

Industrial chiller company puts experience into HVAC

(The following article was published in Australia's Climate Control News, September 2007)

Success in providing chillers for the Gold Coast Desalination Plant in Queensland and for the Boddington Gold Mine expansion project in Western Australia have heralded the entry of Summit Matsu Chilling Systems into the HVAC sector.

The Gold Coast Desalination Plant, now under construction at Tugun on Queensland's Gold Coast is being built by the GCD Alliance - a consortium of John Holland Constructions, Veolia Water Australia, Sinclair Knight Merz and Cardno.

The desalination plant is the largest desalination plant on the Eastern Seaboard and part of the construction involves the boring of two marine tunnels each 2.2km in length. When completed the plant will produce 125ML / day of fresh water.

The chilled water requirement was to cool the heads of the tunnel boring machines with tunneling is expected to take between 6 and 8 months. Cooling tower water could have been used but with the 2.2km pipe run each way, for each tunnel, this needed re-considering.

Summit Matsu Chilling Systems worked on site with the customer and specified a SDA series chiller with screw compressor and shell and tube evaporator giving 245kW cooling with 24 deg C water discharge. The chiller was placed downstream from the cooling tower and was able to take enough temperature out of the water so that GCDA could reduce their pipe diameter from 300mm to 200mm. "The savings on pipework were significant" said Summit Matsu Chilling Systems General Manager Daniel Rollston.

The Boddington Gold Mine (BGM) is located 130 kilometers southeast of Perth in Western Australia and has been in operation for nearly 25 years. After a shutdown and decommissioning period in 2001 the mine is now being expanded at a budget cost of \$1.8bn to \$2bn. Gold and copper ore will be open cut from the basement rock underneath the existing depleted oxide pits and the processing done on site.

It requires the construction of a new processing plant which will include a three-stage crushing circuit, single stage grinding, copper-gold flotation and gold leaching of the flotation residue by the carbon-in-leach (CIL) process.

During the construction phase an accommodation village for up to 1500 people is required with a permanent workforce estimated at 650. The project will take approximately 2.5years to construct, with first production planned for late 2008.

Summit Matsu Chilling Systems was awarded the chiller contract for 2 SDA chiller models for the primary crusher chillers. The project documentation was extensive and Summit Matsu Chilling Systems engineers have been working with BGM representatives in Boddington (WA), Colorado (USA), and Santiago (Chile).



MWC-8-155 chiller for Linde Gas nitrogen liquification plant, Port Kembla, NSW, a high documentation project

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“We are always open to ways to improve our procedure and business – even when that means reworking or improving drawings. But the inclusions and improvements demanded by large scale engineering customers like BGM, Worley Parsons, and Linde Gas have now become standard features on all models” said Rollston.

Summit Matsu Chilling Systems now has a stable of products ideally suited to larger production runs also thanks to its work with a herbal products manufacturer partly owned by Sanitarium. The customer required both the heating and cooling sides of the compressors to be used with water for an industrial sized de-humidifier and dryer. The product was an organic food stuff. “The brief was for cooling to be always on and heating to be required on demand” Rollston said. “The system also required pumps and tanks for both the hot and cold side. By developing a system that was able to meet these requirements and then vent any additional capacity via an extra air-cooled condenser Summit Matsu Chilling Systems was able to translate this into a heat pump series and reverse cycle units.”

Research and development has been a strong point of Summit Matsu Chilling Systems through its life. The first chiller that the company built over 45 years ago was for an injection molding company next door to the Summit factory, and this desire to work with customers and understand customer requirements before building chillers grew from there. “We even built the first chiller for one of our current competitors” said Rollston. “They asked our Chief Engineer to build them a chiller and a few months later they were then building the same model”. The Matsu part of the company name has come from research and development the company did with Hitachi on horizontal scroll compressors for cassette type air conditioning units for high rise apartments. Hitachi built the compressors to designs provided by Summit Matsu Chilling Systems engineers.

Sydneys Coast Golf Club at Little Bay proved to be another customised project with features that can now be incorporated into standard models. Located within 100 metres of the breaking surf, salt spray had destroyed many chillers on this site. Summit Matsu Chilling Systems worked with mechanical services company Quantum to develop a customised chiller for corrosive environments. Features included copper finned condensers, a frame that was sand blasted and hot dipped galvanized, and all panels including the electrical cabinet from 304 stainless steel. Frame body fasteners from stainless steel with an aeronautical-grade electrolysis preventing paste used on all fasteners. The drain tray area was oversized with PVC drain used to prevent rusting.



