TOSHIBA

VRF Series.

The most advanced commercial air conditioning system.

BUSIN

R410A

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VRF Series R410A

The most advanced commercial air conditioning solution.

As a world-wide leader in electronics, Toshiba is committed to delivering the highest standards of quality and innovation in all of the industries in which the company is a major player.
These principles are clearly demonstrated in the air conditioning division, where Toshiba continues to develop market-leading products for both commercial and residential customers.
In 1981 Toshiba was the first manufacturer to launch air conditioners with inverter technology, and now Toshiba has a comprehensive range of split systems designed for use with non-ozone depleting refrigerants. Toshiba entered the VRF market in 1999 with the advanced Super Multi system, and after a very fast upgrading, in 2004 launched the new Super MMS VRF system, optimised for use with energy-efficient, non-ozone-depleting R410A refrigerant, followed by the Super Heat Recovery Multi, the 3 pipe modular system.
For the last 47 years Toshiba's ambitious main objective has been to design and manufacture 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 R410A Series
Innovative technologies

New DC twin-rotary compressors

Unique dual inverter drive in every outdoor unit

New large-diameter fan design for improved air flow

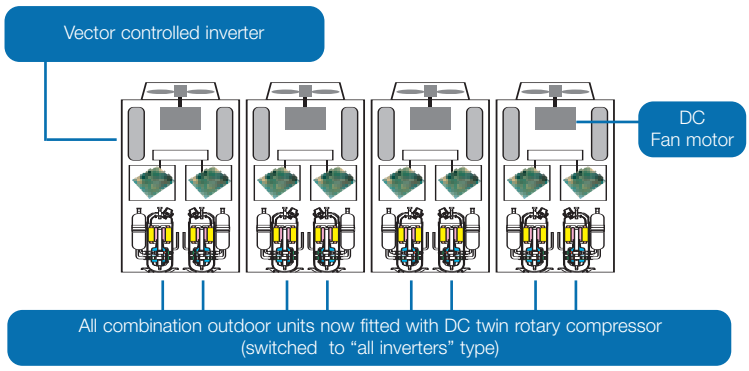
New heat transfer pipe design for greater energy efficiency

Improved fan blade design for smoother air flow and less turbulence

Optimised for energy efficient non-ozone-depleting R410A refrigerant

Extended pipe runs for greater application flexibility

DC Twin-rotary compressor in all outdoor units



New R410A VRF outdoor units

Toshiba: VRF R 410A maximised reliability and energy savings.

With the new generation of variable refrigerant flow units, SMMS and SHRM, Toshiba sets new technological standards, incorporating DC twin-rotary compressors in all outdoor units, compatible with the high-density refrigerant R410A.
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 unit 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 up to 30%.
With the exclusive dual inverter Toshiba technology and the use of high-efficiency R410A refrigerant, the new range of SMMS and SHRM systems offers state-of-the art air conditioning in terms of energy efficiency to the international markets.

Busin

Maximum care and respect of the environment.

Toshiba's commitment to the research and development of new technologies with zero impact on the environment has led to the launch of the new SMMS cooling only and heat pump ranges and the SHRM heat recovery range, optimised for the high-efficiency non-ozone-depleting refrigerant R410A.
The use of the sophisticated dual inverter control optimises the load distribution to deliver the capacity needed to reach and maintain the required temperature, eliminating inefficient power surges typical for non-inverter systems.

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 and managment costs savings is that the systems are sized for maximum load, and usually operate at part load.
Maintenance costs are also minimised. No particular routine maintenance is required, except for the indoor unit filters, that must be cleaned periodically.

Complete peace-of-mind from Toshiba: stable operation.

With the use of the special inverter-controlled compressors, the new 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. The models of the new range 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.

Unlimited flexibility.

Optimised product choice.

The ultimate inverter system.

Minimised consumption.

Precision is our top priority.

With the sophisticated inverter control, it is possible to match 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 relating 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, spoke Toshiba.

One of the main Toshiba objectives is improved quality of life inside, as well as outside buildings. The reduced outdoor unit noise levels are the result of the study and elimination of all noise level peaks, normally present during the unit start-up phase, using the automatic sound dampening mode and the night-operation mode. This has resulted in operating noise levels for below 50 dB(A).
The exclusive use of inverter compressors also significantly contributed to these low noise emission performances, comparable to the rustling of leaves.

VRF. The freedom of choice.

Variable refrigerant flow benefits from the advantages of direct expansion linked to inverter control and the most sophisticated electronic control. 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 equirements.

Compressor development and ecology.

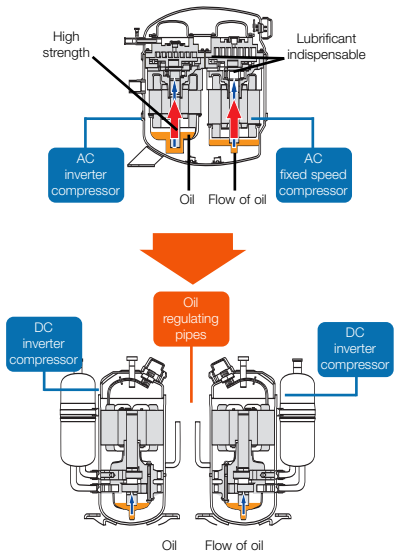
Conventional 2-in-1 scroll (R407C)

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 ubricated. At low compressor speeds lubrication efficiency is reduced, resulting in increased compressor wear.

Dual DC twin-rotary (R410A)

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.

New Dual DC twin-rotary compressors



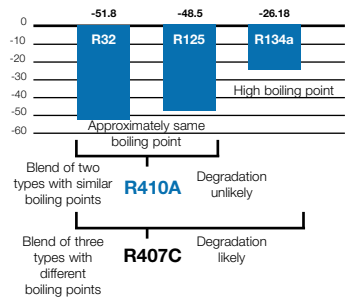
Leading Technologies

Compressor	2-in-1 scroll	DC twin-rotary	Benefit
Efficiency	Standard	20% improved	Greater energy savings
Weight (comparative, %)	92 kg x 1 (100%)	25.2 kg x 2 (55%)	Lighter
Volume (comparative, %)	50 l (100%)	15 l (30%)	and more compact
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)



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 in the new VRF R410A incorporates more, smaller steps to deliver the required power and achieve the temperature desired by the occupant. The increase in control steps ensures a more precise and stable temperature and eliminates power surges common in standard, non-inverter systems.

Toshiba aims to:

- Reduce CO2 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 SMMS and SHRM outdoor units are modular in design; units of different capacities have the same dimensions. The outdoor units fit into a lift making installation much easier. The design of the outdoor units is the same as the MMS VRF system, resulting in a smart appearance on-site when a combination of MMS and SMMS is installed.

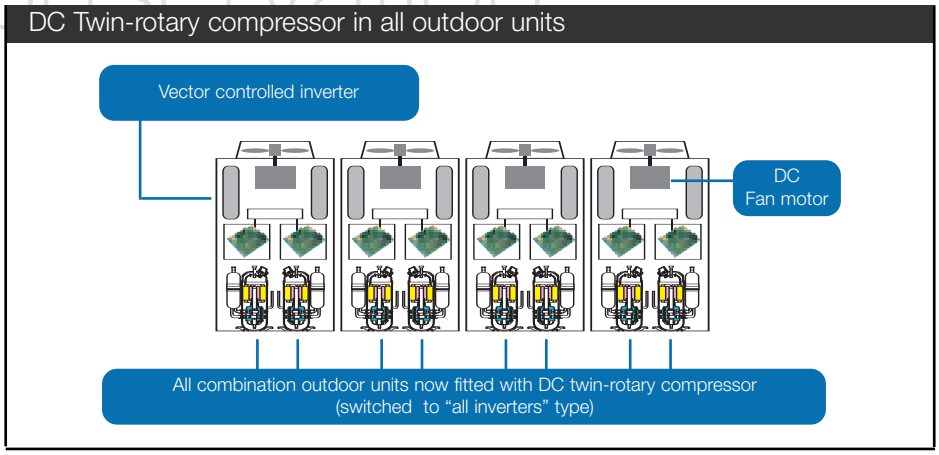
ISO 14001: environmental care from manufacturing

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)
UK	Toshiba UK	Obtained May 1996 (ISO 14001)	SGS (Société Générale de Surveillance SA)
Thailand	Toshiba Carrier Thailand	Obtained May 1998 (ISO 14001)	AJA (Anglo Japanese American)

Number one in energy conservation.

High-efficiency DC twin-rotary compressors

All outdoor units use DC twin-rotary compressors, offering optimum compatibility with high-density R410A refrigerant.



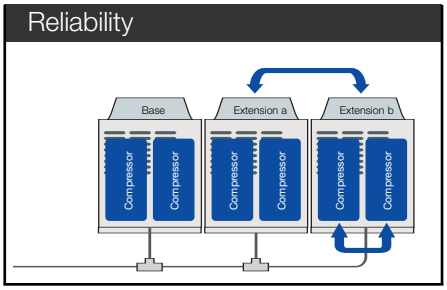
Controlling savings and reliability.

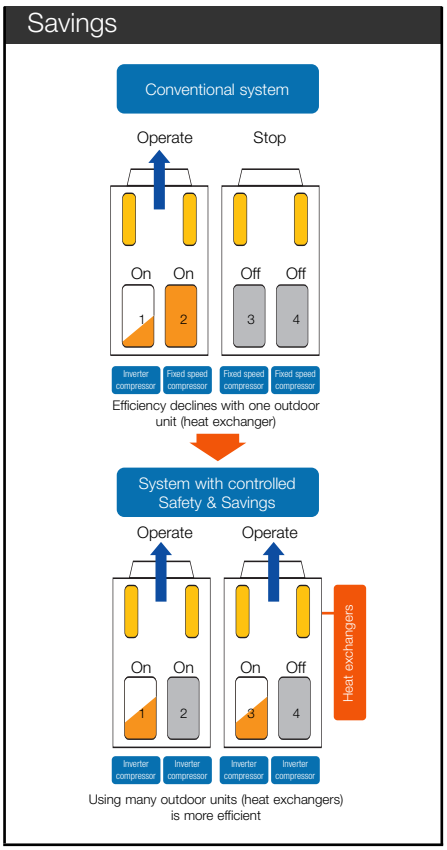
Reliability

With dual-rotation, the load is distributed more evenly – this means that the operating sequence of the outdoor units and the individual compressors 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 reduces the risk of compressor failure, more common in standard non-inverter systems.

Energy savings

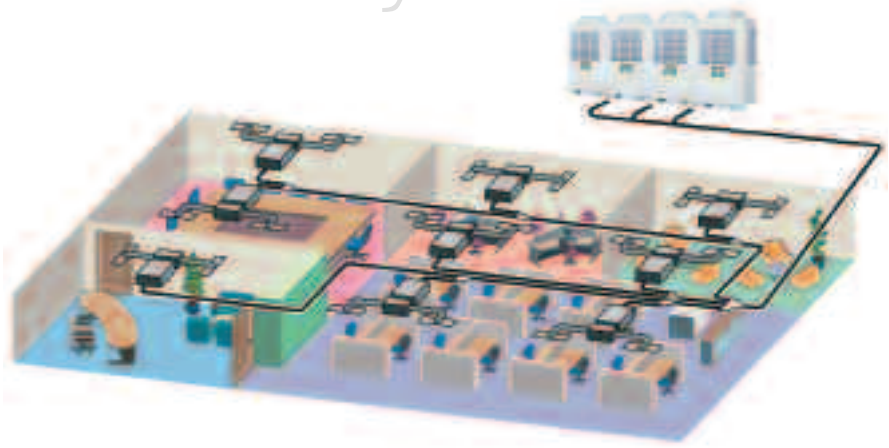
During operation the system determines which heat exchanger can be used most efficiently and selects the compressor to deliver the power required.
Inverter systems save energy as continuous operation offers the same capacity with lower power consumption.
This benefits all occupants by maintaining even room temperatures, as well as the environment by reducing energy consumption.





Leading the way for energy efficiency.

The use of the high-efficiency refrigerant R410A and the dual-inverter system enable Toshiba to deliver the highest COP of 4.1 (14.0 kW size) with SMMS, and a COP of 3.97 with SHRM. Achieving energy, efficiency levels around 1.5 times those of previous models.



