Fantech

TECH-TALK

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Adelaide airport flies high

Adelaide Airport has a breakthrough configuration.

ADELAIDE'S $ 240 million airport terminal breaks new ground with its flexible configuration.

The 750m long and 110m wide building houses an International and two Domestic terminals. But when the centrally-located International is not in use, it can be re-configured for Domestic flights. Swing gates have been devised for Customs, Immigration and Duty-Free facilities to be isolated.

"It's a true multi-use terminal, providing much better use of resources," said Peter Harrland, Project Engineer for Bestec, consulting engineers, working in association with builders Hansen Yuncken and major contractors Frigrite Air Conditioning.

Fantech fans provide multiple services including smoke spill of 312,000 L/s exhaust from the building and general exhaust of 50,000 L/s exhaust from baggage handling, carparks and amenities. "Everyone has been focused and we have had good support from suppliers and contractors," Peter said. "Fantech's Fan Selection Program saved us time and kept the design going at a quick pace."

Grant Oates, Project Manager for Frigrite said it is "the biggest contract we've ever worked on."

"The important point was organising the logistics for such a big job, to ensure that when things were meant to be there, they were there," Grant said.

Grant said there was no major changes, "rather, lots of little changes," such as having fans re-pitched.

Another approach was dual use of economy cycle fans, doubling up as smoke spill fans. "These added an extra layer of protection to the sprinklers," Grant said.

The two-level terminal can service 3000 passengers per hour and 27 aircraft simultaneously, with first planes scheduled to fly out on October 15.

Clients enjoy 'our shout'

IT'S a much anticipated function each year. And the smiles said it all at the annual get-together when Fantech simply said thanks to clients and suppliers for being such great supporters for the previous 12 months.

More than 150 gathered at the Malvern Valley Golf Club & Reception Centre to share drinks, food and good conversation.

Guest speaker Graeme Johnstone spoke of his experiences as a journalist on daily newspapers, wordsmith (including editing Tech-Talk), and now author.

Fantech Managing Director Max Lane welcome guests and thanked them for their support.

"We appreciate your support, we have some great plans in mind, and we look forward to another great twelve months," he said.

ABOVE: Glenn Morgan of Fantech, right, and Warwick Stannus (A. G. Coombes) discuss serious business.

ABOVE: All smiles from (left to right), Des Kulh (NAC Air Conditioning), Thida Kao (Fantech), Bob Sheehan and Ron Keilar (Estair).

RIGHT: Enjoying the night are, from left, Bob Ford (Sharp & Pendrey), Peter Steadler (A. E. Smith) and Eddie Parks (J. L. Williams).

RIGHT: Fantech Managing Director Max Lane, left, introduces guest speaker Graeme Johnstone.

Technically speaking

Electric motor protection -

ELECTRIC motors are expensive pieces of equipment which, among other things, are used to drive fans, often for critical ventilation systems. Failure of motors due to electrical fault or burnout can be costly, inconvenient and above all, dangerous.

Therefore, motors should be protected against the possibility of electrical failure. Electric motor protection is available in a variety of devices and we will look at these in this article.

The Australian and New Zealand Wiring Rules (AS/NZS3000:2000) sets out standards "intended to protect persons, livestock and property from electrical hazards", and for motors specifies requirements for *Protection against overload* and *Protection against overtemperature*.

Now, I hear you saying, "Well, what's the difference between overload and overtemperature?"

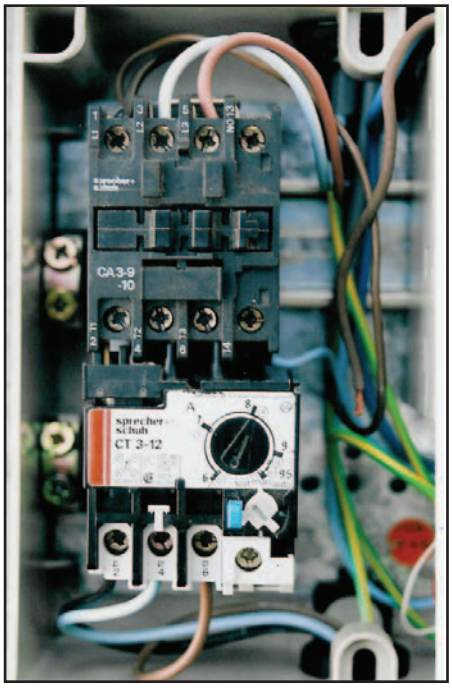
Protection against overload

When a motor is overloaded, it means that whatever it is driving is absorbing more than the available motor power. For example, it could be driving a fan with impeller blades over-pitched, or with over-tightened bearings in the case of a belt driven unit.

