

MOVE THE WORLD FORWARD  MITSUBISHI
HEAVY
INDUSTRIES
GROUP

VRF



TEMPERATURE CONTROL
FOR **TODAY & TOMORROW**

 **MITSUBISHI HEAVY INDUSTRIES
AIR CONDITIONING EUROPE**

KXZ

KXZ Heat Pump System

Heat pump systems operate with 2 inter-connecting pipes and are commonly referred to as '2-pipe systems'. These systems provide either a heating or cooling operation to all indoor units at the same time and are suitable for a wide range of applications from an apartment or villa to an entire multi story building, especially when there are significant open plan areas to be controlled.

The KXZ range starts at 4HP (12.1kW) cooling capacity and ranges up to 20HP (56.0kW) cooling capacity from a single KXZ outdoor unit. Our KXZ units can also be "twinned" or "tripled" providing a maximum of 60HP (168.0kW) from a single modular system.

KXZW Water Cooled Heat Pump System

The water cooled series enables our KXZ series to fit into various challenging environments such as high rise buildings and colder climate conditions where a water source or loop is available for heat exchange. Its small footprint makes it ideal to fit into restricted spaces indoors and is ideal if cooling towers are already located.

KXZR Heat Recovery System

Heat recovery systems operate with 3 inter-connecting pipes, and are commonly referred to as a '3-pipe systems'. These systems can provide simultaneous heating and cooling operation to individual indoor units according to the demand in each room.

The system incorporates sophisticated controls which manage the operation mode of multiple indoor areas, whatever their requirement is, cooling or heating.

The KXZR systems interconnecting pipework has a unique arrangement with two of the interconnecting pipes routed through a PFD distribution controller. The third pipe connects directly to each indoor unit from the main pipe run.

This unique arrangement reduces the installation time and the number of brazed connections on site. The PFD distribution controllers are available for either single connection or as a combined 4 fancoil connection, allowing each connected unit to have independent cooling or heating operation.

The KXZR range starts at 8HP (22.4kW) from a single outdoor up to 24HP (67.0kW) cooling capacity from a single unit. Outdoor units can also be "twinned" or "tripled" up to a maximum size of 60HP (168.0kW) on a single modular system.



PRODUCT LINE-UP

There are multiple combinations of the Hi-COP KXZ Heat pump, Hi-COP KXZR Heat Recovery and the KXZW water cooled series to suit a huge range and variety of applications.

KXZE1	KXZXE1	KXZRE1	KXZWE1	KXZRXE1
Heat Pump	Heat pump (Hi-COP)	Heat Recovery	Heat Pump Water Cooled	Heat Recovery (Hi-COP)
4 - 60HP	8 - 36HP	8 - 60HP	8 - 36HP	16 - 36HP

KXZ VRF series delivers high cooling/heating performance for all commercial leisure, retail and office applicants.

High Efficiency & Comfort	<ul style="list-style-type: none"> High energy efficiency with advanced technology Energy saving control by VTCC (Variable Temperature & Capacity Control) Individual, centralised and customised comfort control
Easy & Customized Control	<ul style="list-style-type: none"> Long piping length and flexible piping applications A variety of indoor units to suit each application Easy selection and design software
Design Flexibility	<ul style="list-style-type: none"> Individual advanced control by wired and wireless remote controllers Numerous options for BMS & Centralised controller
Good Serviceability	<ul style="list-style-type: none"> Easy access for maintenance Engineering and monitoring tool available



By combining 3 outdoor units 60HP can be achieved.

UNIT HP CAPACITY + NO. OF INDOOR UNITS CONNECTABLE



Micro KXZ	HP	4	5	6	8	10	12
Maximum No. of Indoor Units		8	10*	10*	22	24	24

*When connecting over 9 units, please refer to data book



KXZ Lite Heat Pump	HP	8	10
Maximum No. of Indoor Units		8	8



KXZE1 Heat Pump	HP	10	12	14	16	17	18	20	22	24	26	28	30	32	34
	Maximum No. of Indoor Units	24	29	34	39	41	43	48	53	58	63	69	73	78	80
	HP	36	38	40	42	44	46	48	50	52	54	56	58	60	
Maximum No. of Indoor Units		80	80	80	80	80	80	80	80	80	80	80	80	80	



KXZXE1 Heat Pump (Hi-COP)	HP	8	10	12	16	18	20	22	24	26	28	30	32	34	36
	Maximum No. of Indoor Units	29	37	44	60	53	59	65	71	78	80	80	80	80	80



KXZW Heat Pump Water Cooled Series	HP	8	10	12	16	18	20	22	24	26	28	30	32	34	36
	Maximum No. of Indoor Units	22	28	33	44	50	56	61	67	72	78	80	80	80	80



KXZRE1 Heat Recovery	HP	8	10	12	14	16	17	18	20	22	24	26	28	30	32
	Maximum No. of Indoor Units	29	37	44	53	60	50	53	59	65	71	78	80	80	80
	HP	34	36	38	40	42	44	46	48	50	52	54	56	58	60
Maximum No. of Indoor Units		80	80	80	80	80	80	80	80	80	80	80	80	80	



KXZRXE1 Heat Recovery (Hi-COP)	HP	16	18	20	22	24	26	28	30	32	34	36
	Maximum No. of Indoor Units	60	53	59	65	71	78	80	80	80	80	80

DESIGN FLEXIBILITY & EFFICIENCY

Our KXZ series provide high performance and excellent energy savings across the range and is achieved by our heat exchangers increased capacity and the employment of high efficiency DC motors of our Indoor units.

