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EXPANDED



THE MAGAZINE OF BITZER AUSTRALIA

BRIDGING THE GAP:

GEARING UP FOR BITZER AUSTRALIA'S
TECHNICAL ROADSHOW

ALSO IN THIS ISSUE

MEETING OF THE MINDS: All the news and insights from AIRAH's Refrigeration 2017 & ATMOSphere Australia

MISSION CRITICAL: A transcritical first for one of Australia's major supermarket players

CAPACITY CONTROL SHOWDOWN: A comparison between BITZER's VARISPEED, VARIPACK & CR11 options



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LOOKING AHEAD

MD'S MESSAGE

I would like to welcome everyone to our latest edition of EXPANDED.

Our company enjoys an excellent reputation among a large customer base. The core products offer good solutions and provide compelling added value to the customer: greater reliability, greater efficiency, and greater savings. We have what it takes to celebrate huge successes in the future, because we are focused on the needs of our customers and deliver what they need.

Our employees back up my conviction. Rarely have I seen so many highly competent and engaged people in one place as we have here at BITZER. With the change process we have triggered, together we will succeed in forming a highly motivated performing team who will overcome the challenges we face in the years ahead with flying colours.

In July BITZER will engage with many customers during our roadshow during which we will address technical advances and new product releases. In addition to this we will also have independent speakers to address the current topical issues from around the industry. I am certainly looking forward to meeting everyone and understanding the wants and needs of our customers in the coming months and years so that we can continue to deliver the highest levels of service.

I would also like to take this opportunity to thank Rob de Bruyn for leading BITZER Australia for the last 6 months prior to my appointment. Rob has accepted a Senior Board appointment, consulting as Director - Buffalo Trident Heat Exchange Division. This assignment will allow our long serving and experienced Managing Director of several Global Subsidiaries, to contribute his experience to developing the Buffalo Trident Division of BITZER Australia Pty. Ltd.

Please provide any feedback or topics you would like us to focus on in future.

Best regards,
Simon Wood

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THE NEXT
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THE BITZER ROADSHOW: BRIDGING THE GAP

BITZER AUSTRALIA'S EAGERLY ANTICIPATED TECHNICAL ROADSHOW IS BACK THIS JULY. IN ADDITION TO REGULAR PRESENTATIONS ON NEW DEVELOPMENTS, THE 2017 EVENT SEES INDUSTRY LUMINARIES MICHAEL BENNETT, JOHN BOWEN AND JOHN MCCORMACK JOIN A Q&A PANEL FOR WHAT PROMISES TO BE AN INFORMATIVE, WELL-ROUNDED AFTERNOON.

This year's theme of 'bridging the gap' is all about BITZER's responsive design and development in light of the ever-changing refrigerant landscape. The central theme will see speakers address industry trends both locally and internationally, coupled with BITZER's R&D strategies to create equipment that adequately meets the requirements of new legislation and looming changes.

A highlight of the Technical Roadshow this year will be a Q&A style session featuring prominent industry figures Michael Bennett, General Manager of Refrigerant Reclaim Australia; John Bowen, Director of Refrigerant Recovery NZ; John McCormack, co-owner of Sythree and former Director of Chemours Chemicals and Fluoroproducts in Australia; as well as BITZER's own Rainer Große-Kracht, Chief Technology Officer of BITZER.

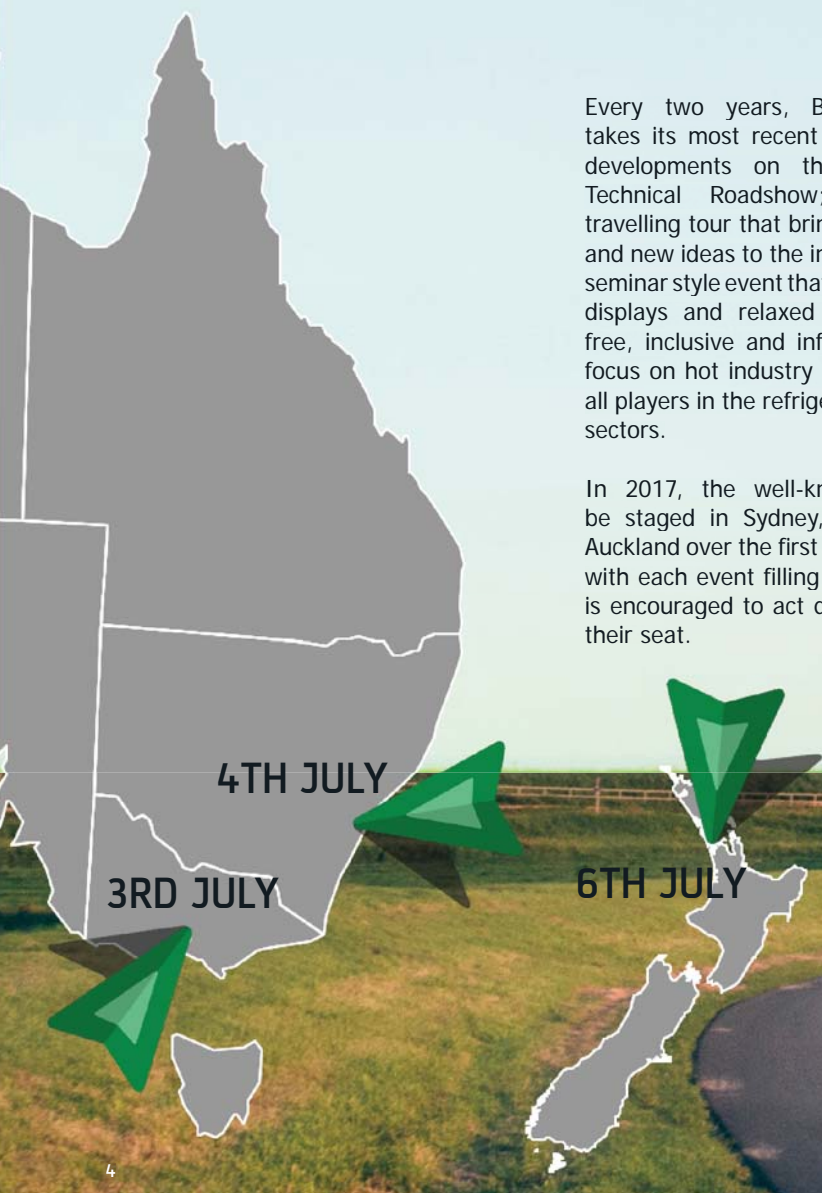
With the addition of the new Q&A panel session, Marketing & Business Development Manager René Le Miere feels that the 2017 Technical Roadshow will be a well-rounded event.

"We've always aimed to make the Roadshow reflective of both BITZER and the wider industry", says René.

"Certainly, we're promoting our products - but our goal has always been to bring information to the people;

Every two years, BITZER Australia takes its most recent local and global developments on the road for its Technical Roadshow; a week-long travelling tour that brings new products and new ideas to the industry through a seminar style event that includes product displays and relaxed networking. It's free, inclusive and informative, with a focus on hot industry topics that affect all players in the refrigeration and HVAC sectors.

In 2017, the well-known event will be staged in Sydney, Melbourne and Auckland over the first week of July, and with each event filling fast the industry is encouraged to act quickly to reserve their seat.



sharing our findings and our research with industry colleagues. Feedback consistently confirms that we're on the right track. Roadshow attendees overwhelmingly respond positively to the 'information sharing' vibe of the

"WE'VE ALWAYS AIMED TO MAKE THE ROADSHOW REFLECTIVE OF BOTH BITZER AND THE WIDER INDUSTRY."

event, and we envisage the addition of Michael Bennett, John Bowen and John McCormack this year will further build on our reputation for hosting a well-rounded, informative and inclusive forum."

