



**MITSUBISHI
ELECTRIC**

Changes for the Better

Air-cooled Chilling Units

for a greener tomorrow



e-Series

P1800



EG1

New modules increased to 50 HP and 60 HP can be applied to larger capacity areas.

Due to advancing global warming, there is a strong demand for central heat sources with higher performance. Mitsubishi Electric's high-efficiency, large-capacity modular chillers can meet the requirements for installation of large-capacity heat source equipment in limited spaces.

New Features

New 50 HP and 60 HP modules

High energy saving performance

Selectable piping system to save space and installation work

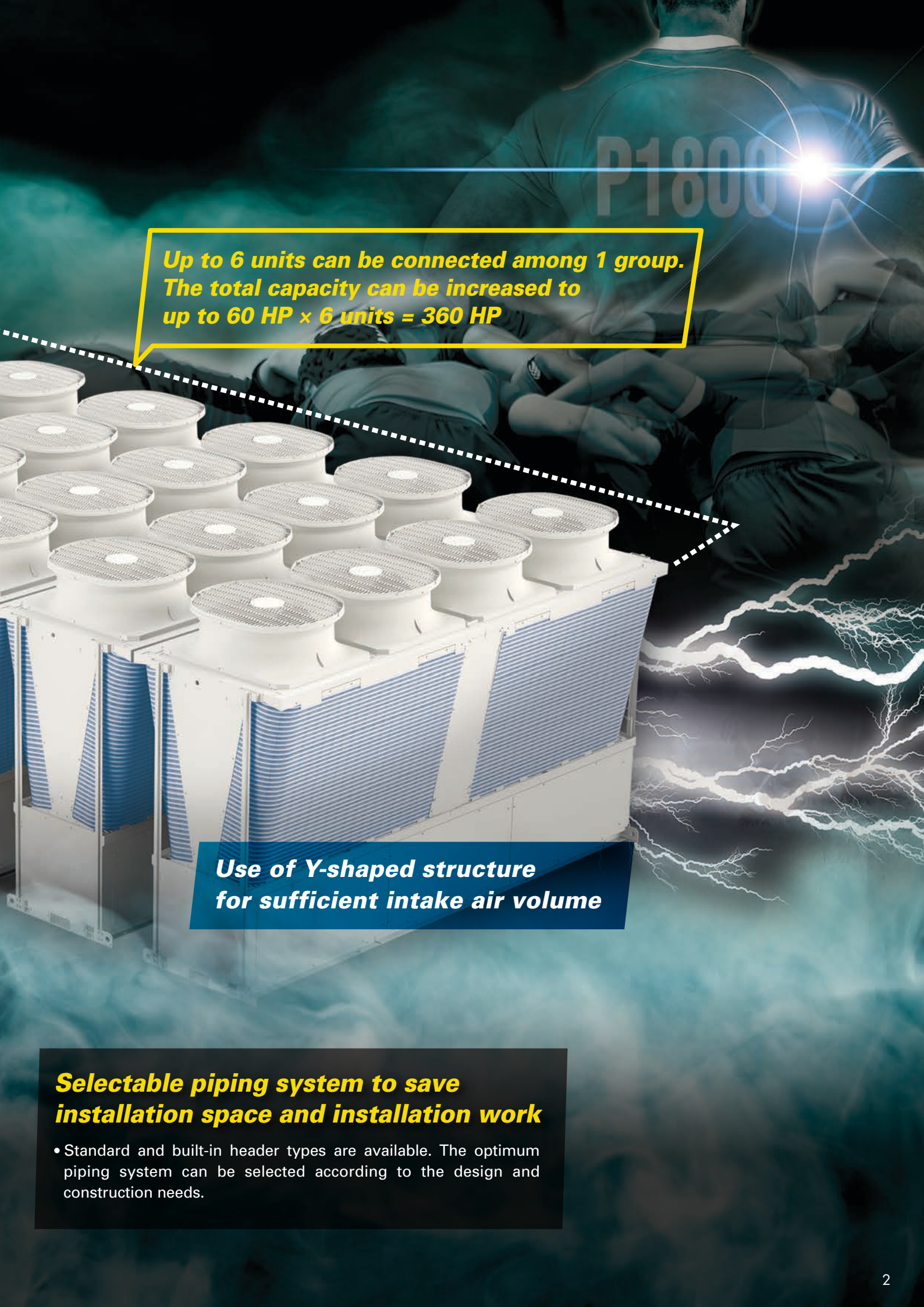
New 50 HP and 60 HP modules

- With the new modules, the range is increased to include 50 and 60 HP.
- Up to 6 units of each module can be connected among 1 group, so capacity can be increased to up to 360 HP (60 HP × 6 units).

High energy saving performance

- Both EER and COP exceed 3.0, and energy saving operation is realized in both cooling and heating modes.
- A high efficiency scroll compressor is equipped with inverter, so optimum operation can be realized according to the load.








**Up to 6 units can be connected among 1 group.
The total capacity can be increased to
up to 60 HP × 6 units = 360 HP**

**Use of Y-shaped structure
for sufficient intake air volume**

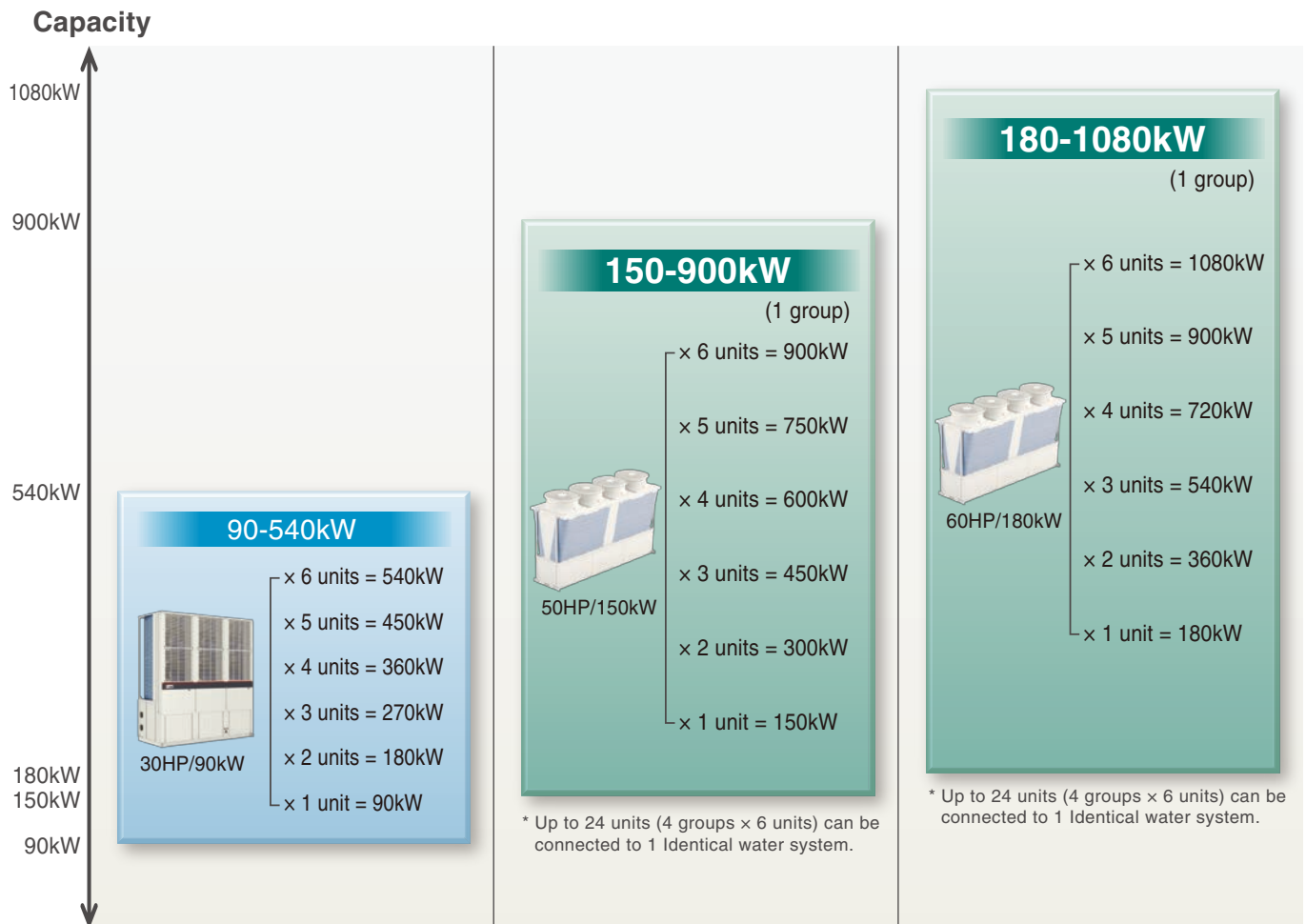
**Selectable piping system to save
installation space and installation work**

