TOSHIBA Leading Innovation

VRF Series

The most advanced commercial air conditioning system

Business

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The most advanced commercial air conditioning solution

As a world-wide leader in electronics Toshiba not only develops new technologies but provides products and systems that improve health and comfort.

Our objective is to serve the needs of all, our customers, shareholders and employees, by implementing forward-looking corporate strategies in a responsible and responsive manner. As good corporate citizens, we seek to further the goals of society. By developing innovative technologies focused on electronics and energy, we strive to create products and services that enhance human life and lead to a thriving, healthy society. We constantly seek new ways to help realise the goals of the world's community, including global environmental challenges.

By the **1980s** Toshiba had a broad product offering. Toshiba was the first to introduce the inverter driven unit in 1981 and the twin-rotary compressor in 1988.

Toshiba entered the VRF market in **1993** with the advanced two-pipe Super Multi system, and after a very fast upgrading, in **2004** launched the new Super Modular Multi system, optimised for use with energy-efficient, non-ozone-depleting R410A refrigerant, followed by the Super Heat Recovery Multi, the 3 pipe modular system.

In **2006** Toshiba completed the current VRF range with the addition of the new compact MiNi-SMMS system, this is a flexible system that bridges the capacity gap between VRF and Multi systems – ideal for commercial and private applications.

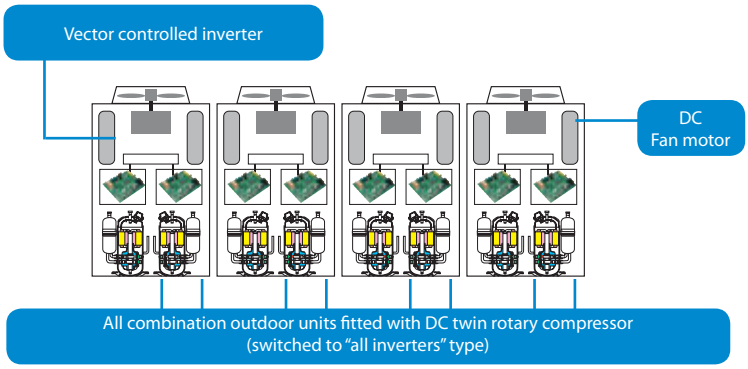
For the last 47 years Toshiba's ambitious objective has been to design and manufacture the most state-of-the-art air conditioning, with innovative technologies in all areas. From superior performance to reduced power consumption, from air treatment to expert assistance.

VRF technology offers the best solution for large commercial and industrial buildings: including hotels, hospitals, leisure and shopping centres. The dual inverter compressor guarantees high efficiency levels, operating flexibility and reduced maintenance requirements. The wide range of indoor units makes VRF system the most flexible choice to satisfy any kind of requirement.

Toshiba: VRF delivers maximum power and energy savings

With the new generation of Variable Refrigerant Flow units, MiNi-SMMS, SMMS cooling only and heat pump and SHRM heat recovery ranges, Toshiba sets new technological standards, incorporating DC twin-rotary compressors in all outdoor units, compatible with the high-density refrigerant R-410A. Thanks to the use of these dual-compressor systems, the system operation load is distributed more evenly, with a special controller regulating the operating sequence of outdoor units and individual compressors. This innovative technology also allows optimisation and balancing of the operating time for each component, considerably enhancing the reliability of the complete system. When the system is in operation, the latest Toshiba control systems select the heat exchanger and compressor to supply the required capacity in the most efficient way. This operating method continuously optimises the power input compared with a traditional on/off system and can reduce it by up to 30%.

DC Twin-rotary compressor in all outdoor units



R410A VRF outdoor units

Business

Only quality, pure and simple

Toshiba has been studying, designing and creating innovative air conditioning systems for 30 years and as a result has always offered the highest performance in the market. Quality and technology have 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.

With the use of the special inverter controlled compressors, the new MiNi-SMMS, SMMS and SHRM ranges offer a significant reduction in mechanical and electrical stress. This is due to the more gradual start-up compared with traditional on/off compressors, increasing the durability and reliability of the components. SMMS 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.

Energy savings according to Toshiba

The advanced electronic technology in these systems permits capacity control that results in significant energy savings. This objective is achieved thanks to the use of sophisticated inverter control and modulating control valves in each indoor unit. These permit linear variation of the refrigerant flow in any circuit, directly proportional to the thermal load, resulting in further energy savings. In fact the power input of the outdoor unit is dramatically reduced with the heat load reduction in the areas served. Another factor of energy savings and management cost savings is that the systems are sized for the maximum load, and usually operate at part load.

Compactness and beyond

In 2006, Toshiba complemented the VRF range with the addition of the new compact MiNi-SMMS system. This new range has been designed to guarantee the most flexible solutions for both commercial and private applications.

VRF offers important features: performance, low noise levels, sophisticated and precise control systems, energy savings and respect for the environment. In fact, Toshiba's commitment to the research and the development of new technologies grants always the maximum care of the environment: all the VRF systems are designed to operate with non-ozone-depleting refrigerant (R-410A) and the sophisticated dual inverter control.

Unlimited flexibility

Optimised product choice

The ultimate inverter system

Minimised consumption

Precision is our top priority

Sophisticated inverter control permits matching the actual refrigerant flow to the capacity required by the application for each indoor unit.

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).

Compressor development and ecology

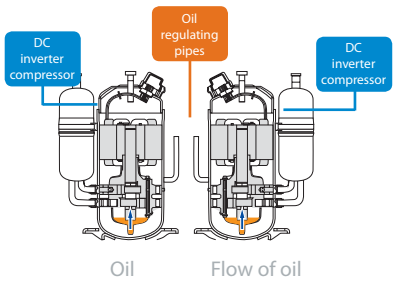
Conventional 2-in-1 scroll

This consists of one inverter-driven compressor and one fixed-speed compressor. Each scroll compressor comprises a fixed scroll (spiral) and an oscillating scroll. The oscillating scroll fits within the fixed scroll. Refrigerant is drawn from the outside of the meshing spirals and squeezed towards the centre of the scrolls, thereby pressurising the refrigerant. To minimise leakage, the contact force required between the two scrolls is considerable and the scroll surfaces must be lubricated. At low compressor speeds lubrication efficiency is reduced, resulting in increased compressor wear.

SMMS-SHRM Dual DC Twin-Rotary
MiNi-SMMS DC Twin Rotary

This consists of two inverter-driven twin-rotary compressors. A twin-rotary compressor has two fixed compression chambers. An off-centre roller orbits each chamber to squeeze the refrigerant. The two rollers are both mounted on the same shaft, but are offset to provide counter balance to each other. The contact force required between the roller and chamber wall is lowered. This means that smaller bearings can be used and lubrication demand is reduced, saving weight and making this type of compressor more suited to lowspeed operation.

Dual DC twin-rotary compressors



Leading Technologies

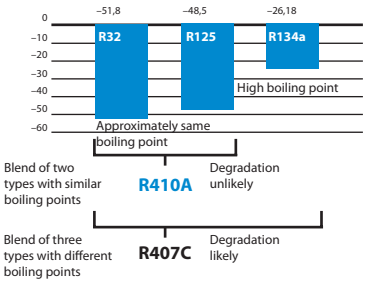
Compressor	2-in-1 scroll	DC twin-rotary	Benefit
Efficiency	Standard	20% improved	Greater energy savings
Weight (comparative, %)	92 kg × 1 (100%)	25,2 kg × 2 (55%)	Lighter and more compact
Volume (comparative, %)	50 l (100%)	15 l (30%)	
Lubrication requirement	(100%)	(2,5%) = 1/40	Higher reliability

Benefits of using **R410A** refrigerant

Incorporating the energy-efficient, non-ozone-depleting R410A refrigerant in air conditioning systems delivers multiple benefits:

- zero ozone-depleting potential
- significant increase in energy efficiency
- reduced pressure loss
- for improved performance

Comparison of refrigerant boiling points (liquid and gas)



ISO 14001: environmental care from manufacturing

Area	Sites	Date Certified	Certifying body
Japan	Toshiba Carrier Fuji site	Obtained April 1997 (ISO 14001)	JACO (Japan Audit and Certification Organization for Environment and Quality)
Thailand	Toshiba Carrier Thailand	Obtained May 1998 (ISO 14001)	AJA (Anglo Japanese American)

Toshiba – focussed on energy conservation

Toshiba has made a significant investment into researching and developing technologies that focus on protecting the environment and saving energy. The inverter control used for Toshiba's VRF range incorporates more, smaller steps to deliver only the required power and achieve the temperature desired by the occupant much faster.

The increase in control steps ensures a more precise and stable temperature and eliminates power surges common in standard, non-inverter systems. This increases energy efficiency, compressor life and user comfort.Toshiba aims to:

- Reduce CO_2 emissions and prevent global warming.
- Recycle and reduce waste emissions.
- Ensure 90% of the components used in the R410A VRF are recyclable.
- Design only products optimised for HFC refrigerants.
- Reduce power consumption with each product feature.
- Use lead-free solder.

Compact and modular in design.

The extremely compact design of the new MiNi-SMMS guarantees a significant volume reduction for the outdoor unit and enables installation on balconies and patios to be fast and simple.

The SMMS and SHRM outdoor units have the same modular design and dimensions, even with different capacities.

This is of particular benefit when an application requires a combination of the two systems, the result is a smart and consistent appearance on site. The units can also fit into a standard lift making installation quick and easy.

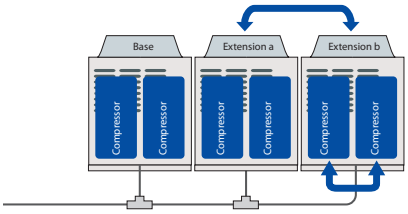
Reliability and savings

With dual-rotation, the load on the compressors is distributed more evenly. The operating sequence of the SMMS and SHRM outdoor units and the individual compressors within them is rotated to spread the operating hours more evenly. As the compressors are all inverter driven, power surges are eliminated. Over or under-utilisation of power, typical for non-inverter compressors, is eliminated, and there is no on/off power surge as the systems adjusts to the demand required by the occupant. The use of inverter compressors with the MiNi-SMMS also reduces the risk of compressor failure, more common in standard non-inverter systems.

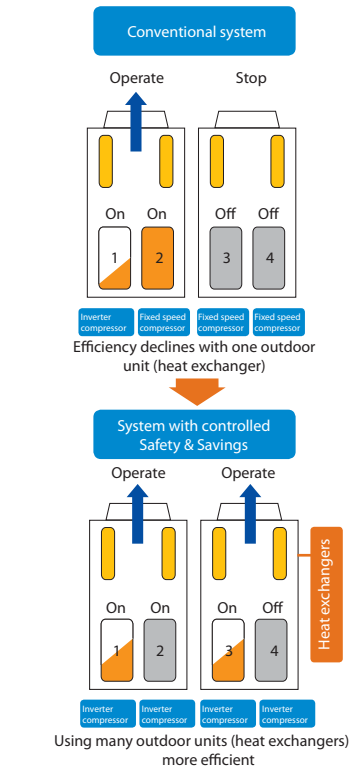
During operation the SMMS and SHRM systems select which outdoor unit and which compressor are to operate to deliver the required power.

Inverter systems save energy as continuous operation offers the same capacity with lower power consumption. This benefits all occupants by maintaining even room temperatures, as well as the environment by reducing energy consumption.

Reliability



Savings



Smooth control

By using all inverter-driven compressors, Toshiba is able to significantly reduce the electrical and mechanical stresses that are placed on fixed-speed compressors during start-up. Current absorption on an inverter-driven compressor is smoothed out at start-up thus reducing the wear on the electrical and mechanical components and increasing reliability.

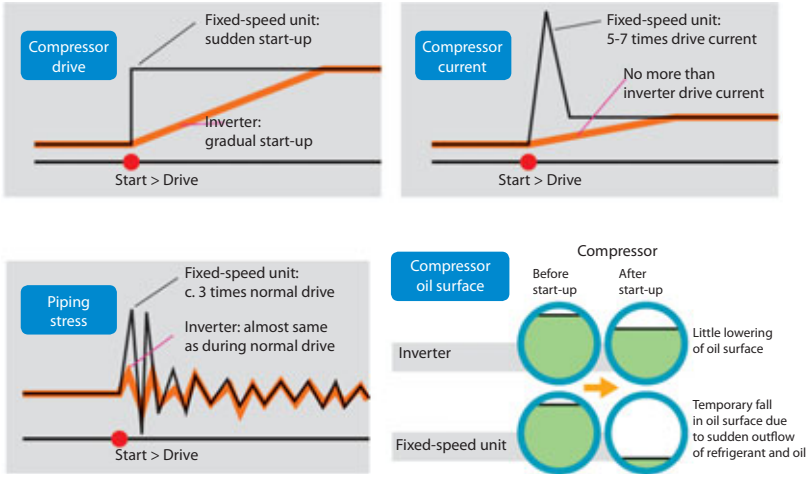
Stable operation

The active oil management system continually monitors the level of oil in all compressors, should an oil shortage be detected in any compressor, oil is automatically transferred from a compressor in another outdoor unit. The two compressors in an individual SMMS-SHRM outdoor unit are connected by way of an oil balancing pipe to ensure a uniform oil levels within the two compressors.