The guest speakers have been selected for their broad industry experience and depth of knowledge on all things refrigerants.

Refrigerant Reclaim Australia (RRA) is the product stewardship organisation for the Australian refrigerants industry, created to work nationally with industry to share the responsibility for, and costs of, recovering, reclaiming and destroying surplus and unwanted refrigerants. Auckland based Refrigerant Recovery

NZ has a similar mission, whilst the Chemours company is at the coalface of refrigerant development worldwide with its focus on forward-thinking chemistry.

Michael Bennett has been involved with Refrigerant Reclaim Australia since its early days and began managing the program on a consulting basis in early 1997. As the program expanded and the quantity of refrigerant being recovered and destroyed grew strongly, the RRA Board recognized the need for a full-time General Manager, and Michael was appointed to the position in mid-2000. Since its commencement the recovery program has grown from 50 tonnes per year in the early days to a peak of more than 500 tonnes.

In addition to his management of RRA, Michael has worked with the OECD on developing extended producer responsibility programs, and was a lead author of the IPCC TEAP Special Report – Safeguarding the ozone layer and the global climate system.

John Bowen, Michael's counterpart in New Zealand with Refrigerant Recovery NZ, is attending the Auckland Roadshow event. A retired refrigeration and air conditioning engineer from Rotorua, John has received numerous awards for his contribution to the industry, including the New Zealand Order of Merit for services to the environment

and the refrigeration industry (2005), and the prestigious James Stuart McAlpine Memorial Award for services to the refrigeration and air conditioning industries (1996). Having worked within the HVAC&R industry for 50 years, John has been actively involved in many industry entities having been President NZIRACE, President IRHACE and Chairman RACCA at various times. John has over 40 years' experience in the design and application of refrigeration and air conditioning systems and is an experienced industry trainer through his management of the "Train the Trainers" refrigeration courses in 13 Pacific Island countries and Trainer of the "Train the Trainers" refrigeration courses in four Pacific Island countries.

Likewise, John McCormack has an equally illustrious background, formerly a Director of the Australian arm of global chemical giant Chemours, formed when DuPont spun off its Chemical business. John is co-owner of Sythree, a chemical trading company that represents Chemours in Australia. He was business manager of the Chemicals and Fluoroproducts business at DuPont for 15 years and is currently a director of Refrigerants Australia and chairman of Refrigerant Reclaim Australia.

Rounding out the panel session will be long-time Roadshow guest, Chief

CONTINUED OVERLEAF >

MEET OUR GUEST SPEAKERS:



JOHN MCCORMACK
CO-OWNER SYTHREE; FORMER
DIRECTOR CHEMOURS CHEMICALS &
FLUOROPRODUCTS IN AUSTRALIA



MICHAEL BENNETT
GENERAL MANAGER
REFRIGERANT RECLAIM
AUSTRALIA



JOHN BOWEN
DIRECTOR
REFRIGERANT RECOVERY
NEW ZEALAND



RAINER GROßE-KRACHT
CHIEF TECHNOLOGY
OFFICER, BITZER SE

THE BITZER ROADSHOW

Technology Officer Rainer Große-Kracht from BITZER's German HQ. Rainer will be offering a global viewpoint on refrigerants in light of the recent Kigali Amendment, and in addition, BITZER Australia's Engineering Manager Compressor Systems, Ian Suffield, brings his wealth of commercial refrigeration knowledge to the table.

"WE'D REALLY LIKE TO SEE A STRONG CONTINGENT OF TRAINEES & APPRENTICES ATTENDING."

However, René is quick to point out that the high calibre of technical speakers should not be a deterrent to those new to the industry or still in the early stages of their training.

"We want to create an inclusive atmosphere at the Roadshow. In particular we'd really like to see a strong contingent of trainees and apprentices attending - our customers are being encouraged to bring an apprentice along and get behind the new blood coming into our industry. Our guest

speakers are professional and engaging presenters and the content will be accessible to all attendees, no matter what stage of their career they are in."

Plus, in contrast to some other large industry events, there is no cost to attend the BITZER Roadshow, making it further accessible to small one-man operations right through to large national organisations.

Throughout the afternoon, the BITZER team will be sharing their technical developments covering the full range of products from compressor systems through to evaporators and condensers.

There will also be displays from a handful of selected suppliers including Carel, Ziehl-Abegg, Henry Technologies, Sky Refrigeration, EBM-Papst and Danfoss plus support from key wholesale partners Actrol and Airefrig.

For more information and registration details, contact our marketing team at marketing@bitzer.com.au or phone us on +61 2 8801 9370.

PROGRAM INCLUDES:

- Compressor Technology and the new Ecoline+ with Rainer Große-Kracht
- History and background to alternative refrigerants with John McCormack
- BITZER Ecostar Condensing Unit Developments with Shannon Egan
- Montreal Protocol and Kigali Amendments including BITZER Refrigerants Viewpoint with Rainer Große-Kracht
- New BDC Condenser and the path to Eurovent; 60 Bar Evaporators, PS with EVD-ice and New developments of BB and Cyclone Evaporators with Edmund Tutty
- New transcritical developments including injectors, boosters, and parallel compression. HFC rack development, acoustically enclosed systems, ammonia developments and electrical enhancements with Ian Suffield
- Handling new refrigerants and how to deal with contaminated systems with Michael Bennett (AU) and John Bowen (NZ)
- BITZER's Customer Focus including new digital developments for customers, combating product piracy and more
- Open Q&A Panel Discussion on "Bridging the Gap" with all special guests

For a complete and up-to-date agenda plus more information on each event, scan the registration codes below.



Hurry! Registrations close 16th June! Scan the code with your smart phone's QR code reader app to register online, or call +61 2 8801 9370 for more information.

MELBOURNE



SYDNEY



AUCKLAND



CUSTOMERS LIKE IT LOCAL

THE NEW BDC CONDENSER, RELEASED IN MARCH 2017, MARRIES INTELLIGENT ENGINEERING WITH FAST LOCAL ASSEMBLY

Critical to the success of every project is the ability to stay on schedule and complete the various stages of delivery, installation and commissioning - on time and on budget.

From planning through to execution, project managers and contractors alike are constrained by precise scheduling windows, and need reliable supply partners to help them get the job done.

BITZER recognises the critical nature of overseeing such projects and the many complex moving parts involved. In designing the new BDC Condenser, the BUFFALO TRIDENT engineering team were conscious of the requirement to respond quickly and effectively to customer needs, and the BDC was

designed using an easy modular framework to ensure assembly and delivery times out of the Melbourne factory were kept to a minimum.

As with other BUFFALO TRIDENT equipment, an Australian based assembly facility has repeatedly proven to benefit our customers with its closely monitored lead times and easy local after sales support.

As customer project demands become increasingly more time critical, imported equipment that spends months on the water just won't do.

That's why BITZER and BUFFALO TRIDENT are focussed on the local operational aspects of our business.

The BDC is a substantial unit and can't be knocked together in a day - but for a premium quality, quiet, efficient (not to mention Eurovent certified) condenser, BUFFALO TRIDENT's turnaround time is surprisingly fast - plus you can rest easy knowing that you have local Australian support when you need it.

For more information on the BDC Condenser, please contact your local BITZER sales team or download the brochure by visiting our website or scanning the QR code below.



