Maintaining HVAC systems

Annually, heating and cooling systems in residential and commercial buildings are depended upon to keep interior temperatures continuously comfortable. However, many people do not realise how the wear and tear on a heating and cooling system can mount up over time.

Ideally, a heating, ventilation and air conditioning (HVAC) system requires a maintenance inspection twice a year, once in the winter before using the heat pump heating system, and once in the summer before starting the cooling cycle of the air conditioner. These inspections help ensure that the installed system is functioning at its most efficient and providing optimum comfort.

A maintenance inspection will also extend the life of the equipment, increase cost-effectiveness and ensure safe heating and cooling.

HVAC systems are a big investment. This fact often comes to light when an entire air conditioning system must be replaced due to poor maintenance.

For safe HVAC installations, modifications, maintenance and repairs, only registered SAQCC Gas practitioners should be used and a Certificate of Conformity received.

It should be remembered, however, that air filters will still need to be cleaned frequently.

Scheduling annual furnace or air conditioning system inspections can save on energy costs.

HVAC systems are a big investment. This fact often comes to light when an entire air conditioning system must be replaced due to poor maintenance. Frequent system inspections and maintenance checks help keep a system effective for a longer period. Sadly, however, most systems are only attended to when they have broken down or likely to be a safety and health hazard.

Safe HVAC installations

While regular inspections are important, the actual installation of an HVAC system is even more important. Maintaining a poorly installed system can prove pointless and possibly harmful. It is vital to use only an installer registered with South African Qualification and Certification Committee-Gas (SAQCC-Gas) when installing HVAC equipment in a property, in order to avoid accidents such as leaking refrigerant gas into the atmosphere, which impacts on ozone depletion and contributes to global warming – both reasons for the drafting of the Montreal Protocol and amendments.

SARACCA is the association of South African Refrigeration and Air Conditioning Contractors whose members have agreed to a set of governing standards whilst freely competing against each other. The Pressure Equipment Regulations (PER) were put in place to ensure that all gas installations meet safety standards. These regulations set out the requirements for the design, manufacture, operation, repair, modification, inspection and testing of pressure for all equipment used in the HVAC Industry.

In terms of the Occupational Health and Safety Act, 1993, (PER) also requires all who intend to work on gas equipment to undergo specific training and to be registered with the SAQCC-Gas. For safe HVAC installations, modifications, maintenance and repairs, only registered SAQCC-Gas practitioners should be used and a Certificate of Conformity received.

Legal documentation

A Certificate of Conformity (COC) for Gas installations is a legal document, which must be obtained whenever a refrigeration or air conditioning system under pressure is installed, modified or repaired. This certificate should be retained for possible future requirement. Only Registered Practitioners may issue a COC. When the refrigeration system size causes it to be in Category II or higher, as defined by SANS 347, an Approved Inspection Authority (AIA) is required to examine and countersign the certificate of conformity issued by the gas practitioner.

The common aim of SARACCA members is to continually strive to improve the image and standards of the industry and the association provides a forum for this purpose.

In July 2009, the Department of Labour published the 'Pressure Equipment Regulations' as part of the Occupational Health and Safety Act Number 85 of 1993. SAQCC-Gas has been accredited by the Department of Labour to register 'Authorised Persons'.

SARACCA, as a member of that committee, is tasked with registering refrigeration and air conditioning practitioners. ❑

Next Generation Refrigerated Dryers

Large industrial applications requiring moisture-free compressed air are now able to withstand the most demanding environmental conditions possible thanks to the Next Generation refrigerated dryers from Ingersoll Rand®. Designed for energy conscious industrial customers, the new refrigerated dryers offer improved operating efficiency with up to 24% lower energy consumption, up to 40% lower pressure drop and increased reliability – all with a 20% smaller footprint compared to the previous generation.

"Our customers want help with their efforts to reduce carbon emissions, increase sustainability and lower their operating and energy costs," says Rolf Paeper, vice president of product management and marketing for Compression Technologies and Services at Ingersoll Rand. "We developed the technology used in these new refrigerated dryers to deliver the efficiency, air quality and reliability while putting it in a smaller, more efficient and economical package."

The newly launched high-efficiency cycling and standard non-cycling refrigerated dryers from Ingersoll Rand feature innovative heat exchanger technology with advanced condensation management and improved heat transfer characteristics. They offer capacity of 1 300 to 2 250 m^3/hr and deliver Class-4 dry air, with a pressure dew point (PDP) of +3.0 °C.

