

Case story | HeFei KDLian

Compact Danfoss PAH pumps protect priceless Chinese cultural heritage from fire

4 times
as compact as
alternative
3-piston pumps

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PAH high-pressure pumps selected to **power** advanced high-pressure **water mist fire suppression system** in China

Hubei Province has long been the economic and cultural hub of Central China. In a region where civilization has thrived for millennia, the Hubei Provincial Archives has the important responsibility of maintaining and protecting the province's collection of nearly one million extremely valuable books, paintings, calligraphy and other historical documents. When the government decided to build a new 60,000 m² building to house these very flammable treasures, many of which date back to the Ming Dynasty, the Danfoss series of high-pressure PAH pumps and other components were selected to power the advanced high-pressure water mist fire suppression system.

The challenge:

Provide **reliable high-pressure** for a water mist system that **protects** 60,000 m² of historical treasures

Hubei Province's new archives building is purpose-built to store Central China's largest collection of historical documents. Because its unique collection is largely paper-based, engineers from fire-suppression specialist HeFei KDLian proposed early on that the system should be a water mist. This system suppresses flames by reducing heat and removing oxygen – resulting in considerably less water damage to the precious documents should the system need to be activated in case of fire.

According to HeFei KDLian General Manager, Jin Weidong, "The sheer size of the archive building places special demands on the high-pressure components of the water mist system. With 15 floors above ground, one floor underground, and a building height of 63.7 m, the system must include many high-pressure pumps and other components, all of which need to be regularly maintained. Thus, long maintenance intervals and the highest standards of reliability were critical selection criteria."

Almost as important, however, were the demands to save space. The client and their architects placed a high premium on developing a fire-suppression solution which would leave as much room as possible for the growing archive.

The solution:

An array of **85 compact Danfoss PAH 80** high-pressure pumps and other **Danfoss components** for both main and jockey systems

HeFei KDLian has extensive experience with the Danfoss range of high-pressure pumps and had used them in many projects before this. Thus, its engineers were confident in selecting the PAH pumps as the high-pressure fire-suppression system's workhorse. In all, the new Hubei Provincial Archive uses 85 PAH 80 as both main pumps to provide misting pressure and jockey pumps to pressurize water from the water supply to the main pumps throughout the 60,000 m² structure.

"We know PAH pumps to be extremely reliable and very low maintenance," says Jin, "with a service interval of 8,000 hours compared to 500 for other pumps. But they are also much more compact than competing three-piston pumps, which require four times as much valuable space as the Danfoss system."

HeFei KDLian also chose to use Danfoss solenoid valves, check valves, and pressure relief valves. "Roughly half of all critical components in the archive's water mist system are from Danfoss," explains Jin. "This simplifies many things for the end user and for us. Fire suppression systems for such sensitive applications are strictly controlled by the government, and the testing and administrative work to fulfill compliance requirements is substantial. Having one proven supplier with an excellent quality control systems and track record, in China and abroad, significantly reduces the administrative workload."

Jin notes that Danfoss PAH high-pressure pumps' IATF 16949 certification also played an important role in the selection process. "IATF 16949 is a very stringent quality management system," he says. "Its focus on preventing defects and establishing processes that drive continual improvement are vital when choosing pumps for an application as sensitive as this."

The result:

A **stunning new building** that will **protect** irreplaceable cultural heritage for years to come

Planned to open in 2021, the Hubei Provincial Archives is ready to house the province's massive collection of historical artifacts.

"Despite the scale of this new water mist fire-suppression system, installation was smooth," relates Jin. "Cooperation with the end user, architects and construction companies – and Danfoss, both in China and Denmark – has been excellent. We are proud to be part of this effort to preserve our cultural heritage for the next many generations to study and enjoy."



PAH 80 high-pressure pump



Founded in 1999, HeFei KDLian is a wholly owned subsidiary of Beijing Chenan Technology Co., Ltd. that specializes in fire safety and emergency equipment development. With support from the Institute of Public Safety and the Hefei Institute of Public Safety of Tsinghua University, it provides intelligent fire protection, fire risk assessment, fire prevention and maintenance services, fire safety detection and early warning, firefighting technology and equipment, and emergency rescue technology and equipment. With its expertise in research and equipment manufacturing, public safety, and Internet of Things monitoring technology and equipment, HeFei KDLian is one of the few enterprises in China that can provide comprehensive fire protection solutions for structures of outstanding cultural and economic value.

For more information (in Chinese) please visit <http://www.kdlian.com/cn/>

Danfoss A/S High Pressure Pumps . Nordborgvej 81 . DK-6430 Nordborg, Denmark

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