



*Trane[®] VRF
variable refrigerant systems*



Trane VRF variable refrigerant systems

Exceptionally efficient cooling and heating — from the cooling and heating expert.



When VRF is the right solution for your application, Trane will help you ensure it's the *best* solution.

Trane® VRF variable refrigerant systems are among the best in the industry. Thoroughly researched. Thoroughly tested. Thoroughly proven to offer exceptional value.

And because Trane offers a full portfolio of heating and cooling solutions, you can be confident that our recommendation of a VRF system for your application is the *best* solution for your heating and cooling needs.

Performance you can count on. Solutions you can trust. Knowledgeable experts you can believe in. **That's the Trane difference.**

The economy owners want. The comfort occupants want.

Trane VRF systems can keep energy costs low while delivering different occupant-selected temperatures to multiple zones — a big benefit for buildings with multiple interior spaces and diverse occupancy patterns.

Significant savings on utility bills can be achieved, because areas can be heated or cooled only when they are occupied.

Occupant satisfaction can be increased, because individual areas can be heated or cooled as desired — even if adjacent and nearby areas are at significantly different temperatures.

Tenants can be accurately and fairly billed for system use, because Trane VRF systems can deliver usage reports that allow landlords to calculate the actual amounts of energy used to heat and cool each leased space.



*There are VRF systems ...
and there are
Trane VRF systems.*



Expert installation

You can be confident that a Trane VRF installation will be performed in accordance with the industry's latest safety standards, because Trane installation technicians follow ASHRAE Standard 15 and the Canadian B 52-M1995 Mechanical Refrigeration Code.

A complete solution — including controls

Trane provides superior controls solutions — solutions that are optimized with specific algorithms to support the unique performance characteristics of individual VRF systems. Programmed to help simplify installations, minimize

The science behind the savings

Variable refrigerant flow systems are inherently efficient. So what makes Trane VRF systems really stand out? Superior design strategy. Advanced technology. Outstanding durability. These industry-leading benefits help Trane VRF systems deliver exceptional energy efficiency: **up to 31 IEER and 30 SCHE.**

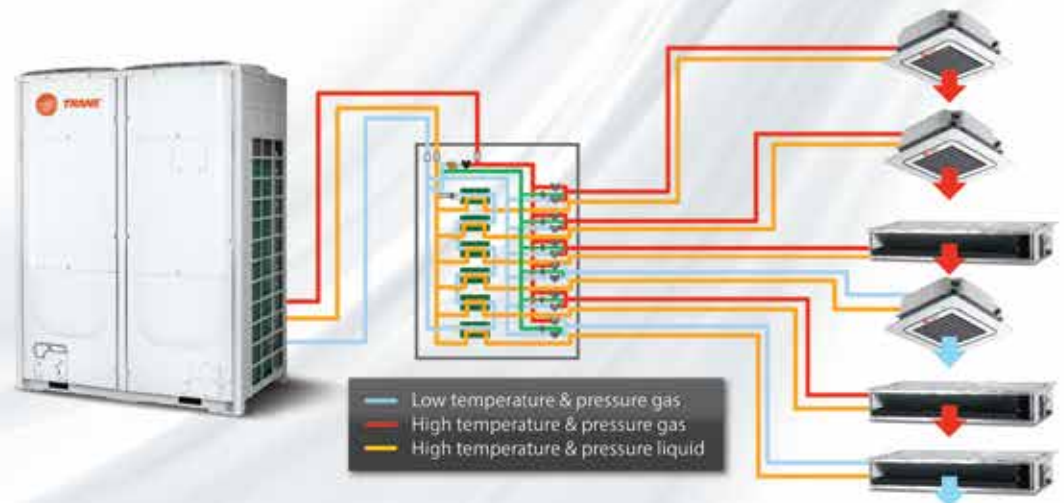
Advanced compressor technology

The compressors at the heart of every Trane VRF system feature multiple technological advantages that help them deliver higher efficiency when cooling or heating.

- **Variable-speed operation** — Precisely matches compressor speed to demand level, maximizing comfort and minimizing energy consumption.
- **Asymmetric scroll design** — Friction-reducing architecture improves both efficiency and longevity.
- **Available dual inverter scroll compressors** — A dual-compressor system can respond to rapid changes in building load during periods of heavy demand, as well as operate both compressors at more efficient speeds throughout the entire demand range.

