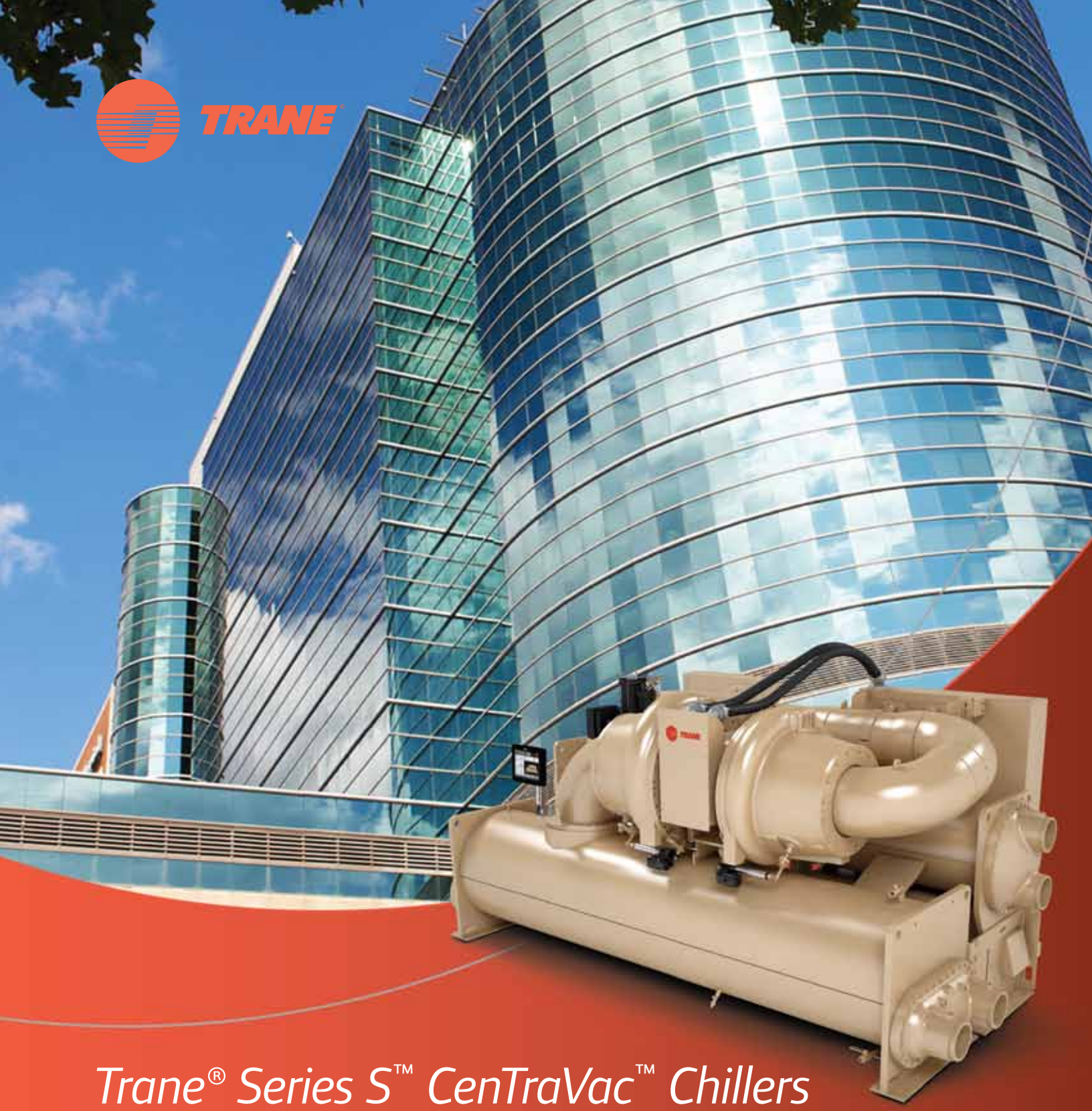


# *Trane® Series S™ CenTraVac™ Chillers with AdaptiSpeed™ Technology*

*180 – 390 tons*

# *The Trane Series S CenTraVac chiller:*

## *Delivering all that CenTraVac chillers stand for—and more!*

**We're proud to introduce the newest addition to the Trane® centrifugal chiller product portfolio: the Series S™ CenTraVac™ chiller.**

Continuing the Trane commitment to provide the most comprehensive HVAC solutions, the Series S CenTraVac chiller delivers best-in-class part-load efficiencies without compromising full-load efficiency. It delivers superior performance, industry-leading reliability and the lowest total cost of ownership.

