

## 109th Anniversary Of Cool

This year marks the 109th anniversary of the invention of modern air conditioning by Willis Carrier, the founder of Carrier Corp.

In a summer of record-setting heat waves, that detail was not lost on the public. Social media sites from Twitter to Facebook were humming with gratitude for Carrier's pioneering innovation, with numerous "shout-outs" about Carrier's invention, some going so far as to label Dr. Carrier as "My Hero."

Carrier's engineering feat, which initially cooled commercial and industrial facilities, led to developments in transport air conditioning – think rail, naval ships and submarines – and eventually transport refrigeration, as well. In 1940, Carrier introduced the Type 68D truck refrigeration unit. This mechanical reefer was a dramatic improvement over the then-common ice/salt and dry-ice/gravity-flow refrigeration systems.



*This summer, Willis Carrier was featured in New York City's Times Square.*

Today's microprocessor controls and Vector hybrid technology are part of a succession of innovations that continue the Carrier heritage of improving the safe, reliable transport of food and other refrigerated products in an environmentally responsible manner.

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## e TRU-torial: An "Open and Shut" Case for Fuel Savings



When the sun is cooking like a broiler, and it's as muggy as a jungle outside, you don't turn on your home air conditioner and leave the windows open. And yet every day all across the country, transport refrigeration units (TRUs) on trailers are running full-tilt while the rear doors are wide open during loading and unloading. This can waste fuel and may temporarily reduce the efficiency of the refrigeration unit's operation, wasting even more fuel.

Door switches and sophisticated reefer software can provide relief from this wasteful practice, and we'll tell you how. We're introducing a new series of "TRU-torials" in which we explain how to take advantage of some of the latest technologies to improve the performance of your operations. In this issue, discover our [Open and Shut Case for Fuel Savings with Door Switches](#).

## On the Road or In the Yard New External Display Verifies Box Temps

Carrier's [Dual-View Temperature Display](#) provides a new and easy way for drivers to verify the temperature inside refrigerated trailers without having to leave the cab to check the unit controller. The display mounts to the corner of the trailer and shows temperature in up to three zones in °F or °C, independently monitored by its own sensor(s). It also shows refrigeration unit status – cool, heat, defrost or warning.

The bright amber LED display is easy to read in direct sunlight and automatically dims to reduce glare for evening and night viewing. The normal view is used for yard monitoring, and the reverse-image mode lets the operator read the display on the road from the rearview mirror.



Sealed electronics protect the unit from weather and high-pressure water spray. It's compatible with most Carrier Transicold and competitive trailer units. For installation or more information contact your Carrier Transicold dealer.

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## TRU-torial: An “Open and Shut” Case for Fuel Savings with Door Switches

When the sun is cooking like a broiler, and it's as muggy as a jungle outside, you don't turn on your home air conditioner and leave the windows open. And yet every day all across the country, the refrigeration units on trailers are running full-tilt while the rear doors are wide open – sometimes for hours – during loading and unloading. This can waste fuel and it may temporarily reduce the efficiency of the refrigeration unit's operation, wasting even more fuel.

“In these scenarios, the refrigeration unit is running flat-out trying to cool an infinite size space because the trailer's rear doors are wide open,” said Mark Fragnito, Carrier Transicold's product manager – electronics. “The unit is usually pushing cold air out of the trailer and pulling in warm, humid air. Not only is the unit running as hard as it can, but that humid air can ‘ice up’ the evaporator coil, forcing more frequent defrost cycles and, consequently, higher fuel consumption.”

“The same situation is repeated when a driver makes a delivery,” Fragnito said. “Many times the unit is left running with the doors open, so the same potential waste of fuel occurs at every stop along the way.”



Best practices call for precooling an empty trailer, as well as the load, to the desired transit temperature prior to loading. And both refrigeration equipment manufacturers and the U.S. Department of Agriculture recommend shutting the unit off during loading. Yet some operators and their customers are not always comfortable with that approach.

An alternative is to balance the needs of the shipper's cargo requirements with the hauler's fuel economy needs in a practical and intelligent manner. Enter one of the newest Reefer Apps™ from Carrier Transicold: Door Man™. The Door Man app can be programmed to optimize unit operation and fuel consumption based on outside ambient conditions that the shipper and hauler agree upon. “People are beginning to realize the value of this compromise,” said Fragnito. “Haulers save fuel, which holds down costs. At the same time, shippers get the temperature integrity they require for their product. It's a ‘win-win.’”

### Not your Father's Door Switch

Door switches have been available for years and used to simply shut down the refrigeration unit when trailer doors are opened. The Door Man app adds control flexibility through Carrier Transicold's patent-pending methodology that allows the unit to be programmed to run in low speed, high speed or not at all, based on exterior temperatures. This can help conserve fuel while satisfying user cargo temperature requirements.

When the trailer is equipped with door switches, the Door Man app can:

1. **Monitor and record door-opening events.** Door switches can record all door openings in the unit microprocessor's integrated data logger. Not only can this information be a helpful verification of deliveries, but it can also help to identify occurrences of potential break-ins, cargo theft or cargo tampering.
2. **Shut the unit off to save fuel** when the doors are open during loading or deliveries, which is the traditional use of reefer door switches.
3. **Save fuel in low-speed mode.** Locking out high-speed can cut fuel consumption dramatically while the doors are open, and yet still keep the unit operating per customer preferences.
4. **Automatically decide** when and how to run the refrigeration unit to optimize fuel economy. Depending on outside temperatures, the refrigeration unit can be programmed to automatically shut down or run in low- or high-speed modes during door openings, adding automated, intelligent decision making to the process.

The shipper and the hauler agree on a range of outside temperatures at which the unit is allowed to run in low- and high-speed modes, or shut off completely. When the doors of the trailer are opened, the unit will then automatically adjust its operation as programmed. (**See Making the Switch**).



#### Making the Switch:

*In this example, an APX display module shows that unit shutdown will occur when the doors are open and outside temperatures are below 39.5 F (highlighted line). Above that, the unit will run in low-speed mode unless ambient temperatures are 80 F, at which point Door Man will run the refrigeration unit in high-speed mode.*

Programming the Door Man options can be done using the keypad of individual refrigeration unit controls – APX™ or Advance™. Alternately, it can be programmed with a PC, using Carrier's TRU-Tech software. One of the key advantages of PC set-up is the ability to quickly load the configuration into multiple refrigeration units.

“Door Man is unique in its ability to run a refrigeration unit in low-speed mode during door openings, providing significant fuel savings compared to high-speed operation,” Fragnito explained. “And Carrier has the only door-switch logic capable of using programmable ambient temperature thresholds to determine whether the unit shuts down or runs in low-speed or high-speed mode.”

Given the importance of fuel conservation balanced with refrigerated product protection, the decision to use door switches and intelligent reefer control truly is an *open and shut case!*

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