Eco HVAC for simple flexible solutions

Following the release by SEW-Eurodrive SA of its dedicated Eco HVAC drive at Electra Mining Africa earlier this year, *MechTech* talks to Norman Maleka (right), the company's national sales manager about suitable applications and advantages.

With the launch of the Movitrac LTP-B Eco HVAC Building product range, SEW-Eurodrive in South Africa hopes to have opened up new markets for its LTP-B range of variable speed drives. With a historic focus on industrial applications such as hoists, conveyors, water and wastewater pumps, the LTP-B general-purpose range has been used for several HVAC applications in the past.

"But, with this exclusive release into the South African market, we have developed a fit-for-purpose HVAC drive specifically for the HVAC industry. Unlike the general-purpose drive, which is still being used, we have incorporated dedicated firmware to tailor the drive to specifically suit ventilation and air handling systems in hospitals, shopping malls, car parks, offices and commercial buildings," Maleka tells *MechTech*.

"We became aware of opportunities in the HVAC industry when we were asked to supply drives to the HVAC sector in Cape Town. It was a smaller scale installation, which is our strength, and we implemented it successfully using VSDs from our general-purpose range. We realised several things: that we needed to have specific HVAC branding and solutions; and that these applications require specific features to allow them to operate successfully and efficiently. We believe that our LTP-B Eco HVAC drives satisfy these needs and will enable us to compete successfully in this market," says Maleka.

With its Movitrac LTP-B Eco HVAC Building product range, SEW-Eurodrive has developed and introduced a fit-for-purpose HVAC drive specifically for the HVAC industry.

Describing the key features of the new drive, he says that electric motors used in HVAC systems are often used to drive fans, either for extraction or for air handling units; and chilled water circulation pumps. "HVAC systems are also heavy energy consumers, so as electricity prices soar and more people become aware of the carbon emissions' problem, the market focus has shifted towards energy efficiency. More and more green buildings are being developed and building service managers are seeking ways of reducing the energy consumption of existing installations," he explains.

"The biggest advantage of installing an Eco HVAC drive is energy efficiency, because of their ability to vary the speed of the fan and/or the chilled water flow based on cooling demand. In modern commercial buildings, shopping malls car parks or hospitals, all energy use is becoming demand driven. An HVAC system will pick up the demand, via temperature or occupancy sensors, for example, and feed this information back into the system. Using software algorithms and firmware, this demand data is then used to regulate the HVAC system. This avoids unnecessary energy use for cooling that is not required. And when cooling is required, these systems adjust the fan speed and/or the chiller pump flow so that the conditioned air in the cooled space closely matches the specific requirement. This prevents excessive over-chilling and associated energy inefficiency," Maleka explains.

"In terms of functionality, our Eco HVAC LTP-B drive incorporates the firmware to work out the demand and to optimise the fan speed or the chilled water flow to minimise energy use.

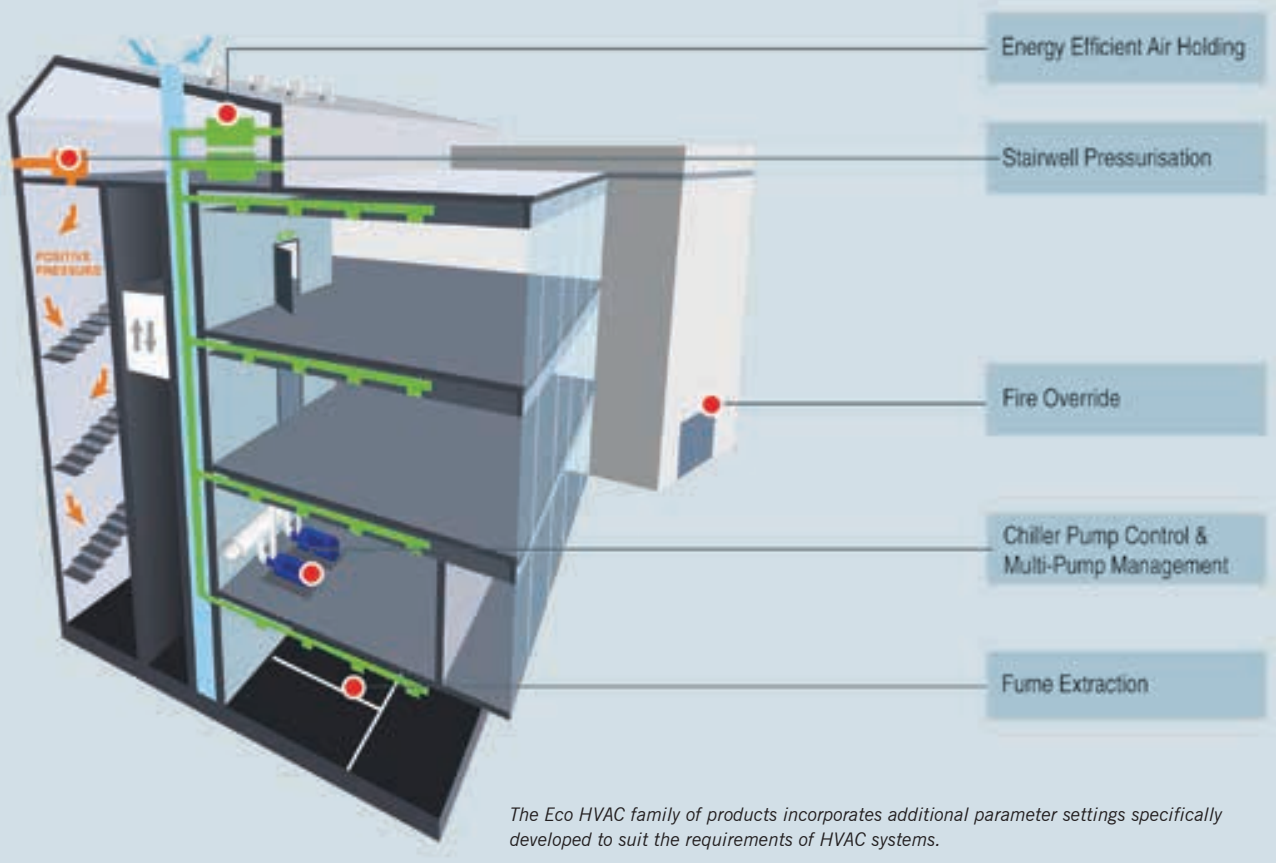
"One drive is needed to control each fan/pump motor, and this can be achieved locally without the need for an additional PLC controller or building management system (BMS). The functionality built into SEW-Eurodrive's Eco HVAC drives, however, enables them to communicate with each other via a simple PLC or a central BMS. The use of this drive solutions is, therefore, easy to scale, from a simple system controlling a single fan, to a small system of four or so units and all the way through to a building wide system of 50+ units centrally controlled by a BMS," Maleka points out, adding that the drives are available with power ratings from 0.75 to 375 kW, "covering a comprehensive range of HVAC applications".