- Standard and built-in header types are available. The optimum piping system can be selected according to the design and construction needs.

Module line-up

	30HP 90kW module	50HP 150kW module New	60HP 180kW module New
			
Heat Pump	EAHV-P900YA(-N)(-BS)	EAHV-P1500YBL(-N)(-BS)	EAHV-P1800YBL(-N)(-BS)
Heating Only	EAHV-P900YA-H(-N)(-BS)	EAHV-P1500YBL-H(-N)(-BS)	EAHV-P1800YBL-H(-N)(-BS)
Cooling Only	EACV-P900YA(-N)(-BS)	EACV-P1500YBL(-N)(-BS)	EACV-P1800YBL(-N)(-BS)

* (-N) indicates model with built-in header.



Remote controller

Centralized Remote Controller*



AE-200E/A



EW-50E/A

Individual Remote Controller



PAR-W31MAA

* Connectable to EAHV-P900YA only

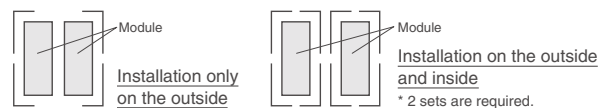
Option parts

Description	Image	P900	P1500/1800	Remarks
Piping Kit		EA-01HK	DT-01HK	for Inside Header type
Connection Piping Kit		EA-02HK	DT-02HK	for Inside Header type
Fin Guard		EA-130FG	—	for Standard Pipe type, Inside Header type *1
		—	DT-150FG	for Standard Pipe type, Inside Header type *2
Representative-water temperature sensor		TW-TH16-E		for Standard Pipe type, Inside Header type
Y type STRAINER 50A		YS-50A	—	for Standard Pipe type

*1 Only one piece of fin guard is included. The necessary quantity is as follows.



*2 One set contains 4 fin guards. Please refer to the following installation examples.



Modular Chiller P900

EAHV-P900YA(-N)
EAHV-P900YA-H(-N)
EACV-P900YA(-N)

Eurovent Certified



Mitsubishi Electric participates in the Eurovent Certification Programme for the chilling units. The certified models are listed in the Directory of Certified Products.

(Only EAHV-P900YA(-N), EACV-P900YA(-N))



Air Guide of Air Blower Available as Standard

Digital Indicator

Cold/Hot Water Outlet
(Inside Header Model)

Cold/Hot Water Inlet
(Inside Header Model)

900mm
in depth

Power/Signal Line
Connection

Position of
Control Box

1 High energy saving performance by the use of inverter compressors

- High efficiency inverter compressor is increased efficiency.
- Optimal control of fans by using inverters contributes to save energy.

2 High functionality of modular chiller

- Up to 6 units can be connected.
- The combination control of modules to compress the capacity of backup.

3 Saving space and installation work

- Small footprint installation help to save space.
- Built-in header type is optional, external piping space can be reduced.

4 Easy system control

- Water temperature can be controlled remotely by using local remote controllers.
- By installing an AE-200E/A, it is possible to centrally control e-series and CITY MULTI at the same time.

5 Other feature

Brine usable

Ability to use brine allows for water supplies of as low as -10°C , suitable for use with process application cooling.

High energy saving performance by the use of inverter compressors

Each module is provided with two high-efficiency inverter scroll compressors developed by Mitsubishi Electric and can operate optimally according to the load. This improves the high energy saving performance.

Excellent Energy Saving Performance

High EER, High COP

EER **3.30**

COP **3.50**

- The air suction area is expanded to maximize the performance of the air heat exchanger.
- Two independent refrigerant circuits are provided in the module to cool and heat water in two stages in series to improve EER and COP.

* EER shows the value at an outdoor air temperature of 35°C and cool water inlet/outlet temperatures of 12°C/7°C, respectively. COP shows the value at an outdoor air temperature of 7°C and hot water inlet/outlet temperatures of 40°C/45°C, respectively. Pump input is not included.

High ESEER

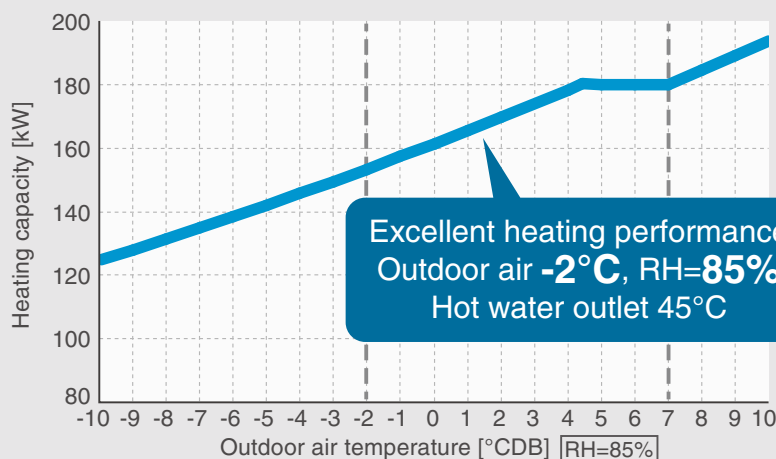
ESEER **5.66**

- Achieved the same ESEER from 30 to 180 HP.

* ESEER shows the value at an outdoor air temperature of 35°C and cool water inlet/outlet temperatures of 12°C/7°C, respectively. Pump input is not included.