Excellent Energy Savings

Outdoor unit (Micro KXZ)	FDC121KXZEN1	FDC121KXZES1	FDC140KXZEN1	FDC140KXZES1	FDC155KXZEN1	FDC155KXZES1	FDC224KXZME1	FDC280KXZME1	FDC335KXZME1
SEER / SCOP (Outdoor unit)	8.15 / 4.63	8.15 / 4.63	7.73 / 4.59	7.73 / 4.59	7.21 / 4.55	7.21 / 4.55	6.55 / 4.55	6.03 / 4.54	5.84 / 4.04
Outdoor unit (KXZ Lite)	FDC224KXZPE1	FDC280KXZPE1							
SEER / SCOP (Outdoor unit)	6.65 / 4.34	6.68 / 4.50							
Outdoor unit (KXZ)	FDC280KXZE1	FDC335KXZE1	FDC400KXZE1	FDC450KXZE1	FDC475KXZE1	FDC500KXZE1	FDC560KXZE1		
SEER / SCOP (Outdoor unit)	7.25 / 4.89	7.38 / 4.85	6.66 / 4.23	6.36 / 4.36	6.84 / 4.31	7.29 / 4.58	6.45 / 4.30		
Outdoor unit (KXZ Hi-COP)	FDC224KXZE1	FDC280KXZE1	FDC335KXZE1						
SEER / SCOP (Outdoor unit)	7.58 / 4.86	7.27 / 4.91	7.41 / 4.86						
Outdoor unit (KXZR)	FDC224KXZRE1	FDC280KXZRE1	FDC335KXZRE1	FDC400KXZRE1	FDC450KXZRE1	FDC475KXZRE1	FDC500KXZRE1	FDC560KXZRE1	
SEER / SCOP (Outdoor unit)	6.27 / 4.06	6.11 / 4.02	7.00 / 4.84	6.34 / 4.22	6.04 / 4.33	6.60 / 4.27	7.01 / 4.54	6.25 / 4.29	
Outdoor unit (KXZR)	FDC615KXZRE1	FDC670KXZRE1							
SEER / SCOP (Outdoor unit)	5.79 / 4.34	5.78 / 4.66							

Indoor Unit Capacity Connection

Multiple indoor units can be connected to the KXZ series, with a range of 17 types of exposed or concealed indoor units over several capacities. A choice of 92 types of indoor units are available.

The tables show the maximum capacity connection range for each model:

Heat Pump Models

	HP	Capacity Connection
Micro KXZ	4 - 6	150%
Micro KXZ	8 - 12	150%
KXZ LITE	8 - 10	120%
KXZ	10 - 60	130%
KXZ Hi-COP	8 - 16	200%
KXZ Hi-COP	18 - 36	160%
KXZ Water Cooled	8 - 36	150%

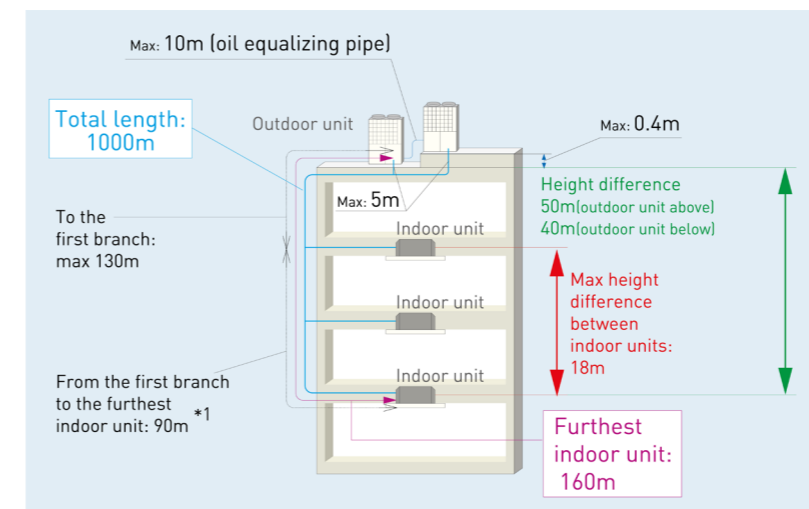
Heat Recovery Models

	HP	Capacity Connection
KXZR	8 - 16	200%
KXZR	17 - 34	160%
KXZR	36 - 60	130%
KXZR Hi-COP	16	200%
KXZR Hi-COP	18 - 34	160%
KXZR Hi-COP	36	130%

Long Pipe Runs 10-60HP

The piping length of our KXZ systems have been extended with a maximum height difference between Indoor units of up to 18m enabling installation of Indoor units on an extra three floors. Also, the furthest unit can be installed up to 160m from outdoor unit.

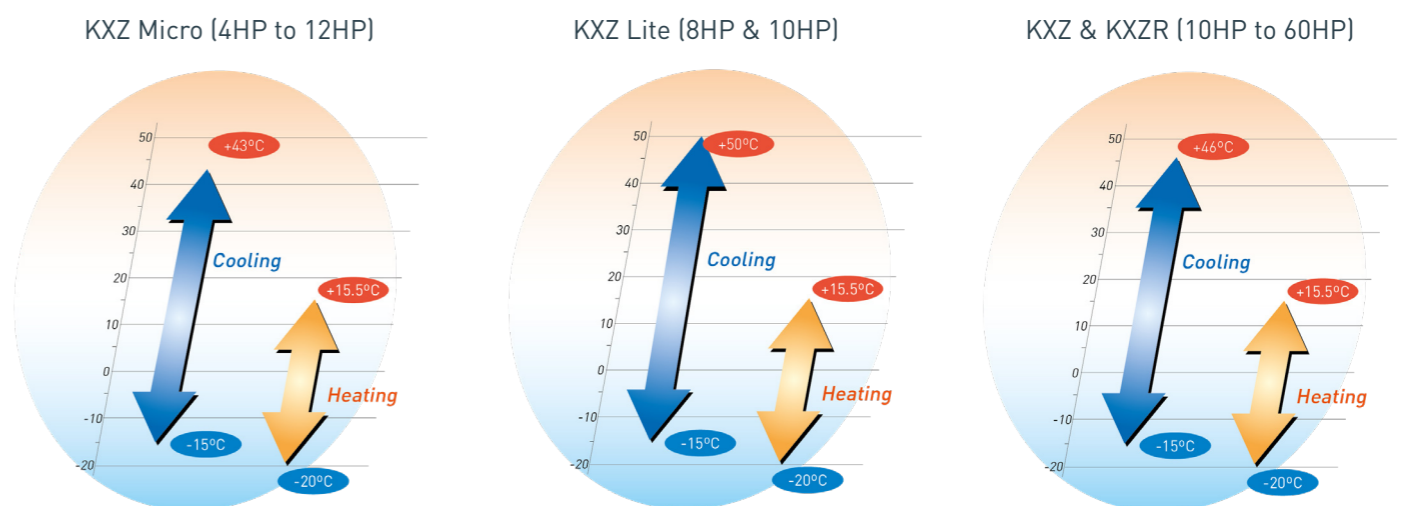
A total piping length of 1000m can be used with our KXZ systems (10-60HP) allowing flexibility and solutions for numerous applications.