Back-up function

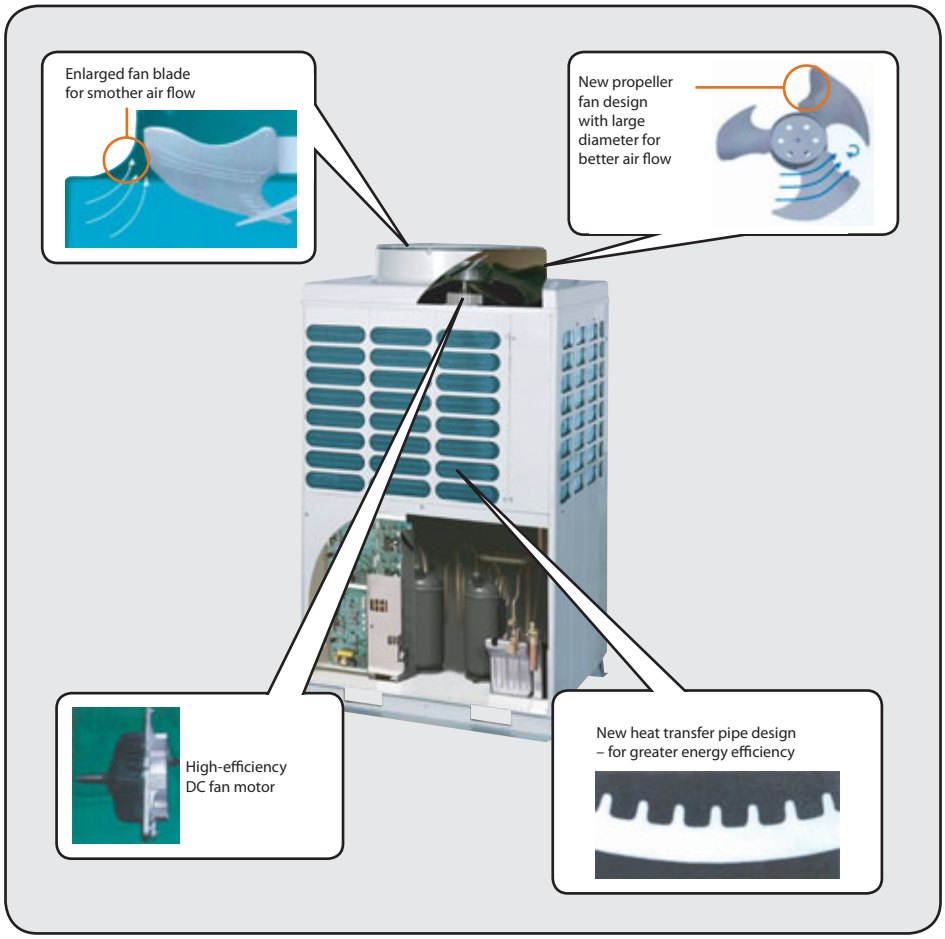
In the unlikely event of one compressor within an outdoor unit failing, it is possible in most circumstances to operate the second compressor on its own simply by setting a switch on the interface PCB. In the case of a complete outdoor unit failure, operation of the system may continue by selecting another outdoor unit to be the master unit. In multiple outdoor unit systems any unit can be selected to be the master.

Start-up using all inverter-driven compressor



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. These studies have eliminated the peak noise levels at start up, normally associated with fixed-speed systems, by using soft start controls. 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 continual 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 regulated. The operating capacity of the outdoor units is matched to meet the overall system requirement.

Wide range of applications

The MiNi-SMMS heat pump is available in three models, 4, 5 and 6 HP, delivering cooling capacities from 12.1 kW to 15.5 kW and heating capacities from 12.5 to 18 kW. One outdoor unit can operate up to nine indoor units.

The SMMS heat pump can incorporate 28 outdoor unit models with 22 cooling capacities from 14 kW to 135 kW and heating capacities from 16 kW to 150 kW, enhancing application flexibility.

Whilst the SHRM, heat recovery system offers a range of 10 outdoor models with capacities from 22.4 kW to 84 kW cooling and 25 kW to 95 kW heating. A very flexible and energy efficient option.

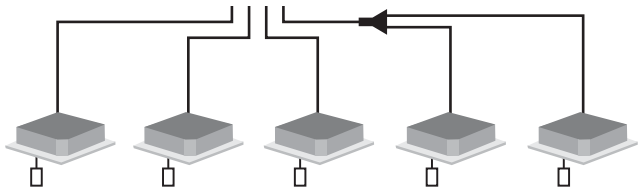
There are 13 different indoor unit models available in 81 sizes ensuring system flexibility.

Complete flexibility

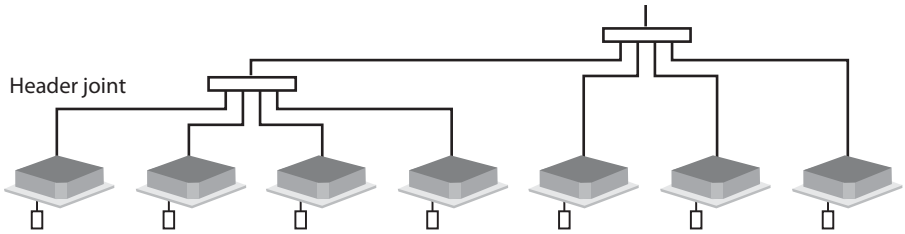
The versatility of VRF Toshiba systems means that virtually any imaginable configuration of the refrigerant y-type branches and/or header piping can be used in an application to give the shortest, most cost-effective piping installation. The piping can be run in any direction to facilitate refurbishment work. In addition, the pipe runs have been extended to offer total flexibility.

The following configurations hold for all VRF range: MiNi-SMMS, SMMS and SHRM

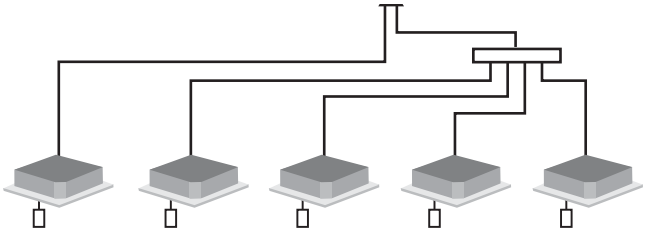
Line branching after header branching - Unique system



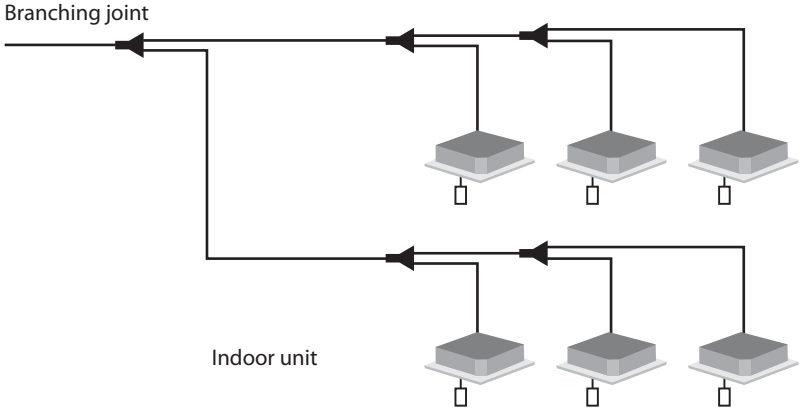
Header branching after header branching - Unique system



Header branching after line branching

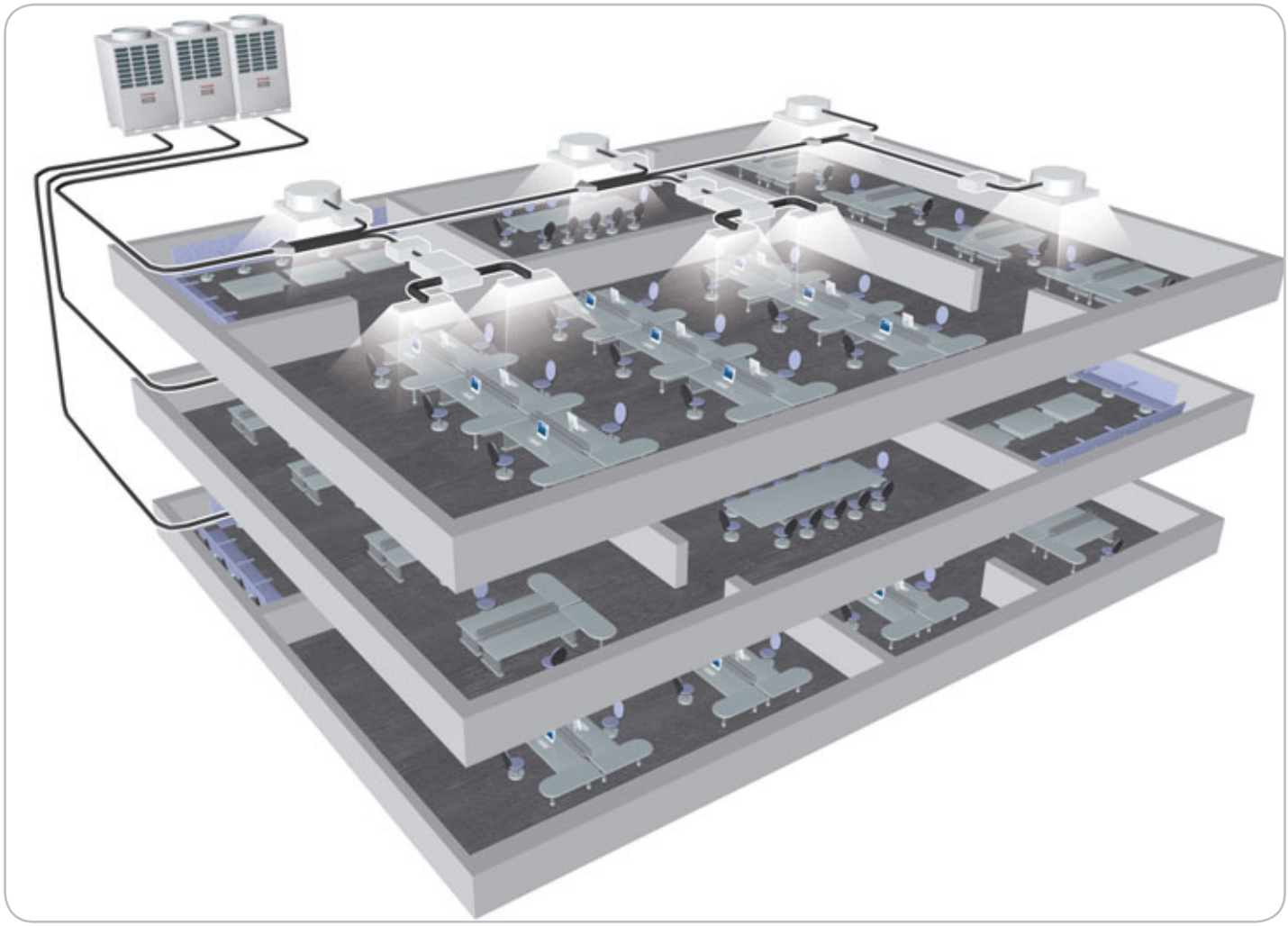


Line branching



VRF.
The freedom of choice

Variable refrigerant flow offer the advantages of direct expansion linked to inverter control and the most sophisticated electronics. This technology has many advantages, from the system design to the installation and operation phase. The wide range of indoor units makes VRF the most flexible choice to satisfy any requirement. The 3 VRF ranges can meet any kind of need: SMMS (Super Modular Multi System) provides cooling or heating, SHRM (Super Heat Recovery Multi) provides simultaneous heating and cooling and MiNi-SMMS, the new compact system provides cooling or heating to smaller commercial or private premises.



Typical applications and advantages

VRF systems offer safety, reliability, comfort, flexibility, ease of installation, durability and energy savings. More and more commercial centres, shopping centres, office towers, hospitals and hotels, all typically requiring the benefit of energy savings, have selected this type of system.

Now, these systems also play an important role in prestigious residential installations, where more than one room needs to be air-conditioned. In addition, direct-expansion indoor units offer many benefits: easy and low-cost installation and precise performance. The range also includes a complete series of heat exchanger ventilation units to supply fresh air for the rooms in a building.

Retail.

With the addition of the MiNi SMMS to the VRF portfolio the flexibility of the Toshiba VRF range ensures the ideal solution for a multitude of commercial buildings. For larger buildings the SHRM and SMMS are ideal, and for smaller premises the MiNi-SMMS. There is a system solution for all commercial buildings, whether large or small, including restaurants, high-street shops, luxury apartments, supermarkets right through to hotels and hospitals.

Offices.

The air-conditioned area can be divided into small or larger individual zones and here too the large choice of indoor units, including cassettes, ducted, floor-mounted and many other unit types always guarantees the perfect solution.

The system is very efficient and unobtrusive, making VRF an excellent investment!

Hotels.

In this type of application up to 48 indoor units can be installed in a single refrigerant circuit, and it is possible to reduce the capacity of one or more indoor units down to the minimum operating limit. This results in considerable energy savings and ensures a faster payback of the investment and optimised comfort.

This system also offers the ideal solution for dual-aspect buildings that require simultaneous heating and cooling, leading to further energy savings and making the systems a reliable choice for many prestigious applications.

Shopping centres.

VRF systems offer maximum flexibility. They can be used for even the smallest commercial rooms. The main features include providing the required cooling or heating capacity and comfort levels, ease of installation, maximum energy efficiency and reliability.

Outdoor units
Panoramic view

High efficiency and reliability

Quiet operation

Small and lightweight

MiNi-SMMS: flexibility and comfort

The Toshiba MiNi-SMMS is a small VRF system suitable for light commercial and residential applications. Great flexibility, power and control combined in a VRF system that is small and compact.

It was designed to bridge the gap between the versatile multi-split systems and the larger capacity of the SMMS. The compact, space-saving system uses R-410A refrigerant and offers all the ground-breaking technology and benefits of the current SMMS.

A solution with precise efficiency and control, as required by smaller offices, shops and private spaces is now available.

Piping connection and operation deliver unbeatable flexibility as only Toshiba know how: joint after header, header after joint, joint after joint and header after header.

Fast and easy to install with simple piping instructions. Automatic system addressing reduces installation hassles. During installation, system addressing can be customised using the wireless remote controller, eliminating the need for manual switch setting.

