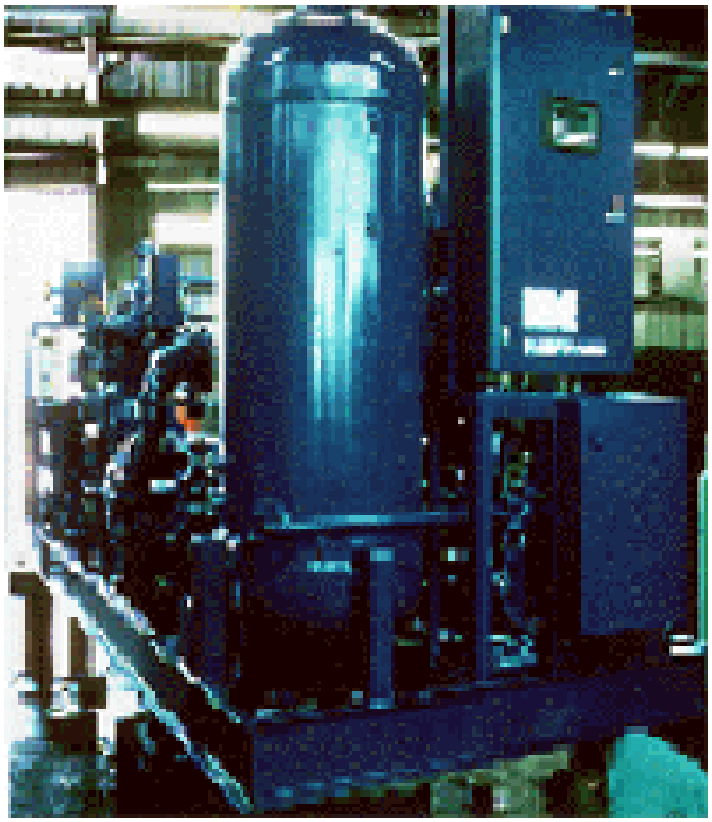
Refrigeration and Air Conditioning



San Diego company uses natural gas powered engines for energy-efficient refrigeration and air conditioning

Industrial Heat Recovery Equipment (IHRE) is providing low cost alternatives to electric chillers for large cooling systems. Replacing existing electric systems with natural gas fired industrial engines can yield 30% to 50% savings in systems ranging from 100 ton to 1,100 ton cooling capacity.

IHRE has been manufacturing cooling equipment for the industrial and process industries since 1981. In choosing a control system for their compressors, IHRE needed robust, highly reliable componentry, easy PC and phone-line communication, and a system that could expand and change along with their equipment. Opto 22 was the only system to meet all requirements.

The control system enables the complex engine-compressor combination to maintain precise (±1°F) leaving chilled water temperature while maintaining maximum engine fuel efficiency by varying engine speed to control chiller load. The control system monitors thirty-three different engine and refrigeration points (temperatures, pressures, levels, etc.) to provide specific outputs (engine speed, liquid refrigerant feed, compressor loading, etc.) and to annunciate or shut down the system if a parameter is out of range.

According to Dave Williams, IHRE's Engine Driven Chiller Product Manager, "Opto 22's flowchart programming was an incredible benefit. It enables really complex programs to be created and maintained with a lot less effort." Recently, IHRE installed three systems totalling 1200 tons at Fort Campbell, KY. The systems ran almost 3,000 hours each during the 1996 cooling season while keeping more than 2,000 troops comfortable.

Another selling point for the Opto 22 equipment was its modular componentry. This feature payed dividends at Fort Campbell when, during an electric storm, lightning damaged one of the controllers' power supplies.

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According to Williams, "We were able to easily pinpoint where the damage was done, had a new power supply shipped overnight, and had the system back on line the next morning."

All systems are equipped with telephone modems which permit IHRE technicians to monitor and adjust the equipment performance from anywhere in the world. On-site control program maintenance is done with a notebook PC connected to the control system by a simple serial cable. Williams states, "Remote monitoring is critical for us since our systems are spread throughout the country. It provides us with the capability to perform trending of potential problems before they become major, thus making the systems more reliable and limiting our warranty exposure. This makes for a win-win situation for the end-user and the manufacturer."

About IHRE and Opto 22

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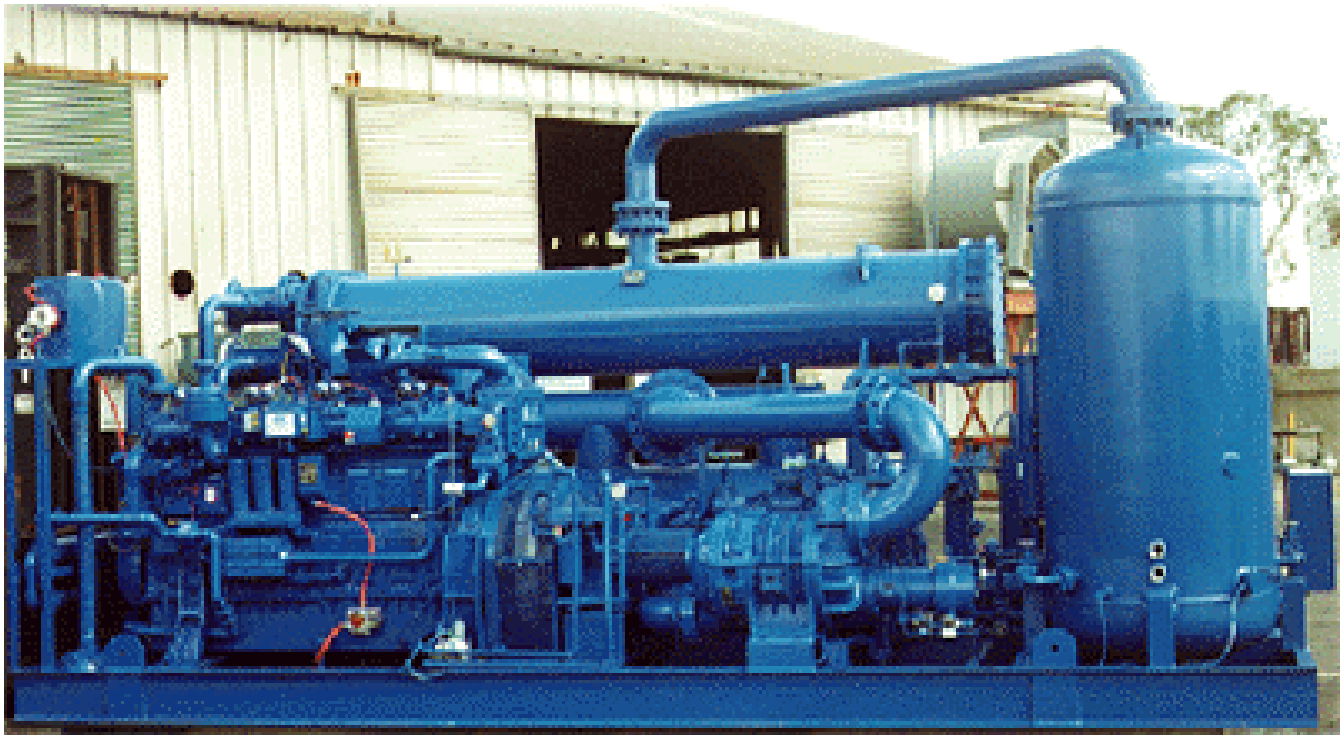

400 Ton Engine-Driven Chiller

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