### AdaptiSpeed technology defined

At the core of the Series S CenTraVac chiller's performance is our new AdaptiSpeed™ technology, the integration of:

- An all-new direct-drive compressor, utilizing the industry's first mixed-flow impeller design and optimized specific speed
- A permanent magnet motor
- The third-generation Adaptive Frequency™ drive, AFD3

This fusion of technologies delivers unmatched efficiency with the lowest sound levels in the HVAC industry.

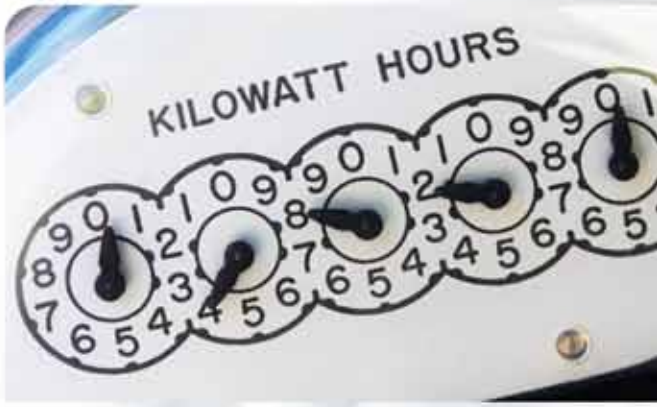
But, let's face it … new technologies are only as good as the benefits they bring to the customers who purchase them and the buildings they serve.

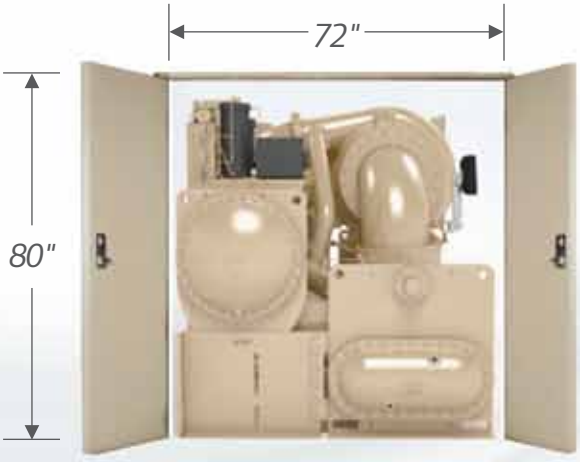
*So, what can you expect from the new Series S CenTraVac chiller from Trane?*

## Industry-leading efficiencies

The Series S CenTraVac chiller utilizing AdaptiSpeed technology delivers the highest full- and part-load efficiencies in its tonnage range (180 – 390 tons).

- **The highest full-load efficiency** minimizes the electrical infrastructure required and reduces the impact of demand-based charges and real-time pricing during peak periods.
- **The highest part-load efficiencies** drive lower overall electrical consumption charges (kWh).
- **The best IPLV** easily exceeds ASHRAE 90.1 part-load efficiency requirements.




## Simple installation

Installing a new chiller is about more than just its physical footprint; it's about ease of getting the chiller into a mechanical room with minimal disruption to the building and its occupants.

- **Fits through a standard double door—**allows for easy entry into an existing building.
- **Bolt-together design—**allows for easy disassembly into its major components, to be moved into the building individually and re-assembled on-site.

## Proven reliability

The industrial oil-free design of the Series S chiller utilizes new technologies that deliver reliable operation over the life of the chiller.

- **Hybrid ceramic bearings,** proven through more than a decade of field operation, eliminate the need for backup bearings and complex electronics.
- **Balanced impellers** provide a balanced thrust load on the driveline, reducing stress on the bearings.
- **AFD3** effectively handles electrical dips and surges to maintain reliable operation.