*1 The difference between the longest and the shortest Indoor unit piping from the first branch must be within 40m.

Wide Range of Operation

Our KXZ and KXZR series enable a heating range operation down to -20°C and a cooling range up to 46°C (43°C for the KXZ Micro). Furthermore, our KXZ Lite models extend to a cooling range operation of up to 50°C.



KXZ-VRF REDESIGNED

Energy Saving Technologies

Via Variable Temperature and Capacity Control

VTCC adjusts the target pressure of the refrigerant cycle in the outdoor unit automatically according to the demand of the indoor units in partial load conditions. These smooth adjustments ensure optimal usage of the indoor units as well as maximised energy savings. Ultimately this also increases comfort for the user.

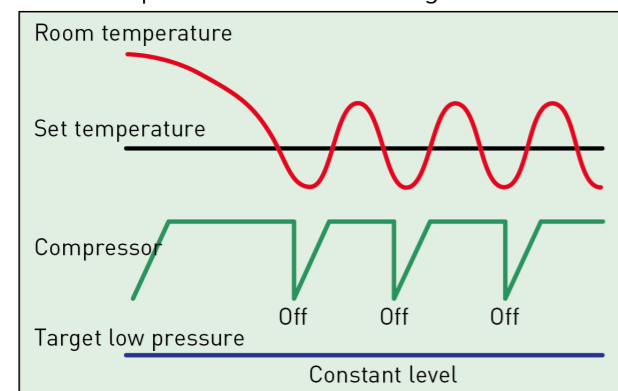


*34% energy savings are based on comparison with a KXZ standard model with VTCC vs. a KXZ standard model both under partial load condition.

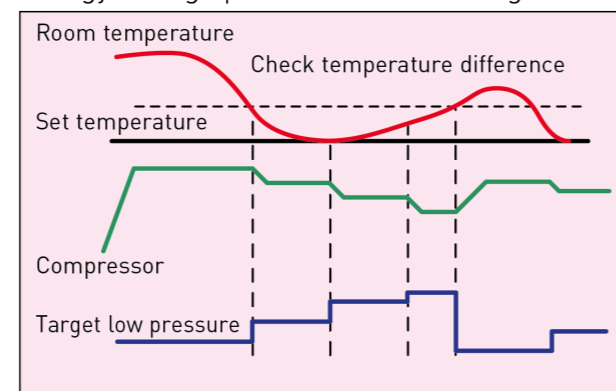
VTCC

- The VTCC is a unique energy saving function designed by MHI.
- It is a feature for all our KXZ ranges which provides up to 34%* energy savings in both cooling and heating mode.
- VTCC is a function specifically designed to maximise energy savings in partial load conditions throughout all seasons.
- 34% energy saving - based on comparison with a KXZ standard model with VTCC vs. a KXZ standard model both under partial load condition.

Normal operation (in the cooling mode)



Energy saving operation (in the cooling mode)



Advances in technologies ensure our KXZ series are efficient, energy saving and reliable.

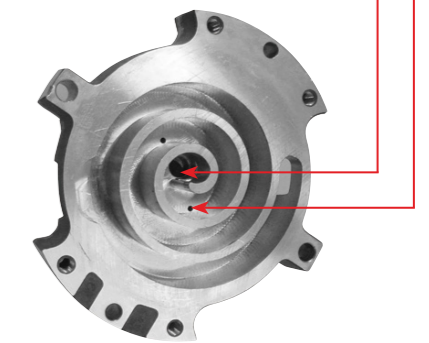
Improved Scroll Compressor

The enhanced KXZ multiport compressor includes two additional discharge ports. This optimises the pressure control within the compressor.

The combination of the new multi discharge compressor and the new concentrated winding motor increases the energy efficiency of the compressor in partial load conditions.

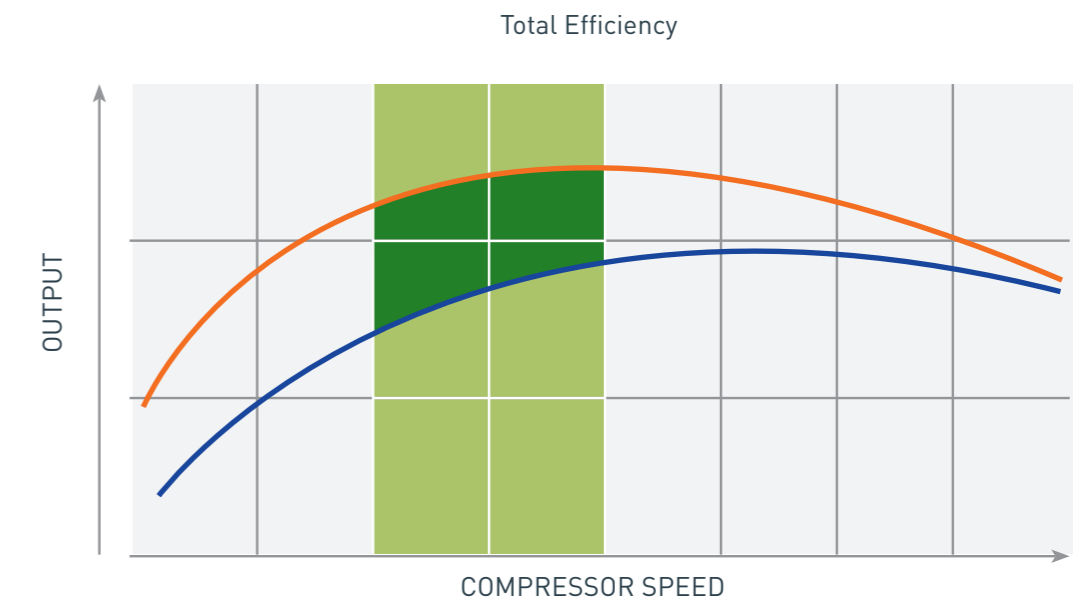
This scroll compressor has proven to be extremely reliable and uses the latest compressor technology.

