

For Immediate Release

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**Toshiba Carrier Commended at 79th IEEJ Academic Promotion Awards
for Energy-Efficient Inverter Technology**

KAWASAKI CITY, Japan, July 4, 2023 - [Toshiba Carrier Corporation](#) (TCC) announced that its energy-efficient inverter technology was recently recognized for innovative technical development at the 79th Academic Promotion Awards of the Institute of Electrical Engineers of Japan (IEEJ). The award ceremony was held in Tokyo in May. TCC is a part of Carrier Global Corporation (NYSE: CARR), global leader in intelligent climate and energy solutions.

The awards honor engineers who make notable achievements in the field of electrical science and technologies by proposing and/or demonstrating a new concept, idea, material, device, system, method or by developing or improving a new product or equipment. TCC was recognized for the development and practical application of its dual-inverter system for open-end-winging motor drive in air conditioning units.

Today, secular trends such as decarbonization and energy conservation are driving demands for highly efficient HVAC products. To achieve both high efficiency at partial load and high maximum capacity, high counts in motor winding turns and high DC voltage for reducing circuit current has been commonly used, but increased circuit current necessary for increased maximum capacity has resulted in larger components and higher costs. The award-winning dual-inverter system technology enables a compact and low-cost system that delivers high-efficiency operation.

“The innovative technology was developed based on our key engineering strengths - inverters and compressors,” said Tsutomu Masamoto, leading Technology and Innovation in Japan, Global Comfort Solutions, Carrier. “We will continue to focus on developing new technologies that support customers’ decarbonization journey.”

For more information about the invention, please visit [here](#).

About Toshiba Carrier Corporation

Toshiba Carrier Corporation (TCC) provides sustainable solutions integrating energy efficient products for residential, light commercial and industrial customers. TCC is a part of Carrier Global Corporation (NYSE: CARR), global leader in intelligent climate and energy solutions that matter for people and our planet for generations to come. For more information, visit www.toshiba-carrier.co.jp/global/.

Appendix

Title and Winners

Title	Development and Practical Application of Dual-inverter system for Open-End-Winding Motor Drive in Air Conditioners		
Winners	Toshiba Carrier Corporation	Design & Development Div. Electronics Design Dept.	Shinya Shimizu
	Toshiba Carrier Corporation	Design & Development Div. Electronics Design Dept.	Masaki Kanamori
	Toshiba Corporation	Corporate Manufacturing Engineering Center Electronics Control Technology Research Department	Takeshi Shibayama

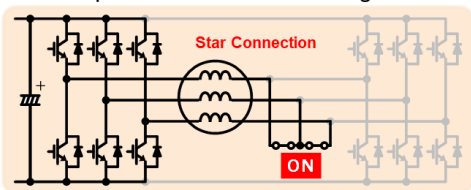


From left to right: Shinya Shimizu, Masaki Kanamori, Takeshi Shibayama

Technology Overview

The award-winning, dual-inverter system was developed with two inverter circuits connected to both ends of the open winding motor on the compressor, and with a function to switch wire connection at the other end of the open-winding motor. At low speed and low load, the connection switch is turned on, and the compressor motor with the star-connection is driven by one inverter to improve efficiency. At high speed and high load, the connection switch is turned off, and the open-winding compressor motor is driven by two inverters to operate within the operating envelope.

【Low speed⇒Connection Change : ON】



【High speed⇒Connection Change : OFF】

