

**X**<sup>TM</sup> **4** Series

Smarter Thinking





# SIMPLER, SMARTER TECHNOLOGY. SIMPLY SMARTER THINKING.

Complying with heightened emissions standards while making significant gains in performance and efficiency is an ongoing challenge for trailer refrigeration.

Now, Carrier transforms compliance into a comprehensive strategy for refrigerated fleets.

The Carrier X4™ trailer refrigeration solution not only combines performance and efficiency with emissions compliance. It presents an opportunity to better manage your business.

Carrier's X4 series Tier 4-compliant platform combines simple, practical design with truly innovative engineering.

The result: outstanding reliability and remarkable efficiency that delivers peace of mind and an improved bottom line—all backed by a dealer network dedicated to exceeding your expectations.

The Carrier X4 series. Simply smarter thinking.  
Simply smarter decision.

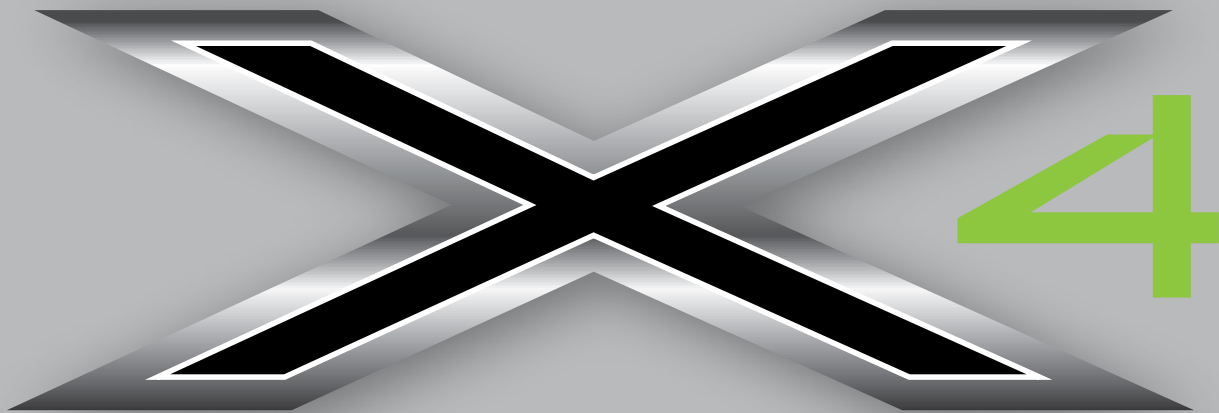
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## RELIABLE DESIGN. RESPONSIBLE CHOICE.

Proven reliable platforms, enhanced using a straightforward, practical approach to deliver compliance at a lower total cost of ownership.

## INNOVATIVE ENGINEERING. INTELLIGENT SOLUTION.

Patented high-efficiency designs deliver significant fuel savings *plus* other benefits including higher cooling capacity, faster pulldown, quieter operation, and less maintenance.



## TURNING COMPLIANCE INTO OPPORTUNITY.

Different businesses require different solutions. That's why Carrier offers what you need, when you need it. Choose from a variety of innovative technologies that best suit *your* business.

## SIMPLY BETTER.

Sustainable solutions to strengthen business intangibles such as driver comfort, technician familiarity, and greater uptime. All to improve *your* bottom line.

# TURNING TIER 4 COMPLIANCE INTO A BETTER BUSINESS MODEL.



Opportunity

Daily challenges and many intangibles affect your fleet's bottom line. Securing bottom-line results calls for more than highly efficient Tier 4 equipment platforms. It calls for highly intelligent Tier 4 business solutions.

In today's regulatory environment, our straightforward Tier 4 approach not only ensures compliance, it presents a real asset to help streamline your operation. And it's environmentally responsible to help meet your sustainability goals.

All to help you control intangibles. So you can manage more profitably.