Intelligent refrigerant flow

Trane VRF heat-recovery systems reduce energy consumption using strategically located mode control units (MCUs), which allow heat energy to be intelligently exchanged between localized zones.



Improved heating performance and efficiency

Through the use of a three-pipe design and vapor-injection technology, Trane VRF heat-recovery systems achieve improved heating performance and overall energy efficiency that competing two-pipe systems simply can't match. Building occupants enjoy more heating comfort, while building owners pay lower utility bills.

troubleshooting and deliver dependable, economical heating and cooling performance, Trane controls add real value to our VRF systems.

Fast, accurate auto-commissioning

Trane VRF systems have a fast, accurate auto-commissioning process, both for initial system installation as well as for applications requiring commissioning on a regular basis. The Trane auto-commissioning process saves time and hassles — and provides proof that your VRF system is delivering the efficient performance you expect. Your Trane VRF system can be up and running quickly — and can stay running at peak performance, year after year.

Extensive self-monitoring capabilities

Trane VRF systems automatically check critical system datapoints every three seconds. In the unlikely event of a performance variation, your Trane VRF system can alert you well in advance of a critical condition.

Best of all ... it's a Trane

The Trane network of sales and service offices is one of the most extensive in the industry. Choosing a Trane VRF system means your nearby Trane office can provide all the assistance you need — and you'll have no worries about hard-to-find parts or service technicians who are unfamiliar with your system.

Durably designed — for comfort you can count on

Reliable, high-performance heating and cooling — day after day, year after year.

Even under challenging conditions. That's what the advanced engineering and design in every Trane® VRF variable refrigerant system help to ensure ... because peace of mind and comfortable temperatures are a great combination.

A Robust compressor shaft

- Oversized diameter and hardened steel construction for exceptional durability.
- Supports sustained operation of up to 8,400 RPM.

B Highly pressurized compressor interior

- Minimizes oil foaming to improve flow under demanding conditions.
- Ensures necessary lubrication at all friction points within the compressor interior to reduce wear.

C Oversized oil capacity

- Ensures adequate lubrication, even during high-speed operation.
- Helps maximize compressor life.

D Cyclone oil separator

- Captures and returns oil discharged from the compressor during high-speed operation, helping prevent oil starvation and extend compressor life.
- Delivers a 60 – 70 percent reduction in the rate of compressor oil circulation in the system's refrigerant.

E Temperature-regulated inverter boards

Temperature extremes can negatively impact inverter boards. That's why Trane VRF inverter boards are kept at proper operating temperatures by the system's own liquid refrigerant, which circulates through integrated heat sinks.



Available dual-compressor design enhances performance and reliability

Quick temperature changes — At system startup or when a large change in temperature is required, both compressors can operate at maximum capacity, providing fast cooling or heating.

Improved longevity and reliability — During periods of moderate demand, the two compressors can alternate in operation, avoiding sustained loads on any single compressor and reducing the stresses and wear that accompany long periods of high speed.

Smart Protection Technology — When both compressors are operating simultaneously, Smart Protection Technology adjusts their rotational frequencies to be slightly out of phase. The result is significantly minimized vibration and pipe resonance for longer component life.

Supports long total piping runs

Tall buildings and structures with large amounts of floor space can benefit from VRF technology — but not all VRF systems can easily support them. Trane variable refrigerant systems can.

- Capable of serving a total pipe run of up to 3,281 feet — one of the longest in the industry.
- Superior technology makes it possible: a combination of up to 8,400 RPM compressor speed and unique electronic expansion valves with a 2,000-step gear-driven design.

Modern heating and cooling for historical structures

For classical architecture, maintaining a period-correct appearance inside and out is vitally important — but so is maintaining comfortable interior temperatures and reasonable utility costs. Which is why Trane VRF systems can be a perfect solution. Using small-diameter pipes instead of large air ducts, Trane VRF systems can be unobtrusively installed, heating and cooling historical buildings with modern energy efficiency — the best of both worlds.



Full support for specialized applications

Trane VRF systems can keep energy costs low while delivering different occupant-selected temperatures to multiple zones — a big benefit for buildings with multiple interior spaces and diverse occupancy patterns.