The Standard states that "unless incorporated in an item of electrical equipment that complies with another appropriate Standard, each electric motor having a rating exceeding 0.37 kW shall be provided with control equipment incorporating means of protection against overload of the motor."

Overload is defined as "an over-current

Motor windings being fitted with a set of thermistors.



Switchboard with typical thermal overload/contactor combination.

occurring in a circuit which is electrically sound". That is, the wiring to the motor is fine but something in the circuit, namely the motor, is overloading.

Protection against overtemperature

Overtemperature could be a result of various factors that can occur within the motor's rated supply current. For example, a high ambient temperature, an excessive start-stop duty cycle, or simply motor cooling vents that have become dirty and blocked.

The Standard states that "overtemperature protective devices must be provided for un-attended motors (where no person is normally in the vicinity) that have a current rating higher than listed below:

Single-phase shaded pole motors at 240 volts	2.0 amps
Single-phase capacitor-start/run motors at 240 volts	1.0 amp
Three-phase motors at 415 volts	0.578 amps

In summary, protecting against overload requires sensing the current in the supply circuit to the motor, whereas protecting against overtemperature requires sensing of the temperature of the motor's windings.

TYPES OF MOTOR PROTECTION

Protection against overload

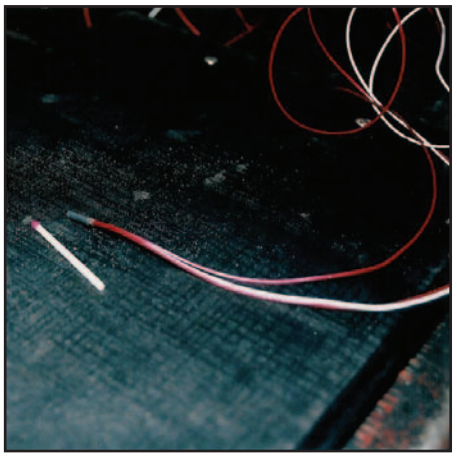
Thermal Overloads are usually installed alongside contactors in the control-switchboard, and start with basic models that operate via a bi-metal strip, where high current causes the bi-metal strip to heat up, bend and open a set of contacts, through to electronic motor relays that are microprocessor based units. The latter simulate motor heating/cooling behaviour based upon programmable parameters and monitored current. They can be integrated into control systems such as PLCs and/or building management systems.

Protection against overtemperature

A very simple form of protection is what is known as Thermal Contacts. These are miniature devices embedded in the motor windings and contain a bi-metal strip.

For single-phase motors they can be connected in series, with the incoming active, and will interrupt the supply when the motor windings get hot and the bi-metal strip opens. As the windings cool down, the bi-metal strip will close and the motor will start again. (Caution should be taken with motors that can re-start automatically.)

Three-phase units can have the device wired to a "piggy back" on the contactor.



RTD (shown) and thermistors are used to monitor temperature by measuring the change of resistance of an accurately calibrated resistive sensor.

When the bi-metal strip opens, it cuts off the power to the coil of the contactor and the contactor drops out, cutting off supply to the motor.

Another unique device is referred to as a Non-Self Resetting Temperature Limiting Switch. This is similar in design to the Thermal Contact device, but will not allow the motor to re-start when the windings cool down.

It is about 10mm in diameter and 5mm thick, embedded in the motor windings and placed in series with the incoming active line.