The MiNi-SMMS can operate up to nine indoor units and is available in three sizes - 4, 5 and 6 HP, with cooling capacities from 12.1 to 15.5 kW and heating capacities from 12.5 to 18.0 kW.

Non-ozone depleting R410A refrigerant

Excellent efficiency (EER and COP)

Compact dimensions

SMMS range: unbeatable performance

With innovative, sophisticated Toshiba technology the SMMS system ensures extraordinary flexibility in any application. The most advanced heat pump system on the market offers a COP of 4.25 in its 22.4 kW size. Units are available with capacities from 14 to 135 kW in cooilng and from 16 to 150 kW in heating, and their exceptional efficiency permits a reduction of up to 50% in annual energy consumption.

SHRM range: heating and cooling

The Toshiba SHRM VRF system introduces important innovations with the possibility to provide simultaneous heating and cooling to different zones or rooms.

They satisfy the most demanding needs and offer superior performances with COPs of 3.97 (8 HP), 3.61 (10 HP) and 3.68 (12 HP).

The compact flow selector enables the system to heat and cool simultaneously and can be used in restricted spaces. The cooling capacity range is from 22.4 to 84 kW and the heating capacity range from 25 to 95 kW. Up to 48 indoor units can be connected to a single system.

COMPACT AND LIGHT-WEIGHT

SUPERIOR EER AND COP

QUIET OPERATION

R-410A

DC twin-roptary compressors

MiNi-SMMS VRF Outdoor unit

Features

The MiNi-SMMS system achieves the best performance in a wide variety of light commercial applications including shops, offices and apartments, where unobtrusive appearance and quiet operation are important advantages. The extraordinary flexibility of this Toshiba system is guaranteed. The outdoor unit is compact and light-weight for fast and easy installation. Available in 4, 5 and 6 HP units delivering cooling capacities from 12.1 to 15.5 kW and heating capacities from 12.5 to 18 kW.

Key features

Best COP (4.61 for 4 HP): represents state-of-art energy saving efficiency.

Wide range: up to 9 indoor units may be connected with a single outdoor unit, from a choice of 13 designs and over 80 sizes.

DC Twin Rotary compressor delivers high efficiency and complete reliability.

Full SMMS indoor and control units available.

The compact design of the outdoor unit (70% smaller overall than standard VRF unit) means it can be easily installed virtually anywhere.

PMV Kit

- The PMV kit is an option for super-silent operation, available for hotel rooms and residential applications where low noise levels are critical.
- Ease of installation
- Integral condensate pump
- Low cost

Technical specifications **heat pump**

Outdoor unit		MCY-MAP0401HT 4 HP	MCY-MAP0501HT 5 HP	MCY-MAP0601HT 6 HP
Cooling capacity	kW	12.1	14.0	15.5
Power input, cooling	kW	2.82	3.47	4.63
EER	W/W	4.29	4.03	3.35
Energy efficiency class, cooling		A	A	A
Running current, cooling	A	13.2	16.1	21.4
Heating capacity	kW	12.5	16.0	18.0
Power input, heating	%	2.71	4.00	4.85
COP	W/W	4.61	4.00	3.71
Energy efficiency class, heating		A	A	A
Running current, heating	A	12.5	18.3	22.2
Peak demand current	A	25	28	31
Air flow	m^3/h – l/s	5820 – 1617	6120 – 1700	6420 – 1783
Sound pressure level, cooling/heating	dB(A)	49/50	50/52	51/53
Operating range - db, cooling	°C	–5 to 43	–5 to 43	–5 to 43
Operating range - wb, heating	°C	–15 to 15.5	–15 to 15.5	–15 to 15.5
Dimensions (H x L x D)	mm	1340 × 900 × 320	1340 × 900 × 320	1340 × 900 × 320
Weight	kg	117	117	117
Compressor type		Hermetic	Hermetic	Hermetic
Refrigerant charge R410A	kg	7.2	7.2	7.2
Pipework				
Suction line type – diameter	in	Flare – 5/8	Flare – 5/8	Brazing – 3/4
Liquid line type – diameter	in	Flare – 3/8	Flare – 3/8	Flare – 3/8
Maximum equivalent length separation*	m	125	125	125
Maximum actual piping separation*	m	100	100	100
Maximum pipe length*	m	180	180	180
Maximum lift (Indoor unit above/below)	m	20/30	20/30	20/30
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50

* When PMV Kit is used: maximum equivalent length separation (80 m); maximum actual piping separation (65 m); maximum pipe length (150 m)

Technical specifications **outdoor units**

Model name		Cooling capacity	Heating capacity	Number of indoor units	Total capacity of connectable indoor units	
				Max.	Min.*	Max.*
MCY-MAP0401HT	4 HP	12.1 kW	12.5 kW	6	3.2 HP	5.2 HP
MCY-MAP0501HT	5 HP	14.0 kW	16.0 kW	8	4.0 HP	6.5 HP
MCY-MAP0601HT	6 HP	15.5 kW	18.0 kW	9	4.8 HP	7.8 HP

Technical specifications **PMV kit**

	Model name	Indoor unit capacity code
	RBM-PMV0901E	0.8 – 1 – 1.25
	RBM-PMV0381E	1.7 – 2 – 2.5

R-410A

SUPER MODULAR MULTI SYSTEM

Dual DC twin-rotary compressors

SMMS VRF Outdoor unit

Features

The 2-pipe VRF Super Modular Multi System (SMMS) operates with R-410A refrigerant and incorporates the latest inverter technology in all outdoor unit models. In addition, the SMMS incorporates twin-inverter compressors in every outdoor unit. The capacities range from 14 to 135 kW in cooling mode and 16 to 150 kW in heating mode with the capability to serve up to 48 indoor units.

Key features

High COP: (4.25 with 22.4 kW size) for reduced energy consumption and increased savings.

Best in class in partial load and precise control based on dual inverter compressors in each unit.

Pipe runs up to 300 m: greater application flexibility.

Advanced compressor Oil Management System: it guarantees improved reliability.

Latest Inverter Technology with the Intelligent Power Drive Unit (IPDU).

TCC Link: state-of-the-art communication bus system with automatically configured addressing.

Protection devices

- Discharge and suction temperature sensors
- Internal overload relay
- Compressor over current relay
- Over-current sensor
- High-pressure switch
- Low-pressure sensors

Technical specifications **heat pump**

Outdoor unit	CO HP	MAP0501T8-E MAP0501HT8-E 5 HP	MAP0601T8-E MAP0601HT8-E 6 HP	MAP0801T8-E MAP0801HT8-E 8 HP	MAP1001T8-E MAP1001HT8-E 10 HP	MAP1201T8-E MAP1201HT8-E 12 HP
Cooling capacity[1]	kW	14	16	22.4	28	33.5
Power input, cooling	%	3.65	4.64	5.67	7.67	11.92
EER	W/W	3.84	3.45	3.95	3.65	2.81
Energy efficiency class, cooling		A	A	A	A	C
Running current, cooling	A	5.85	7.28	8.62	11.55	18.30
Heating capacity[2]	kW	16	18	25	31.5	37.5
Power input, heating	%	3.84	4.56	5.88	7.97	10.19
COP	W/W	4.17	3.95	4.25	3.95	3.68
Energy efficiency class, heating		A	A	A	A	A
Running current, heating	A	6.09	7.08	8.93	11.98	15.65
Peak demand current, heating[3]	A	20	20	30	30	30
Air flow	m^3/h – l/s	9000 – 2520	9000 – 2520	9900 – 2750	10500 – 2917	10500 – 2917
Sound pressure level	dB(A)	55	56	57	58	59
Operating range – db, cooling	°C	–5 to 43	–5 to 43	–5 to 43	–5 to 43	–5 to 43
Operating range – wb[4], heating	°C	–20 to 16	–20 to 16	–20 to 16	–20 to 16	–20 to 16
Dimensions (H x L x D)	mm	1800 × 990 × 750	1800 × 990 × 750	1800 × 990 × 750	1800 × 990 × 750	1800 × 990 × 750
Weight	kg	228	228	258	258	258
Compressor type		Hermetic	Hermetic	Hermetic	Hermetic	Hermetic
Refrigerant charge R410A	kg	8.5	8.5	11.8	11.8	11.8
Pipework						
Suction line type – diameter	in	Flare – 5/8	Brazed – 3/4	Brazed – 7/8	Brazed – 7/8	Brazed –1–1/8
Liquid line type – diameter	in	Flare – 3/8	Flare – 3/8	Flare – 1/2	Flare – 1/2	Flare – 1/2
Discharge line connection type – diameter	in	Flare – 3/8	Flare – 3/8	Flare – 3/8	Flare – 3/8	Flare – 3/8
Maximum equivalent length separation	m	175	175	175	175	175
Maximum actual piping separation	m	150	150	150	150	150
Maximum pipe length	m	300	300	300	300	300
Maximum lift (Indoor unit above/below)[5]	m	40/50	40/50	40/50	40/50	40/50
Power supply	V-ph-Hz	400-3-50	400-3-50	400-3-50	400-3-50	400-3-50

[1] Based on an indoor air temperature of 27 °C db/19 °C wb and an outdoor air temperature of 35 °C db
[2] Based on an indoor air temperature of 20 °C db and an outdoor air temperature of 7 °C db/6 °C wb
[3] If outdoor units are combined, refer to the installation manual
[4] The unit can be operated even if outdoor temperature gets down to –20 °C, however note that the warranty covers only up to –15 °C because operation beyond that temperature is out of specification. When outdoor air temperature falls to under –15 °C, it may cause shortening the product lifetime.
[5] If the height difference between indoor units exceeds 3 m and if the indoor unit is above, max. lift is reduced to 30 m

Technical specifications **outdoor units**

	Model name		Cooling capacity	Heating capacity	Outdoor units in combination	Max. number of indoor units
	MMY-MAP0501HT8-E	5 HP	14 kW	16 kW	1	8
	MMY-MAP0601HT8-E	6 HP	16 kW	18 kW	1	10
	MMY-MAP0801HT8	8 HP	22.4 kW	25 kW	1	13
	MMY-MAP1001HT8-E	10 HP	28 kW	31.5 kW	1	16
	MMY-MAP1201HT8-E	12 HP	33.5 kW	37.5 kW	1	20
	MMY-AP1401HT8-E	14 HP	38.4 kW	43 kW	2 (22.4 kW + 16 kW)	23
	MMY-AP1601HT8-E	16 HP	45 kW	50 kW	2 (22.4 kW + 22.4 kW)	27
	MMY-AP1801HT8-E	18 HP	50.4 kW	56.5 kW	2 (28 kW + 22.4 kW)	30
	MMY-AP2001HT8-E	20 HP	56 kW	63 kW	2 (28 kW + 28 kW)	33
	MMY-AP2201HT8-E	22 HP	61.5 kW	69 kW	3 (22.4 kW + 22.4 kW + 16 kW)	37
	MMY-AP2211HT8-E	22 HP	61.5 kW	69 kW	2 (33.5 kW + 28 kW)	37
	MMY-AP2401HT8-E	24 HP	68 kW	76.5 kW	3 (22.4 kW + 22.4 kW + 22.4 kW)	40
	MMY-AP2411HT8-E	24 HP	68 kW	76.5 kW	2 (33.5 kW + 33.5 kW)	40
	MMY-AP2601HT8-E	26 HP	73 kW	81.5 kW	3 (28 kW + 22.4 kW + 22.4 kW)	43
	MMY-AP2801HT8-E	28 HP	78.5 kW	88 kW	3 (28 kW + 28 kW + 22.4 kW)	47
	MMY-AP3001HT8-E	30 HP	84 kW	95 kW	3 (28 kW + 28 kW + 28 kW)	48
	MMY-AP3201HT8-E	32 HP	90 kW	100 kW	4 (22.4 kW + 22.4 kW + 22.4 kW + 22.4 kW)	48
	MMY-AP3211HT8-E	32 HP	90 kW	100 kW	3 (33.5 kW + 28 kW + 28 kW)	48
	MMY-AP3401HT8-E	34 HP	96 kW	108 kW	4 (28 kW + 22.4 kW + 22.4 kW + 22.4 kW)	48
	MMY-AP3411HT8-E	34 HP	96 kW	108 kW	3 (33.5 kW + 33.5 kW + 28 kW)	48
	MMY-AP3601HT8-E	36 HP	101 kW	113 kW	4 (28 kW + 28 kW + 22.4 kW + 22.4 kW)	48
	MMY-AP3611HT8-E	36 HP	101 kW	113 kW	3 (33.5 kW + 33.5 kW + 33.5 kW)	48
	MMY-AP3801HT8-E	38 HP	106.5 kW	119.5 kW	4 (28 kW + 28 kW + 28 kW + 22.4 kW)	48
	MMY-AP4001HT8-E	40 HP	112 kW	126.5 kW	4 (28 kW + 28 kW + 28 kW + 28 kW)	48
	MMY-AP4201HT8-E	42 HP	118 kW	132 kW	4 (33.5 kW + 28 kW + 28 kW + 28 kW)	48
	MMY-AP4401HT8-E	44 HP	123.5 kW	138 kW	4 (33.5 kW + 33.5 kW + 28 kW + 28 kW)	48
	MMY-AP4601HT8-E	46 HP	130 kW	145 kW	4 (33.5 kW + 33.5 kW + 33.5 kW + 28 kW)	48
	MMY-AP4801HT8-E	48 HP	135 kW	150 kW	4 (33.5 kW + 33.5 kW + 33.5 kW + 33.5 kW)	48

R-410A

SUPER HEAT RECOVERY MULTI SYSTEM

Dual DC Twin Rotary compressors

SHRM VRF Outdoor unit

Features

The three-pipe VRF Super Heat Recovery Multi System (SHRM) delivers simultaneously cooling and heating and has exceptional energy efficiency.

For ease of installation and cost saving the 8 and 10 HP units are modular.

Key features

Unbeatable energy consumption efficiency: the 22.4 kW unit has an exceptional SEER of 6.57 and an average COP of 3.97.