Multi-discharge port
Discharge port



Concentrated winding motor achieves

“High Output” and “Total Efficiency Improvement”



- NEW Concentrated Winding Motor*
- Conventional Distributed Winding Motor
- Improved Seasonal Efficiency Rating

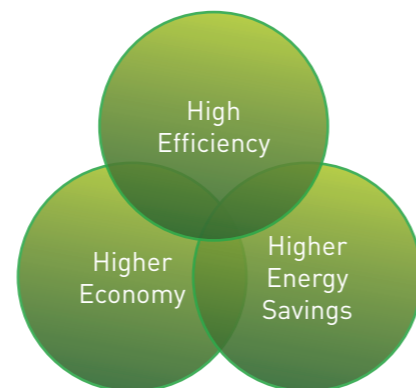
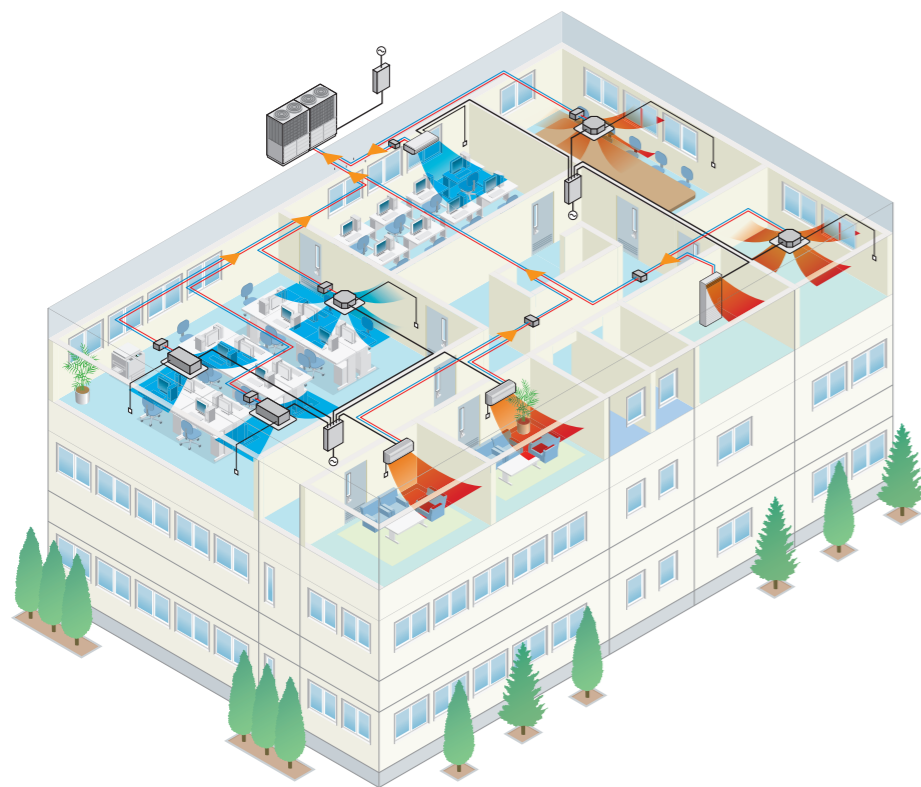
* APPLIED FOR KXZE1:10/12/17/18/20HP & KXZE1:8HP

KXZR – SIMULTANEOUS COMFORT

Flexibility and Performance

Our heat recovery systems operate with 3 inter-connecting pipes, commonly referred to as a '3-pipe system'. 3-pipe systems provide both heating and cooling operations simultaneously to individual indoor units according to room conditions or user requirements. KXZR systems incorporate highly sophisticated controls transferring heat load energy from the entire building to provide an efficient, comfortable heating and cooling environment.

Example of simultaneous heating and cooling:



Up to 24HP [67kW] with 1 Outdoor unit

Easy installation of our PFD box saves time and costs for the installer.

Unique PFD Control Box

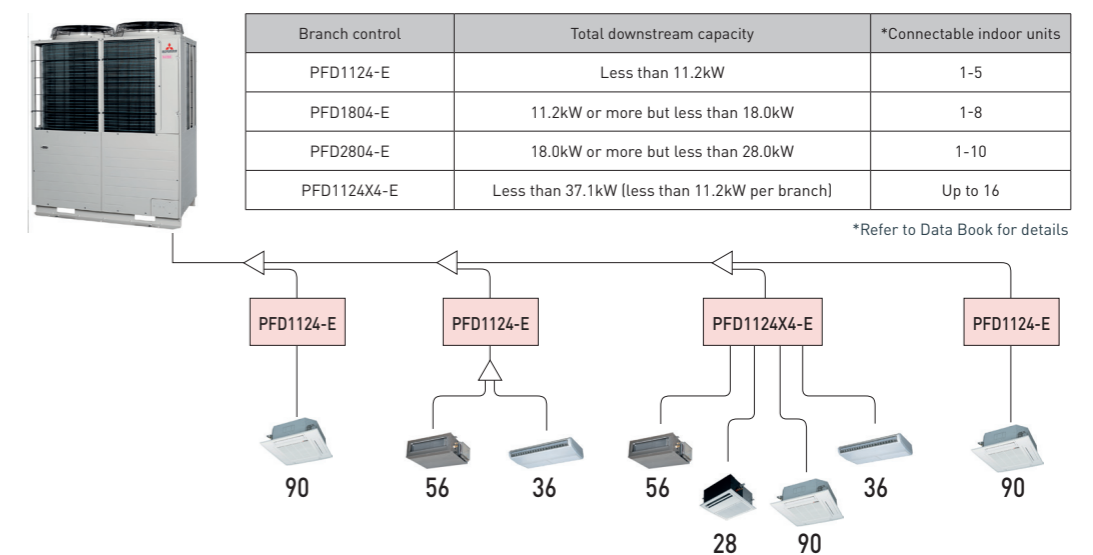
Groups of indoor units can be connected to our PFD control box with a maximum total capacity of 37.1kW achieved from a single PFD. The units connected in this group will operate in the same mode only (cooling or heating) making it ideal for open plan areas.

