RC pump for ammonia refrigeration: Small unit, big gains

RC PUMP: SMALL UNIT, BIG GAINS IN AMMONIA REFRIGERATION

The first time Frede Iversen saw the Grundfos RC pump, he did not believe it was real.

“I thought it was just a dummy model – it was so small,” says Iversen, project engineer at what is today Christian Berg Industri A/S, but then was GEA Grenco Koeleteknik, the Danish subsidiary of GEA Refrigeration.

GEA needed the stainless steel unit for an ammonia refrigeration system it was installing in a new 12,000 m3 provisions warehouse in Aalborg, Denmark, for Wrist Ship Supply A/S, a global ship supply company. The Grundfos RC is the world’s first pump made specifically to circulate natural liquid refrigerants such as ammonia (NH3) and carbon dioxide (CO2).

“We are used to the big, standard-issue, cast-iron pumps, but here comes this sleek, little fellow,” says Iversen. “The electrician was on his way to get a forklift to carry it in, but I told him there was no need. When he saw it, he just put it on his shoulder and climbed the ladder to the engine room.”

NO LEAKS

GEA is testing the RC at this installation in a development cooperation with Grundfos. It runs side-by-side with one of the standard models under the ammonia separator.

“We had the chance to get some background knowledge before the pump was fully on the market,” Iversen says.

TOPIC:

System supplier GEA has been satisfied with the small size, modern features and hydraulic robustness of the Grundfos RC, the world’s first pump optimised for the circulation of natural, liquid refrigerants such as ammonia and carbon dioxide.

LOCATION:

Wrist Ship Supply A/S, Aalborg, Denmark

COMPANY:

Christian Berg Industri A/S, earlier GEA Grenco Koeleteknik, the Danish subsidiary of GEA Refrigeration

The RC has been designed with only one seal between the refrigerant- and ambient sides, explains Grundfos Product Manager Bjarne Dindler Rasmussen. It is also made in stainless steel, another unique feature. Standard pumps used for circulating ammonia were designed some 30 years ago, he adds.

“The pumps that people use today for refrigeration are so old in their design – several innovations have been made possible since then,” Rasmussen says.

Some of these improvements include high energy efficiency, a wide range for variable speed capacity control and the low net positive suction head (NPSH) required, which adds hydraulic robustness to the pump when handling vapour bubbles in the inlet, says Rasmussen.

EASY TO SERVICE

The RC’s barrel-type, semi-hermetic, high pressure design also makes it much easier to install and service. Iversen has been impressed with this feature. “You just empty the pump, loosen the flange between motor and pump sleeve, and pull the pump out,” he says. “When you need to install it, you just slide it into the protective cover, plug it together and start it up.”

In its first year of service, the Grundfos RC pump has run smoothly without problems, he adds. “We just want to get our hands on more of them now,” Iversen says.

STABLE SYSTEM

“This system has given us a good, stable operation, which is important for us,” adds Lise Maria Poulsen, General Manager, Logistics at Wrist Ship Supply A/S. “When you’re dealing with food, you must assure that the cold chain never breaks. We’re under strict, regular control of the Danish Veterinary and Food Administration. We must assure we keep everything at the constant temperature required.”

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