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\*Heat recovery

## Toshiba: consistent leaders through constant innovation

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.



The company's origins go back to 1875 when the Tanaka Engineering Works was established as Japan's first manufacturer of telegraphic equipment.

- 1875 Toshiba established as a pioneer of Japan's technology industry.
- 1957 Toshiba enters the air conditioning business
- 1969 Toshiba introduces the first portable units
- 1977 Toshiba is first to introduce electronic control for air conditioning units
- 1981 The first inverter technology is launched by Toshiba
- 1988 Toshiba is first to introduce the twin rotary compressor
- 1999 Toshiba is the first air conditioning manufacturer to launch a full range of split-system units purpose-designed for use with non-ozone depleting refrigerants, thus reducing the impact of air conditioning on the environment.
- 2000 The most advanced inverter-driven residential units for use with non-ozone depleting refrigerants are introduced, making Toshiba's Super Multi technology available for residential as well as commercial applications.

Today Toshiba's number one objective is the design and manufacture of products in the most environmentally friendly way possible. We offer air conditioning solutions that improve living and working environments, but which also respect the global environment.

Our innovations in energy efficiency and our commitment to using only environmentally neutral refrigerants demonstrate our responsible attitude to preserving the world around us.



## Toshiba factories and quality

The three main Toshiba factories are in Bangkok in Thailand, Fuji in Japan and Plymouth in the United Kingdom.

Together they employ over 3000 people who are committed to innovation and excellence.

All three factories are certified to ISO 14001 for Environmental Management and ISO 9001 for Quality Management.



Toshiba also participates in the Eurovent certification programme under which its products are tested by independent laboratories to verify their compliance with published catalogue data.

All products sold are manufactured in accordance with the directives of the CE marking system.



Originally Toshiba air conditioning products were imported into Europe from Japan, but so great was the demand in Europe that in 1990 the company decided to set up manufacturing facilities in the United Kingdom to serve both the British and continental European markets. Toshiba designed and built one of Europe's most advanced air conditioning factories on the outskirts of Plymouth.

As in all Toshiba factories, quality control standards here are among the highest in the world. In 1995 Toshiba won the much coveted award which Management Today in association with the Cranfield School of Management gives to the best engineering factory in the UK. The company is one of the largest and most enlightened employers in the UK.





## We do not inherit the environment from our parents, we borrow it from our children

Toshiba is proud to be part of an industry whose products have so clearly demonstrated their value to our standard of living. We believe the industry will continue to provide such value without sacrificing the well-being of so many people we serve and upon whom we depend.

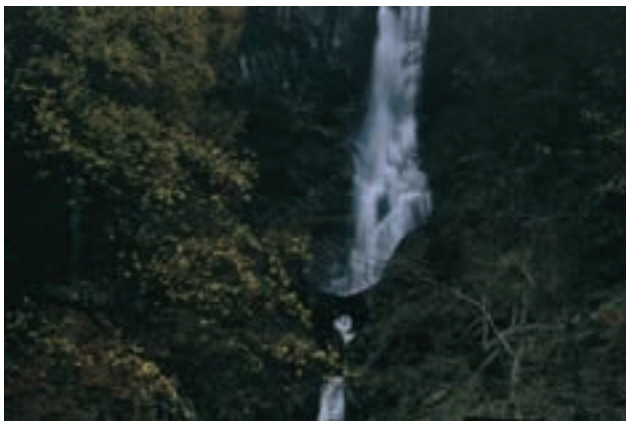


### Refrigerants

Our lifestyle expectations have risen in the last few decades, and refrigeration and air conditioning has become essential to our well-being.

But in today's ecologically aware world we must balance our search for progress with the need to protect the environment for future generations.

By using environmentally neutral refrigerants and minimising the use of refrigerants now, we are protecting our investment today and ensuring a safer environment for tomorrow.



Toshiba has anticipated European legislation, and chosen R-410A and R-407C as replacement refrigerants for R22. Both have an ozone depletion potential of zero, and both are classified as safe A1 class refrigerants (low toxicity and non-flammable). We use energy-efficient equipment to minimise power consumption which ultimately translates into less CO<sub>2</sub> released into the atmosphere, minimising the impact on global warming.

#### R410A refrigerant

R410A is a zeotropic blend of R32 (50%) and R125 (50%). It is acknowledged as the most energy-efficient, environmentally friendly refrigerant available for smaller residential and light commercial products. Because of its high operating pressures it exhibits excellent heat transfer performance.

**R410A**

#### R407C refrigerant

R407C is a zeotropic blend of R32 (23%), R125 (25%) and R134a (52%). It has been specially formulated to closely match the thermophysical properties of R22. It requires careful optimisation of the system components if it is to yield optimum performance.

**R407C**

#### Refrigerant detection and containment system (RDC)

Toshiba offers an optional refrigerant detection system. This senses the air quality within a room, and if refrigerant levels exceed preset limits, it emits an audible alarm and transmits a signal to activate auxiliary valves, isolating the indoor unit from the system and preventing further leakage to the environment, in accordance with European legislation (EN378-400).



## Indoor Air Quality (IAQ)

Indoor air quality is the condition of the air to which the room occupant is exposed. It not only refers to the presence of contaminants in the air, but also includes all elements of comfort air conditioning, such as temperature, humidity and even sound level control. The realisation that many of the contaminants are harmful to the room occupants, makes their control a design objective in HVAC systems. A healthier building environment results in greater worker productivity and lower health costs, making the building more attractive to tenants.

Toshiba has developed advanced new filtering systems that optimise the quality of the indoor air.

**Anti-mould filters** remove larger suspended contaminants from the air, such as dust, pollen and other pollutants. These filters are washable in water for easy maintenance and offer an efficient method to preserve a pleasant and comfortable atmosphere.

**Electrostatic filters** - Smaller contaminants, such as dust particles and tobacco smoke affect our working and living environment. Toshiba air conditioning systems incorporate electrostatic filters:

- **Passive electrostatic filters** eliminate particles up to 0.01 microns. These filters have a limited useful life for the duration of their electrostatic charge. Negatively charged ions attract particles with an efficiency of 40%.
- **Active electrostatic filters** consist of two phases. In these phases the proton and anion charge of the filter neutralises particles with an efficiency of 90%. These filters also offer less resistance to the entering air flow. The filter charge does not exhaust itself, and they recover their efficiency when they are washed in water.

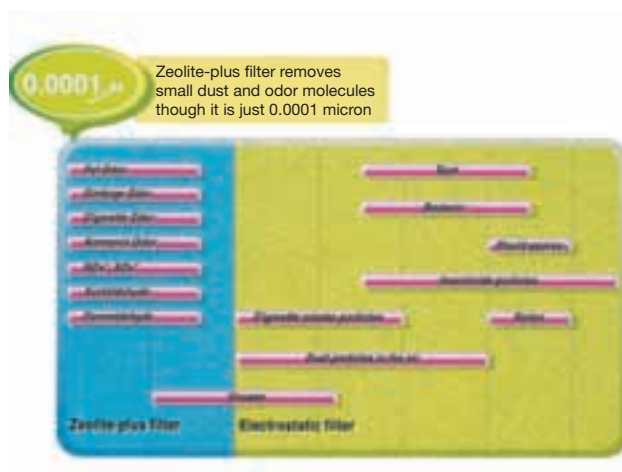


### Negative ions: vitamins in the air

The latest innovation in air purification is integrated into the new Toshiba Daiseikai systems. These are equipped with a high performance ioniser that creates a healthy and natural environment. The concentration of negative ions is higher in nature than in urban environments. They have many beneficial effects: they can lower blood pressure and expand the veins, decrease the level of mental stress, activate the cells that strengthen the immune system, assist the metabolism and reduce exhaustion, lower the humidity in the air and eliminate odours.

**Deodorising filters** are specifically designed to neutralise odour particles suspended in the air, generated by tobacco, food, animals etc.

**Activated carbon filters** absorb odours and contaminants, eliminating up to 80% of pollutants from the air.



**Photocatalytic Zeolite-Plus filters** (Toshiba patent) capture odour-generating particles and molecules up to 0.0001 microns in size. They eliminate odours in half the time needed by a conventional filter. While carbon filters have a useful life of around six months, Zeolite Plus filters guarantee 100% efficiency for up to five years.

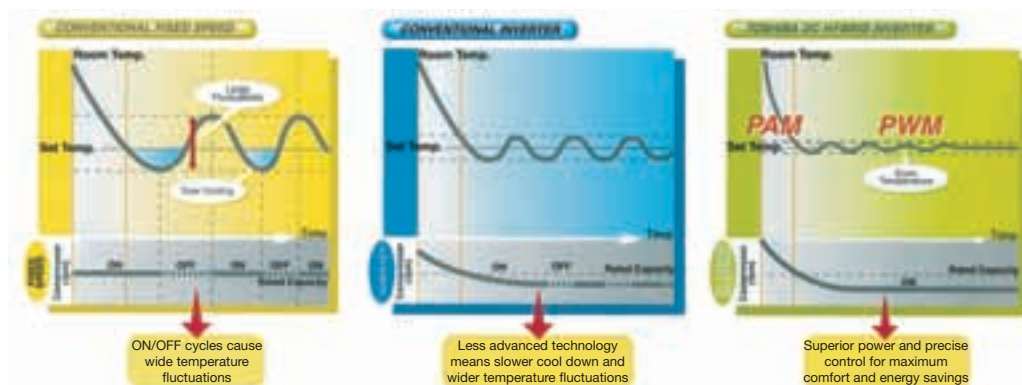
The regeneration process consists of two phases:

1. Clean the filter in soapy water and rinse it to remove soluble pollutants, dust and soap from the surface.
2. Expose the filter to sun light for six hours. The titanium oxide in the filter fibres will regenerate the filter through photocatalytic oxidation to restore 100% filter efficiency.

**ZEOLITE**  
FILTER  
**PLUS**

## DIGITAL hybrid inverter technology

Inverter technology applied to modern air conditioners was invented by Toshiba early in 1980, and the first units were marketed in 1981. Today, roughly 25% of the high-wall air conditioners sold in the world are inverter type. Inverters designed and manufactured by Toshiba have achieved the highest level of perfection and performance. There is a very simple idea at the basis of the success of the inverter concept: Perfect control of power.



### Perfect combination of two distinct inverter technologies

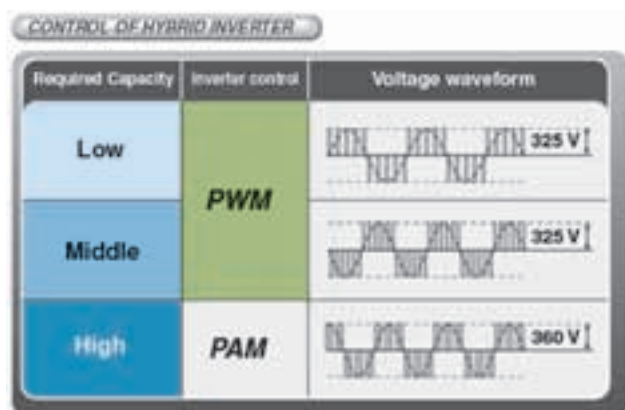
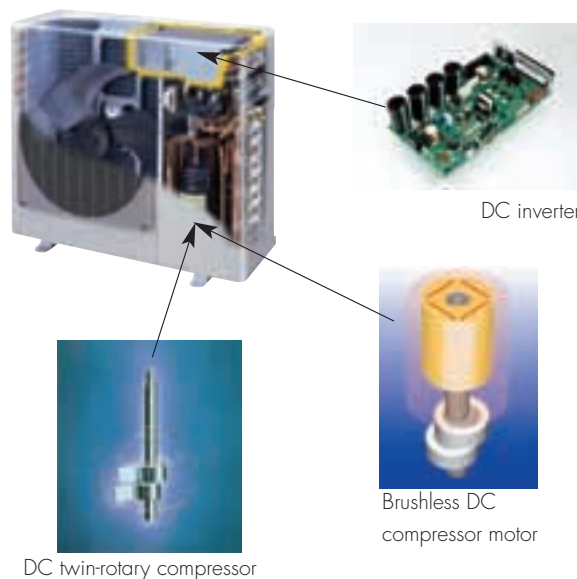
The new Toshiba digital hybrid inverter integrates two distinct control modules ensuring constant, natural comfort, instantly achieved with maximum energy efficiency.

At the start-up, the **Pulse Amplitude Modulation (PAM)** module sets the compressor at maximum power, providing fast cooling in order to achieve the desired room temperature.

Subsequently, the **Pulse Width Modulation (PWM)** module engages automatically to ensure that the desired room temperature is maintained by smoothly modulating the compressor capacity to exactly match room load requirements. This will provide significant savings in power consumption and energy costs.

### DC hybrid inverter and DC twin rotary compressor

Digital hybrid inverter control perfectly blends with the new Toshiba DC (direct current) inverter compressors, allowing greater energy efficiency compared to traditional AC inverter compressors. It offers one of the widest ranges of operating capacities in this class.



#### Pulse Width Modulation

Optimises efficiency at low and mid load conditions

#### Pulse Amplitude Modulation

Optimises efficiency at start-up and high load conditions

## Flexible control

The wide range of operating capacities of Toshiba inverters ensures smooth and effortless compressor operation under the most diverse operating conditions. Conventional inverters show their limits when the air conditioner operates at low capacity load. Under these circumstances, their operation is similar to fixed-speed air conditioners, and their compressors start performing frequent ON and OFF cycles, in an attempt to limit the indoor temperature fluctuations.

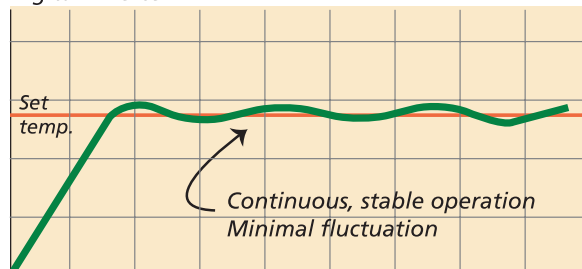
Powerful yet precise, Toshiba DC digital hybrid inverter technology ensures:

- Unmatched comfort, by quickly achieving and evenly maintaining the desired room temperature.
- Higher energy savings, thanks to its accurate digital power control and its efficient and adaptable DC compressors.
- Superior reliability and quieter operation, due to the elimination of the compressor ON/OFF cycle.

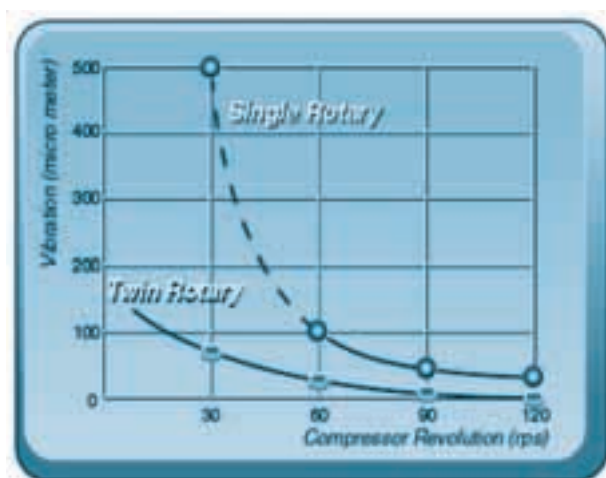
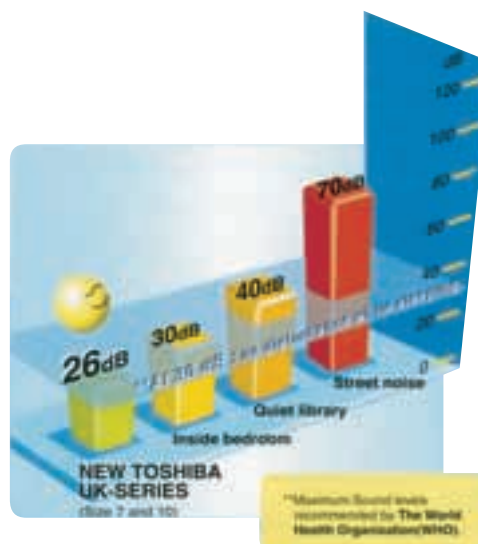
## Quiet operation

- Soft compressor start (no locked rotor current)
- Low operating noise due to reduced compressor speed with low gas flow most of the time
- Low air flow noise due to modulated fan speed
- Sensitive balanced compressor parts

### Digital Inverter



### Conventional type



## DC twin rotary compressor vibration

As shown in the diagram, the speed of the DC twin rotary compressor can be decreased down to 10 r/s, thanks to the counterbalancing forces applied to each of its two rollers, while the minimum speed of single rotary compressors is approximately 30 r/s.

Reliability is also improved, because shaft vibration is greatly reduced, as a result of the balanced rotation of the two rollers.



## Overview residential product range

	Cooling capacity kW Capacity code	2.5 – 2.8 1.1	3.5 – 3.75 1.4 – 1.5	4.5 – 5.2 2.0 – 2.1	6.4 – 7.5 2.6 – 2.8
<b>INDOOR UNITS</b>					
	Daiseikai High-wall, single split, Inverter Heat pump	RAS-10JKVP-E	RAS-13JKVP-E		
	RAS: * High-wall, single split, Inverter Heat pump	RAS-10UKV-E	RAS-13UKV-E2		
	RAS: * High-wall, multisplit, Inverter Cooling only Heat pump	RAS-M10UKCV-E RAS-M10UKV-E	RAS-M13UKCV-E RAS-M13UKV-E	RAS-M16UKCV-E RAS-M16UKV-E	
	RAS: Ducted, multisplit, Inverter Cooling only Heat pump	RAS-M10YDCV-E RAS-M10YDV-E	RAS-M13YDCV-E RAS-M13YDV-E	RAS-M16YDCV-E RAS-M16YDV-E	
	RAS: High-wall units, single split, fixed speed Cooling only Heat pump	RAS-10UKP-ES2 RAS-10UKHP-ES2	RAS-13UKP-ES2 RAS-13UKHP-ES2	RAS-18UKP-ES2 RAS-18UKHP-ES2	RAS-24UKP-ES-1 RAS-24UKHP-ES-1
	RAS: Console/Ceiling, single split, fixed speed Cooling only Heat pump			RAS-18UFP-ES RAS-18UFHP-ES	RAS-24UKP-ES RAS-24UFHP-ES

\* Capacities for operation with one indoor unit to one outdoor unit. The following tables show the capacity ranges for multisplit operation.