We also have a 4-way PFD control; PFD1124X4-E. This 4-way PFD can connect up to four indoor units (or groups of indoor units) with individual control allowing for simultaneous cooling or heating within the application.

1-way PFD box

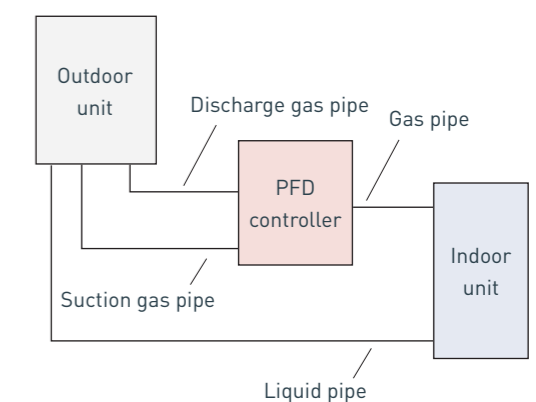


4-way PFD box



Easy Installation

Our PFD control box design means that the connection of the liquid pipe is connected directly to the indoor unit bypassing the PFD control box. This design means that there is less piping connections (x2) to be made per indoor unit, therefore reducing the installation time and cost.



Continuous Heating Capacity Control (CHCC)

Our CHCC defrosting control allows our KXZR system to achieve greater capacities than that of our previous model (KXR) in low ambient temperature conditions. CHCC controls the target pressure automatically before the capacity drops, which increases the period of heating operation and reduces the systems defrosting time.

PRODUCT LINE UP - INDOOR UNITS

Wide variety of 17 types 92 models

Type			Capacity	0.5HP	0.8HP	1HP	1.25HP	1.6HP	2HP	2.5HP	3.2HP	4HP	5HP	6HP	8HP	10HP
			Model Code: kW	15	22	28	36	45	56	71	90	112	140	160	224	280
Ceiling Cassette	4way	FDT				•	•	•	•	•	•	•	•	•		
	4way Compact (600 x 600)	FDTC		•	•	•	•	•	•							
	2way	FDTW				•		•	•	•	•	•				
	1way	FDT5						•								
	1way Compact	FDTQ			•	•	•									
Ducted	High Static Pressure	FDU						•	•	•	•	•	•	•	•	•
	Low/Middle Static Pressure	FDUM			•	•	•	•	•	•	•	•	•	•		
	Low Static Pressure (thin)	FDUT		•	•	•	•	•	•							
	Compact & Flexible	FDUH			•	•	•									
Wall Mounted	FDK			•	•	•	•	•	•							
Ceiling Suspended	FDE					•	•	•	•		•	•				
Floor Standing	2way	FDFW				•		•	•							
	with casing	FDFL								•						
	without casing	FDFU				•		•	•	•						
OA Processing unit	FDU-F										•	•		•	•	

Type	Air flow M3/h	150	250	350	500	800	1000
Fresh Air Ventilation and Heat Exchange unit	SAF		•	•	•	•	•
Fresh Air DX Assembly	SAF-DX			•	•	•	•

NEW & IMPROVED

AWARD WINNING PRODUCTS

FDT - Standard Cassette

- Keeps maximum comfort with minimal draught
- Automatic energy saving control
- Quiet operation
- When the unit is turned off, the louvres close in
- Draught reduction in cooling and heating mode



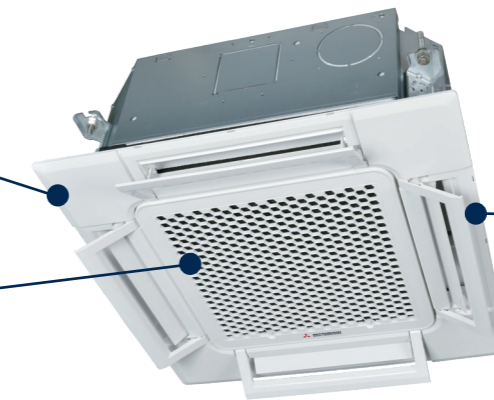
FDTC - Compact & Cassette (600 x 600mm) European design & Flat panel

Thin Panel

FDTC thin panel fits within 10mm of the ceiling.

Unique Grille Design

Honeycomb grille



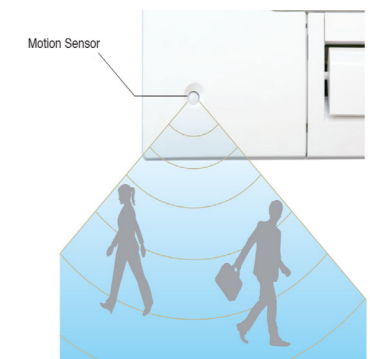
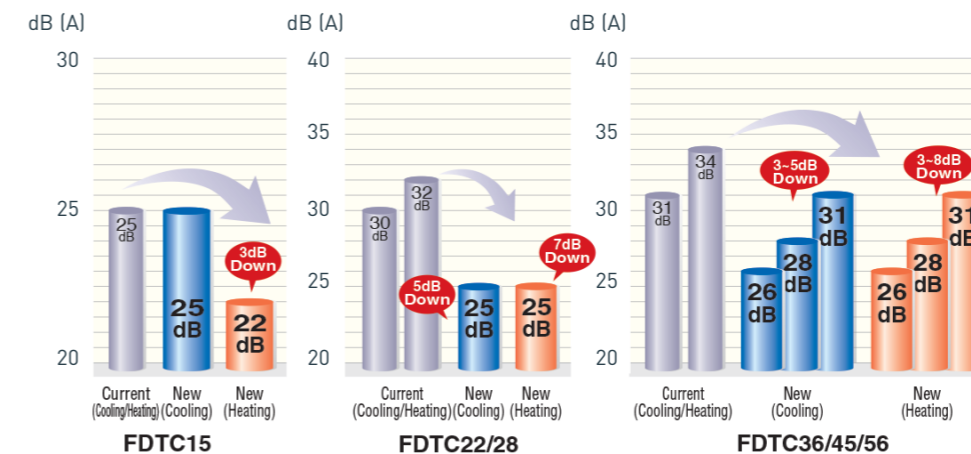
Big Louver

Improved directionally



Quieter operation

Adopting a new turbo fan and improving the heat exchanger enables a reduction in noise.