**EQUIPMENT UPTIME:** Practical, simple solutions based on proven platforms maximize reliability to help you run your fleet more efficiently and deliver on time, every time.

**DRIVER RETENTION:** Simple user interface aids driver familiarity and reduces training. Quieter running systems increase driver comfort.

**REDUCED OVERHEAD:** Powerful diagnostics speed troubleshooting, reduce technician training time, and increase efficiency. Standardized parts reduce inventory.

**UNMATCHED PRODUCT SUPPORT:** Rigorous factory-certified technician training, critical parts stocking at 180 locations, and 24/7 service. The Carrier dealer network is Tier 4-ready.

# DEPENDABILITY IS BUILT IN BECAUSE OF WHAT IT'S BUILT ON.



## Reliability

Running any business involves taking risks. Operating your reefer equipment shouldn't be one of them. Our design philosophy puts reliability above all else.

For years, Carrier has driven innovation by introducing efficient, forward-thinking platforms. So we didn't need to start over. Instead, our engineers chose to leap ahead.

The X4 series is built around next-generation components with proven performance and reliability, now linked by a powerful, unmatched control strategy. The result: superior performance and efficiency, with proven dependable design.

- X2™ series platform enhanced with future-forward technology and controls.
- Compliance without complex unit architectures.
- Proven reliability, more uptime, and greater peace-of-mind.





# Efficiency

## **STREAMLINE COMMUNICATION, ELIMINATE COMPLEXITY. SIMPLE.**

Almost every product today—from cars to appliances to computers—uses less energy to achieve greater results. Applying that forward-thinking design philosophy, Carrier engineers ramped up efficiency—without building in complexity.

The X4 platform boosts the performance-to-power ratio by introducing enhanced power-management algorithms to communicate with a smarter engine and intelligent refrigeration control. Integrated via the powerful APX™ Control System, components communicate, working in harmony instead of isolation.

This efficiency breakthrough offers genuine benefits without adverse trade-offs. Fleets can expect higher performance, lower fuel consumption, lower maintenance costs, and lighter weight, all engineered into a straightforward, practical design that is EPA Tier 4-compliant for engines less than 25 horsepower.

Simply put, the X4 series takes belt-driven refrigeration to a level of ultra-high efficiency others thought not possible, outperforming other platforms while using less power.



### **X4 series delivers:**

**18% lower**  
required engine power.

**35% to 50%  
higher**  
BTU-per-gallon efficiency.

**18% slower**  
engine high-speed operation.

Performance data compared to the Carrier Transicold models they replace and dependent on a range of operational settings, environmental conditions, and model type.



**24% less**  
refrigerant.



*Conventional Unit*



**X<sup>4</sup>** Series



# **MORE COOLING POWER. LESS HORSEPOWER. YES, LESS IS MORE.**

The X4 series is designed to outperform other platforms while using less engine power. It's a paradigm shift to deliver more with less, and that's exactly what the X4 series achieves: higher refrigeration capacities, better performance, and greater fuel efficiency, all while using less power.

The X4 platform features a smarter large-displacement 2.2-liter engine equipped with enhanced sensors and an electronic control module. The engine continually communicates with the APX Control System to optimize performance and eliminate wasted power.

The result: an ultra-high-efficiency platform that generates higher capacity and performance using significantly less power. That means X4 engines operate using fewer run hours at lower speeds, increasing their durability and reliability.





## X<sup>4</sup> FUEL SAVINGS\*



- ◎ **5% to 22%** lower fuel consumption over a full range of operating conditions.

\*Based on: 2,000 hours/year • 0.75 gallons/hour • \$4.00/gallon • 15% efficiency gain

## X4 series also delivers:

- Up to **10%** higher cooling capacity at rating conditions.
- Up to **20%** higher cooling capacity at other (non-rating) conditions.
- Up to **20%** faster pulldown.
- Up to **35%** lower fuel consumption during pulldown.
- Up to **15%** less engine run time during automatic start/stop operation.

