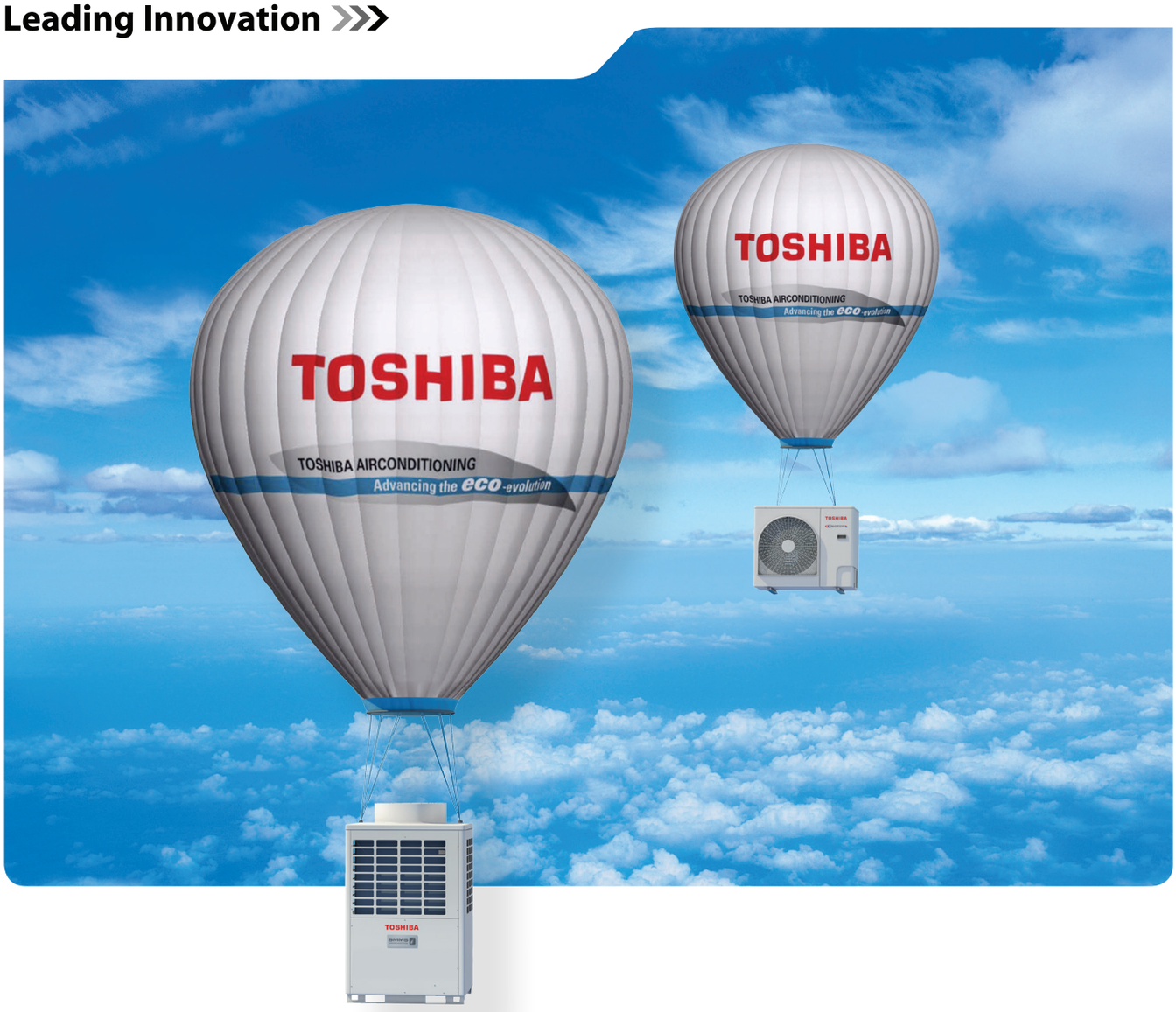
TOSHIBA

Leading Innovation



SHRM SUPER HEAT RECOVERY MULTI — 3 Pipe VRF

SMMS SUPER MODULAR MULTI SYSTEM — 2 Pipe VRF

MiNi-SMMS — MiNi 2 Pipe VRF

VRF Solutions Catalogue

Version 1

TOSHIBA AIRCONDITIONING

Advancing the eco-evolution

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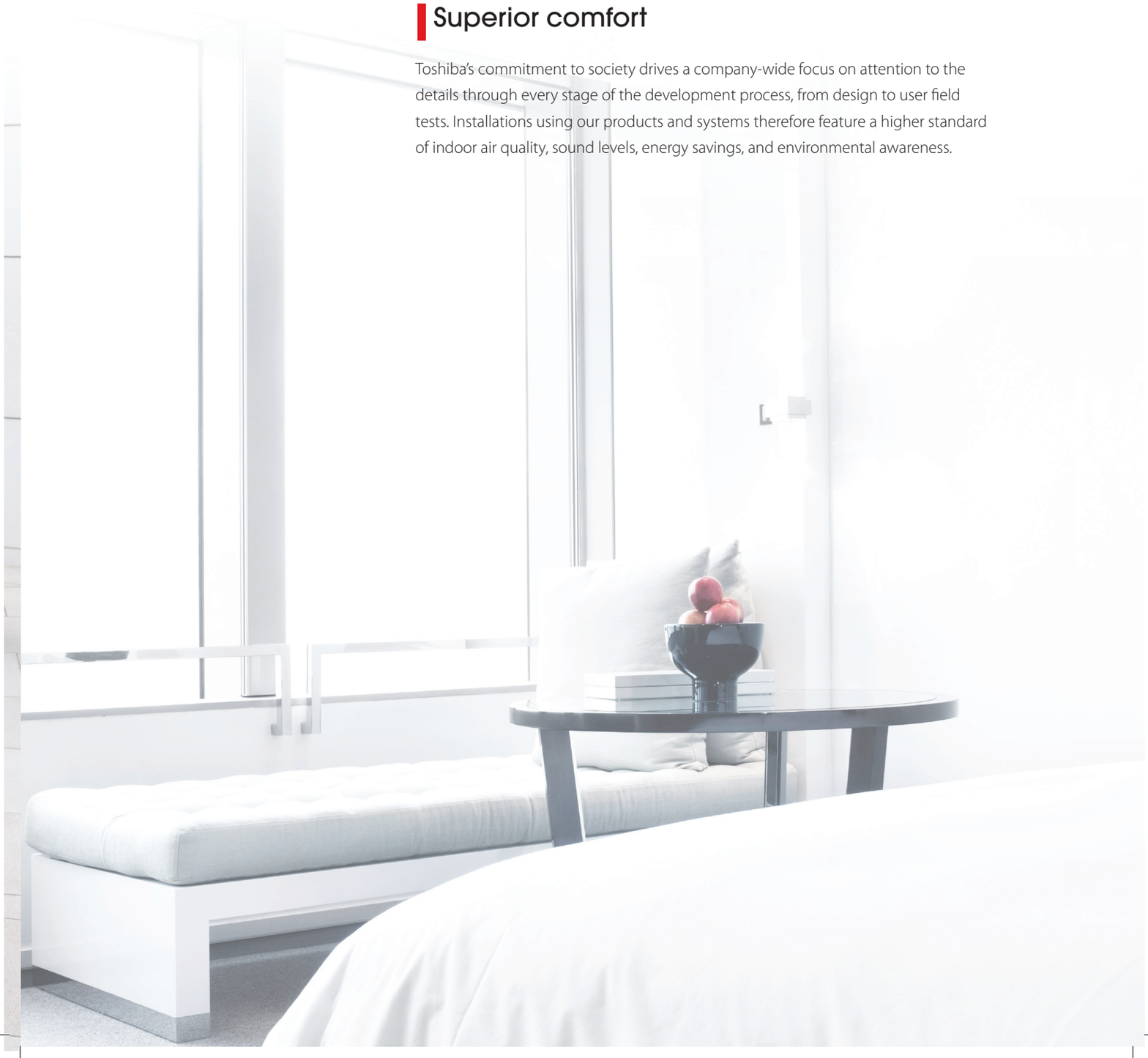
Toshiba solutions

Toshiba offers a solution for all applications: residential, light commercial and larger commercial buildings. Residential indoor units are designed to blend perfectly with all interiors and incorporate advanced filtration systems to deliver optimum indoor air quality. For small commercial premises, products are designed to deliver top performance combined with energy efficiency.

For larger applications, VRF systems combine flexibility, energy efficiency and respect for the environment, with a wide choice of stylish indoor units.

Superior comfort

Toshiba's commitment to society drives a company-wide focus on attention to the details through every stage of the development process, from design to user field tests. Installations using our products and systems therefore feature a higher standard of indoor air quality, sound levels, energy savings, and environmental awareness.



Intelligence

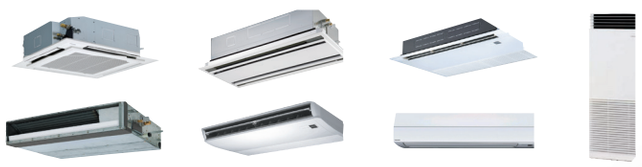
SHRM i
SUPER HEAT RECOVERY MULTI

Innovation

Imagination

Introducing SHRM-i

Introducing SHRM-i, Super Heat Recovery Multi-i, Toshiba's all-new super-efficient solution for mixed heating and cooling requirements. Building upon the proven technologies of the SMMS-i, the SHRM-i delivers even greater comfort, energy efficiency and utmost reliability. Advanced 3-pipe technology enables heat recovery between indoor units, for unprecedented economy and performance.



SMMS-i

High Efficiency
&
Reliability

\+

Simultaneous
Operation
with
Heat Recovery

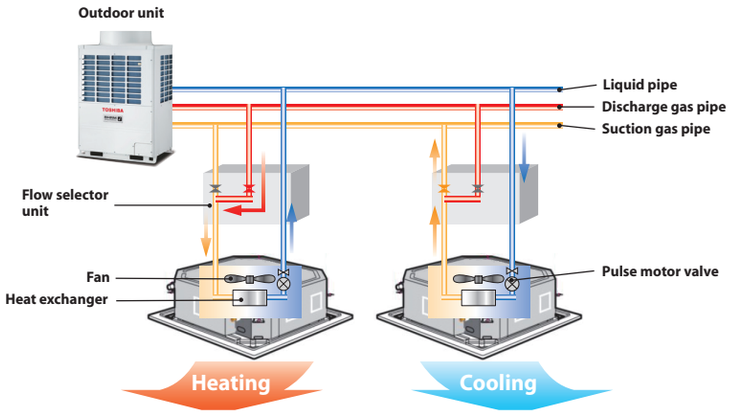
Expanding
possibilities
with
SHRM-i

Simultaneous heating and cooling

The SHRM-i allows freely selectable heating and cooling from each indoor unit on a single refrigerant piping system.

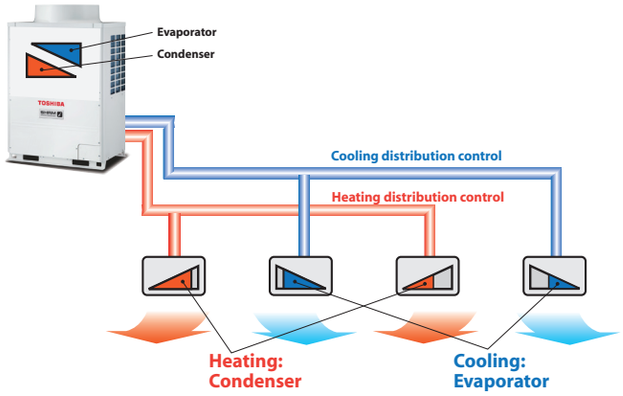
Flexible refrigerant flow

The flow selector unit can automatically shift the flow of refrigerant carried to the indoor unit, thereby switching between heating and cooling modes. Recovered energy from one unit can be used to supply another unit on the same system.



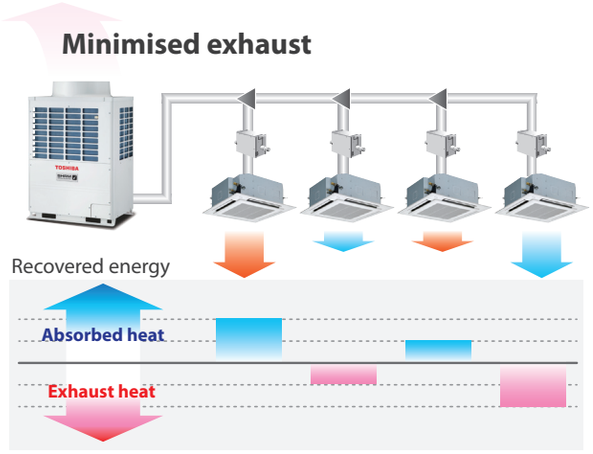
Double refrigerant control

Flex-variable refrigerant flow control regulates aperture of the pulse motor valve and controls the cooling distribution control and heating distribution control.



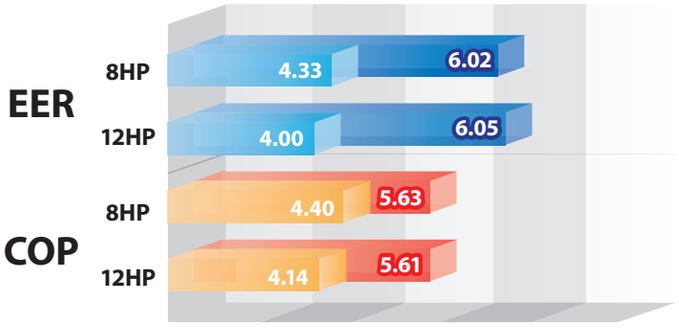
More efficient heat recovery operation than individual heating and cooling only

SHRM-i achieves the highest energy efficiency when both heating and cooling are provided simultaneously, as recovered energy from one zone is reused in another. Highest efficiencies are achieved when heating and cooling capacities are near equal.



World-class EER and COP at partial load

Adopting the new super-efficient DC twin-rotary compressors and advanced vector-controlled inverters realises a partial load COP of 5.63 and EER of 6.02 on the 8HP model.



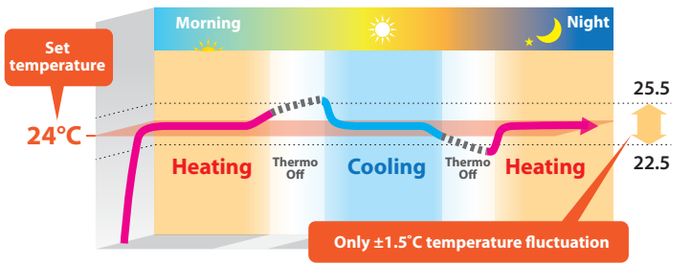
8HP : MMY-MAP0804FT8-E
12HP : MMY-MAP1204FT8-E

Ultra-efficient operation

Intelligent systems work collaboratively to provide optimum operational efficiency.

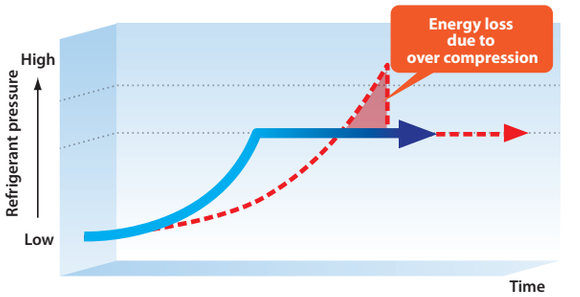
Precision comfort

What truly makes the SHRM-i one of the most flexible solutions available is its ability to provide simultaneous heating and cooling. Temperatures can be controlled and maintained precisely throughout the day. Room temperature is monitored and the air conditioning mode is switched to maintain the ideal temperature. As a result, temperature fluctuations stay within just ±1.5˚C.



Rotary compressor advantage

Unlike scroll compressors that have to initially exceed capacity in order to achieve target partial load, the rotary compressors can efficiently achieve the same target load with little energy loss.

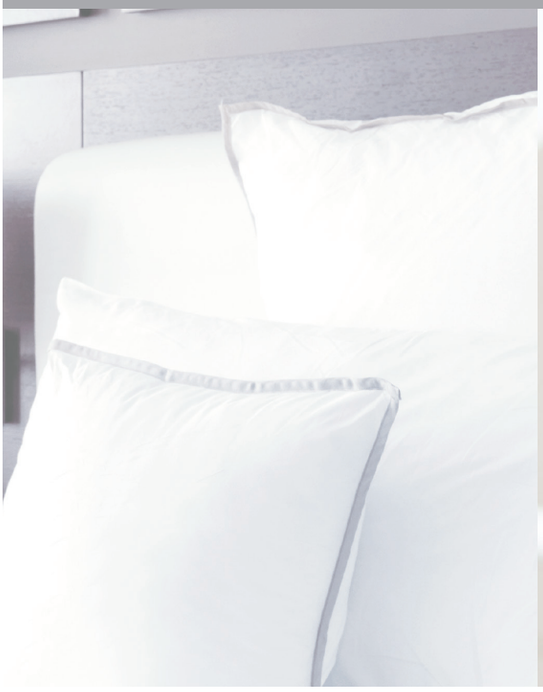


Superior partial load efficency with rotary compressor

Rotary compressor
Scroll compressor

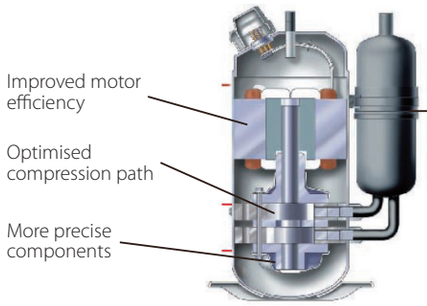
Twin-rotary

The motor employs a compact and powerful magnetic rotor (rare earth magnet) and features reduced eddy-current loss.



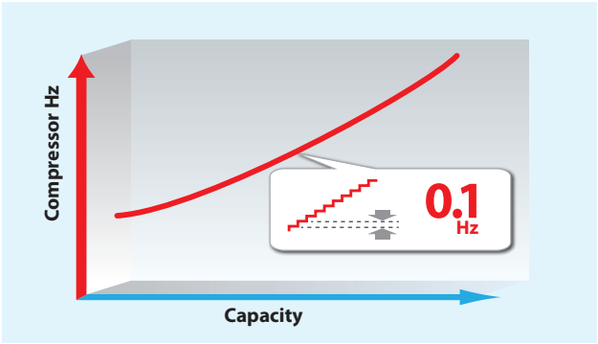
Infinity variable control

Ultra-precise inverter controls the compressor rotation speed in 0.1Hz increments, allowing for fine control over operational loads.



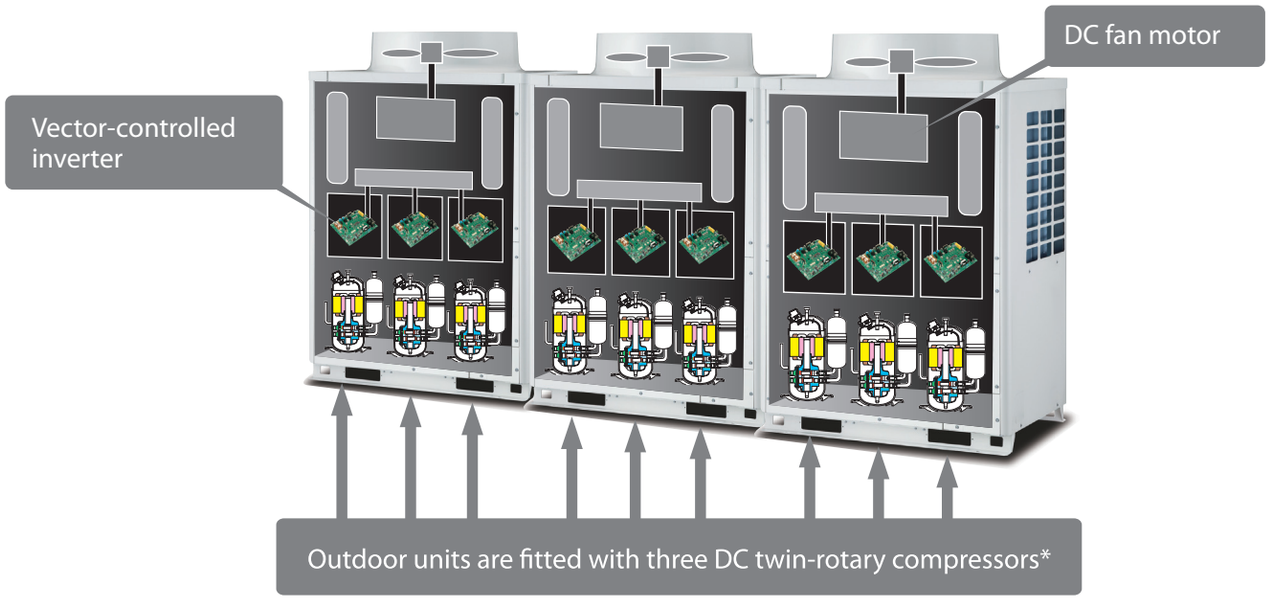
New DC twin-rotary compressor

Optimisation of discharge port positioning and blade thickness reduces compression loss and friction resistance. Increasing the surface area of the rotor magnets and the addition of slits realise greater efficiency and reduced noise.



High-efficiency DC twin-rotary compressors

Every outdoor unit incorporates three DC twin-rotary compressors* and three inverter drives - this is unique to Toshiba and the air conditioning industry.

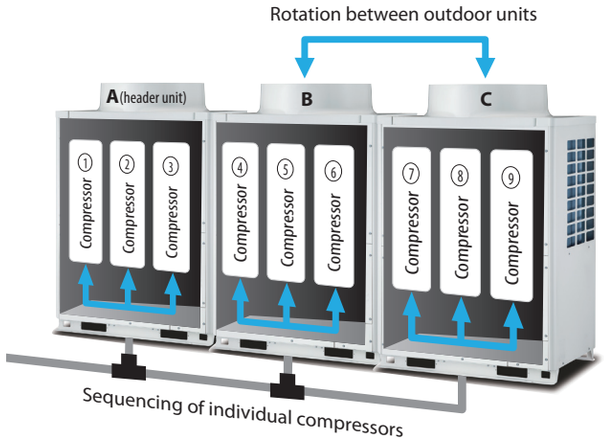


*12,14HP outdoor units

Reliability

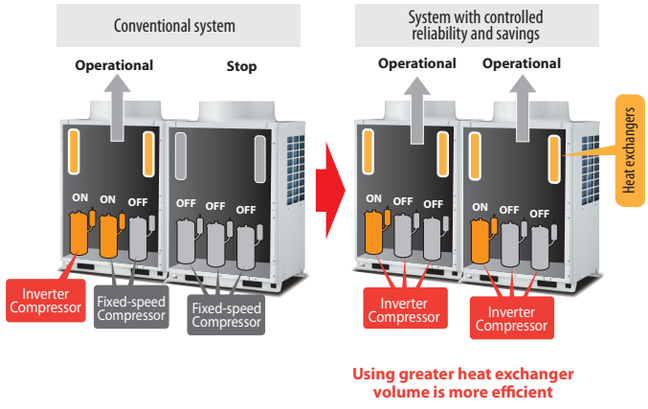
With dual-rotation, the load is distributed more evenly — this means that the operating sequence of the outdoor units and the individual compressors is rotated to spread the operating hours more evenly.

As the compressors are all inverter driven, power surges are eliminated. Over- or under-utilisation of power, typical for non-inverter compressors is eliminated, and there is no on/off power surge as the system adjusts to the demand required by the occupant or system. The use of inverter compressors reduces the risk of compressor failure, more common in standard non-inverter systems.



Energy savings

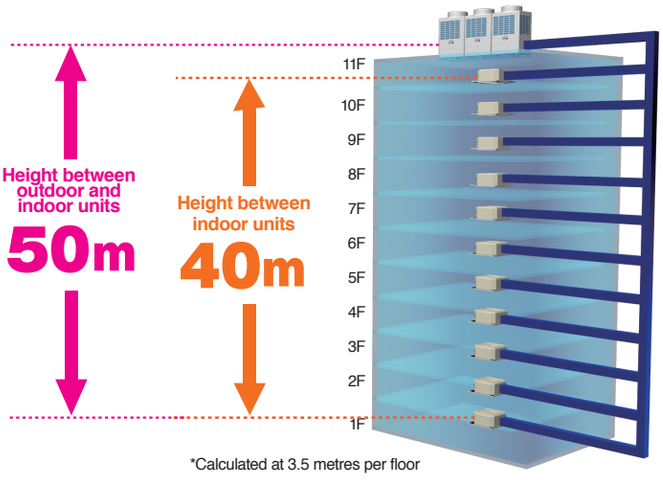
During operation the system determines which heat exchanger can be used most efficiently and selects the compressor to deliver the power required. Inverter systems save energy as continuous operation offers the same capacity with lower power consumption. This benefits all occupants by maintaining even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



Flexible piping configurations

A key advantage of the SHRM-i system is its installation flexibility. Flexible piping configurations allow unsurpassed installation ease. With only a small footprint outdoors, indoor air conditioning units can be placed at a farthest equivalent distance of 200m.

Ample height between outdoor and indoor units

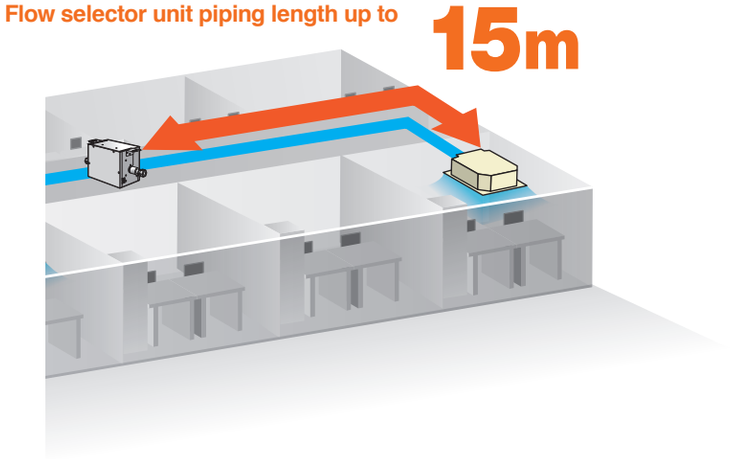


*Calculated at 3.5 metres per floor

Long piping from flow selector unit

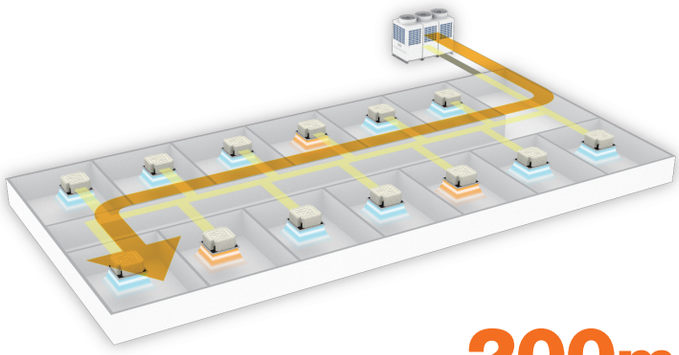
The flow selector can be easily installed in common areas such as hallways.

*Connection cable kit (RBC-CBK15FE) is required.



Farthest equivalent length

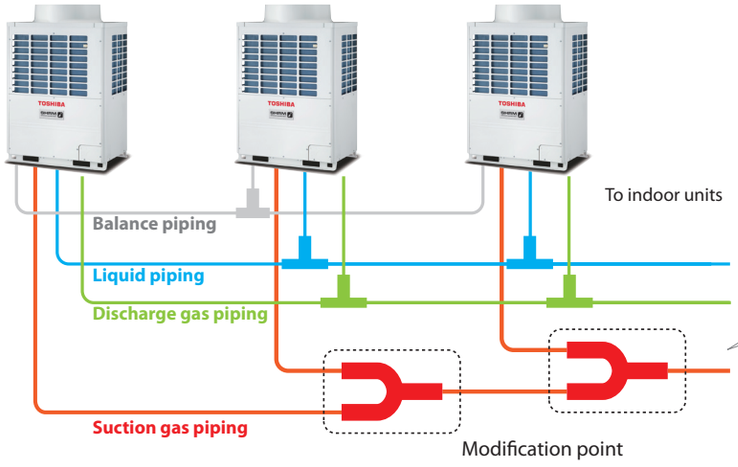
Long piping distance makes it easy to place the outdoor unit far away and out of sight.



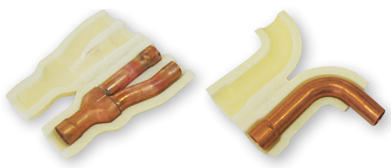
Farthest equivalent length **200m**

Piping

A change from T-shape to Y-shape branching joints on the suction gas pipes between outdoor units results in equalised flow to each branch enabling more reliable operation.



Outdoor unit connection piping kit
(RBM-BT14FE, RBM-BT24FE)



Other features

Operating temperature range

SHRM-i extends the low end of its heating function's outdoor temperature operating range to -20°C. This enables wider applications and use of the system in colder regions.

*Avoid the places where ambient temperature falls below -15°C for more than 72 hours running.
*The cooling performance may decline considerably when total operating capacity of cooling indoor units is less than 4HP while ambient temperature is below 0°C.