Key functionality

As well as incorporating demand-based management principles, the Eco HVAC family of products also incorporates additional parameter settings specifically developed to suit the requirements of HVAC systems. "While the hardware is similar to the general purpose units, we have developed different firmware to cater for the specific requirements of fans and circulating pumps for chilled water."

For extraction fans or fans for air handling units, for example, Maleka cites the Flying restart feature, which protects the motor should the fan be turning in the wrong direction on restart – due to drafts, for example, "This feature automatically detects the fan speed and direction before restarting and, if revolving in the wrong direction, it will first bring the fan to a controlled stop before softly restarting," he explains.

For extraction fans and stairwell pressurisation systems, he says that, in the event of a fire, air pressure needs to be maintained in the stairwell for as long as possible to give time for people to escape. "This feature, called Fire mode, ensures that, if a fire is detected, the fan will maintain the pressure and extrac-



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tion suction for as long as possible to give people the best possible chance of leaving the building safely," he explains, adding, "the unit will ignore all alarms and error messages and continue to run until it self-destructs."

Also included is a Break protection function, which will bring the fan motor to an emergency stop should the belt between the motor and fan break.

Describing features for HVAC circulation pumps, he says the same unit can be used to manage chilled water circuits, simply by accessing the pump menu instead of the one for fans. "For pumps we have a stir function, and unblocking function and a dry run protection function.

"The pump stir function is useful for circulation systems that have been idle for any length of time, following a cool winter spell, for example. Before starting the pump, the stir function gently rotates the pump a few times to dislodge any sediment before accelerating to speed. This is also used as part of the cleaning function, which first dislodges any sediment before coolant draining and recharging," he explains.

The cleaning function has also been successfully employed for small mobile pumps for wine farms, where, combined with blockage detectors, the pumps can be kept in good working order while pumping juices with pulp residues.

Simplicity is key

While the key benefit of using the Eco HVAC drive is energy savings, Maleka says that, across its product range, a key goal for SEW-Eurodrive is to make the units easy to set up. "Customers do not want to struggle with installation. We strive to minimise the effort required to set up these drives and establish the parameters needed for the application.

"SEW goes the extra mile to make it easy to use its products. This is a key differentiator for us. No one wants to spend days on site trying to figure out how a drive works. And, if an installer is experiencing problems, we have a team available to assist with installation and commissioning and, as with all of our technologies, 24/7 breakdown support is available for the HVAC range," he says.

The use of SEW-Eurodrive's Eco HVAC systems enables solutions to be highly customised to achieve the exact requirements a customer is asking for. "We are, therefore, targeting HVAC OEMs and systems integrators who want to do a little more than simply install standard systems for their clients," Maleka continues.

"This drive is also ideal for retrofits and upgrades. We can, for example, convert fixed speed HVAC systems to on-demand systems, simply by installing LTP-B Eco HVAC units between the controllers and the motors. In almost all cases, this will result in energy savings and rapid returns on investments," he asserts.

"Motor technology has also moved on. We are still using IE1 motors in many applications in South Africa. We at SEW have now standardised in IE3 motors and permanent magnet (IE4) motors are already here. The Eco HVAC drive is compatible with both of these, so older HVAC system can now be cost effectively upgraded to meet current energy efficiency standards," he adds. With the emergence of greener and more energy efficient buildings, HVAC technology is changing fast. "We have a product that can be easily upgraded via firmware to match ever greener and more efficient control strategies, a product that offers a cost-effective solution for installations and retrofits of most sizes.

"The LTP-B Eco HVAC Building product range makes sophisticated HVAC solutions available to a much broader spectrum of HVAC users," Maleka concludes. ❑