The new intelligent controller is constantly monitoring the condensate level in the moisture separator to optimise discharge through the electronic no-loss drain valve. If the drain is not properly discharging due to contaminates, or some other malfunction, the controller will automatically adjust the timing sequence of the drain in order to maintain optimum discharge and the dryer's performance.

Ingersoll Rand refrigerated dryers use centrifugal separation to remove moisture at the coldest point in the system. As the air stream is cooled in the heat exchanger, moisture from the air stream condenses and is discharged through an electronic condensate removal drain. The result is highly efficient moisture removal and dry, clean air, combined with low-pressure drop.

In the high efficiency cycling dryer design, a thermal mass storage reservoir is added to the refrigeration circuit to store cold energy. This reduces compressor run time and offers customers additional energy savings.

To ensure durability and reliability during operation, the new refrigerated dryers were tested in a climatic chamber to simulate the most demanding environmental conditions possible and were validated according to ISO 9001 specifications. ❑

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LTB-B Eco HVAC drive saves energy and cuts costs

SEW-EURODRIVE South Africa targets niche sectors such as Heating, Ventilation and Air-Conditioning (HVAC) to ensure sustained growth, with its LTP-B Eco HVAC drive central to this move.

With a large footprint and customer base in food & beverage, automotive and mining, drive and automation specialist SEW-EURODRIVE South Africa is now targeting niche sectors such as HVAC to ensure sustained growth. In this regard, its LTP-B Eco HVAC drive is starting to make inroads in this market thanks to its combination of innovative technology and easy-to-use features.

The LTP-B Eco HVAC drive from SEW-EURODRIVE is available in IP20, IP55 and iIP66 ingress protection ratings with an optional built-in isolator.

High energy efficiency makes the LTP-B Eco HVAC drive ideal for applications as diverse as large buildings, hospitals, and even mills. Sectors range from commercial to residential and industrial. "Energy-saving is a major focus in HVAC. Our drive caters for this with an advanced 'sleep' and 'wake' function that maximises energy efficiency by only switching on a refrigerant pump or compressor, for example, when it is required," SEW-EURODRIVE SA regional sales manager, Clive O'Reilly, explains.

Maximum operating efficiency is guaranteed thanks to an automatic pump-cleaning function, along with additional features such as the fact that the drive allows for the operation of multiple pumpsets, for example, without any need for a costly PLC. Instead, a built-in PLC function allows customised applications to be programmed directly into the drive.

Pump maintenance requirements are reduced dramatically due to blockage detection and run-dry protection. A built-in energy consumption meter has a clear display, which means that end users can calculate energy savings quickly. A motor preheat function allows for smooth start-up every time, without any internal condensation forming inside the drive if the ambient temperature is low.

The LTP-B Eco HVAC drive is available in single-phase variants (220 V) from 0.75 kW to 2.2 kW. This allows for added flexibility in applications where three-phase power is unavailable – a major constraint in Africa. Three-phase variants (440 V) range from 0.75 kW to 160 kW. A 525 V range (0.75 kW to 11 kW) is available specifically for mining-industry applications.

The drive is available in IP20, IP55, and IP66 ingress protection ratings. The latter, for example, can be supplied with an optional built-in isolator that is integrated with the drive for maximum functionality. The range of IP ratings make the drive ideal for demanding operating conditions from food & beverage to hazardous environments.

Of particular interest to the building industry is the drive's fire-detection capability, which means that 'fire run' mode can be activated in the event of any fire. This allows for the normal safety features to be bypassed and for the fan to keep running for as long as it takes to extract any smoke in the immediate vicinity.

O'Reilly reveals that the LTP-B Eco HVAC drive has already been used successfully in a range of large building projects in Cape Town, which represents a very active market in terms of HVAC. It is for this reason that the drives are stocked aggressively nationwide. Not only is training provided for all end users, but 24/7 back-up services and technical support ensure maximum reliability and uptime.

"What gives us the competitive edge in the HVAC market is our capability to supply additional products, such as our electronics and IE3 DRN motor series, which means we can offer our clients complete solutions. Having a single point of contact reduces the risk, while standardisation and modularity reduce costs significantly, and allow for a competitive return-on-investment," O'Reilly concludes. ❑