Outdoor units

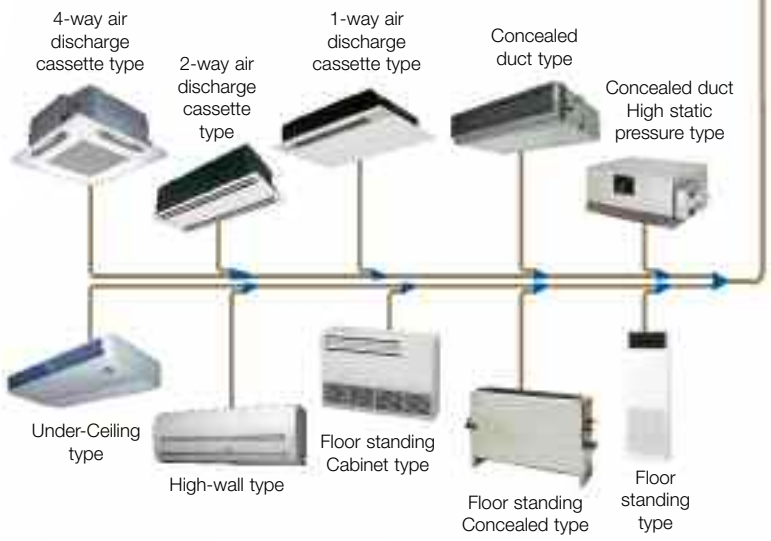
Energy consumption.

Using two compressors and heat exchangers contributes to further energy savings. The amount of energy consumed over a specific period is approximately half that of earlier models.
This greatly enhances the benefits for the end user.

Indoor units

Power input reduced by up to 30%.

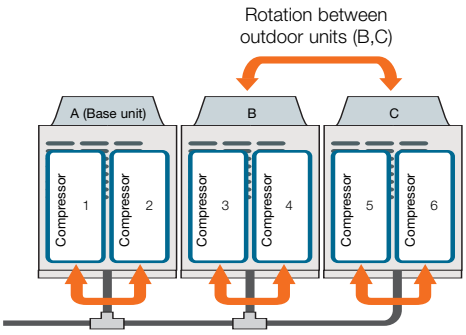
The new design, with its major power-saving features and increase in capacity can reduce power consumption by around 30% compared with previous models.



Reliability as standard.

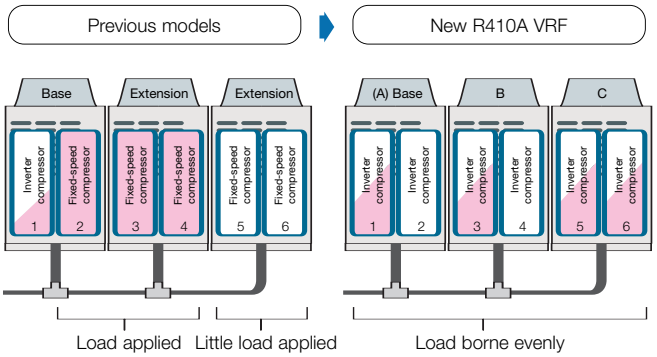
Rotation control ensures the operating hours are balanced between all compressors.
This increases reliability as starting and operating loads are evenly distributed, and compressor ON/OFF cycles are reduced.

Distributing the initial load by means of two rotation options

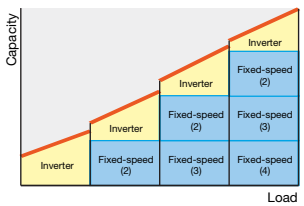


Sequencing of individual compressors (compressors (1) and (2), compressors (3) and (4), compressors (5) and (6)

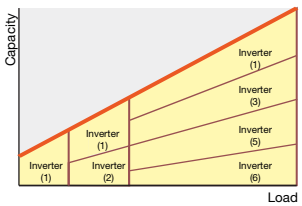
Equalisation of compressor operating hours through load distribution



Equalisation of compressor operating hours through load distribution



The final control of system capacity on previous models was achieved by controlling the speed of the only inverter- driven compressor within the system. All fixed-speed compressors can only operate at maximum capacity.



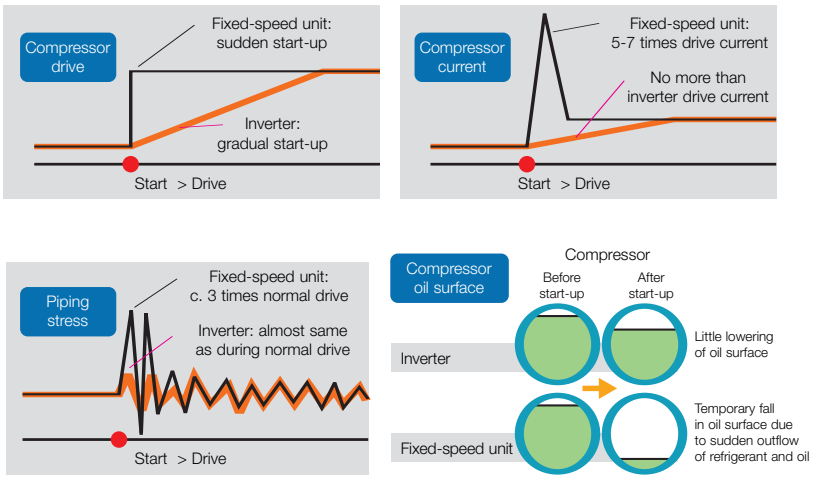
Variation in load is spread evenly across the optimum number of inverter-driven compressors thus reducing the load on individual compressors.

Stable operations

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.

Start-up using all inverter-driven compressor



Stable operation.

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

Back-up function.

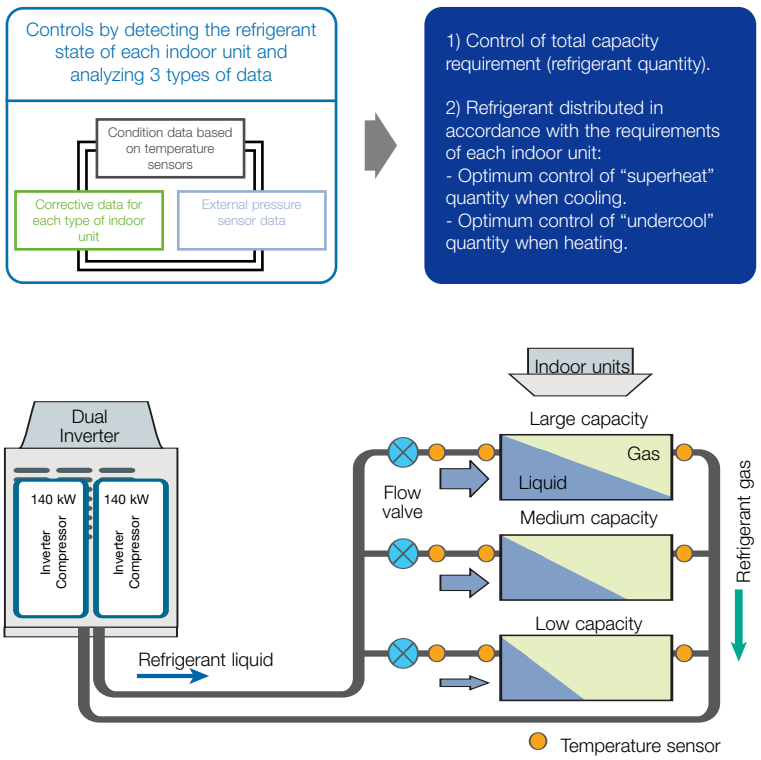
In the unlikely event of one compressor within an outdoor unit failing, it is possible in most circumstances to operate the second compressor on its own simply by setting a switch on the interface PCB. In the case of a complete outdoor unit failure, operation of the system may continue by selecting another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

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.

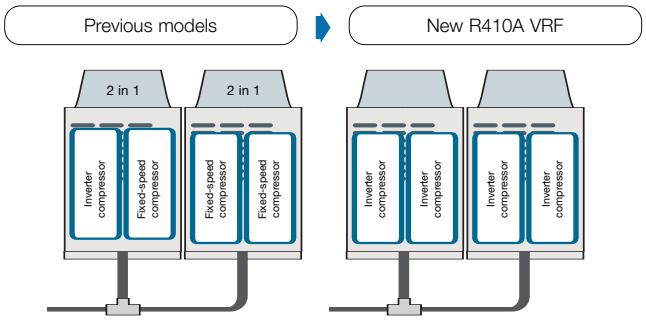
R410A VRF refrigerant flow



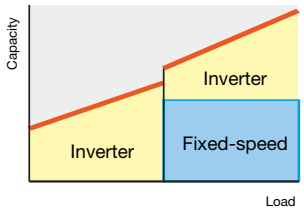
Full linear capacity control.

The new R410A system incorporates all inverter compressors, this ensures smooth linear performance compared with systems that incorporate fixed speed compressors.

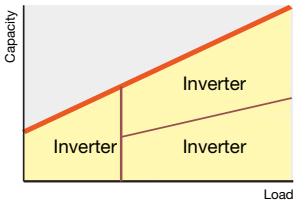
Distributing the initial load by means of two rotation options



Equalisation of compressor operating hours through load distribution



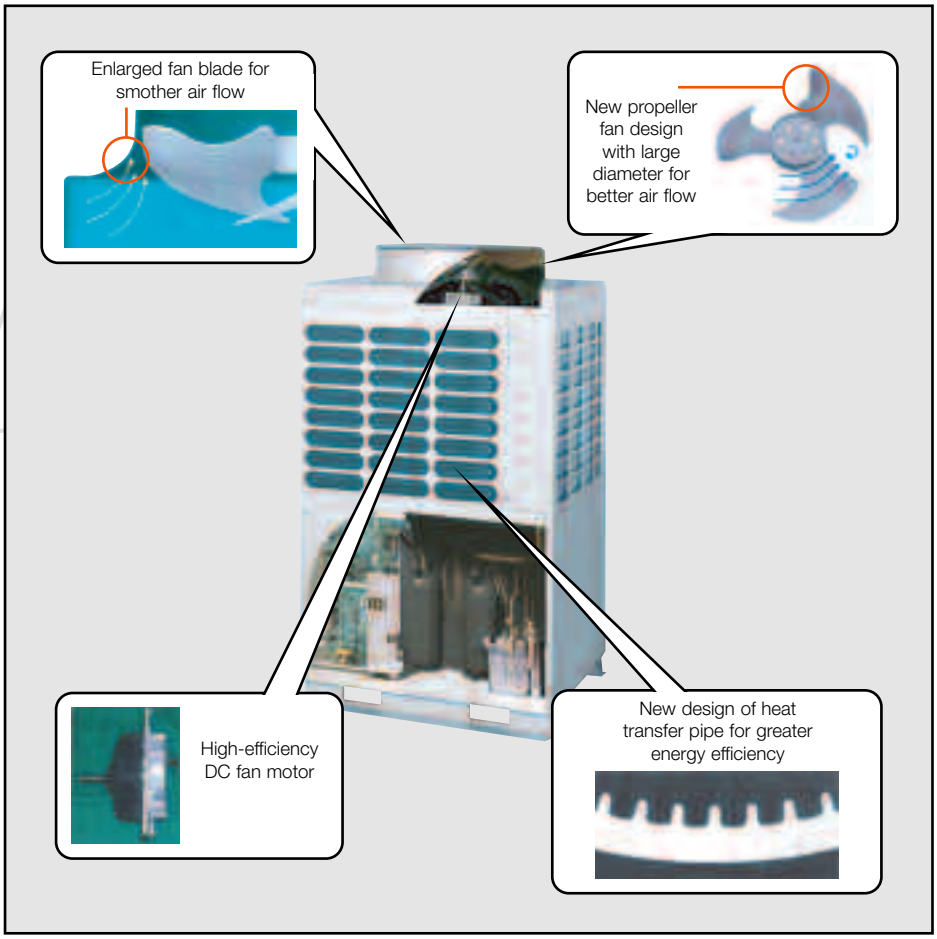
*Inverters/compressors under normal operating conditions.
*When a fixed-speed compressor starts up, the capacity change is not smooth.



With all inverters, the capacity change is smooth and linear.

Major reduction in noise level for outdoor units.

The amount of noise emitted by the outdoor units has been drastically reduced. No intrusive noise during start-up thanks to the automatic sound dampening mode, the night-time low-noise mode and the use of inverters in all units. Moreover, the automatic dampening mode means that the system automatically switches to this mode whenever the outdoor temperature falls and the air conditioning load decreases. The night-time low-noise mode also allows operation at a low noise level of under 50 dB(A).

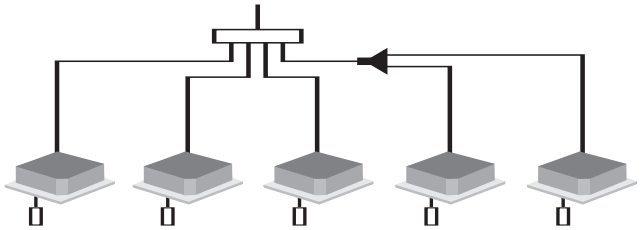


Improved application flexibility.

