave mode can thus apply the defined control value between 0 and 10 volts, such that heat dissipation can also be controlled in the low capacity range (below 10 %).

GMM

GVX condenser with GMM controller



The EC controller calculates how many fans have to run at what speed.

Fan cycling

In order to extend the fans' service life, fan cycling can be activated. This means that whenever a fan is switched on or connected, the fan with the lowest number of operating hours is always selected first. This ensures that each of the fans runs for a similar length of time. If this function is not activated, the EC motors are always connected in a sequence beginning with fan 1 and proceeding to fan n.

Why minimum speed?

As the electricity consumption decreases in proportion to the 3rd power of the speed, it is not advisable, for instance, to operate just one fan at its maximum speed and to disconnect the others. It is better to first activate the fans at minimum speed, one after the other, and to then increase the speed of all of them together, according to the set control value. This is the only way to guarantee energy-optimised operation.

The Güntner Controls department is continually working to enhance the unique Güntner GMM controller. If you would like to know more about the GMM, you will find a Güntner knowlegde brochure on our website:

http://www.guentner.de/en/info-center/guentner-info-brochures/

The drive rating decreases in proportion to the 3rd power of the speed!

$$P2 = P1 * \left(\frac{n2}{n1}\right)^3$$

P1 = power consumption of motor – 100 %
P2 = power consumption of motor – reduced operation
n1 = speed - 100 %
n2 = speed - reduced operation

Fan speed	Air volume	Power
100 %	**100 %**	**100 %**
75 %	75 %	42 %
50 %	50 %	13 %
25 %	25 %	1.6 %
10 %	**10 %**	**0.1 %**

Using the minimum speed saves energy.

Functions for refrigeration engineering

- Five different operating modes for refrigeration engineering
- Externally predefined setpoint via analogue input or bus system from main control system
- Night setback (noise control)
- Control signal preset by main control system (slave mode)
- Activation of special functions by defining a threshold value
- Commutation between heating and cooling mode (heat pump operation or heat recovery)
- Emergency mode or bypass function
- Maintenance mode for fans

Güntner news

Meet us in Nuremberg

Interesting new products await you at Chillventa!

This year, it is happening again. Chillventa 2010 is opening its doors for the second time and the trade fair organisers say that with more space provided by an additional hall, it promises to be a resounding success once more. Also Günter will again be there with interesting new products and enhancements of proven series of units. Our microox® technology is also set to continue its success story. In addition, you can experience our new GFD drycooler up close and take in its impressive size.

We do not want to give too much away just yet, but once again we have prepared a number of highlights from various fields, which we would like to present to you at Chillventa.

Have we aroused your curiosity? Then visit us! As usual, our catering area offers a suitable setting for good conversations and lively discussions in a relaxed atmosphere. Experience suggests that our stand will again be very busy, so if you would like to talk with us, you may want to take the opportunity to make an appointment in advance.

In keeping with Güntner tradition, we will again host an evening event. This year, we would like to invite you to our stand party for relaxed networking in a pleasant atmosphere; musical entertainment and refreshments are provided

Our stand party will take place at our stand on the 13th of October at 6 pm. Come and join in!

In order to be prepared for participation in various trade fairs, Güntner has decided to use a modular concept for trade fair presentations in the future. Not only does this modular system allow us to react flexibly to the different requirements of trade fairs as regards the size and design of the trade fair stand, it also conforms to our vision of using resources as sparingly as possible.

The trade fair presence of the company Güntner has already been designed according to this new system since spring; the new stand concept will also be used at Chillventa.

Visit us from the 13th to the 15th of October in hall 4 at stand 104!

We look forward to your visit!

13th – 15th October
Hall 4
Stand 104

Become acquainted with our new innovations at Chillventa!

CHILLVENTA 2010

In brief

Güntner hosts the 2010 meeting of teaching professionals for the BIV (German Federal Association of Plant Contractors in Refrigeration Engineering)

In 2010, this annual meeting was organised by Güntner.

From the 9th to the 12th of May, Güntner provided an interesting setting for a lively exchange of opinions and ideas between teachers from vocational training schools and training professionals from guild schools. A total of 25 participants, including guild representative Heribert Baumeister and Markus Simmert, deputy chief editor of the trade journal "Die Kälte", set off on a fact-finding tour on the 9th of May.

During the four-day event, sites such as the Güntner production facilities in Tata (Hungary) and Fürstenfeldbruck (Germany) were visited. At the Hungarian production plant, the main points of interest were the microox® production line, housed in the newly built hall 5, and the powder-coating system. Particularly with regard to microox® technology, many interested questions were asked as to whether this technology will indeed become a permanent fixture among the technologies established on the market and thus a topic to be included in training courses in the future.

The participants welcomed the opportunity to exchange ideas.

Presentations were also made by the event's sponsors: Güntner, Westfalen AG and Bitzer. But alongside the technical topics, the interpersonal exchange of ideas was not left out. Not only were there opportunities for this during those parts of the event officially provided for this purpose, such as the so-called teacher-teacher dialogue, but all throughout, the chance was taken to engage in a lively exchange of information and experience.

"Everyone involved in this 'class outing' has benefited from it!" says Markus Simmert.

After this thoroughly positive experience, the next BIV meeting of teaching professionals, which will take place in Duisburg from the 30th of May to the 1st of June 2011, is already being eagerly awaited.

Impressum

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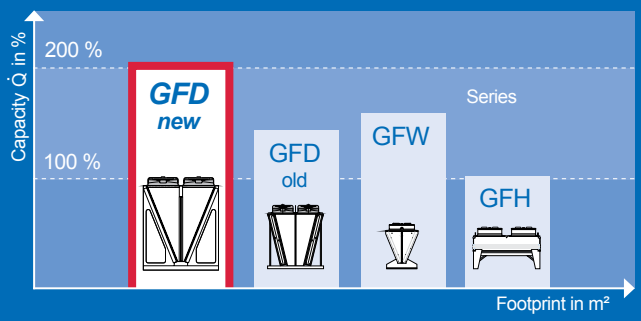

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