Compact flow selector unit: it automatically adjusts the temperature either by unit or by area.

The highest reliability for back up operation thanks to dual inverter compressors.

Piping branch flexibility: the three-pipe connection allows installation height variation of 35 m (equivalent to a 9-story building).

Wide control applications: Artificial Intelligence network system available and Building Management System (BMS) compatible.

Active Oil Management system: it increases the operation reliability.

Protection devices

- Discharge and suction temperature sensors
- Internal overload relay
- Compressor over-current relay
- Over-current sensor
- High-pressure switch
- Low-pressure sensors

Technical specifications **heat pump**

Outdoor unit		MMY-MAP0802FT8-E	MMY-MAP1002T8-E	MMY-MAP1202T8-E
		8 HP	10 HP	12 HP
Cooling capacity[1]	kW	22.4	28	33.5
Power input, cooling	kW	6.07	8.54	12.9
EER	W/W	3.69	3.18	2.6
Energy efficiency class, cooling		A	B	E
Running current, cooling	A	9.25	13.15	19.85
Heating capacity[2]	kW	25	31.5	35.5
Power input, heating	kW	6.29	8.73	9.65
COP	W/W	3.97	3.61	3.68
Energy efficiency class, heating		A	A	A
Running current, heating	A	9.55	13.4	14.85
Peak demand current[3]	A	30	30	30
Air flow	m^3/h – l/s	9900 – 2750	10500 – 2917	10500 – 2917
Sound pressure level – at 1 m	dB(A)	57	58	59
Operating range – db	°C	–10 to 43	–10 to 43	–10 to 43
Operating range – wb[4]	°C	–20 to 16	–20 to 16	–20 to 16
Dimensions (H x L x D)	mm	1800 × 990 × 750	1800 × 990 × 750	1800 × 990 × 750
Weight	kg	263	263	263
Compressor type		Hermetic	Hermetic	Hermetic
Refrigerant charge R410A	kg	11.5	11.5	11.5
Pipework				
Suction line type – diameter	in	Brazed – 7/8	Brazed – 7/8	Brazed – 1 – 1/8
Liquid line type – diameter	in	Flare – 1/2	Flare – 1/2	Flare – 1/2
Discharge line connection type – diameter	in	Brazed – 3/4	Brazed – 3/4	Brazed – 3/4
Maximum equivalent length separation	m	150	150	150
Maximum actual piping separation	m	125	125	125
Maximum pipe length	m	300	300	300
Maximum lift (Indoor unit above/below)[5]	m	30/50	30/50	30/50
Power supply	V-ph-Hz	400-3-50	400-3-50	400-3-50

[1] Based on an indoor air temperature of 27 °C db/19 °C wb and an outdoor air temperature of 35 °C db
[2] Based on an indoor air temperature of 20 °C db and an outdoor air temperature of 7 °C db/6 °C wb
[3] If outdoor units are combined, refer to the installation manual
[4] The unit can be operated even if outdoor temperature gets down to –20 °C, however note that the warranty covers only up to –15 °C because operation beyond that temperature is out of specification. When outdoor air temperature falls to under –15 °C, it may cause shortening the product lifetime.
[5] If the height difference between indoor units exceeds 3 m and if the indoor unit is above, max. lift is reduced to 30 m

Technical specifications **outdoor units**

	Model name		Cooling capacity	Heating capacity	Outdoor units in combination	Number of indoor units	Total cap. of connectable indoor units	
						Max.	Min.	Max.
	MMY-MAP0802FT8-E	8 HP	22,4 kW	25 kW	1	13	5,6 HP	10,8 HP
	MMY-MAP1002FT8-E	10 HP	28 kW	31,5 kW	1	16	7 HP	13,5 HP
	MMY-MAP1202FT8-E	12 HP	33,5 kW	35,5 kW	1	16	8,4 HP	14,4 HP
	MMY-AP1602FT8-E	16 HP	45 kW	50 kW	2 (22,4 kW + 22,4 kW)	27	11,2 HP	21,6 HP
	MMY-AP1802FT8-E	18 HP	50,4 kW	56,5 kW	2 (22,4 kW + 28 kW)	30	12,6 HP	24,3 HP
	MMY-AP2002FT8-E	20 HP	56 kW	63 kW	2 (28 kW+28 kW)	33	14 HP	27 HP
	MMY-AP2402FT8-E	24 HP	68 kW	76,5 kW	3 (22,4 kW + 22,4 kW + 22,4 kW)	40	16,8 HP	32,4 HP
	MMY-AP2602FT8-E	26 HP	73 kW	81,5 kW	3 (22,4 kW + 22,4 kW + 28 kW)	43	18,2 HP	35,1 HP
	MMY-AP2802FT8-E	28 HP	78,5 kW	88 kW	3 (22,4 kW + 28 kW + 28 kW)	47	19,6 HP	37,8 HP
	MMY-AP3002FT8-E	30 HP	84 kW	95 kW	3 (28 kW + 28 kW + 28kW)	48	21 HP	40,5 HP

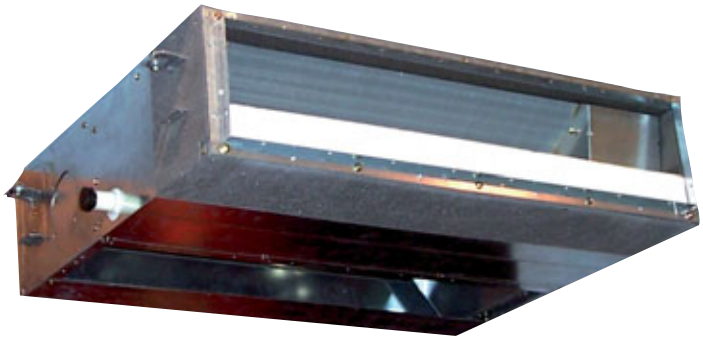
Flow Selector

	Model name	Usage	
	RBM-Y1122FE	Total capacity for indoor unit:	below 11.2 kW
	RBM-Y1802FE	Total capacity for indoor unit:	11.2 to below 18.0 kW
	RBM-Y2802FE	Total capacity for indoor unit:	18.0 to 28.0 kW

Simultaneous cooling and heating from different indoor units to meet all operating environments

Indoor Units

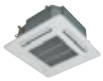
Panoramic view



Complete range of indoor units

The large choice of indoor unit models and sizes compatible with the VRF range ensures the ideal solution for any application requirement. The performances of all units are maximised: low sound levels, optimised air flows and the extremely compact design that reduces installation time and costs. Moreover, the recent additions to the range, the compact high-wall and the slim duct units, reaffirm Toshiba's commitment to create the perfect climate and well-being for business users. Toshiba provides the ideal climate and comfort levels, ensuring a healthy environment, high technology, maximised efficiency and modern design.

Technical specifications **heat pump**

Model Type	Model name	MiNi-SMMS	SMMS and SHRM	Capacity code	Cooling cap. (kW)	Heating cap. (kW)	Height (mm)	Length (mm)	Depth (mm)	Weight (kg)
Four-way cassette 	MMU-AP0091H	●	●	1	2.8	3.2	256	840	840	20
	MMU-AP0121H	●	●	1.25	3.6	4				
	MMU-AP0151H	●	●	1.7	4.5	5				22
	MMU-AP0181H	●	●	2	5.6	6.3				
	MMU-AP0241H	●	●	2.5	7.1	8				23
	MMU-AP0271H	●	●	3	8	9				
	MMU-AP0301H	●	●	3.2	9	10				
	MMU-AP0361H	●	●	4	11.2	12.5	319	840	840	28
	MMU-AP0481H	●	●	5	14	16				
	MMU-AP0561H		●	6	16	18				
Compact four-way cassette 	MMU-AP0071MH	●	●	0.8	2.2	2.5	268	575	575	17
	MMU-AP0091MH	●	●	1	2.8	3.2				
	MMU-AP0121MH	●	●	1.25	3.6	4				
	MMU-AP0151MH	●	●	1.7	4.5	5				
	MMU-AP0181MH	●	●	2	5.6	6.3				
Two-way cassette 	MMU-AP0071WH	●	●	0.8	2.2	2.5	398	830	550	33
	MMU-AP0091WH	●	●	1	2.8	3.2				
	MMU-AP0121WH	●	●	1.25	3.6	4				
	MMU-AP0151WH	●	●	1.7	4.5	5		1350		44
	MMU-AP0181WH	●	●	2	5.6	6.3				
	MMU-AP0241WH	●	●	2.5	7.1	8				48
	MMU-AP0271WH	●	●	3	8	9				
	MMU-AP0301WH	●	●	3.2	9	10				
One-way cassette 	MMU-AP0071YH	●	●	0.8	2.2	2.5	235	850	400	22
	MMU-AP0091YH	●	●	1	2.8	3.2				
	MMU-AP0121YH	●	●	1.25	3.6	4				
	MMU-AP0152SH	●	●	1.7	4.5	5	200	1000	710	21
	MMU-AP0182SH	●	●	2	5.6	6.3				22
	MMU-AP0242SH	●	●	2.5	7.1	8				
Concealed duct, standard type 	MMD-AP0071BH	●	●	0.8	2.2	2.5	320	550	800	27
	MMD-AP0091BH	●	●	1	2.8	3.2				
	MMD-AP0121BH	●	●	1.25	3.6	4				
	MMD-AP0151BH	●	●	1.7	4.5	5		700		30
	MMD-AP0181BH	●	●	2	5.6	6.3				
	MMD-AP0241BH	●	●	2.5	7.1	8		1000		39
	MMD-AP0271BH	●	●	3	8	9				
	MMD-AP0301SH	●	●	3.2	9	10				
	MMD-AP0361BH	●	●	4	11.2	12.5		1350		51
	MMD-AP0481BH	●	●	5	14	16				
	MMD-AP0561BH		●	6	16	18				
Concealed duct, high static pressure 	MMD-AP0181H	●	●	2	5.6	6.3	380	850	660	50
	MMD-AP0241H	●	●	2.5	7.1	8				52
	MMD-AP0271H	●	●	3	8	9				
	MMD-AP0361H	●	●	4	11.2	12.5				56
	MMD-AP0481H	●	●	5	14	16		1200		67
	MMD-AP0721H		●	8	22.4	25	470	1380	1250	155
	MMD-AP0961H		●	10	28	31.5				
Slim Duct 	MMD-AP0071SPH	●	●	0.8	2.2	2.5	210	845	645	22
	MMD-AP0091SPH	●	●	1	2.8	3.2				
	MMD-AP0121SPH	●	●	1.25	3.6	4				23
	MMD-AP0151SPH	●	●	1.7	4.5	5				
	MMD-AP0181SPH	●	●	2	5.6	6.3				
Ceiling-suspended 	MMC-AP0151H	●	●	1.7	4.5	5	210	910	680	21
	MMC-AP0181H	●	●	2	5.6	6.3				
	MMC-AP0241H	●	●	2.5	7.1	8		1180		25
	MMC-AP0271H	●	●	3	8	9				
	MMC-AP0361H	●	●	4	11.2	12.5		1595		33
	MMC-AP0481H	●	●	5	14	16				
High-wall 	MMK-AP0072H	●	●	0.8	2.2	2.5	275	790	208	11
	MMK-AP0092H	●	●	1	2.8	3.2				
	MMK-AP0122H	●	●	1.25	3.6	4				
High-wall 	MMK-AP0151H	●	●	1.7	4.5	5.0	368	1055	210	19
	MMK-AP0181H	●	●	2	5.6	6.3				
	MMK-AP0241H	●	●	2.5	7.1	8.0		1430		25
Floor standing cabinet type 	MML-AP0071H	●	●	0.8	2.2	2.5	630	950	230	37
	MML-AP0091H	●	●	1	2.8	3.2				
	MML-AP0121H	●	●	1.25	3.6	4				
	MML-AP0151H	●	●	1.7	4.5	5				
	MML-AP0181H	●	●	2	5.6	6.3				
	MML-AP0241H	●	●	2.5	7.1	8				40
Floor standing concealed type 	MML-AP0071BH	●	●	0.8	2.2	2.5	600	745	220	21
	MML-AP0091BH	●	●	1	2.8	3.2				
	MML-AP0121BH	●	●	1.25	3.6	4				
	MML-AP0151BH	●	●	1.7	4.5	5		1045		29
	MML-AP0181BH	●	●	2	5.6	6.3				
	MML-AP0241BH	●	●	2.5	7.1	8				
Tall floor-standing	MMF-AP0151H	●	●	1.7	4.5	5	1750	600	210	48
	MMF-AP0181H	●	●	2	5.6	6.3				
	MMF-AP0241H	●	●	2.5	7.1	8				49
	MMF-AP0271H	●	●	3	8	9				
	MMF-AP0361H	●	●	4	11.2	12.5			390	65
	MMF-AP0481H	●	●	5	14	16				
	MMF-AP0561H		●	6	16	18				
Fresh air intake 	MMD-AP0481HFE		SMMS	5	14	12	380	660	1200	67
	MMD-AP0721HFE		SMMS	8	22.4	18.7	470	1380	1250	150
	MMD-AP0961HFE		SMMS	10	28	23.3				

MMU-AP(...)MH

Compact four-way cassette

Features

The compact four-way cassette has been designed to suit all the standard 600 × 600 mm grid ceilings, to allow simple and easy installation and maintenance. Its sophisticated design fits with any room interior, where design is as important as the functionality. Draught prevention and clean ceiling functions make this unit ideal for the most demanding application.

Key features

Slim-line dimensions make this cassette suitable for the most demanding installation, where ceiling restrictions apply.

All the capacity sizes have the same physical dimensions so the installation looks much smarter and consistent.

Easy maintenance: access to the corner pockets is easy and enables convenient installation and adjustment for perfect ceiling fitting.

The depth of the panel is less than 30 mm making the unit unobtrusive in any condition.