User-selectable night operation mode can reduce sound output by up to 15 dB — ideal for noise-sensitive installations.

Compact, lightweight construction makes Trane VRF units among the smallest and easiest to install in the industry. Existing roofs generally don't require modifications or reinforcements to support the relatively light weight of a Trane VRF unit, and new construction often can be designed with lighter-weight, less-expensive techniques and materials.

Support for 575-volt electrical service is available on Trane VRF systems so they can serve more customers — and eliminate the need for expensive electrical modifications.

Local seismic rating requirements can be addressed with solutions that are available for all Trane VRF systems.

Outdoor and indoor units

The lineup of Trane® VRF variable refrigerant system units is among the most complete in the industry, offering multiple solutions to meet virtually any design need.

Modular outdoor units are available in either heat pump or heat recovery configurations, and can be combined to form large-capacity systems up to 36 tons.

		Nominal Tons				
		6	8	10	12	14-36
	Power (Volts/Hz/Phase)	Basic Modules				Combined Modules
Heat Pump	208-230/60/3	✓	✓	✓	✓	✓
	460/60/3					
Heat Recovery	208-230/60/3	✓	✓	✓	✓	✓
	460/60/3					

Mini outdoor units are available in heat pump configurations in 3-, 4- and 5-ton capacities.

		Nominal Tons		
		3	4	5
Heat Pump	208-230/60/1	✓ 	✓ 	✓ 

Indoor units are available in cassette, concealed, high-wall and floor/ceiling configurations, in varying capacities up to 96 MBh. Standard and optional features vary by model and include internal condensate pumps with integral check valves and easy-to-clean filters.

		Nominal Capacity (MBh)												
		7.5	9.0	12.0	18.0	20.0	24.0	30.0	36.0	42.0	48.0	60.0	75.8	96.0
	Slim One-Way	✓	✓	✓										
	Mini Four-Way		✓	✓	✓	✓								
	Four-Way		✓	✓	✓		✓	✓	✓		✓			
	Slim Duct	✓		✓	✓		✓	✓	✓		✓			
	Mid-Static Pressure Duct				✓		✓	✓	✓		✓			
	High-Static Pressure Duct								✓		✓		✓	✓
	High Wall	✓	✓	✓	✓	✓	✓							
	Floor/Ceiling				✓		✓							
	Convertible Air Handler				✓		✓	✓	✓	✓	✓			

Advanced controls for every application

Trane VRF systems include a variety of control options, each programmed with unique algorithms to make systems easy to use and comfort easy to achieve, helping to improve the life of your building.



A complete solution includes superior controls, which are optimized with specific algorithms to support the unique performance characteristics of individual VRF systems. Programmed to help simplify installations, minimize troubleshooting and deliver dependable, economical heating and cooling performance, Trane controls add real value to our VRF systems.



Individual zone controls allow management of up to 16 indoor units via a wired or wireless remote control. Each controller can be used to set zone temperature, heating/cooling mode and fan speed. Simple scheduling is also possible for improved energy savings.



Centralized controls allow power and heating/cooling mode management of up to 128 indoor units connected to a central on/off controller. A typical application for this type of control would be an elementary school, with the entire building's group of VRF units monitored and controlled from the principal's office.



System controls provide a higher level of management for multiple-VRF systems, as might be found in a multi-floor building. System controls provide more-advanced scheduling, operation and alarm history management; they can be accessed remotely for monitoring via an Internet connection.



Optional BACnet® connectivity adds the benefit of VRF system integration with Trane Tracer™ controls for a total building management and control solution. One Trane Tracer control system can coordinate the functions of a VRF system, a chiller, an air handler, a VAV system and more. An available Pulse Input Module can be connected to watt-hour meters to allow individual tenant billing.

Integrated building control software is available for large, stand-alone VRF installations. It offers building owners and managers complete control and monitoring capability of all connected VRF systems and units.

Internet connectivity is easy: communication with the system can take place using any web-connected computer. From virtually anywhere in the world, system set points can be modified and user-definable alarms can be received to ensure immediate notification when specified events occur.

Scan the code or
visit Trane.com/VRF
to learn more.



Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a \$12 billion global business committed to a world of sustainable progress and enduring results.



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