Excellent Heating Performance

● e-series (EAHV-P900YA×3)

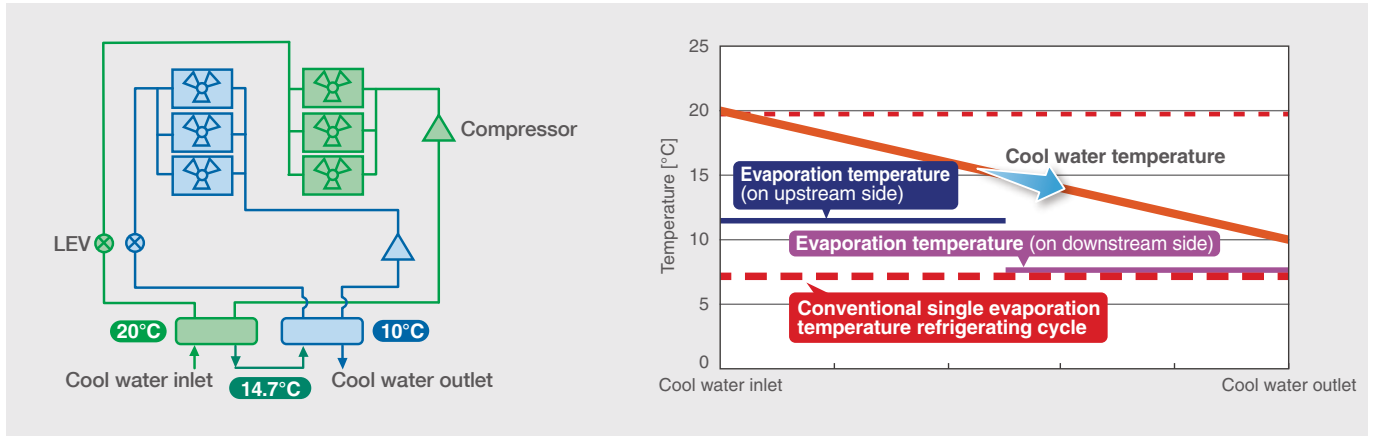


- A heat pump technology captures heat from the outdoor air. The heating performance decrease which occurs with a decrease in outdoor air temperature has been made up for by installing a larger number of units. This disadvantage has been eliminated with the e-series by increasing the heating performance in the low outdoor air temperature range. This allows the user to reduce the required number of units.

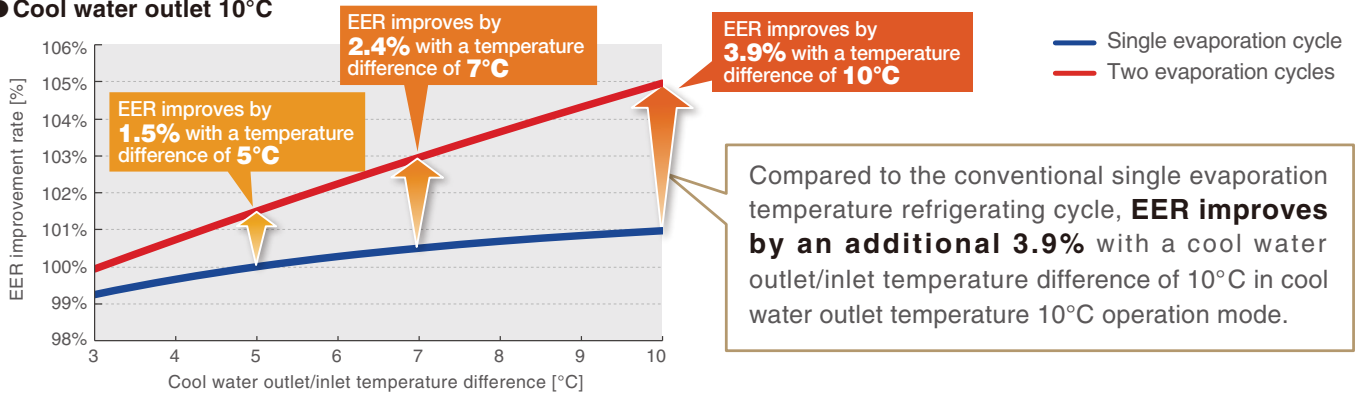
Large Temperature Difference Operation Significantly Increases Efficiency

Two Evaporation Temperature Refrigerating Cycles.

Two evaporators are connected to keep the evaporation temperature on the upstream side of cool water high.



● Cool water outlet 10°C



Energy-saving technology



High Efficiency Inverter Compressor

DC inverter scroll compressor is incorporated. Two compressors each are incorporated to increase efficiency.

Two-stage Cooling Circuit

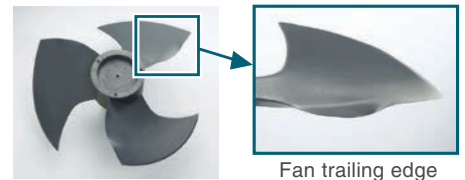
A configuration of two independent refrigerant circuits and the series connection of water-side heat exchangers increase the performance (two-stage cooling).

U-shaped High Performance Compact Air Heat Exchanger

U-shaped air heat exchangers are used. Installing them in a row makes the system thinner. Weather resistant coating is provided for the heat transfer plate fin as standard.

Inflexed Fan

Adoption of a fan with improved ventilation characteristics and a newly designed trailing edge that suppresses wind turbulence raises fan operation efficiency.



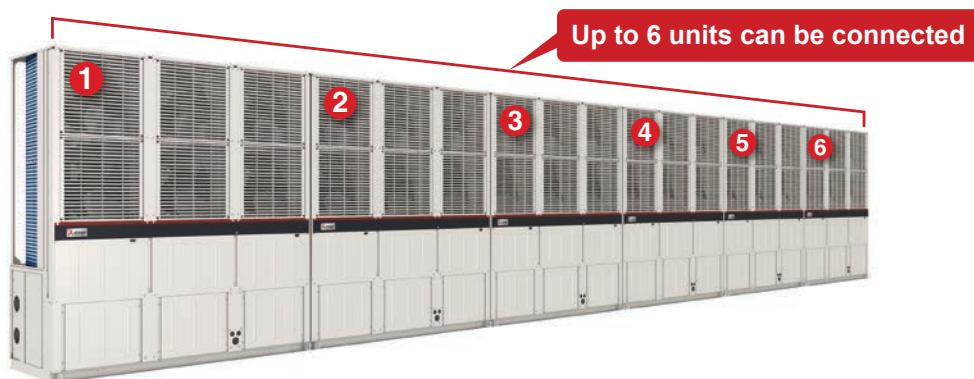
Fan Inverter Control

Air blower fans are also equipped with an inverter to save energy.

High functionality of modular chiller

Up to 6 units can be connected

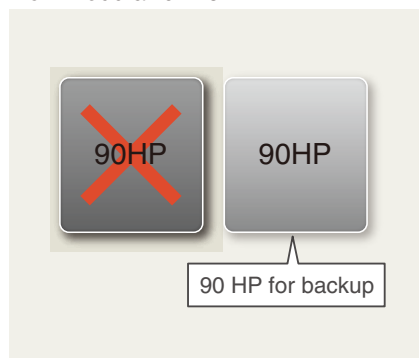
- The total capacity can be increased to up to 30HP × 6 units = 180HP. Because units can be installed horizontally in a row, installation in narrow places such as along building walls is possible.