In the case of the windings over-heating, the bi-metal strip snaps opens and cuts power to the motor. However, next to and in parallel with the bi-metal strip is a tiny heating resister. The heat from this resister

it'll save you!

continues to hold the bi-metal strip open, thus preventing the motor from re-starting when the windings cool down.
The unit is re-set by turning off the switch to the motor and waiting until the bi-metal strip cools down and closes, which takes only a short time.
A common device used on large motors is an RTD (Resistance Temperature Detector). The RTD monitors temperature by measuring the change of resistance of an accurately calibrated resistive sensor. The sensor is usually insulated and contained inside a cylindrical metal tube of dimensions ranging from 3 - 10mm in diameter and 15 - 200mm long.
Because of their size, they are only used in large motors, where they are installed in the motor winding slots at the time of manufacture of the motor. They have become very popular because they provide low cost, high accuracy temperature measurement with a relatively fast thermal response.
Thermistors are what you may call a miniature RTD, and may be used in smaller motors. They are about the size of a match head, embedded in the motor windings, and respond via a resistance. They are coupled with an associated trigger device called a thermistor relay. Fantech recommends this type of motor protection, as it can be easily and cheaply fitted to motors at time of ordering.
Sometimes, on critical installations, it's worth considering the addition of another set of thermistors rated at a different temperature, so that one set would act as an "alarm" and the higher rating set would be the "trip" set.
In conclusion, it is important that for safety reasons alone electrical motor protection be fitted. The type of protection used will be determined by an assessment of the installation, which could vary from a basic HVAC exhaust system through to more onerous, continuous stop-start applications. Correctly matched protection will ensure a safe installation and maximum lifespan of your motor.

Record contracting job on new hospital site

A $376 million redevelopment has brought together two of Victoria's finest public hospitals on one site, offering an expanded range of acute and specialist health services.

The new Alfred and Mercy Hospitals have state-of-the-art facilities.

The new Austin Hospital has been joined by the re-located Mercy Hospital for Women at the Austin's Heidelberg site.
Fantech played a significant role in the twin towers project, providing the complete ventilation requirements, with installation by mechanical contractors A. E. Smith.
Malcolm Wallace, Project Manager for A. E. Smith, said it was the single biggest contracting job done by a mechanical contractor in Melbourne.
"The Casino may have been bigger in dollar value, but that was split between three companies. This was totally done by one company," Malcolm said.
The project was achieved in remarkable time, with A. E. Smith completing all its commitments in two years.
"We began on February 2003, and handed over one hospital in March, 2005, and the other in April," said Malcolm.
"It's been quite a journey. I don't think anyone in the industry believed we could do it.
"But we had the right combination of builders, clients and sub-contractors."
Fantech provided a range of in-line axial fans, varying in diameter size from 400mm up to four two-speed 1800mm fans installed in the new car park.
Malcolm said that despite the size and speed of the project and the number of fans installed, "nothing caused us concern."
However, there was a lot of fan re-selection done, one consideration being selecting fans that were quieter than those specified.
"We looked at what was the best value for money, in terms of fan duty and noise produced," he said. "In some instances, you save money, and in others you spend money."
Sales Engineer Darren Hunter, the Project Manager for Fantech, said:
"This was one of the biggest and most challenging projects I have worked on from start to finish. We worked closely with Malcolm and the team from A.E. Smith to make sure we provided precisely the right fans for the application, and this is what I enjoyed most about the project".
The Austin features more single patient rooms and expanded intensive care, while the Mercy boasts 13 birthing suites.

PRODUCT NEWS

Heritage smoke spill fans find niche

FANTECH has seen an increasing requirement for roof mounted smoke spill fans for smaller air volume applications. The Heritage Roof Mounted Smoke Spill range is available as an approved alternative to the traditional axial roof mounted smoke spill fans. In fact, one of our first installations has been completed at Melbourne's new Juvenile Justice Centre. Fantech offered the fans as an alternative to the originally specified axial roof mounted fans because we felt the Heritage version particularly suited the requirements for the cell blocks, which is typical of this type of building. The smoke spill version is based on Fantech's popular Heritage Roof Mounted Fan, incorporating backward curved centrifugal fan design. They are able to generate higher pressures than the roof axial fans of similar size and speed, and provide significantly lower noise levels. Fans are approved to temperatures of 200ºC for two hours and 300ºC for 30 minutes. Tests up to 300ºC for two hours were also achieved. No discharge dampers are used, therefore no fail open latching is required for non-sprinklered applications (300ºC for 30 minutes). The current size range is from 310mm to 560mm diameter, with 4, 6, and 8 pole speeds, most sizes being cost effective against traditional axial smoke spill roof unit products. The roof cowls are of galvanized steel finish and the windband can be easily removed for access to the fan.

