

SPECIAL FEATURE



An Armstrong variable-frequency drive (VFD) pump, next to Polar Bear President Dennis Campbell, provides the absolute best efficiencies by matching the flow requirement to the building needs.

ATTENTION TO DETAIL

Polar Bear Water Source Heat Pump takes geothermal installations to another level

Dennis Campbell spotted an opportunity to help retrofit a central Toronto building – and he took that opportunity and ran with it.

Campbell, the President of Polar Bear Water Source Heat Pump Mfg. Inc., was already a tenant at 501 Alliance Avenue, owned by S. Strashin and Sons Limited, when he found out that a quote utilizing another system for air conditioning and refrigeration had been made for work needed at the building, which is located near the

heart of the city.

"I was then asked to provide a competitive geothermal bid," recalls Campbell. "With the other bid, I was concerned with the amount of refrigerant flowing in a multitude of piping lines in the ceilings of every floor on the four-storey structure."

Campbell then made his pitch to Elliot Strashin MD, President and CEO of 501 Alliance Investments Inc., and its parent company, S.

Strashin and Sons Limited.

"I was given a shot at quoting using geothermal technology and Polar Bear-manufactured equipment," Campbell says.

"I suggested that the building, with four floors of 65,000 square-feet, plus a basement, required at least 225 tons of cooling and/or heating for the central structure ... and an additional 40 tons for the 54,000 square-foot, one-storey side structure."



The 6 ton BKM energy recovery unit is finally being placed into position

The rest is history. Along with its presentation team, engineer Imran Majeed from Advanced Building Solutions and Stan Reitsma of Geo-Source Energy, Polar Bear proposed using 275

tons of Polar Bear Water to Water heat pumps in 18 15-ton units with provisions to add another 45 tons. "The building analysis indicated that the building was 'cool dominant,' therefore geo-

thermal should have a tremendous advantage, as cooling is nearly 50 per cent cheaper than any other way," Campbell says.

In the proposal to Strashin, it was proposed that 15-ton Polar Bear heat pumps would be manufactured with Copeland compressors and Packless water coils, utilizing only the best components for their stated used. (The geothermal, by the way, supplies 39 of the 80 lead points required to attain a LEED Gold certification.)

Additionally, a vertical loop system would utilize off vertical axis drilling for as much as 10 per cent to provide a much larger footprint, 192 metres (or 630 feet) down, Campbell says.

"Both passive and active ice melt around the building was to be incorporated," he explains. "Pre-cooling the vertical loop system at the end of the winter would greatly reduce summer air conditioning costs. Active ice melt would only be used in loading docks, walkways and basement ramps."

Bill Wolski, of Horus Technologies Inc., points out that an HVAC control system has been engineered so that any piece of equipment tied to the heating and cooling at 501 Alliance can be seen and monitored on designated computers or smart phones.



Unitary control and thermostat provide control set point adjustments. An example is the Victaulic flow control and balancing valve.



Standing in front of the BKM unit are, left, marketing and sales associate Michael Bullock, and, right, engineering technician Cyril Kuenstler. The unit has ninety 110-pound cassettes, 45 on exhaust and 45 on intake.

"We will be able to forecast loads and utilize night-time energy to either pre-cool the building, or heat it."

Advanced Business Solutions, meanwhile, introduced a makeup air unit from BKM. This unit

utilizes no fossil fuel heat or electricity other than that to run the fan motor to provide 90 per cent efficiency during the winter months.

This heat recovery unit utilizes two sets of aluminum plates, one set for exhaust air and the

other for intake.

Warm air from the building on the exhaust side transfers its heat energy into multiple aluminum plates; likewise the fresh air also passes through its own set of aluminum plates.



From left to right: Elliot Strashin (Strashin Developments), Imran Majeed (Advanced Building Solutions) and Dennis Campbell in front of BKM unit before being lifted to the 501 Alliance Ave. rooftop



With a flow meter and digital Thermometer in hand, Polar Bear President Dennis Campbell showcases part of the overall feedback technology incorporated into the 501 Alliance Avenue project.

The trick is, every 70 seconds, a very large damper switches the air flow.

The fresh air intake then comes through the aluminum heat exchange plates which had previously collected the heat from the air being exhausted.

The quote, Campbell says, also included variable-frequency drive (VFD) pumps which provide only enough fluid flow through the building to the installed Polar Bear air handlers or fan coils, as required.

"Every air handler is to be equipped with a very special balancing/flow valves provided by Victaulic," he says.

"These valves eliminate the need for a balancing engineer.

It matters not what part in the building they are located, flows of one gallon per minute (GPM) to 12 GPM can be called for, based on the conditioned space requirements as seen by the thermostats."

Campbell says that proposed air handlers would be equipped with ECM fan motors, providing up to five speeds. With this, excellent efficiencies will be realized through the control of

air and water flows.

Not just lower costs, he stresses, but absolute comfort for the tenant, with no more noisy systems with blasts of air each time there's a call for heating or cooling.

"Good equipment is only part of a smart installation," adds Campbell. "Good engineering and installation practices are also required.

The fourth floor of the building will be up and operating by the end of June 2015, so visitations will be welcome."

About line of heat pumps produced by Polar Bear

Residential standard Water to Air, Water to Air and Water to Water triple function units primarily used to heat outdoor pools. Water to Water and Water to Water to Air heat pumps primarily used in conjunction with in floor heating system. Dehumidification systems for pools. Reheat heat pumps, which absolutely control humidity along with Polar Bear's newest line of digital compressors combined with multiple air handlers. All Polar Bear units are built with industry-leading efficiencies, but more importantly it's how

they are made. Top this all off with a recently manufactured 1.3-ton unit for condo apartments with an efficiency of 490 per cent, or coefficient of performance (COP) of 4.9, Polar Bear has the knowledge and experience to move forward.



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