### Cooling only

Outdoor unit size	No. of rooms	2 indoor units	3 indoor units	4 indoor units
18	2	5.1-5.2	-	-
23	3	5.4-6.1	6.4-6.7	-
27	4	5.4-7.2	7.6-8.0	7.6-8.0

### Heat pumps

Outdoor unit size	No. of rooms	2 indoor units	3 indoor units	4 indoor units
18	2	5.1-5.2	-	-
26	3	5.4-7.2	7.4-7.5	-
27	4	5.4-7.2	7.6-8.0	7.9-8.0



	Cooling capacity kW Capacity code	2.5 – 2.8 1.1	3.5 – 3.75 1.4 – 1.5	4.5 – 5.2 2.0 – 2.1	6.4 – 7.5 2.6 – 2.8
<b>OUTDOOR UNITS</b>					
	Daiseikai High-wall, single split, Inverter Heat pump	RAS-10JAVP-E	RAS-13JAVP-E		
	RAS: High-wall, single split, Inverter Heat pump	RAS-10UAV-E	RAS-13UAV-E2		
	RAS: High-wall, multisplit, Inverter Cooling only Heat pump	RAS-M18YACV-E RAS-M18YAV-E	RAS-3M23YACV-E RAS-3M26YAV-E	RAS-4MYACV-E RAS-4M27YAV-E	
	RAS: Ducted, multisplit, Inverter Cooling only Heat pump	RAS-M18YACV-E RAS-M18YAV-E	RAS-3M23YACV-E RAS-3M26YAV-E	RAS-4MYACV-E RAS-4M27YAV-E	
	RAS: Hi-wall, single split, fixed speed Cooling only Heat pump	RAS-10UA-ES2 RAS-10UAH-ES2	RAS-13UA-ES2 RAS-13UAH-ES2	RAS-18UA-ES2 RAS-18UAH-ES2	RAS-24UA-ES-1 RAS-24UAH-ES-1
	RAS: Console/Ceiling, single split, fixed speed Cooling only Heat pump			RAS-18UA-ES2 RAS-18UAH-ES2	RAS-24UA-ES-1 RAS-24UAH-ES-1

# High-Wall Units

**Daiseikai ultra-high-efficiency split systems**

**DAISEIKAI**  
PURE COMFORT

**R410A**

**INVERTER**

**NEW**



The new sophisticated, state-of-the-art Daiseikai split system heat pumps from Toshiba combine attractive styling with advanced inverter technology and optimised indoor air quality. They use single inverters for smooth capacity control and perfect comfort conditions. With its exceptional EER levels and superior indoor air quality features the Daiseikai launches a new era in air conditioning.

## Key features

- Triple Zeolite 3G filter - Zeolite Plus filter, deodorising filter and plasma pure filter for fast removal of pollutants and odours
- Air ioniser for optimum relaxed user comfort and enhanced well-being
- Superior COP for lowest energy consumption (up to 20% higher than conventional inverter models).
- Elegant design with clean lines - the Daiseikai enhances any room
- Precise capacity control at all conditions
- Innovative inverter technology for precise temperature control
- Quiet operation for enhanced user comfort
- Easy installation and maintenance
- Designed for use with non-ozone depleting refrigerant R410A





## Technical specifications

## Daiseikai High-Wall Units

Outdoor unit		RAS-10JAVP-E	RAS-13JAVP-E
Indoor unit		RAS-10JKVP-E	RAS-13JKVP-E
Cooling capacity (min./rated/max.)	kW	0.6/2.5/3.4	0.6/3.5/4.2
Power input, cooling	kW	0.57	0.95
EER, cooling	W/W	4.39 (max. 5.45)	3.68 (max. 5.45)
Annual power consumption	kWh	285	475
Energy label	A		A
Heating capacity	kW	0.6/3.2/6.2	0.6/4.2/6.6
Power input, heating	kW	0.75	1.09
COP, heating	W/W	4.27 (max. 5.00)	3.85 (max. 5.00)
Indoor unit		RAS-10JKVP-E	RAS-13JKVP-E
Fan type		Tangential	Tangential
Air flow, cooling (high/medium/low)	l/s	149/97/74	154/102/74
Air flow, heating (high/medium/low)	l/s	167/116/77	174/121/81
Sound power level, cooling	dB(A)	55	56
Sound power level, heating	dB(A)	56	57
Dimensions			
Height x width x depth	mm	250 x 790 x 208	250 x 790 x 208
Weight	kg	10	10
Indoor air quality features		Zeolite Plus filter, deodorising filter and plasma pure filter plus air ioniser	
Outdoor unit		RAS-10JAVP-E	RAS-13JAVP-E
Fan type		Propeller	Propeller
Air flow	l/s	597	669
Sound power level, cooling/heating	dB(A)	59/60	61/63
Dimensions	mm		
Height x width x depth	mm	550 x 780 x 270	550 x 780 x 270
Weight	kg	38	38
Compressor		DC twin rotary	DC twin rotary
Pipe connections		Flare	Flare
Gas	in	3/8	3/8
Liquid	in	1/4	1/4
Pipe length, maximum	m	25	25
Pipe length, chargeless	m	15	15
Maximum height difference	m	10	10
Condensate pipe diameter (OD)	mm	8	8
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50
Operating range, cooling	°C	10/43°C	10/43°C
Operating range, heating	°C	-15/24°C	-15/24°C



# High-Wall Units

**RAS split system range - UKV inverter units**

**RAS**

**R410A**

**INVERTER**  
THE INVENTOR OF INVERTER-DRIVE ARCON TECHNOLOGY



The attractive, slimline RAS high-wall inverter units are compact and elegant and blend in with any room decor. They incorporate the digital hybrid inverter with two distinct control modules for constant natural comfort and maximised energy efficiency.

## Key features

- Designed for use with non-ozone depleting refrigerant R410A
- Powerful, yet precise
- Easy installation and maintenance
- Easy-to-use remote control with extra-large display
- Sleep timer with ECO-logic
- Five fan speeds plus auto mode
- Five fixed louvre positions, plus swing mode and auto positioning
- Auto-diagnosis function constantly monitors the main functions and components
- Ultra-quiet operation
- New triple-action filtering system - anti-mould filter, Zeolite-plus filter and passive electrostatic filter
- Latest digital hybrid inverter technology for increased energy efficiency, optimised comfort and superior reliability







## Technical specifications heating/cooling models

## High-Wall Units

Indoor unit		RAS-10UKV-E	RAS-13UKV-E2
Outdoor unit		RAS-10UAV-E	RAS-13UAV-E2
Cooling capacity	kW	2.50	3.50
Power input, cooling	kW	0.76	1.05
EER, cooling	W/W	3.29	3.33
Annual power consumption	kWh	380	525
Energy label	A		A
Operating current	A	3.57	4.49
Heating capacity	kW	3.20	4.20
Power input, heating	kW	0.84	1.13
Operating current	A	3.84	5.31
Indoor unit		RAS-10UKV-E	RAS-13UKV-E2
Air flow, cooling (H/M/L)	l/s	92/122/147	95/125/147
Air flow, heating (H/M/L)	l/s	103/133/163	113/145/172
Fan motor power input	W	30	30
Sound power level	dB(A)	52	52
Dimensions			
Height x width x depth	mm	275 x 790 x 208	275 x 790 x 208
Weight	kg	10	10
Air filter		Triple-action filtering system	Triple-action filtering system
Outdoor unit		RAS-10UAV-E	RAS-13UAV-E2
Fan type		Propeller	
Air flow	l/s	362	668
Motor power input	W	18	43
Sound power level	dB(A)	60	63
Dimensions			
Height x width x depth	mm	530 x 660 x 240	550 x 780 x 270
Weight	kg	28	38
Compressor type		DC inverter	DC inverter
Compressor power input	W	750	750
Pipe connections		Flare	Flare
Gas	in	3/8	3/8
Liquid	in	1/4	1/4
Condensate drain diameter (ID)	mm	15	15
Max. piping length	m	10	15
Chargeless length	m	10	15
Max. elevation	m	5	6
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50
Operating range, cooling/heating	°C	15-43/10-24	15-43/10-24



# High-Wall/Ducted Units

**RAS split system range - multisplit inverter units**

**RAS**

**R410A**

**INVERTER**



The RAS multisplit inverter units offer reliable, controllable comfort all year round. These technologically advanced systems will enhance your living and working environments, and ensure optimum product performance, providing the increased flexibility of one outdoor unit serving up to four indoor units. These units are suitable for a wide range of residential and light commercial applications.

## Key features

- Designed for use with non-ozone depleting refrigerant R410A
- Easy installation and maintenance
- Easy-to-use remote control with extra-large display
- Three selectable fan speeds for high-wall units, and five fan speeds plus auto mode for ducted units)
- Five fixed louvre positions, plus swing mode and auto positioning (high-wall units)
- Auto-diagnosis constantly monitors the main functions and components
- New triple-action filtering system: anti-mould, passive electrostatic, and Zeolite-plus photocatalytic filters (high-wall units only).
- The units incorporate the latest digital hybrid inverter technology for increased energy efficiency and superior reliability, with direct-current inverter compressors, offering a wide operating range.





## Technical specifications cooling only models

## High-Wall/Ducted Units Multisplit

Indoor unit, high-wall type		RAS-M10UKCV-E			RAS-M13UKCV-E			RAS-M16UKCV-E	
Outdoor unit size		18	23	27	18	23	27	23	27
Cooling capacity	kW	2.7	2.7	2.7	3.7	3.7	3.7	4.5	4.5
Power input cooling	kW	0.77	0.77	0.75	1.24	1.20	1.20	1.60	1.65
EER, cooling	W/W	3.51	3.51	3.60	2.98	3.08	3.08	2.81	2.73
Annual power consumption	kWh	385	385	375	620	600	600	800	825
Energy label		A	A	A	C	B	B	C	D
Dimensions (H x W x D)	mm	265 x 790 x 189			265 x 790 x 189			265 x 790 x 189	
Weight	kg	8			8			8	
Air flow (high/low)	l/s	131/103			144/103			167/111	
Sound power level	dB(A)	49			52			55	

Indoor unit, ducted type		RAS-M10YDCV-E			RAS-M13YDCV-E			RAS-M16YDCV-E	
Outdoor unit size		18	23	27	18	23	27	23	27
Cooling capacity	kW	2.7	2.7	2.7	3.7	3.7	3.7	4.5	4.5
Power input, cooling	kW	0.77	0.77	0.75	1.24	1.20	1.20	1.60	1.65
EER, cooling	W/W	3.51	3.51	3.60	2.98	3.08	3.08	2.81	2.73
Annual power consumption	kWh	385	385	375	620	600	600	800	825
Energy label		A	A	A	C	B	B	C	D
Dimensions (H x W x D)	mm	230 x 750 x 440			230 x 750 x 440			230 x 750 x 440	
Weight	kg	19			19			19	
Air flow (high/low)*	l/s	200/111			217/119			217/119	
Sound power level (high/low)*	dB(A)	44/36			45/37			46/38	
Static pressure (upper limit/standard)	Pa	54.9/35.3			63.7/41.2			63.7/41.2	

\* At standard static pressure

Indoor unit data, both types		Size 10		Size 13		Size 16	
Pipe connections							
Liquid side	in	1/4		1/4		1/4	
Gas side	in	3/8		3/8		1/2	
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50	

Outdoor unit		RAS-M18YACV-E		RAS-3M23YACV-E		RAS-4M27YACV-E	
Number of indoor units		2-room multisplit		3-room multisplit		4-room multisplit	
COP	W/W	3.02		3.33		3.20	
Dimensions (H x W x D)	mm	550 x 780 x 270		695 x 780 x 270		795 x 900 x 320	
Weight	kg	42		48		63	
Air flow	l/s	572		583		778/833	
Sound power level*	dB(A)	55/59		58/61/61		61/61	
Max. piping length (per unit/total)	m	20/30		20/40		25/70	
Precharged length	m	30		40		70	
Max. elevation	m	10		10		15	
Operating range	°C	21-43		10-43		10-43	

\* For indoor unit sizes 10, 13 and 16

### Combination ratings, cooling only units

Indoor units: RAS-M10UKCV-E, RAS-M13UKCV-E, RAS-M10YDCV-E, RAS-M13YDCV-E - Outdoor unit: RAS-M18YACV-E

Cooling, 230 V			Two-room multisplit										
Operating status	Combination*		Unit capacity kW		Cooling capacity kW			Power input W			Operating current A		
	Unit A	Unit B	Unit A	Unit B	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	2.70	-	1.1	2.7	3.2	255	770	930	1.59	3.95	4.78
	13	-	3.70	-	1.1	3.7	4.2	255	1240	1430	1.59	6.30	6.94
2 unit operation	10	10	2.55	2.55	1.4	5.1	6.1	260	1700	2150	1.62	7.78	9.84
	13	10	3.01	2.19	1.4	5.2	6.2	260	1720	2170	1.62	7.87	9.93

\* Indoor unit model: RAS-M10UKCV-E/RAS-M10YDCV-E = 10 - RAS-M13UKCV-E/RAS-M13YDCV-E = 13 - RAS-M16UKCV-E = 16

### High-Wall



### Ducted



## Combination ratings, cooling

Indoor units: RAS-M10UKCV-E/YDCV-E, RAS-M13UKCV-E/YDCV-E, RAS-M16UKCV-E/YDCV-E

Outdoor unit: RAS-3M23YACV-E

Cooling, 230 V			Three-room multisplit												
Operating status	Combination*			Unit capacity kW			Cooling capacity kW			Power input W			Operating current A		
	Unit A	Unit B	Unit C	Unit A	Unit B	Unit C	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	2.70	-	-	1.4	2.7	3.2	320	770	950	1.99	3.94	4.86
	13	-	-	3.70	-	-	1.4	3.7	4.4	320	1200	1470	1.99	6.07	7.18
	16	-	-	4.50	-	-	1.4	4.5	4.9	320	1600	1750	1.99	7.32	8.01
2 unit operation	10	10	-	2.70	2.70	-	1.8	5.4	6.0	360	1500	1880	2.24	6.86	8.60
	10	13	-	2.45	3.35	-	1.8	5.8	6.3	360	1800	1970	2.24	8.24	9.02
	10	16	-	2.21	3.69	-	1.8	5.9	6.4	360	1830	2000	2.24	8.38	9.15
	13	13	-	2.95	2.95	-	1.8	5.9	6.4	360	1830	2000	2.24	8.38	9.15
	13	16	-	2.71	3.29	-	1.8	6.0	6.4	360	1850	2000	2.24	8.50	9.15
	16	16	-	3.05	3.05	-	1.8	6.1	6.5	360	1870	2000	2.24	8.56	9.38
3 unit operation	10	10	10	2.13	2.13	2.13	2.2	6.4	7.0	420	1880	2300	2.61	8.60	10.53
	10	10	13	1.99	1.99	2.72	2.2	6.7	7.0	420	2150	2300	2.61	9.84	10.53
	10	13	13	1.80	2.45	2.45	2.2	6.7	7.0	420	2150	2300	2.61	9.84	10.53
	10	10	16	1.83	1.83	3.04	2.2	6.7	7.0	420	2150	2300	2.61	9.84	10.53

\* Indoor unit model: RAS-M10UKCV-E/RAS-M10YDCV-E = 10 - RAS-M13UKCV-E/RAS-M13YDCV-E = 13 - RAS-M16UKCV-E/RAS-M16YDCV-E = 16

Indoor units: RAS-M10UKCV-E/YDCV-E, RAS-M13UKCV-E/YDCV-E, RAS-M16UKCV-E/YDCV-E

Outdoor unit: RAS-4M27YACV-E

Cooling, 230 V				Four-room multisplit													
Operating status	Combination*				Unit capacity				Cooling capacity			Power input			Operating current		
					kW				kW			W			A		
	Unit A	Unit B	Unit C	Unit D	Unit A	Unit B	Unit C	Unit D	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	-	2.70	-	-	-	1.4	2.7	3.2	640	750	950	3.52	3.71	4.44
	13	-	-	-	3.70	-	-	-	1.4	3.7	4.4	640	1200	1520	3.52	5.49	6.88
	16	-	-	-	4.50	-	-	-	1.4	4.5	5.0	640	1650	2000	3.52	7.47	8.87
2 unit operation	10	10	-	-	2.70	2.70	-	-	2.5	5.4	6.3	640	1530	2040	3.48	6.79	9.05
	13	10	-	-	3.41	2.49	-	-	2.7	5.9	6.6	660	1810	2220	3.59	8.03	9.85
	16	10	-	-	3.94	2.36	-	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	13	13	-	-	3.15	3.15	-	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	16	13	-	-	3.73	3.07	-	-	3.0	6.8	7.2	690	2320	2570	3.75	10.29	11.40
	16	16	-	-	3.60	3.60	-	-	3.2	7.2	7.5	700	2550	2750	3.80	11.31	12.20
3 unit operation	10	10	10	-	2.53	2.53	2.53	-	3.8	7.6	8.2	950	2400	2720	4.59	10.65	12.07
	13	10	10	-	3.13	2.28	2.28	-	3.9	7.7	8.3	960	2410	2740	4.64	10.69	12.16
	16	10	10	-	3.50	2.10	2.10	-	4.0	7.7	8.5	960	2410	2790	4.64	10.69	12.38
	13	13	10	-	2.82	2.82	2.06	-	4.0	7.7	8.5	960	2410	2790	4.64	10.69	12.38
	16	13	10	-	3.22	2.65	1.93	-	4.1	7.8	8.6	970	2430	2810	4.69	10.78	12.47
	13	13	13	-	2.60	2.60	2.60	-	4.1	7.8	8.6	970	2430	2810	4.69	10.78	12.47
	16	16	10	-	3.04	3.04	1.82	-	4.1	7.9	8.7	970	2440	2830	4.69	10.83	12.56
	16	13	13	-	2.99	2.46	2.46	-	4.1	7.9	8.7	970	2440	2830	4.69	10.83	12.56
	16	16	13	-	2.80	2.80	2.30	-	4.2	7.9	8.9	970	2440	2880	4.69	10.83	12.78
	16	16	16	-	2.67	2.67	2.67	-	4.3	8.0	9.0	980	2450	2900	4.73	10.87	12.87
4 unit operation	10	10	10	10	1.98	1.98	1.98	1.98	4.0	7.9	8.7	930	2450	2800	4.49	10.87	12.42
	13	10	10	10	2.48	1.81	1.81	1.81	4.1	7.9	8.8	940	2450	2820	4.54	10.87	12.51
	16	10	10	10	2.86	1.71	1.71	1.71	4.1	8.0	9.0	940	2500	2860	4.54	11.09	12.69
	13	13	10	10	2.31	2.31	1.69	1.69	4.1	8.0	9.0	940	2500	2860	4.54	11.09	12.69
	16	13	10	10	2.65	2.18	1.59	1.59	4.2	8.0	9.1	950	2500	2880	4.59	11.09	12.78
	13	13	13	10	2.14	2.14	2.14	1.57	4.2	8.0	9.1	950	2500	2880	4.59	11.09	12.78
	16	13	13	10	2.47	2.03	2.03	1.48	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87
	13	13	13	13	2.00	2.00	2.00	2.00	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87
	16	16	10	10	2.50	2.50	1.50	1.50	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87