Performance data compared to the Carrier Transcold models they replace and dependent on a range of operational settings, environmental conditions, and model type.





# COMPLIANCE SHOULDN'T BE A ONE-WAY STREET.



There's rarely a one-size-fits-all solution to any business challenge. Compliance is no exception.

Rather than design equipment that comes standard with complex, expensive devices you may not need, Carrier gives you choices that allow you to customize your equipment — and overall cost structure — to best suit your business plan.

It starts with a choice of technology platforms — the X4 belt-driven platform or the Carrier-exclusive Vector™ all-electric hybrid platform — both EPA-evergreen in all 50 states.

Carrier Transicold's Engine Emissions System (EES) is a CARB-verified Level 3+ VDEC device that enables fleets to operate indefinitely in California beyond the initial seven years allowed.\* EES offers choices about when the EES may be installed or removed, and it offers the flexibility of redesignating the device between assets.\*\*

Choose the Tier 4-compliant Carrier solution that offers the lowest cost ownership option for *your* business.

\*Refer to CARB executive order for Carrier EES at [www.arb.ca.gov](http://www.arb.ca.gov) or contact your local Carrier Transicold dealer for verification conditions.

\*\*CARB redesignation rules apply. Refer to CARB Advisory 420.



7500 X4

X4 7500  
X4 7300

VECTOR  
8500

Vector 8500  
Vector 8600MT  
Vector 8100

# Operation: **HIGH-EFFICIENCY TECHNOLOGY**

- 1 DuraShell™ 2 Doors** offer a great look for your fleet, combined with the latest composite materials that repel dirt, resist damage, and integrate noise-reduction features to provide exceptionally quiet operation.



- 2 Electronic Expansion Valve (EXV).** Exclusive to Carrier's ultra-high-efficiency designs, the EXV provides optimal fuel efficiency, temperature control, and compressor protection compared to conventional mechanical expansion valves.



- 3 V-Force™ Fan** is engineered with ultra-efficient vortex-suppression blades. The fan is specially designed to pair with microchannel coils to reduce power requirements and noise, while providing more airflow and ensuring operation in the hottest environments.

**NOVATION™**  
HEAT EXCHANGER TECHNOLOGY



- 4 Novation™ Heat Exchanger Technology.** By being the first to apply this technology to trailer units, Carrier has optimized a light, damage-resistant, ultra-high-efficiency coil that lowers pressures, saves fuel, and keeps the system running in the harshest conditions.



- 5 05G 41-CFM 6-Cylinder Compressor.** The proven, large-displacement Carrier 05G compressor delivers higher capacity, high efficiency, and faster pulldown at lower speeds. Its superior efficiency reduces horsepower, saves fuel, and extends unit life.

# SYNCHRONIZED BY POWERFUL CONTROL.



**7 Braze Plate Heat Exchanger (BPHE).** The ultra-compact, brazed-plate heat exchanger offers up to five times greater efficiency than large, traditional “tube and shell” designs. The BPHE increases unit efficiency at frozen setpoints, reduces engine power requirements and fuel use, and is designed to be more robust, offering higher reliability.



**8 Distributed Electronics.** The control system uses automotive-style distributed electronics to place operating modules more efficiently within the unit. The result is higher reliability due to shorter, more efficient wire routing and fewer electrical connections. CAN-bus communication provides easy “plug-and-play” modularity to upgrade units or provide additional functionality.



**9 Suction Modulation Valve (SMV).** The next-generation SMV better controls the flow of refrigerant gas into the compressor, providing better temperature control and compressor power regulation. Operating the compressor at or near its functional design “sweet spot” means it is always running at peak efficiency, reducing engine power, fuel use, and emissions.



**10 APX™ Control System** provides the ideal balance between technology and convenience, combining future-forward sophistication with a people-friendly design. The APX Control System unites a variety of advanced electronics and efficient components to continually balance optimum fuel efficiency and performance. This ensures ultra-high-efficiency operation and precise temperature control.