Technical specifications **heat pump**

Indoor unit	MMU-	AP0071MH	AP0091MH	AP0121MH	AP0151MH	AP0181MH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3
Power consumption	kW	0.034	0.036	0.038	0.041	0.052
Running current	A	0.28	0.30	0.31	0.34	0.42
Starting current	A	0.49	0.52	0.54	0.59	0.73

Indoor unit	MMU-	AP0071MH	AP0091MH	AP0121MH	AP0151MH	AP0181MH
Air flow (h/l)	m^3/h	552/378	570/378	594/402	660/468	762/522
Air flow (h/l)	l/s	153/105	158/105	165/117	183/130	212/145
Sound pressure level (h/l)	dB(A)	36/28	37/28	37/29	40/30	44/34
Dimensions (H x L x D)	mm	268 × 575 × 575				
Weight	kg	17				
Panel dimensions (H x L x D)	mm	27 × 700 × 700				
Panel weight	kg	3				
Connecting pipe, gas	in	3/8	3/8	3/8	5/8	5/8
Connecting pipe, liquid	in	1/4	1/4	1/4	3/8	3/8
Drain port diameter	mm	25	25	25	25	25
Power supply	V-ph-Hz	220/240-1-50				

MMU-AP(...)H

Four-way cassette

Features

This four-way cassette includes Toshiba state-of-the-art technology. With the industry's most advanced high-lift drain pipe provided as standard, it offers the ideal solution for small commercial applications where space is limited. Unobtrusive and flexible, this unit blends in with any room interior décor and is ideal for both new and refurbishment projects.

Key features

Clean Ceiling: the innovative air flow control and the new panel design prevent dust from accumulating around the air outlet of the ceiling.

Clean unit: both the louvre and the grille are easily removed and washed.

Flexible installation: ideal for sites with limited space above the ceiling, the unit features a high-lift drain pipe (850 mm).

Easy maintenance: Corner pockets in all four panel corners allow convenient access to the adjustment controls behind the panel.

Simplified multi-drop wiring connections.

Technical specifications **heat pump**

Indoor unit	MMU-	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H	AP0271H	AP0301H	AP0361H	AP0481H	AP0561H
Cooling capacity	kW	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0	16.0
Heating capacity	kW	3.2	4.0	5.0	6.3	8.0	9.0	10.0	12.5	16.0	18.0
Power consumption	kW	0.02		0.022	0.026	0.032		0.048	0.07	0.11	0.112
Running current	A	0.17		0.19	0.21	0.24		0.35	0.59	0.81	0.83
Starting current	A	0.30		0.33	0.36	0.42		0.59	0.87	1.23	1.26

Indoor unit	MMU-	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H	AP0271H	AP0301H	AP0361H	AP0481H	AP0561H
Air flow (h/l)	m^3/h	800/680		930/780	1050/800	1200/820		1320/850	1680/1070	2040/1130	2090/1230
Air flow (h/l)	l/s	222/189		258/217	292/222	333/278		367/236	467/297	567/314	580/342
Sound pressure level (h/l)	dB(A)	30/27		31/27	32/28	34/28		37/30	40/33	44/34	45/34
Dimensions (H x L x D)	mm	256 × 840 × 840		256 × 840 × 840		256 × 840 × 840			319 × 840 × 840		
Weight	kg	20		22		23			28		
Panel dimensions (H x L x D)	mm	35 × 950 × 950		35 × 950 × 950		35 × 950 × 950			35 × 950 × 950		
Panel weight	kg	4.5		4.5		4.5			4.5		
Air filter		Standard filter fitted (long-life filter)									
Connecting pipe											
Gas	in	3/8		1/2		5/8			5/8		
Liquid	in	1/4		1/4		3/8			3/8		
Drain port diameter	mm	25		25		25			25		
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50			220/240-1-50		

MMU-AP(...)WH

Two-way cassette

Features

With its very compact size, this two-way cassette is the best solution for small rooms. Slim and easy to install, it fits discreetly into any room interior. In addition, thanks to its silent operation, this model creates a very pleasant, quiet and comfortable environment.

Key features

Slim design, with an 8 mm high ceiling panel.

Low noise level: it operates at only 30 dB(A) (sizes 2.2 to 5.6 kW).

Unique Air flow control: the air current is balanced between two directions, for maximum comfort.

Flexible installation: the condensate drain pump raises drain piping up to 500 mm.

Enhanced Indoor Air Quality:
Standard long-life filters.
Fresh air intake: ensures constant air renewal.

Technical specifications **heat pump**

Indoor unit	MMU-	AP0071WH	AP0091WH	AP0121WH	AP0151WH	AP0181WH	AP0241WH	AP0271WH	AP0301WH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3	8.0	9.0	10.0
Power consumption	kW	0.070			0.072		0.105		0.106
Running current	A	0.31			0.32		0.46		0.47
Starting current	A	0.47			0.60		0.89		0.98

Indoor unit	MMU-	AP0071WH	AP0091WH	AP0121WH	AP0151WH	AP0181WH	AP0241WH	AP0271WH	AP0301WH
Air flow (h/l)	m^3/h	570/450			780/600		1140/720		1260/960
Air flow (h/l)	l/s	158/125			217/167		317/200		350/267
Sound pressure level (h/l)	dB(A)	34/30			35/30		38/33		40/34
Dimensions (H x L x D)	mm	398 × 830 × 550			398 × 1350 × 550		398 × 1350 × 550		
Weight	kg	33			44		48		
Panel dimensions (H x L x D)	mm	8 × 1000 × 650			8 × 1520 × 650		8 × 1520 × 650		
Panel weight	kg	8			11		11		
Air filter		Standard filter fitted (long-life filter)							
Connecting pipe									
Gas	in	3/8			1/2		5/8		
Liquid	in	1/4			1/4		3/8		
Drain port diameter	mm	25			25		25		
Power supply	V-ph-Hz	220/240-1-50			220/240-1-50		220/240-1-50		

One-way cassette

MMU-AP(...)YH/SH

Features

Toshiba's innovative slim-line 1-way cassette is simple to install and is suitable for small areas, such as hotels or offices guestrooms and reception rooms.

Key features

Compact hi-tech design: 235 × 850 × 400 mm (sizes 2.2 to 3.6).

Flexible installation: ideal for sites where above ceiling space is limited, the unit features a high-lift drain pipe (350 mm).

Low noise level: it operates at only 34 dB(A) (sizes 2.2 to 3.6).

Technical specifications **heat pump**

Indoor unit	MMU-	AP0071YH	AP0091YH	AP0121YH	AP0152SH	AP0182SH	AP0242SH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating capacity	kW	2.5	3.2	4	5	6.3	8
Power consumption	kW	0.053			0.042	0.046	0.075
Running current	A	0.24			0.34	0.37	0.62
Starting current	A	0.6			0.51	0.52	0.53

Indoor unit	MMU-	AP0071YH	AP0091YH	AP0121YH	AP0152SH	AP0182SH	AP0242SH
Air flow (h/l)	m^3/h	540/420			750/630	780/660	1140/810
Air flow (h/l)	l/s	150/117			208/175	216/183	317/225
Sound pressure level (h/l)	dB(A)	42/34			37/32	38/34	45/37
Dimensions (H x L x D)	mm	235 × 850 × 400			20 × 1230 × 800		
Weight	kg	22			21	21	22
Panel dimensions (H x L x D)	mm	18 × 1050 × 470			20 × 1230 × 800		
Panel weight	kg	3.5			5.5		
Air filter		Standard filter fitted (long-life filter)					
Connecting pipe							
Gas	in	3/8			1/2		5/8
Liquid	in	1/4			1/4		3/8
Drain port diameter	mm	25			25		25
Power supply	V-ph-Hz	220/240-1-50			220/240-1-50		220/240-1-50

MMD-AP(...)BH

Standard ducted unit

Features

The discreet standard ducted unit can easily be installed in ceiling voids or false ceilings, and operates very quietly. Whatever the shape of the room, this flexible model ensures a uniform temperature and air distribution, and enhances the Indoor Air Quality for optimum user comfort.

Key features

Space-saving design: only 320 mm in height.

Low noise level: at low fan speed, it operates at only 26 dB(A).

Flexible installation: ideal for sites with restriction on the space above ceiling level, the unit features a high-lift drain pipe (270 mm).

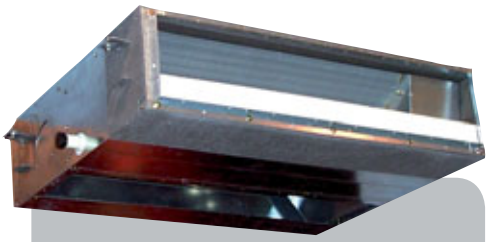
Uniform air distribution.

Enhanced Indoor Air Quality:
Wide range of filters.
Fresh air intake: ensures a constant air renewal.

Technical specifications **heat pump**

Indoor unit	MMD-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH	AP0271BH	AP0301SH	AP0361BH	AP0481BH	AP0561BH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0	16.0
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3	8.0	9.0	10.0	12.5	16.0	18.0
Power consumption	kW	0.033		0.039		0.050	0.060		0.071	0.107	0.128	
Running current	A	0.29		0.34		0.43	0.52		0.61	0.83	0.98	
Starting current	A	0.50		0.59		0.75	0.9		1.05	1.44	1.7	

Indoor unit	MMD-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH	AP0271BH	AP0301SH	AP0361BH	AP0481BH	AP0561BH
Air flow (h/l)	m^3/h	480/340		570/400	650/480	780/540	1140/870		1260/870	1620/1200	1980/1490	
Air flow (h/l)	l/s	133/94		158/111	180/133	217/150	317/242		350/242	450/333	550/414	
Sound pressure level (h/l)	dB(A)	30/26		31/27	31/27	32/28	33/29		34/29	36/32	38/32	
Dimensions (H x L x D)	mm	320 × 550 × 800			320 × 700 × 800		320 × 1000 × 800			320 × 1350 × 800		
Weight	kg	28			32		43			55		
Panel dimensions (H x L x D)	mm	9 × 630 × 500			9 × 780 × 500		9 × 1080 × 500			9 × 1430 × 500		
Panel weight	kg	3.5			4		6			7		
External static pressure	Pa	40 (max 100)										
Connecting pipe, gas	in	3/8			1/2		5/8			5/8		
Connecting pipe, liquid	in	1/4			1/4		3/8			3/8		
Drain port diameter	mm	25			25		25			25		
Power supply	V-ph-Hz	220/240-1-50			220/240-1-50		220/240-1-50			220/240-1-50		



MMD-AP(...)SPH

Slim duct

Features

Whether installed in a ceiling void or in a false ceiling, Toshiba new slim-duct offers the ultimate technology, with exceptional energy savings, high performance and easy installation. This ultra flexible, invisible and silent unit creates a pleasant and comfortable environment for a wide range of applications, such as hotels, offices, shops, etc.

Key features

Very slim design: only 210 mm in height, for easier and more flexible installation.

Very low noise level: it can operate at only 24 dB(A).

Flexible installation: ideal for sites with restriction on the space above ceiling level, the unit features a high-lift drain pipe (850 mm).

Perfect comfort throughout the room: can be used with any kind of air diffuser.

Unobtrusive: concealed installation within a ceiling void.

Technical specifications **heat pump**

Indoor unit	MMD-	AP0071SPH	AP0091SPH	AP0121SPH	AP0151SPH	AP0181SPH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3
Power consumption	kW	0.039	0.039	0.043	0.045	0.054
Running current	A	0.3	0.30	0.31	0.32	0.39
Starting current	A	0.51	0.51	0.54	0.56	0.68

Indoor unit	MMD-	AP0071SPH	AP0091SPH	AP0121SPH	AP0151SPH	AP0181SPH
Air Flow (h/l)	m^3/h	540/400		600/450	690/520	780/580
Air Flow (h/l)	l/s	150/111		167/125	192/144	217/161
Sound pressure level, rear suction (h/l)	dB(A)	28/24		29/25	32/28	33/29
Sound pressure level, bottom suction (h/l)	dB(A)	36/30		38/32	39/33	40/36
Dimensions (H x L x D)	mm	210 × 845 × 645			210 × 845 × 645	
Weight	kg	22			23	
External static pressure	Pa	4 steps: 10 – 20 – 35 – 50				
Connecting pipe, gas	in	3/8			1/2	
Connecting pipe, liquid	in	1/4				
Drain port diameter	mm	25				
Power supply	V-ph-Hz	220/240-1-50				

MMD-AP(...)H

High static pressure ducted unit

Features

This is Toshiba's most powerful ducted unit delivering air flows up to 1400 l/s (5040 m^3/h). Unobtrusive, flexible and compact, it can be installed easily and discretely in any interior. This model is the ideal solution for both new and restored buildings.

Key features

Easy installation.

Inspection hole enables easy access and maintenance.

Wide range of options available: vaporizing humidifiers, long-life filters, etc.

Static pressure can be set to 3 levels (68,6, 137 and 196 Pa).

Technical specifications **heat pump**

Indoor unit	MMD-	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0721H	AP0961H
Cooling capacity	kW	5.6	7.1	8.0	11.2	14.0	22.4	28.0
Heating capacity	kW	6.3	8.0	9.0	12.5	16.0	25.0	31.5
Power consumption	kW	0.184	0.299		0.368	0.414	1.200	1.260
Running current	A	0.81	1.35		1.63	1.84	5.25	5.52
Starting current	A	1.3	3.5		4.1	4.8	13.6	14.8

Indoor unit	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0721H	AP0961H
Air flow (h/l)	1080/720	1580/1060		1920/1280	2520/1680	4320/2880	5040/3360
Air flow (h/l)	300/200	439/295		533/355	700/467	1200/800	1400/933
Sound pressure level (h/l)	37	40				49	50
Dimensions (H x L x D)	380 × 850 × 660				380 × 1200 × 660	470 × 1380 × 1250	
Weight	50	52		56	67	150	
Air filter	Option or field supply						
External static pressure	3 steps: 68.6 – 137 – 196 (137Pa factory setting)						
Connecting pipe							
Gas	1/2	5/8			5/8	7/8	
Liquid	1/4	3/8			3/8	1/2	
Drain port diameter	25	25			25	25	
Power supply	220/240-1-50	220/240-1-50			220/240-1-50	220/240-1-50	

Ceiling-suspended unit

MMC-AP(...)H

Features

The installation of this ceiling-suspended unit is very easy. It creates a very pleasant and relaxing environment, diffusing rapidly and uniformly the required temperature, in cooling and heating modes. This model is the best solution for ceilings that do not have voids. It can be used for a wide range of applications, but is particularly recommended for refurbishment projects.