Trane stands behind the Series S CenTraVac chiller's reliability by offering the same ten-year parts, labor and refrigerant loss warranty that's available on all CenTraVac chillers—100 percent backed and fulfilled by Trane, not a third party.

# Innovation for performance

## Advanced compressor design

Each Trane® Series S™ CenTraVac™ chiller's compressor is optimized to precisely match load requirements and operating conditions, delivering superior efficiency across a wide operating envelope.

**Mixed-flow, balanced impellers**

The new specific-speed compressor features the industry's first "mixed-flow" impeller design. Offering the best attributes of both radial and axial designs, these impellers—coupled with the specific-speed design—enable the compressor to deliver better efficiency across a wider operating range. In addition, the back-to-back impeller orientation provides a balanced thrust load on the driveline, reducing stress on the bearings. This design adds to overall unit reliability, maximizing chiller uptime.

**Permanent magnet motor**

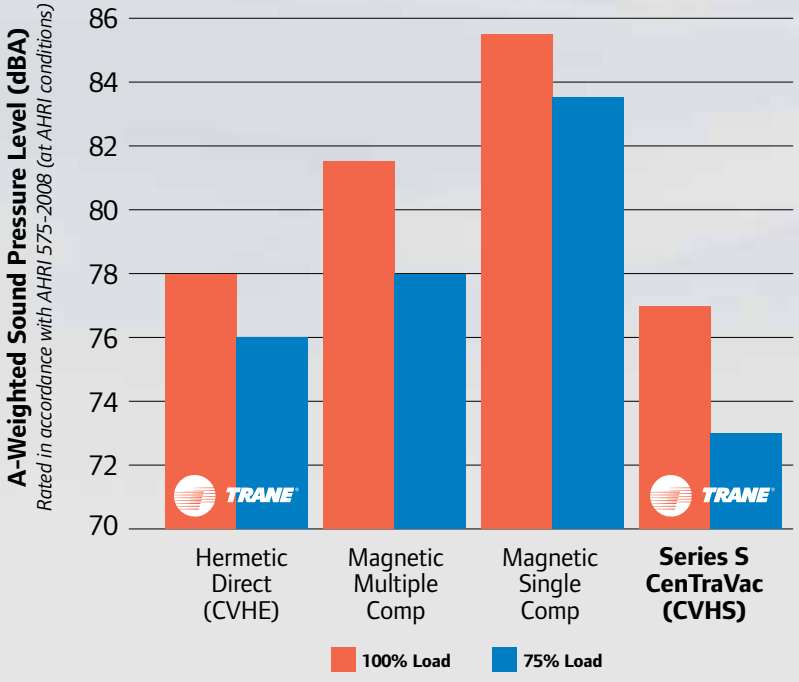
Because it doesn't have the efficiency losses associated with the rotational slip of an induction motor, a permanent magnet motor can achieve up to 4 percent better efficiency than a comparable induction motor.

**Hybrid ceramic bearing system**

These bearings offer a reliable oil-free solution without requiring backup bearings and complex electronics to address extreme operating conditions. The high-strength hybrid ceramic bearings have been proven through extensive field operation for more than ten years.

# Ultra-quiet operation

Comfort is about more than just temperature; building occupants also expect a quiet environment. The Trane Series S CenTraVac chiller produces industry-leading sound levels—typically less than 75 dBA—making it perfect for sound-sensitive applications.

