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Valves & Connectors Boost Heat Pump's Flow Rate

There's a reason Tahiti is a more popular vacation destination than Antarctica: warm water. Okay, maybe there's more than one reason . . . The fact remains, however, that warm water is often more inviting than its ice-cold counterpart.



That's how the founders of AquaCal, a Florida heat pump manufacturer, felt about swimming pool water -- and apparently pool owners agree, because the number of heated swimming pools has risen dramatically over the last 25 years. Consequently,

AquaCal found itself faced with the demands of running a fast-growing company in a fast-growing industry, including managing the often conflicting constraints of design and manufacturing. Fortunately, the CoreMax system from FasTest Inc was available to solve the problems.

Growth Challenge

The company needed to keep line speed high to keep costs down, and needed to draw a deep vacuum on all of its units to pull out contaminants that affect the quality of the product. Plus, it could not keep adding stations to the production lines without running out of area in its limited plant space.

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AquaCal chose to address the engineering problem before turning to a construction solution. The company had been evacuating and charging its heat pumps through a Schrader-style valve with low flow rates that dictated multiple evacuation stations on each line. In this system, the units come down the production line into a pre-evacuation station, which consists of unregulated vac pumps, and then moved to a micron gauge-regulated final evacuation and charge station.

Process Tubes Create New Problems

To speed up the process, engineers evaluated a common approach of using special connectors to fill and evacuate the systems directly through a straight tube, eliminating the valve restriction altogether.

But while faster for evacuation and filling, process tubes required an extra pinch and braze station to seal the tube at the end of assembly -- an imperative step, since a leaking joint requires that the refrigerant be reclaimed and the joint repaired before the evacuation and filling processes are repeated.

AquaCal found that all of the time saved during evacuation and filling was consumed in the extra pinch and brazing station needed to ensure this joint was brazed properly. Process tubes were not the answer.

"Our main objective was to shorten the vac / charge process. We had started testing process tubes with little success," said AquaCal's quality manager. "While we found it sped up the actual vac and charge, we found the extra time involved manufacturing, installing, and sealing them after charging took more time than the Schrader valves we were currently using."

How the CoreMax System Helped

The company then evaluated CoreMax, a new high-flow processing system invented by FasTest Inc, a Minnesota manufacturer of specialty production tools, including connectors used on process tubes. At the heart of the CoreMax system is a high-flow valve and connector that provides about the same flow rate as a ¼ in. process tube.



By replacing the Schrader-style valve with the CoreMax valve and using high-flow FasTest connectors, AquaCal engineers were able to achieve the desired throughput without having to add more stations or a final online pinch and brazing operation.



"The situation at AquaCal was ideally suited for CoreMax," said Rob Danielson, FasTest's vice president of engineering. "CoreMax is designed to provide up to six times more flow than a Schrader-style valve, thus eliminating the need for access valves on both the high and low side of their systems."

"Our application uses both a high and low pressure access on all equipment. We did some time tests and found the speed of vac / charge was comparable to process tubes, without the added manufacturing headaches and adding the possibility of two more possible leak locations," said AquaCal's plant manager.

By incorporating the CoreMax system into its products and manufacturing lines, AquaCal was able to maintain its target line rate of 5-minute tact time and be competitive in product cost, all without incurring added building costs.

"Speed and efficiency have been the major returns to us," the plant manager continued. "While CoreMax is a higher initial investment, we have saved overall by not adding process tubes to all of our equipment."

"Another added benefit is that CoreMax also has the same thread and taper as a Schrader-style valve, which allows service technicians to use all of their existing tools to gain access to the systems," Danielson said -- meaning additional training to the field was not needed.

Conclusion

With the addition of the CoreMax system, AquaCal was able to grow with its industry, continuing its mission to be a leading innovator and provider of quality heat pump pool heater products and services to the widest possible market segment.

An advertisement for GORBEL and OILSKIMMERS, INC. The top section has a blue background with white and yellow text: "Data Loggers From TANDD" and "Humidity", "Evening", "Vol", "Current", "Temperature". Below this is a black section with the GORBEL logo in white and the tagline "A CLASS ABOVE". The bottom section has a blue background with white text: "1-888-OILSKIM", "OILSKIMMERS, INC.", and "oilskim.com".