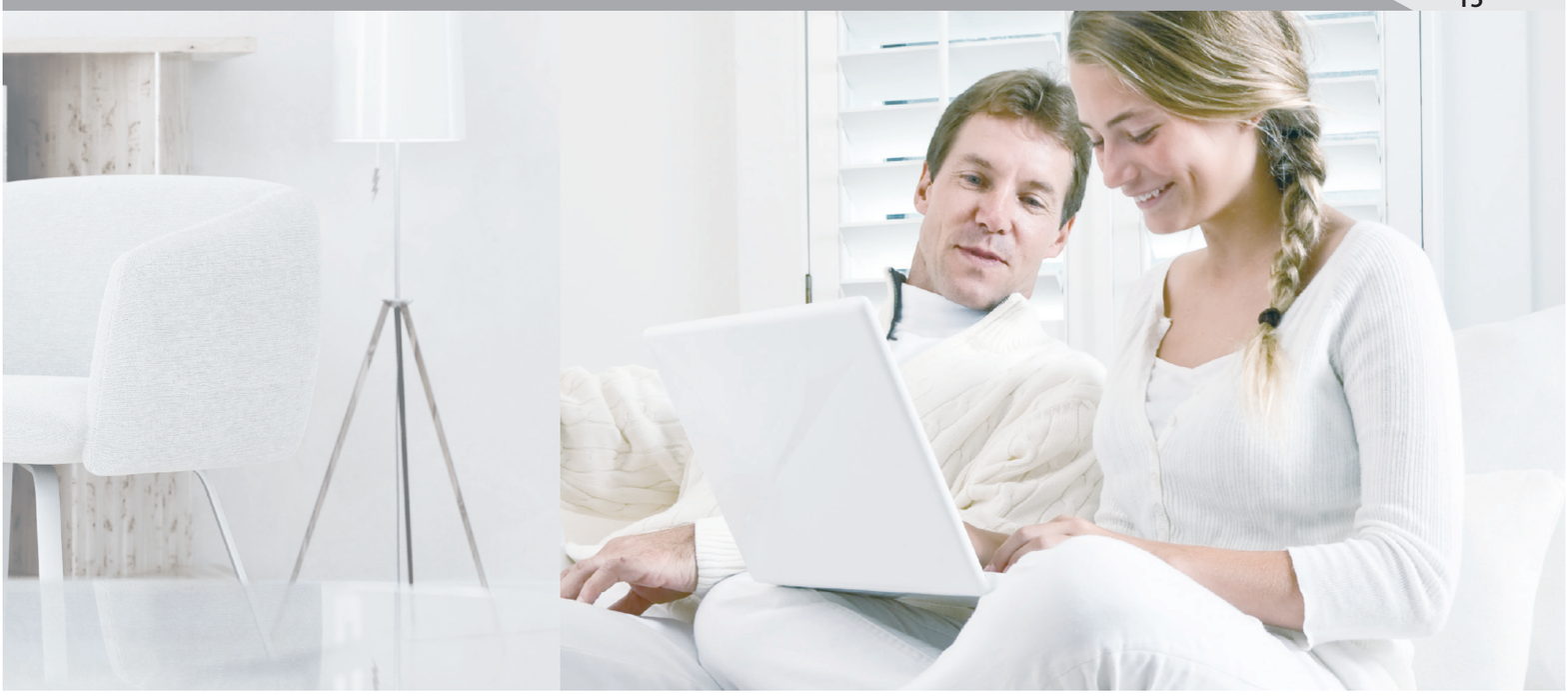
Operation range

Outdoor temp. range when **cooling***	-10°C to 43°C
Outdoor temp. range when **heating***	-20°C to 15.5°C

*Cooling : °CDB, Heating : °CWB

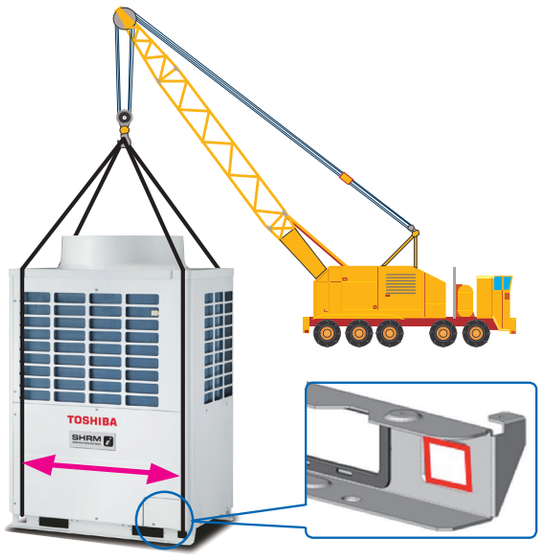
Inverter box inspection window

The SHRM-i inverter box window enables easier maintenance. The window opens quickly to allow inspection of the PCB, test run operations, repairs, and control address settings.



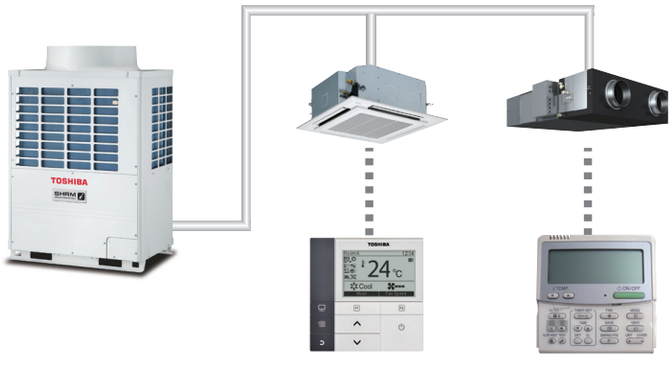
Square carrying holes

Square holes added to the lower corners of the SHRM-i outdoor units facilitate safer and surer lifting by a crane. Belts passed through the dedicated corner holes maintain the balance of the load throughout the lifting operation.



Connect with Air to Air Heat Exchanger with DX-coil

SHRM-i can be connected with the new Air to Air Heat Exchanger with DX-coil to offer even greater flexibility to satisfy the various needs of our customers.



RBC-AMS51E **NRC-01HE**

Outdoor units

				
Capacity	8HP	10HP	12HP	14HP
Model name (MMY-)	MAP0804FT8-E	MAP1004FT8-E	MAP1204FT8-E	MAP1404FT8-E
Cooling capacity (kW)	22.4	28.0	33.5	40.0
Heating capacity (kW)	25.0	31.5	37.5	45.0
Maximum number of indoor units	13	16	20	23

							
Capacity	16HP	18HP	20HP	22HP	24HP	26HP	28HP
Model name (MMY-)	AP1614FT8-E	AP1814FT8-E	AP2014FT8-E	AP2214FT8-E	AP2414FT8-E	AP2614FT8-E	AP2814FT8-E
Units in combination (MMY-)	MAP0804FT8-E MAP0804FT8-E	MAP1004FT8-E MAP0804FT8-E	MAP1004FT8-E MAP1004FT8-E	MAP1204FT8-E MAP1004FT8-E	MAP1404FT8-E MAP1004FT8-E	MAP1404FT8-E MAP1204FT8-E	MAP1404FT8-E MAP1404FT8-E
Cooling capacity (kW)	45.0	50.4	56.0	61.5	68.0	73.0	78.5
Heating capacity (kW)	50.0	56.5	63.0	69.0	76.5	81.5	88.0
Maximum number of indoor units	27	30	33	37	40	43	47

							
Capacity	30HP	32HP	34HP	36HP	38HP	40HP	42HP
Model name (MMY-)	AP3014FT8-E	AP3214FT8-E	AP3414FT8-E	AP3614FT8-E	AP3814FT8-E	AP4014FT8-E	AP4214FT8-E
Units in combination (MMY-)	MAP1004FT8-E MAP1004FT8-E MAP1004FT8-E	MAP1204FT8-E MAP1004FT8-E MAP1004FT8-E	MAP1404FT8-E MAP1004FT8-E MAP1004FT8-E	MAP1204FT8-E MAP1204FT8-E MAP1204FT8-E	MAP1404FT8-E MAP1204FT8-E MAP1204FT8-E	MAP1404FT8-E MAP1404FT8-E MAP1204FT8-E	MAP1404FT8-E MAP1404FT8-E MAP1404FT8-E
Cooling capacity (kW)	85.0	90.0	96.0	101.0	106.5	112.0	118.0
Heating capacity (kW)	95.0	100.0	108.0	113.0	119.5	127.0	132.0
Maximum number of indoor units	48	48	48	48	48	48	48

* Power: 3-phase 50 Hz 400V (380 - 415V)
* The source voltage must not fluctuate more than ±10%.
* Rated conditions
  Cooling: Indoor air temperature 27°C DB/19°C WB, outdoor air temperature 35°C DB
  Heating: Indoor air temperature 20°C DB, outdoor air temperature 7°C DB/6°C WB

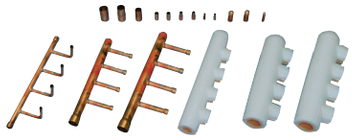
Flow selectors

	RBM-Y1123FE	RBM-Y1803FE	RBM-Y2803FE
Appearance			
Connectable indoor unit capacity (HP)	Below 4.0	4.0 to below 6.4	6.4 to 10.0 or less
Connectable indoor units*	5	8	8

*Only group operation is possible with 1 (or 2) remote controller.

*Connecion cable kit : RBC-CBK15FE

Branching joints

	Y-shape branching joint				Branch headers				Outdoor unit connection piping kit	
Appearance					 (4-branch headers)					
Model name	RBM-BY55FE	RBM-BY105FE	RBM-BY205FE	RBM-BY305FE	RBM-HY1043FE	RBM-HY2043FE	RBM-HY1083FE	RBM-HY2083FE	RBM-BT14FE	RBM-BT24FE
Usage (HP) (Classification according to indoor unit capacity code)	Total below 6.4	Total 6.4 or more and below 14.2	Total 14.2 or more and below 25.2	Total 25.2 or more	Max. 4 branches		Max. 8 branches		Total below 26.0	Total 26.0 or more
					Total below 14.2	Total 14.2 or more and below 25.2	Total below 14.2	Total 14.2 or more and below 25.2		

Outdoor unit specifications

Single units

Technical specifications

Equivalent HP				8HP	10HP	12HP	14HP
Model name			(MMY-)	MAP0804FT8-E	MAP1004FT8-E	MAP1204FT8-E	MAP1404FT8-E
Outdoor unit type				Inverter			
Cooling capacity (*1)			(kW)	22.4	28.0	33.5	40.0
Heating capacity (*1)			(kW)	25.0	31.5	37.5	45.0
Power supply (*2)				3-phase 4 wires 50Hz 400V (380-415V)			
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	5.17	7.28	8.38	11.30
		EER (Energy Efficiency Ratio)		4.33	3.85	4.00	3.54
	Heating	Power consumption	(kW)	5.68	7.50	9.05	12.70
		COP (Coefficient of Performance)		4.40	4.20	4.14	3.54
External dimensions (Height / Width / Depth)			(mm)	1,830 / 990 / 780	1,830 / 990 / 780	1,830 / 1,210 / 780	1,830 / 1,210 / 780
Total weight			(kg)	259	259	334	334
Compressor	Motor output		(kW)	2.3 x 2	3.1 x 2	2.6 x 3	3.1 x 3
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	8,700	9,400	12,000	13,000
Refrigerant piping	Connecting port diameter	Suction gas side	(mm)	ø 22.2	ø 22.2	ø 28.6	ø 28.6
		Discharge gas side	(mm)	ø 19.1	ø 19.1	ø 19.1	ø 22.2
		Liquid side	(mm)	ø 12.7	ø 12.7	ø 12.7	ø 15.9
		Balance pipe	(mm)	ø 9.5	ø 9.5	ø 9.5	ø 9.5
Sound pressure level (Cooling/Heating)			(dB(A))	55.0 / 57.0	57.0 / 59.0	60.0 / 62.0	62.0 / 64.0

Combinations

Technical specifications

Equivalent HP				16HP		18HP		20HP		22HP	
Model name			MMY-	AP1614FT8-E		AP1814FT8-E		AP2014FT8-E		AP2214FT8-E	
Outdoor unit type				Inverter							
Outdoor unit model			MMY-MAP	0804FT8-E	0804FT8-E	1004FT8-E	0804FT8-E	1004FT8-E	1004FT8-E	1204FT8-E	1004FT8-E
Cooling capacity (*1)			(kW)	45.0		50.4		56.0		61.5	
Heating capacity (*1)			(kW)	50.0		56.5		63.0		69.0	
Power supply (*2)				3-phase 4 wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	10.42		12.45		14.56		15.66	
		EER (Energy Efficiency Ratio)		4.32		4.05		3.85		3.93	
	Heating	Power consumption	(kW)	11.36		13.18		15.00		16.55	
		COP (Coefficient of Performance)		4.40		4.29		4.20		4.17	
Total weight			(kg)	259	259	259	259	259	259	334	259
Compressor	Motor output		(kW)	2.3 x 2	2.3 x 2	3.1 x 2	2.3 x 2	3.1 x 2	3.1 x 2	2.6 x 3	3.1 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	8,700	8,700	9,400	8,700	9,400	9,400	12,000	9,400
Refrigerant piping	Connecting port diameter	Suction gas side	(mm)	ø 28.6		ø 28.6		ø 28.6		ø 34.9	
		Discharge gas side	(mm)	ø 22.2		ø 22.2		ø 22.2		ø 28.6	
		Liquid side	(mm)	ø 19.1		ø 19.1		ø 19.1		ø 19.1	
		Balance pipe	(mm)	ø 9.5		ø 9.5		ø 9.5		ø 9.5	
Sound pressure level (Cooling/Heating)			(dB(A))	58.0 / 60.0		59.5 / 61.5		60.0 / 62.0		62.0 / 64.0	

Combinations

Technical specifications

Equivalent HP				24HP		26HP		28HP		30HP		
Model name			MMY-	AP2414FT8-E		AP2614FT8-E		AP2814FT8-E		AP3014FT8-E		
Outdoor unit type				Inverter								
Outdoor unit model			MMY-MAP	1404FT8-E	1004FT8-E	1404FT8-E	1204FT8-E	1404FT8-E	1404FT8-E	1004FT8-E	1004FT8-E	1004FT8-E
Cooling capacity (*1)			(kW)	68.0		73.0		78.5		85.0		
Heating capacity (*1)			(kW)	76.5		81.5		88.0		95.0		
Power supply (*2)				3-phase 4 wires 50Hz 400V (380-415V)								
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	18.58		19.48		21.98		22.26		
		EER (Energy Efficiency Ratio)		3.66		3.75		3.57		3.82		
	Heating	Power consumption	(kW)	20.20		21.35		24.60		22.70		
		COP (Coefficient of Performance)		3.79		3.82		3.58		4.19		
Total weight			(kg)	334	259	334	334	334	334	259	259	259
Compressor	Motor output		(kW)	3.1 x 3	3.1 x 2	3.1 x 3	2.6 x 3	3.1 x 3	3.1 x 3	3.1 x 2	3.1 x 2	3.1 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	9,400	13,000	12,000	13,000	13,000	9,400	9,400	9,400
Refrigerant piping	Connecting port diameter	Suction gas side	(mm)	ø 34.9		ø 34.9		ø 34.9		ø 34.9		
		Discharge gas side	(mm)	ø 28.6		ø 28.6		ø 28.6		ø 28.6		
		Liquid side	(mm)	ø 19.1		ø 22.2		ø 22.2		ø 22.2		
		Balance pipe	(mm)	ø 9.5		ø 9.5		ø 9.5		ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	63.5 / 65.5		64.5 / 66.5		65.0 / 67.0		62.0 / 64.0		

Outdoor unit specifications

Combinations — Technical specifications

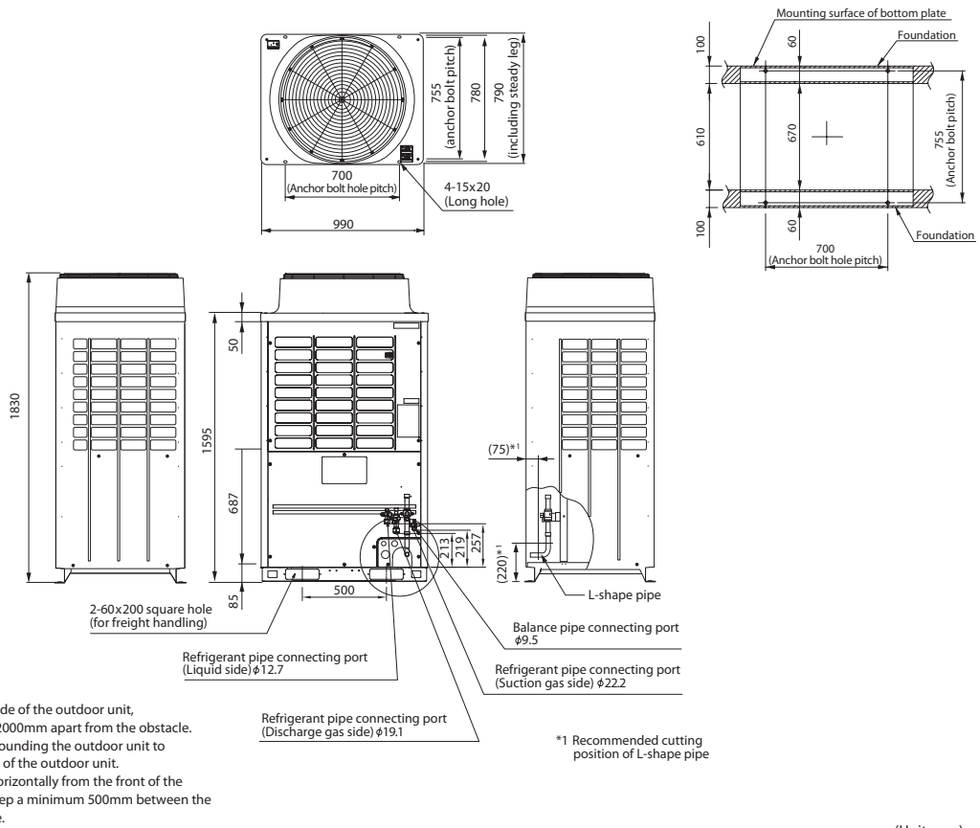
Equivalent HP				32HP			34HP			36HP		
Model name			MMY-	AP3214FT8-E			AP3414FT8-E			AP3614FT8-E		
Outdoor unit type				Inverter								
Outdoor unit model			MMY-MAP	1204FT8-E	1004FT8-E	1004FT8-E	1404FT8-E	1004FT8-E	1004FT8-E	1204FT8-E	1204FT8-E	1204FT8-E
Cooling capacity (*1)			(kW)	90.0			96.0			101.0		
Heating capacity (*1)			(kW)	100.0			108.0			113.0		
Power supply (*2)				3-phase 4 wires 50Hz 400V (380-415V)								
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	23.15			25.86			25.35		
		EER (Energy Efficiency Ratio)		3.89			3.71			3.98		
	Heating	Power consumption	(kW)	23.85			27.70			27.35		
		COP (Coefficient of Performance)		4.19			3.90			4.13		
Total weight			(kg)	334	259	259	334	259	259	334	334	334
Compressor	Motor output		(kW)	2.6 x 3	3.1 x 2	3.1 x 2	3.1 x 3	3.1 x 2	3.1 x 2	2.6 x 3	2.6 x 3	2.6 x 3
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	12,000	9,400	9,400	13,000	9,400	9,400	12,000	12,000	12,000
Refrigerant piping	Connecting port diameter	Suction gas side	(mm)	ø 34.9			ø 34.9			ø 41.3		
		Discharge gas side	(mm)	ø 28.6			ø 28.6			ø 34.9		
		Liquid side	(mm)	ø 22.2			ø 22.2			ø 22.2		
		Balance pipe	(mm)	ø 9.5			ø 9.5			ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	63.0 / 65.0			64.5 / 66.5			65.0 / 67.0		

Combinations — Technical specifications

Equivalent HP				38HP			40HP			42HP		
Model name			MMY-	AP3814FT8-E			AP4014T8-E			AP4214FT8-E		
Outdoor unit type				Inverter								
Outdoor unit model			MMY-MAP	1404FT8-E	1204FT8-E	1204FT8-E	1404FT8-E	1404FT8-E	1204FT8-E	1404FT8-E	1404FT8-E	1404FT8-E
Cooling capacity (*1)			(kW)	106.5			112.0			118.0		
Heating capacity (*1)			(kW)	119.5			127.0			132.0		
Power supply (*2)				3-phase 4 wires 50Hz 400V (380-415V)								
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	27.85			30.40			33.10		
		EER (Energy Efficiency Ratio)		3.82			3.68			3.56		
	Heating	Power consumption	(kW)	30.60			34.25			36.90		
		COP (Coefficient of Performance)		3.91			3.71			3.58		
Total weight			(kg)	334	334	334	334	334	334	334	334	334
Compressor	Motor output		(kW)	3.1 x 3	2.6 x 3	2.6 x 3	3.1 x 3	3.1 x 3	2.6 x 3	3.1 x 3	3.1 x 3	3.1 x 3
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	12,000	12,000	13,000	13,000	12,000	13,000	13,000	13,000
Refrigerant piping	Connecting port diameter	Suction gas side	(mm)	ø 41.3			ø 41.3			ø 41.3		
		Discharge gas side	(mm)	ø 34.9			ø 34.9			ø 34.9		
		Liquid side	(mm)	ø 22.2			ø 22.2			ø 22.2		
		Balance pipe	(mm)	ø 9.5			ø 9.5			ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	65.5 / 67.5			66.5 / 68.5			67.0 / 69.0		

*1 Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB
The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 metre height.
*2 The source voltage must not fluctuate more than ±10%.

Model: MMY-MAP0804FT8-E, MAP1004FT8-E

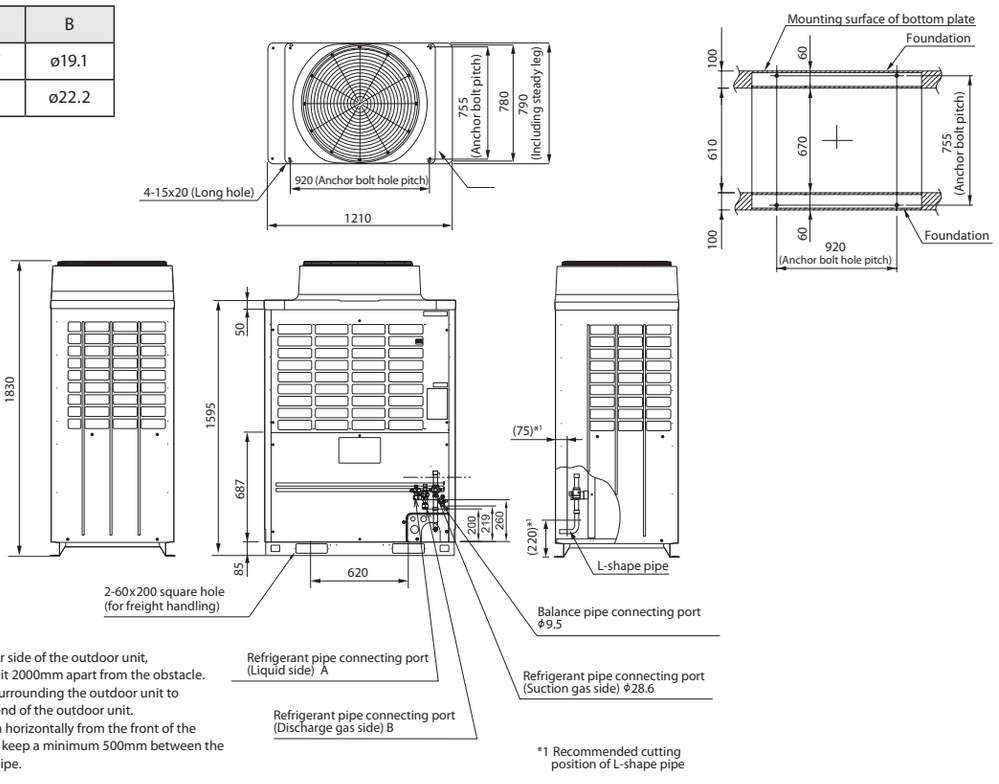


(Note)
1. If there is an obstacle at the upper side of the outdoor unit, set the top end of the outdoor unit 2000mm apart from the obstacle.
2. Limit the height of the obstacle surrounding the outdoor unit to 800mm or less from the bottom end of the outdoor unit.
3. If a locally procured pipe is drawn horizontally from the front of the outdoor unit to a traversing pipe, keep a minimum 500mm between the outdoor unit and the traversing pipe.

(Unit: mm)

Model: MMY-MAP1204FT8-E, MAP1404FT8-E

Applied model (MMY-)	A	B
MAP1204FT8-E	ø12.7	ø19.1
MAP1404FT8-E	ø15.9	ø22.2



(Note)
1. If there is an obstacle at the upper side of the outdoor unit, set the top end of the outdoor unit 2000mm apart from the obstacle.
2. Limit the height of the obstacle surrounding the outdoor unit to 800mm or less from the bottom end of the outdoor unit.
3. If a locally procured pipe is drawn horizontally from the front of the outdoor unit to a traversing pipe, keep a minimum 500mm between the outdoor unit and the traversing pipe.

(Unit: mm)

Refrigerant Leak Detection and Containment

Solutions Accor IBIS Hotel

"Toshiba UK team has provided Accor UK & Ireland Hotel Group with a professional and efficient VRF solution to meet customer comfort requirements while complying with the latest regulations".

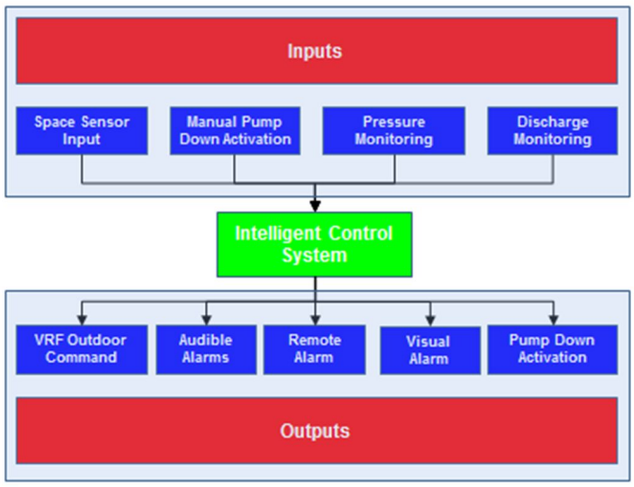
Didier Louis (Operations Director Accor Hotel Group)

Application Details

- BREEAM Compliant
- EN378 Compliant
- 140 x Bedrooms
- 5 x 3-Pipe Heat Recovery Systems
- Leak Detection Pump-Down
- Leak Detection Room Indication
- Fail Safe Pump-Down/Detection Indication

Leak Detection Set-up

The leak detection system works via sensors which detect changes in the refrigerant pressure and temperature that signify a decrease in the levels of refrigerant gas. This triggers an audible and visual alarm and shuts down the device. In the event of the RBC-RD6 activation, the outdoor unit cooling mode is enabled and pump-down operates to recover refrigerant gas.



Challenges

The challenge from the Accor Hotel Group was to provide a system that would achieve heating and cooling to the bedrooms in the most energy efficiency way. As a new build project they also required Toshiba to look at ways in which they could achieve BREEAM credits and compliance with BSEN378 by raising an alarm within the bedrooms and at supervisory level in the event of a major leak of refrigerant from the system. This needed to be achieved without the use of a refrigerant concentration sensor within the bedrooms. There was also a requirement for a simple central control system by which the hotel staff, including the maintenance team, could view and adjust the following key elements of the system:-

- Temperature control limitation to the user
- Room temperature & operation adjustment
- Global reset of the system at a set time during the day
- Simple central control of the system via a PC software based system
- Remote indication of the status of the leak detection system.

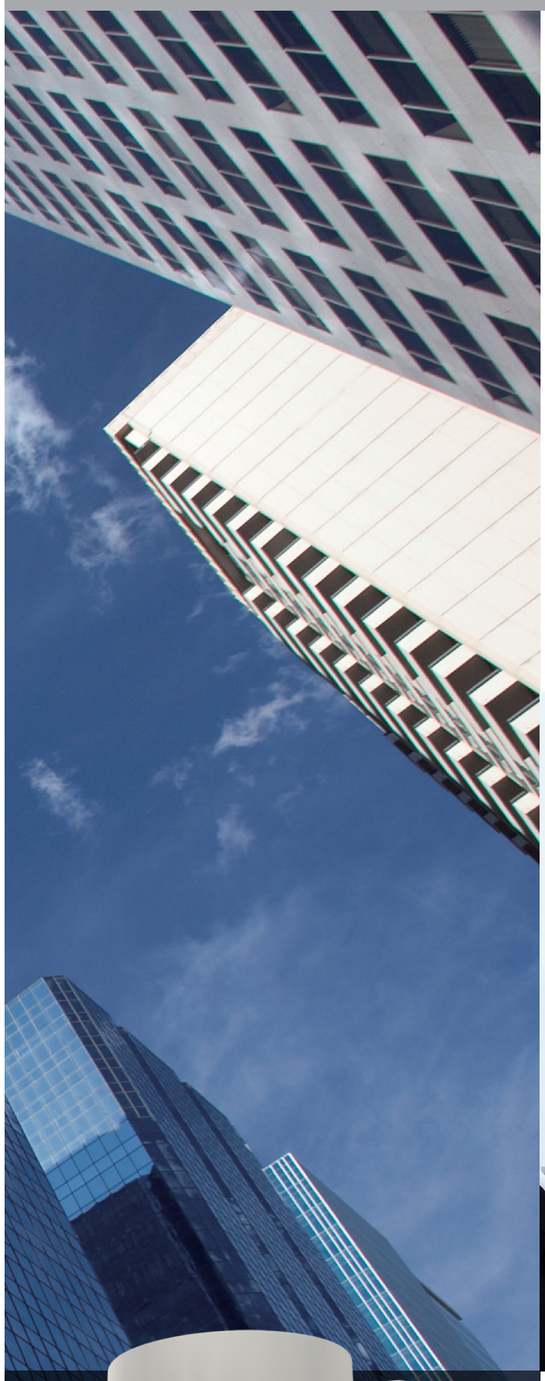
How it all Works

By utilising the above controls solution we are able to provide fully integrated controls systems for Toshiba VRF air conditioning. As a result our leak detection systems comply with BSEN378 and offer real time maintenance and monitoring for the requirements of the F-Gas regulation by providing the ability to identify any potential system leaks at an early stage. Preventing and reducing the amount of R410A leakage to atmosphere ensures that system run at peak energy efficient performance levels.

Introducing SMMS *i*
The next-generation '*i*-quality' trio

Dedication to innovation and advanced intelligence fosters the imaginative creativity with which we deliver total value in air conditioning systems.

SMMS *i*
SUPER MODULAR MULTI SYSTEM



Innovation

The new SMMS-i offers innovations in every savings with highly efficient DC twin rotary compressors and advanced vector-controlled inverters boasting COP of 6.41* at 50% partial load.

Notes: *8HP outdoor unit. European model.
Calculated based on JRA4048:2006 specification.

Intelligence

The intelligent VRF ensures precise control over cooling or heating for each individual room, delivering consistent temperature to even the furthest room from the unit.

Imagination

With flexible layout variations beyond imagination, this extremely versatile system can accommodate up to an impressive 235 metres in length and maximum height of 40 metres between indoor units.

Installation made easy

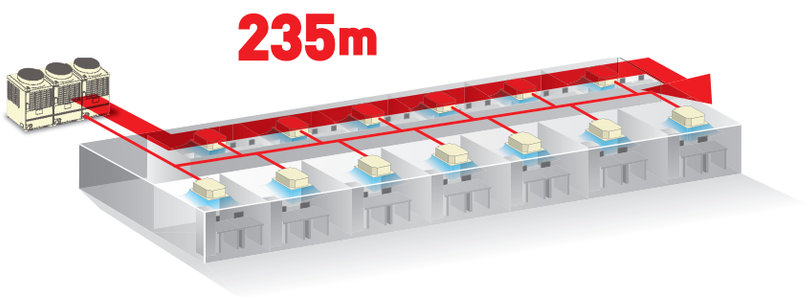
Piping layout flexibility increases design options

Toshiba SMMSi refrigerant distribution and piping design technology, contribute to reach the outstanding distance of 235m between outdoor units and last indoor unit, and the elevation of 40m between indoor units.

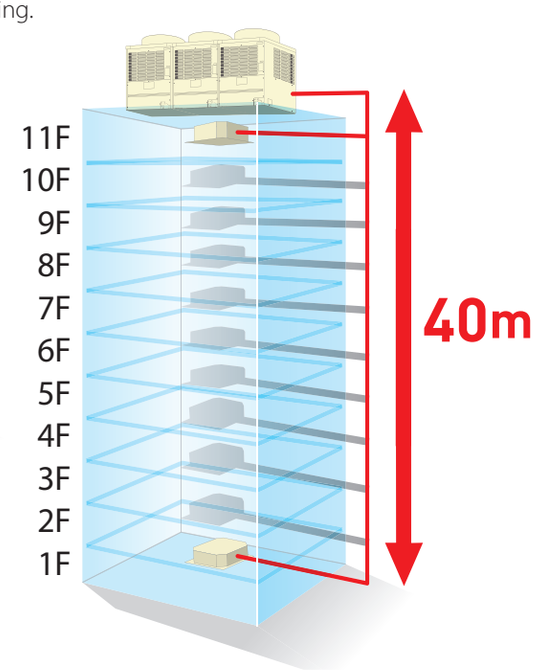
The combination of these two features is a unique advantage for air conditioning layout designers.
They have the freedom to place the indoor units position in building high up to 11 floors.