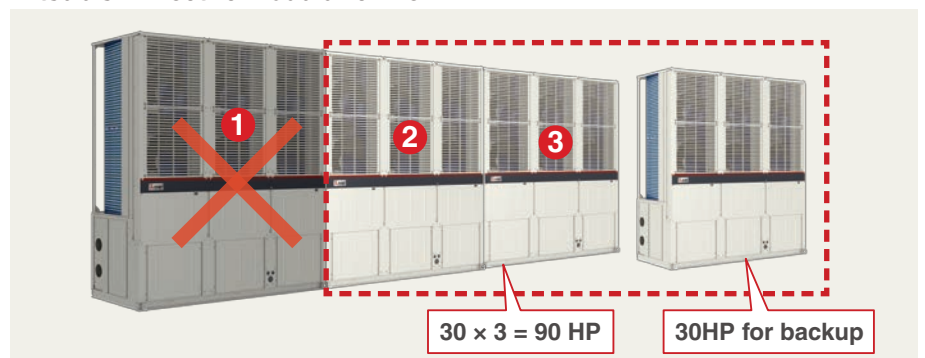
Compression of the capacity of backup

- The combination control of modules help to reduce the capacity of backup and initial cost.

Non-modular chiller



Mitsubishi Electric modular chiller



With our modular chiller system, even if one module goes down, operation can be continued by the backup module and the remaining modules. This eliminates excessive backup.

Saving space and installation work

Small Footprint Installation

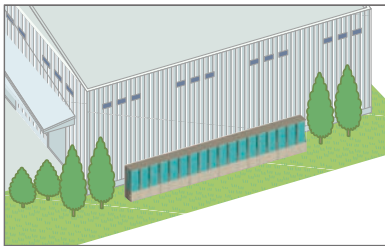
Since this module has a compact and thin body, it is suitable for installation along the exterior walls of buildings or in narrow spaces, and it is possible to install the modules on each floor.

The depth of **900 mm** helps save space.

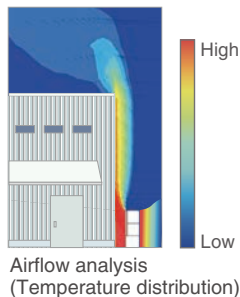


Installation example (single-row installation)

● Example of installation along the outer wall of a factory



* For details on installation, refer to the installation manual.

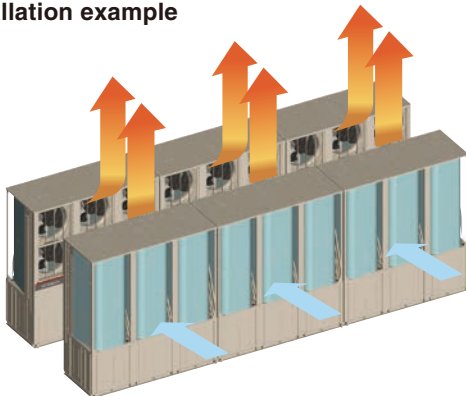


- Installable in limited space, such as along the outer wall or in the corner of a factory, or in a narrow space of a building.
- The compact and thin design allows for the consideration of installation on each floor of a building, as is the case with industrial air conditioners.
(If the inside header specification is selected)
- The figure shows the air blowing surface directed toward the wall (a diagonal blowing air guide is equipped as standard). Directing the air blowing surface toward the wall is effective in preventing short cycling.

Installation example (others)

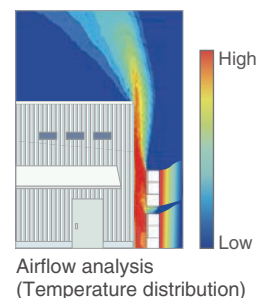
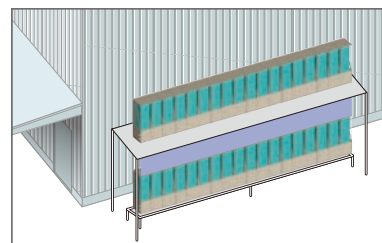
The modules can be installed in two rows or in one row on each of two stages using a frame. They can be installed flexibly according to the installation space.

● Front surface-facing double-row installation example



* For details on installation, please refer to the installation manual.

● Single-row double-stack installation example



- The side-flow feature allows for a single-row double-stack installation by using a frame for the units installed in a row. Additional units can be installed above the units. If you plan to add units in the future, it is recommended to make a plan with consideration given to double-stack installation after the second phase of installation.
- The frame is to be supplied at the customer's site.
- The figure shows an example of using the inside header specification.

Inside Header

"-N" model only

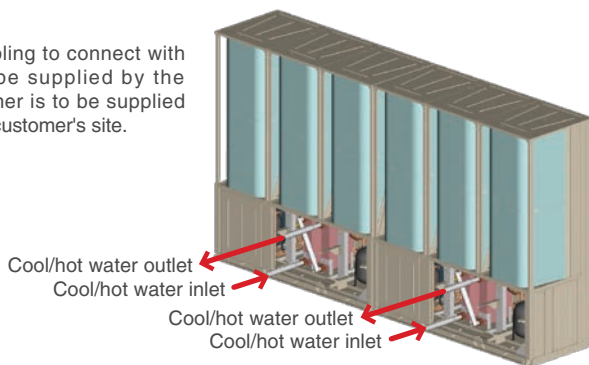
Mitsubishi Electric's Unique Inside Header Incorporates Field Water Pipe Header into Unit

- The field water pipe header section that is usually required to connect the unit to the field water pipe is now available as a manufacturer option (hereinafter referred to as the "inside header") which can be incorporated into the unit at the factory before shipment (a supplied connection kit is used for the connection work at the customer's site).
- This allows for incorporating the field water pipe header section into the unit.
- In addition, the field connection work of the inside header is very simple. Significant simplification of the water pipe connection compared to the previous one has reduced the installation time.

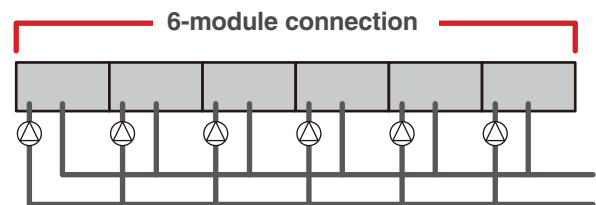
Standard Pipe Specification

- The figure shows a 60 HP unit in which two 30 HP modules are connected.

A coupling to connect with the pipe supplied by the customer is to be supplied at the customer's site.



- Field water pipe header connection image *1 (In the case of installing one pump for one module)



- Number of pumps: 6
- Pipes connected at the site: 12 points

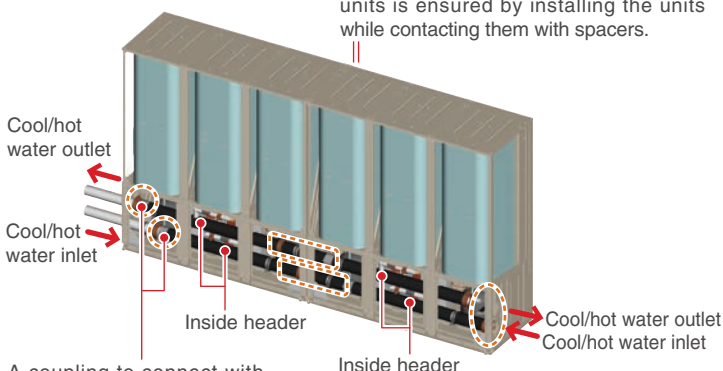
*1 Be sure to install a strainer (optional parts: YS-50A) near the chiller on the inlet side of the cool/hot water pipe to prevent the entry of foreign substances such as dirt and sand particles to the plate heat exchanger.