\* Indoor unit model: RAS-M10UKCV-E/RAS-M10YDCV-E = 10 - RAS-M13UKCV-E/RAS-M13YDCV-E = 13 - RAS-M16UKCV-E/RAS-M16YDCV-E = 16







## Technical specifications heat pump models

## High-Wall/Ducted Units Multisplit

Indoor unit, high-wall type		RAS-M10UKV-E			RAS-M13UKV-E			RAS-M16UKV-E	
Outdoor unit size		18	23	27	18	23	27	23	27
Cooling capacity	kW	2.7	2.7	2.7	3.7	3.7	3.7	4.5	4.5
Power input, cooling	kW	0.77	0.75	0.75	1.24	1.20	1.20	1.65	1.65
EER, cooling	W/W	3.51	3.60	3.60	2.98	3.08	3.08	2.73	2.73
Heating capacity	kW	4.0	4.0	4.0	5.0	5.0	5.0	5.5	5.5
Power input, heating	kW	1.45	1.50	1.50	2.06	2.05	2.05	2.40	2.40
Annual power consumption	kWh	385	375	375	620	600	600	825	825
Energy label		A	A	A	C	B	B	D	D
Dimensions (H x W x D)	mm	265 x 790 x 189			265 x 790 x 189			265 x 790 x 189	
Weight	kg	8			8			8	
Air flow (cooling/heating)	l/s	131/144			144/156			167/167	
Sound power level	dB(A)	52			53			55	

Indoor unit, ducted type		RAS-M10YDV-E			RAS-M13YDV-E			RAS-M16YDV-E	
Outdoor unit size		18	23	27	18	23	27	23	27
Cooling capacity	kW	2.7	2.7	2.7	3.7	3.7	3.7	4.5	4.5
Power input, cooling	kW	0.77	0.75	0.75	1.24	1.20	1.20	1.65	1.65
EER, cooling	W/W	3.51	3.60	3.60	2.98	3.08	3.08	2.72	2.72
Heating capacity	kW	4.0	4.0	4.0	5.0	5.0	5.0	5.5	5.5
Power input, heating	kW	1.45	1.50	1.50	2.06	2.05	2.05	2.40	2.40
Annual power consumption	kWh	385	375	375	620	600	600	825	825
Energy label		A	A	A	C	B	B	D	D
Dimensions (H x W x D)	mm	230 x 750 x 440			230 x 750 x 440			230 x 750 x 440	
Weight	kg	19			19			19	
Air flow, cooling (high/low)*	l/s	200/111			217/119			217/111	
Air flow, heating (high/low)*	l/s	200/125			217/133			217/139	
Sound power level (high/low)*	dB(A)	45/37			46/38			47/39	
Static pressure (upper limit/standard)	Pa	54.9/35.3			63.7/41.2			63.7/41.2	

\* At standard static pressure

Indoor unit data, both types		Size 10		Size 13		Size 16	
Pipe connections							
Liquid side	in	1/4		1/4		1/4	
Gas side	in	3/8		3/8		1/2	
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50	

Outdoor unit		RAS-M18YAV-E		RAS-3M23YAV-E		RAS-4M27YAV-E	
Number of indoor units		2-room multisplit		3-room multisplit		4-room multisplit	
COP (cooling/heating)	W/W	3.02/3.62		3.33/3.53		3.20/4.00	
Dimensions (H x W x D)	mm	550 x 780 x 270		795 x 900 x 320		795 x 900 x 320	
Weight	kg	44		64		65	
Air flow	l/s	572		583		778/833	
Sound power level*	dB(A)	55/59		61/61/61		61/61/61	
Max. piping length (per unit/total)	m	20/30		25/50		25/70	
Precharged length	m	30		50		70	
Max. elevation	m	10		15		15	
Operating range, cooling/heating	°C	21-43/-5-21		10-43/-10-21		10-43/-10-2	

\* For indoor unit sizes 10, 13 and 16

## Combination ratings, heat pump units

Indoor units: RAS-M10UKV-E, RAS-M13UKV-E, RAS-M10YDV-E, RAS-M13YDV-E

Outdoor unit: RAS-M18YAV-E

Cooling, 230 V			Two-room multisplit										
Operating status	Combination*		Unit capacity kW		Cooling capacity kW			Power input W			Operating current A		
	Unit A	Unit B	Unit A	Unit B	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	2.70	-	1.1	2.7	3.2	255	770	930	1.59	3.95	4.78
	13	-	3.70	-	1.1	3.7	4.2	255	1240	1430	1.59	6.30	6.94
2 unit operation	10	10	2.55	2.55	1.4	5.1	6.1	260	1700	2150	1.62	7.78	9.84
	13	10	3.01	2.19	1.4	5.2	6.2	260	1720	2170	1.62	7.87	9.93

Heating, 230 V			Two-room multisplit										
Operating status	Combination*		Unit capacity kW		Cooling capacity kW			Power input W			Operating current A		
	Unit A	Unit B	Unit A	Unit B	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	4.0	-	0.7	4.0	5.2	170	1450	1700	1.06	6.64	7.78
	13	-	5.0	-	0.7	5.0	6.5	170	2060	2530	1.06	9.43	11.58
2 unit operation	10	10	3.20	3.20	0.9	6.4	8.3	170	1770	2390	1.06	8.10	10.94
	13	10	3.72	2.98	0.9	6.7	8.7	170	1850	2450	1.06	8.47	11.21

Indoor units: RAS-M10UKV-E/YDV-E, RAS-M13UKV-E/YDV-E, RAS-M16UKV-E/YDV-E

Outdoor unit: RAS-3M26YAV-E

Cooling, 230 V				Three-room multisplit											
Operating status	Combination*			Unit capacity			Cooling capacity			Power input			Operating current		
				kW			kW			W			A		
	Unit A	Unit B	Unit C	Unit A	Unit B	Unit C	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	2.70	-	-	1.4	2.7	3.2	640	750	950	3.52	3.71	4.44
	13	-	-	3.70	-	-	1.4	3.7	4.4	640	1200	1520	3.52	5.49	6.88
	16	-	-	4.50	-	-	1.4	4.5	5.0	640	1650	2000	3.52	7.47	8.87
2 unit operation	10	10	-	2.70	2.70	-	2.5	5.4	6.3	640	1530	2040	3.48	6.79	9.05
	13	10	-	3.41	2.49	-	2.7	5.9	6.6	660	1810	2220	3.59	8.03	9.85
	16	10	-	3.94	2.36	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	13	13	-	3.15	3.15	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	16	13	-	3.73	3.07	-	3.0	6.8	7.2	690	2320	2570	3.75	10.29	11.40
	16	16	-	3.60	3.60	-	3.2	7.2	7.5	700	2550	2750	3.80	11.31	12.20
3 unit operation	10	10	10	2.47	2.47	2.47	3.8	7.4	8.2	950	2230	2720	4.59	9.89	12.07
	13	10	10	3.01	2.20	2.20	3.9	7.4	8.3	950	2230	2750	4.59	9.89	12.20
	16	10	10	3.36	2.02	2.02	4.0	7.4	8.5	950	2230	2820	4.59	9.89	12.51
	13	13	10	2.71	2.71	1.98	4.0	7.4	8.5	950	2230	2820	4.59	9.89	12.51
	16	13	10	3.10	2.55	1.86	4.0	7.5	8.6	980	2250	2850	4.73	9.98	12.64
	13	13	13	2.50	2.50	2.50	4.0	7.5	8.6	980	2250	2850	4.73	9.98	12.64
	16	16	10	2.88	2.88	1.73	4.1	7.5	8.8	980	2250	2920	4.73	9.98	12.95
	16	13	13	2.84	2.33	2.33	4.1	7.5	8.8	980	2250	2920	4.73	9.98	12.95
	16	16	13	2.66	2.66	2.19	4.2	7.5	8.9	980	2250	2950	4.73	9.98	13.09

Heating, 230 V				Three-room multisplit											
Operating status	Combination*			Unit capacity			Heating capacity			Power input			Operating current		
				kW			kW			W			A		
	Unit A	Unit B	Unit C	Unit A	Unit B	Unit C	Min.	Rated	Max	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	4.00	-	-	0.8	4.0	5.2	300	1500	1980	1.79	6.65	8.78
	13	-	-	5.00	-	-	0.8	5.0	6.5	310	2050	2750	1.85	9.09	12.20
	16	-	-	5.50	-	-	0.8	5.5	6.9	310	2400	3000	1.85	10.65	13.31
2 unit operation	10	10	-	3.60	3.60	-	1.5	7.2	10.0	320	2050	3200	1.86	9.09	14.20
	13	10	-	4.22	3.38	-	1.5	7.6	10.1	320	2240	3210	1.86	9.94	14.24
	16	10	-	4.57	3.33	-	1.5	7.9	10.1	320	2380	3230	1.86	10.56	14.33
	13	13	-	3.95	3.95	-	1.5	7.9	10.1	320	2380	3230	1.86	10.56	14.33
	16	13	-	4.35	3.95	-	1.5	8.3	10.2	320	2560	3240	1.86	11.36	14.37
	16	16	-	4.30	4.30	-	1.5	8.6	10.2	320	2700	3250	1.86	11.98	14.42
3 unit operation	10	10	10	2.87	2.87	2.87	2.0	8.6	10.4	380	2300	2750	2.07	10.20	12.20
	13	10	10	3.35	2.68	2.68	2.0	8.7	10.5	380	2360	2760	2.07	10.47	12.24
	16	10	10	3.59	2.61	2.61	2.0	8.8	10.6	380	2430	2780	2.07	10.78	12.33
	13	13	10	3.14	3.14	2.51	2.0	8.8	10.6	380	2430	2780	2.07	10.78	12.33
	16	13	10	3.34	3.03	2.43	2.0	8.8	10.6	380	2430	2780	2.07	10.78	12.33
	13	13	13	2.93	2.93	2.93	2.0	8.8	10.6	380	2430	2780	2.07	10.78	12.33
	16	16	10	3.26	3.26	2.37	2.0	8.9	10.7	380	2490	2790	2.07	11.05	12.38
	16	13	13	3.16	2.87	2.87	2.0	8.9	10.7	380	2490	2790	2.07	11.05	12.38
	16	16	13	3.09	3.09	2.81	2.0	9.0	10.8	380	2550	2800	2.07	11.31	12.42

\* Indoor unit model: RAS-M10UKV-E/RAS-M10YDV-E = 10 - RAS-M13UKV-E/RAS-M10YDV-E = 13 - RAS-M16UKV-E/RAS-M10YDV-E = 16

### Combination ratings, heat pump units

Indoor units: RAS-M10UKV-E/YDV-E, RAS-M13UKV-E/YDV-E, RAS-M16UKV-E/YDV-E

Outdoor unit: RAS-4M27YAV-E

Cooling, 230 V				Four-room multisplit													
Operating status	Combination*				Unit capacity				Cooling capacity			Power input			Operating current		
					kW				kW			W			A		
	Unit A	Unit B	Unit C	Unit D	Unit A	Unit B	Unit C	Unit D	Min.	Rated	Max.	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	-	2.70	-	-	-	1.4	2.7	3.2	640	750	950	3.52	3.71	4.44
	13	-	-	-	3.70	-	-	-	1.4	3.7	4.4	640	1200	1520	3.52	5.49	6.88
	16	-	-	-	4.50	-	-	-	1.4	4.5	5.0	640	1650	2000	3.52	7.47	8.87
2 unit operation	10	10	-	-	2.70	2.70	-	-	2.5	5.4	6.3	640	1530	2040	3.48	6.79	9.05
	13	10	-	-	3.41	2.49	-	-	2.7	5.9	6.6	660	1810	2220	3.59	8.03	9.85
	16	10	-	-	3.94	2.36	-	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	13	13	-	-	3.15	3.15	-	-	2.9	6.3	6.9	670	2040	2400	3.64	9.05	10.65
	16	13	-	-	3.73	3.07	-	-	3.0	6.8	7.2	690	2320	2570	3.75	10.29	11.40
3 unit operation	16	16	-	-	3.60	3.60	-	-	3.2	7.2	7.5	700	2550	2750	3.80	11.31	12.20
	10	10	10	-	2.53	2.53	2.53	-	3.8	7.6	8.2	950	2400	2720	4.59	10.65	12.07
	13	10	10	-	3.13	2.28	2.28	-	3.9	7.7	8.3	960	2410	2740	4.64	10.69	12.16
	16	10	10	-	3.50	2.10	2.10	-	4.0	7.7	8.5	960	2410	2790	4.64	1.69	12.38
	13	13	10	-	2.82	2.82	2.06	-	4.0	7.7	8.5	960	2410	2790	4.64	1.69	12.38
	16	13	10	-	3.22	2.65	1.93	-	4.1	7.8	8.6	970	2430	2810	4.69	10.78	12.47
	13	13	13	-	2.60	2.60	2.60	-	4.1	7.8	8.6	970	2430	2810	4.69	10.78	12.47
	16	16	10	-	3.04	3.04	1.82	-	4.1	7.9	8.7	970	2440	2830	4.69	10.83	12.56
	16	13	13	-	2.99	2.46	2.46	-	4.1	7.9	8.7	970	2440	2830	4.69	10.83	12.56
	16	16	13	-	2.80	2.80	2.30	-	4.2	7.9	8.9	970	2440	2880	4.69	10.83	12.78
4 unit operation	16	16	16	-	2.67	2.67	2.67	-	4.3	8.0	9.0	980	2450	2900	4.73	10.87	12.87
	10	10	10	10	1.98	1.98	1.98	1.98	4.0	7.9	8.7	930	2450	2800	4.49	10.87	12.42
	13	10	10	10	2.48	1.81	1.81	1.81	4.1	7.9	8.8	940	2450	2820	4.54	10.87	12.51
	16	10	10	10	2.86	1.71	1.71	1.71	4.1	8.0	9.0	940	2500	2860	4.54	11.09	12.69
	13	13	10	10	2.31	2.31	1.69	1.69	4.1	8.0	9.0	940	2500	2860	4.54	11.09	12.69
	16	13	10	10	2.65	2.18	1.59	1.59	4.2	8.0	9.1	950	2500	2880	4.59	11.09	12.78
	13	13	13	10	2.14	2.14	2.14	1.57	4.2	8.0	9.1	950	2500	2880	4.9	11.09	12.78
	16	13	13	10	2.47	2.03	2.03	1.48	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87
	13	13	13	13	2.00	2.00	2.00	2.00	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87
	16	16	10	10	2.50	2.50	1.50	1.50	4.2	8.0	9.2	950	2500	2900	4.59	11.09	12.87
Heating, 230 V				Four-room multisplit													
Operating status	Combination*				Unit capacity				Cooling capacity			Power input			Operating current		
					kW				kW			W			A		
	Unit A	Unit B	Unit C	Unit D	Unit A	Unit B	Unit C	Unit D	Min.	Rated	Max.	Min.	Rated	Max.	Min.	Rated	Max.
1 unit operation	10	-	-	-	4.0	-	-	-	0.8	4.0	5.2	300	1450	1980	1.79	6.43	8.78
	13	-	-	-	5.0	-	-	-	0.8	5.0	6.5	310	2050	2750	1.85	9.09	12.20
	16	-	-	-	5.5	-	-	-	0.8	5.5	6.9	310	2400	3000	1.85	10.65	13.31
2 unit operation	10	10	-	-	3.60	3.60	-	-	1.5	7.2	10.0	320	2100	3200	1.86	9.32	14.20
	13	10	-	-	4.22	3.38	-	-	1.5	7.6	10.1	320	2320	3210	1.86	10.29	14.24
	16	10	-	-	4.57	3.33	-	-	1.5	7.9	10.1	320	2480	3230	1.86	11.00	14.33
	13	13	-	-	3.95	3.95	-	-	1.5	7.9	10.1	320	2480	3230	1.86	11.00	14.33
	16	13	-	-	4.35	3.95	-	-	1.5	8.3	10.2	320	2700	3240	1.86	11.98	14.37
3 unit operation	16	16	-	-	4.30	4.30	-	-	1.5	8.6	10.2	320	2860	3250	1.86	12.69	14.42
	10	10	10	-	2.87	2.87	2.87	-	2.0	8.6	10.4	380	2300	2750	2.07	10.20	12.20
	13	10	10	-	3.35	2.68	2.68	-	2.0	8.7	10.5	380	2350	2760	2.07	10.43	12.24
	16	10	10	-	3.54	2.58	2.58	-	2.0	8.7	10.5	380	2350	2760	2.07	10.43	12.24
	13	13	10	-	3.11	3.11	2.49	-	2.0	8.7	10.5	380	2350	2760	2.07	10.43	12.24
	16	13	10	-	3.34	3.03	2.43	-	2.0	8.8	10.6	380	2400	2780	2.07	10.65	12.33
	13	13	13	-	2.93	2.93	2.93	-	2.0	8.8	10.6	380	2400	2780	2.07	10.65	12.33
	16	16	10	-	3.26	3.26	2.37	-	2.0	8.9	10.7	380	2450	2790	2.07	10.87	12.38
	16	13	13	-	3.16	2.87	2.87	-	2.0	8.9	10.7	380	2450	2790	2.07	10.87	12.38
	16	16	13	-	3.06	3.06	2.78	-	2.0	8.9	10.7	380	2450	2790	2.07	10.87	12.38
4 unit operation	16	16	16	-	3.00	3.00	3.00	-	2.0	9.0	10.8	380	2500	2800	2.07	11.09	12.42
	10	10	10	10	2.23	2.23	2.23	2.23	2.2	8.9	10.8	450	2100	2810	2.45	9.32	12.47
	13	10	10	10	2.62	2.09	2.09	2.09	2.2	8.9	10.10	460	2100	2830	2.50	9.32	12.56
	16	10	10	10	2.83	2.06	2.06	2.06	2.2	9.0	10.9	460	2250	2830	2.50	9.98	12.56
	13	13	10	10	2.50	2.50	2.00	2.00	2.2	9.0	10.9	470	2250	2830	2.55	9.98	12.56
	16	13	10	10	2.68	2.43	1.92	1.95	2.2	9.0	11.0	480	2250	2850	2.61	9.98	12.64
	13	13	13	10	2.37	2.37	2.37	1.89	2.2	9.0	11.0	480	2250	2850	2.61	9.98	12.64
	16	13	13	10	2.54	2.31	2.31	1.85	2.2	9.0	11.0	490	2250	2850	2.66	9.98	12.64
	13	13	13	13	2.25	2.25	2.25	2.25	2.2	9.0	11.0	490	2250	2850	2.66	9.98	12.64
	16	16	10	10	2.61	2.61	1.89	1.89	2.2	9.0	11.0	500	2250	2850	2.72	9.98	12.64

\* Indoor unit model: RAS-M10UKV-E/RAS-M10YDV-E = 10 - RAS-M13UKV-E/RAS-M10YDV-E = 13 - RAS-M16UKV-E/RAS-M10YDV-E = 16

# Console/Ceiling Units

**RAS split system range - UFP/UFHP**

**RAS**

**R410A**



The stylish UF-series console and under-ceiling units bring a touch of luxury to your life. They incorporate the latest Toshiba technology and are ideal for residential applications, offices and shops. The same unit can be used for floor or underceiling mounting, without modification.