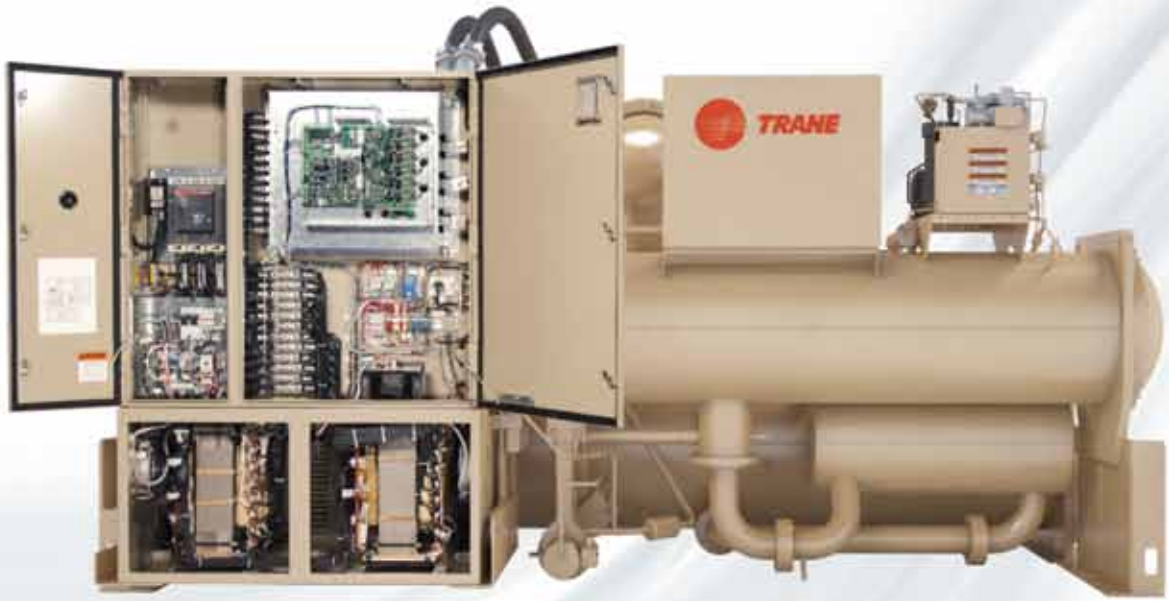


## Third-generation Adaptive Frequency™ drive, AFD3

Designed to last the life of the chiller, the AFD3 consumes less energy at all operating points without the risk of incurring excessive demand charges during near-full-load operation. The rugged AFD3 can effectively handle electrical dips, surges and other imbalances to maintain reliable chiller operation from any utility power source, including renewable power.

A true 24-pulse design provides the harmonic solution to meet the requirements of IEEE 519, reducing harmonic distortion to less than 5 percent total demand distortion (IEEE).

Unique in the industry, the AFD3 is a fully integrated variable-speed drive working with the motor and Tracer AdaptiView™ unit controller to continuously optimize chiller efficiency through compressor speed and guide vane position.




## Other key features

**Tracer AdaptiView controller**

This unit controller provides the intelligence behind CenTraVac chillers and features Adaptive Control™ algorithms: control strategies that respond to a variety of conditions to maintain efficient chiller plant operation. An open-protocol design allows the AdaptiView controller to work with any building automation system without the need for gateways (BACnet®, Modbus RTU and LonTalk®).

**Safety first with "Shore Power"**

Commissioning the chiller and servicing the AFD3 drive panel can be performed with only 110 volts of power through a standard extension cord—a design that helps protect technicians from higher line voltages.

**Flash economizer**

The Series S CenTraVac chiller has a single-stage economizer that provides up to 4½ percent better efficiency than designs with no economizer. Since the Series S chiller uses two impellers, it is able to flash refrigerant gas at an intermediate pressure between the evaporator and condenser, significantly increasing chiller efficiency. This improvement in efficiency is not possible from single-stage chillers, in which all compression is done by one impeller.

**Refrigerant cooling system**

This unique and highly effective system provides cooling to the motor, bearings and AFD3, delivering exceptional unit life without the added maintenance of standalone glycol systems.

*An industrial-grade oil-free solution*

# Environmental sustainability


Direct-drive CenTraVac™ chillers are designed to use a low-pressure refrigerant. This means the chillers operate in a vacuum, which virtually eliminates leaks and enables near-zero emissions throughout their operational life. That's a win in terms of the direct environmental impact of the refrigerant, minimizing the Ozone Depletion Potential (ODP) and Global Warming Potential (GWP).

In fact, Trane is so confident in our ability to keep the refrigerant inside our CenTraVac chillers, we back each one with a leak-tight warranty—free on all CenTraVac chillers installed in the U.S. and Canada for the first five years of ownership, and extended for the life of the chiller when covered by a comprehensive Trane service agreement.