Key features

Easy and fast installation: simplified unit suspension.

Space-saving unit: Ideal for sites where above ceiling space is limited. the unit features a high-lift drain pipe (600 mm).

Optimum louvre control: air flow angle is automatically set to the most suitable setting according to your cooling or heating needs, and an automatic swing mode enables air flow to reach all areas in the room.

Piping flexibility:
Refrigerant piping: 3 possibilities (top, rear or right side of the unit).Drain piping: 2 possibilities.

Technical specifications **heat pump**

Indoor unit	MMC-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H
Cooling capacity	kW	4,5	5,6	7,1	8,0	11,2	14,0
Heating capacity	kW	5,0	6,3	8,0	9,0	12,5	16,0
Power consumption	kW	0,033	0,038	0,050		0,091	0,110
Running current	A	0,29	0,32	0,42		0,78	0,84
Starting current	A	0,43	0,48	0,62		1,17	1,25

Indoor unit	MMC-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H
Air flow (h/l)	m^3/h	720/540	780/540	1110/840		1650/1200	1800/1320
Air flow (h/l)	l/s	200/150	217/150	308/233		458/333	500/367
Sound pressure level (h/l)	dB(A)	35/30	36/30	38/33		41/35	43/37
Dimensions (H x L x D)	mm	210 × 910 × 680		210 × 1180 × 680		210 × 1595 × 680	
Weight	kg	22		26		34	
Air filter		Standard filter fitted (long-life filter)					
Connecting pipe							
Gas	in	1/2		5/8		5/8	
Liquid	in	1/4		3/8		3/8	
Drain port diameter	mm	20		20		20	
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50	

MMK-AP(...)H

Compact high-wall

Features

This compact high-wall is perfect for rooms with limited floor space, such as offices, small shops or hotel rooms. The unit is compact (only 275 × 790 × 208 mm) and light-weight (11 kg). This high-wall also achieves outstanding sound level performances.

Key features

New compact and modern design: Only 45 litres volume, the best in its class.
New rounded shape and grille, for a more attractive design.

Light unit: 11 kg – reduced by 40% less than average equivalent units compared to the previous model.

Clean unit: the panel is easily detachable for fast grille and filters cleaning.

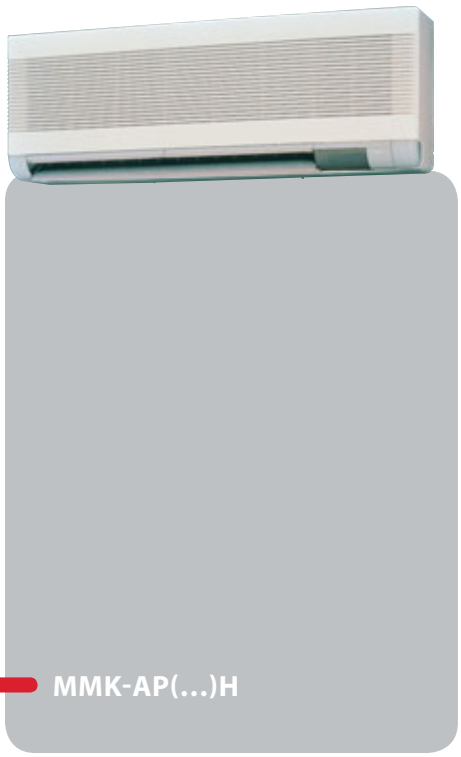
Low noise level: it operates at only 29 dB(A).

Auto-swing mechanism.

Technical specifications **heat pump**

Indoor unit	MMK-	AP0072H	AP0092H	AP0122H
Cooling capacity	kW	2.2	2.8	3.6
Heating capacity	kW	2.5	3.2	4
Power consumption	kW	0.017	0.018	0.019
Running current	A	0.17	0.18	0.19
Starting current	A	0.22	0.23	0.24

Indoor unit	MMK-	AP0072H	AP0092H	AP0122H
Air flow (h/l)	m^3/h	480/360	510/360	540/360
Air flow (h/l)	l/s	133/100	142/100	150/100
Sound pressure level (h/l)	dB(A)	35/29	36/29	37/29
Dimensions (H x L x D)	mm	275 × 790 × 208	275 × 790 × 208	275 × 790 × 208
Weight	kg	11	11	11
Connecting pipe, gas	in	3/8	3/8	3/8
Connecting pipe, liquid	in	1/4	1/4	1/4
Drain port diameter	mm	16	16	16
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50



MMK-AP(...)H

High-wall unit

Features

This classic high-wall is elegant and slim; it can easily blend in with any room interior. Total comfort is granted, thanks also to the 70° directional auto-swing louver that provide uniform air distribution.

Key features

Aesthetic and compact design:
Elegant design.
Slim: only 210 mm, for an easy and discreet installation.

Easy installation, with its auxiliary piping.

Piping flexibility:
Refrigerant piping: 3 possibilities (top, rear or right side of the unit).

Top for comfort: 70° directional auto-swing louver for optimum air distribution.

Technical specifications **heat pump**

Indoor unit	MMK-	AP0151H	AP0181H	AP0241H
Cooling capacity	kW	4.5	5.6	7.1
Heating capacity	kW	5.0	6.3	8.0
Power consumption	kW	0.037		0.040
Running current	A	0.32		0.35
Starting current	A	0.42		0.47

Indoor unit	MMK-	AP0151H	AP0181H	AP0241H
Air flow (h/l)	m^3/h	780/600		1200/900
Air flow (h/l)	l/s	217/167		333/250
Sound pressure level (h/l)	dB(A)	42/35		42/35
Dimensions (H x L x D)	mm	368 × 1055 × 210		368 × 1430 × 210
Weight	kg	19		25
Air filter		Standard filter fitted (long-life filter)		
Connecting pipe				
Gas	in	1/2		5/8
Liquid	in	1/4		3/8
Drain port diameter	mm	20		20
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50

MMI-AP(...)H

Floor-mounted console

Features

Ideal for refurbishment projects or small spaces.
Installed at floor level, this unit is compact and offers a wide choice of installation and user settings, including reverse air distribution.

Key features

Optimum piping flexibility: Refrigerant piping: four possibilities (top, rear, left or right side of the unit). Drain piping: four possibilities (top, rear, left or right side of the unit).

Top for comfort: Air distribution can be easily reversed to meet the occupant's preference.

Wide choice of installation settings.

Compact unit: 630 × 950 × 230 mm, for more flexible installations and space savings.

Technical specifications **heat pump**

Indoor unit	MML-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3	8.0
Power consumption	kW	0.056		0.092		0.102	
Running current	A	0.26		0.43		0.47	
Starting current	A	0.6		0.8		1.1	

Indoor unit	MML-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Air flow (h/l)	m^3/h	480/360		900/650		1080/780	
Air flow (h/l)	l/s	133/100		250/181		300/217	
Sound pressure level (h/l)	dB(A)	39/35		45/38		49/39	
Dimensions (H x L x D)	mm	630 × 950 × 230					
Weight	kg	37				40	
Connecting pipe, gas	in	3/8			1/2		5/8
Connecting pipe, liquid	in	1/4			1/4		3/8
Drain port diameter	mm	20					
Power supply	V-ph-Hz	220/240-1-50			220/240-1-50		

MML-AP(...)BH

Concealed chassis unit

Features

This chassis is compact and slim, it's very easy to install and to conceal behind a decorative panel to blend with any room interior. Ideal for office and other commercial buildings with large fluctuation in load, the unit fits perfectly specialist applications such as libraries and hospitals.

Key features

Very compact design:
Height: only 600 mm, ideal for perimeters walls.
Depth: 200 mm, the unit can be installed along the wall ensuring space saving.

Low noise level: it operates at only 32 dB(A).

Easy maintenance:
Removable split front panel.
Easy access to the drain pan on the right side of the unit.

Technical specifications **heat pump**

Indoor unit	MML-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH
Cooling capacity	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating capacity	kW	2.5	3.2	4.0	5.0	6.3	8.0
Power consumption	kW	0.056			0.090		0.095
Running current	A	0.25			0.45		0.46
Starting current	A	0.6			0.8		1.0

Indoor unit	MML-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH
Air flow (h/l)	m^3/h	460/300			740/490		950/640
Air flow (h/l)	l/s	128/83			206/136		264/178
Sound pressure level (h/l)	dB(A)	36/32					42/33
Dimensions (H x L x D)	mm	600 × 745 × 220			600 × 1045 × 220		
Weight	kg	21			29		
Connecting pipe, gas	in	3/8			1/2		5/8
Connecting pipe, liquid	in	1/4			1/4		3/8
Drain port diameter	mm	20			20	20	20
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50	

MMF-AP(...)H

Floor standing

Features

This system is particularly suitable to air condition large rooms with low ceilings such as restaurants or lofts. The units offer high air flow rates and superior air throw values. Their wide air distribution angle permits air conditioning of larger rooms.

Key features

Reduced footprint
Two sizes, 0.128 m^2 up to 8 kW and 0.243 m^2 up to 16 kW.

High air flows
From 180 l/s to 600 l/s (660 m^3/h to 2160 m^3/h).

Wide air distribution angle
Up to 150°.

Large capacity range
Cooling capacities from 4.5 kW to 16 kW and heating capacities from 5 kW to 18 kW.

Technical specifications **heat pump**

Indoor unit	MMF-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0561H
Cooling capacity	kW	4.5	5.6	7.1	8.0	11.2	14.0	16.0
Heating capacity	kW	5	6.3	8.0	9.0	12.5	16.0	18.0
Power consumption	kW	0.15		0.19		0.28	0.35	
Running current	A	0.67		0.88		1.29	1.60	
Starting current	A	0.9		1.1		1.7	2.1	

Indoor unit	MMF-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0561H
Air flow (h/l)	m^3/h	900/660		1200/840		1920/1380	2160/1560	
Air flow (h/l)	l/s	250/183		333/233		533/105	600/433	
Sound pressure level (h/l)	dB(A)	46/38		49/40		51/44	54/46	
Dimensions (H x L x D)	mm	1750 × 600 × 210		1750 × 600 × 210		1750 × 600 × 390		
Weight	kg	48		49		65		
Air filter		Standard filter fitted (long-life filter)						
Connecting pipe								
Gas	in	1/2	5/8			5/8		
Liquid	in	1/4	3/8			3/8		
Drain port diameter	mm	20	20			20		
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50			220/240-1-50		

MMD-AP(...)HFE

New fresh air intake

Features

This new unit offers the possibility to introduce into the building external fresh air and to control air discharge temperature. It is the ideal solution for schools, hospitals and offices, together with other buildings that require fresh air ventilation.

Fresh air intake units are for Toshiba's SMMS VRF systems of 18 HP or more.

Key features

Pre-heat, pre-cool functions

Compact dimensions.

TCC-Link control connection.

Humidity control option.

Technical specifications **heat pump**

Indoor unit	MMD	AP0481HFE	AP0721HFE	AP0961HFE
Cooling capacity	kW	14,0	22,4	28,0
Heating capacity	kW	8,9	13,9	17,4
Power consumption	kW	0,28	0,45	0,52
Power factor	%	85	78	83
Running current	A	1,43	2,52	2,73
Starting current	A	3,5	7,0	7,0
Air flow (h/l)	m^3/h (l/s)	1188/756 (330/210)	1848/1176 (513/327)	2310/1470 (642/408)
Sound level (h/m/l)	dB(A)	41/43/45	44/45/46	44/45/46
Dimensions (H x L x D)	mm	492 × 892 × 1262	492 × 1392 × 1262	492 × 1392 × 1262
Weight	kg	93	144	144
Air filter		Option or field supply		
External static pressure (h/m/l)	Pa	230/210/170	180/165/140	205/190/160
Connecting pipe, gas - iquid	in	5/8 - 3/8	7/8 - 1/2	7/8 - 1/2
Drain port diameter	in	1	1	1
Operating range, cooling/heating	°C	5 to 43/–5 to 43	5 to 43/–5 to 43	5 to 43/–5 to 43
Power supply	V-ph-Hz	220/240-1-50		

Controls

Technology is nothing without control

An innovative and complete range of integrated controls for application in the Toshiba VRF MiNi-SMMS, SMMS, SHRM systems ensures maximum comfort and excellent performance by perfectly matching the different control requirements. The range is composed of three control types: local, central and network controls.