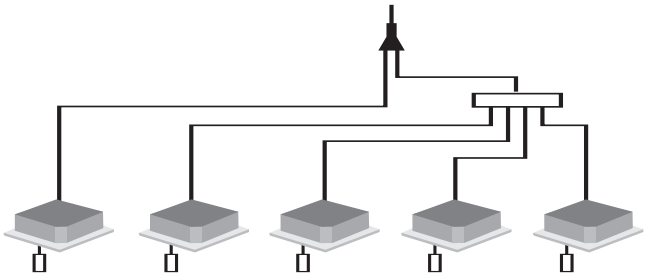
For the SMMS there is a full range of 28 outdoor models and 22 capacities from 14 kW to 135 kW cooling and 16 kW to 150 kW heating enhancing application flexibility.
Regarding the SHRM, a complete range of 10 outdoor models (from 22.4 kW to 84 kW cooling only - from 25 kW to 95 kW heating) is available, so that they are considered the best solutions in terms of flexibility.
The new R410A is capable of serving up to 48 indoor units.
There are 10 different indoor unit types, available in 13 size - offering a total choice of 75 indoor units models for greater application flexibility.

The following configurations hold for SMMS and SHRM provided that an unit is put before any SHRM indoor unit.

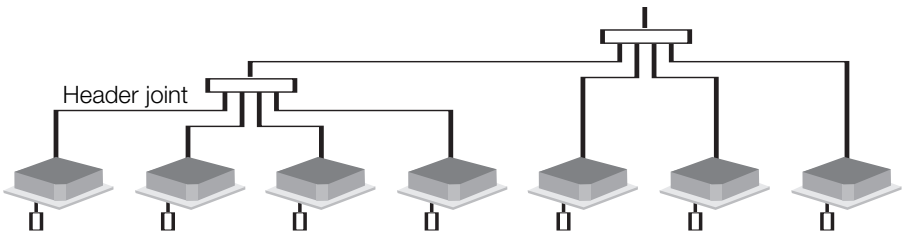
Line branching after header branching - Unique system



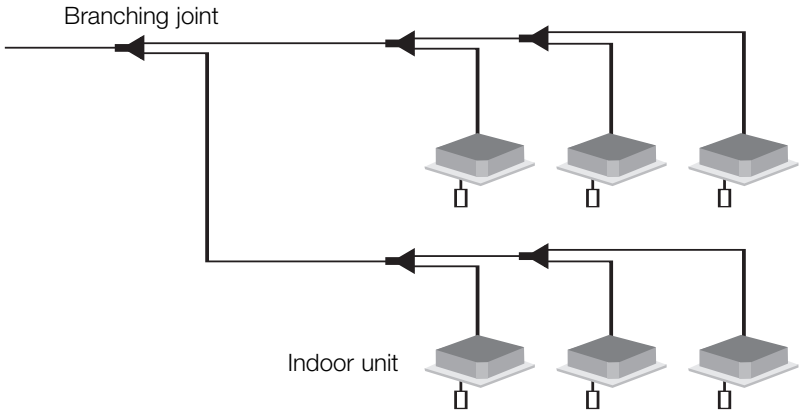
Header branching after line branching



Header branching after header branching - Unique system



Line branching



Flexible branching.

The versatility of the R410A system 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.

Toshiba R410A VRF: the freedom in flexibility .

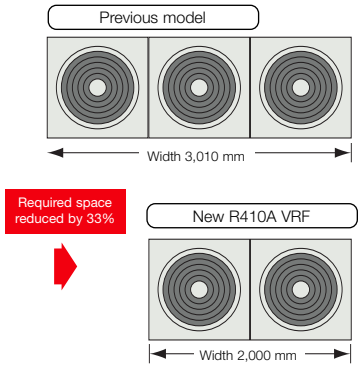
The pipe runs for the Toshiba R410A VRF have been extended to offer greater application flexibility.

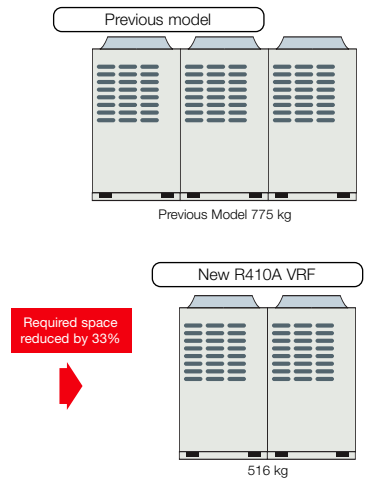
Extended piping **capabilities**

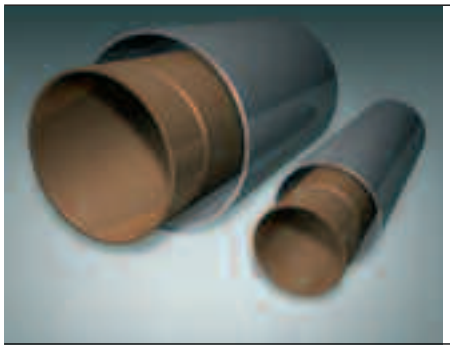
Indoor unit	SMMS	SHRM
Maximum separation	150	125
Maximum equivalent separation	175	150
Total length	300	300
Height difference, outdoor unit above	50	50
Height difference, outdoor unit below	40	30
Height difference between indoor units (Upper outdoor unit)	30	35
Height difference between indoor units (Lower outdoor unit)	30	15
Maximum distance from first branch	65	50
Maximum distance between FS unit and indoor unit		15

The appearance of each outdoor unit is the same as the Toshiba R407C, but the R410A has the capability of offering greater capacities with fewer outdoor units.
Therefore the installation space and the weight required can be reduced by as much as 33%.
An SMMS or SHRM outdoor unit is easy to install and due to its compact size and the reduced weight it can be transported in a standard lift.

Greater capacities with fewer outdoor units





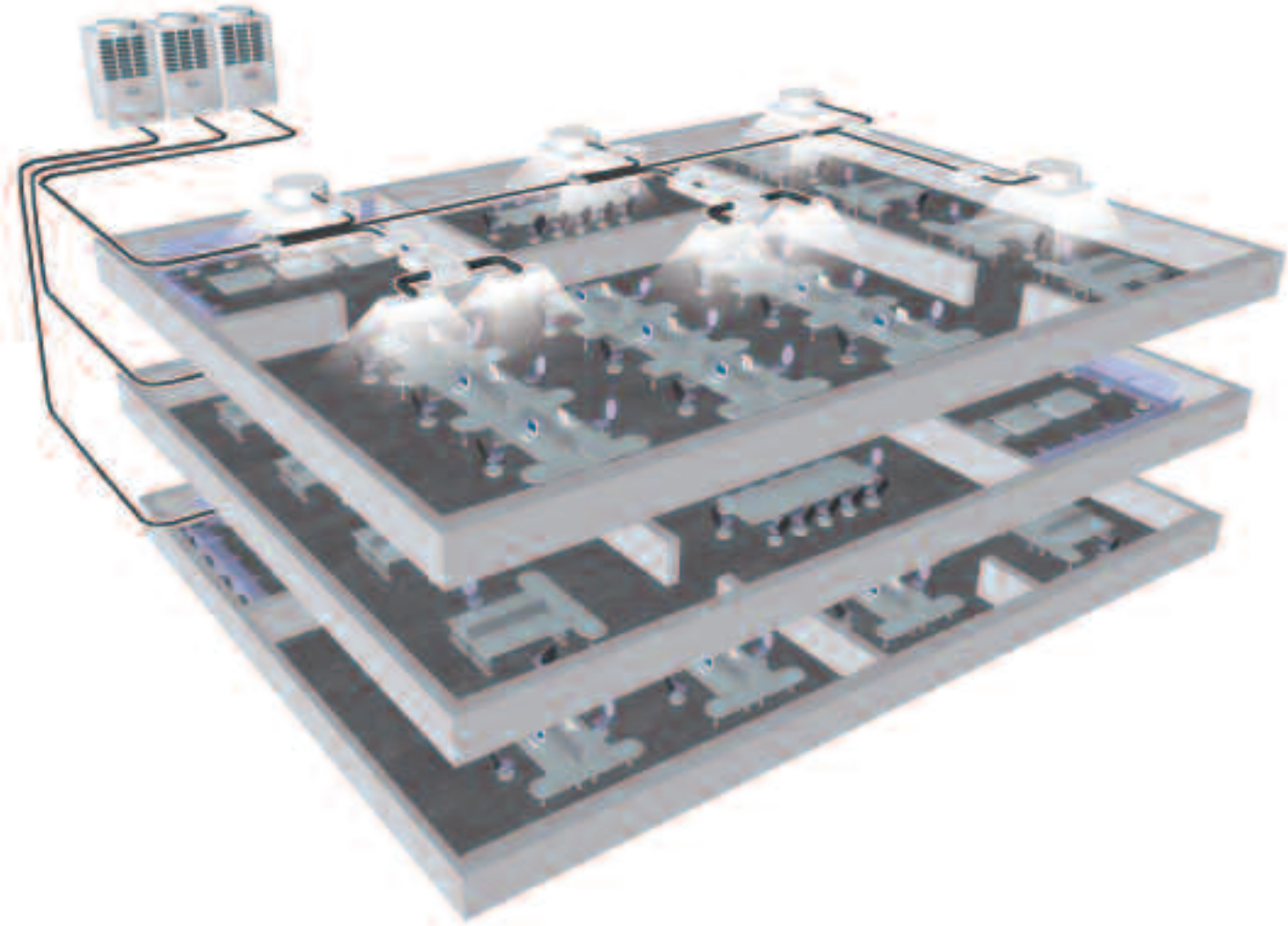


The diameter of the liquid and gas pipes is reduced due to the utilisation of R410A refrigerant (in some units).
More effective use of pipe shafts can also be made.
This results in further savings in installation costs.

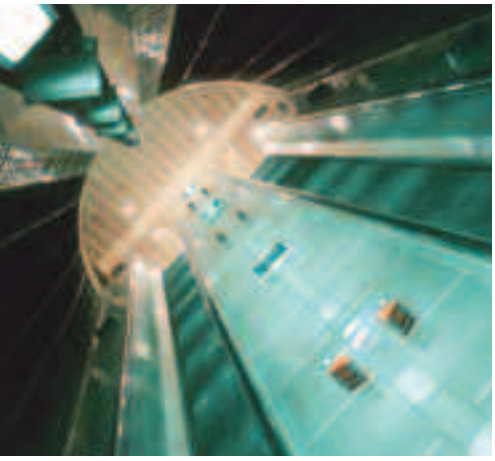
Typical applications.

The new VRF R410A system offers safety, reliability, comfort and modularity. Its main features include installation flexibility, long operating life and increased energy savings.
Typical applications of these units are projects where energy savings are a high-priority requirement, and they are frequently used in shopping centres, business buildings and above all hotels.
Thanks to the ultra-quiet operation of 3-pipe systems, VRF applications now also play an important role in prestigious residential installations, where several rooms need to be air-conditioned.
The wide range of flexible indoor units (from the 10 HP ducted unit to the 0.8 HP high-wall unit) satisfies any requirement.
Direct-expansion indoor units offer many benefits: easy, low-cost installation and precise performance control.
The range also includes a complete series of heat exchanger ventilation units to supply fresh air for the rooms in a building.
SMMS and SHRM units are ideal for even the most demanding installations.

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



Typical Application



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 capacity, easy installation and highest reliability.

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. The modular design of VRF R410A heat recovery systems allows installations up to 10.71 kW (30 HP). 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.

Outd

Outdoor units

Panoramic view.

Dual inverter compressors for each outdoor unit

Design optimised for non-ozone depleting R410A refrigerant

Compatible with Building Management Systems (BMS)

Excellent efficiency (EER and COP)

The new SMMS range: unbeatable performance.

With the innovative and sophisticated Toshiba technology the new generation of the R410A SMMS system ensures extraordinary flexibility in any application.
The most advanced heat pump system on the market offers an COP of 4.1 in its 14 kW size.
The units are available with a cooling capacity from 14 to 135 kW and a heating capacity from 16 to 150 kW, and their exceptional efficiency permits a reduction of up to 50% in annual energy consumption.

Maximised flexibility in any application.

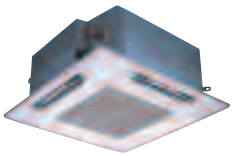
Toshiba offers a wide range of outdoor units with 28 models, and 22 different sizes with cooling capacities from 14 to 135 kW and heating capacities from 16 to 150 kW. With the new SMMS, 48 units can be connected to a single system.
The indoor unit range consists of 10 models and 13 sizes.