In case of repartioning or redesign of the internal layouts (offices) this flexibility simplifies the change of the indoor units positions without the need of installing additional outdoor units or move them in a different location.

For specific projects the height may be increased up to 70m if the outdoor unit is positioned at basement level and the indoor units above.
Assuming 3,5 meter of floor height, it is equivalent of a 20 stories building.



Equivalent length



Height difference between outdoor unit an last indoor unit

Inspection window

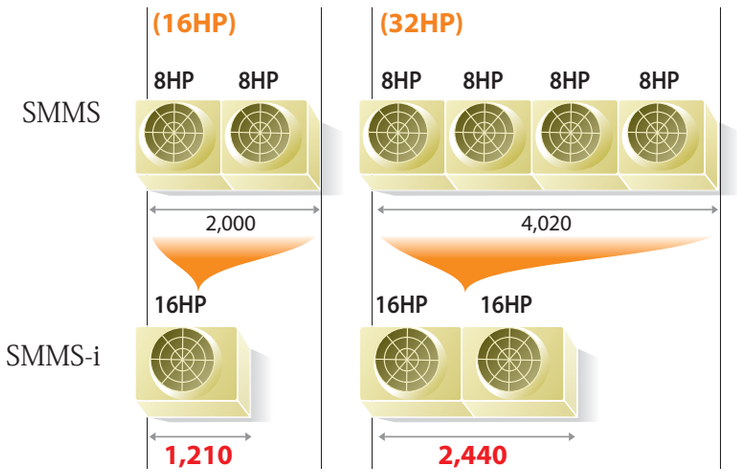
With this easy to open slidig cover, PCB Inverter can be easily accessed without removing the unit panels.
This new feature allows fast access to the inverter board in order to perform maintenance routines, address settings, test run and other operations.

Compact outdoor units size

The introduction of the 16HP single size unit enables the designer of air conditioning plants more freedom in the selection of the necessary installation space.

The overall footprint reduction reaches up to 40%, in units combination.
This solution becomes a paramount advantage in those projects or installations where the overall weight is a major concern and a key driver for the unit choice.

40% footprint reduction



A 16HP system installation now occupies only 2/3 the footprint and weight of two units previously required.

Y shaped gas pipe joints

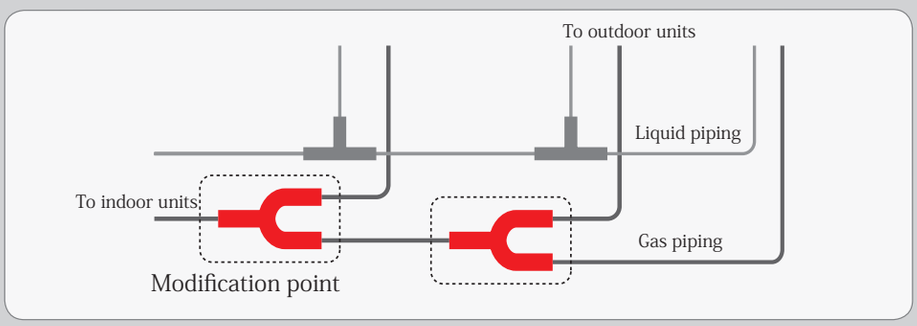
Installation piping layout is made easier with the introduction of the Y-shape pipe design.

As shown in the picture this clever solution reduces the overall spaced needed compared to the standard T-shape joint.

RBM-BT14E (Gas pipe line)

The overall positive effect is a reduced number of bends and consequently a more tidy piping installation.

Y-shape branching joints on the gas lines between SMMS-i outdoor units results in smoother flow to each branch and contributes to the reliability of the system.



Innovation and technology

New intelligent VRF control

Total system control and consistent room-to-room temperature

Toshiba's newly developed intelligent VRF control ensures supply of the right amount of refrigerant to satisfy the demands of each room, regardless of the type of indoor unit used, the length or height differences of the pipes.

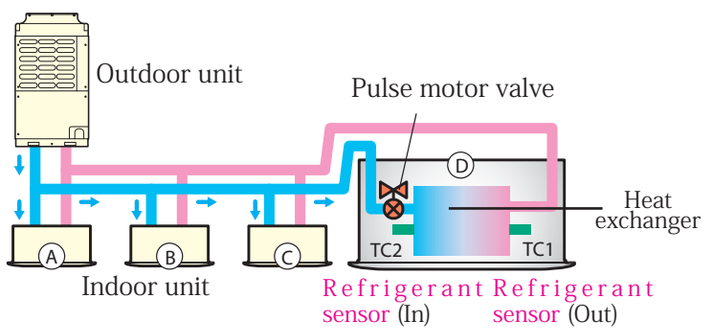
With SMMS-i the refrigerant flow is optimized not only at the level of each fan coil unit but also at total system level.

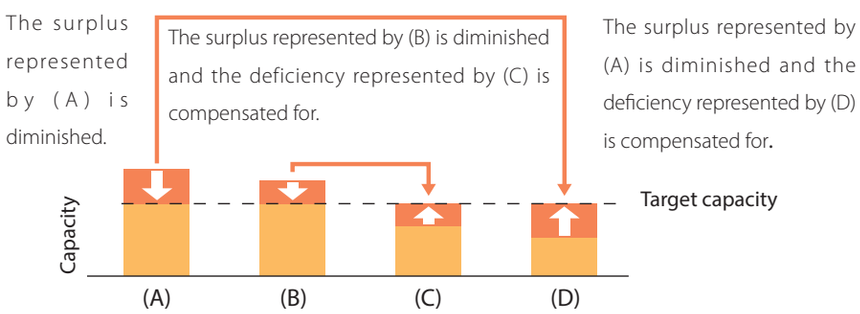
Optimal refrigerant control

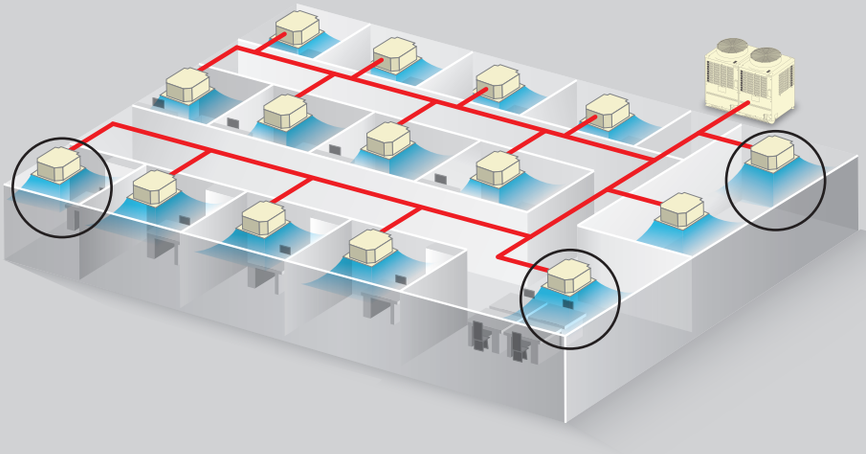
When a multiple number of indoor units are connected on a system, an insufficient or excess amount of refrigerant may be supplied to indoor units depending on the difference in length of the connection pipe from the outdoor unit.

This is caused by pressure loss and heat leaks as the refrigerant travels through the pipes, resulting in incorrect amounts of refrigerant being supplied to the indoor units.

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

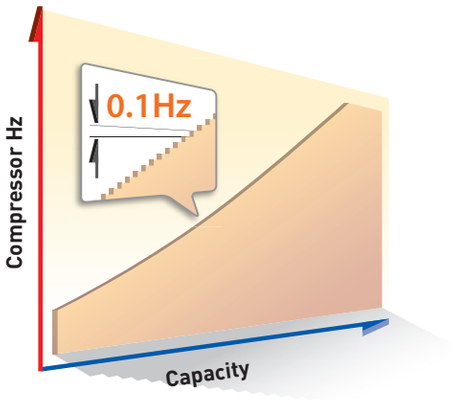






Refrigerant flow is adjusted to maintain consistent individual temperature control

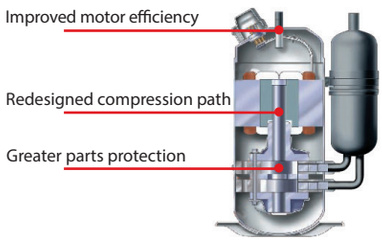
Infinity variable control



Ultra-precise 0.1 Hz control over compressor rotation speed

Infinity variable control adjusts compressor rotation speed in near-seamless 0.1 Hz steps. Responding precisely to the capacity needs of the moment, this fine control minimizes energy loss when changing frequencies, and also creates a comfortable environment subject to minimal temperature variations.

Twin-rotary



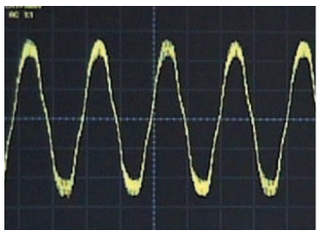
Optimization of discharge port positioning and blade thickness reduces the compression loss and friction resistance. Increasing the surface area of the rotor magnets and the addition of slits realize greater efficiency and reduced noise.

Each motor employs a compact and powerful new magnetic rotor and features reduced eddy-current loss.

Powerful Inverter

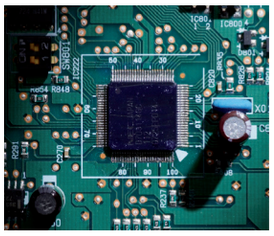
All-inverter compressor control realizes finer control over operation to match the load on the system

Smooth sine curve



The fast-calculating vector-controlled inverter produces a smooth sine curve that improves operating efficiency.

Circuit board



The vector-controlled inverter quickly converts current into a smooth sine curve to achieve smoother operation of the compressor's DC motor.

Performance and reliability

Comfort in all seasons

Either cooling for the warm season or heating for the cold periods of the year the SMMS-i units provide and maintain the right temperature.
These systems are designed to operate even in extreme outdoor conditions. Down to -20°C in heating mode and up to +43°C in cooling mode.

Operating mode	Min	Max
Heating	-20°C	-15°C
Cooling	-5°C	+43°C

Effective air management

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

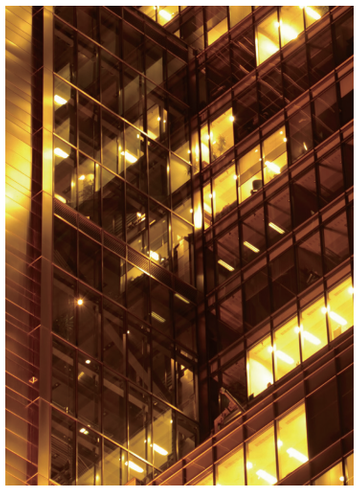
- New patented four baldes fan propeller with a large diameter (740mm)
- New design of the fan guard
- High power motor drive

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

Exceptionally low noise levels

Outdoor unit noise is a combination of two factors: the technology and the material adopted for the moving and vibrating parts and the operation speed of the units.
A new inverter control for the fan motor enables the unit to reduce its speed down to 60 RPM.
The compressors shield and unit casing were designed in order to maximize the containment of the noise produced by the compressor.
The powerful compressor balance load function and the new heat exchanger design enable the SMMS-i system to operate most of the time at lower capacity load. In this condition the running sound of the units is at its lowest levels.

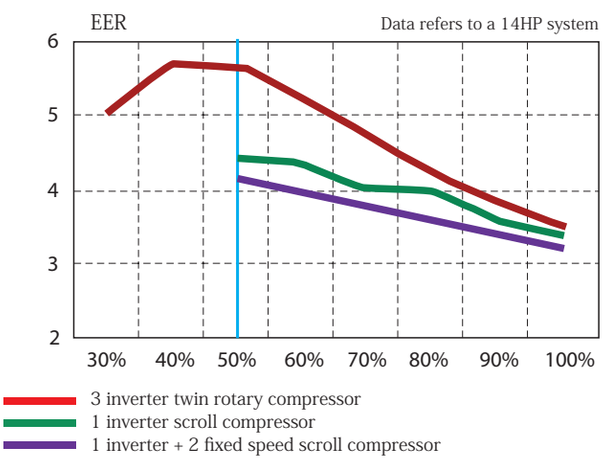
-10dB(A) Sound reduction mode



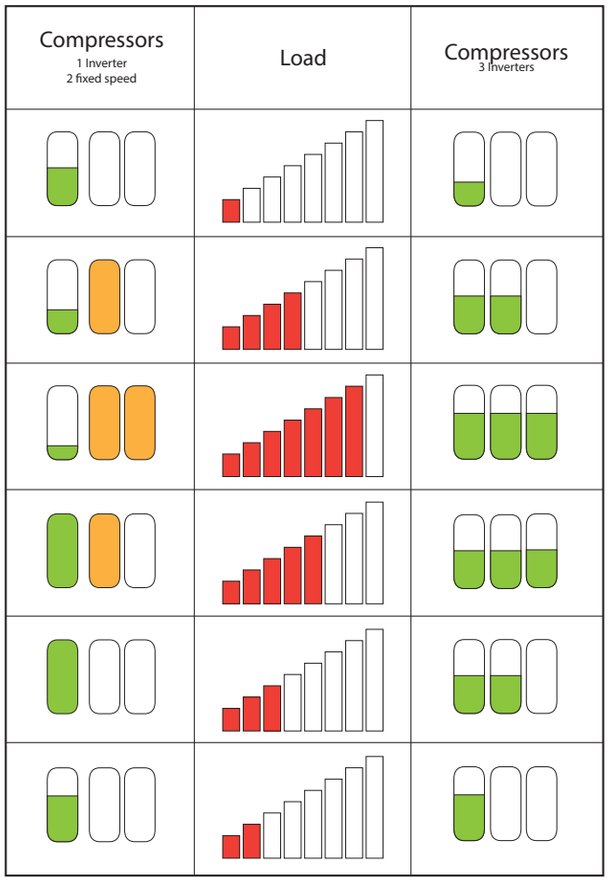
High performance and savings in part load conditions

COP and EER are calculated at nominal value, when the compressors runs at 100% of their capacity.
This condition of maximum load usually happens only for few days a year, therefore most of the time the units are working at medium/ low speed.
This means that the most efficient system is not the one with the higher capacity in the peak conditions, but the system that performs better in medium low speeds of the compressor (part load conditions).

Toshiba products are widely know in the market for their ability to deliver high capacity and efficiency at partial load condition. In the new SMMS-i system this ability is further increased with the use of three inverter and three newly designed compressors which precisely manage and distribute the load in the system.



The graph shows how is effective the SMMS-i compared to other VRF systems. It is important to note that while at full capacity load the efficiency is similar (when the EER and COP are measured) and how effective is at lower capacities, resulting effective even down to 30%: a condition in which other systems cannot operate.



In the table are shown the advantages of the 3 inverter compressors. Instead of a single compressor running at high speed, the load is evenly balanced between three compressors. The capacity load is the same but working at lower speeds the energy consumption is lower.

Outdoor unit specifications

Standard model (Single unit)

Technical specifications

Equivalent HP				5HP	6HP	8HP	10HP	12HP	14HP	16HP
Model name	Heat Pump		MMY-	MAP0501HT8 -E	MAP0601HT8 -E	MAP0804HT8P-E	MAP1004HT8P-E	MAP1204HT8P-E	MAP1404HT8P-E	MAP1604HT8P-E
Outdoor unit type				Inverter						
Cooling capacity (*1)			(kW)	14.0	16.0	22.4	28.0	33.5	40.0	45.0
Heating capacity (*1)			(kW)	16.0	18.0	25.0	31.5	37.5	45.0	50.0
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)						
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	3.65	4.64	5.40	7.41	9.55	11.50	13.70
		EER (Energy Efficiency Ratio)		3.84	3.45	4.15	3.78	3.51	3.48	3.28
	Heating	Power consumption	(kW)	3.84	4.56	5.53	7.50	10.20	11.20	14.20
		COP (Coefficient of Performance)		4.17	3.95	4.52	4.20	3.68	4.02	3.52
External dimensions (Height / Width / Depth)			(mm)	1,800 / 990 / 750	1,800 / 990 / 750	1,830 / 990 / 780	1,830 / 990 / 780	1,830 / 990 / 780	1,830 / 1,210 / 780	1,830 / 1,210 / 780
Total weight	Heat Pump		(kg)	228	228	242	242	242	330	330
Compressor	Motor output		(kW)	1.1 x 2	1.4 x 2	2.3 x 2	3.1 x 2	4.2 x 2	3.0 x 3	3.6 x 3
Fan unit	Motor output		(kW)	0.6	0.6	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	9,000	9,000	9,900	10,500	11,600	12,000	13,000
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 15.9	ø 19.1	ø 22.2	ø 22.2	ø 28.6	ø 28.6	ø 28.6
		Liquid side	(mm)	ø 9.5	ø 9.5	ø 12.7	ø 12.7	ø 12.7	ø 15.9	ø 15.9
		Balance pipe	(mm)	ø 9.5	ø 9.5	ø 9.5	ø 9.5	ø 9.5	ø 9.5	ø 9.5
Sound pressure level (Cooling/Heating)			(dB(A))	55 / 55	56 / 56	55 / 56	57 / 58	59 / 62	60 / 62	62 / 64
Sound power level (Cooling/Heating)			(dB(A))	—	—	77 / 78	78 / 79	82 / 83	82 / 83	83 / 84

Standard model (Combination)

Technical specifications

Equivalent HP				18HP		20HP		22HP		24HP	
Model name	Heat Pump		MMY-	AP1814HT8P-E		AP2014HT8P-E		AP2214HT8P-E		AP2414HT8P-E	
Outdoor unit type				Inverter							
Outdoor unit model	Heat Pump		MMY-MAP	1004HT8P-E	0804HT8P-E	1004HT8P-E	1004HT8P-E	1204HT8P-E	1004HT8P-E	1204HT8P-E	1204HT8P-E
Cooling capacity (*1)			(kW)	50.4		56.0		61.5		68.0	
Heating capacity (*1)			(kW)	56.5		63.0		69.0		76.5	
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	12.81		14.82		16.96		19.66	
		EER (Energy Efficiency Ratio)		3.93		3.78		3.63		3.46	
	Heating	Power consumption	(kW)	13.03		15.00		17.70		21.13	
		COP (Coefficient of Performance)		4.34		4.20		3.90		3.62	
Total weight	Heat Pump		(kg)	242	242	242	242	242	242	242	242
Compressor	Motor output		(kW)	3.1 x 2	2.3 x 2	3.1 x 2	3.1 x 2	4.2 x 2	3.1 x 2	4.2 x 2	4.2 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	10,500	9,900	10,500	10,500	11,600	10,500	11,600	11,600
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 28.6		ø 28.6		ø 34.9		ø 34.9	
		Liquid side	(mm)	ø 15.9		ø 15.9		ø 19.1		ø 19.1	
		Balance pipe	(mm)	ø 9.5		ø 9.5		ø 9.5		ø 9.5	
Sound pressure level (Cooling/Heating)			(dB(A))	59.5 / 60.5		60.0 / 61.0		61.5 / 63.5		62.0 / 65.0	

Standard model (Combination)

Technical specifications

Equivalent HP				26HP		28HP		30HP	
Model name	Heat Pump		MMY-	AP2614HT8P-E		AP2814HT8P-E		AP3014HT8P E	
Outdoor unit type				Inverter					
Outdoor unit model	Heat Pump		MMY-MAP	1604HT8P-E	1004HT8P-E	1604HT8P-E	1204HT8P-E	1604HT8P-E	1404HT8P-E
Cooling capacity (*1)			(kW)	73.0		78.5		85.0	
Heating capacity (*1)			(kW)	81.5		88.0		95.0	
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)					
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	21.11		23.25		25.20	
		EER (Energy Efficiency Ratio)		3.46		3.38		3.37	
	Heating	Power consumption	(kW)	21.70		24.65		25.40	
		COP (Coefficient of Performance)		3.76		3.57		3.74	
Total weight	Heat Pump		(kg)	330	242	330	242	330	330
Compressor	Motor output		(kW)	3.6 x 3	3.1 x 2	3.6 x 3	4.2 x 2	3.6 x 3	3.0 x 3
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	11,500	13,000	11,600	13,000	12,000
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 34.9		ø 34.9		ø 34.9	
		Liquid side	(mm)	ø 19.1		ø 19.1		ø 19.1	
		Balance pipe	(mm)	ø 9.5		ø 9.5		ø 9.5	
Sound pressure level (Cooling/Heating)			(dB(A))	63.5 / 65.0		64 / 66.5		64.5 / 66.5	

Outdoor unit specifications

Standard model (Combination) — Technical specifications

Equivalent HP				32HP		34HP			36HP		
Model name	Heat Pump		MMY-	AP3214HT8P-E		AP3414HT8P-E			AP3614HT8P-E		
Outdoor unit type				Inverter							
Outdoor unit model	Heat Pump		MMY-MAP	1604HT8P-E	1604HT8P-E	1204HT8P-E	1204HT8P-E	1004HT8P-E	1204HT8P-E	1204HT8P-E	1204HT8P-E
Cooling capacity (*1)			(kW)	90.0		96.0			101.0		
Heating capacity (*1)			(kW)	100.0		108.0			113.0		
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	27.40		27.06			28.93		
		EER (Energy Efficiency Ratio)		3.28		3.55			3.49		
	Heating	Power consumption	(kW)	28.40		28.60			30.84		
		COP (Coefficient of Performance)		3.52		3.78			3.66		
Total weight	Heat Pump		(kg)	330	330	242	242	242	242	242	242
Compressor	Motor output		(kW)	3.6 x 3	3.6 x 3	4.2 x 2	4.2 x 2	3.1 x 2	4.2 x 2	4.2 x 2	4.2 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	13,000	11,600	11,600	10,500	11,600	11,600	11,600
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 34.9		ø 34.9			ø 41.3		
		Liquid side	(mm)	ø 19.1		ø 19.1			ø 22.2		
		Balance pipe	(mm)	ø 9.5		ø 9.5			ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	65.0 / 67.0		63.5 / 66.0			64.0 / 67.0		

Standard model (Combination) — Technical specifications

Equivalent HP				38HP			40HP			42HP		
Model name	Heat Pump		MMY-	AP3814HT8P-E			AP4014HT8P-E			AP4214HT8P-E		
Outdoor unit type				Inverter								
Outdoor unit model	Heat Pump		MMY-MAP	1604HT8P-E	1204HT8P-E	1004HT8P-E	1604HT8P-E	1204HT8P-E	1204HT8P-E	1604HT8P-E	1404HT8P-E	1204HT8P-E
Cooling capacity (*1)			(kW)	106.5			112.0			118.0		
Heating capacity (*1)			(kW)	119.5			127.0			132.0		
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)								
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	30.66			32.80			34.47		
		EER (Energy Efficiency Ratio)		3.47			3.41			3.42		
	Heating	Power consumption	(kW)	32.14			35.29			35.46		
		COP (Coefficient of Performance)		3.72			3.60			3.72		
Total weight	Heat Pump		(kg)	330	242	242	330	242	242	330	330	242
Compressor	Motor output		(kW)	3.6 x 3	4.2 x 2	3.1 x 2	3.6 x 3	4.2 x 2	4.2 x 2	3.6 x 3	3.0 x 3	4.2 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	11,600	10,500	13,000	11,600	11,600	13,000	12,000	11,600
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 41.3			ø 41.3			ø 41.3		
		Liquid side	(mm)	ø 22.2			ø 22.2			ø 22.2		
		Balance pipe	(mm)	ø 9.5			ø 9.5			ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	65.0 / 67.0			65.0 / 67.5			65.5 / 67.5		

Standard model (Combination) — Technical specifications

Equivalent HP				44HP			46HP			48HP		
Model name	Heat Pump		MMY-	AP4414HT8P-E			AP4614HT8P-E			AP4814HT8P-E		
Outdoor unit type				Inverter								
Outdoor unit model	Heat Pump		MMY-MAP	1604HT8P-E	1604HT8P-E	1204HT8P-E	1604HT8P-E	1604HT8P-E	1404HT8P-E	1604HT8P-E	1604HT8P-E	1604HT8P-E
Cooling capacity (*1)			(kW)	123.5			130.0			135.0		
Heating capacity (*1)			(kW)	138.0			145.0			150.0		
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)								
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	36.95			38.90			41.10		
		EER (Energy Efficiency Ratio)		3.34			3.34			3.28		
	Heating	Power consumption	(kW)	38.85			39.60			42.60		
		COP (Coefficient of Performance)		3.55			3.66			3.52		
Total weight	Heat Pump		(kg)	330	330	242	330	330	330	330	330	330
Compressor	Motor output		(kW)	3.6 x 3	3.6 x 3	4.2 x 2	3.6 x 3	3.6 x 3	3.0 x 3	3.6 x 3	3.6 x 3	3.6 x 3
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	13,000	13,000	11,600	13,000	13,000	12,000	13,000	13,000	13,000
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 41.3			ø 41.3			ø 41.3		
		Liquid side	(mm)	ø 22.2			ø 22.2			ø 22.2		
		Balance pipe	(mm)	ø 9.5			ø 9.5			ø 9.5		
Sound pressure level (Cooling/Heating)			(dB(A))	66.0 / 68.5			66.5 / 68.5			67.0 / 69.0		

*1 Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB
The standard piping means that main pipe length is 5m, branching pipe length is 2.5m of branch piping connected with a 0 meter height.
*2 The source voltage must not fluctuate more than ±10%.

Outdoor unit specifications

High efficiency model (Combination) — Technical specifications

Equivalent HP				38HP				40HP			
Model name	Heat Pump		MMY-	AP3824HT8P-E				AP4024HT8P-E			
Outdoor unit type				Inverter							
Outdoor unit model	Heat Pump		MMY-MAP	1004HT8P-E	1004HT8P-E	1004HT8P-E	0804HT8P-E	1004HT8P-E	1004HT8P-E	1004HT8P-E	1004HT8P-E
Cooling capacity (*1)			(kW)	106.5				112.0			
Heating capacity (*1)			(kW)	119.5				127.0			
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	27.68				29.64			
		EER (Energy Efficiency Ratio)		3.85				3.78			
	Heating	Power consumption	(kW)	28.03				30.42			
		COP (Coefficient of Performance)		4.26				4.17			
Total weight	Heat Pump		(kg)	242	242	242	242	242	242	242	242
Compressor	Motor output		(kW)	3.1 x 2	3.1 x 2	3.1 x 2	2.3 x 2	3.1 x 2	3.1 x 2	3.1 x 2	3.1 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	10,500	10,500	10,500	9,900	10,500	10,500	10,500	10,500
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 41.3				ø 41.3			
		Liquid side	(mm)	ø 22.2				ø 22.2			
		Balance pipe	(mm)	ø 9.5				ø 9.5			
Sound pressure level (Cooling/Heating)			(dB(A))	63.0 / 64.0				63.0 / 64.0			

High efficiency model (Combination) — Technical specifications

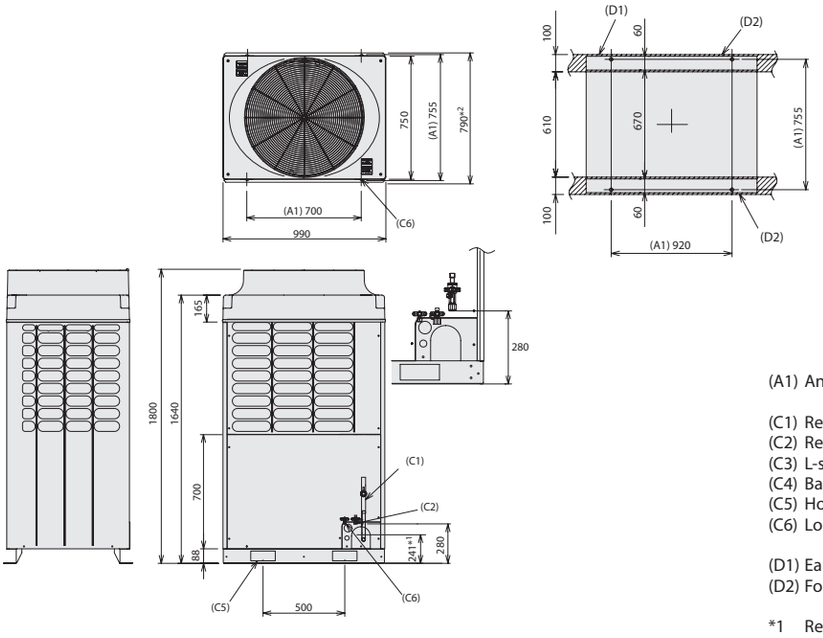
Equivalent HP				42HP				44HP			
Model name	Heat Pump		MMY-	AP4224HT8P-E				AP4424HT8P-E			
Outdoor unit type				Inverter							
Outdoor unit model	Heat Pump		MMY-MAP	1204HT8P-E	1004HT8P-E	1004HT8P-E	1004HT8P-E	1204HT8P-E	1204HT8P-E	1004HT8P-E	1004HT8P-E
Cooling capacity (*1)			(kW)	118.0				123.5			
Heating capacity (*1)			(kW)	132.0				138.0			
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	32.04				34.19			
		EER (Energy Efficiency Ratio)		3.68				3.61			
	Heating	Power consumption	(kW)	32.70				35.40			
		COP (Coefficient of Performance)		4.04				3.90			
Total weight	Heat Pump		(kg)	242	242	242	242	242	242	242	242
Compressor	Motor output		(kW)	4.2 x 2	3.1 x 2	3.1 x 2	3.1 x 2	4.2 x 2	4.2 x 2	3.1 x 2	3.1 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	11,600	10,500	10,500	10,500	11,600	11,600	10,500	10,500
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 41.3				ø 41.3			
		Liquid side	(mm)	ø 22.2				ø 22.2			
		Balance pipe	(mm)	ø 9.5				ø 9.5			
Sound pressure level (Cooling/Heating)			(dB(A))	64.0 / 65.5				64.5 / 66.5			

High efficiency model (Combination) — Technical specifications

Equivalent HP				46HP				48HP			
Model name	Heat Pump		MMY-	AP4624HT8P-E				AP4824HT8P-E			
Outdoor unit type				Inverter							
Outdoor unit model	Heat Pump		MMY-MAP	1204HT8P-E	1204HT8P-E	1204HT8P-E	1004HT8P-E	1204HT8P-E	1204HT8P-E	1204HT8P-E	1204HT8P-E
Cooling capacity (*1)			(kW)	130.0				135.0			
Heating capacity (*1)			(kW)	145.0				150.0			
Power supply (*2)				3phase 4wires 50Hz 400V (380-415V)							
Electrical characteristics (*1)	Cooling	Power consumption	(kW)	36.88				38.76			
		EER (Energy Efficiency Ratio)		3.52				3.48			
	Heating	Power consumption	(kW)	38.57				40.80			
		COP (Coefficient of Performance)		3.76				3.68			
Total weight	Heat Pump		(kg)	242	242	242	242	242	242	242	242
Compressor	Motor output		(kW)	4.2 x 2	4.2 x 2	4.2 x 2	3.1 x 2	4.2 x 2	4.2 x 2	4.2 x 2	4.2 x 2
Fan unit	Motor output		(kW)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Air volume		(m^3/h)	11,600	11,600	11,600	10,500	11,600	11,600	11,600	11,600
Refrigerant piping	Main pipe diameter	Gas side	(mm)	ø 41.3				ø 41.3			
		Liquid side	(mm)	ø 22.2				ø 22.2			
		Balance pipe	(mm)	ø 9.5				ø 9.5			
Sound pressure level (Cooling/Heating)			(dB(A))	65.0 / 67.5				65.0 / 68.0			

*1 Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB
The standard piping means that main pipe length is 5m, branching pipe length is 2.5m of branch piping connected with a 0 meter height.
*2 The source voltage must not fluctuate more than ±10%.