INDOOR UNITS BENEFITS SUMMARY

When using RC-EX3A (Remote control), functions with symbol ● are available.

		FDT	FDTC	FDTW	FDTs	FDTQ	FDU	FDUM	FDUT	FDUH	FDK	FDE	FDW	FDL	FDU-F		
Energy Saving	Inverter technology	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Energy-saving**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Motion sensor**	● Option	● Option	● Option	● Option		● Option	● Option	● (71only) Option		● Option	● Option				● Option	
	Home leave operation**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Set temperature auto return**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Comfort	Automatic operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Silent operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Hi power operation**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Air flow	Flap control system	●	●	●	●						●	●	●				
	Vertical auto swing	●	●	●	●	●					●	●	●				
	Draft prevention setting**	● Option	● Option														
	Automatic fan speed	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Timer	Sleep timer	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Peak-cut timer**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Weekly timer	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Convenient	Function Switch**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Favourite setting**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Static pressure adjustment						●	●	● (71only)							●	
	Select the language**	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Air filter	●	●	●	●	●	● procure locally	● Option	● Option	● Option	●	●	●	●	●	●	● procure locally
	Filter sign	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Outside air intake	●	● Option	●	●	●	●	●	●	●						●	
Others	Self diagnostics	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Built in drain pump	●	●	●	●	●	● *1	●	●	● Option						● *2	
	Improved serviceability						●	●									

*1 : Except 224•280 *2 : Except 1800•2400

RC-EX3A CONTROLLER

Simple use with advanced settings remote control

- Easy touch and easy view with full dot Liquid Crystal display
- Function switch

The function switch allows you to select two preferred functions that you desire from the six available functions shown. These functions can be used by simply pressing the button after they are set, allowing you to use your preferable functions immediately.



1. High Power Mode

High Power Mode achieves extra cooling / heating capacity for 15 minutes to quickly adjust the room temperature to a comfortable level.

2. Energy Saving Mode

Temperature is set to save energy without losing comfort.

3. Quiet Mode

Outdoor unit starts to operate quietly by activating this mode. The time of this mode can be set in conjunction with Indoor Silent Timer.

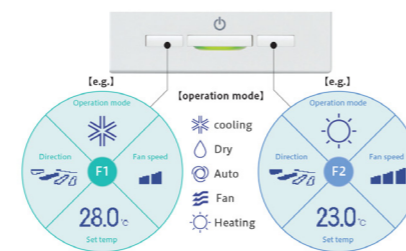


4. Home Leave Mode

Home leave mode maintains the room temperature at a moderate level.

5. Favourite Mode

Operation mode, set temperature, fan speed and air flow direction are automatically adjusted to the programmed favourite setting.



6. Filter Sign

Indicates that it is time to clean the air filter.

7. Anti draught ON/OFF

User can enable/disable the motion of panel with anti-draught for each air outlet for each operation mode. This function can be set while operating.

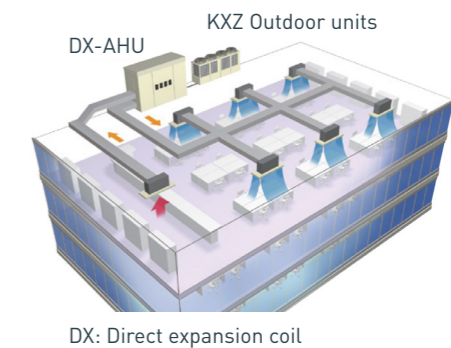
8. Contact Company & Error display

If any error occurs on the system, the "Unit protection stop" is indicated on the message display.

EEV-KIT

CONNECTION TO THE OTHER HVAC TECHNOLOGIES

- The EEV-KIT is a control kit for connecting the KXZ to an externally sourced AHU or FCU with its own direct expansion heat exchanger coils (AHU : Air Handling Unit, FCU : Fan Coil Unit)
- Our EEV-KIT is composed of one EEV-Control Assembly and one EEV-Set.

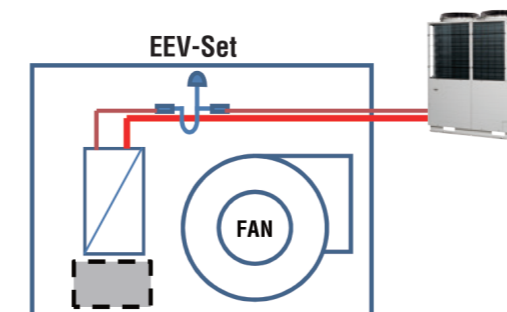


Single refrigerant system

A single refrigerant system is one that can have multiple outdoor units connected to one refrigerant pipework circuit. There are 2 types of EEV-KIT system that can be built into the single refrigeration system.