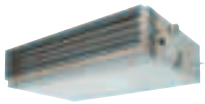
This flexibility means that there is always the right system for any requirement.

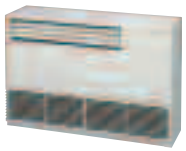
SUPER

SUPER MODULAR MULTI SYSTEM

- SMMS
- R410A
- DUAL INVERTER SYSTEM







SMMS VRF.

Key features

Best COP on the market: (4,1 with 14,4kW size) for reduced energy consumption and increased savings.

Advanced compressor Oil Management System guarantees improved reliability.

Interactive Intelligence.

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

Up to 48 indoor units can be connected - Toshiba exclusivity.

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

Extended pipe runs - 300m - for greater application flexibility.

Protection devices.

- Discharge and suction temperature sensors
- Internal overload relay
- Compressor overcurrent relay
- Overcurrent sensor
- High pressure switch
- Low pressure sensors

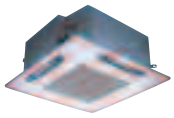
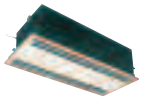
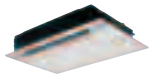
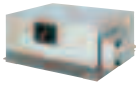
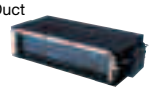
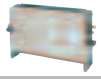
SMMS: Technical specifications **heat pump**

Outdoor unit			MAP0501T8 MAP0501HT8 5 HP	MAP0601T8 MAP0601HT8 6 HP	MAP0801T8 MAP0801HT8 8 HP	MAP1001T8 MAP1001HT8 10 HP	MAP1201T8 MAP1201HT8 12 HP
Cooling capacity*	kW	CO	14	16	22.4	28	33.5
Power input	kW	CO	3.65	4.64	5.67	7.67	11.92
EER	W/W	CO	3.84	3.45	3.95	3.65	2.81
Energy efficiency class		CO	A	A	A	A	C
Running current	A	CO	5.85	7.28	8.62	11.55	18.30
Heating capacity**	kW	HP	16	18	25	31.5	37.5
Power input	kW	HP	3.84	4.56	5.88	7.97	10.19
COP	W/W	HP	4.17	3.95	4.25	3.95	3.68
Energy efficiency class		HP	A	A	A	A	A
Running current	A	HP	6.09	7.08	8.93	11.98	15.65
Peak demand current***	A		20	20	30	30	30
Air Flow	m^3/h - l/s		9000 - 2520	9000 - 2520	9000 - 2520	9000 - 2520	9000 - 2520
Sound pressure level - at 1m	dB(A)		55	56	57	58	59
Operating range - db	°C		-5 - 43°C	-5 - 43°C	-5 - 43°C	-5 - 43°C	-5 - 43°C
Operating range - wb	°C		-20 - 16°C	-20 - 16°C	-20 - 16°C	-20 - 16°C	-20 - 16°C
Dimensions (HxWxD)	mm		1800 x 990 x750	1800 x 990 x750	1800 x 990 x750	1800 x 990 x750	1800 x 990 x750
Weight	kg		228	228	228	228	228
Compressor type			Hermetic	Hermetic	Hermetic	Hermetic	Hermetic
Refrigerant charge R410A	kg		8.5	8.5	12.5	12.5	12.5
Pipework							
Suction line type - diameter			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)****	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

* Based on an indoor air temperature of 27°C db/19°C wb and an outdoor air temperature of 35°C db.
** Based on an indoor air temperature of 20°C db and an outdoor air temperature of 7°C db/6°C wb.
*** If outdoor units are combined, refer to the installation manual.
**** If the height difference between indoor units exceeds 3 m and if the indoor unit is above, max. lift is reduced to 30 m.

	Model Name	Size	Cooling capacity	Heating capacity	Outdoor units in combination	Number of indoor units Max
	MAP0501HT8	5 HP	14 kW	16 kW	1	8
	MAP0601HT8	6 HP	16 kW	18 kW	1	10
	MAP0801HT8	8 HP	22.4 kW	25 kW	1	13
	MAP1001HT8	10 HP	28 kW	31.5 kW	1	16
	MAP1201HT8	12 HP	33.5 kW	37.5 kW	1	20
	MAP1401HT8	14 HP	38.4 kW	43 kW	2 (22.4 kW + 16 kW)	23
	MAP1601HT9	16 HP	45 kW	50 kW	2 (22.4 kW + 22.4 kW)	27
	MAP1801HT10	18 HP	50.4 kW	56.5 kW	2 (28 kW + 22.4 kW)	30
	MAP2001HT11	20 HP	56 kW	63 kW	2 (28 kW + 28 kW)	33
	MAP2201HT12	22 HP	61.5 kW	69 kW	3 (22.4 kW + 22.4 kW + 16 kW)	37
	MAP2211HT13	22 HP	61.5 kW	69 kW	2 (33.5 kW + 28 kW)	37
	MAP2401HT14	24 HP	68 kW	76.5 kW	3 (22.4 kW + 22.4 kW + 22.4 kW)	40
	MAP2411HT15	24 HP	68 kW	76.5 kW	2 (33.5 kW + 33.5 kW)	40
	MAP2601HT16	26 HP	73 kW	81.5 kW	3 (28 kW + 22.4 kW + 22.4 kW)	43
	MAP2801HT17	28 HP	78.5 kW	88 kW	3 (28 kW + 28 kW + 22.4 kW)	47
	MAP3001HT18	30 HP	84 kW	95 kW	3 (28 kW + 28 kW + 28 kW)	48
	MAP3201HT19	32 HP	90 kW	100 kW	4 (22.4 kW + 22.4 kW + 22.4 kW + 22.4 kW)	48
	MAP3211HT20	32 HP	90 kW	100 kW	3 (33.5 kW + 28 kW + 28 kW)	48
	MAP3401HT21	34 HP	96 kW	108 kW	4 (28 kW + 22.4 kW + 22.4 kW + 22.4 kW)	48
	MAP3411HT22	34 HP	96 kW	108 kW	3 (33.5 kW + 33.5 kW + 28 kW)	48
	MAP3601HT23	36 HP	101 kW	113 kW	4 (28 kW + 28 kW + 22.4 kW + 22.4 kW)	48
	MAP3611HT24	36 HP	101 kW	113 kW	3 (33.5 kW + 33.5 kW + 33.5 kW)	48
	MAP3801HT25	38 HP	106.5 kW	119.5 kW	4 (28 kW + 28 kW + 28 kW + 22.4 kW)	48
	MAP4001HT26	40 HP	112 kW	126.5 kW	4 (28 kW + 28 kW + 28 kW + 28 kW)	48
	MAP4201HT27	42 HP	118 kW	132 kW	4 (33.5 kW + 28 kW + 28 kW + 28 kW)	48
	MAP4401HT28	44 HP	123.5 kW	138 kW	4 (33.5 kW + 33.5 kW + 28 kW + 28 kW)	48
	MAP4601HT29	46 HP	130 kW	145 kW	4 (33.5 kW + 33.5 kW + 33.5 kW + 28 kW)	48
	MAP4801HT30	48 HP	135 kW	150 kW	4 (33.5 kW + 33.5 kW + 33.5 kW + 33.5 kW)	48

SMMS: Technical specifications **heat pump**

Model Type	Model Name	Capacity Code	Cooling cap. (kW)	Heating cap. (kW)	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
4-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				
2-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				
	MMU-AP0481WH	5	14	16	406	1650	650	52
1-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-AP0151SH	1.7	4.5	5	198	1100	655	27
	MMU-AP0181SH	2	5.6	6.3				
	MMU-AP0241SH	2.5	7.1	8		1200		31
Concealed duct, stand 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-AP0071SH/SPH	0.8	2.2	2.5	210	845	645	24
	MMD-AP0091SH/SPH	1	2.8	3.2				
	MMD-AP0121SH/SPH	1.25	3.6	4				26
	MMD-AP0151SH/SPH	1.7	4.5	5				
	MMD-AP0181SH/SPH	2	5.6	6.3				
Under-ceiling 	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-AP0071H	0.8	2.2	8	368	895	210	18
	MMK-AP0091H	1	2.8	9.6				
	MMK-AP0121H	1.25	3.6	12.8				
	MMK-AP0151H	1.7	4.5	15.8		1055		19
	MMK-AP0181H	2	5.6					
	MMK-AP0241H	2.5	7.1			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-AP151H	1.7	4.5	5	1750	600	210	48
	MMF-AP181H	2	5.6	6.3				
	MMF-AP241H	2.5	7.1	8				49
	MMF-AP271H	3	8	9				
	MMF-AP361H	4	11.2	12.5			390	65
	MMF-AP481H	5	14	16				
	MMF-AP561H	6	16	18				

Dual-inverter compressors for each outdoor unit

Design optimised for non-ozone depleting R410A refrigerant

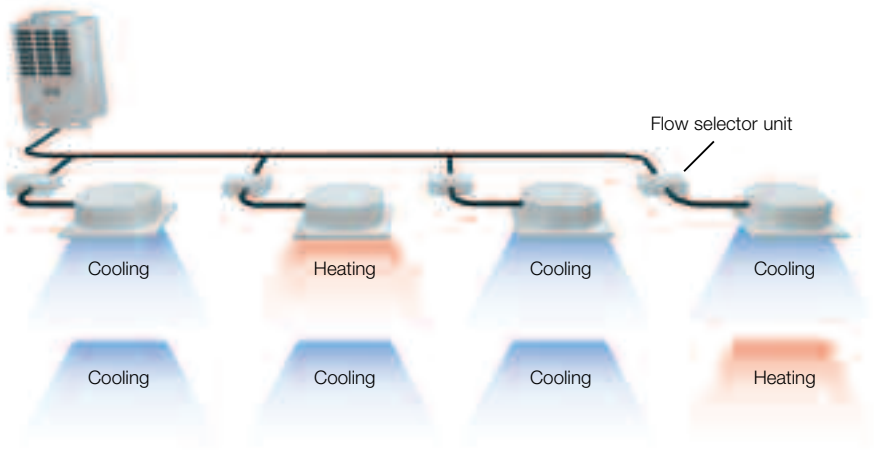
Low noise level

Excellent efficiency (EER and COP)

Toshiba now offers simultaneous heating and cooling.

The new Super Heat Recovery Multi (SHRM) range introduces important innovations with the possibility to provide simultaneous us heating and cooling.
This new model range can satisfy the most demanding needs and offers superior performances with COPs of 3.97 (8 HP), 3.61 (10 HP) and 3.68 (20/30 HP).
The new compact flow selector that can be used even in restricted spaces, enables the system to work simultaneously in cooling and heating mode.

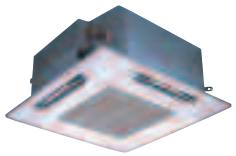
The cooling capacity range is from 22.4 to 84 kW and the heating capacity range from 25 to 95 kW. Up to 48 indoor units can be connected to a single system.

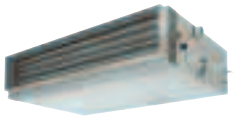


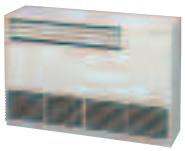
SUPER

SUPER HEAT RECOVERY MULTI

- SHRM
- R410A
- DUAL INVERTER SYSTEM







SHRM VRF.

Key features

Unbeatable energy consumption efficiency: average COP of 3.97 (22.4 kW).

Top for comfort: cooling or heating is automatically selected on a unit-by-unit basis to suit local area requirements and operating environment, thanks to the compact flow selector unit.

Toshiba's unique piping branch flexibility: the three-way pipe connection between indoor and outdoor units accommodates an installation height variation between indoor units of 35 m (equivalent to a 9-story building).

Enviable reliability with the Active Oil Management system.

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

Protection devices.

