DATA CENTER COOLING – SATISFYING HIGHEST DEMANDS ON PERFORMANCE AND RELIABILITY

Servers have become an ever more important part in our daily lives because of the phenomenal growth in web hosting and cloud computing. Server reliability is crucial in sensitive industries like banks, insurance companies, major corporations, as well as for government agencies.

Carrier France, a recognised supplier of energy-efficient cooling systems, has been relying on hermetic refrigerant pumps with canned motors made by HERMETIC for years. The Carrier department „Advante3c" has compared several solutions regarding efficiency, reliability and space requirements for a current reference project. One solution utilised air cooling, requiring 5000 m^3 of air; the second used water at a volumetric flow rate from 75 to 100 m^3/h. The third solution involved cooling with carbon dioxide at a volumetric flow rate of approx. 12m^3/h. Following extensive analysis, Advante3c has opted for the third solution: cooling with CO_2 as a refrigerant. The first two options were rejected due to the required space and the high risk associated with using water to cool a server room.

Heat exchanger (CARRIER)

LEDERLE Hermetic
HERMETIC-Pumpen GmbH · D-79194 Gundelfingen
hermetic@hermetic-pumpen.com · www.hermetic-pumpen.com

HERMETIC-Pumpen GmbH was selected as refrigerant pump supplier to put this development into practise. Hence, a new pump for refrigeration applications was developed in close collaboration with Advante3c engineers. The CAM 30 series from HERMETIC meets high expectations for performance, reliability, tightness, and the physical requirements for the utilisation of CO_2. This pump features a maximum leakage rate of less than 1 gram of CO_2 per year at a system pressure of 64 bars. Innovative materials provided the solution, especially where seals were concerned. The special design of the pump within the so-called „Tandem" design ensures reliable cooling of the motor and effective degassing. With the extensive expertise of HERMETIC-Pumpen GmbH in resolving complicated issues in the oil & gas industry, as well as chemical and refrigeration engineering applications, it was possible to successfully and quickly realise this solution-focussed design.

Technical data

Pump type:	CAMV 30/3+0
Nominal pressure:	PN 75 bars
Medium:	CO_2
Operating temperature:	15 °C
Vapour pressure:	52 bars
Motor output:	3 kW
Reliability according to Advante3c calculations:	99,88 %

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CONTACT INFORMATION

HERMETIC-Pumpen GmbH
Gewerbestrasse 51
79194 Gundelfingen
Germany
phone +49 761 5830-0
fax +49 761 5830-280
hermetic@hermetic-pumpen.com
www.hermetic-pumpen.com