AVAILABLE NOW & PRODUCTION READY



AN EARLY IN-HOUSE PROTOTYPE UNDER TESTING



LOCAL ASSEMBLY EQUALS FAST TURNAROUND

MEETING OF THE MINDS

RENÉ LE MIERE OFFERS A WRAP-UP OF ONE OF THE BIGGEST EVENTS ON AUSTRALIA'S REFRIGERATION CALENDAR: AIRAH'S REFRIGERATION 2017 CONFERENCE.

Taking place at the end of March at Melbourne's Etihad Stadium, AIRAH held its major annual conference, Refrigeration 2017.

The Conference looked at the state of the industry, the challenges initiated by COP 21 and the global HFC phase-down, and how this will impact upon educators, legislators, regulators, end users, engineers, consultants and technicians.

Over 150 delegates turned out to hear from an insightful group of speakers covering a broad spectrum of topics.

AIRAH's CEO Tony Gleeson said in a media statement, "Those in attendance have the capability to shape the refrigeration space for years to come. So to have these influencers gathered in the one space, and to witness so much robust conversation throughout the two days was wonderful to see."

From all communications throughout the two days, everyone was in agreement that CO₂ and ammonia will play a big role in future direction for refrigerants, and CO₂ and ammonia solutions are gaining traction in local industry.

So where are the gaps currently? The staged steps with HFC options are a commercial reality, not least because of equipment changeover and transition costs. Relatively low GWP options are available for direct retrofit in many applications. However, HFC options need to be carefully considered to achieve the Kigali set targets of 85% phase down by 2036. This transition will include steps to low GWP HFC, HFO and ultimately to the natural refrigerant options, but we must also take into consideration the huge number of low charge units currently using refrigerants such as hydrocarbon R290.

Some of the key ideas emerging from the conference centered around education and training, mitigating risks

associated with natural refrigerants, managing strict regulations and adapting technology to meet changing legislation.

Keynote international speaker Monika Witt from Eurammon outlined the European standpoint on F-Gas regulations, how the quota system works and other aspects of the revised regulations which will no doubt have knock-on effects for the rest of the world, notably that risk assessments are likely to become mandatory under the 2nd level of the EU phase-down.

Managing risk in general was a hot topic with many speakers making mention of the urgent need for training and certification for many technicians beginning to come across more and more systems running on natural refrigerants in their day to day activities.

AIRAH's Phil Wilkinson covered some of the programs that AIRAH is running to try to address the knowledge gap, while Dario Ferlin outlined how Woolworths is investing in not just training personnel but creating a support ecosystem to spark imaginations about working with new equipment, and in turn generate momentum that will help the company reach its environmental goals.

Incidentally, Woolworths has just recently installed a BITZER transcritical CO₂ system in its Colebee store, the first transcritical system adopted by the organisation (you can read more about this landmark installation on page 12). Mike Baker of Baker Refrigeration



MONIKA WITT

"BETTER CONTROLS OF THE OVERALL SYSTEM WILL BE KEY."

- MONIKA WITT, EURAMMON

"BUSINESSES THAT EMBRACE CHANGE EARLY WILL FIND A COMPETITIVE EDGE ABOVE THOSE THAT DON'T."

- GRAEME DEWERNON, A-GAS



IAN SUFFIELD

"FOSTERING A COLLABORATIVE ENVIRONMENT CONDUCTIVE TO EFFECTIVE COMMUNICATION IS PARAMOUNT."

- DARIO FERLIN, WOOLWORTHS

"SIMPLE [TRANSCRITICAL CO₂] PLANT DESIGNS ARE MAKING THE TECHNOLOGY MORE EASILY UNDERSTOOD BY MECHANICS."

- MIKE BAKER, BAKER REFRIGERATION

STOP INSTALLING NEW SYSTEMS WITH R404A!"

- ROBERT KEBBY, HONEYWELL



Refrigeration 2017
Conference

presented some insights into the company's own full transcritical efficiency concept, noting that there are certainly benefits for high ambient climates, and that CO₂ needs to be designed for use by all technicians.

All speakers spoke positively about natural refrigerants being the way forward, with Robert Kebby from Honeywell putting it bluntly and imploring the industry to simply stop installing new systems running R404A.

Whilst manufacturers are continuously innovating to ensure future trends are accounted for, government and legislative bodies are also working hard to manage the support infrastructure and guidelines required for a smooth and fair phasedown.

Keynote speaker Bruce Nelson, President of Colmac in Washington, spoke of the heavy regulations Stateside at all levels of government that create many hoops for the industry to jump through, not to mention the as yet unclear 'Donald effect' that could change things up significantly. US refrigerant regulations even extend to terrorist activity: because ammonia is considered toxic and flammable, systems with >10k lbs are regulated not just by the EPA, but also the Department of Homeland Security, as ammonia in the wrong hands could pose a potential terror threat.

Closer to home, Annie from the Department of Heritage and Environment explained that although Australia has had a faster start to the HFC phasedown compared to other countries, standards and training will need to be reviewed in line to meet legislation that is slated to be implemented January 2018. The DHE is considering programs to increase the levels of preventative maintenance and provisional bans on new equipment are under discussion.

Some other interesting ideas that came out of the conference included trends around thermal storage, thermal batteries and expanding the use of solar panels. In addition it was noted that there has been a significant decline in Apprenticeship levels and the trade was not growing much overall.

So where does all this leave us? BITZER's Engineering Manager - Heat Exchange, Ed Tutty, attended the conference and offers his thoughts.

"I expect trends towards smaller units, refined system integration, and higher level control systems. Within regulatory framework and realistic economic constraints, the market will ultimately head towards natural refrigerant systems. Therefore by making smart medium to long term economic and regulatory decisions now, we will be in a great place for the industry and the planet within 20 years."



NATURAL SELECTION

AUSTRALIA'S NATURAL REFRIGERANTS FORUM, ATMOSPHERE, WAS HELD IN SYDNEY IN MAY, AND BITZER WAS THERE AS THE PLATINUM SPONSOR. RENÉ LE MIERE OFFERS A WRAP-UP OF THE EVENT.

This year's ATMOSPHERE event, held recently at Luna Park, built on the success of last year's inaugural event which aimed to provide a forum for discussions on advancing natural refrigerant awareness in the market.

BITZER was the Platinum sponsor of this event that attracted well over 200 participants and a range of industry experts who spoke about the way forward and how to better collaborate on all the aspects of business required to lead the charge in natural refrigerants.

Patrick McNerney from the Department of the Environment and Energy implored the audience to work together towards a common goal.

"We need to work with all levels of the industry to see what levels of support are required. We need to work with you to see what the requirements are, what can be done, and who should be doing them. It's too early to make any promises. Let's work together on it," said McNerney in a media statement.

Among the hot topics of the day were the state of training, the need to boost collaboration, and the impressive progress of natural refrigerants in Australia and New Zealand over the past year.

Along with representatives from Mitsubishi, Scantec, Mayekawa, Epta, Danfoss, Hussmann and of course shecco, BITZER's Ian Suffield presented an update on market trends, and in an afternoon session, presented a commercial refrigeration case study covering the efficiency gains of a booster system with parallel compression.

shecco's global monitoring of natural refrigerant trends provided some interesting insights: some countries or states are aiming well above the Montreal Protocol for the HFC phase down. California is the 6th largest economy in the world (which does matter) and

is aiming to have any refrigerant >150 GWP restricted / banned by 2021 - in any system. Japan's government has the best subsidies program in the world supporting natural refrigerant choices. Europe's F-Gas regulation is in place but is being continually reviewed, along with the standard and training programs that are in place. Canada has moved to an ETS (Emissions Trading Scheme) and the cost is \$50/tonne CO₂.