A standard powder-coated Heritage roof mounted fan.

Smart staff became Allstaff success

IN 1975, a group of 30 people, ranging from plumbers to factory workers to managers, came together to create their own business.

They had all been working for Frigrite, who had decided to get out of mechanical services.

"The thirty of us could have gone our separate ways," said Frank Wiedermann. "But we had worked together for a long period, and there was a lot of camaraderie and mateship as well as a diversity of skills and experience. So, we thought, 'Let's continue working together'."

They each chipped in money, formed a company, completed the existing Frigrite contracts and began building up their own clientele.

Thirty years on and Allstaff Airconditioning is one of the industry's major and best-known contractors, with 190 staff at its headquarters in Victoria, 40 in NSW, and 35 at its Albury-Wodonga branch, Complex Airconditioning.

"As we were all staff members, it seemed appropriate the name of the new company we were so excited about forming should reflect that. That is how the name Allstaff Airconditioning was derived," said Frank, the company's General Manager.

The happy staff at Allstaff, celebrating 30 years of success.

"Everyone dug deep into their pockets to buy in. It was a matter of whatever one could afford, so the running of the business was very democratic - everyone had input."

Since then Allstaff has developed an enviable record as a provider of mechanical services and air conditioning, as well as design and installation, service and maintenance, cleanroom facilities, energy auditing, indoor air quality, metal fabrication, thermal storage and sustainable/renewable energy.

"We have worked on some of Australia's most significant projects, including Federation Square, Crown Casino and the County Court in Melbourne, and St Vincent's Hospital, the World Square and Concord Hospital in Sydney," said Frank.

Some shareholders have left and some, sadly, have passed on. The company has been bought and sold several times, and is now owned by the Chief Executive Kent Williams.

Starting out at a small factory in Moorabbin, it went through a couple of moves before settling at its spacious Dingley site.

"Understandably, we are very proud of what we have achieved over the past thirty years," said Frank, "and we're looking forward to the challenges of the next thirty!"

More than just a museum piece

IT was so big it could not be transported in one piece from Sydney to Perth.

So the monster Size 73 double-width centrifugal Fan & Blower fan was specially constructed in segments, assembled, checked, dismantled, loaded on board a truck in pieces, driven more than 3000km from the east coast of Australia to the west, delivered and reassembled on site.

"It is the largest fan we have supplied," said Peter Ramage of Systemaire, who also supplied Fantech axial fans for this project.

"Systemaire supervised the re-assembly of the large fan and the installation of the motor, which was flown straight in from Taiwan."

Peter Ramage installing the Size 73 fan.

The 4.8 tonne fan, powered by a 100kW 10-pole motor was designed for the special requirements of the new Collections Building for the Western Australian Museum. The building, a converted warehouse in Kewdale, will store thousands of artefacts not on display in the Museum proper. These include wood, fur, bone and skin that can deteriorate if not kept in the right air conditions.

"Maintaining correct temperature and humidity levels is critical," said Peter.

The mechanical contractor, Mechanical Consultants, said the installation went without a hitch, with the fan showing exceptionally smooth running qualities.

The museum inventory numbers more than 2,500,000 specimens/artefacts.

WOULD YOU LIKE MORE INFORMATION?

Please contact me regarding: ❒ **Heritage smoke spill fans**

❒ **Please send me a copy of the 2004 Fans by Fantech CD.**

❒ **Please send me a copy of the 2004 Fans by Fantech Catalogue.**

Is there anything else we can help you with?

❒ **I would like to be included on the Tech-Talk distribution list.**

❒ **I would like to be removed from the Tech-Talk distribution list.**

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