- Discharge and suction temperature sensors
- Internal overload relay
- Compressor overcurrent relay
- Overcurrent sensor
- High pressure switch
- Low pressure sensors

SHRM: Technical specifications **heat pump**

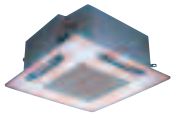
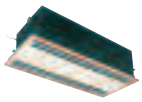
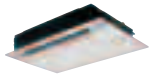
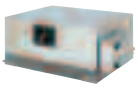
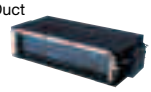
Outdoor unit	hp		MMY-MAP0802FT8 8 HP	MMY-MAP1002FT8 10 HP	MMY-MAP1202FT8 12 HP
Cooling capacity*	kW	CO	22.4	28.0	33.5
Power input	kW	CO	6.07	8.54	12.9
EER	W/W	CO	3.69	3.28	2.60
Energy efficiency class		CO	A	B	E
Running current	A	CO	9.25	13.15	19.85
Heating capacity**	kW	HP	25.0	31.5	35.5
Power input	kW	HP	6.29	8.73	9.65
COP	W/W	HP	3.97	3.61	3.68
Running current	A	HP	9.55	13.4	14.85
Air Flow	m^3/h - l/s		9900-2750	10500-2916	10500-2916
Sound pressure level - at 1m	dB(A)		57	58	59
Operating range (Cooling)dB(A)	°C		-10 - 43°C	-10 - 43°C	-10 - 43°C
Operating range (Heating) wb	°C		-20 - 15.5°C	-20 - 15.5°C	-20 - 15.5°C
Dimensions (HxWxD)	mm		1800 x 990 x 750	1800 x 990 x 750	1800 x 990 x 750
Weight	kg		263	263	263
Compressor type			Hermetic	Hermetic	Hermetic
Refrigerant charge R410A	kg		11,5	11,5	11,5
Pipework					
Suction gas type -diameter	in		Brazed - 7/8	Brazed - 7/8	Brazed - 1 1/8
Liquid type -diameter	in		Brazed - 3/4	Brazed - 3/4	Brazed - 3/4
Discharge gas type - diameter	in		Flare - 1/2	Flare - 1/2	Flare - 1/2
Maximum equivalent length separation	m		150	150	150
Maximum real rength	m		125	125	125
Maximum total pipe lengh	m		300	300	300
Maximum lift (Indoor unit above/below)***	m		30/50	30/50	30/50
Power supply	V-ph-Hz		400-3-50	400-3-50	400-3-50

* Based on an indoor air temperature of 27°C dB(A)/19°C wb and an outdoor air temperature of 35°C dB(A).
** Based on an indoor air temperature of 20°C dB(A) and an outdoor air temperature of 7°C dB(A)/6°C wb.
*** If the height difference between indoor units exceeds 3 m and if the indoor unit is above, max. lift is reduced to 30 m.

SHRM: Technical specifications **heat pump**

	Model Name	Size	Cooling capacity	Heating capacity	Outdoor units in combination	Number of indoor units Max	Total cap.of connectable indoor units Min	Total cap.of connectable indoor units Max
	MMY-MAP0802FT8	8 HP	22.4 kW	25 kW	1	13	5.6 HP	10.8 HP
	MMY-MAP1002FT8	10 HP	28 kW	31.5 kW	1	16	7.0 HP	13.5 HP
	MMY-MAP1202FT8	12 HP	33.5 kW	35.5 kW	1	16	8.4 HP	14.4 HP
	MMY-AP1602FT8	16 HP	45 kW	50 kW	2 (22,4kW+22,4kW)	27	11.2 HP	21.6 HP
	MMY-AP1802FT8	18 HP	50.4 kW	56.5 kW	2 (22,4kW+28,0kW)	30	21.0 HP	40.5 HP
	MMY-AP2002FT8	20 HP	56 kW	63 kW	2 (28,0kW+28,0kW)	33	14.0 HP	27.0 HP
	MMY-AP2402FT8	24 HP	68 kW	76.5 kW	3 (22,4kW+22,4kW+22,4kW)	40	16.8 HP	32.4 HP
	MMY-AP2602FT8	26 HP	73 kW	81.5 kW	3 (22,4kW+22,4kW+28,0kW)	43	18.2 HP	35.1 HP
	MMY-AP2802FT8	28 HP	78.5 kW	88 kW	3 (22,4kW+28,0kW+28,0kW)	47	19.6 HP	37.8 HP
	MMY-AP3002FT8	30 HP	84 kW	95 kW	3 (28,0kW+28,0kW+28,0kW)	48	21.0 HP	40.5 HP

SHRM: Technical specifications **heat pump**

Model Type	Model Name	Capacity Code	Cooling cap. (kW)	Heating cap. (kW)	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
4-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				
2-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				
	MMU-AP0481WH	5	14	16	406	1650	650	52
1-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-AP0151SH	1.7	4.5	5	198	1100	655	27
	MMU-AP0181SH	2	5.6	6.3				
	MMU-AP0241SH	2.5	7.1	8		1200		31
Concealed duct, stand 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-AP0071SH/SPH	0.8	2.2	2.5	210	845	645	24
	MMD-AP0091SH/SPH	1	2.8	3.2				
	MMD-AP0121SH/SPH	1.25	3.6	4				26
	MMD-AP0151SH/SPH	1.7	4.5	5				
	MMD-AP0181SH/SPH	2	5.6	6.3				
Under-ceiling 	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-AP0071H	0.8	2.2	8	368	895	210	18
	MMK-AP0091H	1	2.8	9.6				
	MMK-AP0121H	1.25	3.6	12.8				
	MMK-AP0151H	1.7	4.5	15.8		1055		19
	MMK-AP0181H	2	5.6					
	MMK-AP0241H	2.5	7.1			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-AP151H	1.7	4.5	5	1750	600	210	48
	MMF-AP181H	2	5.6	6.3				
	MMF-AP241H	2.5	7.1	8				49
	MMF-AP271H	3	8	9				
	MMF-AP361H	4	11.2	12.5			390	65
	MMF-AP481H	5	14	16				
	MMF-AP561H	6	16	18				

Indoo

Indoor Units

Panoramic view.

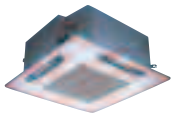
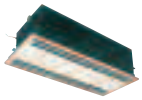
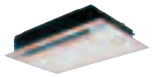
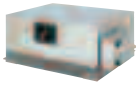
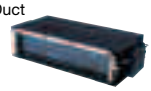
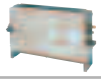
indoor

Complete range of indoor units.

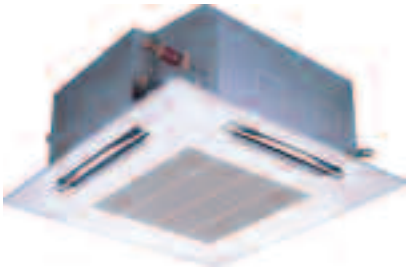
The large choice of indoor unit models and sizes for the new R410A VRF range makes it ideal for any type if installation, meeting space, aesthetic and functional requirements. The performances of all units are maximised - lowest sound levels, optimised air flows and the extremely compact design are the key features of the Toshiba units.

The latest additions to the range, the new compact hi-wall and the slim duct units, reaffirm Toshiba's commitment to create the perfect climate and well-being for business users. Toshiba provides not only comfort, but also the ideal climate conditions for any application.

Technical specifications **heat pump**

Model Type	Model Name	Capacity Code	Cooling cap. (kW)	Heating cap. (kW)	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
4-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				
2-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				
	MMU-AP0481WH	5	14	16	406	1650	650	52
1-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-AP0151SH	1.7	4.5	5	198	1100	655	27
	MMU-AP0181SH	2	5.6	6.3				
	MMU-AP0241SH	2.5	7.1	8		1200		31
Concealed duct, stand 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-AP0071SH/SPH	0.8	2.2	2.5	210	845	645	24
	MMD-AP0091SH/SPH	1	2.8	3.2				
	MMD-AP0121SH/SPH	1.25	3.6	4				26
	MMD-AP0151SH/SPH	1.7	4.5	5				
	MMD-AP0181SH/SPH	2	5.6	6.3				
Under-ceiling 	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-AP0071H	0.8	2.2	8	368	895	210	18
	MMK-AP0091H	1	2.8	9.6				
	MMK-AP0121H	1.25	3.6	12.8				
	MMK-AP0151H	1.7	4.5	15.8		1055		19
	MMK-AP0181H	2	5.6					
	MMK-AP0241H	2.5	7.1			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-AP151H	1.7	4.5	5	1750	600	210	48
	MMF-AP181H	2	5.6	6.3				
	MMF-AP241H	2.5	7.1	8				49
	MMF-AP271H	3	8	9				
	MMF-AP361H	4	11.2	12.5			390	65
	MMF-AP481H	5	14	16				
	MMF-AP561H	6	16	18				

MMU-AP (...) H



4 Way Cassette SMMS and SHRM.

Features

This 4-Way cassette benefits from Toshiba state-of-the-art energy saving technology:
With the industry's most advanced high-lift drain pipe provided as a 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 detachable and washable.

Flexible installation: ideal for sites with restriction on the space above ceiling level, 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.

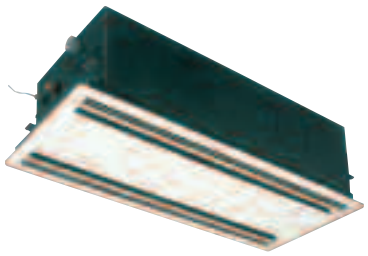
Simplified multidrop wiring connections.

Technical specifications **heat pump**

Indoor unit		MMU-	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H	AP0271H	AP0301H	AP0361H	AP0481H	AP0561H
Cooling capacity	kW	CO	2.8	3.6	4.5	5.6	7.1	8	9	11.2	14	16
Cooling capacity	Frig/h	CO	2408	3096	3870	4816	6106	6880	7740	9632	12040	13760
Heating capacity	kW	HP	3.2	4	5	6.3	8	9	10	12.5	16	18
Heating capacity	Frig/h	HP	2752	3440	4300	4816	6106	6880	7740	9632	12040	13760
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		0.3		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 (HxWxD)	mm		256 x 840 x 840		256 x 840 x 840		256 x 840 x 840			319 x 840 x 840		
Weight	kg		20		22		23			28		
Panel dimensions (HxWxD)	mm		35 x 950 x 950		35 x 950 x 950		35 x 950 x 950			35 x 950 x 950		
Panel weight	kg		4.5		4.5		4.5			4.5		
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



2 Way Cassette SMMS and SHRM.

Features

With its very compact size, this 2-Way Cassette is the best solution for small rooms. Discreet and slim, it can be easily installed and fits any interior decor. In addition, thanks to its silent operation, this model creates a very pleasant, quiet and comfortable environment.

Key features

Slim design, with a 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 2 directions, for a maximised comfort.

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

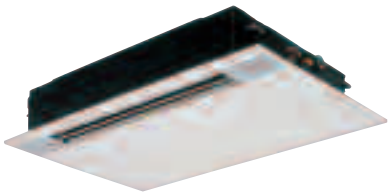
Enhanced Indoor Air Quality:
- Standard long-life filters.
- Fresh air intake: ensures
- constant air renewal.

Technical specifications **heat pump**

Indoor unit		MMU-	AP0071WH	AP0091WH	AP0121WH	AP0151WH	AP0181WH	AP0241WH	AP0271WH	AP0301WH
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1	8	9
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106	6880	7740
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8	9	10
Heating capacity	Frig/h	HP	2150	2752	3096	4300	5418	6880	7740	8600
Power consumption	kW		0.07			0.072		0.105		0.106
Running current	A		0.31			0.32		0.46		0.47
Starting current	A		0.47			0.6		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 (HxWxD)	mm		398 x 830 x 550			398 x 1350 x 550		398 x 1350 x 550		
Weight	kg		33			44		48		
Panel dimensions (HxWxD)	mm		8 x 1000 x 650			8 x 1520 x 650		8 x 1520 x 650		
Panel weight	kg		8			11		11		
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		

MMU-AP (...) YH/SH



1 Way Cassette SMMS and SHRM.

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 x 850 x 400 mm (sizes 2.2 to 3.6).

Flexible installation: ideal for sites with restriction on the space above ceiling level, the unit features a high-lift drain pipe (350 mm).

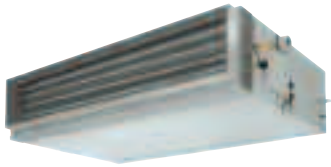
Low noise level: it operates at only 34 dB(A) (sizes 2.2 to 3.6).

Technical specifications **heat pump**

Indoor unit		MMU-	AP0071YH	AP0091YH	AP0121YH	AP0151SH	AP0181SH	AP0241SH
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8
Heating capacity	Frig/h	HP	2150	2752	3440	4300	5418	6880
Power consumption	kW		0.053			0.103		0.115
Running current	A		0.24			0.48		0.55
Starting current	A		0.6			0.8		1.1

Indoor unit		MMU-	AP0071YH	AP0091YH	AP0121YH	AP0151SH	AP0181SH	AP0241SH
Air Flow (h/l)	m^3/h		540/420			780/660		
Air Flow (h/l)	l/s		150/117			217/183		
Sound pressure level (h/l)	dB(A)		42/34			42/35		
Dimensions (HxWxD)	mm		235 x 850 x 400			198 x 1000 x 655		198 x 1200 x 655
Weight	kg		22			27		31
Panel dimensions (HxWxD)	mm		18 x 1050 x 470			10 x 1220 x 755		10 x 1420 x 755
Panel weight	kg		3.5			8		9
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 SMMS and SHRM.