Compact design and minimised installation space

Simplified display using icons

Automatic network addressing

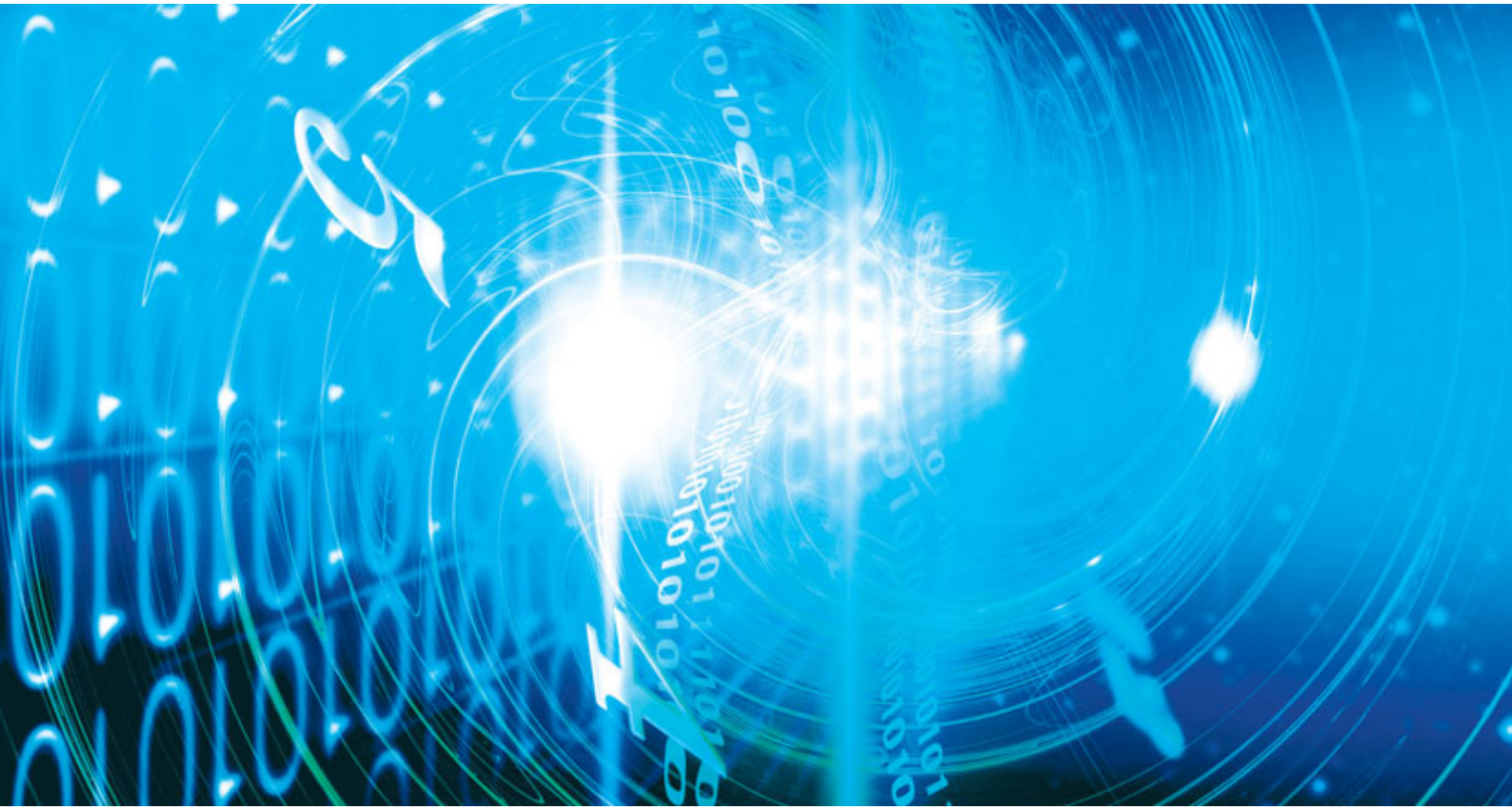
TCC-Link connections with non-polarised wiring

Local control systems

The wired local controller RBC-AMT32E (or simplified model RBC-AS21E2) can monitor a single unit or a group of a maximum of eight indoor units. It offers the following functions: start/stop, operating mode change, temperature and fan speed adjustment, timer, auto-diagnostics and fault code display. To define a timer scheduled for each day of the week, the schedule/weekly timer TCB-EXS21TLE, can be used with a single local or central controller. Its main functions are: weekly programming with different daily start/stop cycles, summer/winter programming, repeat, clear, day omit. To facilitate application flexibility, a range of wireless controls is also available (TCB-AX21E2, RBC-AX22CE2, TCB-AX21U (W)E2) to manage the main control functions.

Central control systems

With the Toshiba central controller TCB-SC642TLE2, up to 64 indoor units can be monitored individually. The central Toshiba controllers are compact and user-friendly and can also be combined with local controls and a weekly timer to guarantee optimised user comfort under any conditions.



Toshiba network solutions

Toshiba offers precise control of new VRF systems in both stand-alone applications for autonomous monitoring of the air conditioning system, and integrated into a central control scheme together with Super Digital Inverter and Digital Inverter split systems. The innovative solutions of the Toshiba Network guarantee maximised integration with other building systems such as elevators, fire protection systems, lighting etc. Open-network controls are specifically designed for Building Management Systems.

LonWorks Interface

BACnet System

Windows™ gateway

Touch screen control saver

Toshiba units have everything under control

Wired Control

RBC-AMT32E

The standard remote controller gives access to all of the functions for the indoor unit. It also gives access to the configurable engineer's menu and data retrieval features of the system, such as fault code and sensor information. The device is compatible with the new 4 Series DI/SDI cassette and the existing DI/SDI/SMMS and SHRM indoor units.

Simplified Control

RBC-AS21E2

The simplified remote controller is connected in the same way as the standard remote controller, but offers reduced functionality. The remote controller does not have the lapse timer and the ability to set up the indoor unit. Unit fault codes are still displayed.

Central Controller

TCB-SC642TLE2

The central controller can control up to 64 indoor units individually. All their functions can be controlled. Malfunction checks are available for each indoor unit. This controller can also connect to the weekly timer and has volt-free inputs to enable the indoor units and indicate a fault. It has the ability to shut down all units in the event of a fire. Up to four controllers can be connected to the network.

IR Remote Control

TCB-AX21E2

The wireless remote controller can be used with the appropriate indoor units to give full control of the indoor units. Two remote controllers can be used on the same indoor unit. The sensor on the remote controller can be used to control the system. Fault codes are displayed.

Weekly/Schedule Timer

TCB-EXS21TLE

Operates in weekly timer mode and schedule timer mode

6 programming schedules per day

Allows programming of 8 groups

100 hours max. back-up power supply

7 weekly schedule types and 3 programming schedules per day (weekly timer mode): combination of ON and OFF operation with a timer that can be set by a minute unit

Special holiday program

Compliant Manager

BMS-CM1280TLE / BMS-CM1280FTLE*

WEB function (Intranet)*

Energy monitoring*

Easy settings and operations (10 times per day/ 32 times per week: on/off, operating mode, setting temp., remote control restriction)

TCC-Link direct connection

Password available

Schedule timer

LonWorks Gateway

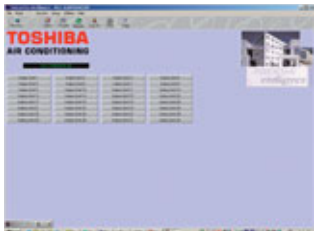
TCB-IFLN640TLE

The LonWorks Gateway uses all standard network variables to control the individual functions of the indoor units. The gateway can also be used with Toshiba Interactive Intelligence.

Intelligent Server

BMS-LSV6E

The intelligent server is the connection point between the PC station for BACnet system and TCS.NET relay interfaces of the air conditioner network.



Windows Package
RBC-WP1-PE
The Windows™ package Interactive Intelligence allows all indoor units connected to the gateway to be set and monotored on the PC. All individual indoor units can be controlled. The program can be customised to allow implementation of site-specific graphics. It can perform time scheduling data logging and alarm handling.

Energy Monitoring Kit
RBC-EM1-PE
The Energy Monitoring Kit is a power meter designed to connect to Interactive Intelligence. It provides the power supply for an outdoor unit. This information is then used to calculate the unit running costs, depending upon the demand from the unit.

Touch Screen

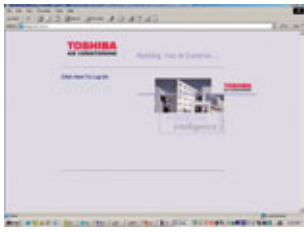
BMS-TP0641ACE - up to 64 indoor units

BMS-TP05121ACE - up to 512 indoor units

BMS-TP0641PWE - up to 64 indoor units + electrical bill calculation

BMS-TP5121PWE - up to 512 indoor units + electrical bill calculation

The new Touch Screen Controller provides a graphical interface with the air conditioning system in multi-language versions (EN, FR, IT, DE, ES) It can control each of the individual indoor units and is capable of providing information from the indoor unit settings and malfunction check codes. It is also used to calculate the energy consumption for the selected indoor units. This controller runs time schedules for the indoor units and allows you to set up data logs. The Touch Screen is connected to the air conditioner control network directly by relay interfaces. Password function available.



Internet Kit
RBC-IK1-PE
The Internet Kit allows Interactive Intelligence to be viewed over a network using Internet explorer for up to 5 users.

DI Module
RBC-DI1-PE
The DI1 module allows Interactive Intelligence to enable and monitor other equipment within the building.
It can also be used to shut down the indoor units in the event of a fire or other conditions like a timed plant extend.

Fan Accessory
RBC-SMFI
The fan interface connects to the indoor unit. Its function is to control an external ventilation fan. The relay can be operated with the indoor unit or independently.

Fault Detection Panel
RBC-FDP2-F-PE
The fault detection panel gives an output if any fault is present in the system. It also has preset modes for cooling, heating and automatic mode. This enables it to be used without a remote controller. Two FDP2s can be networked for a duty share application.
The BMS version of the FDP (RBC-FDP-BMS-PE) is more advanced with dedicated configurable inputs. These can set the operating parameters of the indoor unit. They can be voltage or resistance inputs.

SMMS/SHMR/MiNi SMMS **Control Options**

Model Number	Reference	Description	Used with
RBC-AMT32E	Wired Remote Controller	To suit DI and SDI systems (excluding Flexi)	All indoor units
RBC-AS21E2	Simplified Wired Remote Controller	As above but designed for hotel and domestic applications	All indoor units
TCB-SC642TLE2	Central Remote Controller	Enables the control of up to 64 individual units	All VRF units, network adapter required for DI/SDI
TCB-EXS21TLE	Weekly/Schedule Timer	Operates in weekly or schedule timer mode, 6 programming schedules per day, up to 64 indoor units	All VRF units, network adapter required for DI/SDI
RBC-FDP2-F-PE	Fault Display Module	Gives indication of a unit malfunction and relay output	All indoor units
TCB-CC163TLE2	On/Off Controller	Enables on/off control (max. 16 units)	All VRF units, network adapter required for DI/SDI
RBC-SMTI	Timer Interface Lead	Timer interface lead suitable for all DI & SDI units	RBC-AMT32E/TCB-SC642TLE
RBC-SMFI	Fan Interface Kit	Enables the control of external fans	All indoor units
RBC-AX22CE2	Infra-red Remote Kit	Wireless remote unit kit for Ceiling suspended units	All ceiling units
TCB-AX21E2	Infra-red Remote Kit	Wireless remote unit kit for Ducted units	All ducted units
TCB-AX31U(W)-E	Infra-red Remote Kit	Designed as a replacement corner panel for Cassettes	All cassettes
TCB-TC21LE2	Remote Sensor	Remote temperature sensor	All indoor units
TCB-CC163TLE2	In/Off Controller	Controller that enables individual on/off control of up to 16 indoor units	All indoor units
TCB-PCNT20E	Network/Protocol Adaptor Kit	Enables the intergration with the AI network	All indoor units
TCB-IFCB-4E2	On / Off Control Box	Enables remote location control of on / off	All indoor units
TCB-PCDM2E	Power Peak Cut Control Board	Power Peak Cut Control Board	All VRF outdoor units
TCB-PCIN2E	Error Output Control Board	Error output control board	All VRF outdoor units
TCB-PCMO2E	External Master On/Off control	External Master On/Off control board	All VRF outdoor units
TCB-PCNT30TLE2	Interface	1 : 1 model connection interface	Allows DI/SDI indoor unit connection to TCC link network
BMS-CM1280TLE	Compliant Manager	Central controller, 10 times per day operation, operating mode, setting temp., remote control restriction, up to 128 indoor units	All VRF units, network adapter required for DI/SDI
BMS-CM1280FTLE	Compliant Manager	As BMS-CM1280TLE with Web connection and energy monitoring function	All VRF units, network adapter required for DI/SDI
BMS-WB2561PWE	Web Based Controller	Network Intranet connection, yearly schedule, error message history, up to 256 IDUs	All VRF units, network adapter required for DI/SDI
BMS-WB01GTE	Web Based Controller	Network Intranet connection, yearly schedule, error message history, up to 2.048 IDUs	All VRF units, network adapter required for DI/SDI
BMS-TP0641ACE	Touch Screen Controller	Enables full control of up to 64 indoor units, ML	All VRF units, network adapter required for DI/SDI
BMS-TP5121ACE	Touch Screen Controller	Enables full control of up to 512 indoor units, ML	All VRF units, network adapter required for DI/SDI
BMS-TP0641PWE	Touch Screen Controller	Enables full control of up to 64 indoor units with electric billing, ML	All VRF units, network adapter required for DI/SDI
BMS-TP5121PWE	Touch Screen Controller	Enables full control of up to 512 indoor units with electric billing, ML	All VRF units, network adapter required for DI/SDI
BMS-LSV6E	Intelligent Server	Allows connection to a BACcnet™ system	Relay interface
BMS-STBN08E	BACnet™ Server Software	Enables integration with BACnet™	Intelligent server to allow connection to a BACnet system
BMS-STCC06E	Intelligent Server Software	Software package for the intelligent server	Intelligent server to allow connection to a 1st generation Touch Screen system
BMS-IFLSV2E2	TCS -Net Relay Interface	Relay for integration to TCS-Net	All VRF units, network adapter required for DI/SDI
BMS-IFWH4E2	Energy Monitoring Interface	Relay interface to allow energy monitoring	Web-based controller/Touch Screen/Intelligent Server
BMS-IFDD02E2	Digital I/O Relay Interface	Digital I/O relay interface	Web-based controller/Touch Screen/Intelligent Server
TCB-IFLN640TLE	Lonworks® Gateway	Allows control of 64 indoor units from a Lonworks based BMS	All VRF units, network adapter required for DI/SDIDI/SDI
RBC-IT4	Timer Interface	Allows all DI/SDI/SMMS/SHRM units to be time controlled via 240 V signal	All indoor units
RBC-WP1-PE	Windows Package	Windows control package	Used with Windows package
RBC-EM1-PE	Energy Kit	Energy monitoring kit (used with the Windows control package)	Used with Windows package
RBC-IK1	Internet Kit	Internet kit (used with the Windows control package)	Used with Windows package
RBC-DI1-PE	Digital I/O Module	Digital input/output module (used with the Windows control package)	Used with Windows package