It is necessary to install connecting piping for installing a pump for each module.

Inside Header Specification (Left or right connection can be selected for the water pipes)

- The figure shows a 60 HP unit in which two 30 HP modules are connected.

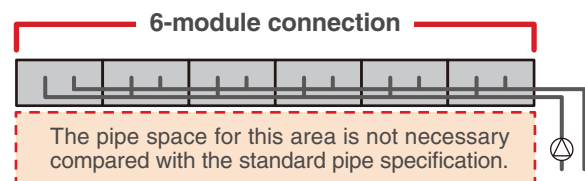
Installation spacing of 10 mm between units is ensured by installing the units while contacting them with spacers.



A coupling to connect with the pipe supplied by the customer is to be supplied at the customer's site.

Left or right connection can be selected for the water pipes.

- Field water pipe header connection image *1 (In the case of installing one pump for one unit)



- Number of pumps: 1
- Pipes connected at the site: 2 points (10 internal connection points)

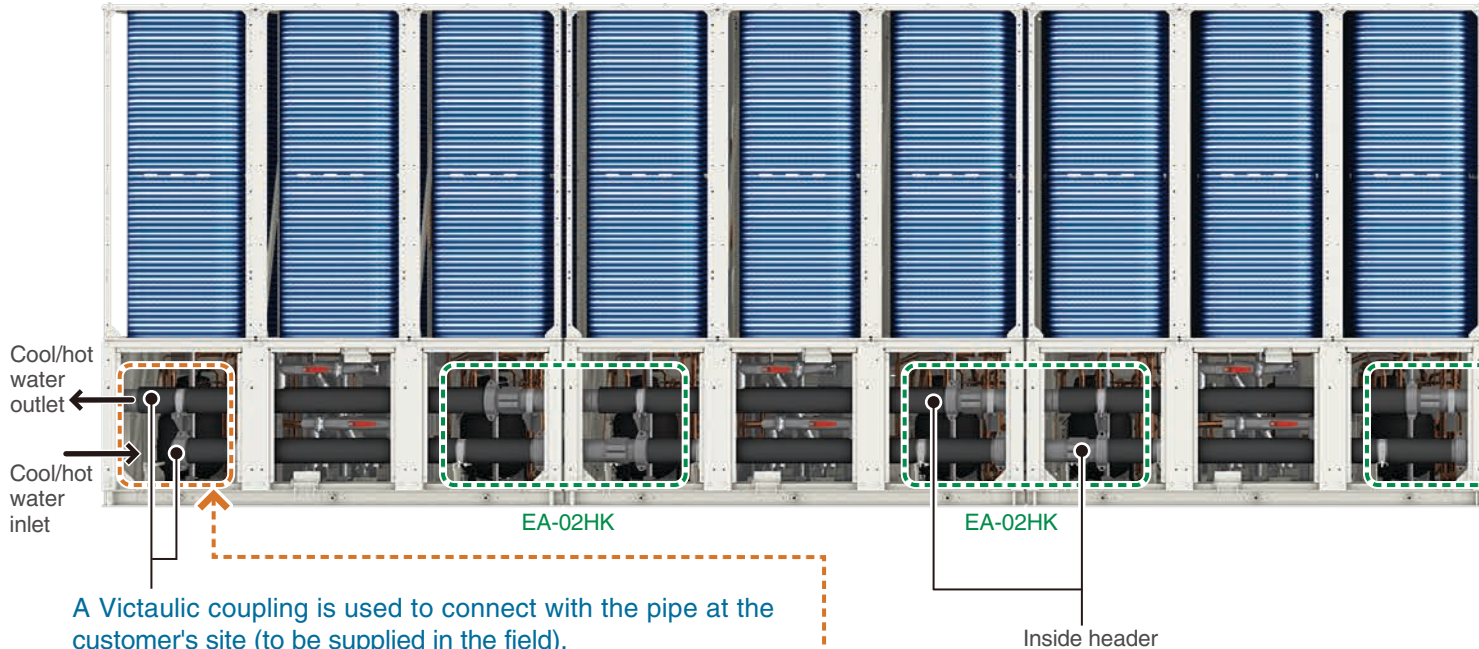
*1 Be sure to install a strainer near the chiller on the inlet side of the cool/hot water pipe to prevent the entry of foreign substances such as dirt and sand particles to the plate heat exchanger.

● Since the module contains a header, the external piping space can be reduced, and the on-site water piping work is simpler.*
● It is only necessary to install one pump, and the number of piping connections on site is reduced.

* On-site piping work using the connection piping kit (optional parts) is required. For more information, please refer to the following page.

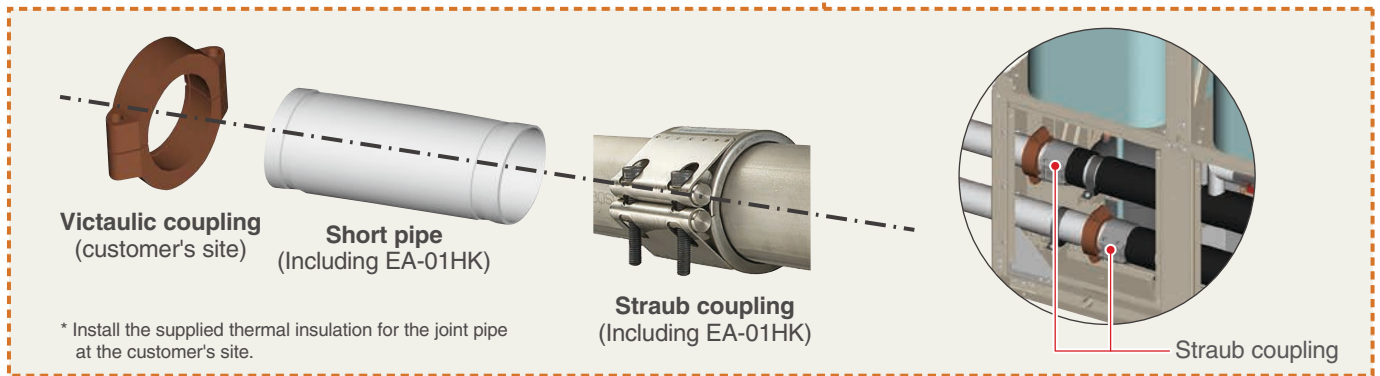
About Pipe Connection Kit

● This figure shows 540 HP (EAHV-P900A-N×6) as an example.

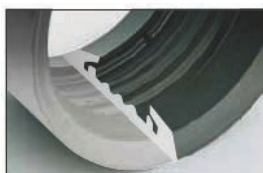
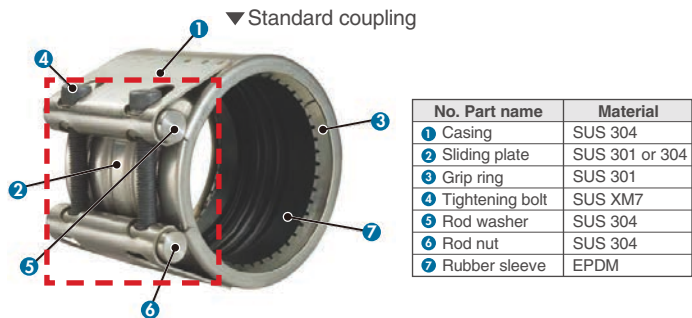


A Victaulic coupling is used to connect with the pipe at the customer's site (to be supplied in the field).