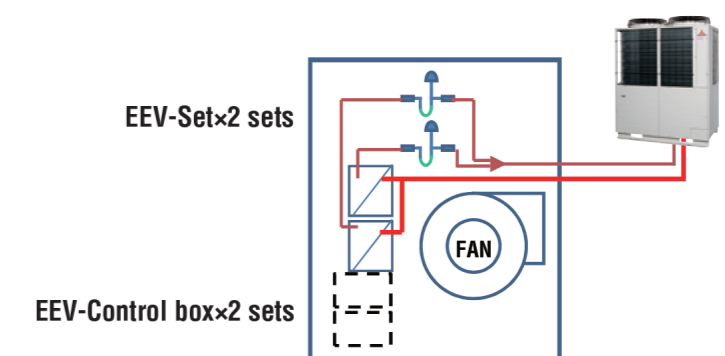
System A: One EEV-KIT

This system has only one EEV-KIT built into one indoor unit with only one heat exchanger. This system can be applied to an indoor unit whose capacity is up to 10HP.



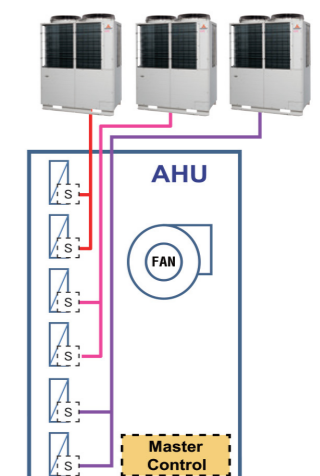
System B - Multiple EEV-KIT's

System B is a system that has multiple EEV-KITs built into one indoor unit with multiple heat exchangers on one refrigerant circuit. This system can be applied with a KXZ/ AHU arrangement providing up to 168kW.



Multiple Refrigerant System

A multiple refrigerant system is an AHU system with multiple independent refrigerant circuits and one master control to control the whole system.



Advantage

- Large systems are possible [max capacity 896kW]
- External control
- Capacity step control

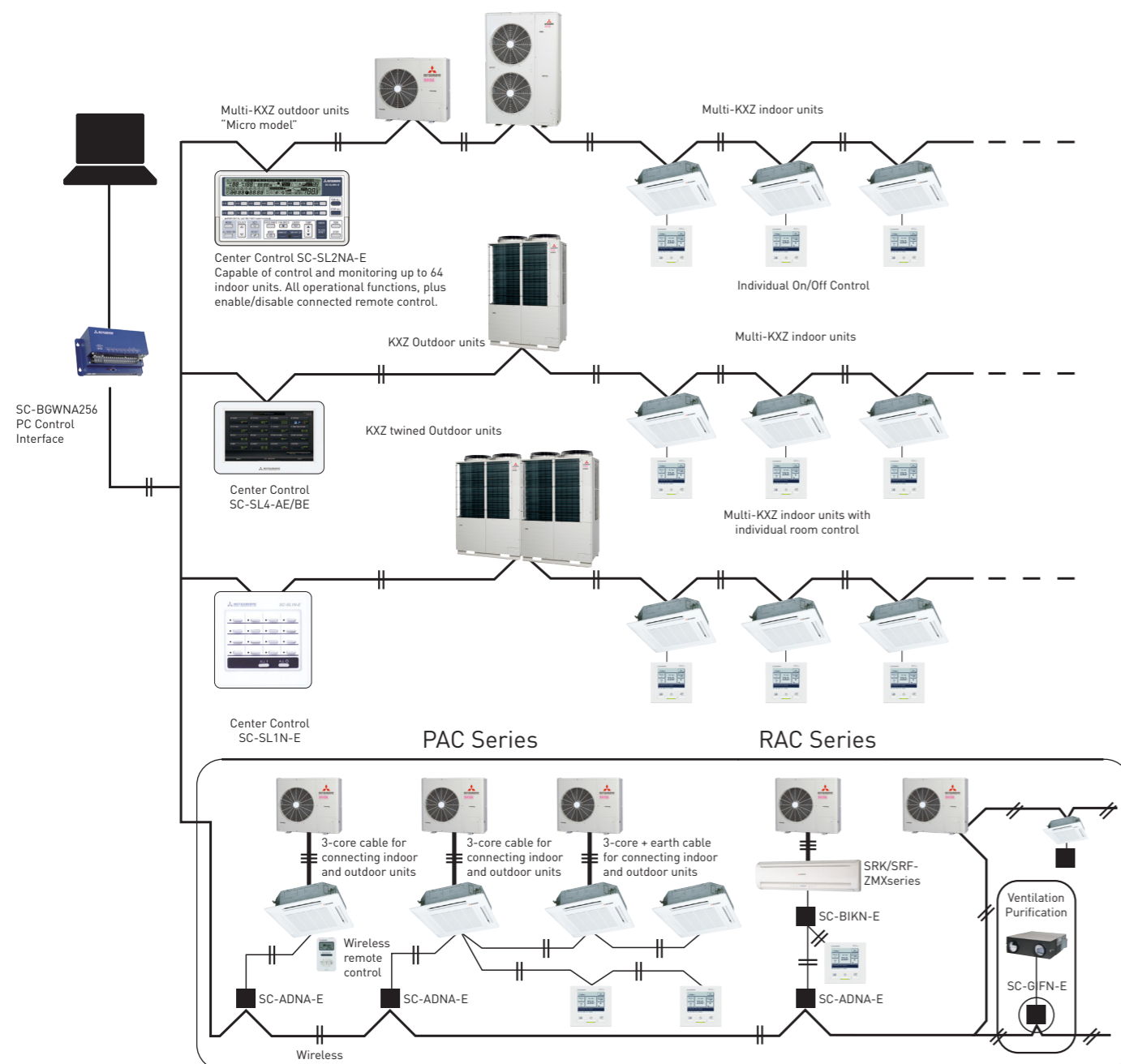
Additional parts over a single refrigeration system

- One master control
- The slave EEV control and EEV set are the same as a single refrigeration system.

CONTROLS NETWORK OVERVIEW

IMPROVED CONNECTABILITY

MHI offers simplicity in installation with the highly sophisticated Super link - II Control System



- This offers building owners and occupiers a comprehensive control and management system while providing complete commissioning and service maintenance assistance for installers and service engineers.
- The Super link - II is an advanced high speed data transmission system which can connect up to 256 indoor units and 48 outdoor units onto one network.
- A wide range of control options are available for the Super link - II network to suit any application large or small, as well as connection to a new or existing Building Management System (BMS).