Somewhat surprisingly, one of the largest manufacturing countries in the world, China, is leapfrogging many 1st world countries and is moving directly to natural refrigerant solutions. Jan Dusek indicated that China is already manufacturing domestic splits on R290a Propane and is already producing up to 100,000 units per year. Highly flammable refrigerants may soon enter our homes without anyone knowing the difference.

Discussions surrounding the skill level of technicians – a hot topic of late – was raised again with Steve Smith from TAFE NSW commenting that apprenticeships are failing across all industries. In 2010 there was 500,000 apprentices and in 2016 there was only 260,000 apprentices. Steve also indicated that 70% of apprentices completing their Refrigeration and Air Conditioning trade go into the industry installing split air conditioners. More complex CO₂, ammonia and hydrocarbon systems will become an issue for end users in the future.

Kim Limburg from ARMA (Australian Refrigeration Mechanics Association) is seeking a national training scheme instead of the state based courses run at the moment. The request for government supported funding for training would be a step in the right direction. ARMA in association with AARA released their app to help the trade in their day to day activities called Mates Rates for Fridgys. Download the app to see how it can help you. This is

certainly a great initiative and will help upskill technicians in the future.

An interesting interview with a CEO of a cold storage facility indicated that the industry as a whole needs to promote the changes that are occurring. It is quite clear that end users do not have enough information available to themselves to make educated decisions around the latest market trends. The question was posed, "What is the biggest consideration in new systems - is it the refrigerant, the maintenance costs, the leakage rates or the seasonally adjusted power consumption?", and this brought about several conversations on making the right choice for your next system.

Stefan Jensen believes that we should adopt the 'International Energy Conservation Code' (IECC) which reviews the energy consumption of a system, while other formulas like TEWI take into consideration other relative industry considerations like the GWP of the refrigerant used and the expected leakage rate.

The old familiar opinions between the industrial and commercial sectors about ammonia had everyone considering all options. It's clear that there is a couple of strong alternative refrigerant choices now available. In some areas a single refrigerant may be best, while in other systems a combination of CO₂ with ammonia high stage might provide the ultimate package. Clearly all systems cannot be considered equal and the best solution takes some calculations to determine the best outcome.

These discussions underlined the need to upskill the workforce. New refrigerant trends combined with lack of new technicians coming into the workforce means we will indeed, as Patrick McNerney suggested, have to work together as an industry to create pathways for the future success of all involved.



MISSION: CRITICAL

IAN SUFFIELD SHARES HOW BITZER IS HELPING ONE OF AUSTRALIA'S BIGGEST RETAILERS TRANSITION TO TRANSCRITICAL CO₂

Colebee is located in Sydney's North West, sitting adjacent to the major commercial and industrial centre known as Sydney Business Park. Colebee's Greenway residential estate opened in 2013 and included in its masterplan a 3400 sqm Woolworths supermarket and BWS planned to service the estate and surrounding suburbs. As was fitting for a store located in one of Sydney's premier new developments, Woolworths looked at a series of environmentally friendly innovations that could be incorporated into the greenfield site, and with the support of BITZER, took the courageous step to install their first transcritical CO₂ rack in 2017.

Dario Ferlin, Refrigeration & Sustainable Innovations Engineer at Woolworths, details how BITZER's engineering expertise with transcritical CO₂ dovetailed neatly with Woolworths' own business targets surrounding natural refrigerants.

"As Australia's largest fresh produce retailer, it is incumbent on us as one of the most influential players in the local refrigeration industry to show leadership in pursuing the use of natural refrigerants," states Dario.

"In 2006 we took the first uncertain but courageous steps away from R404A systems by opening first cascade R134a/CO₂ store in the fleet at Bankstown in Western Sydney. By 2017 cascade R134a/CO₂ systems have become

commonplace with 200+ stores running on this technology."

"The use of CO₂ as a refrigerant underpinned the realisation of our 2015 Sustainability Strategy, achieving a 40% reduction of our carbon emissions, proving the viability of CO₂ and paving the way for a completely HFC free store."

"This year we've released our corporate responsibility strategy that looks ahead to 2020, including targets to further reduce our carbon emissions and innovate with natural refrigerants. Specifically, we're looking to install 10 natural systems using transcritical CO₂ or water loop technology by 2020. We're pleased

to say the first transcritical system has just been commissioned by BITZER in our Colebee store."

The Transcritical system designed and engineered by BITZER for the Colebee site features BITZER ME series compressors for low temperature fixtures as well as Ecoline-T series compressors for medium temperature and parallel compression stages.

The BITZER CO₂ compressors have been used worldwide since 2004, with over 40,000 units in service today.

Dario notes that the booster system which includes parallel compression

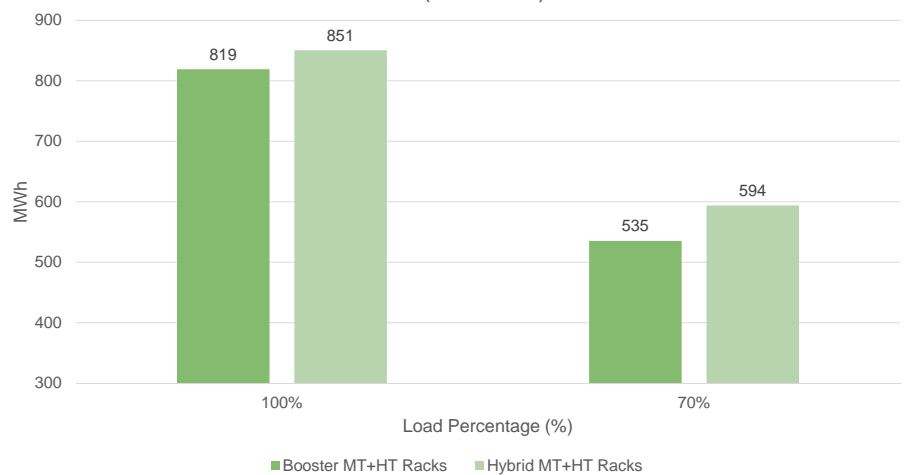


should result in reduced energy consumption compared to an equivalent CO₂ / R134a cascade store.

Modelling completed by BITZER during the planning stages of the project indicated a potential energy saving of up to 10% compared to an existing system, which helped Woolworths make the decision to proceed with the transcritical technology.

For more information on custom designed transcritical systems to suit your unique requirements, please contact your local BITZER sales team.

Compressor Yearly Power Consumption - Refrigeration
2011 (Jan - Dec)



CAPACITY CONTROL SHOWDOWN

VARISPEED COMPRESSORS, VARIPACK, & THE CRII CONTROL MODULE: A CLOSER LOOK AT THE BENEFITS OF EACH CAPACITY CONTROL SYSTEM

VARISPEED

IQ INTELLIGENT
COMPRESSORS



A VARISPEED compressor includes a frequency inverter combined into a single unit. The suction gas-cooled frequency inverter and the compressor form a compact unit and all the components are factory mounted.

BEST FOR:

The VARISPEED product series is the most simple frequency inverter solution for small and medium sized reciprocating compressors, as it represents a compact, reliable and convenient option: with the components factory mounted, separate installation becomes a thing of the past. The components are fully wired – refrigeration and air conditioning engineers don't have to put any thought into mounting or the frequency inverter and motor wiring. Due to their special design, VARISPEED compressors can be operated at a frequency of up to 87 Hz.