Model: MMY-MAP0501, MAP0601 (SMMS)



(A1) Anchor bolt pitch

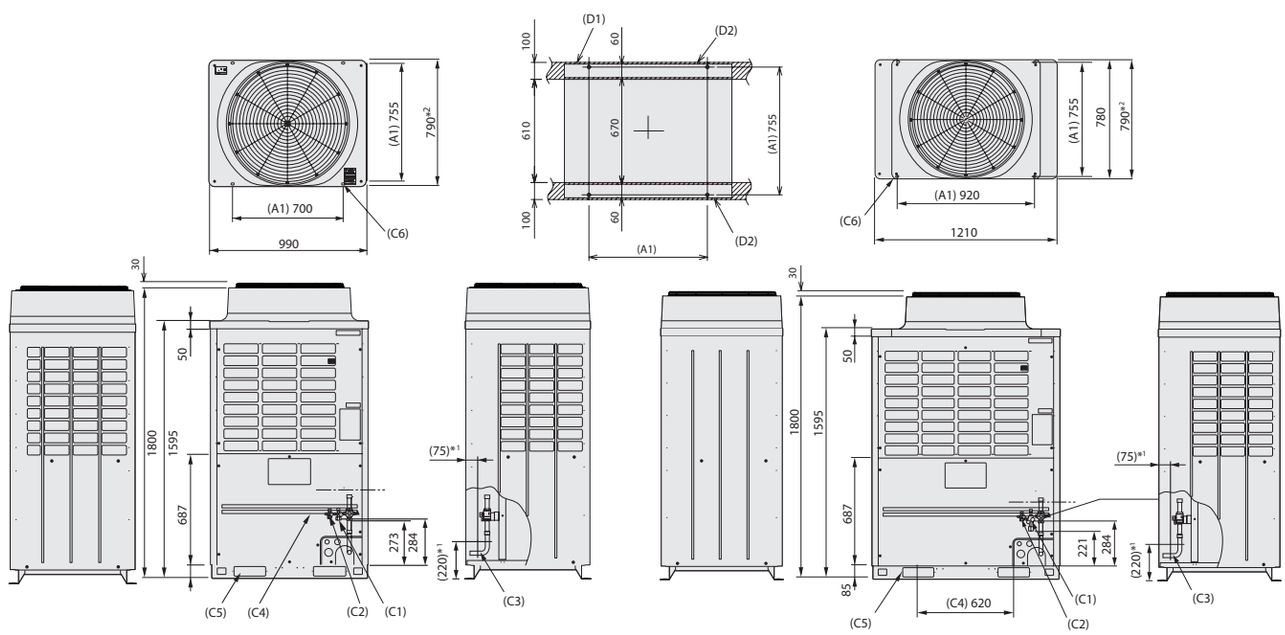
(C1) Refrigerant pipe connecting port Gas side [A]
(C2) Refrigerant pipe connecting port Liquid side [B]
(C3) L-shape pipe
(C4) Balancing pipe connection port Ø 9.5
(C5) Hole for handling goods (2-60x150)
(C6) Long hole (4-15x20)

(D1) Earth-attaching section of bottom plate
(D2) Foundation

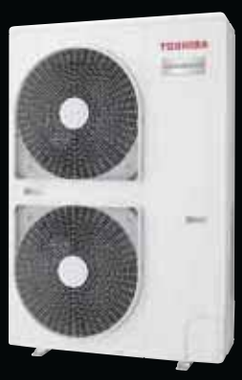
*1 Recommended cutting position of L-shape pipe
*2 Including steadk leg

Model: MMY-MAP0804, MAP1004, MAP1204

Model: MMY-MAP1404, MAP1604



Applied model	MAP0501T8	MAP0601T8	MAP0804	MAP1004	MAP1204	MAP1404	MAP1604
A Ø	15,9	15,9	22,2	22,2	28,6	28,6	28,6
B Ø	9,5	9,5	12,7	12,7	12,7	15,9	15,9



R-410A

MiNi - SMMS

MCY-MAP***1HT

MiNi-SMMS VRF Outdoor unit

Features

The MiNi-SMMS system has been developed to achieve the best performance in a wide variety of commercial applications including shops, offices and large apartments, where unobtrusive appearance and quiet operation are important advantages.

The extraordinary flexibility of this Toshiba system is guaranteed by the breadth of the range of SMMS indoor units – up to 13 models with a combination of 81 units. MiNi-SMMS can be easily installed.

Key features

Best COP (4,61 for 4HP): represents state-of-art energy saving efficiency.

Wide range: up to 9 indoor units may be connected with a single outdoor unit.

DC Twin Rotary compressor delivers high efficiency and complete reliability.

Full SMMS indoor and control units available.

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

Performance data

Outdoor unit		HP	MCY-MAP0401HT	MCY-MAP0501HT	MCY-MAP0601HT
			4 HP	5 HP	6 HP
Cooling capacity	kW		12,1	14	15,5
Power input	kW	CO	2,82	3,47	4,63
EER	W/W		4,29	4,03	3,35
Running current	A	CO	13,2	16,1	21,4
Heating capacity	kW		12,5	16	18
Power input	kW	HP	2,71	4	4,85
COP	W/W		4,61	4	3,71
Running current	A	HP	12,5	18,3	22,2
Peak demand current	A		25	28	31

Physical data Outdoor unit

Outdoor unit		HP	MCY-MAP0401HT	MCY-MAP0501HT	MCY-MAP0601HT
Air Flow	m^3/h - l/s		5820 - 1612	6120 - 1695	6420 - 1778
Sound pressure level	dB(A)	CO/HP	49/50	50/52	51/53
Dimensions (HxWxD)	mm		1340x900x320	1340x900x320	1340x900x320
Weight	kg		117	117	117
Compressor type			Twin Rotary	Twin Rotary	Twin Rotary
Refrigerant charge R410A	kg		7,2	7,2	7,2
Suction line type - diameter			Flare - 5/8"	Flare - 5/8"	Brazing - 3/4"
Liquid line type - diameter		CO/HP	Flare - 3/8"	Flare - 3/8"	Flare - 3/8"
Discharge line connection type - diameter					
Maximum equivalent length separation*	m		125	125	125
Maximum actual piping separation*	m		100	100	100
Maximum total pipe length*	m		180	180	180
Maximum lift (indoor unit above/below)	m		20/30	20/30	20/30
Operating range - db	°C	CO	-5÷43	-5÷43	-5÷43
Operating range - wb	°C	HP	-15,0÷15,5	-15,0÷15,5	-15,0÷15,5
Power supply	V-ph-Hz		230-1-50	230-1-50	230-1-50

* when PMV Kit is used: Maximum equivalent length separation (80 m);
Maximum actual piping separation (65 m); Maximum total pipe length (150 m)

CO = cooling mode HP = heating mode

PMV Kit

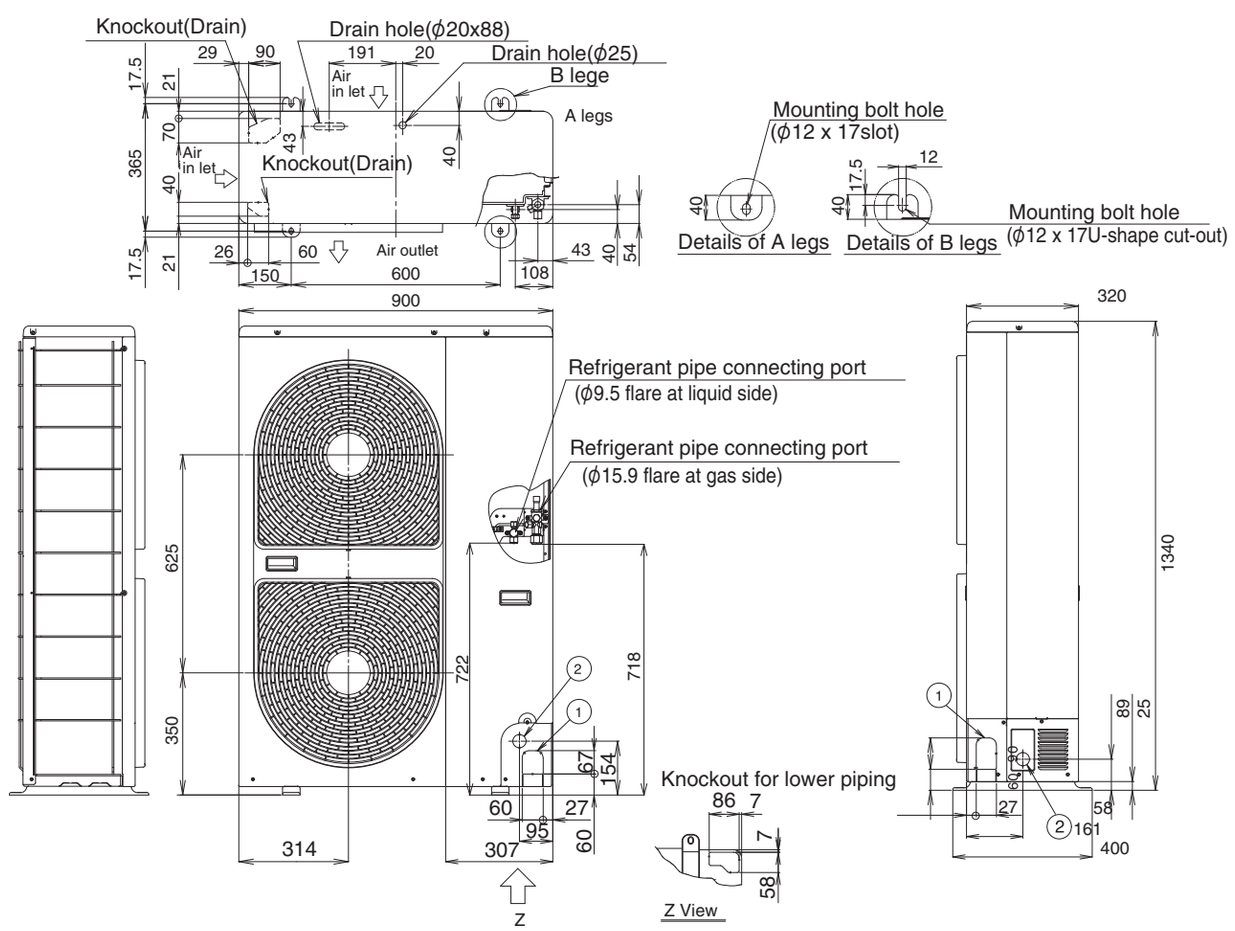
- The PMV kit is an option for super-silent operation, available for hotel rooms and residential applications where noise levels are critical
- Ease of installation
- Integral condensate pump
- Low cost

Indoor units combinations

Model Name		Cooling capacity	Heating capacity	Number of indoor units	Total capacity of connectable indoor units	
				Max	Min	Max
MCY-MAP0401HT	4 HP	12,1 kW	12,5 kW	6	3,2 HP	5,2 HP
MCY-MAP0501HT	5 HP	14,0 kW	16,0 kW	8	4,0 HP	6,5 HP
MCY-MAP0601HT	6 HP	15,5 kW	18,0 kW	9	4,8 HP	7,8 HP

Technical specifications PMV kit

Model Name	Indoor unit capacity code
RBM-PMV0361E	0,8 – 1 – 1,25 HP
RBM-PMV0362E	For new High wall MMK-AP***3H - 0,8 – 1 – 1,25 HP
RBM-PMV0901E	1,7 – 2 – 2,5 HP
RBM-PMV0902E	For new High Wall MMK-AP***3H - 1,7 – 2 – 2,5 HP



	Name	Notes
①	Control wiring and piping hole	—
②	Power supply wiring hole	Knockout hole ϕ38

Diameter of refrigerant pipe

Model name	Gas side	Liquid side
MCY-MAP0401HT*	ϕ15.9 (Flare)	ϕ9.5 (Flare)
MCY-MAP0501HT*	ϕ15.9 (Flare)	ϕ9.5 (Flare)
MCY-MAP0601HT*	ϕ19.1 (Blazing connection with attached joint socket.)	ϕ9.5 (Flare)

VRF Indoor Units

Toshiba VRF systems has a wide range of indoor units which enable designers and tenants to make the right product choice in terms of aeshestetic and performance. 14 different type of units ranging from 0.8 to 10HP are connectable to the VRF outdoor units. With the SMMSi and SHRMi range it is possible to install up to 48 different units individually controlled or managed centrally with a wide range of Toshiba controls solutions.

Cassette

The cassette unit is the preferred solution for offices and buildings with false ceiling installations. The Toshiba range of cassette units are suitable for local standard ceiling panels.

The choice can be made between products with different air flow configurations: 1, 2, 4 air outlets. The 4 way cassettes feature a selectable automatic air flow pattern in speed and direction. The designer can also select other Cassette types: compact 600x600 4-way, 1-way and the new slimmer 2-way cassette.

4-way Cassette

Ducted

Large building applications make extensive use of ducts to deliver air to the different parts of the building. Toshiba designers have been able to create different unit types with latest technology features in order to serve different purposes:

Slim duct
For applications where the ductwork space is limited in height and length (Hotels).

High-static
For applications that require elevated external static pressure (open space).

Standard static
When limited duct work is involved (office).

Fresh air intake
To manage the distribution of fresh air throughout the ductwork of a building.

Heat exchangers
To treat the incoming air and benefit of the free cooling process.

Standard Duct

Heat Exchanger

Wall Mounted

Hi-wall and ceiling

A preferred solution for buildings where false ceiling cannot be used. It is the perfect choice for those applications that needs air conditioning in conjunction with the existing conventional radiator heating.

Hi-walls units in the VRF range adopt the similar high-end design of the units used in residential applications. These type of products are silent, with personalized air flow control and powerful indoor air quality filters.

Suspended Ceiling

Floor standing console

Typical installations where the indoor unit is placed on the floor against one wall or under a window sill.

Concealed installations
where the console is hidden behind a panel in order to be unobtrusive and blend perfectly in the interior.

Concealed Chassis

Chassis cabinet
Positioned usually in places of radiators around the perimeter of the building or at the base of the building columns in the room.

Floor standing
These are slim tall units that can be placed in different positions. These units feature the additional horizontal swing pattern (from left to right) which make them the preferred solution for corner installations (restaurants).

Indoor units





Cooling capacity (HP equivalent)	4-way air discharge cassette type	Compact 4-way cassette (600 × 600) type	2-way air discharge cassette type	1-way air discharge cassette type	Concealed duct type
007 type 2.2 kW (0.8HP)		MMU-AP0074MH-E	MMU-AP0072WH	MMU-AP0074YH-E	MMD-AP0076BHP-E
009 type 2.8 kW (1HP)	MMU-AP0094HP-E	MMU-AP0094MH-E	MMU-AP0092WH	MMU-AP0094YH-E	MMD-AP0096BHP-E
012 type 3.6 kW (1.25HP)	MMU-AP0124HP-E	MMU-AP0124MH-E	MMU-AP0122WH	MMU-AP0124YH-E	MMD-AP0126BHP-E
015 type 4.5 kW (1.7HP)	MMU-AP0154HP-E	MMU-AP0154MH-E	MMU-AP0152WH	MMU-AP0154SH-E	MMD-AP0156BHP-E
018 type 5.6 kW (2HP)	MMU-AP0184HP-E	MMU-AP0184MH-E	MMU-AP0182WH	MMU-AP0184SH-E	MMD-AP0186BHP-E
024 type 7.1 kW (2.5HP)	MMU-AP0244HP-E		MMU-AP0242WH	MMU-AP0244SH-E	MMD-AP0246BHP-E
027 type 8.0 kW (3HP)	MMU-AP0274HP-E		MMU-AP0272WH		MMD-AP0276BHP-E
030 type 9.0 kW (3.2HP)	MMU-AP0304HP-E		MMU-AP0302WH		MMD-AP0306BHP-E
036 type 11.2 kW (4HP)	MMU-AP0364HP-E		MMU-AP0362WH		MMD-AP0366BHP-E
048 type 14.0 kW (5HP)	MMU-AP0484HP-E		MMU-AP0482WH		MMD-AP0486BHP-E
056 type 16.0 kW (6HP)	MMU-AP0564HP-E		MMU-AP0562WH		MMD-AP0566BHP-E
072 type 22.4 kW (8HP)					
096 type 28.0 kW (10HP)					





Cooling capacity (HP equivalent)	Concealed duct high static pressure type	Slim duct type	Ceiling type	High wall type 4 series*1	High wall type 3 series
007 type 2.2 kW (0.8HP)		MMD-AP0074SPH-E		MMK-AP0074MH-E	MMK-AP0073H
009 type 2.8 kW (1HP)		MMD-AP0094SPH-E		MMK-AP0094MH-E	MMK-AP0093H
012 type 3.6 kW (1.25HP)		MMD-AP0124SPH-E		MMK-AP0124MH-E	MMK-AP0123H
015 type 4.5 kW (1.7HP)		MMD-AP0154SPH-E	MMC-AP0157HP-E		MMK-AP0153H
018 type 5.6 kW (2HP)	MMD-AP0184H-E	MMD-AP0184SPH-E	MMC-AP0187HP-E		MMK-AP0183H
024 type 7.1 kW (2.5HP)	MMD-AP0244H-E	MMD-AP0244SPH-E	MMC-AP0247HP-E		MMK-AP0243H
027 type 8.0 kW (3HP)	MMD-AP0274H-E	MMD-AP0274SPH-E	MMC-AP0277HP-E		
030 type 9.0 kW (3.2HP)			MMC-AP0367HP-E		
036 type 11.2 kW (4HP)	MMD-AP0364H-E		MMC-AP0487HP-E		
048 type 14.0 kW (5HP)	MMD-AP0484H-E		MMC-AP0567HP-E		
056 type 16.0 kW (6HP)					
072 type 22.4 kW (8HP)	MMD-AP0724H-E				
096 type 28.0 kW (10HP)	MMD-AP0964H-E				

*1 : European market only.





Cooling capacity (HP equivalent)	Console	Floor standing cabinet type	Floor standing concealed type	Floor standing type	Air to air heat exchanger with DX-coil type*2
007 type 2.2 kW (0.8HP)	MML-AP0074NH-E	MML-AP0074H-E	MML-AP0074BH-E		
009 type 2.8 kW (1HP)	MML-AP0094NH-E	MML-AP0094H-E	MML-AP0094BH-E		MMD-VN(K)502HEXE
012 type 3.6 kW (1.25HP)	MML-AP0124NH-E	MML-AP0124H-E	MML-AP0124BH-E		
015 type 4.5 kW (1.7HP)	MML-AP0154NH-E	MML-AP0154H-E	MML-AP0154BH-E	MMF-AP0154H-E	MMD-VN(K)800HEXE
018 type 5.6 kW (2HP)	MML-AP0184NH-E	MML-AP0184H-E	MML-AP0184BH-E	MMF-AP0184H-E	
024 type 7.1 kW (2.5HP)		MML-AP0244H-E	MML-AP0244BH-E	MMF-AP0244H-E	MMD-VN(K)1002HEXE/2
027 type 8.0 kW (3HP)				MMF-AP0274H-E	
030 type 9.0 kW (3.2HP)					
036 type 11.2 kW (4HP)				MMF-AP0364H-E	
048 type 14.0 kW (5HP)				MMF-AP0484H-E	
056 type 16.0 kW (6HP)				MMF-AP0564H-E	
072 type 22.4 kW (8HP)					
096 type 28.0 kW (10HP)					

*2 : (K) indicates models equipped with humidifier.

Air volume	Air to air heat exchanger*3
150 m^3/h	MMD-VNM150HE
250 m^3/h	MMD-VNM250HE
300 m^3/h	MMD-VNM350HE
500 m^3/h	MMD-VNM500HE
650 m^3/h	MMD-VNM650HE
800 m^3/h	MMD-VNM800HE
1000 m^3/h	MMD-VNM1000HE
1500 m^3/h	MMD-VNM1500HE
2000 m^3/h	MMD-VNM2000HE

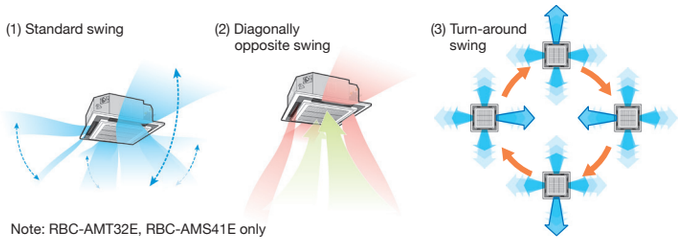
*3: Does not connect to refrigerant piping from outdoor unit. Control wires can be connected.

MMU-AP***4HP-E

4-way Air Discharge Cassette Type

Individual louver control

The angles of each of the four louver can be set individually
⇒ Enables airflow to be adapted to user preferences.



Note: RBC-AMT32E, RBC-AMS41E only

Easy installation

The panel is attached using the bolt already installed on the indoor unit.

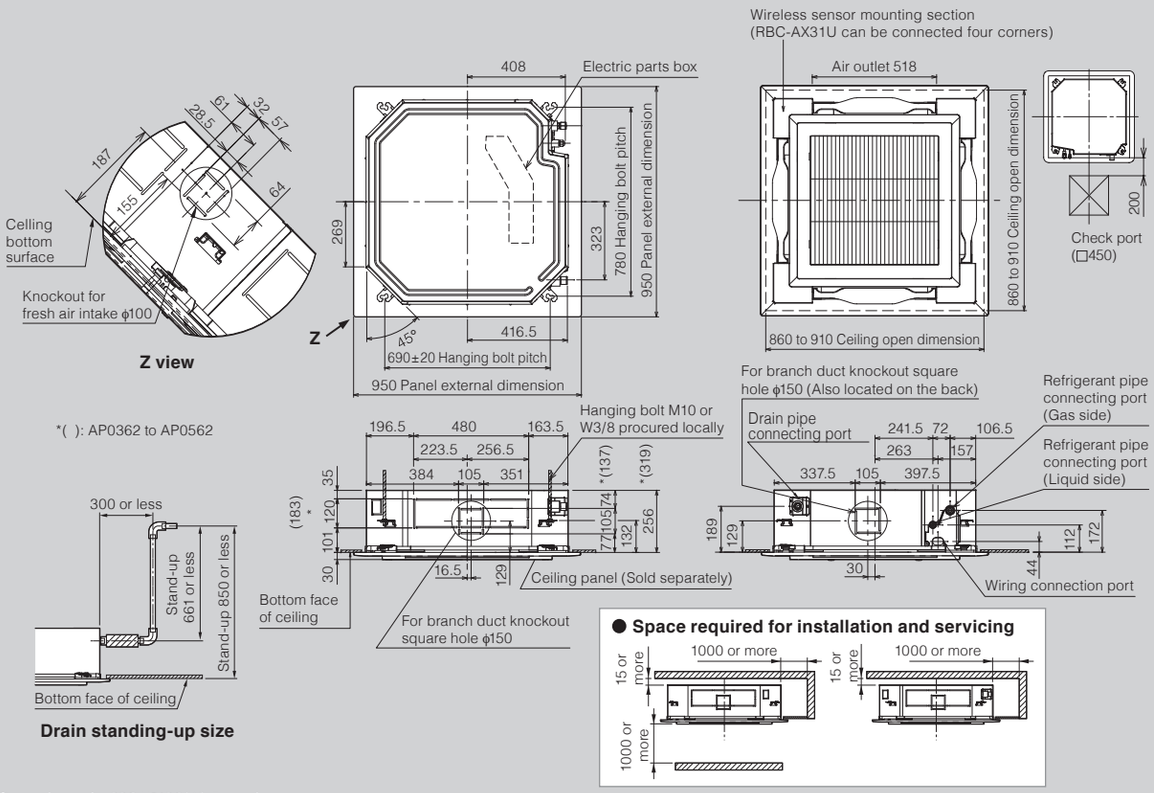
RBC-U31PGP(W)-E

Technical specifications

Model name		MMU-	AP0094HP-E	AP0124HP-E	AP0154HP-E	AP0184HP-E	AP0244HP-E	AP0274HP-E	AP0304HP-E	AP0364HP-E	AP0484HP-E	AP0564HP-E
Cooling/Heating capacity*1		(kW)	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)									
	Power consumption 50 Hz/60 Hz	(kW)	0.021/0.021		0.023/ 0.023	0.026/ 0.026	0.036/0.036		0.043/ 0.043	0.088/ 0.088	0.112/ 0.112	0.112/ 0.112
Appearance (Ceiling panel)		Model	RBC-U31PGP(W)-E									
External dimensions: Main unit (Ceiling panel)*	Height	(mm)	256 (30)*							319 (30)*		
	Width	(mm)	840 (950)*									
	Depth	(mm)	840 (950)*									
Total weight: Main unit (Ceiling panel)*		(kg)	18 (4)*		20 (4)*					25 (4)*		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	800/730/680		930/ 830/790	1050/ 920/800	1290/920/800		1320/ 1110/850	1970/ 1430/1070	2130/ 1430/1130	2130/ 1520/1230
	Motor output	(W)	14				20			68	72	
Connecting pipe	Gas side	(mm)	ø9.5		ø12.7		ø15.9					
	Liquid side	(mm)	ø6.4				ø9.5					
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)									
Sound pressure level*2 (High/Mid/Low)		(dB(A))	30/29/27		31/29/27	32/29/27	35/31/28		38/33/30	43/38/32	46/38/33	46/40/33

*Figures in parentheses are for ceiling panels.
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

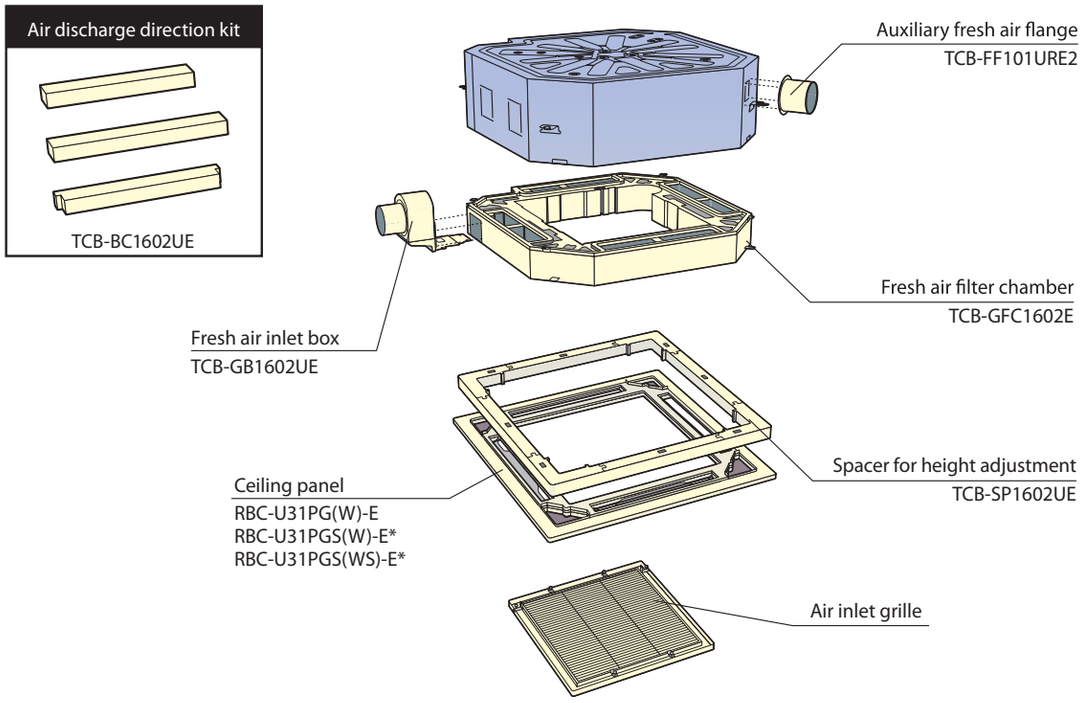
MMU-AP0094HP-E to MMU-AP0564HP-E

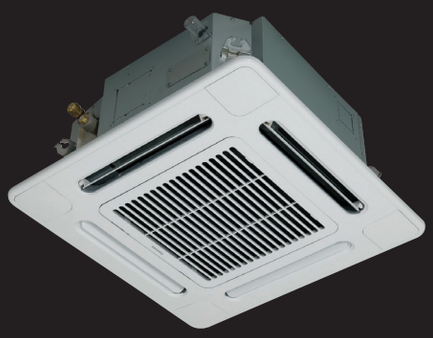


* The figure shows the RBC-U31PG(W)-E panel.

(Unit: mm)

Options





MMU-AP***4MH-E

Compact 4-way Cassette (600 × 600) Type

Perfect for grid system ceiling

This compact unit (575 × 575 mm) fits perfectly into ceilings and matches standard architectural modules, without the need to cut ceiling tiles.

The flaps fold tightly against the ceiling when operation stops so that the ceiling is affected only slightly even if air conditioning is installed.

Designed for simple & easy installation and maintenance

The slim design is only 268 mm in height even when an electrical box is located inside the unit.

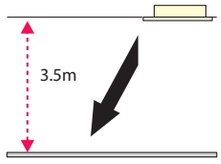
Easy installation is also possible using the panel adjust pocket. Use the "adjust pocket" function for fine adjustments after installation.

Available for ceilings up to 3.5 m in height.

The drain-checking hole makes it possible to check the drain pan through the side case.