**6 Next-Generation Large-Displacement 2.2-Liter Engine** has become “smarter” with the addition of an engine control module, CAN-bus communication, and the powerful APX Control System. Compliant with EPA Tier 4 Final regulations for engines less than 25 HP.

Intelligence

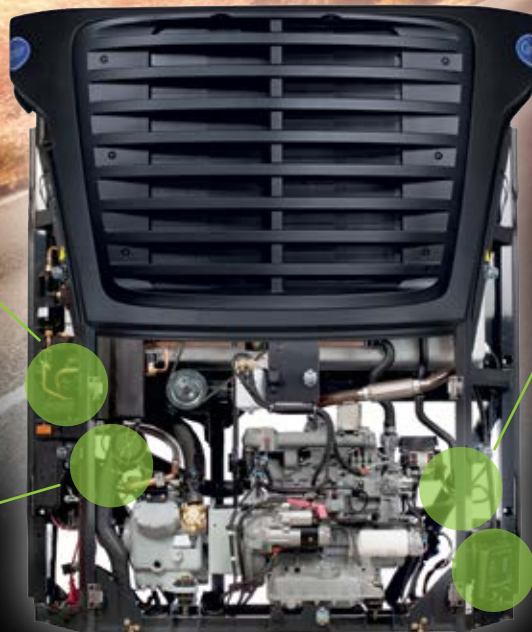
# POWERFUL CONTROL FOR REFRIGERATION. AMAZING SIMPLICITY FOR PEOPLE.



**Power Control  
Module**



**Main Micro  
Module**



**Expansion  
Modules**



**Display Module**

As technology becomes more powerful, it can become more complex, at a time when your business needs it to be faster and easier to use.

Enter the APX Control System from Carrier Transicold.

Our APX Control System helps you realize the ideal balance between technology and convenience. It combines future-forward technology with a people-friendly design. The result is remarkable control intelligence and system reliability with amazingly simple operation.

The APX Control System is based on a unique approach: It uses distributed electronics in a completely modular system, similar to passenger vehicles and heavy-duty trucks.

### HARDWARE: RELIABILITY.

The industry's first decentralized control system, the APX Control System eliminates the single, large control box and replaces it with automotive-style compact modules using CAN-bus communication.

Strategic and efficient hardware placement dramatically reduces the size of the electrical system. A simplified system design with fewer components means higher reliability, which helps keep your equipment on the road.

### SOFTWARE: INTELLIGENCE.

Sophisticated software and temperature control algorithms maintain an ideal environment inside the trailer, so you can focus on delivering the highest-quality products on time.

New Carrier Transicold Reefer Apps™ offer expanded functionality and value-added features to streamline your operations. Because more than ever, you have to deliver goods at the optimum temperature, in the most fuel-efficient and cost-effective manner.

### HUMANWARE: SIMPLICITY.

The power of the APX Control System is amazingly simple and intuitive for drivers, warehouse personnel, and service technicians.


## EVERYTHING YOU NEED. WHERE YOU CAN SEE IT.



A large dashboard-style display shows all key operating information, providing an at-a-glance visual indicator of both unit operation and conditions inside the trailer.

An ATM-style interface and exclusive message center walk users through unit operation in their choice of language.

The thoughtful design, display, and ATM-style menu system simplify operation and deliver five times more information with up to 80% fewer keystrokes.



# GREEN TECHNOLOGY TO KEEP FLEETS IN THE BLACK.



## Sustainability

Carrier believes industry leadership and environmental leadership go hand-in-hand. Sustainability is a focal point of our culture. Carrier is proud to help integrate sustainable practices into your operation by continuing to develop cleaner, higher-performing platforms that take a practical approach to compliance.