LIMITATIONS:

The VARISPEED series is not available for all BITZER ECOLINE compressors and the frequency inverters have limitations when it comes to the maximum evaporation and suction gas temperature. VARISPEED compressors are therefore not the first choice when it comes to many heat pump applications.

VARIPACK

IQ INTELLIGENT
COMPRESSORS



The VARIPACK module is a frequency inverter offering electronic capacity control when used in combination with all BITZER reciprocating compressors.

BEST FOR:

Specially developed by BITZER for use with refrigeration compressors, the external frequency inverters are particularly suitable for simple and reliable capacity control. BITZER software enables application-specific selection of the frequency inverter, whilst the BEST software promotes simple operation and monitoring. Stored databases allow for straightforward configuration of each compressor simply by selecting the compressor model and refrigerant. With its modular design, the VARIPACK series achieves a high degree of flexibility and opens up a wide spectrum of variants for a large range of applications in supermarkets, hotels, restaurants and food production and processing centres. The series is suitable for refrigeration, air conditioning and heat pumps and can be integrated into both systems with single compressors and compound systems.

LIMITATIONS:

The VARIPACK is the higher end option and therefore may not be suited to entry level installations.

CRII



The CRII is a mechanical capacity control module which BITZER developed from its predecessor, the CR capacity control. The CRII has been simplified with fewer control deviations, yet a much larger range of control.

BEST FOR:

One of the benefits of the CRII capacity control: electromagnetic compatibility is not an issue and the mechanical solution has no influence on network quality in buildings. The CRII is also an inexpensive entry-level capacity control module. The modulation range for two, four and six-cylinder compressors is between 10 and 100 per cent and, for eight-cylinder compressors, between 50% and 100%. The CRII is good at limiting in-rush current as it starts fully unloaded.

LIMITATIONS:

Compared with compressors operated with frequency inverters, the CRII achieves somewhat lower efficiency levels in the lower part-load range and, despite the high switching frequency, wider control band. However, this is of little importance when it comes to systems with several compressors and large-volume cooling positions.

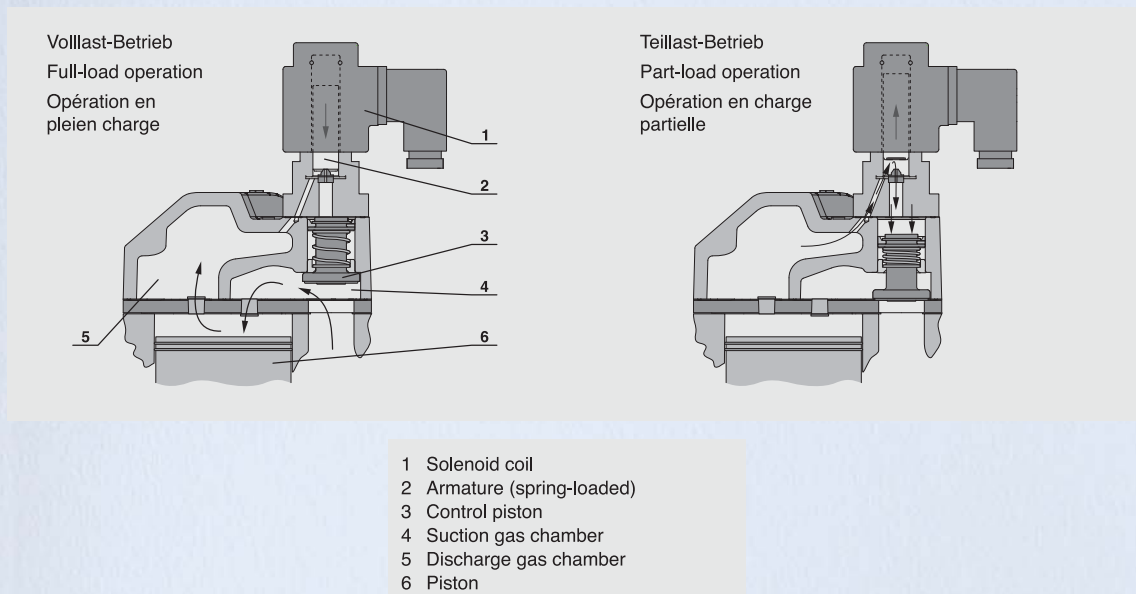


Fig. 1 Design of the CRII capacity control

EFFICIENT PART LOADING: HOW CAPACITY CONTROL WORKS

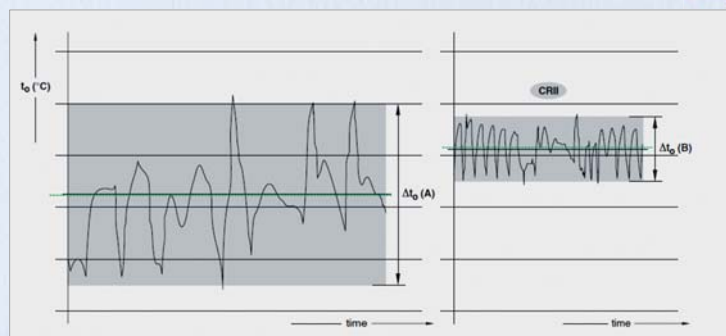
Each application is unique, which is why BITZER refrigeration compressors, like the capacity controls, are specially tailored for specific requirements. With the CRII capacity control, the intelligent VARIPACK frequency inverters and the VARISPEED compressors, BITZER can offer several options – users can select the appropriate technology for their application.

Both mechanical capacity control and capacity control based on speed adjustment have their specific benefits under the prevailing operating conditions.

BITZER's frequency inverters fundamentally have a soft start characteristic combined with low starting currents when starting the compressor. What's more, they don't work in stages and are therefore the optimal solution in terms of control, as

the desired evaporation temperature can be selected with the utmost precision. If part-load operation is the primary mode, systems with an electronic frequency inverter are more efficient than mechanical systems due to limited switch cycles. A disadvantage compared to mechanical capacity control: the investment costs for electronic frequency inverters are somewhat higher.

**WHY OFFER
A RANGE OF
OPTIONS?**



CRII IN ACTION: CURRENT DRAW IS MODULATED, REDUCING SURGES AND THEREFORE INCREASING EFFICIENCY

**WHAT IS
IQ ?**

The IQ icon denotes BITZER compressors that have either built-in or optional intelligent components such as the VARIPACK frequency inverter, CM-RC-01 monitoring module, or SE-i1 motor protection device. These options also allow monitoring through BITZER's BEST software.

WHAT WILL COILS LOOK LIKE IN THE LOW-GWP FUTURE?

ED TUTTY OUTLINES HOW TUBES ARE SHRINKING THANKS TO NEW REFRIGERANTS AND NEW MANUFACTURING TECHNIQUES THAT MAKE COMPLEX INTERNAL GEOMETRIES POSSIBLE.

In highly competitive refrigeration and HVAC industries, cost is still king. However the move to low GWP refrigerants necessitates highly efficient solutions. Australian industry has shown a strong willingness to support environmentally responsible solutions. As stated in the BITZER refrigerant report (Edition 19) "the aim is a clear reduction of direct emissions caused by refrigerant losses and indirect emissions by particularly efficient system technology."

The BITZER report also describes the importance of Total Equivalent Warming Impact (TEWI), which gives analysts a broader reflection of the total influence on greenhouse effect of any system. This approach is important as the choices are more diversified than ever, with many low GWP HFC, HFO, blends and natural refrigerant solutions available for all applications.

The 28th meeting of the Parties of the Montreal Protocol (MOP 28) was held in Kigali during October 2016. The Kigali Amendment was a great step forward, with a global agreement to reduce HFC emissions by 85%.