RBC-UM11PG(W)E

Drain-checking hole



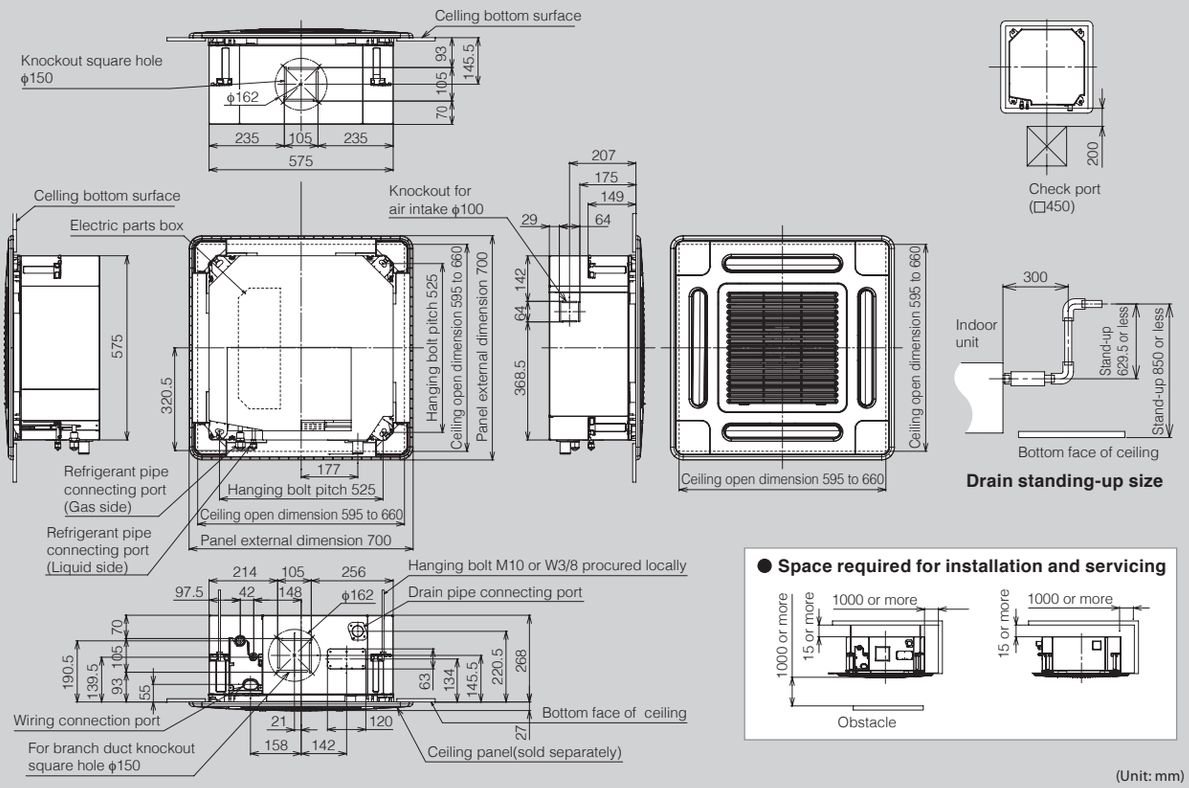
Maximum height

Technical specifications

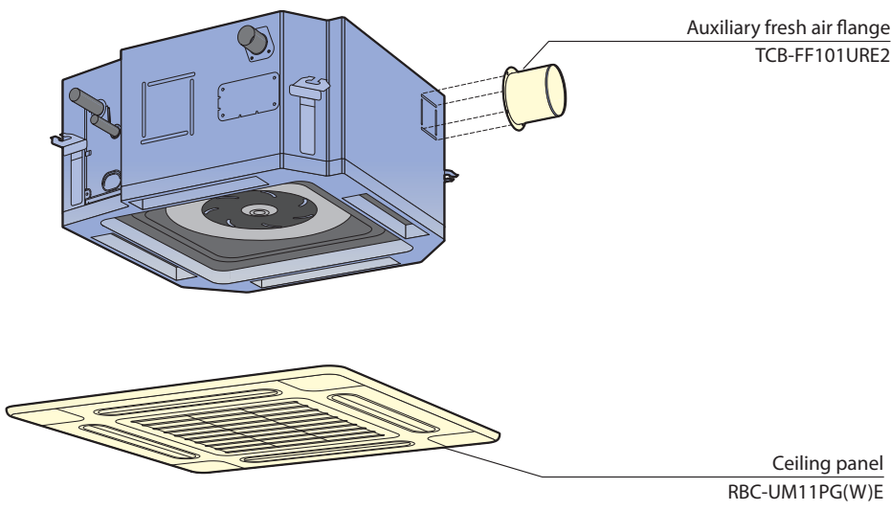
Model name		MMU-	AP0074MH-E	AP0094MH-E	AP0124MH-E	AP0154MH-E	AP0184MH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)				
	Power consumption 50 Hz/60 Hz	(kW)	0.034/0.034	0.036/0.036	0.038/0.038	0.041/0.041	0.052/0.052
Appearance (Ceiling panel)		Model	RBC-UM11PG(W)-E				
External dimensions: Main unit (Ceiling panel)*	Height	(mm)	268 (27)*				
	Width	(mm)	575 (700)*				
	Depth	(mm)	575(700)*				
Total weight: Main unit (Ceiling panel)*		(kg)	17 (3)*				
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	552/462/378	570/468/378	594/504/402	660/552/468	762/642/522
	Motor output	(W)	60				
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7	
	Liquid side	(mm)	ø6.4				
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)				
Sound pressure level*2 (High/Mid/Low)		(dB(A))	36/32/28	37/33/28	37/33/29	40/35/30	44/39/34

* Figures in parentheses are for ceiling panels.
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMU-AP0074MH-E to AP0184MH-E



Options



MMU-AP***2WH

2-way Air Discharge Cassette Type

Slim and compact unit

Unified the width of ceiling panel to 680mm.

Condensate drain pump included.

Available for ceilings up to 3.8m in height. (in case of 0.8HP to 3.2HP).

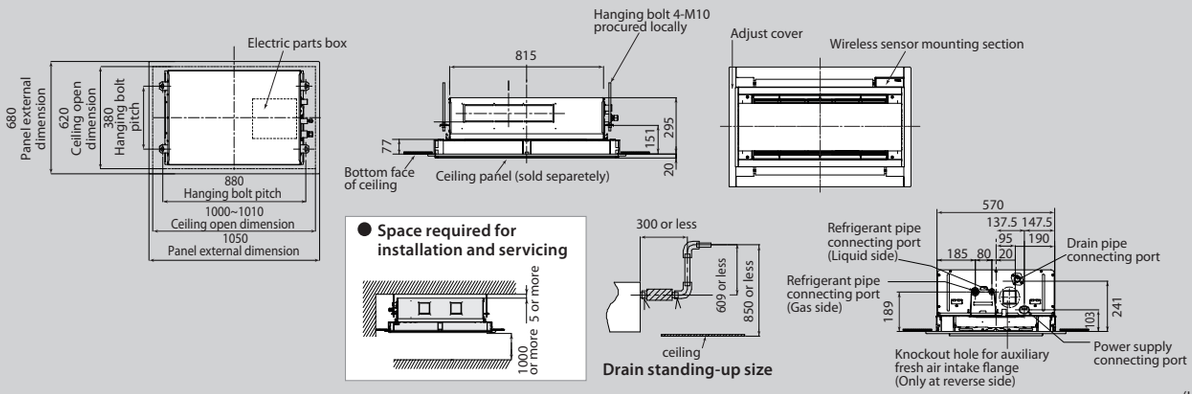
Easy installation and fine adjustment using the "Adjust-Cover" function.

Technical specifications

Model name		MMU-	AP0072WH	AP0092WH	AP0122WH	AP0152WH	AP0182WH	AP0242WH	AP0272WH	AP0302WH	AP0362WH	AP0482WH	AP0562WH
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)										
	Power consumption 50 Hz/60 Hz	(kW)	0.029/0.029			0.030/0.030	0.044/0.044	0.054/0.054		0.064/0.064	0.076/0.076	0.088/0.088	0.117/0.117
Appearance (Ceiling panel)		Model	RBC-UW283PG(W)-E				RBC-UW803PG(W)-E				RBC-UW1403(W)PG-E		
External dimensions: Main unit (Ceiling panel)*	Height	(mm)	295 (20)				345 (20)						
	Width	(mm)	815 (1050)				1180 (1415)				1600 (1835)		
	Depth	(mm)	570 (680)										
Total weight: Main unit (Ceiling panel)*		(kg)	19 (10)				26 (14)				36 (14)		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	558/498/450			600/534/450	900/750/618	1050/840/738		1260/900/780	1740/1434/1182	1800/1482/1230	2040/1578/1320
	Motor output	(W)	20				30	40		50	70		
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9					
	Liquid side	(mm)	ø6.4					ø9.5					
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)										
Sound pressure level*2 (High/Mid/Low)		(dB(A))	34/32/30			35/33/30		38/35/33		40/37/34	42/39/36	43/40/37	46/42/39

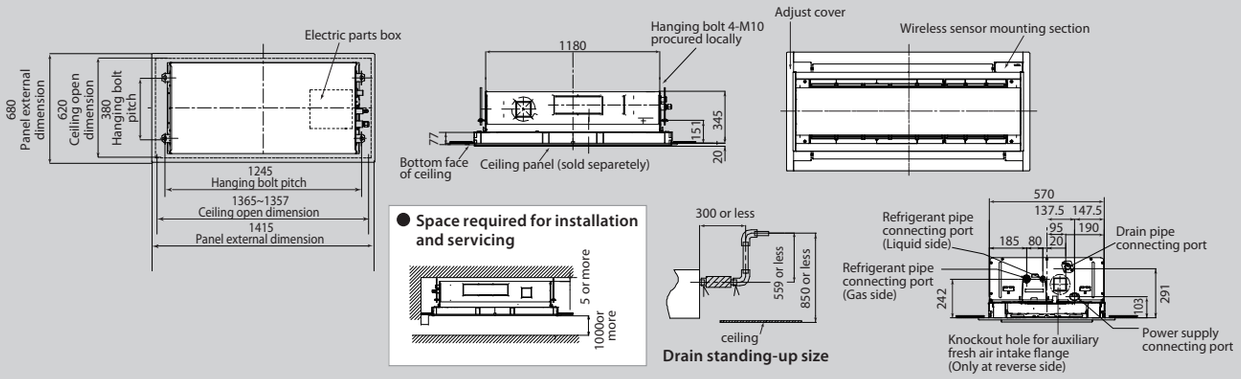
* Figures in parentheses are for ceiling panels.
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMU-AP0072WH to AP0152WH



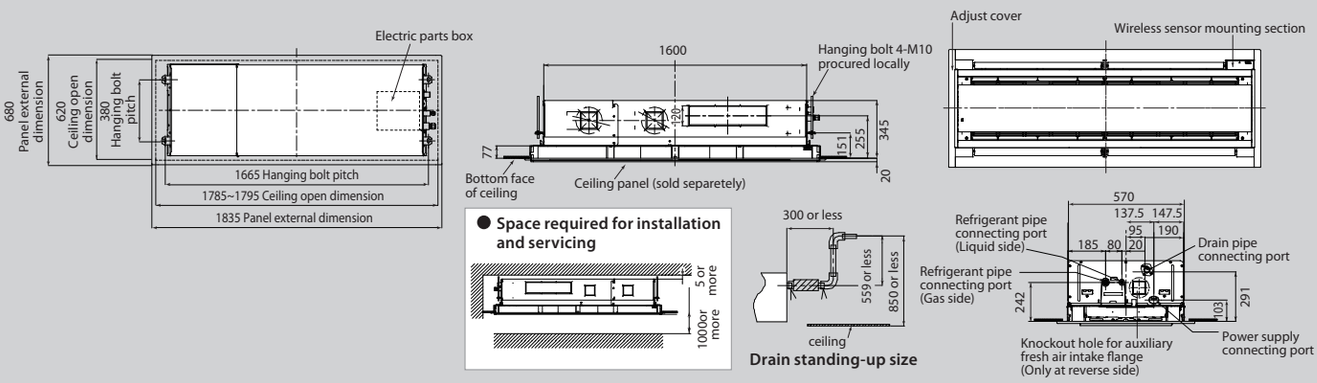
(Unit: mm)

MMU-AP0182WH to AP0302WH



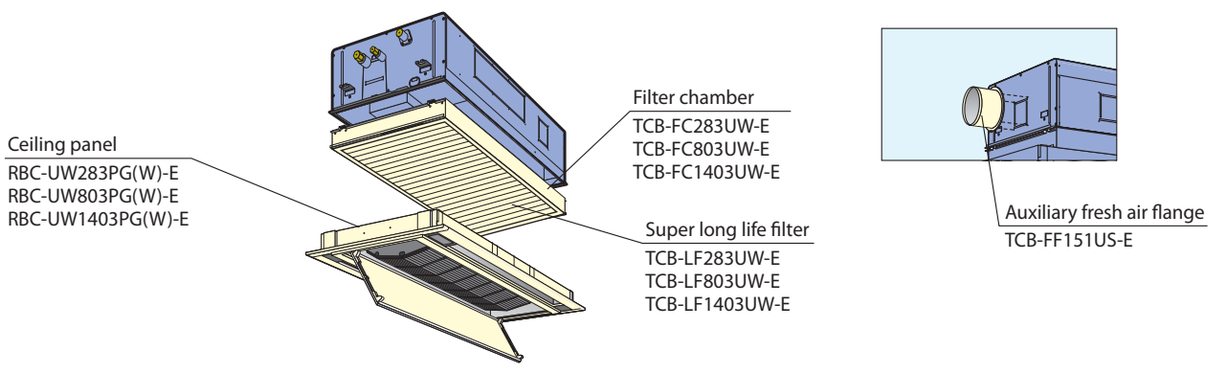
(Unit: mm)

MMU-AP0362WH to AP0562WH



(Unit: mm)

Options



MMU-AP*4YH-E**

MMU-AP*4SH-E**

* The photo shows the MMU-AP***4SH Series.

1-way Air Discharge Cassette Type

The perfect choice for hotels and reception areas

Silent sound design ensures the quiet required for the office.

Ideal for smaller rooms where one-way air distribution is required.

Able to blow air straight out.

Condensate drain pump included.

Long-life filters fitted as standard.

Fresh air intake is possible

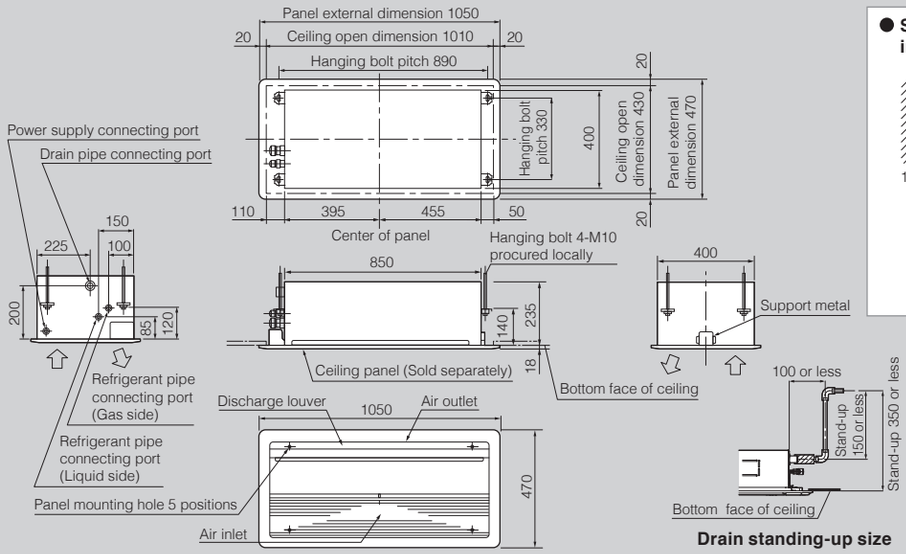
Preparations/connection possible with a circle duct flange.

Technical specifications

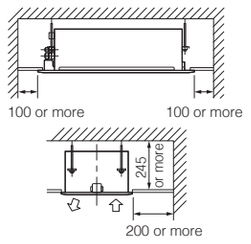
Model name		MMU-	AP0074YH-E	AP0094YH-E	AP0124YH-E	AP0154SH-E	AP0184SH-E	AP0244SH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)					
	Power consumption 50 Hz/60 Hz	(kW)	0.053/0.056			0.042/0.041	0.046/0.045	0.075/0.073
Appearance (Ceiling panel)		Model	RBC-UY136PG			RBC-US21PGE		
External dimensions: Main unit (Ceiling panel)*	Height	(mm)	235 (18)*			200 (20)*		
	Width	(mm)	850 (1050)*			1000 (1230)*		
	Depth	(mm)	400 (470)*			710 (800)*		
Total weight: Main unit (Ceiling panel)*		(kg)	22 (3.5)*			21 (5.5)*		22 (5.5)*
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	540/480/420			750/690/630	780/720/660	1140/960/810
	Motor output	(W)	22			30		
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9
	Liquid side	(mm)	ø6.4					ø9.5
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)					
Sound pressure level*2 (High/Mid/Low)		(dB(A))	42/39/34			37/35/32	38/36/34	45/41/37

* Figures in parentheses are for ceiling panels.
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMU-AP0074YH-E to AP0124YH-E

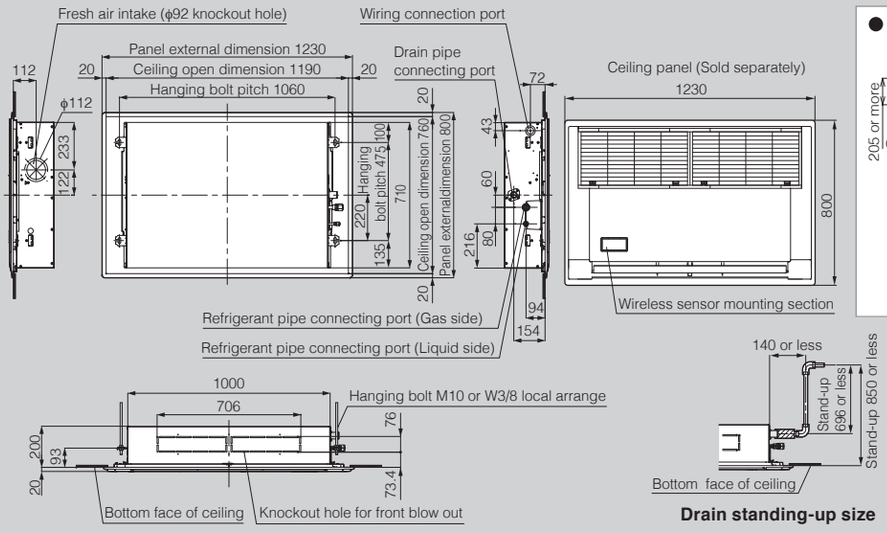


● **Space required for installation and servicing**

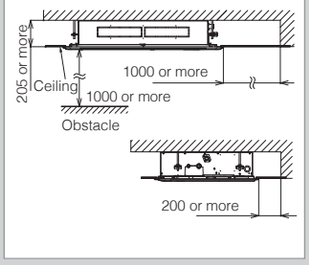


(Unit: mm)

MMU-AP0154SH-E to AP0244SH-E



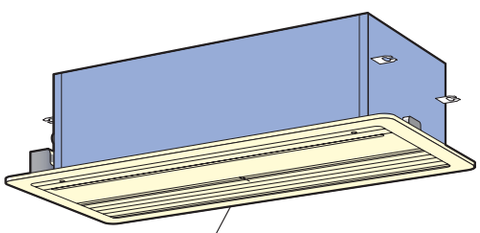
● **Space required for installation and servicing**



(Unit: mm)

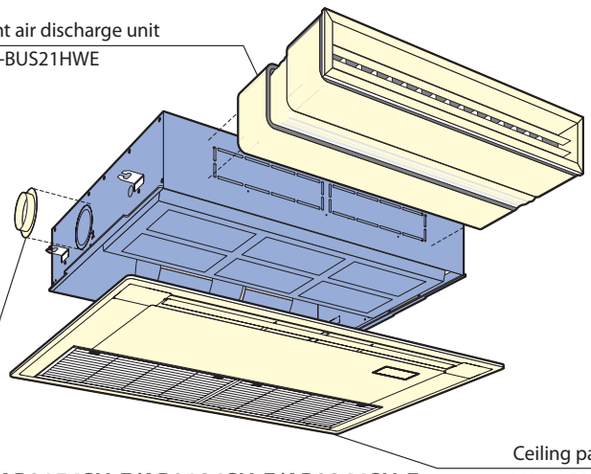
Options

AP0074YH-E/AP0094YH-E/AP0124YH-E



Ceiling panel
RBC-UY136PG

Front air discharge unit
TCB-BUS21HWE



Auxiliary fresh air flange
TCB-FF101URE2

Ceiling panel
RBC-US21PGE

AP0154SH-E/AP0184SH-E/AP0244SH-E

MMD-AP***6BHP-E

Concealed Duct Type

High static pressure

External static pressure can be raised as high as 120 Pa, so that all areas of the room can be reached for even temperature distribution, no matter how complex the layout.

High-lift drain pump

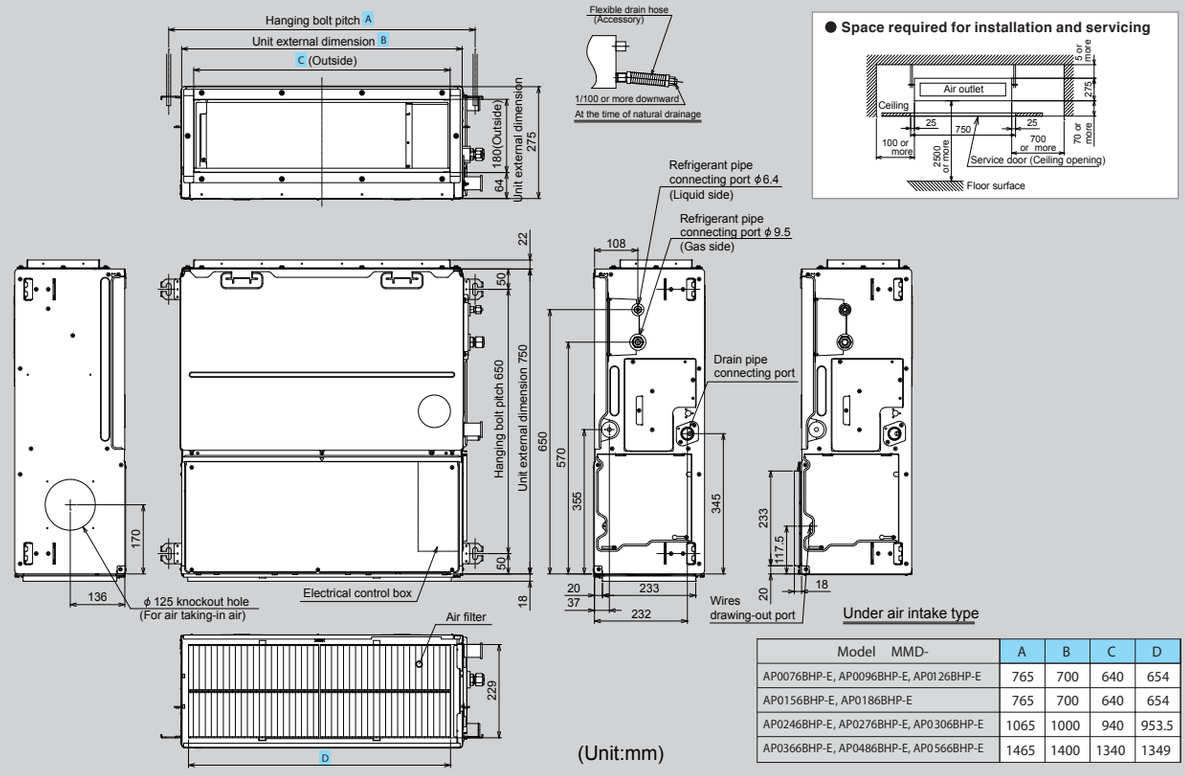
Kit that raises the drain piping up to 27 cm from the drain port.

Technical specifications

Model name		MMD-	AP0076BHP-E	AP0096BHP-E	AP0126BHP-E	AP0156BHP-E	AP0186BHP-E	AP0246BHP-E	AP0276BHP-E	AP0306BHP-E	AP0366BHP-E	AP0486BHP-E	AP0566BHP-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	9.0/10.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)										
	Power consumption 50 Hz/60 Hz	(kW)	0.038/0.038	0.043/0.043		0.062/ 0.062		0.077/0.077		0.094/ 0.094	0.172/ 0.172	0.198/0.198	
External dimension	Height	(mm)	275										
	Width	(mm)	700			700		1000			1400		
	Depth	(mm)	750										
Total weight		(kg)	23					30			40		
Fan unit	Standard air flow (Mid/Low)	(m^3/h)	540/ 420/330	570/ 450/330		800/ 630/480		1200/930/720		1260/ 960/720	1920/ 1500/1140	2100/ 1650/1260	
	Motor output	(W)	150								250		
	External static pressure (factory setting)	(Pa)	30					40			50		
	External static pressure	(Pa)	30-40-50-65-80-100-120 (7 steps)										
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9					
	Liquid side	(mm)	ø6.4					ø9.5					
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)										
Sound pressure level*2 (High/Mid/Low)		(dB(A))	29/26/23	30/26/23		33/29/25		36/31/27			40/36/33		

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMD-AP0076BHP-E to AP0566BHP-E

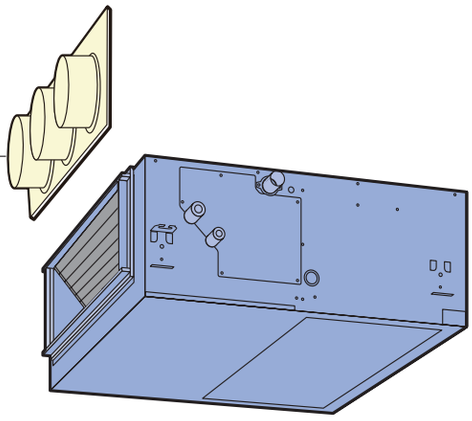


Model MMD-	A	B	C	D
AP0076BHP-E, AP0096BHP-E, AP0126BHP-E	765	700	640	654
AP0156BHP-E, AP0186BHP-E	765	700	640	654
AP0246BHP-E, AP0276BHP-E, AP0306BHP-E	1065	1000	940	953.5
AP0366BHP-E, AP0486BHP-E, AP0566BHP-E	1465	1400	1340	1349

Options

Spigot shaped flange

TCB-SF56C6BE
TCB-SF80C6BE
TCB-SF160C6BE



MMD-AP***4H-E

Concealed Duct High Static Pressure Type

Design flexibility

Satisfies all your design needs.

Compatible with external static pressures up to 196 Pa.

Can be equipped with the following options:
- high-efficiency filter (65, 90)
- drain pump kit

Construction characteristics

Three-stage-switchable static pressure.

The flexible duct is accessible.

Easy service and installation.

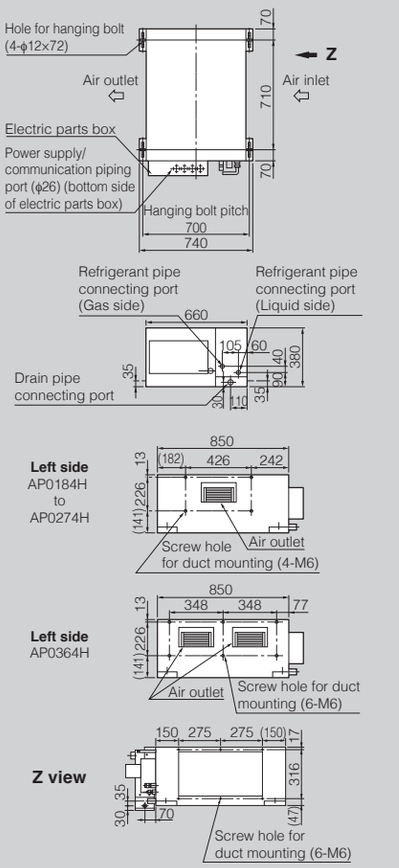
Inspection hole enables easy access and maintenance.

Technical specifications

Model name		MMD-	AP0184H-E	AP0244H-E	AP0274H-E	AP0364H-E	AP0484H-E	AP0724H-E	AP0964H-E
Cooling/Heating capacity*1		(kW)	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0	22.4/25.0	28.0/31.5
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)						
	Power consumption 50 Hz/60 Hz	(kW)	0.184/0.198	0.299/0.385		0.368/0.450	0.414/0.490	1.200/1.540	1.260/1.610
External dimensions	Height	(mm)	380					470	
	Width	(mm)	850				1200	1380	
	Depth	(mm)	660					1250	
Total weight		(kg)	50	52		56	67	150	
Fan unit	Standard air flow	(m^3/h)	900	1320		1600	2100	3600	4200
	Motor output	(W)	160			260		370×3	
	External static pressure (factory setting)	(Pa)	137						
	External static pressure	(Pa)	68.6 – 137 – 196						
Connecting pipe	Gas side	(mm)	ø12.7	ø15.9				ø22.2	
	Liquid side	(mm)	ø6.4	ø9.5				ø12.7	
	Drain port	(nominal dia.)	25 (male screw)						
Sound pressure level*2 (High/Mid/Low)		(dB(A))	37	40				49	50

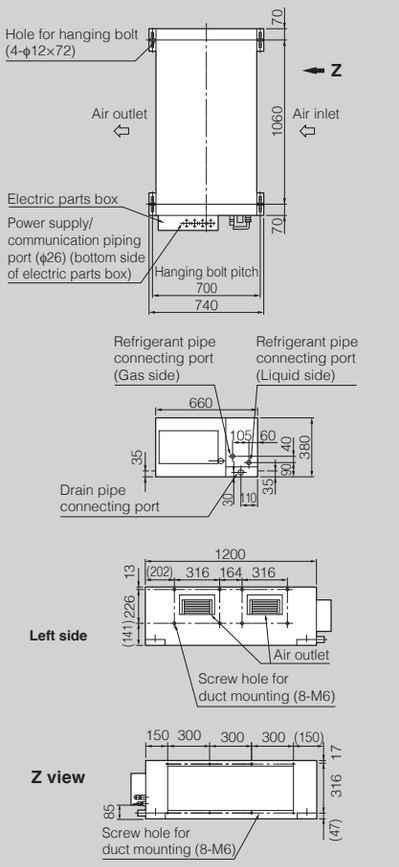
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMD-AP0184H-E to AP0364H-E



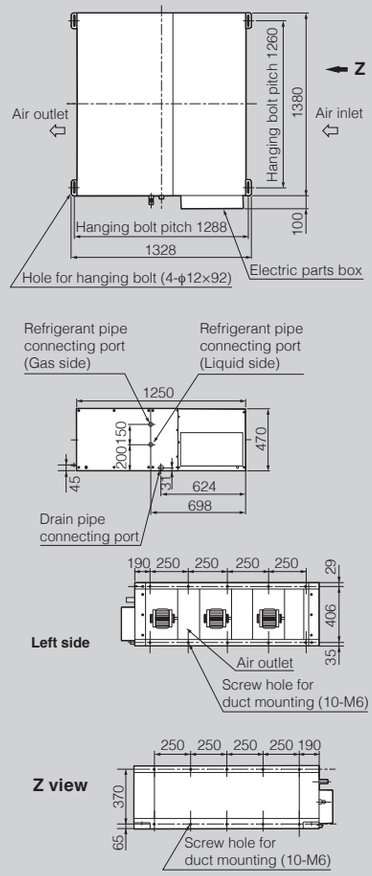
(Unit: mm)

MMD-AP0484H-E



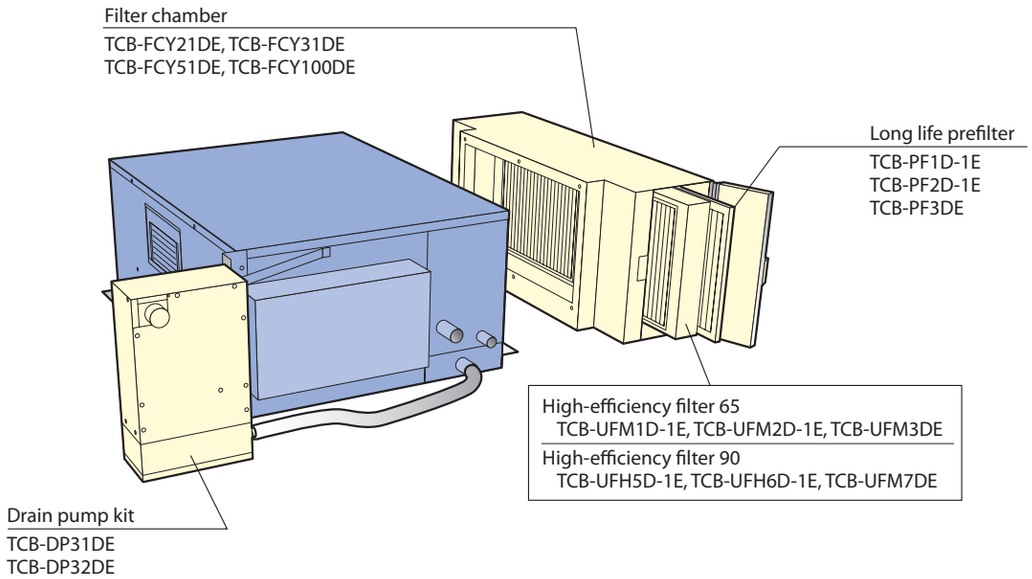
(Unit: mm)

MMD-AP0724H-E, AP0964H-E



(Unit: mm)

Options



MMD-AP***4SPH-E

Slim Duct Type

Functional design

Only 210 mm in height for greater application flexibility.