## Key features

- Designed for use with non-ozone depleting refrigerant R410A
- Easy installation and maintenance
- Easy-to-use remote control with extra-large display
- Sleep timer with ECO-logic for higher energy savings
- Five fan speeds plus auto model
- Five fixed louvre positions, plus swing mode and auto positioning
- Auto-diagnosis function constantly monitors the main functions and components
- Ultra-quiet operation
- New triple-action filtering system: anti-mould filters remove dust and other contaminants, passive electrostatic filters entrap solid particles such as spores and bacteria, and Zeolite-plus photocatalytic filters absorb even smaller pollutants such as viruses, smoke and odours







## Technical specifications cooling only models

## Console/Ceiling Units

Indoor unit		RAS-18UFP-ES	RAS-24UFP-ES
Outdoor unit		RAS-18UAH-ES2	RAS-24UAH-ES-1
Cooling capacity	kW	5.20	6.43
Power input, cooling	kW	1.90	2.58
EER, cooling	W/W	2.74	2.49
Annual power consumption	kWh	950	1290
Energy label		D	E



## Technical specifications heat pump models

Indoor unit		RAS-18UFHP-ES	RAS-24UFHP-ES
Outdoor unit		RAS-18UAH-ES2	RAS-24UAH-ES-1
Cooling capacity	kW	5.05	6.25
Power input, cooling	kW	1.99	2.54
EER, cooling	W/W	2.54	2.46
Operating current	A	8.70	12.30
Annual power consumption	kWh	995	1270
Energy label		E	E
Heating capacity	kW	5.73	7.05
Power input, heating	kW	1.86	2.48
Operating current	A	9.00	11.80

Indoor unit		RAS-18UFHP-ES	RAS-24UFHP-ES
Air flow (cooling/heating)	l/s	231/239	261/269
Fan motor power input	W	50	50
Sound power level (cooling/heating)	dB(A)	56	59
Dimensions			
Height x width x depth	mm	633 x 1093 x 208	633 x 1093 x 208
Weight (cooling/heating)	kg	23	23
Air filter		Triple-action filtering system	Triple-action filtering system

Outdoor unit		RAS-18UAH/UAH-E2	RAS-24UAH/UAH-E-1
Fan type		Propeller	Propeller
Air flow	l/s	585-642	939-989
Fan motor power input	W	42	65
Sound power level, cooling/heating	dB(A)	65/66	70/71
Dimensions			
Height x width x depth	mm	538 x 830 x 300	690 x 880 x 310
Weight (cooling/heating)	kg	50/51	64/67
Compressor power input	W	1500	2200
Pipe connections		Flare	Flare
Gas	in	1/2	1/2
Liquid	in	1/4	1/4
Condensate drain diameter (ID)	mm	15	15
Max. piping length	m	20	25
Precharged length	m	15	15
Max. elevation	m	10	10

Power supply	V-ph-Hz	220/240-1-50	220/240-1-50
Operating range, cooling/heating	°C	15-43/-10-24	15-43/-10-24



# High-Wall Units

**RAS split system range - UKP/UKHP**

**RAS**

**R410A**



The elegant, slimline RAS high-wall units are compact and lightweight and blend in with any room interior. They are powerful and precise, yet ultra-quiet - for optimised user comfort. These units are ideal for residential and commercial applications, such as offices, small shops and hotels.

## Key features

- Designed for use with non-ozone depleting refrigerant R410A
- Elegant slimline design
- Easy installation and maintenance
- Easy-to-use remote control with extra-large display
- Sleep timer
- Five fan speeds plus auto mode
- Five fixed louvre positions, plus swing mode and auto positioning
- Auto-diagnosis function constantly monitors the main functions and components
- New triple-action filtering system: anti-mould filters remove dust and other contaminants, passive electrostatic filters entrap solid particles such as spores and bacteria, and Zeolite-plus photocatalytic filters absorb even smaller pollutants such as viruses, smoke and odours.
- Low noise level





## Technical specifications cooling only models

## High-Wall Units

Indoor unit		RAS-10UKP-ES2 RAS-10UA-ES2	RAS-13UKP-ES2 RAS-13UA-ES2	RAS-18UKP-ES2 RAS-18UA-ES2	RAS-24UKP-ES-1 RAS-24UA-ES-1
Cooling capacity	kW	2.70	3.75	5.08	6.43
Power input, cooling	kW	0.83	1.15	1.85	2.40
EER, cooling	W/W	3.25	3.26	2.75	2.68
Annual power consumption	kWh	415	575	925	1200
Energy label	A	A	A	D	D
Operating current, cooling/heating	A	3.80	5.81	8.40	11.20



## Technical specifications heating/cooling models

Indoor unit		RAS-10UKHP-ES2 RAS-10UAH-ES2	RAS-13UKHP-ES2 RAS-13UAH-ES2	RAS-18UKHP-ES2 RAS-18UAH-ES2	RAS-24UKHP-ES-1 RAS-24UAH-ES-1
Cooling capacity	kW	2.70	3.60	5.03	6.30
Power input, cooling	kW	0.83	1.11	1.88	2.47
EER, cooling	W/W	3.25	3.24	2.68	2.55
Heating capacity	kW	2.93	4.23	5.50	6.85
Power input, heating	kW	0.80	1.16	1.79	2.48
Annual power consumption	kWh	415	555	940	1235
Energy label	A	A	A	D	E
Operating current, cooling/heating	A	4.55/4.26	5.85/5.58	8.60/8.10	11.50/11.50

Indoor unit		RAS-10UKP-ES2 RAS-10UKHP-ES2	RAS-13UKP-ES2 RAS-13UKHP-ES2	RAS-18UKP-ES2 RAS-18UKHP-ES2	RAS-24UKP-ES-1 RAS-24UKHP-ES-1
Air flow (cooling/heating)	l/s	181/167	189/181	208/208	264/264
Fan motor power input, cooling only	W	20	20	30	30
Fan motor power input, heat pump	W	19	19	30	30
Sound power level	dB(A)	52	54	55	58
Dimensions					
Height x width x depth	mm	275 x 790 x 208	275 x 790 x 208	298 x 998 x 208	298 x 998 x 208
Weight (cooling/heating)	kg	10/8	10/8	12/12	12/13
Air filter		Washable	Washable	Washable	Washable

Outdoor unit		RAS-10UA/UAH-ES2	RAS-13UA/UAH-ES2	RAS-18UA/UAH-ES2	RAS-24UA/UAH-ES-1
Fan type		Propeller			
Air flow	l/s	417-472	475-528	508-558	939-989
Sound power level, cooling/heating	dB(A)	60/62	63/64	65/66	70/71
Dimensions					
Height x width x depth	mm	530 x 770 x 200	538 x 780 x 300	538 x 830 x 300	690 x 880 x 310
Weight, cooling/heat pump	kg	29/31	39/42	50/51	64/67
Compressor power input	W	750	1100	1500	2200
Fan motor power input	W	18	28	42	65
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50
Operating range, max./min., cooling	°C	15-43	15-43	15-43	15-43
Operating range, heat pumps					
Max./min., cooling/heating	°C	21-43/5-21	21-43/5-21	15-43/10-24	15-43/10-24



## Technical data refrigerant lines high-wall outdoor units

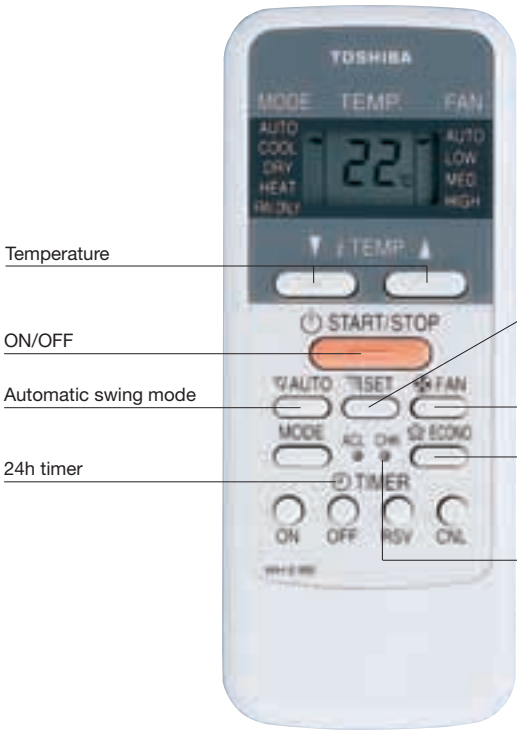
### RAS Single-split refrigerant connections

Outdoor unit model RAS, cooling only		10UA-ES-2	13UA-ES-2	18UA-ES-2	24UA-ES-1
Pipe connections		Flare			
Gas	in	3/8	3/8	1/2	1/2
Liquid	in	1/4	1/4	1/4	1/4
Max. piping length	m	10	15	20	25
Min. cable section, indoor unit	mm <sup>2</sup>	3G 1.5	3G 1.5		
Min. cable section, outdoor unit	mm <sup>2</sup>			3G 4	3G 4
Fuse rating	aM	16	16	20	20
Cable section, connection piping	mm <sup>2</sup>	3G 1.5	3G 1.5	4G 1.5	4G 1.5
Condensate drain diameter	mm	15	15	15	15

Outdoor unit model RAS, heat pump		10UAH-ES-2	13UAH-ES-2	18UAH-ES-2	24UAH-ES-1
Pipe connections		Flare			
Gas	in	3/8	3/8	1/2	1/2
Liquid	in	1/4	1/4	1/4	1/4
Max. piping length	m	10	15	20	25
Min. cable section, indoor unit	mm <sup>2</sup>	3G 1.5	3G 1.5		
Min. cable section, outdoor unit	mm <sup>2</sup>			3G 4	3G 4
Fuse rating	aM	16	16	20	20
Cable section, connection piping	mm <sup>2</sup>	5G 1.5	5G 1.5	4G 1.5	4G 1.5
Condensate drain diameter	mm	15	15	15	15



# RAS series remote controls



Temperature

ON/OFF

Automatic swing mode

24h timer

Set point control

5 fan speeds + auto

Louvre swing

Timer control

Fixed 5 position louvre

Filter dirty warning

ON/OFF

Preset memory

Mode selection

Automatic mode

Hi power mode

Eco mode

Personalised memory key

Auto diagnosis



Louvre position

Fan speeds control, 3 speeds + auto

Eco mode

Auto diagnosis

## Overview light commercial product range (RAV)

Cooling capacity kW		4.5 – 6.0	6.1 – 7.9	10.0 – 13.8	12.5 – 13.8
<b>Digital Inverter*</b>					
<b>Indoor units Digital Inverter</b>					
4-way cassettes		RAV-SM560UT-E	RAV-SM800UT-E	RAV-SM1100UT-E**	RAV-SM1400UT-E**
Duct		RAVSM560BT-E	RAV-SM800BT-E	RAV-SM1100BT-E**	RAV-SM1400BT-E**
High-wall		RAV-SM560KRT-E	RAV-SM800KRT-E		
Flexi		RAV-SM560XT-E*	RAV-SM800XT-E*		
Ceiling				RAV-SM1100CT-E**	RAV-SM1400CT-E**
<b>Outdoor units Digital Inverter</b>					
Heat pump		RAV-SM560AT-E	RAV-SM800AT-E	RAV-SM1100AT-E**	RAV-SM1400AT-E**

\* These units will be available from mid 2003

\*\* These units will be available in autumn 2003

Cooling capacity kW Capacity code		2.5 – 2.8 1	3.6 – 4.2 1.5	4.5 – 5.0 2.0	5.7 – 6.7 2.5	7.1 – 7.9 3.0	10.0 – 13.8 4.0	12.5 – 13.8 5.08
<b>Indoor units standard RAV series</b>								
High-wall								
Cooling only Heat pump		RAV-105KH-PE	RAV-135KH-PE	RAV-164K-PE RAV-165KH-PE	RAV-265KH-PE	RAV-264K-PE RAV-264KH-PE*		
Low-wall/floor								
Heat pump Chassis				RAV-164SH-PE		RAV-264SH-PE*		
Heat pump		RAV-104NH-PE	RAV-134NH-PE	RAV-164NH-PE	RAV-264NH-PE			
Ceiling								
Cooling only Heat pump			RAV-134C-PE RAV-134CH-PE	RAV-164C-PE RAV-164CH-PE		RAV-264C-PE* RAV-264CH-PE*	RAV-364C-PE RAV-364CH-PE	RAV-464C-PE RAV-464CH-PE
2-Way cassettes								
Cooling only Heat pump		RAV-104TUH-1-PE	RAV-134TU-1-PE RAV-134 TUH-1-PE	RAV-164TU-1-PE RAV-164TUH-1-PE				
4-Way cassettes								
Cooling only Heat pump				RAV-164U-PE RAV-164UH-PE		RAV-264U-PE* RAV-264UH-PE*	RAV-364U-PE RAV-364UH-PE	RAV-464U-PE RAV-464UH-PE
Duct and Slim Duct								
Cooling only Heat pump		RAV-104SBH-PE		RAV-164B-PE RAV-164BH-PE		RAV-264B-PE* RAV-264BH-PE*	RAV-364B-PE RAV-364BH-PE	RAV-464B-PE RAV-464BH-PE
Twin-Split								
Cooling only Heat pump				2 x RAV-104/105#-PE		2 x RAV-134#-PE 2 x RAV-134/135#-PE	2 x RAV-164#-PE 2 x RAV-164/165#-PE	2 x RAV-264#-PE 2 x RAV-264/265#-PE
<b>Outdoor units standard RAV series</b>								
Standard Series								
Cooling only Heat pump		SMi outdoor unit SMi outdoor unit	RAV-134A-PE RAV-134AH-PE	RAV-164A-PE RAV-164AH-PE	RAV-264A-PE RAV-264AH-PE	RAV-364A8-PE RAV-364AH8-PE	RAV-464A8-PE RAV-464AH8-PE	
Twin-Split								
Cooling only Heat pump				RAV-164AH-PE		RAV-264A-PE RAV-264AH-PE	RAV-368A8-PE RAV-364AH8-PE	RAV-464A8-PE RAV-464AH8-PE

\* These units are available with 220/240-1-50 and 380/415-3-50 power supply. 380/415-3-50 power supply is indicated by the figure 8 after the letter A in the outdoor unit designation (e.g. RAV-264A8-PE).

# Digital Inverter Units

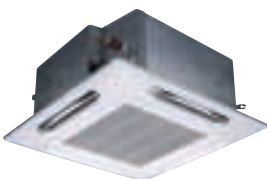
Light commercial heat pump system with digital inverter



The Digital Inverter from Toshiba combines economy and ecology in a smart body. It offers state-of-the-art technology, exceptional energy savings, high performance, easy installation and flexible control. The latest digital inverter technology ensures smooth start-up and capacity control for optimum comfort. A choice of indoor units includes cassettes, ducted, under-ceiling, wall-mounted and floor-mounted units.

## Key features

- Superior EER with significant savings in annual power consumption
- High-performance operation, using digital inverter control systems
- Designed for use with non-ozone depleting refrigerant R410A
- Compact, space-saving design - the weight up to 35% lower than comparable models
- Easy installation and maintenance
- Reduced installation cost with smaller piping diameter
- Precise capacity control at all conditions
- Quiet operation with automatic quiet mode
- Performance tuning for optimised comfort
- The innovative inverter technology ensures precise temperature control
- The same outdoor unit is compatible with a choice of indoor units





## Technical specifications

## Digital Inverter Units

Outdoor unit	RAV-SM	560AT-E	800AT-E	560AT-E	800AT-E	560AT-E	800AT-E	560AT-E	800AT-E
Indoor unit	RAV-SM	Four-way cassette		Duct		Hi-Wall		Flexi (ceiling/floor model)	
		560UT-E	800UT-E	560BT-E	800BT-E	560KRT-E	800KRT-E	560XT-E	800XT-E
Cooling capacity	kW	5.3	7.1	5.0	7.1	5.1	6.7	5.0	6.8
Power input, cooling	kW	1.76	2.34	1.92	2.60	1.74	2.72	1.81	2.82
EER, cooling	W/W	3.01	3.03	2.60	2.73	2.93	2.46	2.76	2.41
Heating capacity	kW	5.6	8.0	5.6	8.0	5.6	8.0	5.6	8.0
Power input, heating	kW	1.44	2.32	1.71	2.49	1.70	2.67	1.60	2.66
COP, heating	W/W	3.90	3.45	3.27	3.21	3.29	3.00	3.50	3.01
Annual power consumption	kWh	xx	xx	xx	xx	xx	xx	xx	xx
Energy label, cooling		B	B	D	D	C	E	D	E
Energy label, heating		A	B	C	C	C	D	B	D

Indoor unit	RAV-SM	Four-way cassette		Duct		Hi-Wall		Flexi (ceiling/floor model)	
		560UT-E	800UT-E	560BT-E	800BT-E	560KRT-E	800KRT-E	560XT-E	800XT-E
Fan type		Turbo fan	Turbo fan	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Air flow	l/s	292	333	233	317	233	308	t.b.a.	t.b.a.
Dimensions	mm								
Height		256	256	320	320	298	298	208	208
Width		840	840	700	1000	998	998	1093	1093
Depth		840	840	800 (+75)	800 (+75)	208	208	633	633
Weight	kg	21	22	39	53	12	12	23	23
Panel dimensions	mm								
Height x width x depth	mm	35 x 950 x 950		-	-	-	-	-	-
Panel weight	kg	4,5	4,5	-	-	-	-	-	-
Sound power level, cooling	dB(A)	45	47	55	56	52	58	56	59
Sound power level, heating	dB(A)	45	47	55	56	52	58	56	59