What does this mean for heat exchangers? System design will have three primary design areas of focus, low charge, high efficiency, and smart

controls. For tube type heat exchangers, smaller diameter tubes offer a pathway to better efficiencies. An equivalent heat exchanger with smaller tubes will require more tubes for a given area – by up to 20%. So where is the advantage?

Primarily heat exchange is driven by surface area and temperature difference between fluids. Smaller tubes facilitate more primary surface area in a more compact design. Smaller tubes also result in better airflow due to less resistance for a given face area. The optimal solution in some areas will be non-spherical tubes, to further reduce airflow resistance.

When tube diameter is decreased, the smaller pitch between rows means that fin height will be smaller. This overall means less cost of fins, leading to lower heat exchanger cost.

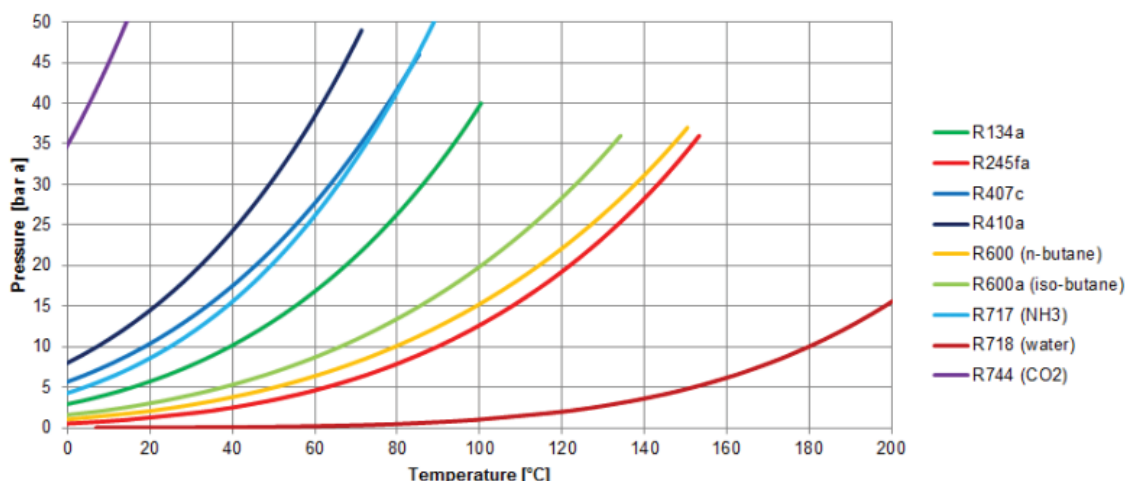
Smaller tubes mean lower weight in the overall product. But on the refrigerant side, lower internal volume is also a very important attribute. With lower internal volume, refrigerant charge level will be reduced to get the same performance.

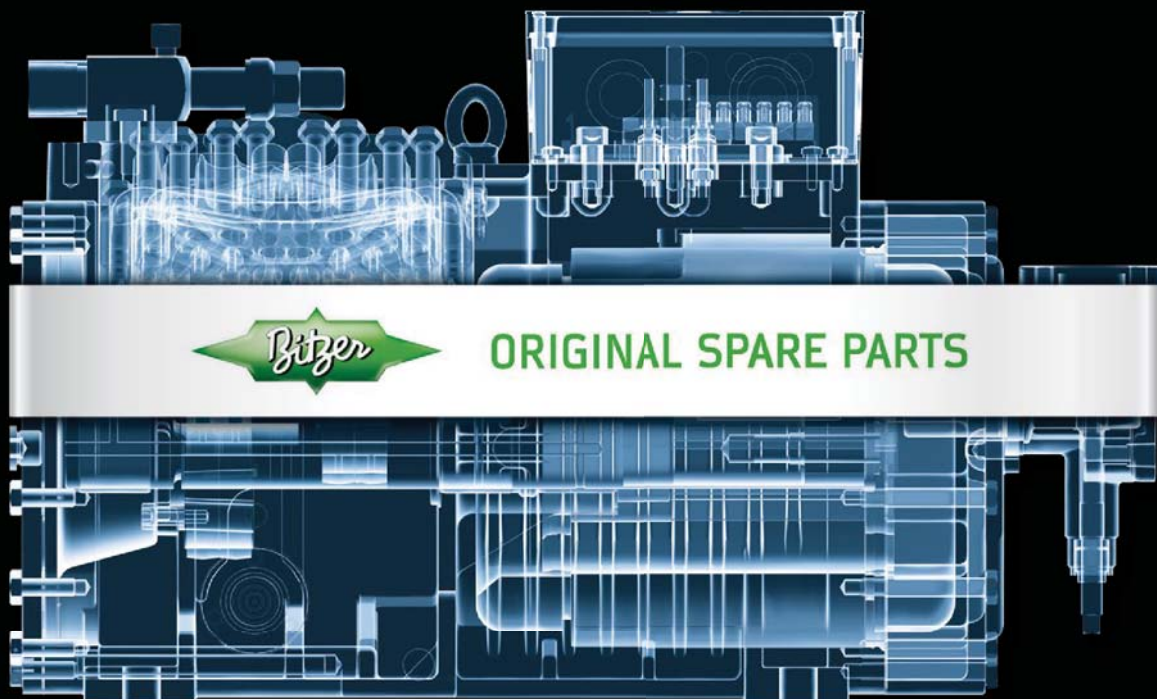
Once again, this leads to lower costs on site. In applications where flammability is a consideration, lower charge level is a critical attribute due to legislative constraints.

"FOR TUBE TYPE HEAT EXCHANGERS, SMALLER DIAMETER TUBES OFFER A PATHWAY TO BETTER EFFICIENCIES"

Modern manufacturing for small tubes provides optimised internal geometries. Internal microfins give high surface area for better heat exchange. Improved manufacturing plus new expansion methods have made complex small geometries possible. In some industries, microchannel tube designs will also give the improved result of high performance in a very compact design. This has been seen extensively in automotive MAC but we expect will also spill into other design areas.

The future will see low GWP refrigerant systems matched with highly efficient heat exchangers. Smaller refined tube designs will give optimised solutions for the market that not only reduce hardware costs, but keep refrigerant costs lower as well.





PERFORMANCE IS IN THE DETAILS.
ORIGINAL IS SAFE.



By choosing BITZER ORIGINAL SPARE PARTS, you are opting for excellence. Complying with international laws and standards, they provide the safety of optimal performance and are designed to match the compressor perfectly. A parts warranty ensures the highest operational standards, whereas counterfeit components may cause system hazards and immense losses. From our headquarters in Germany and our global logistics centres, we can offer an extremely fast supply around the world. Learn more about BITZER ORIGINAL SPARE PARTS at www.bitzer.de



THE HEART OF FRESHNESS

STAR OF THE SHOW

THE ECOSTAR CONDENSING UNIT: SMART & ENERGY EFFICIENT, AND COMING SOON TO AUSTRALIA

At the EuroShop trade fair in Düsseldorf in March, BITZER presented its new ECOSTAR condensing units.

With the ECOSTAR LHV5E and LHV7E, BITZER has developed two air cooled and particularly energy efficient series of condensing units. The new ECOSTAR series clearly exceeds the specifications in the EU Ecodesign Directive, offering users long-term planning security.

From July 2018 the minimum efficiency performance standards (MEPS) requirements will become much more strict. This is why BITZER has taken early action to not just meet these strict efficiency criteria, but to exceed them.