## Here's what the EPA has to say:

*"Trane has led the industry in technical innovation and performance that has defined superior environmental performance. Through both managerial leadership and technological innovation, Trane has drastically minimized the environmental impact of its centrifugal chillers by developing numerous technologies to detect and prevent refrigerant emissions and to maximize the energy efficiency of centrifugal chillers."**

– U.S. Environmental Protection Agency

## Rated "Best of the Best" by the EPA

CenTraVac chillers have received U.S. Environmental Protection Agency awards three times, including a "Best of the Best" award in 2007.

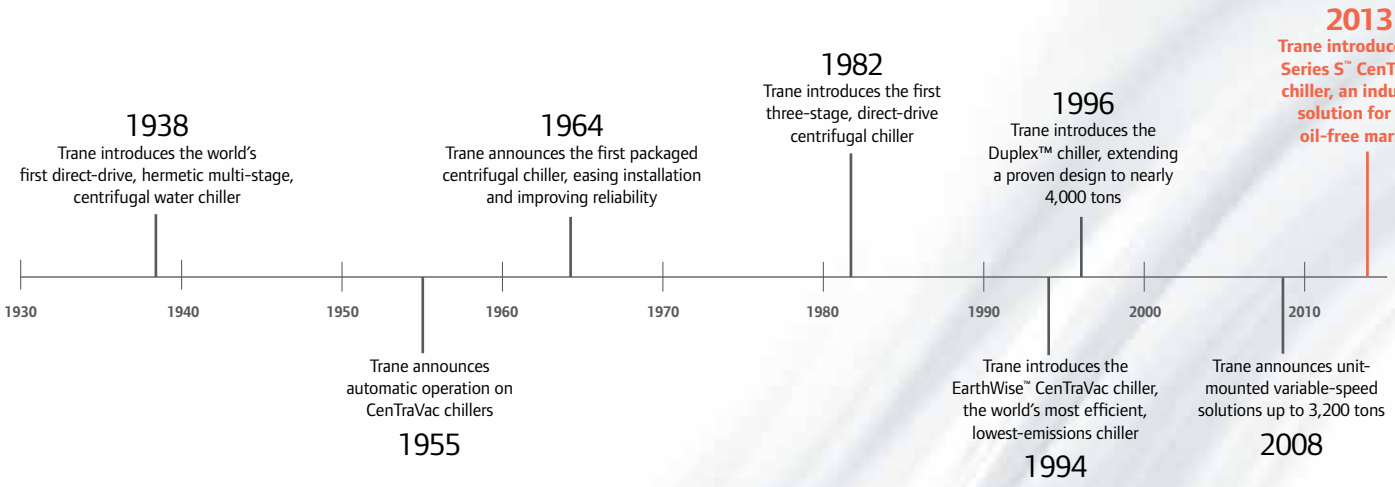

*2007 Best-of-the-Best Stratospheric Ozone Protection Award*

*1998 EPA Climate Protection Award*


*1992 EPA Stratospheric Ozone Protection Award*

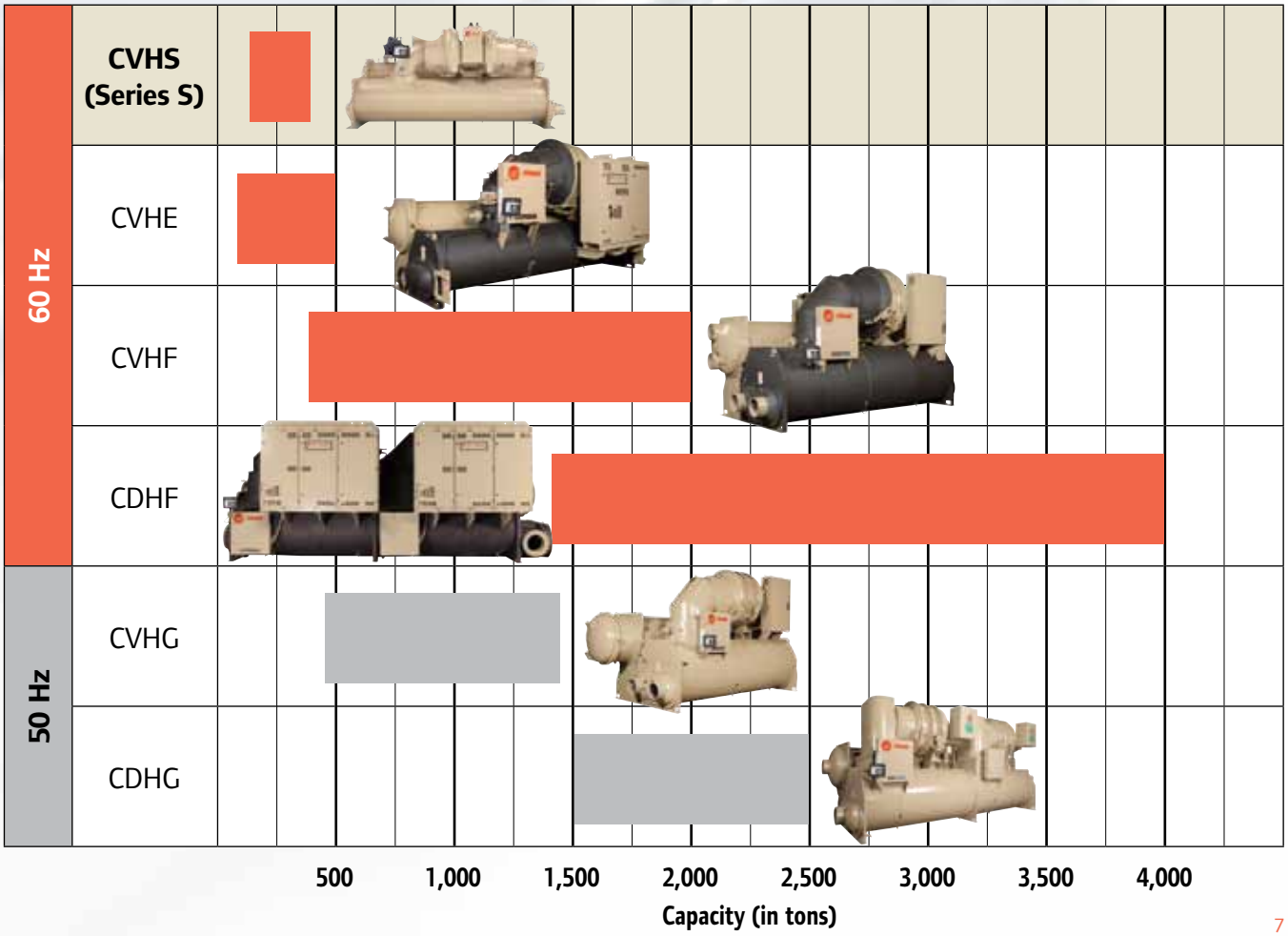
*U.S. Environmental Protection Agency, "2007 Best of the Best," www.epa.gov/Ozone/awards/bestofthebest/2007_botb_winners.html (Accessed 2013).

# *Delivering superior performance, CenTraVac chillers define the industry.*




We're proud to introduce the Trane® Series S CenTraVac chiller, the newest addition to our centrifugal chiller product portfolio and an ideal solution for any application, including retrofit and replacements.

## *CenTraVac Chiller Product Family*



# *Making buildings better for life*


Scan the code to learn more about the all-new Trane Series S CenTraVac chiller with AdaptiSpeed technology.

**Performance**

Trane® products are designed, engineered, built and tested to be solid performers, quietly doing their jobs year after year with minimal need for maintenance and repairs. The Trane Series S™ CenTraVac™ chiller with AdaptiSpeed™ technology builds on a long history of centrifugal chiller performance—a history that shows many Trane CenTraVac chillers working reliably for more than 50 years.

**Innovation**

Founded a century ago on the belief that imagination and inspiration can overcome any obstacle, the Trane legacy of technological breakthroughs has made it an industry legend. Today's Series S CenTraVac chiller contains more innovative solutions to boost performance and efficiency while maintaining higher levels of reliability and environmental sustainability than any other chiller on the market.

Ingersoll Rand

Ingersoll Rand (NYSE:IR) advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Schlage®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; secure homes and commercial properties; and increase industrial productivity and efficiency. We are a $14 billion global business committed to a world of sustainable progress and enduring results.

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