Outdoor unit	RAV-SM	560AT-E	800AT-E	560AT-E	800AT-E	560AT-E	800AT-E	560AT-E	800AT-E
Dimensions	mm								
Height		595	795	595	795	595	795	595	795
Width		780	900	780	900	780	900	780	900
Depth		270	320	270	320	270	320	270	320
Weight	kg	35	55	35	55	35	55	35	55
Sound power level, cooling	dB(A)	59	61	59	61	59	61	59	61
Sound power level, heating	dB(A)	61	63	61	63	61	63	61	63
Pipe connections		Flare	Flare	Flare	Flare	Flare	Flare	Flare	Flare
Gas	in	1/2	5/8	1/2	5/8	1/2	5/8	1/2	5/8
Liquid	in	1/4	3/8	1/4	3/8	1/4	3/8	1/4	3/8
Pipe length, maximum	m	30	50	30	50	30	50	30	50
Pipe length, chargeless	m	20	20	20	20	20	20	20	20
Height difference	m	30	30	30	30	30	30	30	30
Condensate pipe diameter (OD)	mm	16	16	16	16	16	16	16	16
Operating range, cooling	°C	-5/43	-5/43	-5/43	-5/43	-5/43	-5/43	-5/43	-5/43
Operating range, heating	°C	-15/15	-15/15	-15/15	-15/15	-15/15	-15/15	-15/15	-15/15
Power supply	V-ph-Hz	220/240-1-50		220/240-1-50		220/240-1-50		220/240-1-50	



\* option

\*

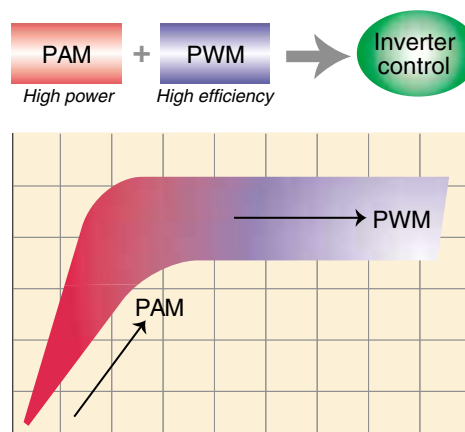
\*



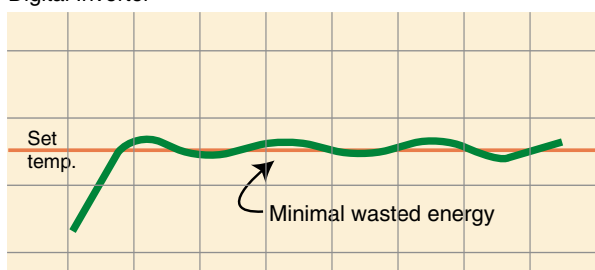
## The new Digital Inverter sets new standards

The Digital Inverter units from Toshiba stand for high performance and control flexibility, combined with superior energy efficiency and optimised comfort. The innovative outdoor units can be connected to a wide choice of indoor units to suit offices, shops, restaurants and other light commercial applications.

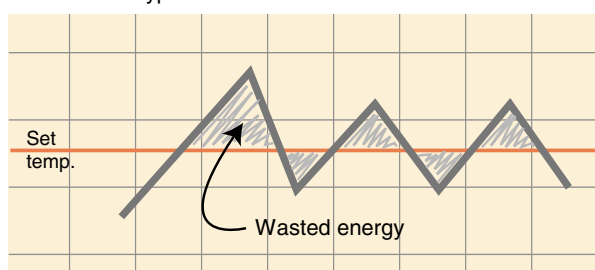
The Digital Inverter uses the latest inverter technology, ensuring high power and high efficiency. Inverter control, assisted by PAM (pulse amplitude modulation), increases compressor frequency to rapidly reach the desired temperature. Once the temperature has been reached, the inverter control uses PWM (pulse width modulation) to adjust the compressor speed and efficiently maintain precise temperature control without excessive power consumption (size 560 with PAM and PWM Digital Inverter, and size 800 with Digital Inverter). By adopting this innovative inverter technology, the Toshiba Digital Inverter offers remarkable energy savings, efficient economical operation, and superior comfort.



**Digital Inverter**



**Conventional type**



The digital inverter maintains precise room temperature control and creates a comfortable environment.

In conventional units, the compressor switches off once the set temperature is reached, and on again after the temperature drops. During the time it takes for the unit to switch on and off the room temperature fluctuates greatly.

With the digital inverter compressor power is reduced, once the desired temperature has been reached, and operation continues at a reduced state to maintain a stable room temperature with minimal fluctuations. This also results in significantly reduced noise levels.

The variable compressor power levels maintain even room temperature control, so that little energy is wasted, resulting in minimum power input levels and a superior EER (Energy Efficiency Ratio) for all Toshiba Digital Inverter models.

### Innovative outdoor units

The Digital Inverter outdoor units are equipped with rotary compressors and an Intelligent Power Drive Unit (IPDU) for increased reliability and efficiency and minimised noise levels.

With their ultra compact and lightweight design they guarantee easy and convenient installation. The outdoor units are fitted with smaller diameter piping than conventional models to further facilitate installation and reduce installation time and cost.



## A choice of indoor units and remote controls

### Four-way cassettes

With new airflow control and panel design, the ceiling is kept clean. Flap and grille are easily detachable and washable. Corner pockets in all four panel corners allow convenient access to the controls. The control box is easily removed and electrical parts and connections are simplified for easy installation and maintenance.



"Clean" design



Easy-access control box



Corner pocket



Remote control

### High-wall units

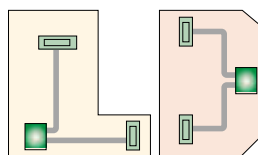
With their new rounded shape and slim-line design, the high-wall units blend in with any room setting.

Air quality is greatly improved with a triple filtering system, removing first large solid particles and dust, then solids as small as 0.01 microns and finally air-borne pollutants such as smoke and odours from the air.

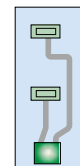
The auto louver mode ensures even diffusion of air throughout the room.

### Ducted units

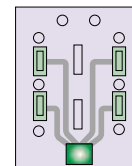
The use of ducts allows unobtrusive air outlets to be conveniently installed anywhere on the ceiling and is ideal for a wide variety of room layouts. External static pressure can be raised to 98 Pa, so that all areas of the room can be reached for even temperature distribution, no matter how complex the layout. An optional drain pan kit offers a flexible piping layout that raises drain piping up to 300 mm.



Polygonal rooms



Narrow rooms



Rooms with fixtures and obstacles



Natural air distribution



### Console and under-ceiling units

These units can be installed on the floor or under the ceiling without modification or accessory. Both are easily installed by removing the air intake grille and connecting the refrigerant piping and electrical wiring. Airflow can be directed as desired for non-intrusive, natural air distribution. Like the high-wall units, these units include a triple-action air filtering system for improved room air quality, as well as an optional 300-mm lift drain pump for extra convenience.

### Optional remote controls

Wired remote control - available for 4-way cassettes and ducted units to control a group of up to eight indoor units. Includes a 72-hour on/off timer, and an error indication and diagnosis function.

Weekly timer - available for 4-way cassettes and ducted units, allows setting a weekly time schedule with three different on/off time settings for precise and effective unit operation.

Wireless remote controller - available for the 4-way cassettes, includes a remote controller and receiver.



Wireless remote control



Wired remote control



Weekly timer



Remote receiver

# High-Wall Units

RAV indoor unit range

RAV

R407C

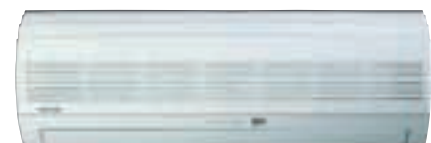
RDC



These Toshiba high-wall units use AI controls and are fully compatible with RAV heat pump outdoor units and SMi heat recovery systems. They are available in a wide range of capacities and ideal for small and medium-size commercial applications.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- The same unit supplies cooling and heating.
- Quiet operation
- Four fan speeds - high, medium, low and ultra-low
- Wired and wireless remote control options
- Motorised louvres
- Easy installation and maintenance with long-life washable filter
- Ideal for new and refurbishment projects
- Performance tuning for optimised comfort



**Sizes 105, 135, 165, 265**



**Size 264**



## Technical specifications cooling only models

## High-Wall Units

Indoor unit		RAV-164K-PE	RAV-264K-PE
Outdoor unit		RAV-164A-PE	RAV-264A-PE*
Cooling capacity	kW	4.5	7.1
Power input, cooling	kW	2.2	3.1/2.9*
EER, cooling	W/W	2.05	2.29/2.45*
Annual power consumption	kWh	1100	1550/1450*
Energy label	G		F/E



## Technical specifications heating/cooling models

Indoor unit		RAV-105KH-PE	RAV-135KH-PE	RAV-165KH-PE	RAV-265KH-PE	RAV-264KH-PE
Outdoor unit		SMi outdoor unit	RAV-134AH-PE	RAV-164AH-PE	RAV-264AH-PE*	RAV-264AH-PE
Cooling capacity	kW	2.5	3.6	4.5	5.7	7.1
Power input, cooling	kW	-	2	2.2	2.9	3.1/2.9*
EER, cooling	W/W	-	1.80	2.05	1.97	2.29/2.45*
Heating capacity	kW	2.8	4.2	5.0	6.7	7.9
Power input, heating	kW	-	2.15	2.2	2.8	2.8/2.8*
Annual power consumption	kWh	-	1000	1100	1450	1550/1450*
Energy label	-	-	G	G	G	F/E*

Indoor unit		RAV-105KH-PE	RAV-135KH-PE	RAV-165KH-PE	RAV-265KH-PE	RAV-264KH-PE
Fan type		Tangential	Tangential	Tangential	Tangential	Tangential
Air flow (high/medium/low)	l/s	170/153/136	233/210/186	283/255/226	308/277/246	333/250/194
Sound power level	dB(A)	47	49	53	53	53
Dimensions						
Height x width x depth	mm	298 x 998 x 208	298 x 998 x 208	298 x 998 x 208	372 x 1478 x 226	372 x 1478 x 226
Weight	kg	15	15	15	15	26
Air filter		Washable	Washable	Washable	Washable	Washable

Outdoor unit		SMi outdoor unit	RAV-134AH-PE	RAV-164AH-PE	RAV-264AH-PE*	RAV-264AH-PE
Fan type			Propeller	Propeller	Propeller	Propeller
Air flow	l/s	-	750	750	833	833
Sound power level	dB(A)	70	63	67	67	67
Dimensions						
Height x width x depth	mm	-	740 x 880 x 364	740 x 880 x 364	790 x 880 x 364	790 x 880 x 364
Weight, cooling/heating	kg	-	58/61	58/61	80/80	80/80
Power supply	V-ph-Hz	380/415-3-50	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50**
Operating range, max./min., cooling	°C	-2/43	-2/43	-2/43	-2/43	-2/43
Operating range, max./min., heating	°C	-10/21	-10/21	-10/21	-10/21	-10/21

\* The second value is for units with 380/415-3-50 power supply, indicated by the figure 8 after the letter A in the unit designation (e.g. RAV-264A8-PE)

\*\* Also available with 380/415-3-50 power supply,



# Low-Wall/Chassis Units

RAV indoor unit range

RAV

R407C

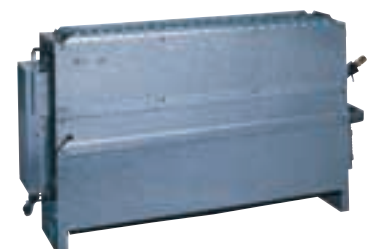
RDC



The slim fully-encased low-wall units and the compact wall or floor-mounted chassis units occupy very little floor space and are ideal for installation against a perimeter wall, in areas where under-ceiling installation is not possible. The low-wall units match the ceiling model and provide the perfect solution, where both configurations are required.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- Three fan speeds
- Minimum footprint for maximum lettable/usable floor space
- Uniform air distribution
- User-friendly controls
- Adjustable louvres (low-wall units)
- Easy installation and maintenance with long-life washable filter
- Ideal for partitioned offices, banking halls, retails sites etc.
- Performance tuning for optimised comfort







## Technical specifications heating/cooling models

## Chassis Units

Indoor unit		RAV-104NH-PE	RAV-134NH-PE	RAV-164NH-PE	RAV-264NH-PE
Outdoor unit		SMi outdoor unit*	RAV-134AH-PE	RAV-164AH-PE	RAV-264AH-PE
Cooling capacity	kW	2.5	3.6	4.5	5.7
Power input, cooling	kW	-	2	2.2	2.8
EER, cooling	W/W	-	1.80	2.05	2.04
Heating capacity	kW	2.8	4.2	5.0	7.9
Power input, heating	kW	-	2.15	2.2	2.95
Annual power consumption	kWh	-	1000	1100	1400
Energy label		-	G	G	G

Indoor unit		RAV-104NH-PE	RAV-134NH-PE	RAV-164NH-PE	RAV-264NH-PE
Fan type		Centrifugal	Centrifugal	Centrifugal	Centrifugal
Air flow (high/medium/low)	l/s	153/138/113	174/157/129	206/179/151	250/225/185
Sound power level	dB(A)	52	54	54	52
Dimensions***					
Height x width x depth	mm	580 x 750 x 230	580 x 1050 x 230	580 x 1050 x 230	580 x 1050 x 230
Weight	kg	21	25	29	34
Air filter		Washable	Washable	Washable	Washable



## Technical specifications heating/cooling models Low-wall Units

Indoor unit			RAV-164SH-PE	RAV-264SH-PE
Outdoor unit			RAV-164AH-PE	RAV-264AH-PE**
Cooling capacity	kW	-	4.5	7.1
Power input, cooling	kW	-	2.2	3.1/2.9**
EER, cooling	W/W	-	2.05	2.29/2.45**
Heating capacity	kW	-	5.0	7.9
Power input, heating	kW	-	2.2	2.95/2.95**
Annual power consumption	kWh	-	1100	1550/1450**
Energy label		-	G	F/E**

Indoor unit			RAV-164SH-PE	RAV-264SH-PE
Fan type			Centrifugal	
Air flow (high/medium/low)	l/s	-	236/213/175	333/300/250
Sound power level	dB(A)	-	54	54
Dimensions				
Height x width x depth	mm	-	640 x 1030 x 188	640 x 1230 x 188
Weight	kg	-	24	28
Air filter		-	Washable	Washable

Outdoor unit		SMi outdoor unit*	RAV-134AH-PE	RAV-164AH-PE	RAV-264AH-PE*
Fan type			Propeller	Propeller	Propeller
Air flow	l/s	-	750	750	833
Sound power level	dB(A)	70	63	67	67
Dimensions					
Height x width x depth	mm	-	740 x 880 x 364	740 x 880 x 364	790 x 880 x 364
Weight	kg	-	61	61	80

Power supply	V-ph-Hz	380/415-3-50	220/240-1-50	220/240-1-50	220/240-1-50†
Operating range, max./min., cooling	°C	-2/43	-2/43	-2/43	-2/43
Operating range, max./min., heating	°C	-10/21	-10/21	-10/21	-10/21

\* Please refer to the SMi section for data on the SMi outdoor unit.

\*\* The second value is for units with 380/415-3-50 power supply, indicated by the figure 8 after the letter A in the unit designation (e.g. RAV-264A8-PE)

\*\*\* The unit is supplied configured for top discharge. If required, the flange plate may be removed and repositioned on the front face of the unit. In this case the unit height is 600 mm and the unit depth is 250 mm. These values include the dimension of the discharge flange in either position.

† Also available with 380/415-3-50 power supply.



# Ceiling Units

RAV indoor unit range

RAV

R407C

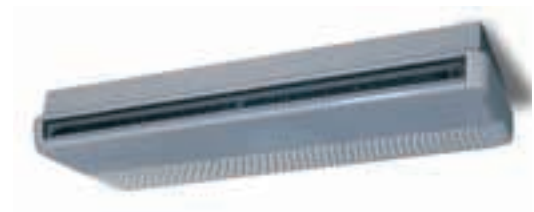
RDC



These attractively styled units are ideal for rooms without ceiling voids, and can be fitted into any standard ceiling. Where a shallow ceiling void exists, the unit can be semi-recessed to make it even more unobtrusive.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- Quiet operation with automatic air flow control
- Can be fitted to any standard ceiling
- User-friendly controls
- Performance tuning for optimised comfort
- Motorised louvre
- Fresh air intake facility
- Easy installation and maintenance with long-life washable filter
- Adjustable air flow with separate cooling and heating settings
- Ideal for commercial applications





## Technical specifications cooling only models

## Ceiling Units

Indoor unit		RAV-134C-PE	RAV-164C-PE	RAV-264C-PE*	RAV-364C-PE	RAV-464C-PE
Outdoor unit		RAV-134A-PE	RAV-164A-PE	RAV-264A-PE	RAV-364A-PE	RAV-464A-PE
Cooling capacity	kW	3.6	4.5	7.1	10.0	12.5
Power input, cooling	kW	2	2.2	3.1/2.9*	4.2	5.15
EER, cooling	W/W	1.80	2.05	2.29/2.45*	2.38	2.43
Annual power consumption	kWh	1000	1100	1550/1450*	2100	2570
Energy label	G		G	F/E*	F	E



## Technical specifications heating/cooling models

Indoor unit		RAV-134CH-PE	RAV-164CH-PE	RAV-264CH-PE*	RAV-364CH-PE	RAV-464CH-PE
Outdoor unit		RAV-134AH-PE	RAV-164AH-PE	RAV-264AH-PE	RAV-364AH-PE	RAV-464AH-PE
Cooling capacity	kW	3.6	4.5	7.1	10.0	12.5
Power input, cooling	kW	2	2.2	3.1/2.9*	4.2	5.15
EER, cooling	W/W	1.80	2.05	2.29/2.45*	2.38	2.43
Heating capacity	kW	4.2	5.0	7.9	10.8	13.8
Power input, heating	kW	2.15	2.2	2.95/2.95*	3.9	5.4
Annual power consumption	kWh	1000	1100	1550/1450*	2100	2570
Energy label	G		G	F/E*	F	E

Indoor unit		RAV-134C/CH-PE	RAV-164C/CH-PE	RAV-264C/CH-PE*	RAV-364C/CH-PE	RAV-464C/CH-PE
Fan type		Centrifugal				
Air flow (high/medium/low)	l/s	217/150/138	236/213/175	333/300/250	467/417/369	583/528/483
Sound power level	dB(A)	51	55	55	56	57
Dimensions						
Height x width x depth	mm	188 x 1030 x 640	188 x 1030 x 640	188 x 1230 x 640	240 x 1430 x 640	240 x 1630 x 640
Weight	kg	24	24	28	39	44
Air filter		Washable	Washable	Washable	Washable	Washable

Outdoor unit		RAV-134A/CH-PE	RAV-164A/CH-PE	RAV-264A/CH-PE*	RAV-364A/CH-PE	RAV-464A/CH-PE
Fan type		Propeller				
Air flow	l/s	750	750	833	1667	1667
Sound power level	dB(A)	63	67	68	70	71
Dimensions						
Height x width x depth	mm	740 x 880 x 364	740 x 880 x 364	790 x 880 x 364	1240 x 930 x 440	1240 x 930 x 440
Weight (cooling - cooling/heating)	kg	58/61	58/61	80/80	102/101	114/109

Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50**	380/415-3-50	380/415-3-50
Operating range, max./min., cooling	°C	-2/43	-2/43	-2/43	-2/43	-2/43
Operating range, max./min., heating	°C	-10/21	-10/21	-10/21	-10/21	-10/21

\* The second value is for units with 380/415-3-50 power supply, indicated by the figure 8 after the letter A in the unit designation (e.g. RAV-264A8-PE).