Another advantage of the ECOSTAR condensing units is that their outstanding energy efficiency quickly pays for itself in the face of rising electricity prices. Low noise and reliable operation, ease of installation and use as well as their low maintenance are further distinguishing features of the LHV5E and LHV7E units.

AN EFFICIENT SOLUTION FOR EVERY APPLICATION

Users can choose between three models of the LHV5E and from ten models of the larger LHV7E. Both series of condensing units have an improved mini-channel, copper tube and aluminium fin condenser, which means they need less refrigerant charge, while at the same time being more efficient than their predecessors.

The new ECOSTAR condensing units also have EC fans to save electricity with the latest generation of active PFC monitoring. Users can smoothly adjust the speed and power of the fans and of the integrated ECOLINE VARISPEED compressor. In this way it is possible to operate with optimised energy requirements with a low number of switching cycles. Devices can be quickly

**// EFFICIENT AND RELIABLE
// EASY TO CONTROL VIA BLUETOOTH,
MODBUS OR INTERNET
// OPERATION CAN BE HIGHLY PERSONALISED
WITH INTELLIGENT SETTINGS**

installed on-site thanks to the control electronics being factory-wired, making them ready to operate immediately.

The ECOSTAR's integrated controller automatically adjusts the compressor speed as well as the fans to match the actual cooling load, i.e. the ambient temperature, making the overall system especially efficient. Using the BITZER Electronics Service Tool (BEST) users can also adjust the characteristic curves for unusual applications via Bluetooth.

FLEXIBLE RANGE OF OPTIONS

Depending on the choice of model, the condensing units are designed for use with the refrigerants R134a, R404A, R507A, R407A, R407C and R407F, so that BITZER can cover a wide range of applications. Additional refrigerants with a low global warming potential (GWP), for example R448A, R449A, R450A and R513A have already been programmed into the firmware so that they are available on request. With their robust and corrosion-resistant housing, the systems can be used outdoors, due to their compact size they can just as well be used in smaller equipment rooms.

As the running noise is particularly low thanks to the integrated sound absorber and the noise-optimised airflow, the condensing units are suitable for use in locations sensitive to noise such as in a hotel courtyard. The integrated winter start feature allows the compressor to be

started even at cold times of year when the ambient temperature falls below the saturated suction temperature.

CONTROL MADE EASY

Users can control and monitor the new ECOSTAR condensing units remotely via an Ethernet LAN connection or via the Internet and a Modbus RTU. In addition, BITZER has added a menu for the LHV5E and LHV7E to the latest version of its free BEST software so that they can also be controlled like this. Using Bluetooth 4.0 the ECOSTAR unit can also be operated using the password protected controller from a distance of 30 metres (if in line of sight). Manual control and monitoring is also possible via the LCD display in the controller's housing. With the help from a new function in the current firmware, up to four ECOSTAR condensing units can be connected via Modbus. They then form an ECOSTAR control network and, working ideally together, the temperature of a cold store can be controlled without their refrigerant circuits having to be connected.

IMPROVED SOFTWARE MEANS MORE PROTECTION

The ECOSTAR condensing units' optimised software provides a number of improvements. Thanks to the updated emergency mode, the compressors and fans will continue to work at the same speed even if the sensors fail. If sensors

only fail sporadically, e.g. due to a loose contact, then the emergency mode will automatically be deactivated. If the sensors work normally again, the unit will continue to work independently.

Also, frequency ranges can be skipped without the need for a BEST converter thanks to the improved avoidance of resonances. The update now enables the external access to be configured.

An optional alarm signal can be set that sounds whenever the external enable is disabled.

In the new night mode, the firmware also limits the maximum speed of the compressor and the fans so that operating noise lies below 45 db(A) (-10 °C/32 °C/20 °C R134a). Declarations of conformity and supplementary performance datasheets corresponding

to EU requirements are available on the BITZER web site for the ECOSTAR condensing units. These documents can also be generated using the BITZER software.

For more information on Australian availability of the ECOSTAR, please contact your local BITZER sales team or Airefrig Australia.

REMOTE BLUETOOTH
CONNECTION WORKS UP
TO 30 METRES AWAY

EASILY SET UP WEEKLY
RUNNING CYCLES
DEPENDING ON YOUR
UNIQUE HIGH OR LOW
VOLUME DAYS

CONNECT UP TO 4 UNITS
TOGETHER WITH MODBUS -
NO CIRCUIT CONNECTIONS
REQUIRED

QUIET NIGHT MODE
OPERATES BELOW
45dB(A) (ABOUT
THE SAME AS AN
AVERAGE OFFICE
ENVIRONMENT!)

EMERGENCY MODE
KEEPS THE ECOSTAR
RUNNING - EVEN IF
SENSORS FAIL

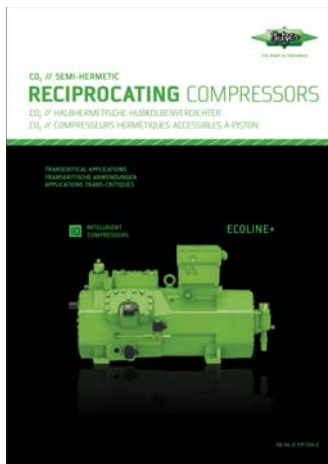
ECOLINE VARISPEED
COMPRESSOR INSIDE



NEAT, POLISHED
FINISH MEANS
THE ECOSTAR
IS PERFECT FOR
MOUNTING IN
AREAS THAT ARE
OPEN TO THE
PUBLIC

SIMPLE, LOW
MAINTENANCE
CONSTRUCTION
WITH EASY
ACCESSIBILITY

NEW BROCHURE: ECOLINE+



BITZER has just released a new brochure detailing the ECOLINE+ semi-hermetic reciprocating CO₂ compressors for transcritical applications.

The ECOLINE+ series of reciprocating compressors are now equipped with new line start permanent magnet motors (LSPM), an enhanced motor technology which forges ahead into better efficiency ranges.

Mechanical capacity control for transcritical CO₂ applications is also new. This enables systems which are just as efficient for full- and part-load as is otherwise only possible today when using frequency inverters. So that users can fully exploit the potential of this technology, BITZER has also developed a new operating concept with intelligent (IQ) modules.

Download by entering the brochure number KP-133-2 into the search box at the top of our website.



OLD SCHOOL

2004: State of the art BITZER and BUFFALO TRIDENT products on display at ARBS - thirteen years ago!



EuroShop
The World's No. 1 Retail Trade Fair
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IN
MARCH 2017
BITZER ATTENDED
EUROSHOP, IN THE
WORLD'S #1 RETAIL
FAIR, UNVEILING THE NEW
ECOLINE+ RECIPROCATING
COMPRESSOR SERIES FOR
TRANSCRITICAL CO₂
APPLICATIONS.

IN THE FIELD

A JOINT EFFORT FROM BITZER'S BRISBANE TEAM, AIREFRIG AND ALLFRIGE SOLUTIONS HELPS RIZZI COLD STORAGE IN THEIR QUEST TO REDUCE ENERGY CONSUMPTION

Rizzi Cold Storage is a multi-zoned cold storage facility based in Hemmant, Queensland, supplying services to international clients. Rizzi are constantly looking for ways to reduce the energy consumption of their site and with some old R22 and R507 BITZER compressor sets requiring updating, they chose BITZER and BUFFALO TRIDENT equipment for its reliability, efficiency and ease of installation.

Long-time contractor David Wilson from Allfrige Solutions, a service provider to Rizzi for many years, contacted Airefrig to discuss the best possible equipment configurations to provide the efficiency gains desired by Rizzi which included BUFFALO TRIDENT evaporators retrofitted with electronic expansion valves supplied and installed by Allfrige Solutions.

