

## The business solutions

VRF technology offers the best solution for large commercial and industrial buildings: including hotels, hospitals, leisure and shopping centers.

The dual inverter compressor guarantees high efficiency levels, operating flexibility and reduced maintenance requirements.

Moreover, the wide range of indoor units makes VRF system the most flexible choice to satisfy any kind of requirement and to be ideal for many installations.

## Committed to quality

Quality has always been Toshiba's strength and will remain the trademark that will differentiate Toshiba air conditioners from the competition.

This is the philosophy behind every Toshiba product especially in the highly technological VRF systems where the use of the special inverter controlled compressors, guarantee a significant reduction in mechanical and electrical stress.

This is due to the more gradual startup compared with traditional on/off compressors, increasing the durability and reliability of the components. SMMSi and SHRM models also feature the active Oil Management System that constantly checks the oil level in each compressor and automatically transfers oil from another outdoor unit, if an oil shortage is detected in any compressor.



B u s i n e s s

THE BUSINESS RANGE

THE MOST ADVANCED SOLUTIONS  
FOR LARGER BUILDINGS.

## Precision is our top priority

Sophisticated inverter control permits matching of the actual refrigerant flow to the capacity required by each indoor unit in an application. This results in optimised efficiency of the refrigerant cycle and increased precision in maintaining the required temperature, improving comfort for the occupants.

The required capacity and the related technical parameters for each indoor unit are electronically transmitted to the outdoor unit in order to optimise the zone load calculation and to control the actual refrigerant flow to each indoor unit, using the special Pulsed Modulating Valves (PMV).

## Silence is golden

As a result of detailed improvements such as the fan drive circuit, fan blade design and construction of the outlet duct, our design teams have successfully reduced outdoor unit noise levels.

An optional night operation/sound deadening control circuit board is available for reducing noise levels overnight by limiting the system's maximum operation. This has resulted in operating noise levels below 50 dB(A).

The exclusive use of inverter-driven compressors also significantly contributes to reduce noise emissions.

## Accurate refrigerant flow

Refrigerant flow is adapted rapidly to match the capacity required, irrespective of each indoor unit type, position or length of piping. This results in optimum efficiency in the refrigerant cycle and precise temperature control creating improved comfort for the occupant. The characteristic values of each indoor unit are input into the outdoor unit, and optimum refrigerant control is achieved through continuous monitoring and adjustment.

By measurement of refrigerant conditions within each indoor unit, the load requirement is calculated and the flow of refrigerant to each indoor unit is controlled. The operating capacity of the outdoor units is matched to meet the overall system requirement.



SMMS-i



MINISMMS



SHRM-i



With the innovative and sophisticated Toshiba technology and the use of 3 compressors and 3 inverter SMMSi systems ensures extraordinary flexibility in any application. The SMMSi offers innovations in energy savings with highly efficient DC twin rotary compressors and advanced vector-controlled inverters boasting higher COP at 50% partial load.



The Toshiba MiNi-SMMS is a small VRF system suitable for both commercial applications and more private spaces. Great flexibility and control are combined in a VRF system, which is small and compact enough to fit a balcony.

It managed to bridge the gap between the versatile Multi-Split Systems and the larger capacity of the SMMSi.



New Toshiba three-pipe VRF Super Heat Recovery Multi System (SHRM-i) delivers simultaneously cooling and heating to different zones or rooms and has exceptional energy efficiency.

Its compact flow selector enables the system to heat and cool simultaneously and can be used in restricted spaces.

Four outdoor unit model line-up that can be installed in 18 different combinations up to a capacity of 42 HP.

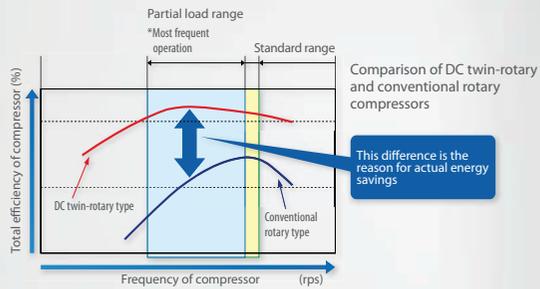
# Business

INVERTER SYSTEMS

VARIABLE REFRIGERANT FLOW

## DC Twin rotary compressor advantage

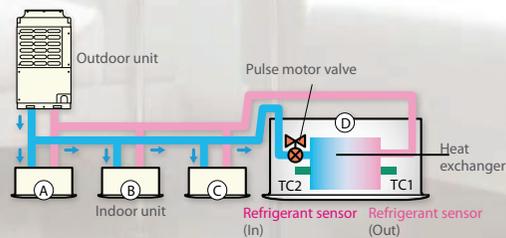
The systems consumption is highly effected by the outside temperature and most of the time the compressor work in part load conditions. Toshiba DC Twin rotary compressor is widely know for its great performance in part load which lead to a seasonal power consumption lower than the conventional rotary compressor.



## Optimal refrigerant control

When a multiple number of indoor units are connected on a system, an insufficient or excess amount of refrigerant may be supplied to indoor units depending on the difference in length of the connection pipe from the outdoor unit. This is caused by pressure loss and heat leaks as the refrigerant travels through the pipes, resulting in incorrect amounts of refrigerant being supplied to the indoor units.

Optimal refrigerant flow control featuring intelligent control over the refrigerant sensors and opening rate of individual pulse motor valves realizes stable indoor temperatures throughout a building with height differences of up to 40m between indoor units.



The surplus represented by (A) is diminished.

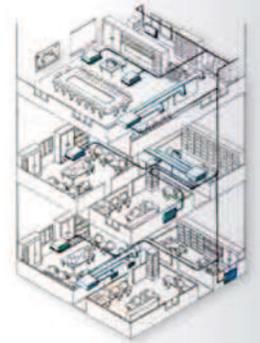
The surplus represented by (B) is diminished and the deficiency represented by (C) is compensated for.

The surplus represented by (A) is diminished and the deficiency represented by (D) is compensated for.



## Simplified piping design

Toshiba double header branching and Y shape joints and piping lines combination is very flexible, allowing the shortest route between the outdoor and the indoor. Installation material and time are minimized and in addition the system will have less refrigerant in the circuit.



## High installation flexibility

Toshiba VRF units enable installations with great equivalent length and height differences between outdoor and indoor units. This makes it much easier to design for floors with many small rooms, or for tenants who often rearrange their floor layouts. SMMSi units may reach up to 40 meters in height, the equivalent of a 11 story building.



## Effective air management

Better air management contributes to the achievement of high energy efficiency. It also allows higher standard pressure for applications with condensing units installed indoors (city environments, etc).

Toshiba engineers have focused on the air management components in order to improve the amount and speed of the air throw while reducing to the minimum the noise and the sound of the rotating parts.

Toshiba uses in all the outdoor unit specially designed patented fan propeller and high power motor drive.