VRF **Accessories**

Model Number	Size (max. indoor load)	Description
VRF - 3-pipe headers and Y-joints (SHRM only) - reducers and insulation included		
RBM-BY53FE	5 (6.3) hp	Y-joint, 3-pipe
RBM-BY103FE	10 (14.1) hp	Y-joint, 3-pipe
RBM-BY203FE	20 (25.1) hp	Y-joint, 3-pipe
RBM-BY303FE	30 (48) hp	Y-joint, 3-pipe
RBM-HY1043FE	10 (14.1) hp - 4-way	4-way header, 3-pipe
RBM-HY2043FE	20 (25.1) hp - 4-way	4-way header, 3-pipe
RBM-HY1083FE	10 (14.1) hp - 8-way	8-way header, 3-pipe
RBM-HY2083FE	20 (25.1) hp - 8-way	8-way header, 3-pipe
RBM-BT13FE		T-piece kit for 3-pipe SHRM outdoor unit
VRF - 2-pipe headers and Y-joints (SMMS and 2-pipe sections of SHRM)		
RBM-BY53E	5 (6.3) hp	Y-joint, 2-pipe
RBM-BY103E	10 (14.1) hp	Y-joint, 2-pipe
RBM-BY203E	20 (25.1) hp	Y-joint, 2-pipe
RBM-BY303E	30 (48) hp	Y-joint, 2-pipe
RBM-HY1043E	10 (14.1) hp - 4-way	4-way header, 2-pipe
RBM-HY2043E	20 (25.1) hp - 4-way	4-way header, 2-pipe
RBM-HY1083E	10 (14.1) hp - 8-way	8-way header, 2-pipe
RBM-HY2083E	20 (25.1) hp - 8-way	8-way header, 2-pipe
RBM-BT13E		T-piece kit for 2-pipe SMMS outdoor unit
VRF accessories		
TCP-PCM02E*	External control CN 508	Low-noise operation (50 dBA) by external switch
TCP-PCM02E*	External control CN 509	Run outdoor fans by external switch (snow control)
TCP-PCM02E*	External control CN 510	Mode selection by external switch (SMMS)
TCP-PCM02E*	External control CN 512	Stop and start of all associated indoor units by pulse
TCP-PCDM02E**	Load shedding PCB	Limits compressor speed by external switches
TCP-PCIN2E	Output PCB from CN511	Continuous contacts made when either in system shutdown or when at least one indoor unit is operating
Dyna Doctor	Dyna Doctor	Monitoring and diagnostic software
TCB-DP31DE2	High static duct (18 to 48)	Drain pump kit (600 mm lift from top of indoor unit)
TCB-DP32DE2	High static duct (72 to 96)	Drain pump kit (600 mm lift from top of indoor unit)
TCB-DP22CE2	Ceiling units	Drain pump kit (600 mm lift from top of indoor unit)
TCB-KP12CE***	Ceilng unit (2 hp)	Elbow piping kit (required by drain pump kit)
TCB-KP22CE***	Ceilng unit (3/4/5 hp)	Elbow piping kit (required by drain pump kit)

* Master outdoor unit only (if used). Function is dependent on which interface PCB socket is used (all four could be used if required)
** Master outdoor unit only (if used).
*** Elbow piping kits allow the refrigeration circuit connections to be routed to make space for pump

Complementary products
Panoramic view

With Toshiba everything is easier

Toshiba's commitment to the development of technological and innovative products with improved performances is complemented by a responsibility to supply more sophisticated and functional tools for the design, installation and control of these systems.

Selection Software: everything at the click of a button

Sophisticated system design software has been developed for the whole Mini-SMMS, SMMS and SHRM range and is a useful and irreplaceable support tool for engineers, architects, installers and, in general, for anyone who wants to apply innovative Toshiba solutions. With this software, the user can create a complete VRF system by simply clicking on the icons for the indoor units and the other connection components. It is also possible to define, in advance, relevant parameters such as outside and inside temperatures, fan speed, pipe system length and routing etc. The software automatically manages all the parameters entered, and the actual system capacity for the conditions required can be quickly calculated and simulated during the design stage. Using this software, the design of VRF systems is guaranteed for the project at the given conditions. The software constantly monitors possible design errors and warns the user, when it reaches the system limits.

Graphical representation of the required pipe connection system and pipe sizing.

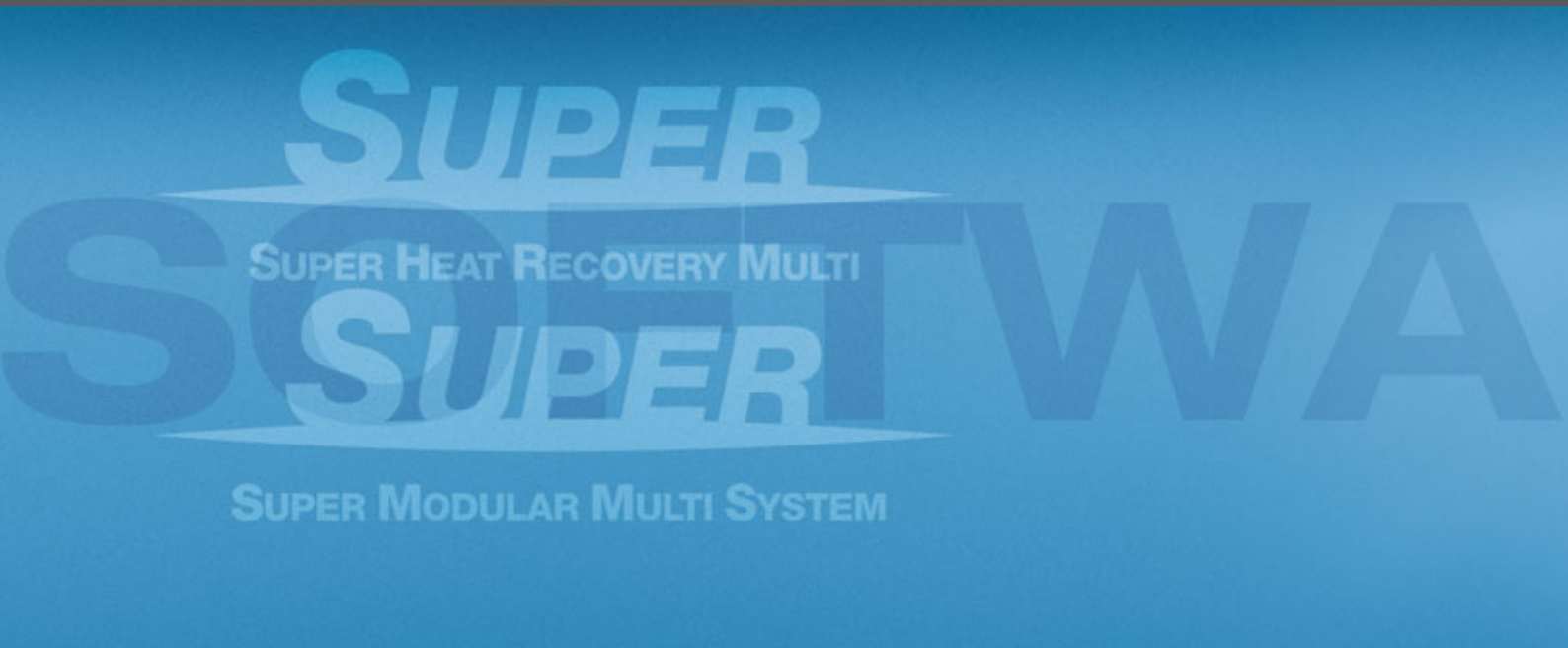
Specific details and data of the system selected: heating capacity, sensible and total cooling capacity, actual cooling capacity, additional refrigerant charge and pricing indications.

Multiple system management as a single project.

Export function to transfer the project report using standard Microsoft® Word® and Adobe® Acrobat® (PDF). The images can also be exported to an AutoCAD® (DXF) file.

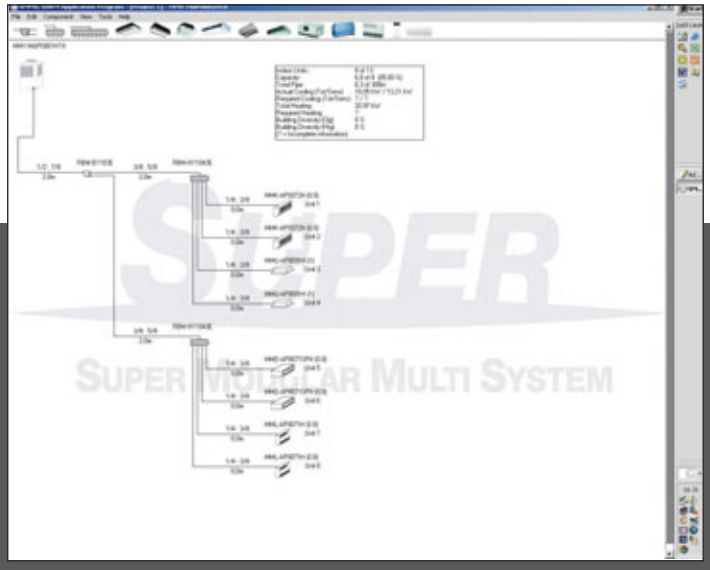
Automatic regeneration when adding or amending an existing project selection.

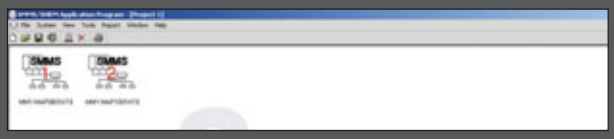
Indoor unit fan speed indication (high/ medium/low) on the system report.



Diagnostic software

The correct operation of sophisticated systems such as VRF is important to the long-term reliability of the system. In order to assist with the correct commissioning of MiNi-SMMS, SMMS and SHRM systems, Toshiba has developed a diagnostic software programme – a valuable tool for the commissioning and service engineer. The engineer can connect to the VRF system using a dedicated interface – enabling the download of all operating parameters and providing the engineer with detailed information for instant analysis or record. Diagnostic software is distributed exclusively by the Toshiba EMEA RLC Technical Department.





Selection software screenshots

VN(...)TE/KTAE

Air-to-air heat exchangers

Features

The air-to-air heat exchangers can be integrated with the air conditioning system. They use exhaust air to pre-condition the incoming air, thus reducing the cooling or heating load and the overall size of the required air conditioning system. A range of electric heaters is available, together with controls that enable integration with both split and VRF indoor units.

Key features

Five models available with air flow ranges from 70 to 280 l/s (250-1000 m^3/h).

Fresh air ventilation: increasingly required in rooms with no window access.

Temperature and humidity: changed by the entering fresh air.

Recycles 20-50% of the energy lost by ventilation.

Improved energy efficiency, particularly during extremes of heat and cold.

Recovers up to 75% heat from exhaust air.

Technical specifications **heat pump**

Model		VN-250TE	VN-350TE	VN-500TE	VN-800TE	VN-1KTAE
Air flow (h/l)	m^3/h – l/s	250/170 – 70/48	350/280 – 98/78	500/370 – 140/104	800/650 – 224/182	1000/810 – 218/227
Temperature exchange efficiency (h/l)	%	75/77	75/77	75/77	75/77	75/77
Sound pressure level (h/l)						
Heat reclaim mode	dB(A)	28/21	32/26	34/25	39/32	38.5/31
Bypass mode	dB(A)	28/22.5	32/26	34/26.5	38.5/33	39/31.5
Operating range	°C	–10 to 40°C	–10 to 40°C	–10 to 40°C	–10 to 40°C	–10 to 40°C
Power Input (h/l)						
Heat reclaim mode	W	119/79	154/117	214/151	347/302	445/332
Bypass mode	W	119/79	151/113	210/145	337/297	438/326
Enthalpy exchange efficiency (h/l)						
Heating	%	70/73	69/71	67/71	71/74	71/73
Cooling	%	63/66	66/69	62/67	65/68	65/68
Max.. external static pressure (h/l)	Pa	90/37	95/42	105/38	140/70	90/35
Dimensions (H x L x D)	mm	270 × 599 × 882	270 × 804 × 882	270 × 904 × 962	388 × 884 × 1322	388 × 1134 × 1322
Weight	kg	29	37	43	71	83
Duct diameter	mm	150	150	200	250	250
Filtration efficiency grade (EU3)	%	82	82	82	82	82
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50
Maximum relative humidity	%	85	85	85	85	85

The capacities in this catalogue are based on Eurovent conditions:

Cooling: Entering indoor air temperature: 27 °C db/19 °C wb. Outdoor air temperature: 35 °C db/24 °C wb.

Heating: Entering indoor air temperature: 20 °C db. Outdoor air temperature: 7 °C db/6 °C wb.

The sound pressure level is given at 1 m distance from outdoor units, and 1,5 m distance from indoor units.

Energy class and annual consumption are determined according to 2002/31/EC Commission Directive.

HFC R-410A CE

Toshiba Carrier UK Ltd
United Technologies House
Guildford Road
Leatherhead
Surrey KT22 9UT
Tel: 01372 220 240. Fax: 01372 220241.
marketing.uk@toshiba-ac.com
www.toshiba-aircon.co.uk

TOSHIBA AIRCONDITIONING
Advancing the eco-evolution