\*\* Also available with 380/415-3-50 power supply.



# Two-Way Cassettes

RAV indoor unit range

RAV

R407C

RDC



If ceiling void space is limited - a common problem with retrofit applications, Toshiba has the solution with its range of innovative slim-line two-way cassettes. These units are ideal for new and refurbishment projects.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- Slim-line grille (25 mm)
- Changes temperature and humidity of the entering fresh air
- Adjustable air distribution via remote controller
- Compact unit - only 190 mm void space required
- Performance tuning for optimised comfort
- Easy installation and maintenance with long-life washable filter
- Motorised louvres
- Quiet operation with automatic air flow control





## Technical specifications cooling only models

## Two-Way Cassettes

Indoor unit		RAV-134TU-1-PE	RAV-164TU-1-PE
Outdoor unit		RAV-134A-PE	RAV-164A-PE
Cooling capacity	kW	3.6	4.5
Power input, cooling	kW	2	2.2
EER, cooling	W/W	1.80	2.05
Annual power consumption	kWh	1000	1100
Energy label		G	G



## Technical specifications heating/cooling models

Indoor unit		RAV-104TUH-1-PE	RAV-134TUH-1-PE	RAV-164TUH-1-PE
Outdoor unit		SMi outdoor unit*	RAV-134AH-PE	RAV-164AH-PE
Cooling capacity	kW	2.5	3.6	4.5
Power input, cooling	kW	-	2	2.2
EER, cooling	W/W	-	1.80	2.05
Heating capacity	kW	2.8	4.2	5.0
Power input, heating	kW	-	2.15	2.2
Annual power consumption	kWh	-	1000	1100
Energy label		-	G	G

Indoor unit		RAV-104TUH-1-PE	RAV-134TU/TUH-1-PE	RAV-164TU/TUH-1-PE
Fan type		Tangential	Tangential	Tangential
Air flow (high/medium/low)	l/s	153/139/124	194/176/158	208/189/169
Air throw (guide vanes at 45°)	m	3	4	4
Sound power level	dB(A)	47	48	48
Dimensions				
Height x width x depth	mm	190 x 910 x 480	190 x 910 x 480	190 x 910 x 480
Weight	kg	23	23	23
Air filter		Washable	Washable	Washable
Panel reference number		RBC-U134PG (W)-E		
Dimensions: Height x width x depth	mm	25 x 1050 x 550	25 x 1050 x 550	25 x 1050 x 550
Panel depth below ceiling	mm	25	25	25
Panel weight	kg	4.5	4.5	4.5

Outdoor unit		SMi outdoor unit*	RAV-134A/AH-PE	RAV-164A/AH-PE
Fan type			Propeller	Propeller
Air flow	l/s	-	750	750
Sound power level	dB(A)	70	63	67
Dimensions				
Height x width x depth	mm	-	740 x 880 x 364	740 x 880 x 364
Weight (cooling - cooling/heating)	kg	-	58/61	58/61
Power supply				
	V-ph-Hz	380/415-3-50	220/240-1-50	220/240-1-50
Operating range, max./min., cooling	°C	-	-2/43	-2/43
Operating range, max./min., heating	°C	-	-10/21	-10/21

\* Please refer to the SMi section for data on the SMi outdoor unit.





# Four-Way Cassettes

RAV indoor unit range

RAV

R407C

RDC



The unobtrusive four-way cassettes from Toshiba blend in with any room interior decor, and offer the ideal solution for small commercial applications where space is limited. These flexible units are ideal for new and refurbishment projects.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- User-friendly controls
- Fresh air intake facility
- Flexible air distribution through 2, 3 or 4 sides
- Slim easy-to-clean one-piece panel
- Threaded drain connection as standard
- Quiet operation with automatic air flow control
- Easy installation and maintenance with long-life washable filter
- Synchronised motor-driven louvres
- Branch duct option
- Performance tuning for optimised comfort





## Technical specifications cooling only models

## Four-Way Cassettes

Indoor unit		RAV-164U-PE	RAV-264U-PE*	RAV-364U-PE	RAV-464U-PE
Outdoor unit		RAV-164A-PE	RAV-264A-PE	RAV-364A-PE	RAV-464A-PE
Cooling capacity	kW	4.5	7.1	10.0	12.5
Power input, cooling	kW	2.2	3.1/2.9*	4.2	5.15
EER, cooling	W/W	2.05	2.29/2.45*	2.38	2.43
Annual power consumption	kWh	1100	1550/1450*	2100	2570
Energy label	G		F/E*	F	E



## Technical specifications heating/cooling models

Indoor unit		RAV-164UH-PE	RAV-264UH-PE*	RAV-364UH-PE	RAV-464UH-PE
Outdoor unit		RAV-164AH-PE	RAV-264AH-PE	RAV-364AH-PE	RAV-464AH-PE
Cooling capacity	kW	4.5	7.1	10.0	12.5
Power input, cooling	kW	2.2	3.1/2.9*	4.2	5.15
EER, cooling	W/W	2.05	2.29/2.45*	2.38	2.43
Heating capacity	kW	5.0	7.9	10.8	13.8
Power input, heating	kW	2.2	2.95/2.95*	3.9	5.4
Annual power consumption	kWh	1100	1550/1450*	2100	2570
Energy label	G		F/E*	F	E

Indoor unit		RAV-164U/UH-PE	RAV-264U/UH-PE*	RAV-364U/UH-PE	RAV-464U/UH-PE
Fan type		Centrifugal	Centrifugal	Centrifugal	Centrifugal
Air flow (high/medium/low)	l/s	283/247/231	350/317/283	486/422/378	517/450/419
Air throw (guide vanes at 45°)	m	4	4	4.5	5
Sound power level	dB(A)	43	49	49	52
Dimensions					
Height** x width x depth	mm	259 x 820 x 820	259 x 820 x 820	309 x 1230 x 820	309 x 1230 x 820
Weight	kg	25	25	43	43
Panel reference number		RBC-U264PG/PGR** (W)-E		RBC-U464PG/PGR** (W)-E	
Dimensions: height** x width x depth	mm	59 x 940 x 940	59 x 940 x 940	59 x 1350 x 940	59 x 1350 x 940
Panel depth below ceiling	mm	20	20	20	20
Panel weight	kg	6	6	8	8
Air filter		Washable	Washable	Washable	Washable

Outdoor unit		RAV-164A/AH-PE	RAV-264A/AH-PE	RAV-364A/AH-PE	RAV-464A/AH-PE
Fan type		Propeller	Propeller	Propeller	Propeller
Air flow	l/s	750	833	1667	1667
Sound power level	dB(A)	67	67	71	71
Dimensions					
Height x width x depth	mm	740 x 880 x 364	790 x 880 x 364	1240 x 930 x 440	1240 x 930 x 440
Weight (cooling - cooling/heating)	kg	58/61	80/80	102/101	114/109
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50***	380/415-3-50	380/415-3-50
Operating range, max./min., cooling	°C	-2/43	-2/43	-2/43	-2/43
Operating range, max./min., heating	°C	-10/21	-10/21	-10/21	-10/21

\* The second value is for units with 380/415-3-50 power supply, indicated by the figure 8 after the letter A in the unit designation (e.g. RAV-264A8-PE)

\*\* For the total unit height add the unit height to the panel height

\*\*\* Also available with 380/415-3-50 power supply.



# Duct and Slim-Duct Units

RAV indoor unit range

RAV

R407C

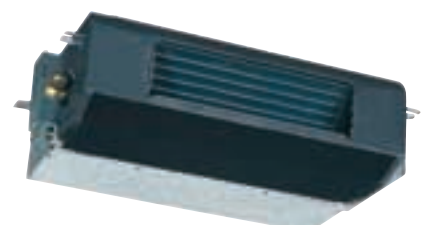
RDC



Whatever the shape of the room, ducted units ensure uniform temperatures throughout. Cool or warm air is ducted into the room through diffusers, discreetly positioned in the walls or ceiling. These units are ideal for hotels, banks and similar applications.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- Quiet, powerful operation
- Fresh air intake facility
- Perfect comfort throughout the room
- Can be used with any style of diffuser
- User-friendly control options
- Performance tuning for optimised comfort
- Concealed installation in a ceiling void makes the unit unobtrusive
- Increased design flexibility
- Easy installation and maintenance with optional long-life washable filter kit





## Technical specifications cooling only models

## Duct/Slim-Duct Units

Indoor unit		RAV-164B-PE	RAV-264B-PE	RAV-364B-PE	RAV-464B-PE
Outdoor unit		RAV-164A-PE	RAV-264A-PE	RAV-364A-PE	RAV-464A-PE
Cooling capacity	kW	4.5	7.1	10.0	12.5
Power input, cooling	kW	2.2	3.1/2.9**	4.2	5.15
EER, cooling	W/W	2.05	2.29/2.45**	2.38	2.43
Annual power consumption	kWh	1100	1550/1450**	2100	2570
Energy label		G	F/E**	F	E



## Technical specifications heating/cooling models

Indoor unit		RAV-104SBH-PE	RAV-164BH-PE	RAV-264BH-PE	RAV-364BH-PE	RAV-464BH-PE
Outdoor unit		SMI outdoor unit*	RAV-164AH-PE	RAV-264AH-PE	RAV-364AH-PE	RAV-464AH-PE
Cooling capacity	kW	2.5	4.5	7.1	10.0	12.5
Power input, cooling	kW	-	2.2	3.1/2.9**	4.2	5.15
EER, cooling	W/W	-	2.05	2.29/2.45**	2.38	2.43
Heating capacity	kW	2.8	5.0	7.9	10.8	13.8
Power input, heating	kW	-	2.2	2.95/2.95**	3.9	5.4
Annual power consumption	kWh	-	1100	1550/1450**	2100	2570
Energy label		-	G	F/E**	F	E

Indoor unit		RAV-104SBH-PE	RAV-164B/BH-PE	RAV-264B/BH-PE	RAV-364B/BH-PE	RAV-464B/BH-PE
Fan type		Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Air flow (high/medium/low)	l/s	125/112/100	233/208/190	317/288/263	506/456/392	583/532/480
Sound power level	dB(A)	47	55	58	60	61
Dimensions						
Height x width x depth	mm	220 x 800 x 500	345 x 770 x 875	345 x 1070 x 875	345 x 1420 x 875	345 x 1420 x 875
Weight	kg	22	39	53	58	62
Air filter		Washable	Washable	Washable	Washable	Washable

Outdoor unit		SMI outdoor unit*	RAV-164A/AH-PE	RAV-264A/AH-PE	RAV-364A/AH-PE	RAV-464A/AH-PE
Fan type		-	Propeller	Propeller	Propeller	Propeller
Air flow	l/s	-	750	833	1667	1667
Sound power level	dB(A)	70	67	67	71	71
Dimensions						
Height x width x depth	mm	-	740 x 880 x 364	790 x 880 x 364	1240 x 930 x 440	1240 x 930 x 440
Weight	kg	-	58/61	80/80	102/101	114/109

Power supply	V-ph-Hz	380/415-3-50	220/240-1-50	220/240-1-50***	380/415-3-50	380/415-3-50
Operating range, max./min., cooling	°C	-2/43	-2/43	-2/43	-2/43	-2/43
Operating range, max./min., heating	°C	-10/21	-10/21	-10/21	-10/21	-10/21

\* Please refer to the SMI section for data on the SMI outdoor unit.

\*\* The second value is for units with 380/415-3-50 power supply, indicated by the figure 8 after the letter A in the unit designation (e.g. RAV-264A8-PE)

\*\*\* Also available with 380/415-3-50 power supply.



\* Duct model only

# Twin-split Systems

RAV twin-split indoor unit range

RAV

R407C

RDC



The twin-split system allows the connection of two indoor units of the same type and the same capacity to one outdoor unit in order to ensure more even air distribution in a larger zone. The master unit measures the temperature for both indoor units. The indoor units are installed in the same room, always operate simultaneously, and have a single control.

## Key features

- Designed for use with non-ozone depleting refrigerant R407C
- Precise capacity control at all conditions
- Ideal for larger shops, open plan offices and similar applications.
- Twin operation is possible with all RAV indoor units
- User-friendly controls.
- Compact outdoor unit for easy installation
- Performance tuning for optimised comfort
- Easy installation and maintenance with long-life washable filter
- Twinning is possible for both cooling only units and heat pumps, but cooling only models require a connection kit (Twin Kit). Heat pump units do not require this kit.







## Technical specifications cooling only

## Twin-Split Units

System capacity	kW	4.5	7.1	10	12.5
Indoor unit	-	-	2 x RAV 134#-PE RAV-264A-PE	2 x 164 #-PE RAV 364A8-PE	2 x RAV 264 #-PE RAV-464A8-PE
Outdoor unit	-	-	RBC-TK-45/CO	RBC-TK-45/CO	RBC-TK-45/CO
Connection kit	-	-	-	-	-
Cooling capacity per unit	kW	-	3.55	5.0	6.25
Connection cable section	mm <sup>2</sup>	-	4G 1.5 + 3G 1.5	4G 1.5 + 3G 1.5	4G 1.5 + 3G 1.5



## Technical specifications cooling/heating

## Twin-Split Units

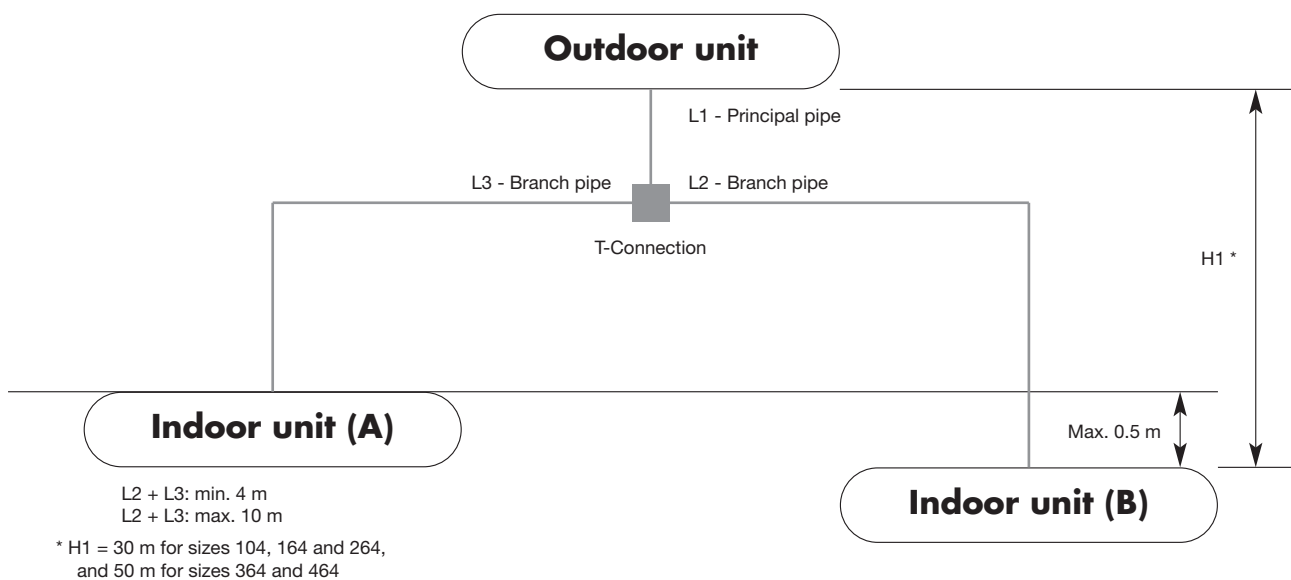
System capacity	kW	4.5	7.1	10	12.5
Indoor unit	-	2 x RAV 104/105#-PE RAV164AH-PE	2 x RAV 134/135 #-PE RAV-264AH-PE	2 x RAV164/165 #-PE RAV 364AH8-PE	2 x RAV 264/265 #-PE RAV-464AH8-PE
Outdoor unit	-	-	-	-	-
Cooling capacity per unit	kW	2.25	3.55	5.0	6.25
Heating capacity per unit	kW	2.5	3.95	5.4	6.9
Connection cable section	mm <sup>2</sup>	-	4G 1.5 + 3G 1.5	4G 1.5 + 3G 1.5	4G 1.5 + 3G 1.5

## Possible indoor/outdoor unit combinations

Cooling only		Heat pumps		
Outdoor unit	Indoor unit	Outdoor unit	Indoor unit	Compatible indoor units
-	-	RAV-164AH8-PE	2 x RAV-104/105#H-PE	K = High-wall units
RAV-264A-PE	2 x RAV-134#H-PE	RAV-264AH-PE	2 x RAV-134/135#H-PE	TU = Two-way cassette
RAV-264A8-PE		RAV-264AH8-PE		U = Four-way cassettes
RAV-364A8-PE	2 x RAV-164#H-PE	RAV-364AH8-PE	2 x RAV-164/165#H-PE	K = High-wall units
RAV-464A8-PE	2 x RAV-264#H-PE	RAV-464AH8-PE	2 x RAV-264/265#H-PE	C = Ceiling units
				B = Ducted units
				S = Low-wall units
				N = Chassis units

Twin systems consist of RAV indoor and outdoor units. For details please refer to the relevant catalogue section. For connection, control and accessory information please refer to the relevant pages in this catalogue.

