

The World's Biggest Sealed Inverter Turbo Chiller Starts Operation

Minato Mirai 21 has been updating the chillers in its Central Plant since last fiscal year, and recently, it scrapped the 3,000 RT electric turbo chiller that began operation in 1988 and installed a 5,400 RT sealed inverter turbo chiller, the world's biggest. It started operation on Thursday, March 30.

The rate of revolution of the compressor, as well as the cold water pump and cooling water in this chiller are controlled with inverters, enabling substantial reductions in power consumption during periods of low demand, such as between seasons and in winter. The maximum coefficient of performance (COP) of this chiller used standalone can reach 24.3 (when operated with a cold water load of 20% and cooling water at 11°C at the inlet).

5,400 RT is equivalent to the cooling capacity of about 5,400 home air conditioners, exceeding that of the 5,000 RT sealed electric turbo chiller installed in our No. 2 Plant in June 2009, which was then one of the largest turbo chillers in the world. The newly installed equipment has now taken over as the largest in the world.

Table: Comparison of the newly installed and existing equipment

	Equipment installed this time (Central Plant)	Existing equipment (No. 2 Plant)	Existing equipment (Central Plant)
Refrigeration capacity ^{*2}	5,400 RT (18,988 kW)	5,000 RT (17,581 kW)	3,000 RT (10,549 kW)
Rated output of main motor	3,379 kW (Inverter)	3,082 kW (Fixed speed)	2,044 kW (Fixed speed)
Coefficient of performance (COP) ^{*1}	Rating: 5.6 Maximum: 24.3	Rating: 5.70	Rating: 5.16
Refrigerant	HFC134a	FC134a	R-11
Year installed	2016	2009	1993

*1. COP = Coefficient of Performance. A higher COP indicates greater energy conservation.

$COP = \text{Refrigerating capacity (kW)} / \text{Power consumption (kW)}$

The rated value is the value under the conditions of use (Cold water: Inlet 13°C, outlet 6°C, Cooling water: Inlet 32°C, outlet 40°C)

The maximum value is the value under the conditions of use (Cold water load: 20%, Cooling water: Inlet 11°C)

*2. The RT above is U.S. refrigeration ton (USRT). 1 USRT = 3.517 kW



Photo: The recently installed 5,400 RT inverter turbo chiller