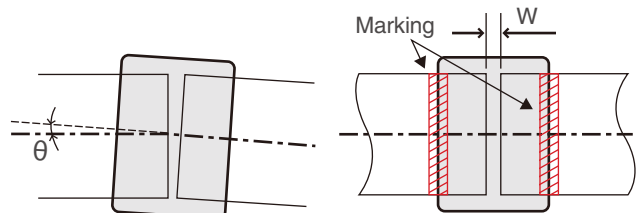
*Straub couplings and short pipes are included for the inside header specification.



Structure

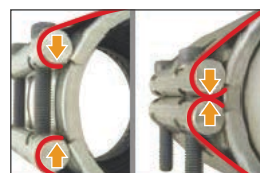


The sealed rubber has a lip structure to improve the water-stopping performance. Adjust the position of the Straub coupling so the marking on both sides can be seen.



● Allowable clearance and tilt range

Allowable pipe clearance value [W]=0 to 25 mm
 Allowable pipe tilt angle [θ]=±2°

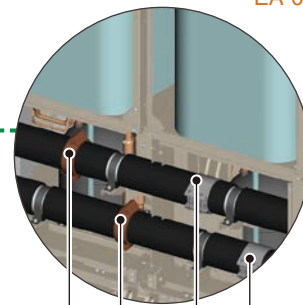


Just tighten the bolt until the casing fits against (comes into contact with) the metal. Anyone can connect the pipes evenly and securely, regardless of their skills and the type of the pipe used.



Inside header

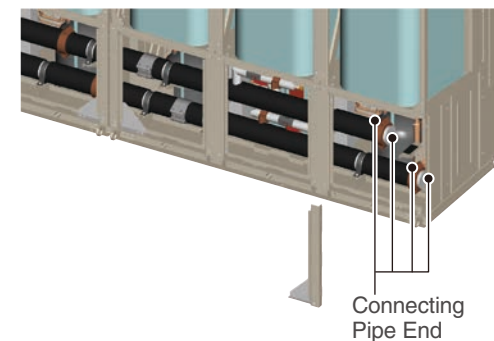
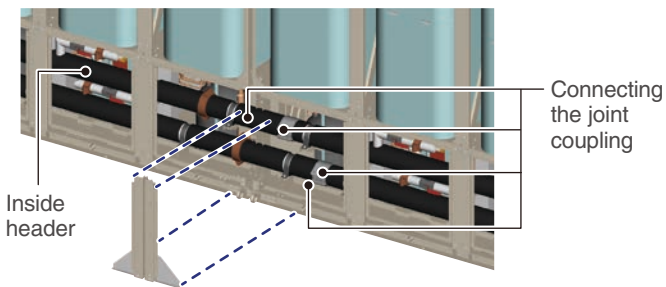
EA-01HK



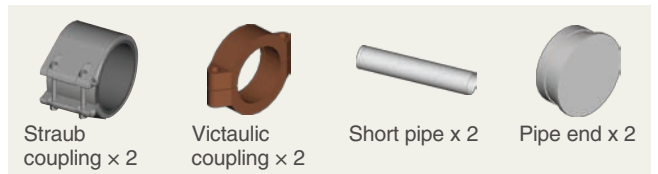
Victaulic coupling

Straub coupling

Connecting Pipe End (Connection at Customer's Site)



Optional parts ① (Piping Kit) EA-01HK



Straub coupling x 2

Victaulic coupling x 2

Short pipe x 2

Pipe end x 2

Optional parts ② (Connection Piping Kit) EA-02HK

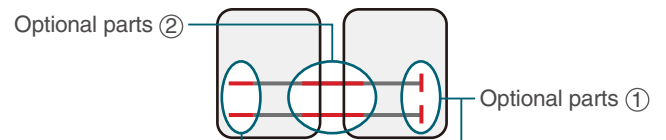


Straub coupling x 2

Victaulic coupling x 2

Joint pipe x 2

Capacity	Module (Inside header)	Optional parts ① EA-01HK (model)	Optional parts ② EA-02HK (model)
30 HP	1	1	0
60 HP (30 HP×2)	2	1	1
90 HP (30 HP×3)	3	1	2
120 HP (30 HP×4)	4	1	3
150 HP (30 HP×5)	5	1	4
180 HP (30 HP×6)	6	1	5




The Victaulic coupling and Straub coupling mentioned in the explanation are product names.

Easy system control

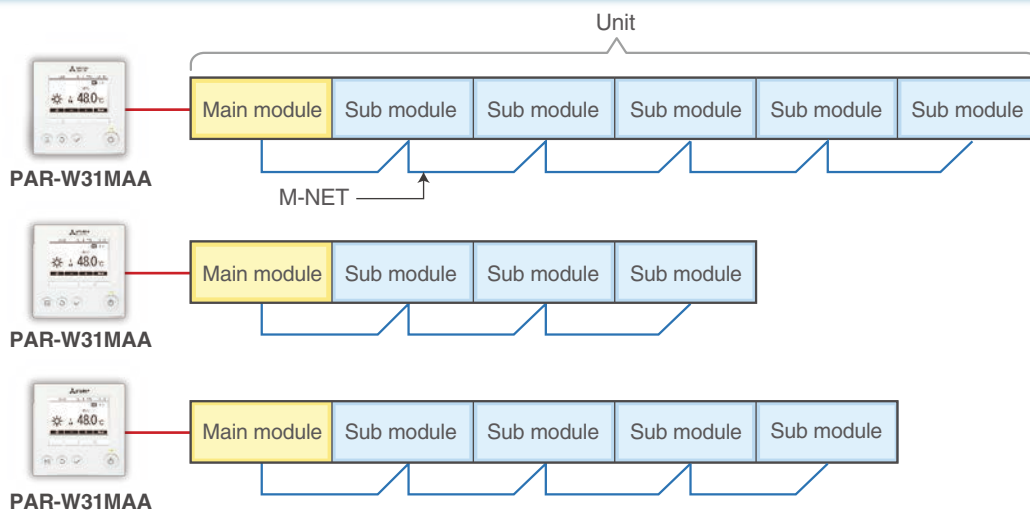
The water temperature in each module can be controlled by using local remote controllers or by using centralized controller “AE-200E/A”. The control method can be selected at the request of customer.

Remote control connection

- Up to 6 modules and one unit can be connected for each remote control.
- Simultaneous control.