### Twin connection schematic



## RAV, MMS and SMi controls and accessories

Accessories	Denomination	Application
RBC-CR1-PE	Central remote controller	RAV heat pump, SMi and MMS
RBC-CR64-PE	64-way central remote	RAV heat pump, SMi and MMS
RBC-BG1-PE	AI BMS gateway	RAV heat pump, SMi and MMS
RBC-LG1-PE	AI LG1 gateway	RAV heat pump, SMi and MMS
RBC-IM1-PE	Indicator module	RAV heat pump, SMi and MMS
RBC-FDP1-PE	Fault display module	All RAV, SMi and MMS
RBC-IT2-PE	External timer interface	RAV heat pump and cooling only
RBC-TK45ESCO	Twin-Kit, cooling only	RAV cooling only
RBC-TMR7	Weekly timer S3	RAV cooling only
RBC-WT1-PE	Weekly timer AI	RAV heat pump, SMi and MMS
RBC-16DIF1-PE	16 to 1 interface	SMi
RBC-RK162BE-PE	Filter kit	RAV 164B/BH ducted
RBC-RK262BE-PE	Filter kit	RAV 264B/BH ducted
RBC-RK462BE-PE	Filter kit	RAV 364/464B/BH ducted
RBC-SR1-PE	Heat pump remote controller	RAV heat pump, SMi and MMS
RBC-SR2-PE	Heat pump single controller	RAV heat pump, SMi and MMS
RBC-SRC-PE	Cooling only controller	RAV cooling only
RBC-IR1-PE	Infrared remote MMS/RAV	RAV heat pump, MMS
RB C-WP1-PE	Windows control package	RAV heat pump, SMi and MMS
RBC-WG1-PE	Windows gateway	RAV heat pump, SMi and MMS
RBC-EM1-PE	Energy monitoring package	MMS
RBC-IK1-PE	Internet access licence package	RAV heat pump, SMi and MMS
RBC-RD1-PE	RDC refrigerant sensor indoor	SMi and MMS
RBC-RD2-PE	RDC refrigerant sensor outdoor	SMi and MMS
RBC-TA1-PE	Room sensor & lead MM-B-ducted	All RAV, MMS and SMi
RBC-U264PG(W)-E	4-way cassette panel	RAV/MMS 4-way cassettes
RBC-U464PG(W)-E	4-way cassette panel	RAV/MMS 4-way cassettes
RBC-U133PG(W)-E	2-way cassette panel	RAV/MMS 2-way cassettes



Central controller - RBC-CR1-PE



Central controller - RBC-CR64-PE



Standard remote controller - RBC-SR1-PE



Weekly timer (7-day timer module) - RBC-WT1-PE



LonWorks® interface - RBC-LG1-PE



Room controller - RBC-SR2-PE



Infrared remote controller - RBC-IR1-PE



Cooling only controller - RBC-SRC-PE



Energy monitoring package - RBC-EM1-PE



Internet access license package - RBC-IK1-PE

## Variable Refrigerant Flow (VRF)

Growing end user demand for air conditioning systems that are reliable, flexible, easy to install and yet superior in terms of comfort and control, makes VRF systems the ideal candidate for many applications such as offices, hotels, theatres, shops and hospitals.



### Why VRF?

VRF systems are ideal for variable load applications, as their design is based on inverter technology. This adapts the speed of the variable-speed compressor to the varying thermal loads in a building. The Pulse Modulating Valve (PMV) in each unit controls the exact amount of refrigerant to be injected into each indoor unit (2-pipe system).

In addition, two temperature sensors and a pressure sensor permanently control the amount of superheat, ensuring a safe operation. The pressure sensor also helps to balance the refrigerant flow. With VRF outdoor units, indoor units, Y-joints, headers and controls are all part of a single package.

### Easy installation

- Outdoor unit has a small footprint
- High piping network design flexibility - Y-joints and headers can be interconnected in any sequence.
- Only 20 mm separation needed between two adjacent outdoor units.
- Outdoor unit fitted with a heat exchanger drain pan
- Up to 135% overload

### 2-pipe or 3-pipe?

Toshiba offers a choice of two systems: 2-pipe system (MMS) with up to 40 indoor units (heat pump or cooling only) or 3-pipe system (SMi) with up to 16 indoor units (heat recovery - simultaneous cooling and heating)

### Piping layout flexibility

- Up to 100 m between outdoor and indoor units
- 30 m height difference between indoor units (MMS), and 50 m between outdoor and indoor units
- 4 m maximum lift between outdoor units and 20 m total separation between them (MMS)
- 250 m total system piping network, and up to 70 m between outdoor unit and first Y-joint/header (MMS)

### New efficient outdoor unit design

- Reduced footprint (fits into elevators)
- Four-sided heat exchanger
- Integrated electrical isolator
- Intelligent oil balancing control OMS
- Parallel-twin pulse PMVs
- Single stealth fan design for reduced sound levels

### Comfort and safety

- The temperature is maintained within 0.5 K for optimum comfort
- Quiet operation
- Direct refrigerant to air heat exchange for rapid and efficient temperature control
- Wide range of indoor units
- Precise capacity control through the combined use of PMVs, temperature and pressure sensors in each indoor unit. This prevents a refrigerant circuit imbalance.
- End user safety through use of the Toshiba Refrigerant Detection and Containment system (RDC), with room sensors for user safety, in accordance with the European EN 378-400 refrigerant standard.

### Control and BMS (Interactive Intelligence)

The advanced Toshiba Building Management System (BMS), a user-friendly software with a Windows based platform, permits management of up to 1024 units with the possibility to control the entire system through a Local Area Network (LAN) or remote monitoring via the Internet.

Interactive control alerts the user or the service engineer about system failures through e-mail messages, alphanumeric beepers and fax.

Energy monitoring to meter the system's power consumption per individual indoor unit is also possible.

## Piping Design Software - Toshiba's latest selection program innovation

The piping design program helps consultants and contractors design their VRF application in a very user-friendly environment. This software enables the user to build a complete VRF system by simply clicking and dragging icons, representing indoor components such as Y-joints/headers and indoor units.



Furthermore, it is possible to define all relevant design conditions such as indoor and outdoor temperature, fan speed, pipe length and diversity factor. The combination of all these elements is essential to precisely calculate the true capacities in real conditions. Toshiba is the only manufacturer to offer such accuracy in terms of VRF system selection software.

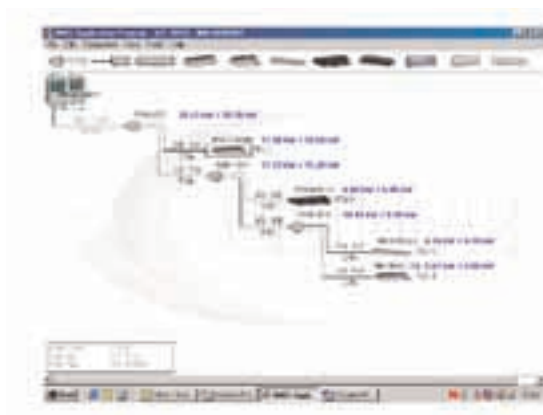
With the piping design program you can be sure of the validity of your design in actual conditions. The software also checks for mistakes and alerts the user when he is outside the system limits.

The program also includes the following features:

- Graphical representation of piping layout including pipe sizing
- Tabulated results including full component listings, actual cooling (total and sensible) and heating capacities, piping summary, refrigerant charge and pricing.
- Multiple systems in a single project
- Export function to transfer output using standard Microsoft Word format

The piping design program - a revolution in VRF design!

VRF system selection is now only a few mouse clicks away, and so much easier, as it makes the use of complicated charts and capacity tables unnecessary.





# Modular Multi System

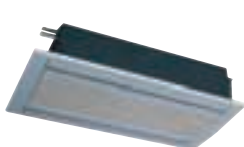
Cooling only and heat pump system



The Modular Multi System (MMS) from Toshiba combines world-leading technology with flexible application, easy installation and a range of innovative control options. The system uses combinations of variable and fixed-speed outdoor units, ranging from 22.4 to 128.8 kW cooling capacity with a capability to serve up to 40 indoor units. These units meet the ECA criteria.

## Key features

- Optimised for use with the non-ozone depleting refrigerant R407C
- Advanced compressor oil management system guarantees improved reliability.
- Light and compact with small individual footprint
- Ducted units possible (up to 2 m)
- Indoor unit capacity may be between 50 and 135% of the connected outdoor units
- Inverter models provide smooth capacity control
- Unit isolator provided
- Separation up to 100 m possible; vertical separation between indoor units of up to 30 m
- Incremental load capacity steps up to 128.8 kW by grouping inverter with fixed-speed units
- Common refrigerant piping
- Outdoor units may be installed on different floors
- Temperature control to within 0.5 K
- Extensive data retrieval







## Technical specifications

## Outdoor unit range

Model		Inverter 8 hp	Inverter 10 hp	Fixed 6 hp	Fixed 8 hp	Fixed 10 hp
<b>Heat pump model</b>		<b>MM-A0224HT</b>	<b>MM-A0280HT</b>	<b>MM-A0160HX</b>	<b>MM-A224HX</b>	<b>MM-0280HX</b>
<b>Cooling only model</b>		<b>MM-A0224CT</b>	<b>MM-A0280CT</b>	<b>MM-A0160CX</b>	<b>MM-A224CX</b>	<b>MM-0280CX</b>
Cooling capacity	kW	22.4	28.0	16.0*	22.4*	28.0*
Heating capacity (heat pump only)	kW	25.0	31.5	18.0*	25.0*	31.5*
Power input, cooling	kW	11.2	13.0	5.9	11.2	13.0
Running current, cooling	A	16.9	19.5	10.6	16.9	19.5
Power input, heating	kW	10.4	11.4	5.3	10.4	11.4
Running current, heating	A	16.7	18.1	10.0	16.7	18.1
Peak demand current	A	59	60	58	59	60
Sound pressure level	dB(A) @ 1 m	58	58	58	58	58
<b>Refrigerant type</b>		<b>R407C</b>	<b>R407C</b>	<b>R407C</b>	<b>R407C</b>	<b>R407C</b>
Quantity	kg	15.5	17.0	5.0	7.0	9.0
<b>System pipe parameters</b>						
Maximum equivalent separation	m	125	125	125	125	125
Maximum actual separation	m	100	100	100	100	100
Maximum lift	m	30	30	30	30	30
Maximum drop	m	50	50	50	50	50
<b>Dimensions</b>						
Footprint	mm	990 x 790	990 x 790	990 x 790	990 x 790	990 x 790
Height x width x depth	mm	1700 x 990 x 790	1700 x 990 x 790	1700 x 990 x 790	1700 x 990 x 790	1700 x 990 x 790
Weight	kg	289	295	215	283	291
Compressor type		Twin scroll	Twin scroll	Single scroll	Twin scroll	Twin scroll
Power output	kW	6.0	7.5	4.1	6.0	7.5
Drive		Inverter/fixed	Inverter/fixed	Fixed	Fixed/fixed	Fixed/fixed
Power supply	V-ph-Hz	380/415-3-50	380/415-3-50	380/415-3-50	380/415-3-50	380/415-3-50
Operating range, cooling	°C	-2/43	-2/43	-2/43	-2/43	-2/43
Operating range, heating	°C	-10/21	-10/21	-10/21	-10/21	-10/21
Protection devices	Discharge and suction temperature sensors, internal overload relay, overcurrent relay (inverter units only), overcurrent sensor (inverter units only), high and low pressure switches, high and low pressure sensors					



22.4-28 kW



38.4-56 kW



60.8-84 kW





89.6-112 kW



117.6-128.8 kW

## Connection kits

Description	Model number	Total indoor unit capacity* kW                      hp		Shape	
Branch kit	RBM-Y018SK	< 18 kW	< 6.4 hp		
	RBM-Y037SK	18 < 37 kW	6.4 < 13.2 hp		
	RBM-Y071SK	37 < 71 kW	13.2 < 25.2 hp		
	RBM-Y129SK	> 71 kW	> 25.2 hp		
Four-way header**	RBM-H4037SK	18 < 37 kW	6.4 < 13.2 hp		
	RBM-H4071SK	37 < 71 kW	13.2 < 25.4 hp		
Eight-way header**	RBM-H8037SK	18 < 37 kW	6.4 < 13.2 hp		
	RBM-H8071SK	37 < 71 kW	13.2 < 25.2 hp		
Kit of 3 T-connections to combine as required					
T-connection for outdoor units	RBM-T129SK	Connections	Diameter in mm (in)		
		- Oil balance piping	9.52 (3/8)		
		- Liquid line	12.7 (1/2) to 22.2 (7/8)		
		- Gas line	22.2 (7/8") to 54.1 (2-1/8)		

\* If the total capacity of the indoor units exceeds the total for the outdoor unit, use the total capacity for the outdoor unit.













\*\* The total indoor unit capacity connected to any single header should not exceed 16.8 kW (6 hp).





## Technical specifications

## Indoor units

Model Type	Model Name	Capacity Code	Cooling Capacity kW	Heating Capacity kW	Height mm	Width mm	Depth mm	Weight kg
<b>4-way Cassette*</b> 	MM-U056	1.0	2.8	3.2	259	820	820	25
		1.25	3.5	4.0				
	MM-U080	1.5	4.2	4.8				
		1.7	4.8	5.4				
<b>Concealed Duct</b> 	MM-B056	2.0	5.6	6.4	345	770	875	39
		2.5	6.7	8.0				
	MM-B080	3.0	8.0	9.6		1070	875	53
		3.2	9.0	10.2				
<b>2-way Cassette</b> 	MM-TU028	4.0	11.2	12.8	309	1230	820	43
		5.0	14.0	15.8				
	MM-TU042	1.0	2.2	2.6		910	480	23
		1.25	3.5	4.0				
<b>High Wall*</b> 	MM-TU056	1.5	4.2	4.8	190	910	480	23
		1.7	4.8	5.4				
	MM-K/KR042	2.0	5.6	6.4	372	1150	226	20
		2.5	6.7	8.0				
<b>Ceiling*</b> 	MM-K/KR056	3.0	8.0	9.6	372	1478	226	26
		3.2	9.0	10.2				
	MM-K/KR080	4.0	11.2	12.8	368	895	210	18
		4.2	12.8	14.4				
<b>Floor Low Wall*</b> 	MM-K P0091H	1.0	2.8	3.2	368	1055	210	19
		1.25	3.6	4.0				
	MM-K P0151H	1.5	4.5	5.0	368	1430	210	25
		2.0	5.6	6.3				
<b>Chassis</b> 	MM-K P0161H	2.5	7.1	8.0	368	1630	640	44
		2.5	7.1	8.0				
	MM-K P0241H	3.0	8.0	9.6	240	1430	640	39
		3.0	8.0	9.6				
<b>Slim Duct</b> 	MM-C/CR042	1.0	2.2	2.6	188	1030	640	24
		1.25	2.8	3.2				
	MM-C/CR056	1.5	4.2	4.8	188	1230	640	28
		1.7	4.8	5.4				
<b>Floor Low Wall*</b> 	MM-C/CR080	2.0	5.6	6.4	188	1230	188	28
		2.5	6.7	8.0				
	MM-C/CR112	3.0	8.0	9.6	240	1430	640	39
		4.0	11.2	12.8				
<b>Chassis</b> 	MM-C/CR140	5.0	14.0	15.8	240	1630	640	44
		5.0	14.0	15.8				
	MM-S/SR056	1.0	2.8	3.2	640	1030	188	24
		1.25	3.5	4.0				
<b>Slim Duct</b> 	MM-S/SR080	1.5	4.2	4.8	640	1230	188	28
		1.7	4.8	5.4				
	MM-N028	2.0	5.6	6.4	600	750	230	21
		2.5	6.7	8.0				
<b>Chassis</b> 	MM-N042	3.0	8.0	9.6	600	1050	230	25
		3.0	8.0	9.6				
	MM-N056	4.0	11.2	12.8	600	1050	230	29
		4.0	11.2	12.8				
<b>Slim Duct</b> 	MM-N080	5.0	14.0	15.8	220	800	500	22
		5.0	14.0	15.8				
	MM-SB028	0.8	2.2	2.6	220	800	500	22
		1.0	2.8	3.2				

\* These units are available with infrared remote control. For the four-way cassette unit a separate infrared panel is required.

## Overview of the 19 Modular Multi System Configurations

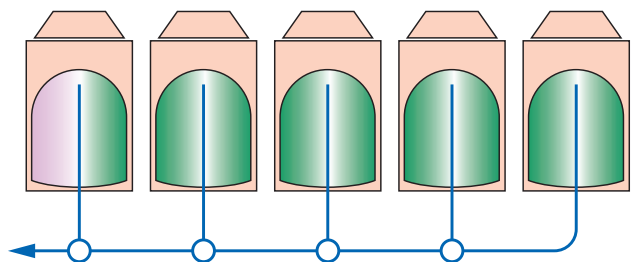
OUTDOOR SYSTEM CAPACITY			INVERTER		FIXED			Maximum No. of indoor units	Total connected code	
Cooling only (no heating)	Heating*	Code hp	28 kW (10 hp) MM-A0280CT MM-A0280HT	22.4 kW (8 hp) MM-A0224CT MM-A0224HT	28 kW (10 hp) MM-A0280CX MM-A0280HX	22.4 kW (8 hp) MM-A0224CX MM-A0224HX	16 kW (6 hp) MM-A0160CX MM-A0160HX		Min	Max
22.4	25.0	8		1				13	4	11
28.0	31.5	10	1					16	5	14
38.4	43.0	14		1			1	16	7	19
44.8	50.0	16		1		1		18	8	22
50.4	56.5	18	1			1		18	9	24
56.0	63.0	20	1		1			20	10	27
60.8	68.0	22		1		1	1	22	11	30
67.2	75.0	24		1		2		24	12	32
72.8	81.5	26	1			2		26	13	35
78.4	88.0	28	1		1	1		28	14	38
84.0	94.5	30	1		2			30	15	41
89.6	100.0	32		1		3		32	16	43
95.2	106.5	34	1			3		34	17	46
100.8	113.0	36	1		1	2		36	18	49
106.4	119.5	38	1		2	1		38	19	51
112.0	126.0	40	1		3			40	20	54
117.6	131.5	42	1			4		40	21	57
123.2	138.0	44	1		1	3		40	22	59
128.8	144.5	46	1		2	2		40	23	62

\* Heating capacities only apply to heat pump systems.

\*\* Indoor capacity range estimated based on 50 - 135% indoor to outdoor capacity ratio.

### Installation made easy

- The compact light-weight outdoor unit ensures easy manoeuvrability on site.
- Installation can be carried out zone by zone, minimising disruption and allowing scheduled capital expenditure. Operation of selected refrigerant circuits can be isolated allowing future expansion of the system.
- Simplified pipework and refrigeration circuit ensures ease of design, installation and servicing and reduces time and costs.
- No need for a plant room: outdoor units can be banked together on a on a roof, saving valuable internal floor space for other uses.
- BMS compatible - the system can be integrated into a LonWorks® or analogue network-based Building Management System.
- Easy commissioning.
- Common refrigerant pipework reduces the service riser space.
- System check facility verifies correct pipework and wiring installation, with system fault diagnosis from outdoor unit and remote controllers.