4-step static pressure setup.

Concealed installation within a ceiling void.

Auxiliary fresh air intake available.

Slim & quiet

Perfect comfort throughout the room.

Can be used with any style of air diffuser.

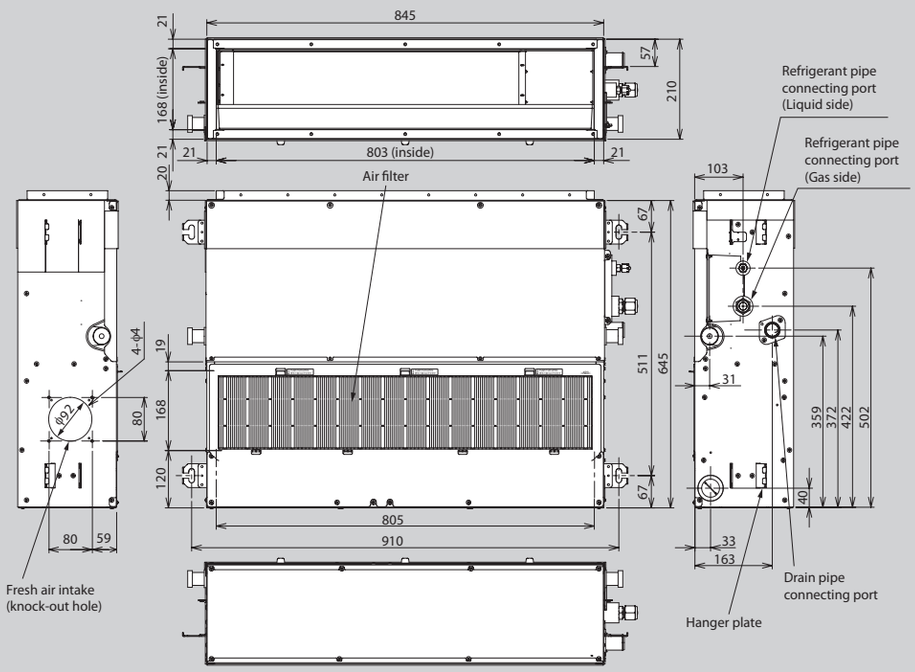
Quiet, powerful operation.

Technical specifications

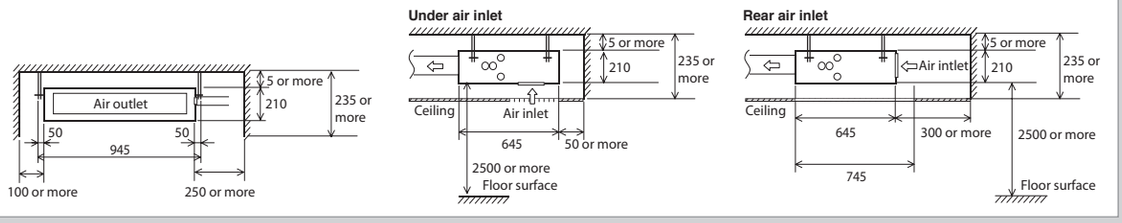
Model name		MMD-	AP0074SPH-E	AP0094SPH-E	AP0124SPH-E	AP0154SPH-E	AP0184SPH-E	AP0244SPH-E	AP0274SPH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0
Electrical characteristics	Power supply		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)						
	Power consumption 50 Hz/60 Hz	(kW)	0.039/0.037		0.043/0.041	0.045/0.043	0.054/0.052	0.105//0.105	
External dimensions	Height	(mm)	210						
	Width	(mm)	845					1140	
	Depth	(mm)	645						
Total weight		(kg)	22			23		29	
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	540/470/400		600/520/450	690/600/520	780/680/580	1080/1000/900	
	Motor output	(W)	60					120	
	External static pressure	(Pa)	6-16-31-46 (4 steps)		5-15-30-45 (4 steps)		4-14-29-44 (4 steps)	2-12-22-42 (4 steps)	
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9	
	Liquid side	(mm)	ø6.4					ø9.5	
	Drain port	(nominal dia.)	25 (Polyvinyl chloride tube)						
Sound pressure level*2 (High/Med./Low)	Under air inlet	(dB(A))	36/33/30		38/35/32	39/36/33	40/38/36	49/47/44	
	Back air inlet	(dB(A))	28/26/24		29/27/25	32/30/28	33/31/29	38/36/33	

*1 The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping.
The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 metre height.
*2 The sound level are measured in an anechoic chamber in accordance with JIS B 8616.
The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.
Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

MMD-AP0074SPH-E to AP0274SPH-E*

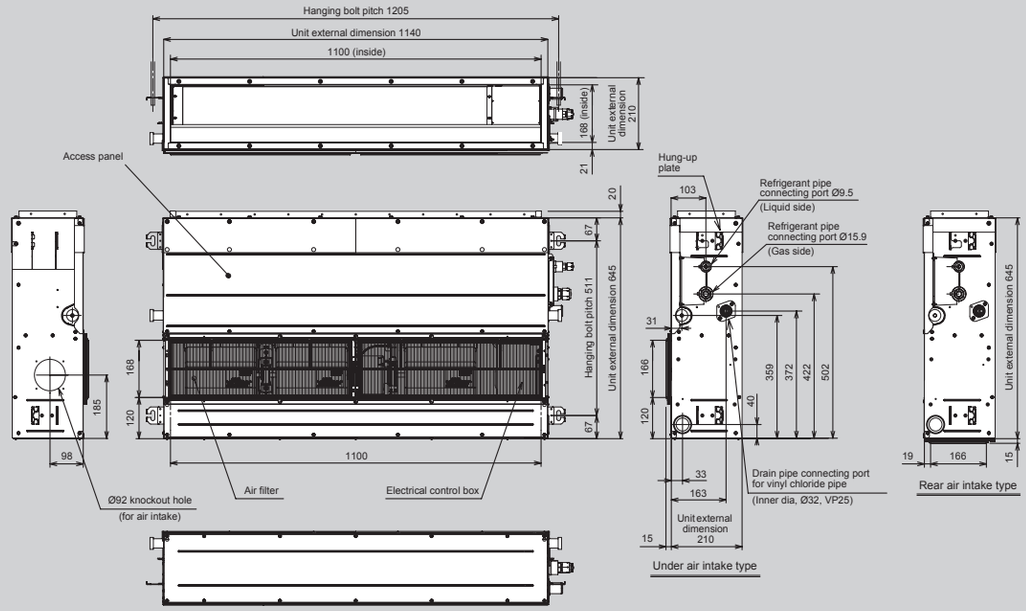


● Space required for installation and servicing



(Unit: mm)

MMD-AP0244SPH-E, AP0274SPH-E



MMC-AP***7HP-E

Ceiling Type

Comfortable ambience

Top-class quietness

• New design reduces sound level to half that of conventional units.

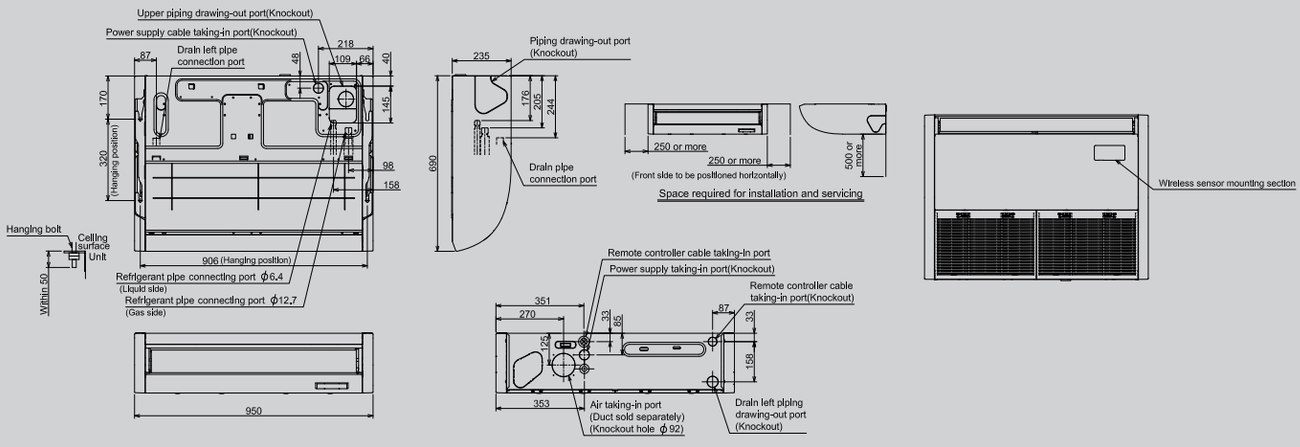
Flap control

• The airflow angle is automatically set to the most suitable setting according to your cooling or heating needs, and an automatic swing mode enables airflow to reach all areas of the room to create a comfortable ambience.

Installation efficiency

The unit can be suspended from the ceiling simply by adjusting two screws on the intake grille, avoiding complex procedures which can involve up to a dozen installation screws.

MMC-AP0157HP-E, AP0187HP-E

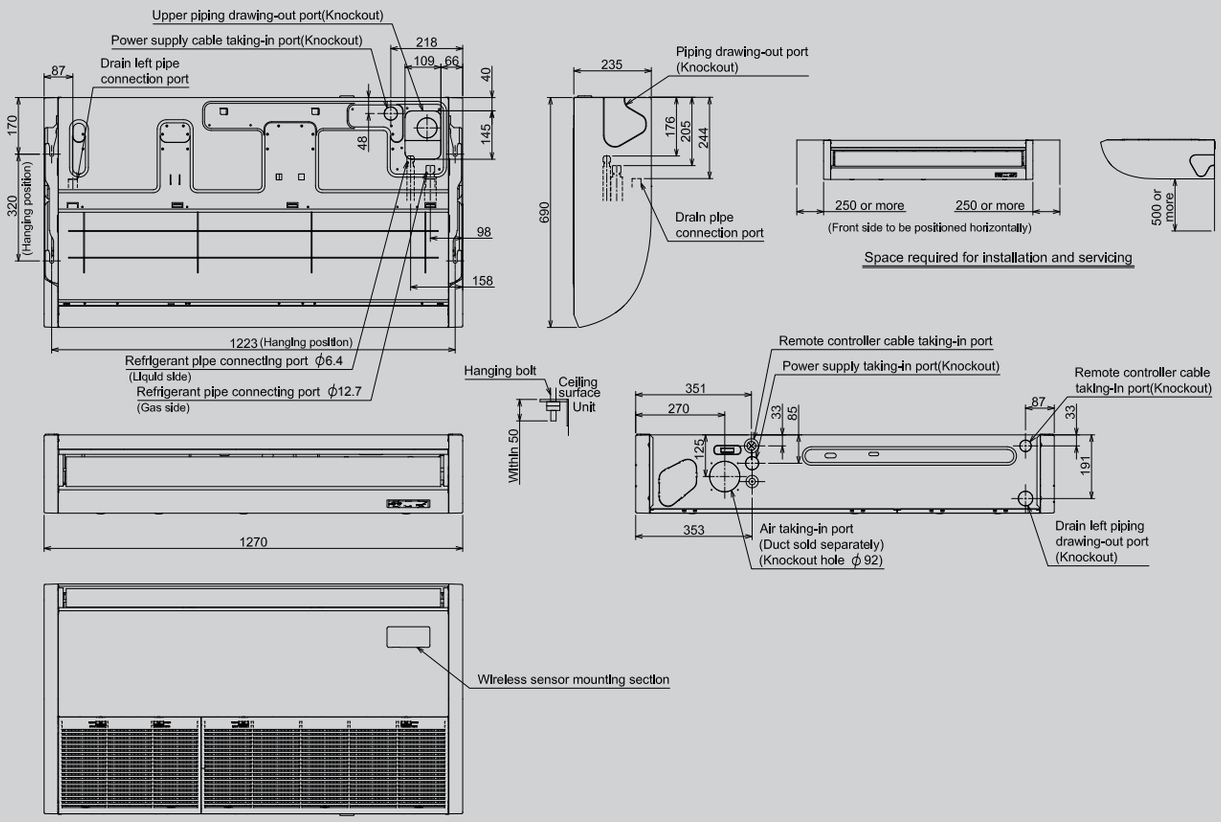


Technical specifications

Model name		MMC-	AP0157HP-E	AP0187HP-E	AP0247HP-E	AP0277HP-E	AP0367HP-E	AP0487HP-E	AP0567HP-E
Cooling/Heating capacity*1		(kW)	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)						
	Power consumption 50 Hz/60 Hz	(kW)	0.033	0.034	0.067		0.083		0.111
External dimensions	Height	(mm)	235						
	Width	(mm)	950		1,270		1,586		
	Depth	(mm)	690						
Total weight		(kg)	24		30		37		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	840/690/540	960/720/540	1440/1020/750		1860/1350/1020	1860/1530/1200	2040/1650/1260
	Motor output	(W)	94				139		
Connecting pipe	Gas side	(mm)	ø12.7		ø15.9				
	Liquid side	(mm)	ø6.4		ø9.5				
	Drain port (nominal dia.)		20 (Polyvinyl chloride tube)						
Sound pressure level*2 (High/Mid/Low)		(dB(A))	36/34/28	37/35/28	41/36/29		44/38/32	44/41/35	46/42/36

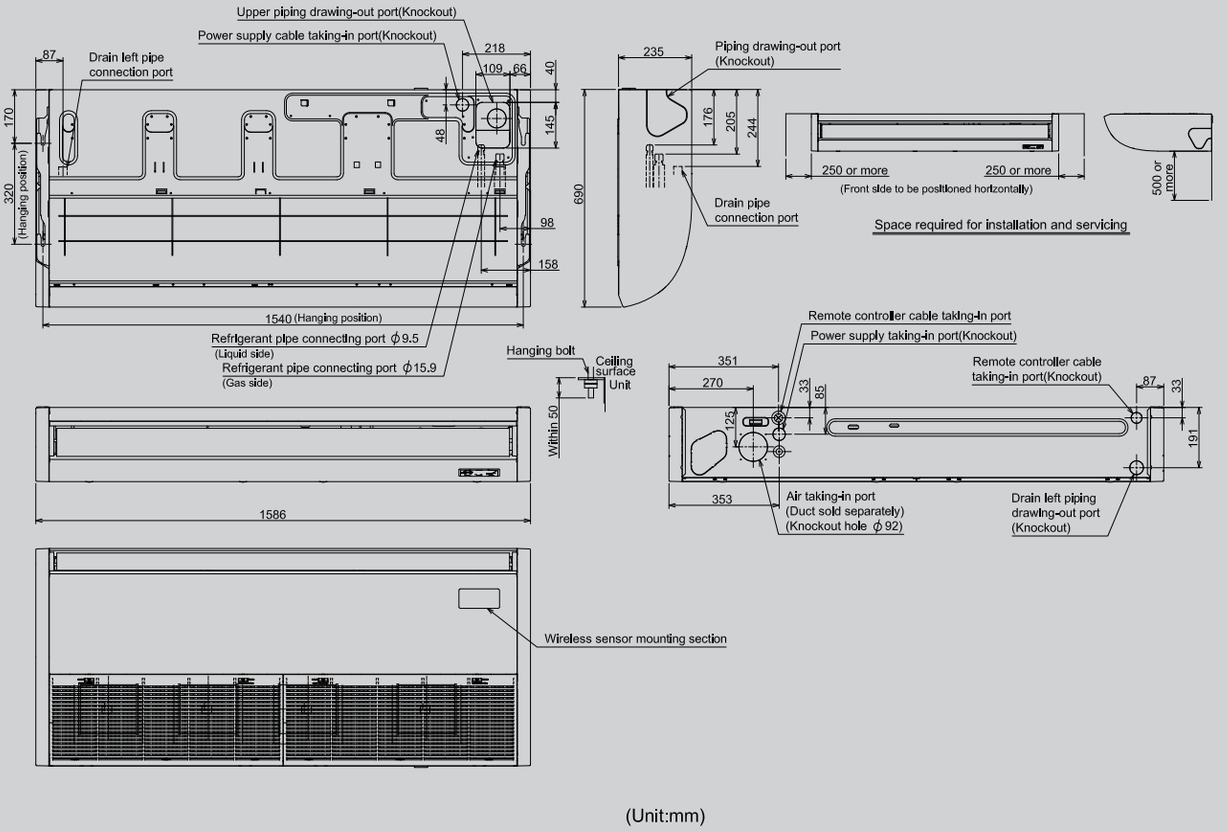
*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMC-AP0247HP-E, AP0277HP-E



(Unit:mm)

MMC-AP0367HP-E, AP0487HP-E, AP0567HP-E



(Unit:mm)

MMK-AP*4MH-E**

High-wall Type (4 series) European market only

Slim-line design

With its attractive, slim-line design, this unit is best suited for restaurants and other applications requiring understated elegance.

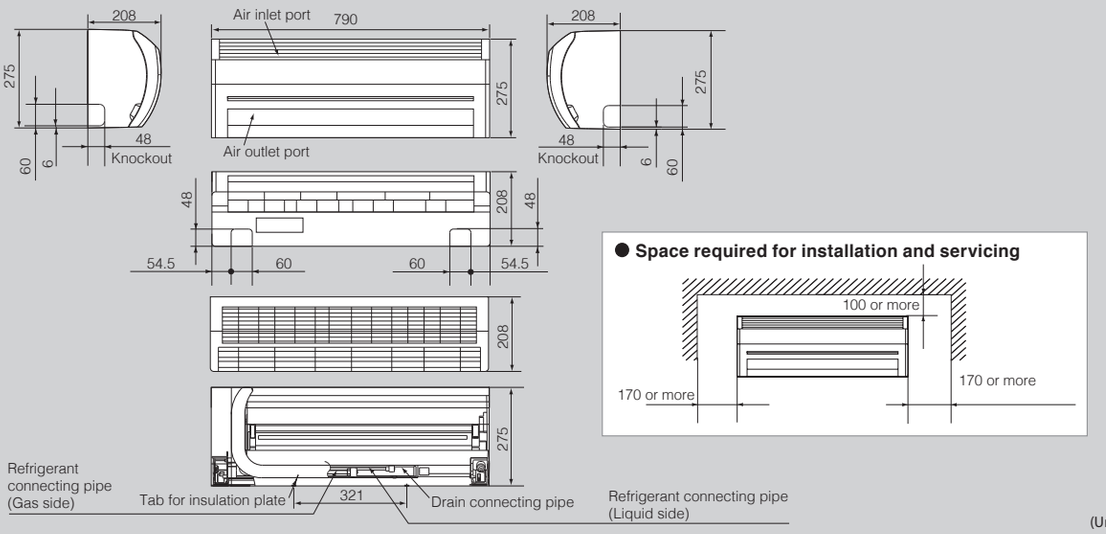
The filtration system further improves the indoor air quality benefits of this high-wall unit.

Auto-louver mode allows optimum air distribution throughout the room.

Wireless controller is included.

Remote controller

MMK-AP0074MH-E to AP0124MH-E



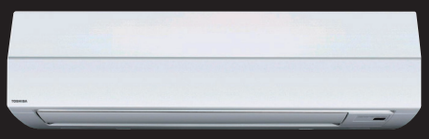
● **Space required for installation and servicing**

(Unit: mm)

Technical specifications

Model name		MMK-	AP0074MH-E	AP0094MH-E	AP0124MH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) (Separate power supply for indoor units is required.)		
	Power consumption 50 Hz	(kW)	0.017	0.018	0.019
External dimensions	Height	(mm)	275		
	Width	(mm)	790		
	Depth	(mm)	208		
Total weight		(kg)	11		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	480/420/360	510/450/360	540/450/360
	Motor output	(W)	30		
Connecting pipe	Gas side	(mm)	ø9.5		
	Liquid side	(mm)	ø6.4		
	Drain port	(nominal dia.)	16 (polyvinyl chloride tube)		
Sound pressure level*2 (High/Mid/Low)		(dB(A))	35/32/29	36/33/29	37/33/29

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.



MMK-AP*3H**

High-wall Type (3 series)

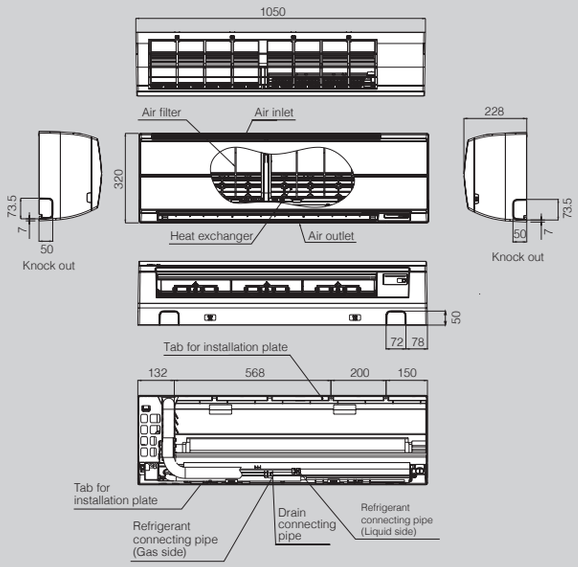
Elegant and slim

This classic high-wall is elegant and slim; it can easily blend in with any room interior.

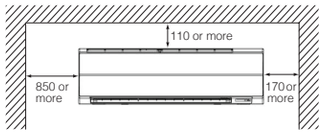
Total comfort is granted, thanks also to the 70° directional auto-swing louver that provides uniform air distribution.

Remote controller

MMK-AP0073H to AP0243H



● **Space required for installation and servicing**



(Unit: mm)

Technical specifications

Model name		MMK-	AP0073H	AP0093H	AP0123H	AP0153H	AP0183H	AP0243H
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220-240V) (Separate power supply for indoor units required.)					
	Power consumption 50 Hz	(kW)	0.018	0.021		0.043		0.050
External dimensions	Height	(mm)	320					
	Width	(mm)	1050					
	Depth	(mm)	228					
Total weight		(kg)	15					
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	570/450/390	600/480/390		840/660/540		1020/750/570
	Motor output	(W)	30					
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9
	Liquid side	(mm)	ø6.4					ø9.5
	Drain port	(nominal dia.)	16 (polyvinyl chloride tube)					
Sound pressure level*2 (High/Mid/Low)		(dB(A))	35/31/28	37/32/28		41/36/33		46/39/34

*1 The cooling capacities and electrical characteristics are measured under the conditions specified by JIS B 8615 based on the reference piping.
The reference piping consists of 5 m of main piping and 2.5 m of branch piping connected with 0 metre height.
*2 The sound level are measured in an anechoic chamber in accordance with JIS B 8616.
The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MML-AP***4NH-E

Console

Features

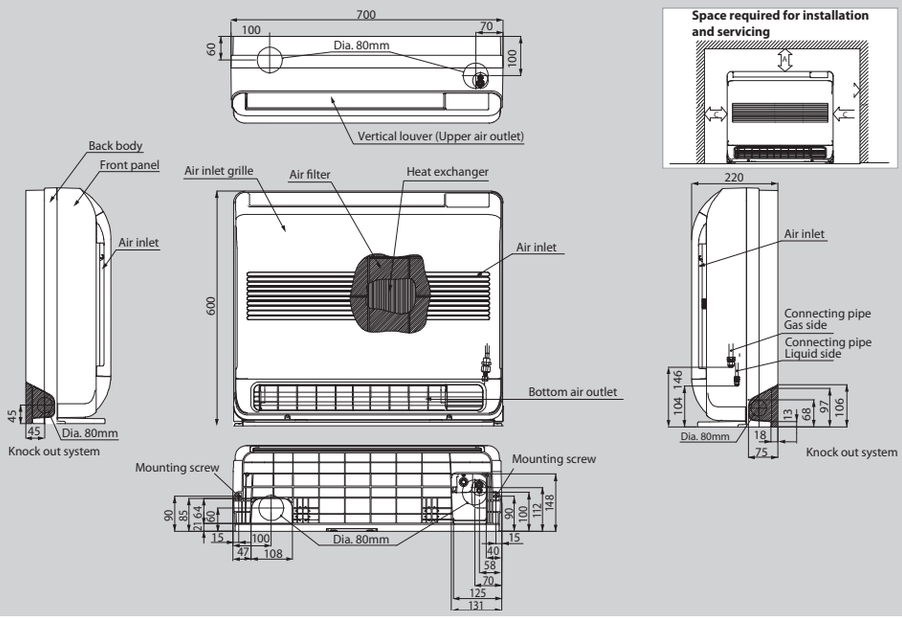
Elegant & simple design makes this unit a perfect fit for shops, office buildings, and luxury apartments.

Bottom flow functionality ensures comfortable air bi-flow for an advantage in heating and floor warming.

Multi-function operation is convenient, making adjustments by the user possible using the wireless remote controller.

Remote controller

MML-AP0074NH-E to AP0184NH-E



Technical specifications

Model name		MML-	AP0074NH-E	AP0094NH-E	AP0124NH-E	AP0154NH-E	AP0184NH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)				
	Power consumption 50 Hz/60 Hz	(kW)	0.021		0.025	0.034	0.052
External dimensions	Height	(mm)	600				
	Width	(mm)	700				
	Depth	(mm)	220				
Total weight		(kg)	17				
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	510/366/282		552/408/324	624/468/384	726/528/426
	Motor output	(W)	41				
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7	
	Liquid side	(mm)	ø6.4				
	Drain port	(nominal dia.)	16 (Polyvinyl chloride tube)				
Sound pressure level*2 (High/Mid/Low)		(dB(A))	38/32/26		40/34/29	43/37/31	47/40/34

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MML-AP*4H-E**

Floor Standing Cabinet Type

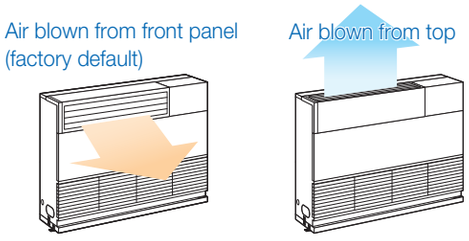
Slim & compact design

Under-window mounting does not block lighting.

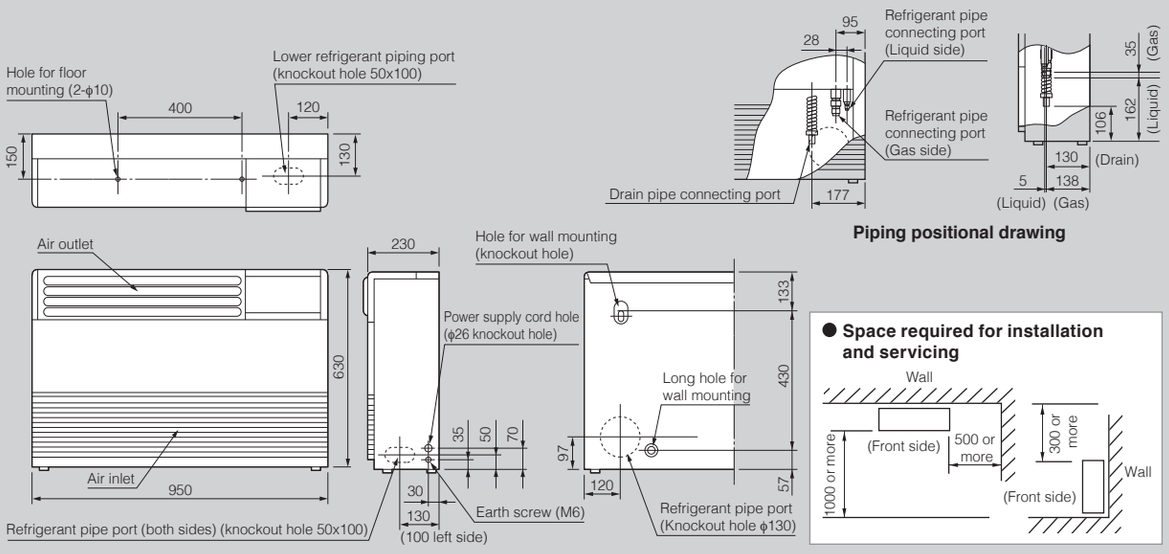
Indoor unit size of 2.2 kW to 7.1 kW is the same.

Air exits from front or top

Distribution can be reversed to suit occupant preference.



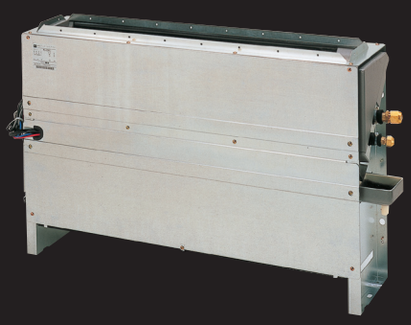
MML-AP0074H-E to AP0244H-E



Technical specifications

Model name		MML-	AP0074H-E	AP0094H-E	AP0124H-E	AP0154H-E	AP0184H-E	AP0244H-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)					
	Power consumption 50 Hz/60 Hz	(kW)	0.056/0.053		0.092/0.092		0.102/0.113	
External dimensions	Height	(mm)	630					
	Width	(mm)	950					
	Depth	(mm)	230					
Total weight		(kg)	37				40	
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	480/420/360		900/780/650		1080/930/780	
	Motor output	(W)	45				70	
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9
	Liquid side	(mm)	ø6.4					ø9.5
	Drain port	(nominal dia.)	20 (Polyvinyl chloride tube)					
Sound pressure level*2 (High/Mid/Low)		(dB(A))	39/37/35		45/41/38		49/44/39	

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.