Features

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

Key features

Space-saving design: only 320 mm in height.

Low noise level: at the low fan speed mode, 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 (270mm).

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	AP0301BH	AP0361BH	AP0481BH	AP0561BH
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1	8	9	11.2	14	16
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106	6880	7740	9632	12040	13760
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8	9	10	12.5	16	18
Heating capacity	Frig/h	HP	2150	2752	34400	4300	5418	6880	7740	8600	10750	13760	15480
Power consumption	kW		0.033		0.039		0.05	0.06		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		0.5		0.59		0.75	0.9		1.05	1.44	1.7	

Indoor unit		MMD-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH	AP0271BH	AP0301BH	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		133/64		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		32/28	33/29		34/29	36/32	38/32	
Dimensions (HxWxD)	mm		320 x 550 x 800			320 x 700 x 800		320 x 1000 x 800			320 x 1350 x 800		
Weight	kg		28			32		43			55		
Panel dimensions (HxWxD)	mm		9 x 630 x 500			9 x 780 x 500		9 x 1080 x 500			9 x 1430 x 500		
Panel weight	kg		3.5			4		6			7		
External static pressure	Pa												
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		

MMD-AP (...) SH

New Slim Duct SMMS and SHRM.

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 23 cm in height, for easier and more flexible installation.

Very low noise level: it can operate at only 28 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.

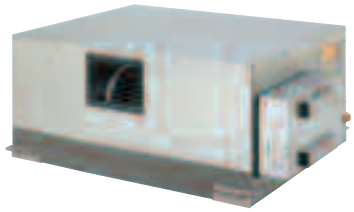
Technical specifications **heat pump**

Indoor unit		MMD-	AP0071SH	AP0091SH	AP0121SH	AP0151SH	AP0181SH
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816
Heating capacity	kW	HP	2.5	3.2	4	5	6.3
Heating capacity	Frig/h	HP	2150	2752	3440	4300	5418
Power consumption	kW		(x)	(x)	(x)	(x)	(x)
Running current	A		(x)	(x)	(x)	(x)	(x)
Starting current	A		(x)	(x)	(x)	(x)	(x)

Indoor unit		MMD-	AP0071SH	AP0091SH	AP0121SH	AP0151SH	AP0181SH
Air Flow (h/l)	m^3/h		540		630	690	780
Air Flow (h/l)	l/s		150		175	191.7	216.7
Sound pressure level (h/l) Rear suction	dB(A)		32/28		33/29	33/29	34/50
Sound power level (h/l) Bottom suction	dB(A)		36/32		38/33	39/34	40/36
Dimensions (HxWxD)	mm		210 x 845 x 945			210 x 845 x 945	
Weight	kg		24			26	
External static pressure	Pa		4 steps: 10 - 20 - 35 - 49				
Connecting pipe							
Gas	in		9.5			12.7	
Liquid	in		6.4				
Drain port diameter	mm		25				
Power supply	V-ph-Hz		(x)	(x)	(x)	(x)	(x)

P R E L I M I N A R Y

MMD-AP (...) BH



High Static Pressure Ducted Unit SMMS and SHRM.

Features

With a maximum Air Flow of around 2000 m³/h, this high-pressure ducted unit is Toshiba's most powerful duct unit. Unobtrusive, flexible and compact, it can be installed easily, and fits perfectly to any interior decor or design.
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.

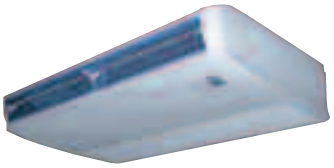
Static pressure can be set to 3 levels (68.6, 137 and 196 Pa)

Technical specifications **heat pump**

Indoor unit		MMD-	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0721H	AP0961H
Cooling capacity	kW	CO	5.6	7.1	8	11.2	14	22.4	28
Cooling capacity	Frig/h	CO	4816	6106	6880	9632	12040	19264	24080
Heating capacity	kW	HP	6.3	8	9	12.5	16	25	31.5
Heating capacity	Frig/h	HP	5418	6880	7740	10750	13760	21500	27090
Power consumption	kW		0.184	0.299		0.368	0.414	1.2	1.26
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		MMD-	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0721H	AP0961H
Air Flow (h/l)	m³/h		1080/720	1580/1060		1920/1280	2520/1680	4320/2880	5040/3360
Air Flow (h/l)	l/s		300/200	439/295		533/355	700/467	1200/800	1400/933
Sound pressure level (h/l)	dB(A)		37	40				49	50
Dimensions (HxWxD)	mm		380 x 850 x660				380 x 1200 x 660	470 x 1380 x 1250	
Weight	kg		50	52		56	67	150	
External static pressure	Pa		3 steps: 68.6 - 137 - 196						
Connecting pipe									
Gas	in		1/2	5/8			5/8	7/8	
Liquid	in		1/4	3/8			3/8	1/2	
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	

MMC-AP (...) H



Ceiling Suspended Unit SMMS and SHRM.

Features

Thanks to its simple suspension, the installation of this ceiling suspended unit is very easy. Moreover, this model creates a very pleasant and relaxing environment, diffusing automatically, rapidly and uniformly the required temperature, in cooling and heating modes.
Best solution for fixed ceilings, 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 with restriction on the space above ceiling level, 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 area of 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	CO	4.5	5.6	7.1	8	11.2	14
Cooling capacity	Frig/h	CO	3870	4816	6106	6880	9632	12040
Heating capacity	kW	HP	5	6.3	8	9	12.5	16
Heating capacity	Frig/h	HP	4300	5418	6880	7740	10750	13760
Power consumption	kW		0.033	0.038	0.05		0.091	0.11
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 (HxWxD)	mm		210 x 910 x 680		210 x 1180 x 680		210 x 1595 x 680	
Weight	kg		22		26		34	
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

New Compact High Wall SMMS and SHRM.

Features

Toshiba is proud to launch the new compact and light High Wall for the SHRM and SMMS range.
In addition to its enhanced design, this silent unit benefits from capacity control at all conditions.

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.

Lighter unit:11kg - 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	AP0121H
Cooling capacity	kW	CO	2.2	2.8	3.6
Cooling capacity	Frig/h	CO	1892	2408	3096
Heating capacity	kW	HP	2.5	3.2	4
Heating capacity	Frig/h	HP	2150	2752	3440
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-	AP0071H	AP0091H	AP0121H
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 (HxWxD)	mm		275 x 790 x 208	276 x 790 x 208	277 x 790 x 208
Weight	kg		11	12	13
Connecting pipe					
Gas	in		3/8	3/9	3/10
Liquid	in		1/4	1/5	1/6
Drain port diameter	mm		17	17	17
Power supply	V-ph-Hz		220/240-1-50	220/240-1-50	220/240-1-50

MMK-AP (...) H

High Wall unit SMMS and SHRM.

Features

Toshiba High Wall is elegant and slim, to blend in with any interior decor.

Key features

Aesthetic and compact design:
- Elegant, with its soft white colour and round design.
- Depth: only 210 mm, for an installation along the wall without wasting valuable floor space.

Easy installation, with its auxiliary piping.

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

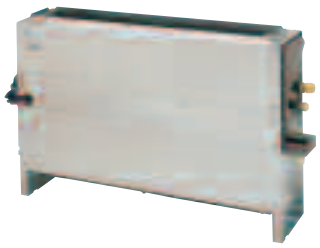
Top for comfort: 70° directional auto-swing louver for optimum air distribution.

Technical specifications **heat pump**

Indoor unit		MMK-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8
Heating capacity	Frig/h	HP	2150	2752	3440	4300	5418	6880
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		MMK-	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		250/180		300/217	
Sound pressure level (h/l)	dB(A)		39/35		45/38		49/39	
Dimensions (HxWxD)	mm		630 x 950 x 230		630 x 950 x 230		630 x 950 x 230	
Weight	kg		37		37		40	
Connecting pipe								
Gas	in		3/8			1/2		5/8
Liquid	in		1/4			1/4		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

MML-AP (...) H



Floor Mounted Console SMMS and SHRM.

Features

Suitable for refurbishment projects of small spaces.

Key features

Optimum piping flexibility:
- Refrigerant piping: 4 possibilities (top, rear, left or right side of the unit).
- Drain piping: 4 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.

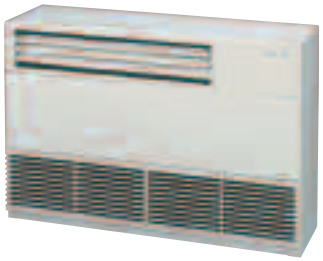
Compact unit : 630 x 950 x 230 mm, for more flexible installations and valuable space savings.

Technical specifications **heat pump**

Indoor unit		MML-	AP0071BH	AP0091BH	AP0121BH	AP0151BH	AP0181BH	AP0241BH
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8
Heating capacity	Frig/h	HP	2150	2752	3440	4300	5418	6880
Power consumption	kW		0.056			0.09		0.095
Running current	A		0.25			0.45		0.46
Starting current	A		0.6			0.8		1

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			205/136		264/178
Sound pressure level (h/l)	dB(A)		36/32			36/32		42/33
Dimensions (HxWxD)	mm		600 X 745 X 220			600 X 1045 X 220		
Weight	kg		21			29		
Connecting pipe								
Gas	in		3/8			1/2		5/8
Liquid	in		1/4			1/4		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

MML-AP (...) BH



Concealed Chassis Unit SMMS and SHRM.

Features

Toshiba's concealed chassis is the perfect solution for perimeter walls and can be hidden 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, hospitals, etc.

Key features

Very compact design:
- Height: only 600 mm, ideal for perimeters walls.
- Depth: 200 mm, the unit can be installed along the wall without wasting valuable floor space.

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-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Cooling capacity	kW	CO	2.2	2.8	3.6	4.5	5.6	7.1
Cooling capacity	Frig/h	CO	1892	2408	3096	3870	4816	6106
Heating capacity	kW	HP	2.5	3.2	4	5	6.3	8
Heating capacity	Frig/h	HP	2150	2752	3440	4300	5418	6880
Power consumption	kW		0.035			0.037		0.04
Running current	A		0.3			0.32		0.35
Starting current	A		0.36			0.42		0.47

Indoor unit		MML-	AP0071H	AP0091H	AP0121H	AP0151H	AP0181H	AP0241H
Air Flow (h/l)	m^3/h		600/480			780/600		1200/900
Air Flow (h/l)	l/s		167/133			217/167		333/250
Sound pressure level (h/l)	dB(A)		39/31			42/35		42/35
Dimensions (HxWxD)	mm		368 x 895 x 210			368 x 1055 x 210		368 x 1430 x 210
Weight	kg		18			19		25
Connecting pipe								
Gas	in		3/8			1/2		5/8
Liquid	in		1/4			1/4		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

MMF-AP (...) H

Floor Standing SMMS and SHRM.

Features

This system is particularly suitable to air condition large rooms that are not very high. It is also the right solution for small, low areas 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 even large 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°.

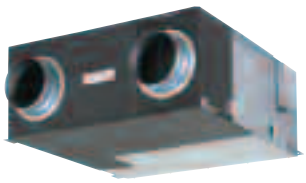
Large capacity range
- Cooling capacities from 4.5 kW to 16 kW and heating capacities from 5 kW to 18 kW.

Technical specifications **heat pump**

Indoor unit		MMF-	AP0151H	AP0181H	AP0241H	AP0271H	AP0361H	AP0481H	AP0561H
Cooling capacity	kW	CO	4.5	5.6	7.1	8	11.2	14	16
Cooling capacity	Frig/h	CO	3870	4816	6106	6880	9632	12040	13760
Heating capacity	kW	HP	5	6.3	8	9	12.5	16	18
Heating capacity	Frig/h	HP	4300	5418	6880	7740	10750	13760	15480
Power consumption	kW		0.15		0.19		0.28	0.35	
Running current	A		0.67		0.88		1.29	1.6	
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 (HxWxD)	mm		1750 x 600 x 210		1750 x 600 x 210		1750 x 600 x 390		
Weight	kg		48		49		65		
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		

5 AVAILABLE MODELS



- Reduced energy consumption (up to 70%)
- Free cooling for in-between seasons

Air-to-Air Heat Exchangers.

Features

The Toshiba heat recovery range allows treatment of the primary air. With this system exhaust heat is recovered and used to pre-condition the supply air and reduce the load on the air conditioning system. This helps prevent the sick building syndrome and reduces the energy required to cool or heat the indoor air by up to 70%.
Five system sizes meet any specific requirements, with an air flow range from 70 to 280 l/s (250 to 1000 m^3/h) and an external pressure of 140 Pa.