Unit Remote Control	 PAR-W31MAA
Control	Simultaneous control
Number of modules that can be connected	6
Number of units that can be connected	1
Number of supported water lines	1
ON/OFF	○
Cooling/heating switch	○
FAN operation switch for snowfall	○
Target outlet temperature setting	○
Scheduled operation	○
Individual error display	○
Outlet water temperature setting of 5°C or below (Brine)	○

System configuration



Demand control

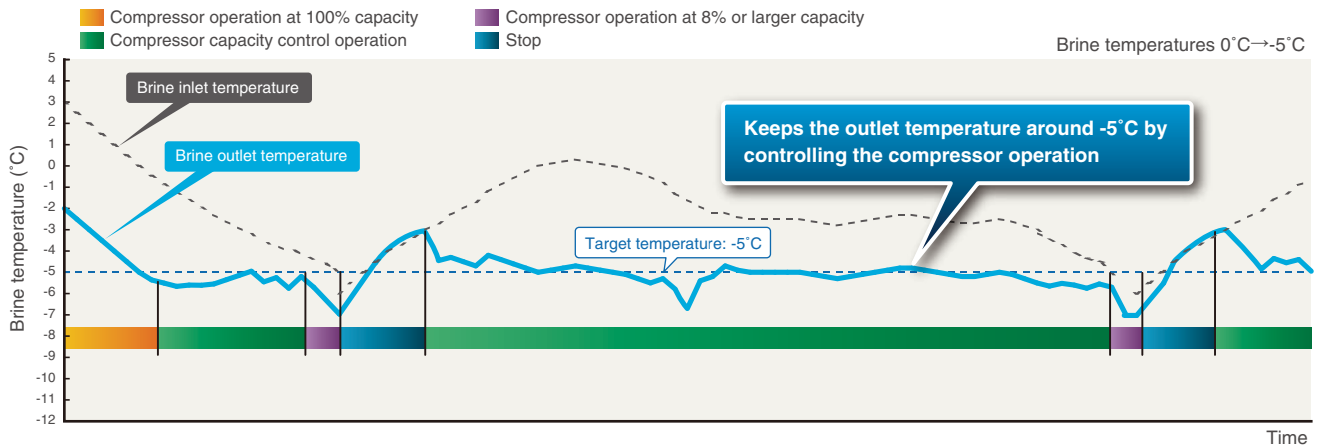
Forced capacity control up to the demand upper limit by an external input to the unit (non-voltage normal open). Heating demand is possible in addition to the cooling demand.

The EACV-P900YA(-N) model is suitable for versatile use, including process cooling.

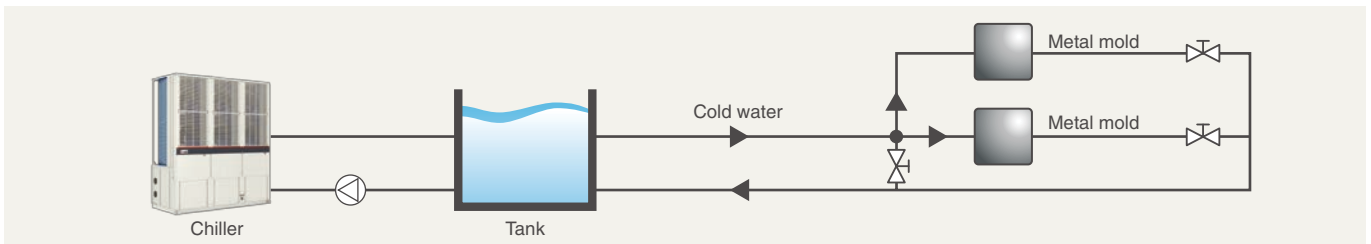
*P1500/P1800 is not usable

- The EACV-P900YA(-N) model supports a wider outlet water temperature setting range (between 5°C and -10°C) and is suitable for use for a variety of applications. The use of inverter controlled fan and compressor enables precise control of outlet water temperature, which is essential in process cooling. This model is also suitable for use at metal and food factories and for use to cool testing equipment at hospitals.

Inverter controlled fan and compressor enables precise control of outlet temperatures on air-cooled unit.



Application examples



Manufacturing industries

Temperatures of metal for molding plastic products such as housings of electric products going out of range even in a single circuit shuts down the entire system, and its recovery takes time. This model helps boost productivity by ensuring stable temperature control.

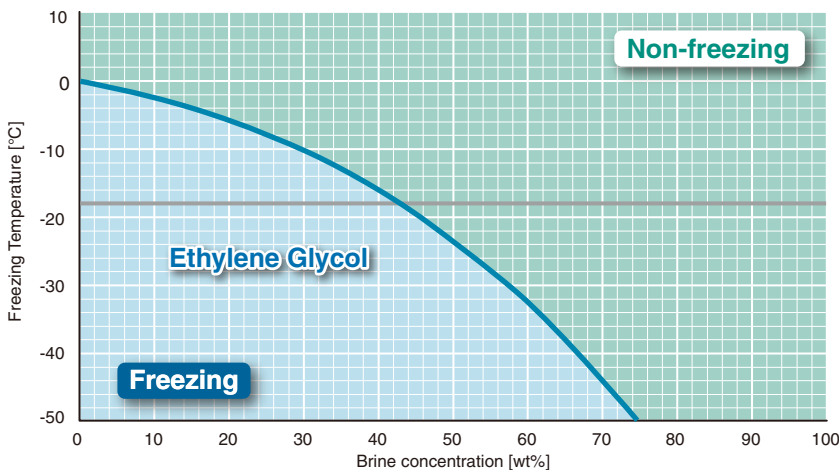
Food industries

Bread factories, beer brewery factories, and wholesale fish markets

Medical industries

For cooling MRI and CT equipment

What is brine?



Brine is a mixture of water and antifreeze solution that brings the freezing point down to prevent freezing at subzero temperatures. The freezing point depends on the percentage of antifreeze, whose main component is ethylene glycol. This model is available with the outlet water temperature setting range down to -10°C.

Note:
The graph was referred from chemical company data. But Freezing Temperature condition will be slightly different based on each company.
Please confirm detail data to the chemical company directly.
It is recommended to set the brine concentration to a percentage that will keep the freezing temperature at -18°C or less.



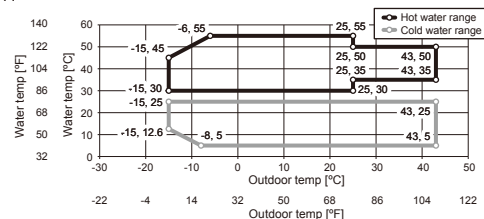
Specifications (Heatpump model)

