

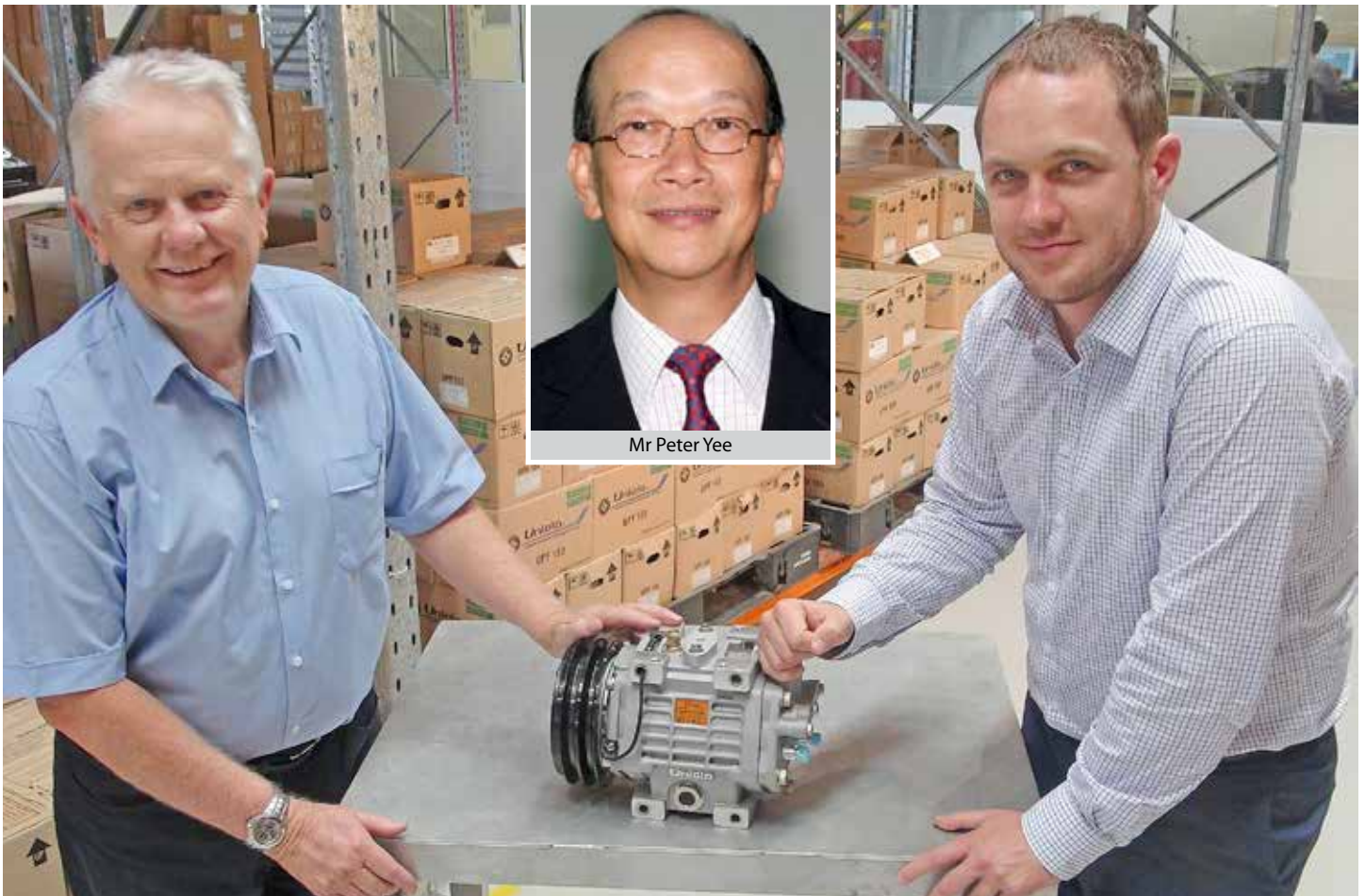


Advanced compressor technology  
for the world

# Unicla

UNICLA INTERNATIONAL NEWSLETTER

## Unicla's 'can do' ethos results in world first compressor for a new bus fleet



Mr Peter Yee

**The development of the new 380 Series Unicla compressor is a prime example of how the company responds to customer requests – in this case for a high capacity compressor to fit into a limited engine space.**

It all began when leading Hong Kong tour bus designer and manufacturer, Jit Luen Auto Body Works Company Limited revealed plans to build a medium size passenger coach to compete with the 28-seater Toyota coaches that had cornered the medium bus size market.

This company, established in 1978 has an enviable record in design and construction of all kinds of coaches and special purpose vehicles, using advanced production and design concepts from Europe and Japan.

With the blessing of the Isuzu truck factory in Japan, the company's designers converted three Isuzu truck chassis to carry a compact 34-seat medium coach. However, these have a front engine, requiring a big air conditioning compressor, but the mounting space was very limited. They soon realised that a compressor with a 380cc to 400cc capacity, able to fit into a tight space, just didn't exist.