Their final solution, after consultation between engineer Ross Angel from Airefrig QLD and the BITZER QLD team, was to replace the now outdated compressor sets with one three compressor rack system which incorporated an inverter for the lead compressor. The site had a restricted condenser deck so providing space for the new condenser was a challenge to overcome. The compact VB condenser, with the latest generation ZA Plus EC fan assemblies was chosen which, when combined with optimum placement of the rack, enabled a close-coupled design and practical install.

Rizzi Cold Storage required assurances that the proposed equipment would have sufficient refrigeration for all operating conditions plus provide significant energy savings when compared to the current systems. The current draw for the 6 VB condenser fans does not exceed 2 amps!

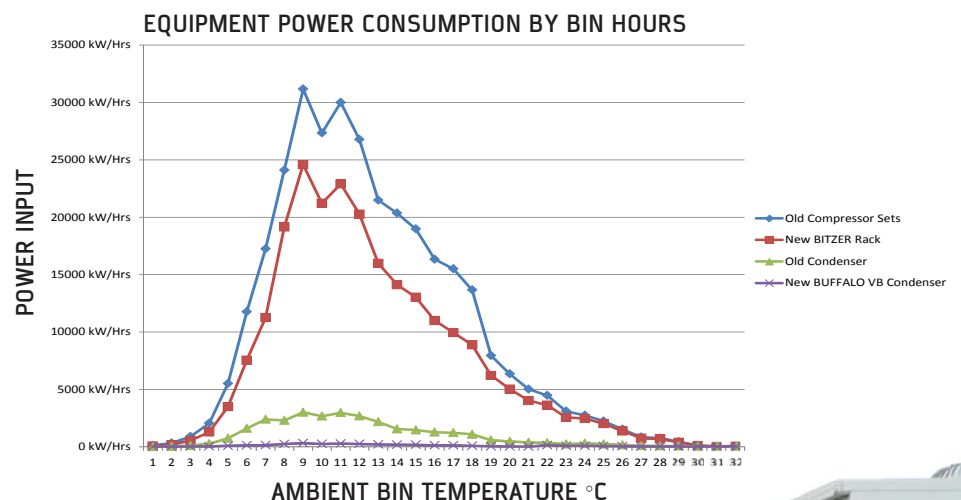
Energy savings were further improved through the use of the Allen Bradley Control system incorporating floating the rack suction pressure and head

pressures based on a Allfrige Solutions control logic that also incorporates the peak demand load shedding and time of day schedules.

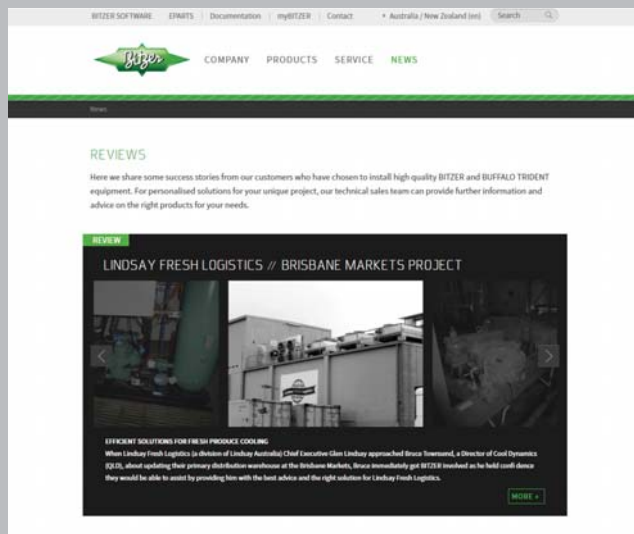
Tony Queenin of BITZER QLD says initial energy savings, using bin hour analysis, were projected to be up to 28% and over summer the actual recorded savings were 30% plus. Rizzi Cold Storage were also pleasantly surprised to see that the BUFFALO TRIDENT VB series air cooled condenser with ZA Plus EC fan assemblies are operating at 810 rpm which is 40% of max. fan speed at high load: this for a number of reasons, is very – very sweet.

The combination of ambient temperature and high equipment loadings over

summer were easily accommodated by the BITZER Maxi Rack fitted with three 4FE-28Y Ecoline compressors which provided extremely stable operating conditions over the last summer. The electrical and lead compressor VSD were supplied by Airefrig and fitted by Allfrige Solutions.



USER REPORTS NOW ONLINE



Would you like to hear how our other customers have successfully achieved their project goals with BITZER? We now have a selection of 'user reports' online - brief case studies detailing some interesting projects we have recently been involved with. For more information or to download a user report, scan the code below or go to www.bitzer.com.au and click on NEWS - there you'll see a link to Reviews where you can find a library of projects that have included BITZER and BUFFALO TRIDENT equipment.

Thanks to our customers for helping us put these together!

If you have used BITZER products and would like your project featured, simply call your local BITZER representative or get in touch with our marketing department: marketing@bitzer.com.au



SUPPORTING THE INDUSTRY THAT SUPPORTS US



BITZER regularly supports AIRAH industry events including trade nights and golf days. Our WA Sales Manager Clint recently enjoyed a day out at the Perth golf day event. Also pictured is our QLD Sales Manager Glen at a local trade night event in Townsville.

AIRAH's local events are a great opportunity to network with industry colleagues in a relaxed environment. With over 20 local events throughout the year, it's highly likely there's one in your area - for more information on upcoming dates, check the events calendar on the AIRAH website at www.airah.org.au

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LOOKING TO THE FUTURE

BITZER WILL ONCE AGAIN BE SUPPORTING THE FUTURE:GAS SEMINARS

Following a successful pilot event in Sydney in February, an industry-led education initiative called future:gas will deliver seminars about these new technologies and the reasons they came about at 12 locations around Australia between June and September this year.

Conveniently timed on mid-week evenings with entry priced at just \$10, future:gas seminars are designed to be as accessible as possible to those working in refrigeration and air conditioning.

Attendees to future:gas seminars will be among the first in Australia to receive a comprehensive overview of new-generation refrigerants and the related technologies in one knowledge-enhancing evening.

Spaces are limited, so early booking is advised. Tickets are heavily subsidised

by contributions from industry associations and corporate sponsorship, priced at just \$10 per delegate and available from www.futuregas.ac



GREG PICKER AT A PREVIOUS FUTURE:GAS EVENT

future:gas
ROADSHOW

IN THE NEXT ISSUE...

- // ROADSHOW WRAP-UP - ALL THE NEWS FROM OUR BIG WEEK IN JULY!
- // BECOMING A NATURAL REFRIGERANTS CHAMPION
- // BEST IN CLASS - MONITORING PERFORMANCE WITH BITZER SOFTWARE
- // ...PLUS MUCH MORE!

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THE NEXT
ISSUE!

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REGISTER NOW!
3RD JULY - MELBOURNE
4TH JULY - SYDNEY
6TH JULY - AUCKLAND

BITZER'S TECHNICAL ROADSHOW: JOIN US IN JULY



Every two years, BITZER creates a renowned industry event: the BITZER Technical Roadshow. Providing information and commentary on issues affecting the refrigeration sector both locally and worldwide, the Technical Roadshow returns this year to Sydney, Melbourne and Auckland with a host of thought-provoking speakers, along with new research and developments from the BITZER and BUFFALO TRIDENT teams. Don't miss out! To register or find out more, scan the QR code above or [visit **bitzer.eventbrite.com**](http://www.bitzer.eventbrite.com)

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