# Super Multi System

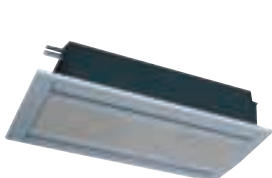
VRF heat recovery system



Toshiba is proud to introduce the new SMi. This 3-pipe, heat recovery VRF system operates on R407C and incorporates the latest inverter drive technology. The letter "i" stands for the added intelligence of the Intelligent Power Drive Unit (IPDU) and the sophistication of the controls. SMi delivers the output of the classic Super Multi in a smaller, quieter, more sophisticated and energy-efficient unit, and meets the ECA criteria.

## Key features

- Low weight, compact design with reduced footprint
- Optimised for use with the non-ozone depleting refrigerant, R407C
- Up to 16 individually controlled indoor units to one outdoor unit, with precise temperature control
- Easy to install and maintain
- High energy efficiency
- Unique capability to adjust the sensible heat ratio
- Latest inverter technology with the Intelligent Power Drive Unit (IPDU)
- Compatible with RAV indoor units that can operate from 100% down to 10% of maximum rated capacity
- Up to 160% loading
- Low noise level





## Technical specifications

## Outdoor unit range

Model		MAR-F 105HTM8-PE
Cooling capacity	kW	28.0
Heating capacity	kW	31.5
Minimum capacity code		2
<b>Maximum capacity code</b>		
1 Multi Controller		27
2, 3 or 4 Multi Controllers		32
Power supply	V -ph-Hz	380-415/3/50
Electrical power required at site		Three-phase neutral + earth - integral IP 56 isolator
Power input, cooling	kW	11.8
Power factor, cooling	%	98
Running current, cooling	A	17.4
Power input, heating	kW	10.5
Power factor, heating	%	98
Running current, heating	A	15.5
Peak demand current	A	60
Sound pressure level	dB(A) @ 1 m	58
Refrigerant type		R407C
<b>Pipework</b>		
Suction line O.D.	mm (in)	Brazed - 28.6 (1-1/8)
Liquid line connection, type - O.D.	mm (in)	Flare - 15.9 (5/8)
Discharge line connection, type - O.D.	mm (in)	Flare - 19.1 (3/4)
Maximum equivalent length separation	m	120
Maximum actual piping length	m	100
Maximum lift -Indoor unit above/below	m	20/50
<b>Dimensions</b>		
Footprint	mm	990 x 790
Height x width x depth	mm	1700 x 990 x 790
Weight	kg	285
<b>Fan type</b>		
Fan rated air flow @ high speed	l/s (m <sup>3</sup> /h)	Sickle-shaped propeller 2778 (10000)
<b>Compressor type</b>		
Power input	kW	Hermetically-sealed twin scroll 7.5



### Protection devices

- Discharge and suction temperature sensors
- Internal overload relay
- Overcurrent relay
- Overcurrent sensor
- High and low pressure switches
- High pressure sensors
- Reverse phase protection
- Internal compressor crankcase heater
- Accumulator heater

## Technical specifications, Multi controllers

Model		RBM-Y1034F-PE	RBM-Y1044F-PE
Maximum number of branches		3	4
Power (derived from outdoor unit)	V/ph/Hz	220-240/1/50	220-240/1/50
<b>Inlet braze connection outside diameter</b>			
Liquid line	mm (in)	15.9 (5/8)	15.9 (5/8)
Discharge line	mm (in)	19.1 (3/4)	19.1 (3/4)
Suction line	mm (in)	28.6 (1-1/8)	28.6 (1-1/8)
<b>Outlet braze connection outside diameter</b>			
Liquid line	mm (in)	9.5 (3/8)	9.5 (3/8)
Suction line	mm (in)	19.1 (3/4)	19.1 (3/4)
Max. equivalent separation, Multi Controller to each indoor unit	m	30	30
Max. difference in equivalent length between any two branches	m	10	10
Maximum vertical separation from outdoor unit	m	15	15
<b>Where two Multi Controllers are used:</b>			
Maximum equivalent sub-pipe length (each)	m	15	15
Maximum difference between sub-pipes	m	10	10
<b>Sub-pipe outside diameter</b>			
Liquid line	mm (in)	12.7 (1/2)	12.7 (1/2)
Discharge line	mm (in)	15.9 (5/8)	15.9 (5/8)
Suction line	mm (in)	19.1 (3/4)	19.1 (3/4)
Net weight	kg	30	34
<b>Dimensions: height x width x depth</b>			
- excluding pipes	mm	300 x 640 x 460	300 x 640 x 530
- including pipes	mm	300 x 880 x 460	300 x 880 x 530
Fixing centres	mm	610 x 300	610 x 370





## Technical specifications

## Indoor units

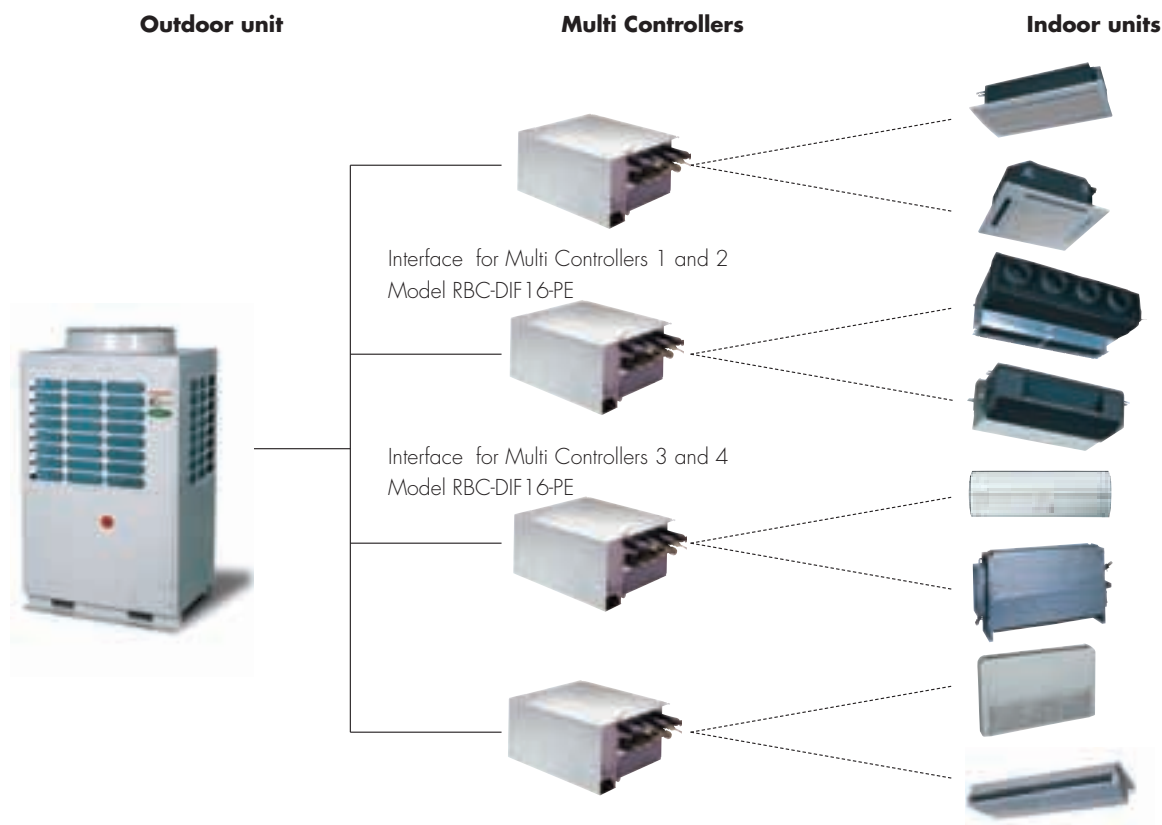
Model Type	Model Name	Capacity Code	Cooling Capacity kW	Heating Capacity kW	Height mm	Width mm	Depth mm	Weight kg
<b>4-way Cassette*</b> 	RAV-164UH-PE	2	3.10	2.80	259	820	820	25
		3	4.00	4.20				
		4	4.50	5.00				
	RAV-264UH-PE	4	5.50	5.36				
		5	6.30	6.70				
		6	7.10	7.90				
	RAV-364UH-PE	6	7.80	8.10	309	1230	820	43
		7	8.80	9.45				
		8	10.00	10.80				
<b>Concealed Duct</b> 	RAV-164BH-PE	2	3.10	2.80	345	770	875	39
		3	4.00	4.20				
		4	4.50	5.00				
	RAV-264BH-PE	4	5.50	5.36	345	1070	875	53
		5	6.30	6.70				
		6	7.10	7.90				
	RAV-364BH-PE	6	7.80	8.10	345	1420	875	58
		7	8.80	9.45				
		8	10.00	10.80				
<b>2-way Cassette</b> 	RAV-104TUH-1-PE	1	1.88	2.10	190	910	480	23
		2	2.50	2.80				
	RAV-134TUH-1-PE	2	2.80	2.80				
		3	3.60	4.20				
	RAV-164TUH-1-PE	2	3.10	2.80				
		3	4.00	4.20				
		4	4.50	5.00				
		5	5.50	5.36				
<b>High-Wall*</b> 	RAV-105KH-E	1	1.88	2.10	372	1150	226	20
		2	2.50	2.80				
	RAV-135KH-E	2	2.80	2.80				
		3	3.60	4.20				
	RAV-165KH-E	2	3.10	2.80				
		3	4.00	4.20				
	RAV-265KH-E	4	4.50	5.00				
		3	4.40	4.20				
<b>Ceiling*</b> 	RAV-134CH/CHR-PE	2	2.80	2.80	188	1030	640	24
		3	3.60	4.20				
		4	4.50	5.00				
	RAV-164CH/CHR-PE	2	3.10	2.80				
		3	4.00	4.20				
		4	4.50	5.00				
	RAV-264CH/CHR-PE	4	5.50	5.36	240	1430	640	39
		5	6.30	6.70				
		6	7.10	7.90				
	RAV-364CH/CHR-PE	6	7.80	8.10	240	1630	640	44
		7	8.80	9.45				
		8	10.00	10.80				
<b>Floor Low Wall</b> 	RAV-164SH/SHR-PE	2	3.10	2.80	640	1030	188	24
		3	4.00	4.20				
		4	4.50	5.00				
	RAV-264SH/SHR-PE	4	5.50	5.36	640	1230	188	28
		5	6.30	6.70				
		6	7.10	7.90				
<b>Concealed Duct</b> 	RAV-104NH-PE	1	1.88	2.10	600	750	230	21
		2	2.50	2.80				
	RAV-134NH-PE	2	2.80	2.80	600	1050	230	25
		3	3.60	4.20				
	RAV-164NH-PE	2	3.10	2.80	600	1050	230	29
		3	4.00	4.20				
	RAV-264NH-PE	4	4.50	5.00				
		3	4.40	4.20				
		4	5.00	5.36				
		5	5.70	6.70				
<b>Slim Duct</b> 	RAV-104SBH-PE	1	1.88	2.10	220	800	500	22
		2	2.50	2.80				

\* These units are available with infrared remote control. For the four-way cassette unit a separate infrared panel is required.



## Complete range of indoor units

One outdoor unit can operate up to 16 individually controlled indoor units with precise temperature control up to 28 kW cooling and 31.5 kW heating. The SMi is compatible with all Toshiba RAV indoor units, including the new-look High Wall. Indoor units are capacity coded via the multi controller, allowing precise matching of indoor unit capacity to room load. They can operate from 100% to 10% of maximum capacity, adjustable throughout system life. Each indoor unit senses and responds to minute temperature changes to maintain pre-selected temperatures to precise tolerances.



## Installation made easy

- The compact light-weight outdoor unit ensures easy manoeuvrability on site.
- Power and control wiring are supplied through the same cable or conduit - indoor units do not require separate power supplies.
- Installation can be carried out zone by zone, minimising disruption and allowing scheduled capital expenditure.
- Simplified pipework and refrigeration circuit ensures ease of design, installation and servicing and reduces time and costs.
- No need for a plant room: outdoor units can be installed externally on a roof or in a car park, saving valuable internal floor space for other uses.
- Easy commissioning.
- System check facility verifies correct pipework and wiring installation, with system fault diagnosis from outdoor unit, multi controllers and remote controllers.



# Air-to-Air Heat Exchangers

Ventilation systems



The Toshiba air-to-air heat exchanger ventilation units can be integrated into the air conditioning system. They use exhaust air to pre-condition the incoming air, in order to significantly reduce the cooling or heating load placed on the air conditioning system. Integrating these units into your heating and ventilation system will reduce the overall size of the required air conditioning system.

## Key features

- Five models with an air flow range from 70 to 280 l/s (250-1000 m<sup>3</sup>/h)
- Individual control or air conditioner-integrated control
- Fresh air ventilation - increasingly required in internal rooms without window access
- Changes temperature and humidity of the entering fresh air
- Helps prevent sick building syndrome
- 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

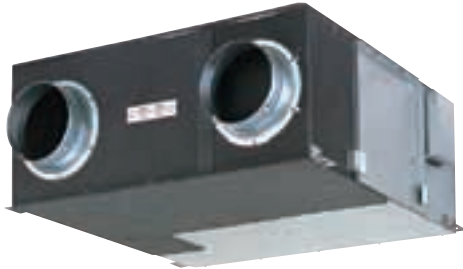


## Technical specifications

## Air-to-Air Heat Exchangers

Model		VN-250SE	VN-350SE	VN-500SE	VN-800SE	VN-1KSAE
Air flow rate, high	l/s (m3/h)	69 (250)	97 (350)	139 (500)	222 (800)	278 (1000)
Air flow rate, low	l/s (m3/h)	47 (170)	78 (280)	103 (370)	181 (650)	225 (810)
Temperature exchange efficiency (EH/H/L)	%	75/75/77	75/75/77	75/75/77	75/75/76	75/75/77
Input power (EH/H/L)	W					
Heat reclaim mode		119/114/90	153/137/128	212/188/166	347/329/327	439/391/359
Bypass mode		119/114/90	150/132/125	209/182/164	337/325/316	433/385/355
Enthalpy exchange efficiency (EH/H/L)						
Heating	%	70/70/73	69/69/71	67/67/71	71/71/74	71/71/74
Cooling	%	63/63/66	66/66/69	62/62/67	65/65/68	65/65/68
Max. external static pressure (EH/H/L)	Pa	90/80/37	95/65/42	105/70/38	140/110/70	90/55/35
Sound pressure level (EH/H/L)	dB(A)					
Heat reclaim mode		28/27/22	32/30/26	34/32/26	39/37.5/34	38.5/37/33
Bypass mode		28/27.5/22.5	32/31/27	35/33/27.5	39.5/38/35	39/37.5/33.5
Dimensions						
Height	mm	270	270	270	388	388
Width	mm	599	804	904	884	1134
Depth	mm	882	882	962	1322	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

L - Low  
H - High  
EH - Extra high



## Interactive Intelligence Management System

Interactive Intelligence offers the latest in air conditioning control software to provide a complete interactive building management system.

Easy to install and simple to use, this Windows™ based software package provides two-way communication. The building manager sets operating parameters and the system transmits information on system status.

Additional options include power consumption monitoring of individual indoor units and Internet access.



## Integration and compatibility

Interactive Intelligence is compatible with the following products:

- Toshiba Modular Multi Systems
- Toshiba Super Multi Systems
- Toshiba RAV 4-Series Heat Pumps
- Allows various other building features (i.e. lighting, ventilation, motion sensors, etc.)
- Can accept an input and shut down in the event of a fire.

This controls package can be used to integrate systems and can be applied to previously installed equipment.

## Tailored control from one location

- Air conditioning systems with up to 1024 indoor units can all be monitored and controlled from one location. Local controllers can determine the unit settings or Interactive Intelligence can be set to override parameters as required.
- The software can be customised to your application by introducing the building schematics and graphics to provide a true representation of the site. Each indoor unit can be named corresponding to its location within the building.
- With the Optimised-Start feature, the system can be programmed to achieve a specific temperature at a selected time.
- The program can export data to any OLE compliant application, such as Microsoft Excel™ or Microsoft Word™. This will allow trend analysis and forecasting to assist in the reduction of overall running and maintenance costs.
- Users choose how they receive messages from the system, either via GSM (mobile network), fax, e-mail, modems or pagers.



## Interactive Intelligence Products



### Windows gateway

Allows individual control of 64 master systems and connection of multiple gateways for monitoring and adjustment from a single PC (MMS, SMi and cooling only and heat pump RAV systems).

### Windows control package

This monitoring software uses the LonWorks protocol and is compatible with Windows 98SE/NT/2K and XP.



### Energy monitoring (optional)

The Interactive Intelligence monitoring software permits calculating the energy usage for each indoor unit or for a group of indoor units.

### Remote monitoring and control via the Internet

Web interface for data transmission via the Internet with data access via a simple navigator such as the Microsoft Internet Explorer.



### BMS alarm reporting

Offers numerous solutions, based on automated industrial equipment, all controlled from the monitoring station, with alarm transmission via GSM telephone, e-mail or fax.



### Building control

Offers numerous solutions, based on automated industrial equipment, all controlled from the monitoring station

## Energy monitoring (optional)

- The power consumption of each individual indoor unit can be monitored allowing energy bills for shared systems to be sub-divided across multiple occupants.
- Building managers can identify high-use systems and investigate potential opportunities for energy savings.
- An energy meter must be connected to each outdoor system to measure its usage (kW/h) and the energy consumption is proportioned to the indoor units based on their capacity demand.
- A billing package is already included with the software, which allows billing on multiple tariffs.

## Internet access (optional)

This feature is ideal for building management services with more than one site.

- Remote monitoring and control is possible for multiple users at any one time using Microsoft Internet Explorer™.
- Various levels of access are permitted for security.
- Immediate access to operating conditions and historical performance. Allows rapid response to customer enquiries.

## Minimum system requirements:

- PIII 500 MHz
- 128 MB or 256 MB RAM
- Hard drive with 50 MB free space
- 16 bit High Colour 800 x 600 SVGA or greater display
- Win®98, Second edition or greater
- Modem 3 com/US Robotics

**The capacities in this catalogue are based on Eurovent conditions:**

**Conditions:**

The capacity are based on Eurovent conditions:

**Cooling:**

Entering indoor air temperature: 27°C db/19°C wb, outdoor air temperature: 35°C db/24°C wb

**Heating:**

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