The new Unicla 380 Series compressor with Unicla International Director of Global Marketing and Technical Support, Mark Mitchell (left) and General Manager – Global Service and Technical Support, Jon Mitchell. Unicla International Managing Director Peter Yee assembled the design team that successfully developed the 380 Series compressor.

When Jit Luen approached Unicla for help, the design team responded quickly by modifying the working assembly of the existing and well proven UX330 model compressor and increasing its cubic capacity to 380cc.

The trials on the prototypes were so successful that the Unicla 380 Series compressor is certain to be adopted for the bus factory's annual manufacturing capacity of 80 medium size buses.

The 380 Series configuration can deliver 14 to 16 kilowatts in specified system conditions.

It will appeal to those looking for a single compressor capable of operating bus rooftop systems on a 32 to 34 passenger medium size bus.



Picture shows the unique capability of the large UX380 compressor to fit into the tight engine bay of a modern vehicle, plus being fitted with shut-off valves.

Meanwhile, in Taiwan, Suetrak Pacific Air-Conditioning Co Ltd trialled 14 of the 380 Series compressors with impressive results, leading to further large orders from the same company.

The company's air conditioning system is based on the original design of Sutrak in Germany and is popular in luxury tour coaches.

Many well known bus and coach OEM manufacturers in China have adopted the Suetrak system.



The two leading industrialists who are spearheading the trials that are leading to greater efficiencies in passenger bus air conditioning systems are (left) Cham TaT Yuen, Managing Director of Jit Luen Auto Body Works Co.,Ltd. and Lai Kai Wing, Managing Director of Jit Wing Bus Aircon Engineering Co. Ltd., the sales and service agent for Jit Luen Auto Body Works.



# Without proper tests, manufacturers could be 'shooting in the dark'

**Manufacturers of high capacity air conditioning or refrigeration systems could be 'shooting in the dark' on the selection of key system components, without the advantage of solid test data on the entire system under real life operating conditions.**

The advantage of performance testing was illustrated yet again at Unicla International's well equipped environmental test laboratory in Australia which had answered a call for help from two of China's prominent mass transport air conditioning system manufacturers.

As Unicla's Director of Global Marketing and Technical Support Mark Mitchell says, 'Without good, solid data collected from testing in a properly equipped test environment, combined with an acute sense of what can go right and wrong in these high capacity systems, manufacturers can only be guessing at their efficiency and durability.'

'The variables at play when putting together a heavy duty mass transport air conditioning system on a vehicle are quite diverse,' he added.

All components, like hoses, compressor, condenser and so on, can be tested and validated in their own right, but until they are all joined together as one, the variables that can affect these systems will never reveal themselves.

## EFFICIENCY ASSUMPTIONS CAN'T BE MADE WITHOUT TESTING

Assumptions about the efficiency and durability of the system cannot be made without testing.

Leading rooftop air conditioning manufacturer, CLING, released its DZ-8B rooftop 8 kW unit in 2014 and along with other Unicla customers, wanted to test the performance of a Unicla UP170 compressor on this system.

Technician Daniel Drennan conducting running tests on the CLING rooftop bus air conditioning unit. Conditions on the condenser side were 35°C and 50 per cent relative humidity.



Representing the interior of the bus cabin, the airflow and temperature from the rooftop unit is measured, while conditions in what would be a bus full of passengers is replicated by heaters and a humidifier. Typical conditions for a test of this type are 27°C dry bulb temperature and 19°C wet bulb temperature.



Unicla conducted extensive testing on both 6 Kw and 8 Kw units, running with the UP170 and the UP200 compressors.

The tests produced worthwhile efficiency and capacity data which not only helped the manufacturer, but gave Unicla a practical demonstration of how its compressors perform in real life situations and that's a win – win for both parties.

'Testing is a great way for Unicla to keep up to date in the market. Relying on our own internal testing is not enough,' explained Mark Mitchell.

Another leading manufacturer, Opat, wanted performance and capacity tests of their TCH12U bus rooftop unit connected to a 610cc Unicla UWX550 compressor, a smaller and more compact swashplate design than the traditional 600cc piston-type reciprocating compressor.

'So Unicla had a vested interest in knowing how the 550 would perform on a rooftop unit,' Mark said. The 610cc swashplate UWX550 compressor performed admirably, easily matching the performance of its piston-type competitors.

Advanced testing of coach air conditioning systems is carried out inside the large heat booth at the Unicla SuperTest facility in Queensland, Australia. Unicla director Mark Mitchell supervises heat load tests on a coach, where sensors measure the air temperature over the entire side of the bus to determine that it is in steady state conditions. There must be no more than 1°C variation between each sensor. Square heat plate sensors measure the heat flow in watts per square metre across the glass and composite body panel. This information helps vehicle body builders and system designers to determine the total heat load on a bus body in different ambient conditions, and to understand the limitations of the bus in extreme hot and cold conditions.