MML-AP***4BH-E

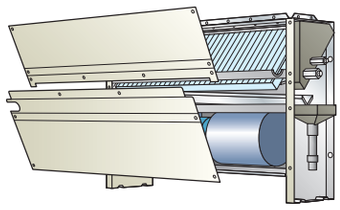
Floor Standing Concealed Type

Cool air makes for a pleasant indoor environment

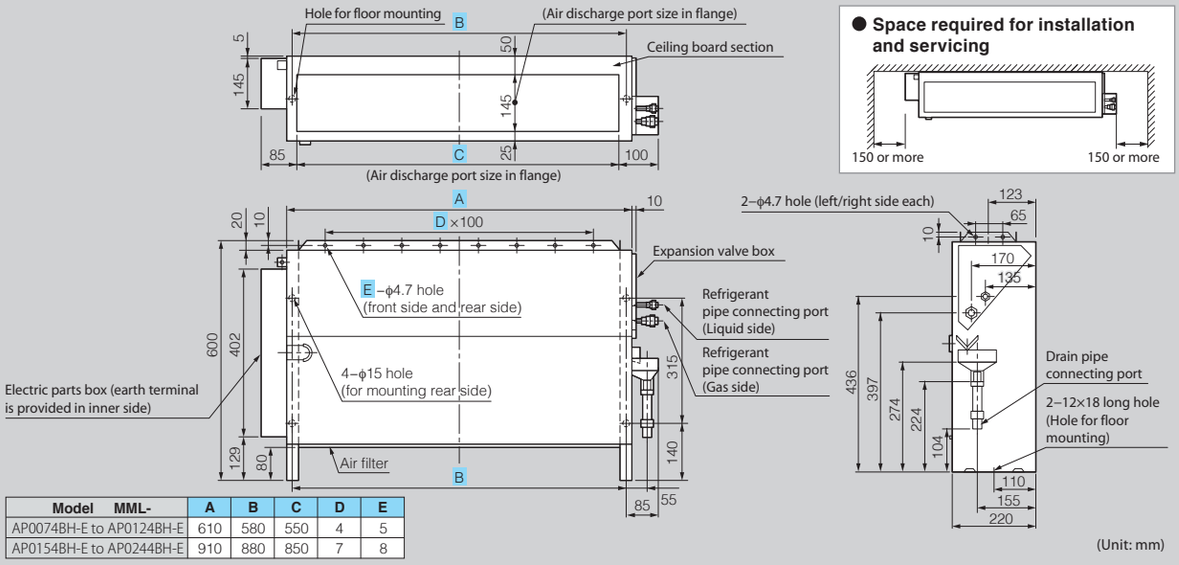
Install it under a window and air-condition any room effectively.

Easy maintenance

Simplified design of fan and drainage pipe eases maintenance.



MML-AP0074BH-E to AP0244BH-E



Model MML-	A	B	C	D	E
AP0074BH-E to AP0124BH-E	610	580	550	4	5
AP0154BH-E to AP0244BH-E	910	880	850	7	8

(Unit: mm)

Technical specifications

Model name		MML-	AP0074BH-E	AP0094BH-E	AP0124BH-E	AP0154BH-E	AP0184BH-E	AP0244BH-E
Cooling/Heating capacity*1		(kW)	2.2/2.5	2.8/3.2	3.6/4.0	4.5/5.0	5.6/6.3	7.1/8.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)					
	Power consumption 50 Hz/60 Hz	(kW)	0.056/0.058			0.090/0.096		0.095/0.110
External dimensions	Height	(mm)	600					
	Width	(mm)	745			1045		
	Depth	(mm)	220					
Total weight		(kg)	21			29		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	460/400/300			740/600/490		950/790/640
	Motor output	(W)	19			70		
Connecting pipe	Gas side	(mm)	ø9.5			ø12.7		ø15.9
	Liquid side	(mm)	ø6.4					ø9.5
	Drain port	(nominal dia.)	20 (Polyvinyl chloride tube)					
Sound pressure level*2 (High/Mid/Low)		(dB(A))	36/34/32					42/37/33

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.

MMF-AP*4H-E**

Floor Standing Type

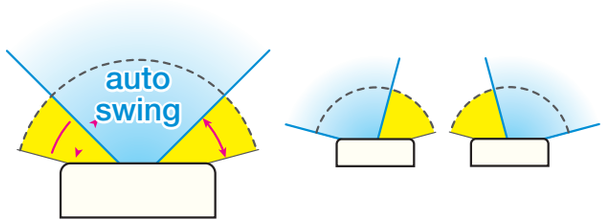
Thin profile suits interior design

Slender, space-saving type (1.7–8.0HP)

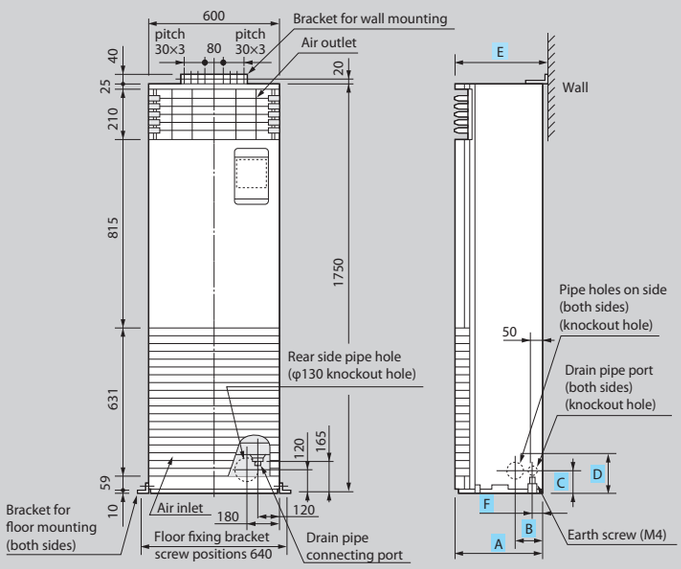
Wide outlet

Corner location is also possible, with right and left auto swing.

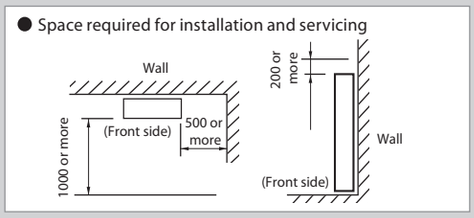
Set the vertical angle manually.



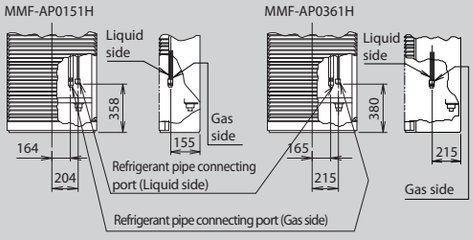
MMF-AP0154H-E to AP0564H-E



● Space required for installation and servicing



Model MMD-	A	B	C	D	E	F
AP0154H-E to AP0274H-E	200	107	132	157	210	50
AP0364H-E to AP0564H-E	380	125	120	160	390	40



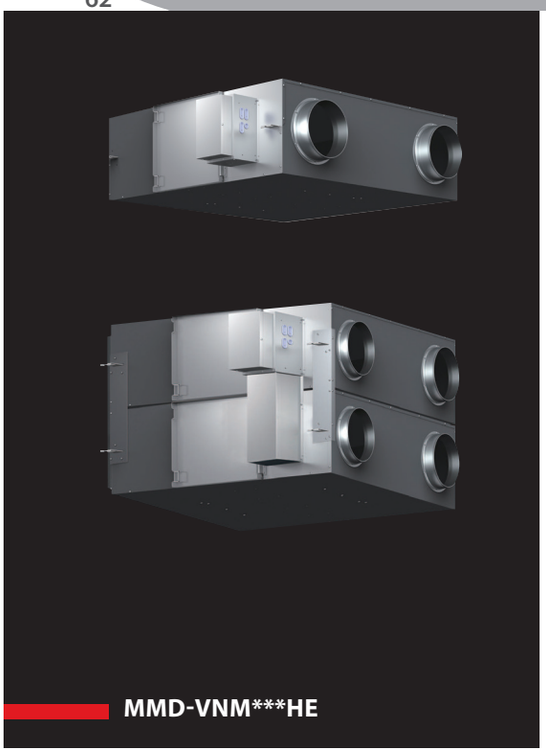
Refrigerant piping position

(Unit: mm)

Technical specifications

Model name		MMF-	AP0154H-E	AP0184H-E	AP0244H-E	AP0274H-E	AP0364H-E	AP0484H-E	AP0564H-E
Cooling/Heating capacity*1		(kW)	4.5/5.0	5.6/6.3	7.1/8.0	8.0/9.0	11.2/12.5	14.0/16.0	16.0/18.0
Electrical characteristics	Power requirements		1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)						
	Power consumption 50 Hz/60 Hz	(kW)	0.150/0.146		0.190/0.195		0.280/0.295	0.350/0.380	
External dimensions	Height	(mm)	1750						
	Width	(mm)	600						
	Depth	(mm)	210				390		
Total weight		(kg)	48		49		65		
Fan unit	Standard air flow (High/Mid/Low)	(m^3/h)	900/780/660		1200/1020/840		1920/1680/1380	2160/1860/1560	
	Motor output	(W)	37		63		110	160	
Connecting pipe	Gas side	(mm)	ø12.7		ø15.9				
	Liquid side	(mm)	ø6.4		ø9.5				
	Drain port	(nominal dia.)	20 (polyvinyl chloride tube)						
Sound pressure level*2 (High/Mid/Low)		(dB(A))	46/43/38		49/45/40		51/48/44	54/50/46	

*1 This reference piping consists of 5 m of main piping and 2.5 m of branch piping connected at the same height level.
*2 The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.



MMD-VNM***HE

Air to Air Heat Exchanger

Greater comfort and reduced load

Easily integrated into air conditioning systems of 150m^3/h to 2000m^3/h air volume, the air-to-air heat exchangers use exhaust air to pre-condition the incoming air, thus reducing the cooling or heating load and the overall size of the required system.

Easy maintenance

The heat exchange element can be washed in water.

Free cooling at night

When the air outdoors is cooler at night, the system expels warm air from the room. This reduces the air conditioning load the next day for improved energy efficiency.

Flexible control

Supply and exhaust fan speed ratios can be changed for improved air volume control that best matches the needs of the environment and location.

*3 Does not connect to refrigerant piping from outdoor unit. Control wires can be connected.

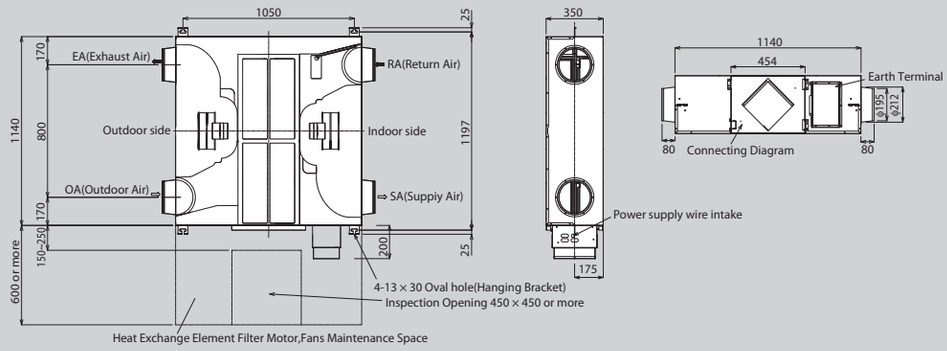
Remote controller
NRC-01HE

Technical specifications

Model name			MMD-	VNM150HE	VNM250HE	VNM350HE	VNM500HE	VNM650HE	VNM800HE	VNM1000HE	VNM1500HE	VNM2000HE
Power supply (V)	Fan speed			1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)								
Power consumption 50Hz/60Hz (W)	(Extra high)			68-78/76	123-138/131	165-182/209	214-238/260	262-290/307	360-383/446	532-569/622	751-786/928	1084-1154/1294
	High			59-67/65	99-111/105	135-145/162	176-192/206	240-258/283	339-353/408	494-538/589	708-784/830	1032-1080/1220
	Low			42-47/45	52-59/54	82-88/94	128-142/144	178-191/206	286-300/333	353-370/411	570-607/660	702-742/818
Air volume (m^3/h)	(Extra high)			150/150	250/250	350/350	500/500	650/650	800/800	1000/1000	1500/1500	2000/2000
	High			150/150	250/250	350/350	500/500	650/650	800/800	1000/1000	1500/1500	2000/2000
	Low			110/110	155/155	210/210	390/390	520/520	700/700	755/755	1200/1200	1400/1400
External static pressure (Pa)	(Extra high)			82-102/99	80-98/97	114-125/167	134-150/181	91-107/134	142-158/171	130-150/185	135-156/165	124-143/165
	High			52-78/59	34-65/38	56-83/33	69-99/63	58-82/68	102-132/102	97-122/120	103-129/108	92-116/102
	Low			47-64/46	28-40/22	65-94/39	62-92/44	61-96/52	76-112/58	84-127/55	112-142/109	110-143/87
Sound pressure level (dB(A))	(Extra high)			26-28/27.5	29.5-30/31.5	34-35/35.5	32.5-34/33.5	34-36/35.5	37-38.5/38	39.5-40.5/41.5	38-39/39.5	41-42.5/42.5
	High			24-25.5/24.5	25-27/25	30-32/29.5	29.5-31/29	33-34/34	35.5-37/35	38.5-40/39	36.5-37.5/36.5	39.5-41/40
	Low			20-22/20	21-22/21	27-29/23.5	26-29/24.5	31-32.5/29.5	33.5-35/32.5	34-35.5/33.5	36-37.5/35.5	37-38/36.5
Temperature exchange efficiency (%)	(Extra high)			81.5/81.5	78/78	74.5/74.5	76.5/76.5	75/75	76.5/76.5	73.5/73.5	76.5/76.5	73.5/73.5
	High			81.5/81.5	78/78	74.5/74.5	76.5/76.5	75/75	76.5/76.5	73.5/73.5	76.5/76.5	73.5/73.5
	Low			83/83	81.5/81.5	79.5/79.5	78/78	76.5/76.5	77.5/77.5	77/77	79/79	77.5/77.5
Enthalpy exchange efficiency (%)	for heating	(Extra high)		74.5/74.5	70/70	65/65	72/72	69.5/69.5	71/71	68.5/68.5	71/71	68.5/68.5
		High		74.5/74.5	70/70	65/65	72/72	69.5/69.5	71/71	68.5/68.5	71/71	68.5/68.5
		Low		76/76	74/74	71.5/71.5	73.5/73.5	71.5/71.5			73.5/73.5	72/72
	for cooling	(Extra high)		69.5/69.5	65/65	60.5/60.5	64.5/64.5	61.5/61.5	64/64	60.5/60.5	64 /64	60.5/60.5
		High		69.5/69.5	65/65	60.5/60.5	64.5/64.5	61.5/61.5	64/64	60.5/60.5	64/64	60.5/60.5
		Low		71/71	69/69	67/67	66.5/66.5	64/64	65.5/65.5	64.5/64.5	67/67	65.5/65.5
Dimensions (Length x Width x Height) (mm)				900 x 900 x 290			1140 x 1140 x 350		1189 x 1189 x 400		1189 x 1189 x 810	
Weight (kg)				36		38	53		70		143	
Duct diameter (mm)				100	150		200		250		inside: 250, outside: 283 x 730	
Operating range	Around unit			-10°C – 40°C 80% RH or less								
	Outdoor Air (OA)			-15°C (*1) – 43°C RH								
	Return Air (RA)			5°C – 40°C 0% RH or less								

* Air volume can be changed over to high (extra high) mode or low mode.
* Sound pressure level is measured 1.5m below the center of the unit.
*Sound pressure level is the value which was measured at the acoustic room.
*The actual values in an external operating environment are generally higher than the indicated values due to the contribution from ambient noise.
* Sound pressure level is less than 70 dBA

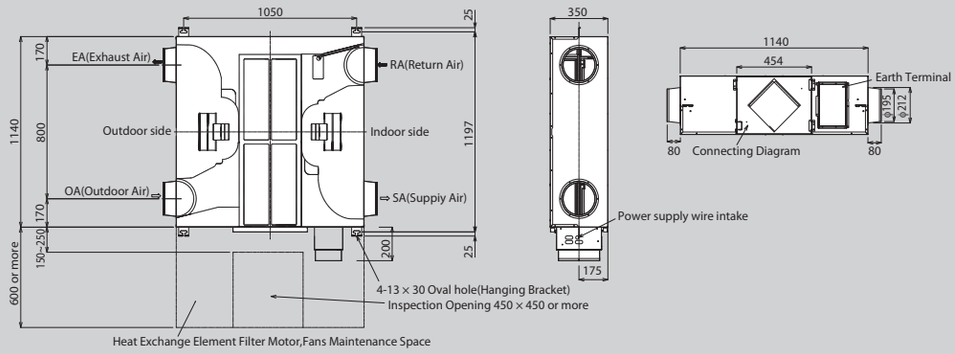
MMD-VNM150HE to VNM350HE



Duct size (Nominal Diameter): ϕ200

(Unit: mm)

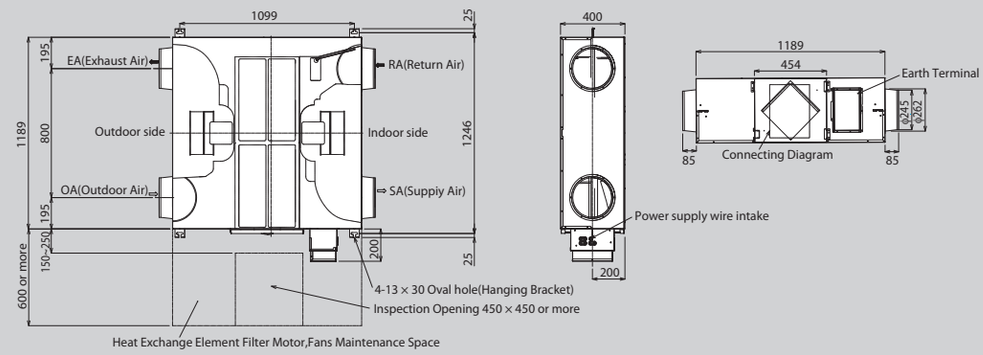
MMD-VNM500HE, VNM650HE



Duct size (Nominal Diameter): ϕ200

(Unit: mm)

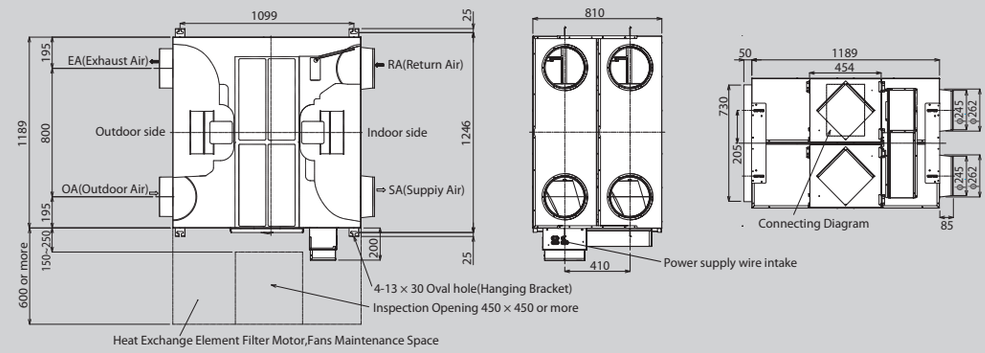
MMD-VNM800HE, VNM1000HE



Duct size (Nominal Diameter): ϕ250

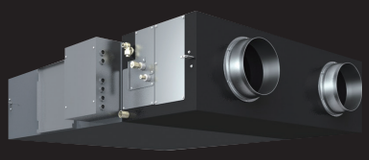
(Unit: mm)

MMD-VNM1500HE, VNM2000HE



Duct size (Nominal Diameter): ϕ250

(Unit: mm)



MMD-VN(K)*HEXE/HEXE2**

Air to Air Heat Exchanger with DX-coil

Greater comfort and reduced load

Functionality built into the cooling system reduces load on cooling beyond that of the heat exchanger itself. This improves air quality and ensures maximum comfort throughout room being cooled.

Free cooling at night

When the air outdoors is cooler at night, the system expels warm air from the room. This reduces the air conditioning load the next day for improved energy efficiency.

Flexible control

Supply and exhaust fan speed ratios can be changed for improved air volume control that best matches the needs of the environment and location.

*Limitations
The total capacity of indoor units combined should be within 80 - 135% of the capacity of the outdoor unit.
The capacity of the air to air heat exchanger should be no more than 30% of the capacity of the outdoor unit.

Remote controller
NRC-01HE

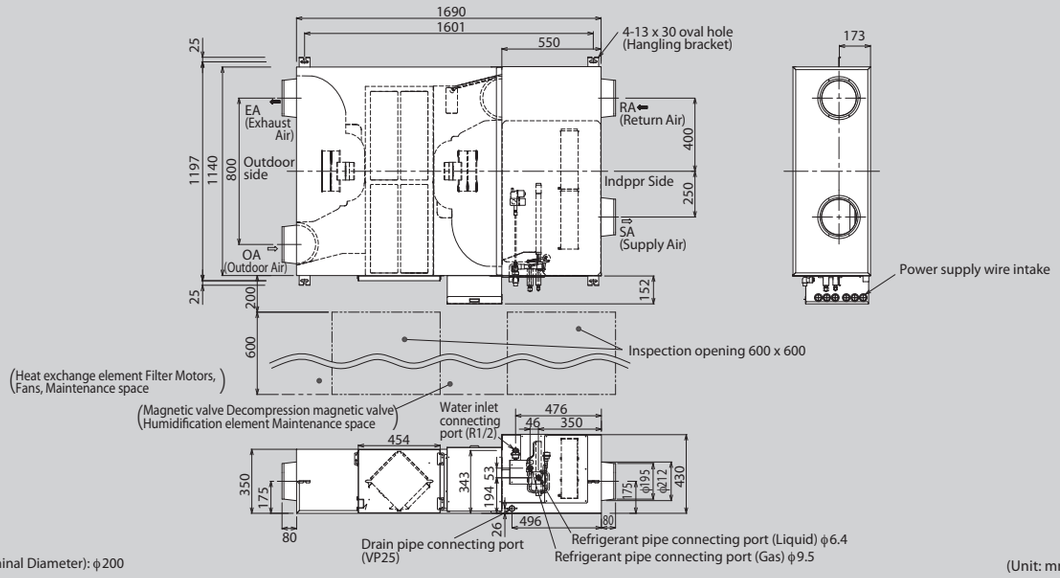
Technical specifications

Model name				MMD-	VN(K)502HEXE	VN(K)802HEXE	VN(K)1002HEXE	VN(K)1002HEXE2
Fresh air conditioning load	Cooling (*1)			(kW)	4.10 (1.30)	6.56 (2.06)	8.25 (2.32)	8.25 (2.32)
	Heating (*1)			(kW)	5.53 (2.33)	8.61 (3.61)	10.92(4.32)	10.92 (4.32)
Power supply					1-phase 50Hz 230V (220–240V) / 1-phase 60Hz 220V (Separate power supply for indoor units required.)		1-phase 50Hz 230V (220V-240V) (Separate power supply for indoor units is required.)	1-phase 60Hz 220V (Separate power supply for indoor units is required.)
Temperature exchange efficiency 50Hz / 60Hz	High			(%)	70.5/70.5	70.0/70.0	65.5	
	Mid			(%)	70.5/70.5	70.0/70.0	65.5	
	Low			(%)	71.5/72.0	72.5/73.0	67.5	68.0
Enthalpy exchange efficiency 50Hz / 60Hz	Cooling	High		(%)	56.5/56.5	56.0/56.0	52.0	
		Mid		(%)	56.5/56.5	56.0/56.0	52.0	
		Low		(%)	57.5/58.0	59.0/59.5	54.5	55.0
	Heating	High		(%)	68.5/68.5	70.0/70.0	66.0	
		Mid		(%)	68.5/68.5	70.0/70.0	66.0	
		Low		(%)	69.0/69.0	73.0/73.5	68.5	69.0
Fan unit 50Hz / 60Hz	Standard air flow	High		(m^3/h)	500/500	800/800	950	
		Mid		(m^3/h)	500/500	800/800	950	
		Low		(m^3/h)	440/410	640/600	820	800
	External static pressure	High		(Pa)	120/200	120/190	135	195
		Mid		(Pa)	105/170	100/155	120	160
		Low		(Pa)	115/150	105/130	105	130
Sound pressure 50Hz / 60Hz	High			(dB)	37.5/40.0	41.0/43.0	43.0	43.5
	Mid			(dB)	36.5/38.0	40.0/42.0	42.0	
	Low			(dB)	34.5/36.5	38.0/37.0	40.0	
External Dimensions	Height			(mm)	430			
	Width			(mm)	1140	1189		
	Depth			(mm)	1690	1739		
Total weight				(kg)	84	100	101	103
Connecting piping	Gas side			(mm)	ø9.5	ø12.7		
	Liquid side			(mm)	ø6.4			
Drain port				(Nominal dia .mm)	25(Polyvinyl chloride tube)			

(*1) Cooling and heating capacities are based on the following conditions:
Cooling capacities are based on : indoor temperature :27 °CDB/19°CWB, Outdoor temperature : 35°CDB
Heating capacities are based on : indoor temperature :20 °CDB, Outdoor temperature : 7 °CDB/6°CWB
Fan is based on High and Middle
( ): The figures in ( ) indicate the heat reclaimed from the heat recovery ventilator.

* : (K) indicates models equipped with humidifier.

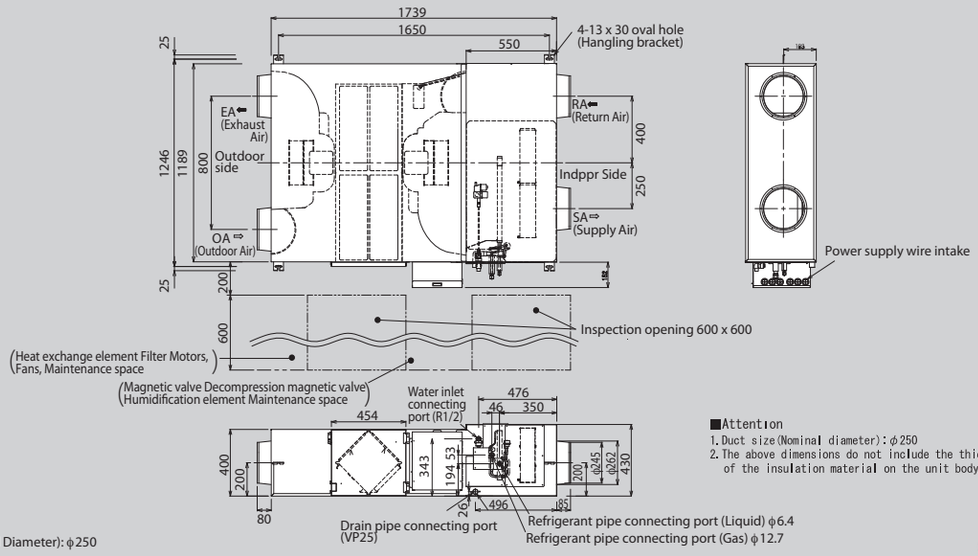
MMD-VN(K)502HEXE



Duct size (Nominal Diameter): ϕ200

(Unit: mm)

MMD-VN(K)802HEXE to VN(K)1002HEXE2

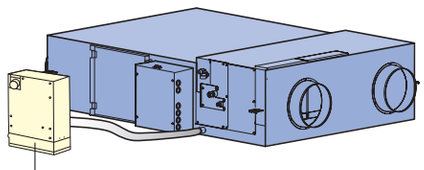


■Attention
1. Duct size(Nominal diameter): ϕ250
2. The above dimensions do not include the thickness of the insulation material on the unit body.

Duct size (Nominal Diameter): ϕ250

(Unit: mm)

Options

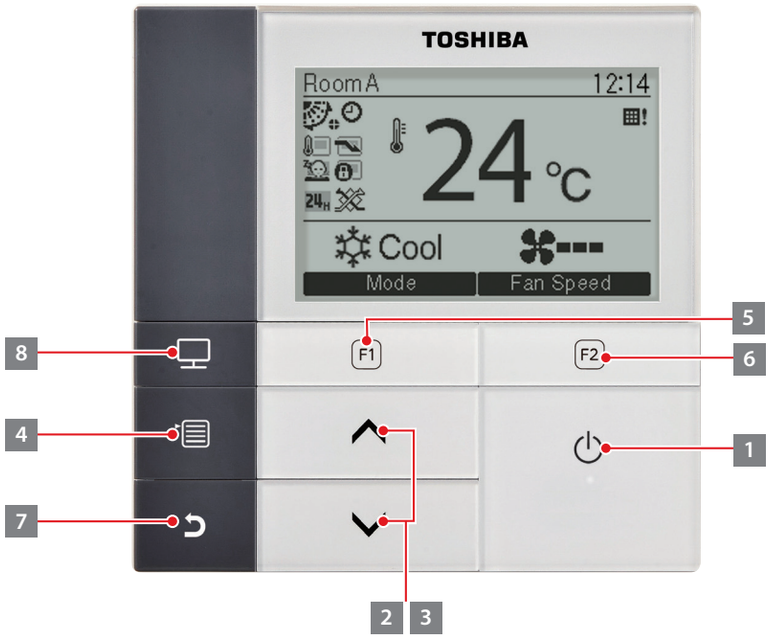


Drain pump kit
TCB-DP31HEXE

Remote controllers

Lite-Vision plus Remote Controller

RBC-AMS51E-ES



The RBC-AMS51E-ES/EN is the new wired remote controller with a built in 7-day timer-featuring a new multi-language LCD display with backlight, energy saving options and a return back function.

Key Features

- Possibility to set and display the room name to easily set-up and monitor the working parameters.
- New modern and desirable controller design with menu driven display.
- Save mode by schedule timer to optimise energy consumption.
- Room temperature display always available.
- Two "Hot Keys" (F1, F2) for easy operation of air conditioner functions.
- Easy to read layout including display of indoor unit model name and serial number.
- Built-in backup power. Settings are kept in memory up to 72 hours in case of power failure.
- Remote TA sensor available in controller.
- Can be connected to a single indoor unit or a group of up to 8 indoor units.

Languages

RBC-AMS51E-ES
English, Spanish, Portuguese, French, Dutch, German

1 ON/OFF button

2 ∧ button
During normal operation: adjusts the temperature.
On the menu screen: selects a menu item.

3 ∨ button
During normal operation: adjusts the temperature.
On the menu screen: selects a menu item.

