

Carrier
Transicold

ULTRAFRESH 2



OPTIMUM
temperature
control for
TOTAL cargo
PROTECTION.



ULTRAFRESH 2. OPTIMUM *temperature control* for perishable, frozen, and deep-frozen cargo. STANDARD.

When you're hauling sensitive products, precise temperature control is critical. The challenge is to keep the refrigerated trailer as close to setpoint as possible for maximum product quality and shelf life. And profitability. Otherwise, cargo can be readily damaged by thermal shock or dehydration.

Enter UltraFresh 2™, the temperature control system that makes all others obsolete. UltraFresh 2 optimizes temperature control in all temperature ranges without reducing capacity or adding components and complexity to the refrigeration system. UltraFresh 2 also reduces fuel consumption and improves overall system reliability. And UltraFresh 2 is standard on every Carrier Transicold single-temperature trailer refrigeration system.



Conventional suction modulation technology forces a compromise between fresh-range control and low-end capacity. As a result, improving control tolerances in the perishable range reduces capacity in the frozen range. Conversely, boosting frozen-range capacity diminishes setpoint control in the perishable range.

Using microprocessor-based control logic to sense supply- and return-air temperatures, unload the compressor, and pulse refrigerant, UltraFresh 2 essentially "mixes" cooling with heating to deliver the most precise temperature control and optimum capacity for superior pulldown and recovery. Below 10°F (-12°C) UltraFresh 2 maintains temperature control to within $\pm 4^{\circ}\text{F}$ ($\pm 2^{\circ}\text{C}$) to preserve product quality of sensitive frozen loads that can turn brittle when overcooled. At setpoints above 10°F (-12°C), capacity control tests with perishable loads have confirmed UltraFresh 2 holds box temperatures within 2°F (1°C) of setpoint – with total supply-air temperature variation of only $\pm 2^{\circ}\text{F}$ ($\pm 1^{\circ}\text{C}$).

The *difference* is in the PERFORMANCE. And in the LOAD.

To appreciate what UltraFresh 2 does, understand what it doesn't do. UltraFresh 2 does NOT maintain setpoint by cycling the system between high- and low-speed heat and cool operation. With competitive heat-cool cycling, discharge-air temperature can run significantly below setpoint during pulldown. Then as the unit goes into the heat mode, it overshoots the setpoint. The result is often significant and recurring variances between the box temperature/cargo temperature and setpoint. When testing competitive units – even with their expensive capacity-control option – products loaded near the supply-air outlet risked top freezing. In fact, supply-air temperature with the competitors' standard trailer unit varied 8°F (4°C) above and 12°F (7°C) below setpoint, supplying subfreezing air nearly 30% of the time.



UltraFresh 2 not only achieves temperature control by eliminating heat-cool cycling, it does so without compromising low-end capacity. Our competition's costly "premium" temperature-control option uses a suction modulation valve to "maximize" temperature control. Problem is, even when fully open, the valve obstructs the refrigerant flow back to the compressor, significantly diminishing low-end capacity. With UltraFresh 2, no modulation valve and no cycling between heat and cool mean no obstruction of the refrigerant line, the best temperature control, and superior low-end capacity.

ULTRAFRESH 2 MIXES temperatures. For *uniform* control.

UltraFresh 2 is simply better. Unlike suction modulation – where you're running in either heat or cool – UltraFresh 2 works like a faucet mixing hot and cold water to achieve the precise desired temperature.

With UltraFresh 2, if the box temperature deviates from setpoint, the microprocessor controller reacts instantly, using advanced computer logic to open or pulse the system's solenoid valves at precise frequencies. This actually controls the temperature of the refrigerant entering the evaporator, better matching the temperature of the refrigerant to the required cooling capacity. Just like the "hot" and "cold" water valves on a faucet, if supply-air temperature drops too far below setpoint, the microprocessor "tells" the "hot" valve



to pulse, injecting hot gas into the system, thus raising the supply-air temperature.

The magic of the Carrier Transicold microprocessor controller is its ability to fully monitor system operation. It determines the pulsing frequency of the solenoid valves every second. An added benefit of the Carrier system is its unique ability to unload the compressor to reduce capacity. Unlike competitive compressors, ours can unload two or four of six cylinders, resulting in 33% or 66% reduced-capacity states. This further enables the system to maintain temperature equilibrium closer to setpoint and reduces system stress that would be caused by a fully loaded compressor, increasing compressor life. Bottom line: Eliminating the stress of heat-cool cycling, in conjunction with unloading the compressor, significantly increases fuel economy.

The *bottom line* is PROTECTION. For *YOUR bottom line*.

With UltraFresh 2™ there are benefits for the shipper, the hauler, and the end-user:

1. **Unmatched temperature control.** UltraFresh 2 reduces fluctuation in temperature across the evaporator coil, typically ranging from 8°F to 18°F (-13°C to -8°C) with conventional systems, to less than 2°F (1°C), with no loss of low-end performance. This increases system flexibility in hauling fresh and frozen products, and increases system resale value.
2. **Proven reliability,** thanks to more stable operating conditions – without additional or more complex components. Lower pressure across the compressor increases compressor life.
3. **Reduced engine load and less cycling** from low-speed to high-speed cooling also reduce fuel consumption and maintenance requirements, and extend system life.
4. **Achieves setpoint faster** than conventional systems, without compromising low-end capacity. Faster temperature pulldown conditions the load in less time.
5. **Simple design for simpler service.** Enhanced performance has been achieved without added complexity. This also ensures ready availability of replacement parts and simplifies service.
6. **Improved product quality at delivery, extended shelf life.** Reduced temperature variation across the evaporator coil reduces product moisture loss. Improved trailer temperature control optimizes product condition at delivery. Products reach the market fresher and stay fresher longer.

Only increased temperature-control accuracy combined with maximum efficiency and reliability ensure the delivery of the highest quality products. Compare UltraFresh 2 to any other temperature-control system in trailer refrigeration – standard or optional. It adds more value to your Carrier Transicold equipment. Day after day. Load after load. Customer after customer.



Carrier

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