Key features

5 available models, with an air flow range from 70 to 280 l/s (250-1000 m^3/h).

Fresh air ventilation: increasingly required in internal rooms without window access.

Changes temperature and humidity of the entering fresh air.

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

Improved energy efficiency, especially during the hot and cold seasons.

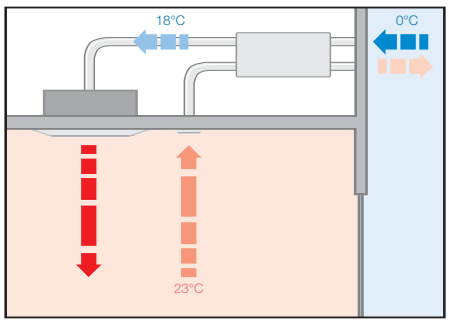
Recovery of up to 75% heat from the outgoing air.

Helps prevent sick building syndrome.

Technical specifications **heat pump**

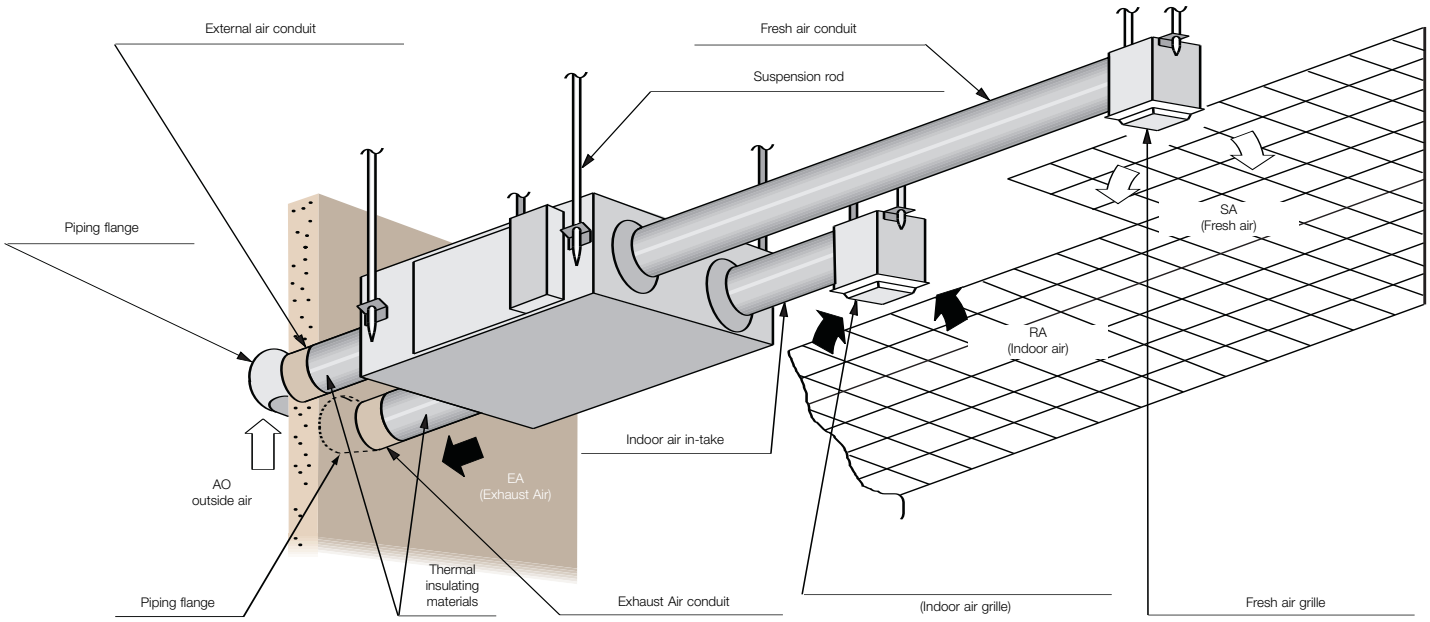
Outdoor unit		VN-250SE	VN-350SE	VN-500SE	VN-800SE	VN-1SAE
Air Flow (h/l)	m^3/h - l/s	250/170 - 70/48	350/280 - 98/78	500/370 - 140/104	800/650 - 224/182	1000/810 - 218/227
Temperature exchange efficiency (h/l)	%	75/77	75/77	75/77	75/77	75/77
Sound pressure level (h/l)	dB(A)					
Heat reclaim mode		27/22	30/26	32/36	37.5/34	37/33
Bypass mode		27.5/22.5	31/27	33/27.5	38/35	37.5/33.5
Sound power level	dB(A)					
Operating range	°C	-10 - 40°C	-10 - 40°C	-10 - 40°C	-10 - 40°C	-10 - 40°C
Power Input (h/l)	W					
Heat reclaim mode		114/90	137/128	188/166	329/327	391/359
Bypass mode		114/90	132/125	182/164	325/316	85/355
Enthalpy exchange efficiency (h/l)						
Heating	%	70/73	69/71	67/71	71/74	71/74
Cooling	%	63/66	66/69	62/67	65/68	65/68
Max. external static pressure (h/l)		80/37	65/42	70/38	110/70	55/35
Dimensions (HxWxD)	mm	270 x 599 x882	270 x 804 x 882	270 x 904 x 962	388 x 884 x 1322	388 x 1134 x 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

Heat recovery



Heating

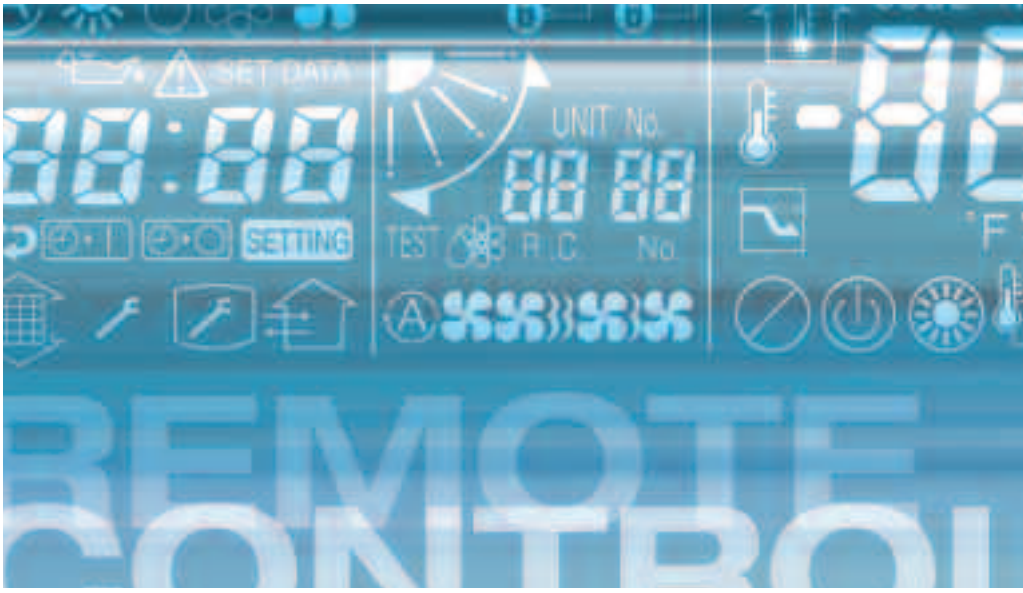
Installation example of a VN unit



Cont

Controls
Panoramic view.

Contr



Technology is nothing without control.

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

TCC-Link controls.

These controls known as TCC-Link - provide an effective response to the user's demands. TCC-Link incorporates a two-wire, non-polarity system with automatic addressing of the indoor units and provides the communication link between the indoor and outdoor units.

Improved operation features.

- Automatic addressing of indoor units overcomes the need for manually setting each indoor unit individually.
- The remote controller enables the user to change parameters, such as air flow adjustment for high ceilings, from the remote controller, and to check operating data.
- The actual room temperature can be displayed at the remote controller.

Temperature sensor

Compact design and minimised installation space.

Simplified display using icons.

Automatic network addressing.

TCC-Link connections with non-polarised wiring.

New R410A VRF TCC Link Control

Controls	Description	Available Applications
RBC-AMT21E	Wired remote controller	SMMS/SHRM - DI/SDI
RBC-AS21E	Simple wired remote controller	SMMS/SHRM - DI/SDI
RBC-AX22CE	Wireless remote controller kit - ceiling	SMMS/SHRM - DI/SDI
RBC-EXW21E	Weekly timer	SMMS/SHRM - DI/SDI
BMS-IFDD01E	Digital I/O Relay Interface	SMMS/SHRM
BMS-IFLSV1E	TCS-Net Relay Interface	SMMS/SHRM
BMS-IFWH3E	Energy Monitoring Relay Interface	SMMS/SHRM
BMS-LSV2E	Intelligent Server	SMMS/SHRM
BMS-STCC01E	Intelligent Server Software	SMMS/SHRM
BMS-TP0640ACE	Touch Screen Controller	SMMS/SHRM
BMS-TP0640TWE	Touch Screen Controller	SMMS/SHRM
BMS-TP5120ACE	Touch Screen Controller	SMMS/SHRM
BMS-TP5120TWE	Touch Screen Controller	SMMS/SHRM
TCB-AX21E	Wireless remote controller kit - others	SMMS/SHRM - DI/SDI
TCB-AX21U(W)-E	Wireless remote controller kit - cassette	SMMS/SHRM - DI/SDI
TCB-IFCB-4E	Remote location ON/OFF control box	SMMS/SHRM
TCB-PCDM2E	Power peak-cut control board	SMMS/SHRM
TCB-PCIN2E	Error output control board	SMMS/SHRM
TCB_PCMO2E	External master ON/OFF control board	SMMS/SHRM
TCB-PCNT20E	Network adapter	SMMS/SHRM
TCB-PCNT30TLE	“1:1 model” connection interface	SMMS/SHRM - DI/SDI
TCB-SC642TLE	Central remote controller	SMMS/SHRM - DI/SDI
TCB-TC21LE	Remote sensor	SMMS/SHRM - DI/SDI

Local control systems.

The wired local controller RBC-AMT21E (or simplified model RBC-AS21E) 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 weekly timer RBC-EXW21E, 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 AX21E, TCB AX22CE, TCB AX21U (W)E) to manage the main control functions.

Control via indoor remote controller.

RBC-AMT21E
Remote controller.
Remote controller type RBC-AMT21E is designed to control single or multiple (maximum 8) indoor units - up to 500 m away if required.
Group control.
A maximum of eight indoor units can be controlled within the same parameters by a single remote controller.
The standard remote controller contains these functions:
– Start/stop
– Mode change
– Temperature adjustment
– Air flow adjustment
– Timer
– Filter maintenance time
– Diagnostics and fault code display
- Control by two remote controllers is available

RBC-AMT21E

RBC-AS21E
Two controlling positions.
One indoor unit can be controlled from two locations using a standard remote controller and a sub-controller type RBC-AS21E.
This simplified controller contains these functions:
– Start/stop
– Temperature adjustment
– Air flow adjustment
– Filter maintenance time
– Fault code display

RBC-AS21E

TCB-AX21E
Functions of the remote controller.
– Start/stop
– Mode adjustment
– Temperature adjustment
– Fan speed adjustment
– Timer function
– Filter maintenance time
– Fault code display
– Connection to a second (sub) controller.

IR Remote Control TCB AX21

Central control systems.

Central control systems.

RBC-EXW21E

Weekly timer.
A weekly timer type RBC-EXW21E can be used in conjunction with a single remote controller or a central remote controller. The timer contains 7-day scheduling and day copy functions and a clock.
Functions of the weekly timer
– Weekly scheduling
– Different cycle times each day
– ON/OFF two times each day
– Repeat function
– Clear function
– Summer/winter scheduling
– Day omit function
– Memory retention for 72 hours after power failure.

Weekly Timer RBC EX21E

TCB-SC642TLE

Enables the individual control of up to 64 indoor units.
This controller contains the same functions as the main remote controller and can display the operating parameters of unit or groups of units such as:
• Integrated set-up function
• Zone control
• Last-touch priority function
• Providing full, restricted or no control to the remote controller.

Central controller TCB SC642TLE

With the Toshiba central controller TCB-SC642TLE, up to 64 indoor units can be monitored individually, and be divided into 4 zones (up to 16 indoor units for each zone).
In case of Light Commercial models (Digital and Super Digital Inverter) maximum 512 indoor units are controllable by one central remote control (8 units in groups per 64 units).
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.

