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Case Study: Hazardous Location Room Air Conditioners

Friedrich's Hazardgard Air Conditioners units make cooling affordable for ABB analyzer cabinets in hazardous applications



ABB Engineering

Company Bio

AB Engineering (Shanghai) Ltd., founded in 1999 is a wholly owned enterprise of ABB with 2000 employees. The company is located in the Shanghai Pudong Kangqiao Industrial Zone. ABB Engineering (Shanghai) Ltd. is one of ABB's key local enterprises, and a major manufacturing/engineering base for industrial robots and systems (Discrete Automation and Motion), instrumentation (Process Automation), substation automation systems (Power Systems), and analytical systems (Process Automation), and is ranked among China's top 100 electric enterprises.

The Challenge

Analytical instruments used for gas and oil measurements need to stay cool to maintain accuracy in desert or tropical environments. Add heat generated by electrical equipment in a confined space, plus hazardous and possibly flammable chemicals in the air, and it's easy to think that only a custom engineered HVAC system could handle the demanding duty.

The Approach

But a world leader in packaged analyzer cabinets -- ABB Engineering (Shanghai), a wholly owned enterprise of ABB -- turned to Hazardgard window-sized AC units, made by Friedrich (San Antonio, Texas) for a safe, cost-effective cooling solution for cabinets deployed from Saudi Arabia to South America.

The Solution

"Our analyzer cabinets are custom made to meet the exacting specifications of many different petrochemical, natural gas and chemical customers," says a supply chain specialist for ABB Engineering Shanghai. "We integrate a variety of analytical instruments and electrical equipment into a man-sized cabinet up to 140 cubic feet (4 cubic meters) in size. We typically recommend Friedrich Hazardgard room AC units because they can handle up to 130°F ambient temperatures in a hazardous environment where constant runtime is required."

A Cooling Solution that Performs in Harsh Conditions for Less Cost

Meeting the stringent operating conditions -- high ambient temperatures, high runtimes, highly hazardous environment -- normally would require a custom-engineered HVAC system. ABB went to many different vendors with the hope of finding an AC solution that could meet their parameters, but all the vendors had to design-engineer their HVAC systems, causing long lead times and high costs.

Instead, they discovered that Hazardgard units were being mass-manufactured and were in stock and ready to ship. ABB produces dozens of analyzer cabinets every year based on varying customer orders. So it seemed logical to order Hazardgard units to fit into their just-in-time, short-cycle cabinet manufacturing.

A Hazardgard SH15M30A unit is installed about four feet (1.2 meters) from the ground at one end of each 6 foot (2 meter) high cabinet. The 60Hz and 230/208V units are rated at 9.7 EER, with a cooling capacity up to 14,500 Btu/hr and dehumidification up to 4.0 pints/hr.

According to ABB, the Hazardgard units were selected because they meet three critical performance parameters:

First, the selected Hazardgard units are specifically designed for enclosed applications where volatile flammable liquids or gases are used. They comply with National Fire Protection Association NFPA 70 and National Electric Code Article 501 and Article 505 for Class 1 vapors and T4 Temperature Classification.

Second, Hazardgard coils employ a corrosion resistant coating. All outdoor coils are protected by proprietary Advanced Corrosion Protection to withstand up to 6,048 hour salt spray and extend unit life in coastal and corrosive environments.

Third, Hazardgard size comes in convenient dimensions typical for window-size AC units: 15-15/16-inch high, 25-15/16 wide, and 27-3/8-inch deep. (Units up to 24,000 Btu/hr capacity are two inches higher.)



About Hazardgard

It's the ideal solution for offshore rigs and energy manufacturing facilities: Friedrich Hazardgard® is the only mass produced, room A/C window unit available globally and built to perform in some of the world's most demanding conditions. For more than 30 years, industrial professionals have trusted Hazardgard to deliver safe and reliable cooling in the most extreme conditions.

Engineered to Perform in the Harshesht Environments such as: Offshore oil rigs, on-shore oil company offices and refineries; Petrochemical sites; Propane fill-up stations; Paint & varnish storage or processing plants; Grain alcohol processors or storage sites; Plant areas using strong solvents or chemicals; Munitions plants or armories; PVC or plastics plants and processing points; Recycling plants; Furniture refinishing workshops; Office complexes where methane is a by-product; Hazardous materials storage

Two other major factors fit ABB's manufacturing needs: product availability to meet tight lead times and price affordability.

The ABB specialist notes "that our lead times can be very tight. Once drawings are approved, all the components must come together to assemble the complete cabinet in eight to ten weeks."

According to Mario Martucci, Export Sales Manager for Friedrich, Hazardgard units met ABB's product availability and cost considerations "because they are the only mass-manufactured window-sized units made for hazardous locations. As a result, they can meet short lead times, deliver consistent quality and keep the cost affordable. Mass manufacturing also means specs and components are standardized. There's no guesswork about what's inside."

To handle harsh environments, Hazardgard units use a permanent split capacitor motor with a corrosion-resistant stainless steel shaft. Environmentally sealed on/off switch and gold plated thermostat contacts also ensure corrosion resistance.



"Hazardgard units meet our cost and performance parameters out of the box."

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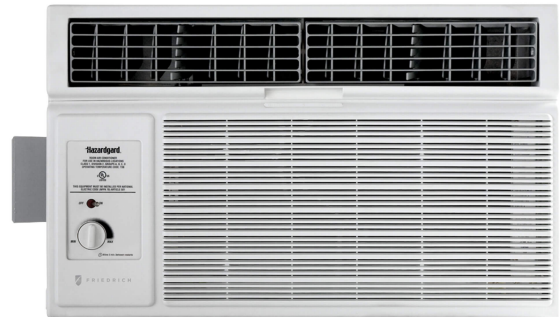
To tolerate higher outdoor temperatures up to 130 F (55°C), a hermetically sealed design is used to internally cool the reciprocating compressor during the refrigeration cycle. Hot gas bypass allows operation at outdoor temperatures as low as 45° F (7°C) without freezing.

To ensure arc-free operation, large-commercial-grade, enclosed fan motors are used with hermetically sealed overload protection -- and the motor is totally enclosed to assure efficient operation under adverse electrical conditions.

"The design is the result of more than 30-years of experience in cooling hazardous applications all around the world," says Martucci.

International certifications include UL/CAS Class 1, Division 2, ATEX and IECEx Zone 2 as well as SASO certifications.

For ABB, the engineering and support that Friedrich supplies has also proven valuable: "Hazardgard units meet our cost and performance parameters out of the box. Friedrich has a good track record of delivering an affordable, safe and consistent cooling solution for analytical cabinets used around the world."



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About Friedrich Air Conditioning Co.

Founded in 1883, Friedrich Air Conditioning Co. is a leading U.S. manufacturer of premium room A/C and other home environment products, designed for residential and commercial applications. Constructed of the highest quality components, Friedrich products are built to exacting standards and are among the most sophisticated, energy efficient and quietest available. Friedrich is recognized as the top brand of specialty air treatment products for the worldwide market, offering differentiated solutions for room air conditioning, dehumidification, and air purification.