220kW chiller for The Coast Golf Club involved customisations like copper/copper condensers, hot dipped galvanized frames and stainless steel panels to withstand the harsh coastal environment

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Stainless steel corrosion proofing covers were mounted over compressors which were Refcomp screw type. "The compressor enclosures could also have been noise proofed" Rollston said. "Then we discovered that the screw compressors were quieter than expected. Many months were spent on non-standard components and customizations for the harsh environment and now the harsh environment chiller is part of the standard range" he said.

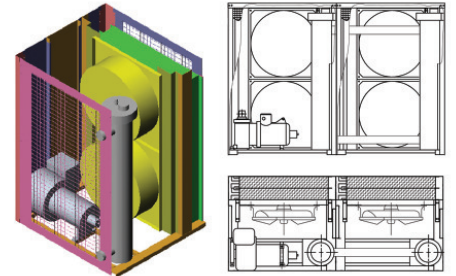


Smaller chillers 2kW to 5.8kW for optical lens companies have allowed the company to develop a specialty in accurate, close control chillers

Summit Matsu Chilling Systems now has a greater share of the market on the back of its customisation work. Changing things like water pipework, pump models, and compressors specifically to suit the application has resulted a greater market share in the industrial space, but also a specific ability to be able to do this successfully for any customer.

"Close temperature control has always been a feature demanded by industrial customers" Rollston said. Optical lens companies Essilor and Hoya bought a number of smaller chillers with temperature control requirements at a variation of +/- 0.5 deg C. Although part of the smaller range, manufacturing these chillers involved using technology learned when building chillers for the Alcatel optical fibre extrusion plants, and selecting a configuration of parts to give the reliability and close control required. This accuracy of supply requirement is now part of the standard range for HVAC installations.

The new SDA series (Summit Door Access) was spearheaded after working on specifications with a commercial engineering and contracting company. The SDA series is designed to fit through standard doorways and into standard lifts. The chillers can be fork lifted or can be fitted with castors for movement around site. "The idea came to us from one of our customers who suggested the convenience of being able to do this, and after 24 months of research and development the SDA series is now part of our standard HVAC chiller offering. By incorporating screw compressors from Refcomp and vertical shell and tube evaporators developed with the Thermokey research team we are able to gain surprisingly high capacities for a small footprint" said Rollston.



SDA Series modular chillers with screw compressors, developed by listening to customers

Adapting manufacturing and machines to varying environments across Australia has also been key to the company's product offering. In response to a call from industrial customers for fully featured plug in and play systems Summit Matsu chillers are now delivered with all contactors, starters, fused breakers and safety devices such as water flow switches included as standard.

The company has had a huge response to its implementation of fully run testing all machines prior to dispatch. This was on the back of the remote location issues such as skilled refrigeration mechanics not necessarily always being close to site. Chillers are fully run tested prior to shipment, reducing costs and commissioning downtime for customers on site.

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A full test report showing power usage in the actual running environment is produced as standard for each industrial customer, and now for HVAC customers.

“Fast response time has always been a key selling point for our business” Rollston said. He cites how this was translated to the breakdown situation in remote locations where there may be a narrower choice of spare parts available, and greater distances for refrigeration mechanics to travel. With this in mind, and because they are manufactured in Australia, chillers from Summit Matsu Chilling Systems use controls and parts available locally from wholesalers. “Some chillers require a laptop for maintenance, and we do offer this as part of our PLC package, but generally we keep the local fridgy in mind and make the units as easy and fast to service as possible” said Rollston.

In response to industrial customer demands for durability and movement around site the company now builds as standard rigid steel bases IP55 electrical enclosures which are now on HVAC models.

“Industrial customers are also demanding in terms of delivery times, which has forced us to build our entire business around a 6-8 week lead time for all projects. We can now offer this to HVAC projects.” said Rollston.

“We are using a similar business development model to Honda” said Rollston. “Honda dominates the Indy 500 in the USA and then puts this R&D technology into their mass production cars. Summit Matsu Chilling Systems has a dominant position in industrial chillers in Australia. We are now putting this R&D into our production models for HVAC applications.”

Matsu Chilling Systems manufacture and distribute water chillers Australia wide for air conditioning, industrial processes, food processing, petrochemical applications, scientific uses, and process cooling machinery for all types of applications.

Matsu Chilling Systems also commission and service from 2kW to 1200kW water chillers Australia wide.

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