The Opat rooftop unit running in one of the Unicla International test chambers in Australia



The Unicla UWX550 compressor connected up to the Opat rooftop unit



# UNICLA goes to sea



**Australia's most experienced builder of high performance pilot boats, Hart Marine, based in Mornington, Victoria, has adopted Unicla's UX330 compressor for the dual evaporator air conditioning systems on their fleet.**

With that decision, Hart has joined an impressive league of special vehicle and vessel manufacturers that have all adopted the robust 330 series, including two of the world's most famous military vehicles, Australia's Bushmaster and Germany's Dingo – both troop carriers.

In Canada, Pacific West Refrigeration also uses the Unicla 330 compressor on systems across the commercial fishing fleet.

Hart Marine ordered its first Unicla compressor in 2013, and has installed them in its fleet of pilot boats that are used by port authorities on the east and west coasts of Australia.

Having a reliable air conditioning system on a pilot vessel is essential for more than keeping the crew comfortable – it is a port requirement in Australia that boats cannot leave the

wharf if the air conditioning is not working properly. Hart Marine found that the Unicla met the demand for a heavy duty, durable compressor, capable of surviving in a full-time marine environment.

It also had to cope with 25 metre long suction and discharge hose runs, an issue which led to Unicla's recommendation of Unicla B-type large capacity oil separators, specifically made for applications where adequate oil flow could be maintained.

Hart Marine has been building high performance vessels for the past 30 years, and last year it received an engineering excellence award from Energy Power Systems Australia for the installation of two Cat C18 diesel engines in their latest state-of-the-art ORC pilot boat Kestrel.

In this pilot boat engine room, the Unicla compressor is just visible in the lower right of the picture. These are twin QSM11 six cylinder, 600 horsepower Cummins diesels.





## Good advice from big Australian bus fleet customer: **FIRST CLASS UNIT DEMANDS FIRST CLASS INSTALLATION**

**Road distances are vast in Australia, with temperature ranges that are punishing on air conditioning compressors.**

A major tour and charter bus company, Surfers Paradise Coaches, based in the international tourist city of Gold Coast, about midway on Australia's Pacific coastline, runs big 57-seat coaches from the tropics of Northern Australia, to the snowfields of Victoria, and west to remote towns in the outback.

Keeping their passengers cool under all conditions is a major concern for the company which has had issues in the past with compressors that suffered with shaft seal leaks – that was until they were introduced to the Unicla UWX heavy duty compressor.

Three years ago, the company's general manager Allan Russell put a Unicla compressor on trial on one of their long haul tour coaches that averaged up to 300,000 kilometres every year.

On each tour, the coach air conditioning system had to cope with temperatures ranging from 45 degrees C at Birdsville on the edge of the Simpson Desert in Central Australia to minus 15 degrees C in the snowfields.

Over the three years, the coach travelled more than 800,000 and the UWX didn't miss a beat, leading the company to adopt Unicla compressors for all future retrofits in the fleet.

'The Unicla system is far better than any other we have tried. The heavy duty compressors run very smoothly, and

passengers never complain of vibration transferring back through the chassis,' Allan said.

'The Unicla is the ideal compressor for the coach industry because of its reliability and efficiency, smooth and quiet operation, and passenger and driver comfort,' he added.

And he had some advice for one or two bus companies that had complained of Unicla compressor failure. 'Unicla is a first class unit that requires a first class installation by technicians who know what they are doing,' he said, adding that his investigations into several such incidents revealed that poor installation and commissioning was the cause. 'There was nothing wrong with the compressor,' he added.

This is the Unicla UWX550 compressor that has kept its passengers cool in more than 800,000 of cross-Australia touring



General Manager of Surfers Paradise Coaches Allan Russell insists on Unicla compressors for all coach retrofits



# Unicla adopted for new STEYR-powered SUV

Five years ago, the Austrian-based diesel engine specialist STEYR MOTORS adopted Unicla UX200cc and UX170cc compressors exclusively for its line of specialist marine engines.

The company is now moving into a line of engines for SUVs at their new plant in Changzhou, China and these will be fitted with the new Unicla US150cc compressor. The SUVs are being manufactured in China.

A team from Unicla Hong Kong and Australia was given a tour of the new factory, including an inspection of the first STEYR SUV engine fitted with the new compressor that has a direct mount with a special rear cap to suit the four cylinder and six cylinder STEYR engines.



Inspecting the SUV STEYR engine at the new plant in China were (from left, standing, representing Unicla International) Jon Mitchell, General Manager – Global Service and Technical Support; Lody Yuen, Global Marketing Manager and Mark Mitchell, Director of Global Marketing and Technical Support; (front, from left, representing STEYR Motors (Changzhou) Engine Co Ltd) Fish Yu and Alvin Wang, Purchasing Engineers.



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