Control without indoor remote controller

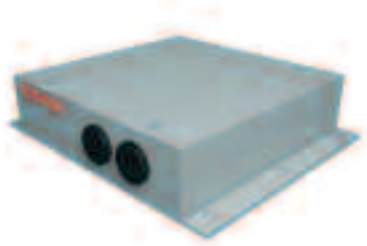
The units can be operated from the central remote controller only, without using indoor remote controllers.

Network control system.

Toshiba offers precise control of the 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 Toshiba network guarantee maximised integration with other building systems such as elevators, fire protection systems, lighting etc. The range of open-network controls was been specifically designed for Building Management Systems.

Lon Gateway

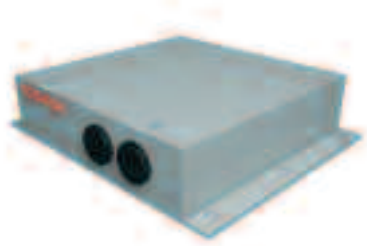
The Lon Gateway interface manages the New R410A VRF air conditioning system as a Lon device to communicate with the customer's Building Management System and to monitor operational status.
Lon Gateway using SNVT signals and providing the following functions:
Command:
– ON/OFF
– Mode: cool/heat/fan
– Temperature setting
– Central/local
Monitoring:
– ON/OFF
– Mode: cool/heat/fan/failure
– Temperature setting
– Room temperature
– Central/local



Lon Gateway

BACnet Gateway

The BACnet system operates in conjunction with the Intelligent Server and uses object signals providing the following functions:
– Object signals
Command:
– ON/OFF
– Mode: cool/heat/fan
– Temperature setting
– Central/local
– Fan speed
Monitoring:
– ON/OFF
– Mode: cool/heat/fan/failure
– Temperature setting
– Room temperature
– Central/local
– Energy monitoring



BACnet Gateway

Touch screen controller

Using the touch screen controller with the intelligent server provides a clear display and enables easy operation.
Command:
– ON/OFF
Network control:
– Cool/heat
– Temperature setting
– Central/local
Monitoring:
– ON/OFF
– Cool/heat
– Room temperature
– Central/local
– Failure
– Scheduler
Energy monitoring using the power meter interface and a locally-supplied power meter.
– Fault code display
– Operational data logging/recording

Touch Screen

	Touch screen controller		
Switching HUB	Procured on site	*	Comply with 10BASE-T ** Number of ports: As required
Ethernet wire	Procured on site	*	Category 5 UTP straight wire
PC	Procured on site		OS: Windows 2000 or later Excell 2000 or later
Power mater	Procured on site	***	Pulse output type Pulse generetor constants: 1 kWh/pulse or 10 kWh/pulse Pulse duration: 50 - 1000 ms Output terminal: ON/OFF contactor

* The number of ethernet wires and the number of switching HUB port vary with the number of intelligent Server connected.
** 100 BASE-T compliant is required in using 5 or more server, or 2 or more controllers.
*** The number of power meters vary with power meter specifications.
- Two or more refrigerant system can be connected to one power meter.
- For heat recovery VRF (SHRM) and “Super Digital Inverter”, “Digital Inverter”, it is necessary to install the power meter independently.
- All power meters connected same controller must be set same pulse generator constants.

Network Control Intelligent Server

Connects directly to the customer's PC without the need to install additional software and provides the following functions:
Command:
– ON/OFF
– Cool/heat
– Temperature setting
– Central/local
Monitoring:
– ON/OFF
– Cool/heat
– Room temperature
– Central/local
– Failure
– Scheduler
Energy monitoring using the power meter interface and a locally-
supplied power meter.
– Fault code display
– Operational data logging/recording
Energy monitoring application
– Power meter interface, power meter locally supplied (specification 1 pulse/kWh - 200/400 ms pulse width)

Server

TCB-PCNT30LE

TCC-Link adapter for integrating Digital and Super Digital Inverter units into a Super MMS control network.

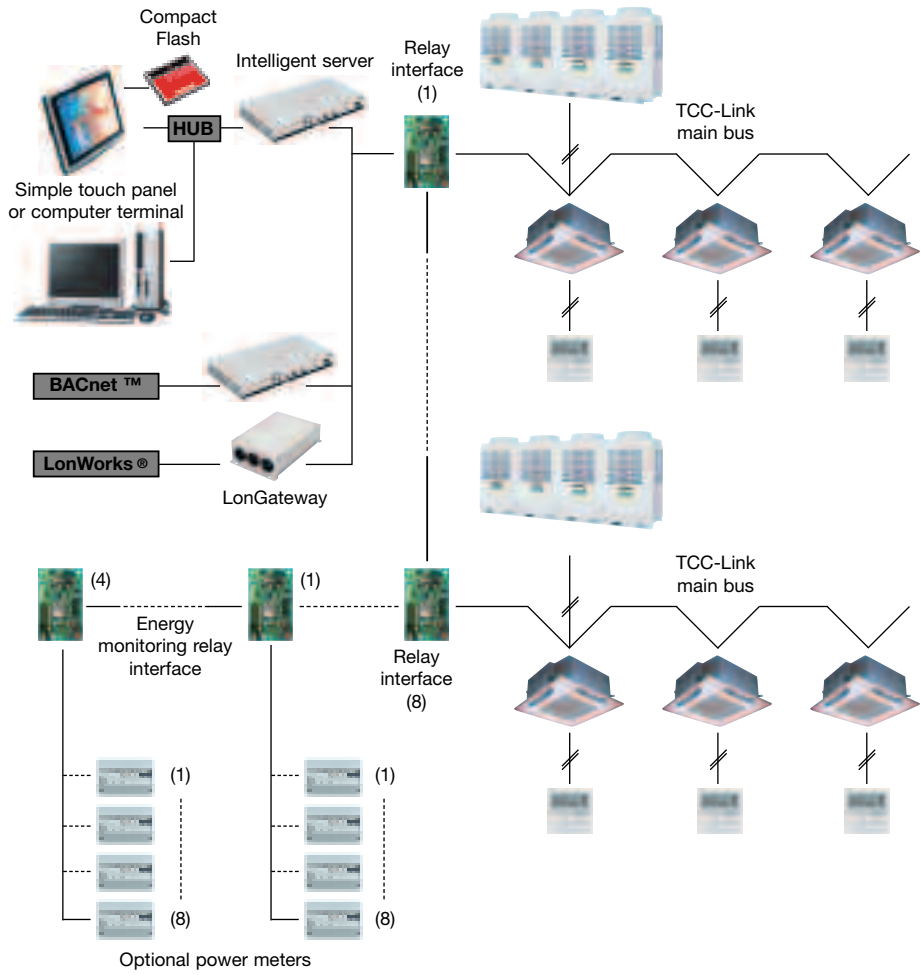
TCB-IFCB3E

An external switching device for remote on/off system operation.

TCB-IF21CGTLE

TCC-Link adapter for RAS HA control interface.

TCC-Link



Complementary Products

Panoramic view.

With Toshiba Everything is easier.

Toshiba's commitment to the development of technologically innovative products with improved performances is complemented by the 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 new system design software has been developed for the R410A* VRF and is a useful and irreplaceable support tool for engineers, architects, installers and in general for anyone who wants to apply the innovative Toshiba solutions.

This new Selection Software can be considered the most friendly and easy-to-use selection tool in the VRF market.
With this software, the user can put together 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.

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 innovative and high performance selection software, developed exclusively by Toshiba, the design of VRF systems is supported for the project at the given conditions. The software constantly monitors possible design errors and warns the user, when it exceeds the system limits.

* SHRM Selection Software under development.

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

Specific details and data of the unit 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 HTML software.

Automatic regeneration when adding or amending an existing projects 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 VRF systems, Toshiba has developed the diagnostic software - 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.

Evaluation of the **indoor unit performance.**

Evaluation of the **outdoor unit performance.**

Supervision of the **refrigerant circuit** and the related **operating parameters:**

- valve conditions,

- refrigerant flow temperatures,

- detailed refrigerant cycle diagram, etc.

Memorisation of the **1000 most recent events.**

Provision of data for analysis by engineers.


Branching line up
T-SHAPE BRANCHING
RBM-BT13FE

Acce

Accessories

VRF R410A

Branching line up

Controls	SMMS (2 piping)	SHRM (3piping)	Total indoor unit capacity	Appearance
Y-SHAPE BRANCHING JOINT	RBM-BY53E RBM-BY103E RBM-BY203E RBM-BY303E	RBM-BY53FE RBM-BY103FE RBM-BY203FE RBM-BY303FE	less than 18kW 18 to 40kW 40 to 70.5 kW 70,5kW or more	
4-BRANCHING HEADER	RBM-HY1043E RBM-HY2043E	RBM-HY1043FE RBM-HY2043FE	Less than 40kW 40 to 70,5kW	
8-BRANCHING HEADER	RBM-HY1083E RBM-HY2083E	RBM-HY1083FE RBM-HY2083FE	Less than 40kW 40 to 70,5kW	
T-SHAPE BRANCHING		RBM-BT13FE	For outdoor units connections	

New R410A VRF Accessories

Code	Description	Power cooling
RBM-BY53E RBM-BY103E RBM-BY203E RBM-BY303E RBM-BY53FE RBM-BY103FE	Branch Kits	< 6.4HP < 6.4-14.2HP < 14.2-25.2HP 25.2HP < 6.4HP < 6.4-14.2HP

Code	Description	Power cooling
RBM-HY1043E 4-way RBM-HY2043E 4-way RBM-HY1083E 8-way RBM-HY2083E 8-way RBM-HY1043FE RBM-HY1083FE	Headers 4 way - 3 pipe 8 way - 3 pipe	< 14.2 < 14.2-25.2HP < 14.2 < 14.2-25.2HP < 14.2 < 14.2

Code	Description	Power cooling
RBM-BT13E	T-Connector - 2 pipe range	

New R410A VRF **Accessories**

Code	Description	Compatible with
TCB-PCBO2E TCB-LF1601UE TCB-UFM1601UE TCB-UFH1601UE TCB-GFC1601UE TCB-GB1601UE TCB-FF101URE TCB-SP1601UE TCB-BC1601UE	Snowfall Outdoor Control Super Long Life Filter High Efficiency Filter 65 High Efficiency Filter 90 Frech air and Filter Chamber Fresh air inlet Box Auxiliary fresh air Flange Spacer for height adjustment Air discharge direction kit	
(For rear suction) TCB-UFM11BFCE TCB-UFM21BFCE (For underside suction) TCB-UFM11BE TCB-UFM21BE TCB-UFM31BE TCB-UFM41BE	High Efficiency Filter 65	 AP0071-0121/AP0241-0301 AP0151-0181/AP0361-0561 AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
(For rear suction) TCB-UFH51BFCE TCB-UFH61BFCE (For underside suction) TCB-UFH51BE TCB-UFH61BE TCB-UFH71BE TCB-UFH81BE	High Efficiency Filter 90	 AP0071-0121/AP0241-0301 AP0151-0181/AP0361-0561 AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
(Half panel for underside suction) RBC-UD281PE(W) RBC-UD501PE(W) RBC-UD801PE(W) RBC-UD1401PE(W)	Ceiling panel	 AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
TCB-CA281BE TCB-CA501BE TCB-CA801BE TCB-CA1401BE	Suction Canvas	AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
(For rear suction) TCB-FC281BE TCB-FC501BE TCB-FC801BE TCB-FC1401BE	Filter Chamber	 AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
TCB-FK281BE TCB-FK501BE TCB-FK801BE TCB-FK1401BE	Filter kit for underside	AP0071-0121 AP0151-0181 AP0241-0301 AP0361-0561
TCB-UFM1D-1E TCB-UFM2D-1E TCB-UFM3DE	High Efficiency Filter 65	AP0181/0481 AP0241-0361 AP0721-0961
TCB-UFH5D-1E TCB-UFH6D-1E TCB-UFH7DE	High Efficiency Filter 90	AP0181/0481 AP0241-0361 AP0721-0961
TCB-PF1D-1E TCB-PF2D-1E TCB-PF3DE	Long life Pre-filter	AP0181/0481 AP0241-0361 AP0721-0961
TCB-FCY21DE TCB-FCY31DE TCB-FCY51DE TCB-FCY100DE	Filter Chamber	AP0181 AP0241-0361 AP0481 AP0721-0961
TCB-DP31DE TCB-DP32DE	Drain Pump Kit	AP0181-0481 AP0721-0961
TCB-DP22CE	Drain Pump Kit	AP0151-0481
TCB-KP12CE TCB-KP22CE	Elbow Piping Kit	AP0151-0181 AP0241-0481

Master Release 1.0 - February 2005

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