Building Management Systems

MHI offers a wide range of control options for the KXZ system to suit any application, large or small, as well as connection to a new or existing BMS.

	SC-BGWNA256 Web & BACnet gateway		SC-LGWNB LonWorks BMS Gateway	
	MH-AC-MBS Modbus Controller B Version includes an electric power calculation function	Powered by Intesis		MH-AC-KNX KNX Controller Powered by Intesis

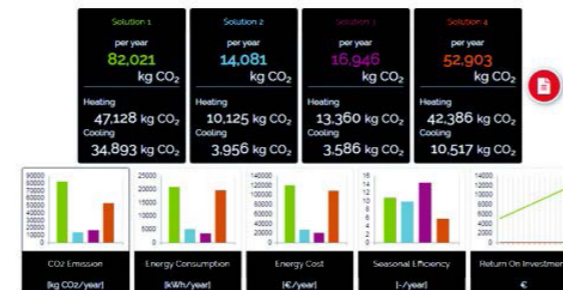
TIME SAVING SOFTWARE

e-seasonal (coming soon)

e-seasonal is an application for our air cooled VRF outdoor units. By selecting a combination of systems, location and occupancy profiles you can simulate,

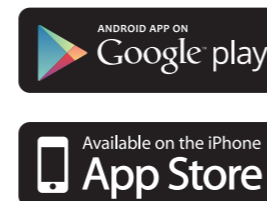
1. Annual seasonal efficiency calculation,
2. Annual energy consumption, cost and CO2 emission estimation.
3. Comparison with multiple alternative solutions including conventional heaters.

e-seasonal is a downloadable program and provides solution suggestions according to your requested design conditions.



MHI e-service App

MHI e-service application is free to download to both IOS and Android devices. The application covers "Mitsubishi Heavy Industries Thermal Systems Ltd" Air conditioning systems: Split (RAC & PAC), VRF, Q-ton & A2W. This "MHI e-service" Application enables field engineers to make:



- A quick search of the meaning of error codes that may appear when there is a malfunction in a "Mitsubishi Heavy Industries Thermal Systems, Ltd" Air conditioning system, and the probable cause for the malfunction.
- Scan the unit's QR code and search the meaning of error codes depending on the model type.
- Carry out additional refrigerant charge calculation for Split (PAC, RAC) & VRF.
- Currently available in English & Spanish languages.

SL Checker

By linking to the system Super Link II communication network, you can force operation of the indoor and outdoor units, view the system operating details and trouble shoot system anomalies. The maximum connectable number of indoor units from the SL Checker is 128 indoor units on one Super link system.

Building Information Modelling (BIM)

Building Information Modelling (BIM) is an intelligent 3D model-based -program that gives architectural, engineering, and construction professionals the insight and tools to more efficiently plan, design, construct, and manage buildings and infrastructure.

Building information modelling can be accessed at:

[Http://www.mhiae.com/Support-Downloads/Bim-\(Building-Information-Modelling\)](http://www.mhiae.com/Support-Downloads/Bim-(Building-Information-Modelling))

Easy selection tool E-Solution

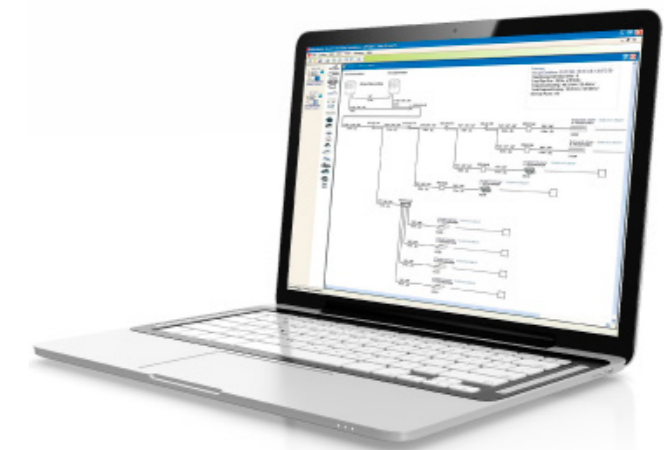
E-Solution is a design software tool which includes specification details of the latest KXZ VRF systems. E-Solution provides selection software to draw up full system schematics and enables engineers to select the most cost-effective and energy efficient mix of indoor units, outdoor units, pipework and controls.

Engineers must register and download the E-solution software to ensure they are automatically sent updates as they become available and this can be done by simply visiting:

www.mhiae.com/support-downloads/e-solution

It also generates wiring diagrams and engineering drawings which can be exported to AutoCAD or saved in PDF format.

This flexibility enables engineers to print select design information and comprehensive operation and maintenance manuals for presentations to clients. Engineers can also incorporate design information into their own formats and documents for personalised proposals.





TEMPERATURE CONTROL FOR TODAY & TOMORROW

Mitsubishi Heavy Industries, Ltd. (MHI), are unwaveringly dedicated to facing the challenges of the future.

MHI are dedicated to supporting global sustainability by offering the most energy-efficient air-conditioning systems. Through our in-depth research and development we are able to incorporate new technologies within our units to maximise their energy efficiency and significantly reduce carbon emissions.

Environmental Impact

MHI recognises the increasing importance of reducing carbon emissions as this is becoming a priority when selecting air and water distribution systems. Furthermore new technologies are constantly being developed to help meet heating and cooling requirements as well as environmental objectives.

The future of our planet rests in the sustained evolution of humankind while caring, with love and responsibility, for all life forms that inhabit it. Therefore MHI will continue to develop new technologies and products and will remain competitive in the market to achieve a sustainable future.

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ISO9001

Our Air Conditioning & Refrigeration Systems Headquarters is an ISO9001 approved factory for residential air conditioners and commercial-use air conditioners (including heat pumps).



BIWAJIMA PLANT
Mitsubishi Heavy Industries, Ltd.
Air-conditioning & Refrigeration Systems Headquarters
Certified ISO 9001
Certificate number : JQA-0709



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