X4 series sustainability initiatives include:

- 5% to **22%** less greenhouse gas emissions.
- **24%** less refrigerant charge.
- Zero Ozone Depletion Potential refrigerant.
- 35% to **50%** higher BTU-per-gallon efficiency.
- Up to **15%** less engine run time in auto start/stop operation.
- **98%** less particulate matter and **93%** less carbon monoxide and hydrocarbons when equipped with the Engine Emissions System option.

Performance data compared to the Carrier Transicold models they replace and dependent on a range of operational settings, environmental conditions, and model type.





# COMMITTING THE RESOURCES TO FIND A SMARTER WAY.

Carrier Transicold is a part of UTC Climate, Controls & Security, a unit of United Technologies Corporation (UTC). As the 45th largest U.S.-based company,\* UTC is comprised of a family of companies that also include Otis, Pratt & Whitney, and UTC Aerospace Systems. UTC companies manufacture high-tech products, and each ranks as a leader in its respective industry—making UTC the 19th largest U.S. manufacturer.

Most important, UTC commits more than \$4 billion a year to R&D spending.\*\*

Carrier Transicold clearly benefits from this commitment to developing innovative technologies, components, and products. And it is key to helping refrigerated fleets lead their industries and improve their businesses.

\*Fortune magazine annual 2015 rankings of America's largest companies.

\*\*2014 reported annual UTC and customer-funded development spending.

# SKILLED MANUFACTURING DEPENDS ON MORE THAN MACHINES.



Carrier units are manufactured by a specialized workforce in a high-tech, ISO-certified facility. Our plant uses a variety of advanced manufacturing technologies and processes that are tightly controlled and designed for maximum productivity. Our X4 platforms are proudly assembled in the USA, in the community of Athens, Georgia. Our home for more than 27 years.

Carrier's manufacturing philosophy is centered on safety, sustainability, and state-of-the-art technology, with the ultimate goal of delivering the highest-quality product at the best price.

- ISO 9001 and ISO 14001 Process Certification.
- OSHA Voluntary Protection Program Star Status.
- Over 7.5 million hours without a lost-time injury.
- Automated processes and Lean Manufacturing.
- Sustainable operations in our Athens facility have reduced water usage by 38%, industrial process waste by 70%, non-recycled waste by 85%, and greenhouse gas footprint by 32% since 2006.





# Network

## DEALER SUPPORT, THE ESSENTIAL LINK IN THE COLD CHAIN.

A product is only as good as the people behind it. The industry-leading X4 series is backed by customer-focused dealer support. No other network is better trained or better equipped to provide the professional personnel and superior technical support that you depend on to keep the Carrier units in your fleet on the road, operating at peak efficiency.

- **180** locations across North America.
- **24/7** service access.
- Rigorous factory training for technicians.
- Comprehensive critical parts stocking.
- Expert refrigeration maintenance and repairs, bumper-to-bumper, coast-to-coast.

Trust us to handle your maintenance and service so you can focus on your customers. Choose from a variety of customizable product support agreements to help you achieve optimum productivity:

- Comprehensive maintenance and repair agreements.
- Fixed hourly rate or prepaid maintenance packages.
- Customized billing and reporting.
- Flexible extended warranty programs.

Most important, the Carrier dealer network is fully Tier 4-trained and ready to support your investment, whenever and wherever you need it.





# Strength in numbers. And a number of strengths.

- Requires **18%** less engine power.
- Delivers 3% to **10%** higher-rated cooling capacity.
- Pulls down up to **20%** faster.
- Consumes 5% to **22%** less fuel.
- Uses up to **35%** less fuel during pulldown.
- Reduces engine run time up to **15%**.
- Provides 35% to **50%** higher BTU-per-gallon efficiency.
- Operates **18%** slower in high speed.
- Requires **24%** less refrigerant.

The X4 Series. **Smarter Thinking.** Smarter Business Decision.

Performance data compared to the Carrier Transicold models they replace and dependent on a range of operational settings, environmental conditions, and model type. Specifications are subject to change without notice. Form 62-11688 REV. C.

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