4 MENU button
Displays the menu screen.

5 F1 button
Varies its function according to the setting screen.

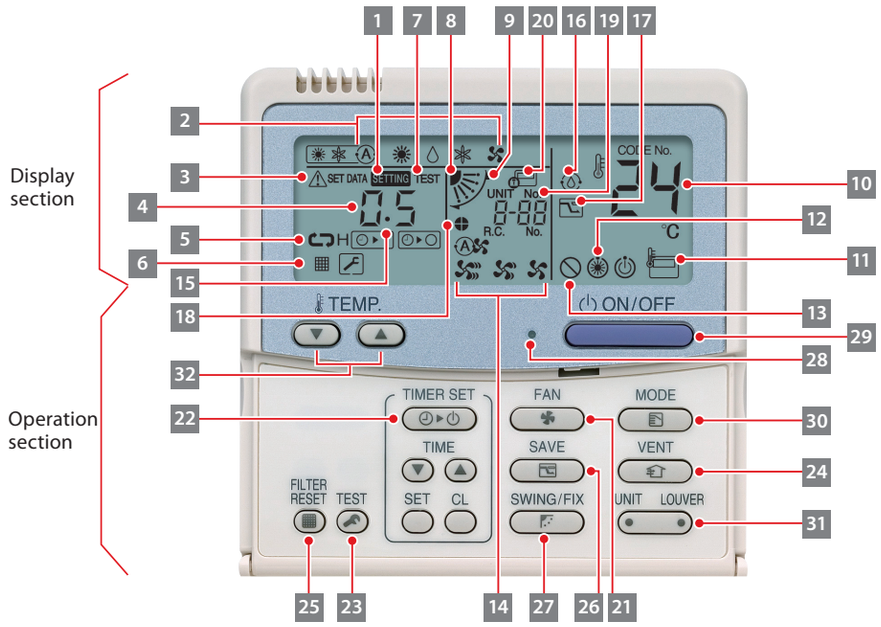
6 F2 button
Varies its function according to the setting screen.

7 CANCEL button
Functions as indicated on the screen, such as returning to the previous menu screen.

8 MONITOR button
Displays the monitoring screen.

Standard Remote Controller

RBC-AMT32E



Display section

1 SETTING display
Displayed during setup of the timer, etc.

2 Operation mode select display
The selected operation mode is displayed.

3 CHECK display
Displayed while the protective device is triggered or a problem occurs.

4 Timer time display
Time of the timer is displayed.
(When a problem occurs, the check code is displayed.)

5 Timer SET IN setup display
When pushing the Timer SET IN button, the display of the timer is selected in order of [OFF] → [OFF] repeat OFF timer → [ON] → No display.

6 Filter display
If "FILTER" is displayed, clean the air filter.

7 TEST run display
Displayed during a test run.

8 Louver position display
Displays louver position.

9 SWING display
Displayed during up/down movement of the louver.

10 Set up temperature display
The selected set up temperature is displayed.

11 Remote controller sensor display
Displayed while the sensor of the remote controller is used.

12 PRE-HEAT display
Displayed when the heating operation starts or defrost operation is carried out.
While this indication is displayed, the indoor fan stops.

13 No function display
Displayed if there is no function even if the button is pushed.

14 Air volume select display
The selected air volume mode is displayed.
(AUTO) (HIGH)
(MED.) (LOW)

15 Louver Number display
(example: 01, 02, 03, 04)

16 Dry operation in self-cleaning function
Displayed during dry operation in self-cleaning function.

17 Power-saving mode display
Displayed during capacity saving mode by temporary peak-cut limiting the power current level of the outdoor unit.

18 Louver lock display
Displayed when there is a louver-locked unit in the group (including 1 indoor unit by 1 outdoor unit).

19 Unit Number display
Unit number of the indoor unit selected with the unit select button or abnormal indicate the indoor/outdoor unit.

20 Central control display
Displayed when the air conditioner is used under the central control in combination with a central control remote controller.
In case the remote controller is disabled by the central control system, flashes . The button operation is not accepted.
Even when you push ON/OFF, MODE, or TEMP. button, and the button operation is not accepted.
(Settings made by the remote controller vary with the central control mode. For details, refer to the Owner's Manual of the central control remote controller.)

Operation section

21 FAN button (Air volume select button)
Selects the desired air volume mode.

22 TIMER SET button (Timer set button)
TIMER SET button is used when the timer is set up.

23 TEST button (Check button)
The CHECK button is used for the check operation.
During normal operation, do not use this button.

24 VENT button
(Ventilation button)
Ventilation button is used when a fan which is sold separately is connected.
•If "No function" is displayed on the remote controller when pushing the Ventilation button, a fan is not connected.

25 FILTER RESET button (Filter reset button)
Resets (Erases) "FILTER" display.

26 SAVE button
(Power-save operation)
SAVE button is used for power-save operation.

27 SWING/FIX button
(Swing/Wind direction button)
Selects automatic swing or setting the louver direction.

28 Operation lamp
Lamp is lit during operation. Lamp is off when stopped.
The lamp flashes when operating the protection device or abnormal time.

29 ON/OFF button
When the button is pushed, operation starts, and it stops by pushing the button again.
When operation has stopped, the operation lamp and all the displays disappear.

30 MODE button
(Operation select button)
Selects desired operation mode.

31 UNIT LOUVER button
(Unit/Louver select button)
Selects a unit number (left) and louver number (right).
UNIT:
Selects an indoor unit when adjusting wind direction when multiple indoor units are controlled with one remote controller.
(4-way air discharge cassette type only)
LOUVER:
Selects a louver when setting louver lock or wind direction adjustment independently.

32 TEMP. button
(Set up temperature button)
Adjusts the room temperature.
Set the desired set temperature by pushing TEMP. or TEMP. .

OPTION:
Remote controller sensor
Usually the TEMP. sensor of the indoor unit senses the temperature. The temperature surrounding the remote controller can also be sensed.
For details, contact the dealer from which you have purchased the air conditioner.

Remote controller with weekly timer (7-day timer function)

RBC-AMS41E

- **Clock display**
- **Schedule timer:**

Possible to program schedule timer (7-day timer) function
Possible to program 8 functions for each day of the week

*The following items can be set in program: operation time, operation start/stop, operation mode, temperature setting, restriction on button operation.

Simplified Remote Controller

RBC-AS41E

- Start/Stop
- Temperature setting
- Air flow changing
- Check code display.

Remote sensor

TCB-TC21LE2

Install this sensor when outside air has been introduced or when overcooling and overheating are to be minimised.

Wireless remote controller kit & sensor unit (receiver unit)

- Start/Stop •Changing mode •Temperature setting •Air flow changing
- Timer function
  Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated.
- Control by 2 remote controllers is available.
  Two wireless remote controllers can operate one indoor unit. The indoor unit can then be operated separately from the two different locations.
- Check code display

*The wireless remote control cannot be connected to concealed duct high static pressure type.

RBC-AX32U(W)-E/RBC-AX32U(WS)-E

Integral receiver (For 4-way air discharge cassette) (MMU-AP***2H).

RBC-AX32CE2

Integral receiver
(For ceiling, 1-way air discharge cassette) (MMU-AP****SH-E, MMC-AP****H-E).

Wireless remote controller kit & sensor unit (receiver unit)

- Start/Stop •Changing mode •Temperature setting •Air flow changing
- Timer function
  Either "ON" time or "OFF" time or "CYCLIC" can be set how many 30 min. later ON or OFF is operated.
- Control by 2 remote controllers is available.
  Two wireless remote controllers can operate one indoor unit. The indoor unit can then be operated separately from the two different locations.
- Check code display

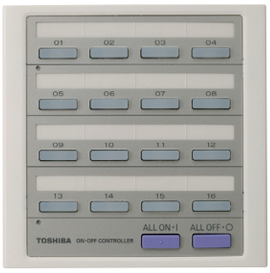
*The wireless remote control cannot be connected to concealed duct high static pressure type.

TCB-AX32E2

Stand alone receiver
(For 4-way air discharge cassette, compact 4-way cassette (600 x 600), 2-way air discharge cassette, ceiling, concealed duct standard, slim duct, floor standing cabinet, floor standing, 1-way discharge cassette (MMU-AP****YH-E/SH-E)).

RBC-AX23UW(W)-E

Integral receiver (For 2-way air discharge cassette) (MMU-AP***2WH).



ON-OFF controller

TCB-CC163TLE2

- Individual control of up to 16 indoor units.
- Setting of simultaneous ON/OFF 3 times per day combined with the weekly timer.

Schedule timer

TCB-EXS21TLE

- **Schedule mode timer**
  - 6 programmings per day
  - Enabling 8 groups to be programmed
  - A maximum of 64 indoor units can be controlled
  - A maximum of 100 hours back-up power supply
- **Weekly mode timer**
  - 7 types of weekly schedule and 3 programmings per day.

Black Pear Controller

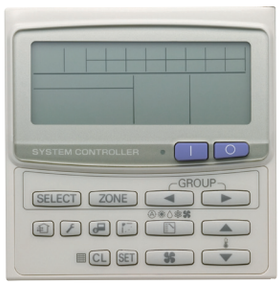
RBC-BPB1, RBC-BPT1, RBC-BPM1

The BLACK PEAR Toshiba HVAC controller is the most versatile on the market, connecting directly to the 2-wire TCC link network.

The integrated LCD display provides an engineer's interface for local control, removing the need for a central controller and separate interface. The units will operate on systems with or without a central controller and supports Modbus, BACnet or Trend protocols. The device is easily configured to communicate with units in the same way that a standard central controller communicates with connected units. When the controller is powered it scans the entire network for all connected indoor units. The keypad controller can be used to operate all indoor units. This feature is very useful in the event of a BMS failure in providing and enabling continuous communication. The controller can be configured by a PC interface to group units and name zones.

There are 3 models providing different protocol solutions: -

TM-50 TM-50D Modbus RTU via RS232/RS485 and Modbus/TCP
TB-50 TB-50D BACnet/IP
TT-50 TT-50D Trend via Ethernet (requires an IQ3/4 outstation with spare memory).



Central remote controller

TCB-SC642TLE2

- Individual control for max. 64 indoor units divided into 1 to 4 zone (Up to 16 indoor units for each zone)
- Up to 16 outdoor header units are connectable
- 4 types of central control settings to inhibit individual operation by remote controller can be selected
- Usable with other central control devices (Max. 10 devices in one control circuit)
- Two control mode selectivity
  (Central controller mode
  Remote controller mode)
- Setting of simultaneous ON/OFF 3 times per day combined with the weekly timer.

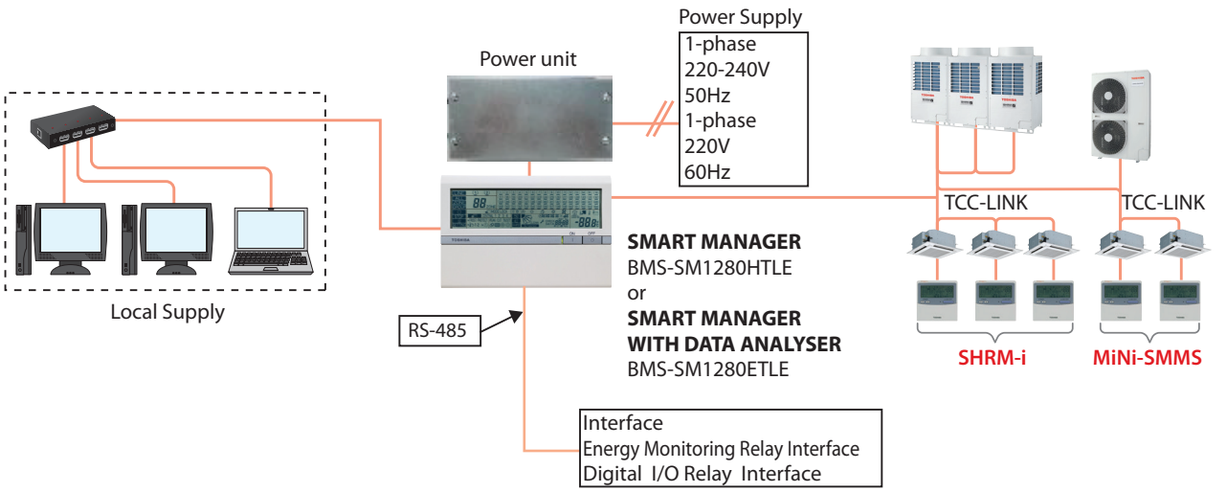
Wired remote controller for air to air heat exchanger

NRC-01HE

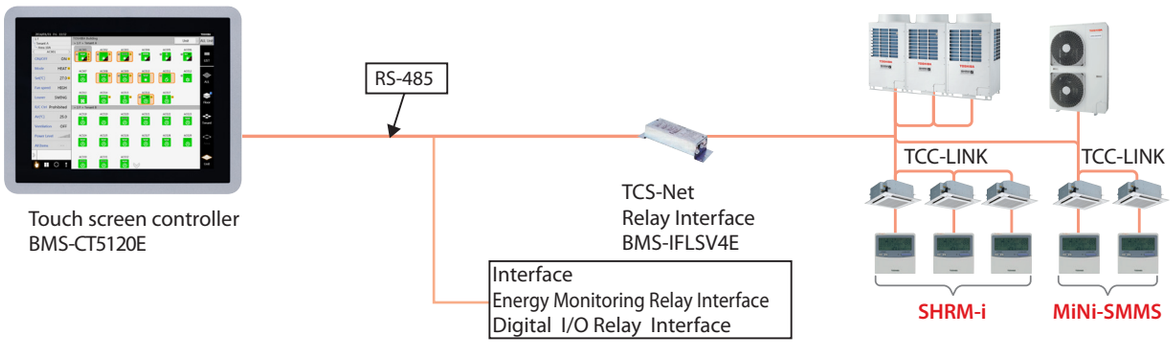
- Up to 8 units of the Air to Air Heat Exchanger can be operated using this remote controller.
- Control by 2 remote controllers is available.
  Two remote controllers can operate a single Air to Air Heat Exchanger.
- Air conditioning units may be controlled in addition to controlling the Air to Air Heat Exchanger.
- Central control allows linked ON/OFF operation of air conditioner and Air to Air Heat Exchanger.
- Central control can be set to allow standalone operation of the Air to Air Heat Exchanger.
- Switchable ventilation modes (Automatic/Air to Air/Normal)
- Switchable ventilation air volume (Extra-high/High)-Low.

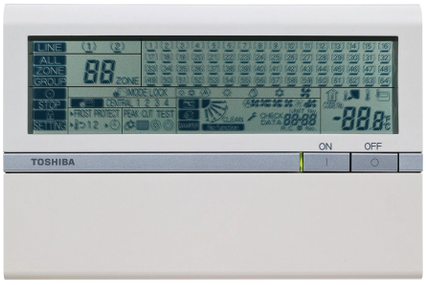
Building management systems

SMART MANAGER / SMART MANAGER WITH DATA ANALYSER



Touch screen controller



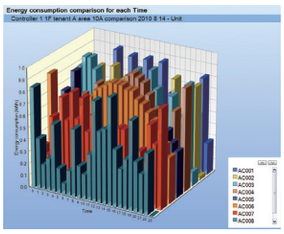


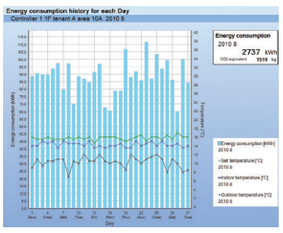
SMART MANAGER
BMS-SM1280HTLE

Web browser control software

- List View available - Displays all indoor units in one screen
- Set View available - Shows basic indoor unit settings on main screen
- Advanced operation and master schedule functions available
- Advanced operation & master schedules can be set on a calendar
- Up to 4 concurrent users can be connected
- Up to 32 user accounts can be programmed with different levels of access (at least 1 must be administrator level)
- Energy monitoring and billing functions available
- Additional digital I/O device available
- Thin profile controller and separate power supply unit enables easy installation.

SMART MANAGER WITH DATA ANALYSER
BMS-SM1280ETLE





Touch screen controller
BMS-CT5120E

- **Touch screen controller**

Using the touch screen controller provides a clear display and enables easy operation.
A maximum of 512 units / groups are controllable.

- **Energy monitoring and billing application**

Power meter interface, power meter locally supplied Energy Monitoring relay I/F (BMS-IFWH5E)

- **Power meter**

(Local Supply)
1 kWh/pulse or 10 kWh/pulse
(Pulse duration 50 to 1000 ms)
(Maximum 8 power meters per interface)

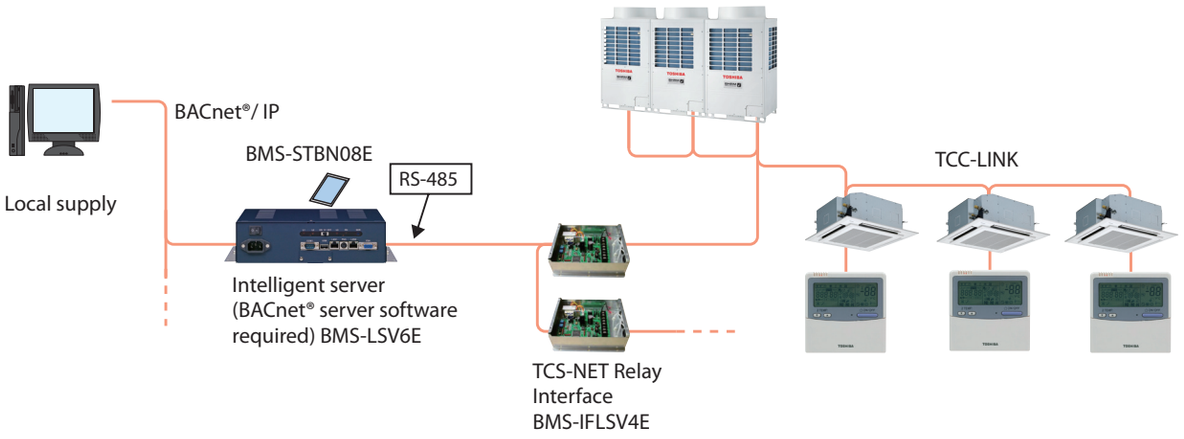
Relay Interface BMS-IFWH5E
For Energy Monitoring

Relay Interface BMS-IFDD03E
For Digital I/O

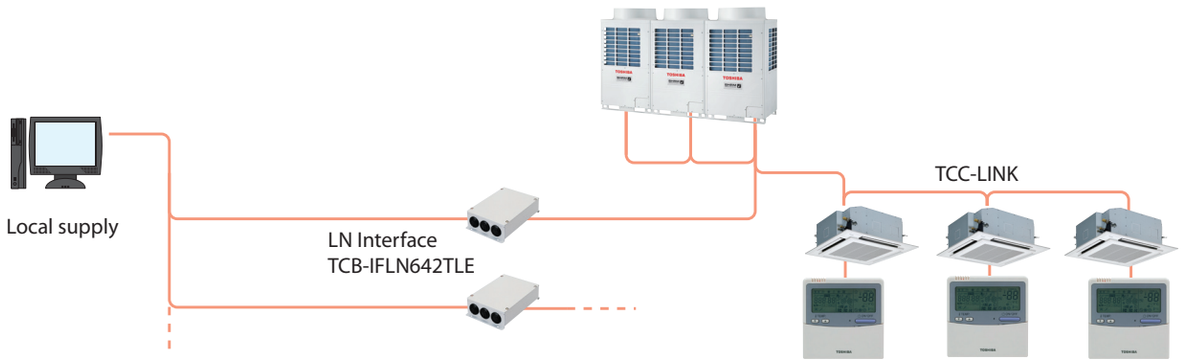
Relay Interface BMS-IFLSV4E
For TCS-NET

Open network systems

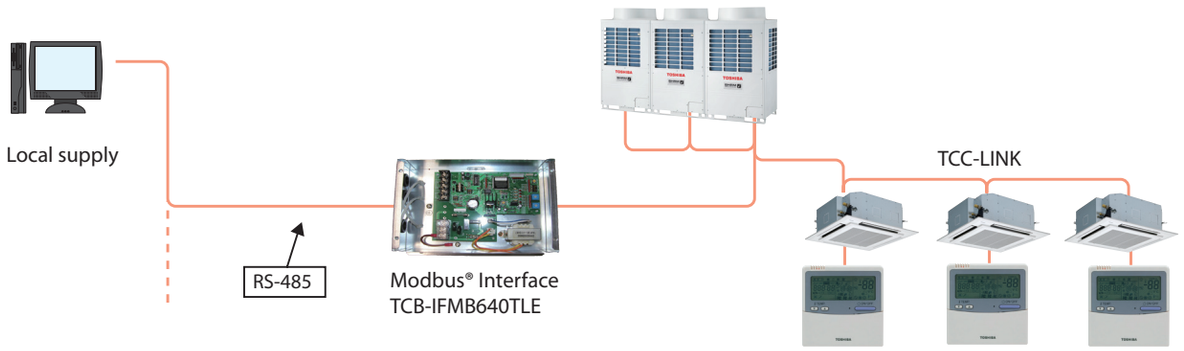
BACnet® system



LonWorks®



Modbus®



Intelligent Server
BMS-LSV6E

• **BACnet®**

The BACnet® system operates in conjunction with the BACnet.
Server uses object signals to provide the following functions:

• **Control**
– ON/OFF
– Temperature setting
– Fan speed

• **Monitoring**
– ON/OFF
– Operation mode
– Temperature setting
– Room temperature
– Local remote controller : permit / prohibit

BACnet® Server Software
BMS-STBN08E

Relay Interface BMS-IFLSV4E
For TCS-NET

LN Interface
TCB-IFLN642TLE

• **LonWorks® LN Interface**

The LonWorks® interface manages the SHRM-i air conditioning system as a Lon device to communicate with the custormer's Building Management System and to monitor operational status.
A maximum of 64 units / groups are controllable per interface.

• **SNVT signal**

Signals and provides the following functions:

• **Control**
– ON/OFF
– Temperature setting
– Fan speed

• **Monitoring**
– ON/OFF
– Operation mode
– Temperature setting
– Room temperature
– Local remote controller : permit / prohibit

Modbus Interface
TCB-IFMB640TLE

• **Modbus®**

The Modbus® interface manages the SHRM-i air conditioning system as a Modbus® device to communicate with the custormer's Building Management System.
Accessible to 64 units / groups per one TCB-IFMB640TLE, 15 TCB-IFMB640TLEs on one Modbus® Master (prepared by user).
Signals and provides the following functions:

• **Control**
– ON/OFF
– Temperature setting
– Fan speed

• **Monitoring**
– ON/OFF
– Operation mode
– Temperature setting
– Room temperature
– Local remote controller : permit / prohibit

1. LonWorks®: Registered trademark Echelon corporation.
2. BACnet®: ANSI/ASHRAE 135-1995, A data Communication Protocol for Building Automation and Control Networks.
3. Modbus® is a registered trademark of Schneider E.

Application controls

TCB-PCDM4E

Size: 71 × 85 (mm)

* Install the optional P.C. board in the inverter assembly of the outdoor header unit.

Power peak-cut control

• Feature

The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting.

• Function

Two control settings are selectable by setting SW07 on the interface P.C. board on the header outdoor unit.

TCB-PCMO4E

Size: 55.5 × 60 (mm)

* Install the optional P.C. board in the inverter assembly of the outdoor header unit.

Snowfall fan control

• Feature

The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting.

External master ON/OFF control

• Feature

The outdoor unit starts or stops the system.

Night operation (Sound reduction) control

• Feature

Sound level can be reduced by restricting the compressor and fan speeds.

Operation mode selection control

• Feature

This control can restrict the selectable operation modes.

TCB-PCIN4E

Size: 73 × 79 (mm)

* Install the optional P.C. board in the inverter assembly of the outdoor header unit.

Error/Operation output control

• Feature

Enables external output of error and operation signals.

Compressor operation output

• Feature

Enables external signal output for each compressor that is in operation within any given outdoor unit. This feature provides a practical method for calculating total operating times for each compressor.

Operating rate output

• Feature

External output of system operating rates enables remote monitoring of operating conditions.

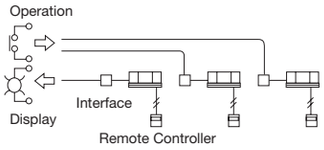
TCB-IFCB-4E2

Size: 200 × 170 × 66 (mm)

Remote location ON/OFF control box

• Feature

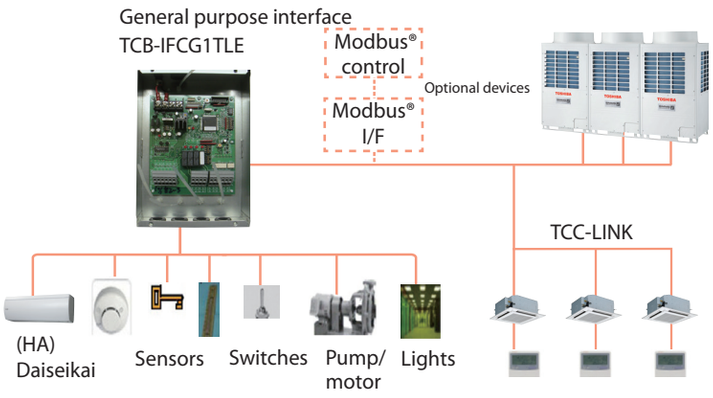
Start and stop of the air conditioner is possible by an external signal and indication of operation/ alarm externally.



Monitoring

ON/OFF status (for indoor unit)
Alarm status (system & indoor unit stop)
ON/OFF command
Air conditioner can be turned ON/OFF by the external signals.
The external ON/OFF signals will initiate the signals shown below.

General Purpose Interface



Concept

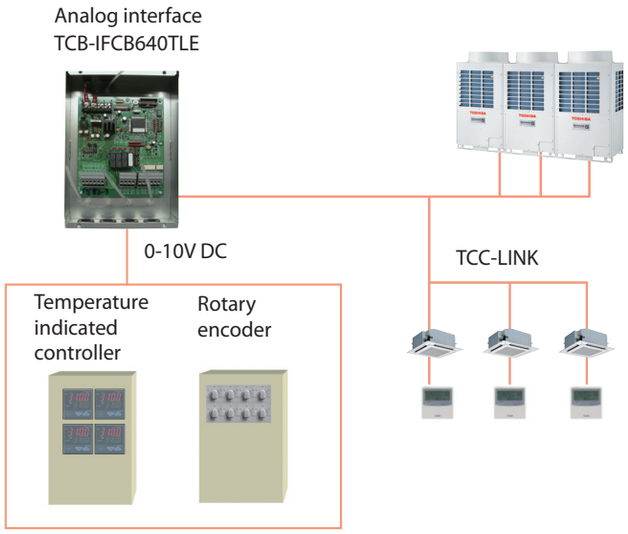
• Controls the operation status of each indoor unit.

• ON/OFF control of peripheral equipment via the relay point of Toshiba's BMS. (1pt only)

Standard function
Central remote controller and Building Management System devices can control ON/OFF function via digital I/O ports.

Optional function
Control using the following channels: 4-channel relay control, 6-channel digital input, 2-channel analog voltage input and output, and 2-channel temperature measurement functions via Modbus I/F.

Analog Interface



Concept

• Provides access to 64 indoor units.

• Does not require special network knowledge.

• Can control each indoor unit on TCC-LINK, (on/off, temperature setting, airflow volume, louver position), and monitor status based on 0-10V DC voltage input.

• Enables relay control and status monitoring of general-purpose I/F TCB-IFCG1TLE.

Installation and the use of refrigerants not specified by Toshiba Carrier Corporation

Toshiba refrigeration and air-conditioning units are designed and manufactured on the assumption that the product is used with a specific refrigerant suitable for each unit.

We have recently seen some cases where the type of refrigerant used is different from the one originally installed in the product. Such actions may cause mechanical defects, malfunctions, failures and in some cases result in a serious safety issue. Therefore do not install any refrigerant other than the one specified by Toshiba Carrier Corporation for its respective products.

The type of the refrigerant used for each of our products is shown in the accompanying owners manual, or on the product label attached on the product itself.

Toshiba Carrier Corporation shall not assume any liability for failures, malfunctions or safety in its products if the refrigerant used is different from the one specified.

⚠ SAFETY PRECAUTIONS

For operation:

• Before use, read through the operating instructions to ensure proper use.

Concerning the purpose for which the air conditioners are to be used

• The air conditioners presented in this catalogue are air conditioning/heating units to be used solely by general consumers.
  – Do not use these air conditioners for special applications such as for the storage of food items, animals, plants, precision machines or works of art. Doing so may degrade the quality of the items.
  – Do not use these air conditioners for air-conditioning applications in vehicles or ships. Doing so may cause water and/or power leakages.

Precautions for using air conditioners

Concerning the automatic defrosting unit

When the outdoor air temperature drops, frost may form on the heat exchanger of the outdoor unit. In such cases, the automatic defrosting unit will be activated, and it will take 5 to 8 minutes for the heating operation to be restored.

Concerning the air conditioner's operating conditions and their selection

(1) Avoid using the air conditioner in the following locations.
  • Locations with acidic or alkaline atmospheres (locations at which highly acidic or alkaline air is directly drawn in, such as in hot springs areas from which sulfur gases are given off, or where chemicals, vinegar, exhaust air from burners, etc., are given off) The heat exchangers and other parts may become corroded.
  • Locations with atmospheres filled with coolant or other machine oil or steam exhaust (such as at food preparation factories or machine plants). The heat exchangers may corrode; frost may form as a result of heat exchanger malfunction; air conditioner operating performance may be compromised or condensation may form as a result of clogged filters; plastic parts may incur damage; heat-insulation materials may become separated, etc.

(2) Before using an air conditioner in any of the following locations, consult with your dealer or a qualified contractor.
  • Locations where vapors from edible oils are given off (such as in bakeries or kitchens and restaurants that use edible oils) ...The air conditioner's operating performance may be compromised or condensation may form as a result of clogged filters, and the plastic parts may incur damage. In line with the prevailing conditions, take countermeasures such as tailoring the installation conditions in accordance with the conditions, using air conditioners designed for kitchens or oil guard filters, etc.
  • Locations with disinfectant-induced chlorine atmospheres (water tanks, etc.) The metal parts in the heat exchangers, motors, etc., may become corroded.
  • Locations with high salinity (coastal areas, etc.) Corrosion may occur so use outdoor units specifically designed to withstand exposure to salt.
  • Locations where power is supplied from independent power generators. The power line frequency and/or voltage may fluctuate, possibly causing the air conditioner to malfunction.
  • Locations where high frequencies or electrical noise is generated (from high-frequency welders used for vinyl welding and processing, high-frequency therapeutic devices used for thermotherapy, etc.) The electronic components may be adversely affected, possibly causing the air conditioner to malfunction.
  • Locations where electronic equipment is installed. Electrical noise may adversely affect the operation of the electronic equipment.

(3) Concerning use in locations with high ceilings
  • In locations with high ceilings, use of circulators for improving the temperature distribution during heating is recommended.

(4) Concerning use in high-humidity environments
  • When the ceiling-recessed type of indoor unit is installed in a location, such as those described below, and it is very hot and humid inside the ceiling, condensation may form on the external surfaces of the indoor unit and drip down. In such cases, add external heat-insulating materials.
    – Locations such as food preparation sites in which the areas above the ceilings are hot and humid
    – Locations in which outside air is drawn in and routed above the ceiling
    – Above ceilings with a slate roof or tiled roof overhead

(5) Even when an air conditioner is shut down, it will still consume a small amount of power to protect the unit. If the air conditioner will not be used for a prolonged period, turn OFF the main switch (ground fault circuit breaker). However, before the unit is to be used again, turn ON the main switch (ground fault circuit breaker) for at least 12 hours in order to prevent trouble.

NOTES

NOTES

TOSHIBA

Leading Innovation »»

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