Model			EAHV-P900YA(-N)(-BS)			
Power source			3-phase 4-wire 380-400-415V 50/60Hz			
Capacity change mode			Capacity priority			
Cooling capacity *1			kW	90.00		
			kcal/h	77,400		
			BTU/h	307,080		
Power input *3			kW	27.27		
Current input 380-400-415V			A	46.0 - 43.7 - 42.2		
Pump input is not included			EER	3.30		
			ESEER	5.66		
Certified value by EUROVENT			EER *4	2.94		
			ESEER *4 *6	4.71		
ESEER (Includes pump input based on EN14511) *4 *7				5.46		
IPLV *8			kW/kW	6.34		
Water flow rate			m³/h	15.5		
Heating capacity *2			kW	90.00		
			kcal/h	77,400		
			BTU/h	307,080		
Power input *3			kW	25.71		
Current input 380-400-415V			A	43.4 - 41.2 - 39.7		
COP (Pump input is not included)				3.50		
COP (Includes pump input based on EN14511) *4				3.25		
Seasonal space heating energy efficiency class for medium-temperature application				A+		
Seasonal space heating energy efficiency class for low-temperature application				A+		
Water flow rate			m³/h	15.5		
Maximum current input			A	61		
Water pressure drop *5			kPa	135		
Temp range			Cooling			
			°C		Outlet water 5-25 *11	
			°F		Outlet water 41-77 *11	
			Heating		°C	Outlet water 30-55 *11
			°F		Outlet water 86-131 *11	
			Outdoor		°C	-15-43 *11
			°F	5-109.4 *11		
Circulating water volume range			m³/h	7.7-25.8		
Sound pressure level (measured in anechoic room) at 1m *1			dB (A)	65		
Sound power level (measured in anechoic room) *1			dB (A)	77		
Diameter of water pipe (Standard piping)			Inlet	50A (2B) housing type joint		
			Outlet	50A (2B) housing type joint		
Diameter of water pipe (Inside header piping)			Inlet	100A (4B) housing type joint		
			Outlet	100A (4B) housing type joint		
External finish			Polyester powder coating steel plate			
External dimension HxWxD			mm	2450 x 2250 x 900		
Net weight			Standard piping	kg (lbs)		
			Inside header piping	1022 (2253)		
Design pressure			R410A	MPa		
			Water	1.0		
Heat exchanger			Water side	Stainless steel plate and copper brazing		
			Air side	Plate fin and copper tube		
Compressor			Type	Inverter scroll hermetic compressor		
			Maker	mitsubishi		
			Starting method	Inverter		
			Quantity	2		
			Motor output	kW		
			Case heater	0.045 x 2		
			Lubricant	MEL32		
Fan			Air flow rate	m³/min		
				L/s		
				cfm		
			Type, Quantity	Propeller fan x 6		
			Starting method	Inverter		
			Motor output	kW		
Protection			High pressure protection	High pres.Sensor & High pres.Switch at 4.15MPa (601psi)		
			Inverter circuit	Over-heat protection, Over current protection		
			Compressor	Over-heat protection		
Refrigerant			Type/GWP *10	R410A/2088		
			Factory charged	Weight		
				kg		
			CO ₂ equivalent *10	12		
			Maximum additional charge	Weight		
				kg		
			CO ₂ equivalent *10	26		
			Total charge	Weight		
				kg		
			CO ₂ equivalent *10	54.29		
				kg		
			CO ₂ equivalent *10	38		
				t		
			CO ₂ equivalent *10	79.37		

Note

- *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB/75.2°FWB) outlet water temp 7°C (44.6°F) inlet water temp 12°C (53.6°F).
- *2 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) inlet water temp 40°C (104°F).
- *3 Pump input is not included.
- *4 Pump is not included in e-series.
- *5 Under normal cooling or heating conditions capacity 90kW, water flow rate 15.5m³/h
- *6 EN14511 standard (2013) formula is applied to figure out this value in case of fixed flow rate operation (flow rate is fixed at any heat load)
Pump input is included in cooling capacity for EER calculation. Condition of water inlet and outlet is fixed at inlet 12°C and outlet 7°C.
- *7 EN14511 standard (2013) formula is applied to figure out this value in case of variable flow rate operation (flow rate varies per heat load).
Pump input is included in cooling capacity for EER calculation.
Condition of water temperature : inlet water temperature varies due to fixed water flow rate and outlet is fixed at outlet 7°C.
- *8 Calculations according to standard performances (in accordance with AHRI 550-590).
- *9 Amount of factory-charged refrigerant is 6 (kg)×2. Please add the refrigerant at the field.
- *10 These values are based on Regulation (EU) No.517/2014.
- *Please don't use the steel material for the water piping.
- *Please always make water circulate, or pull the circulation water out completely when not in use.
- *Please do not use groundwater or well water in direct.
- *The water circuit must be closed circuit.
- *Due to continuous improvement, the above specifications may be subject to change without notice.

*11



Unit converter	
kcal/h	= kW x 860
BTU/h	= kW x 3,412
lbs	= kg/0.4536
cfm	= m³/min x 35.31



Specifications (Heating only model)

Model			EAHV-P900YA-H(-N)(-BS)	
Power source			3-phase 4-wire 380-400-415V 50/60Hz	
Capacity change mode			Capacity priority	COP priority
Heating capacity *1			90.00	63.00
			kcal/h	54,180
			BTU/h	214,956
Power input *2			kW	25.71
Current input 380-400-415V			A	43.4 - 41.2 - 39.7
COP (Pump input is not included)				3.50
COP (Includes pump input based on EN14511) *3				3.25
Seasonal space heating energy efficiency class for medium-temperature application				A+
Seasonal space heating energy efficiency class for low-temperature application				A+
Water flow rate			m³/h	15.5
Maximum current input			A	61
Water pressure drop *5			kPa	135
Temp range			Heating	°C
			°F	Outlet water 30-55 *8
Outdoor			°C	Outlet water 86-131 *8
			°F	-15-43 *8
				5-109.4 *8
Circulating water volume range			m³/h	7.7-25.8
Sound pressure level (measured in anechoic room) at 1m *4			dB (A)	65
Sound power level (measured in anechoic room) *4			dB (A)	77
Diameter of water pipe (Standard piping)			Inlet	50A (2B) housing type joint
			Outlet	50A (2B) housing type joint
Diameter of water pipe (Inside header piping)			Inlet	100A (4B) housing type joint
			Outlet	100A (4B) housing type joint
External finish			Polyester powder coating steel plate	
External dimension HxWxD			mm	2450 x 2250 x 900
Net weight			Standard piping	kg (lbs)
			Inside header piping	987 (2176)
				1022 (2253)
Design pressure			R410A	MPa
			Water	4.15
				1.0
Heat exchanger			Water side	Stainless steel plate and copper brazing
			Air side	Plate fin and copper tube
Compressor			Type	Inverter scroll hermetic compressor
			Maker	MITSUBISHI ELECTRIC CORPORATION
			Starting method	Inverter
			Quantity	2
			Motor output	kW
			Case heater	11.7 x 2
			Lubricant	0.045 x 2
				MEL32
Fan			Air flow rate	m³/min
				77 x 6
				L/s
				1283 x 6
				cfm
				2719 x 6
			Type, Quantity	Propeller fan x 6
			Starting method	Inverter
			Motor output	kW
				0.19 x 6
Protection			High pressure protection	High pres.Sensor & High pres.Switch at 4.15MPa (601psi)
			Inverter circuit	Over-heat protection, Over current protection
			Compressor	Over-heat protection
Refrigerant			Type/GWP *7	R410A/2088
			Factory charged	Weight
				kg
			CO2 equivalent *7	12
				t
				25.08
			Maximum additional charge	Weight
				kg
			CO2 equivalent *7	26
				t
				54.29
			Total charge	Weight
				kg
				38
				t
				79.37

Note.

*1 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) inlet water temp 40°C (104°F).

*2 Pump input is not included.

*3 Pump is not included in e-series.

*4 Under normal heating conditions at outdoor temp 7°CDB/6°CWB (44.6°FDB/42.8°FWB) outlet water temp 45°C (113°F) inlet water temp 40°C (104°F).

*5 Under normal heating conditions capacity 90kW, water flow rate 15.5m³/h

*6 Amount of factory-charged refrigerant is 6 (kg)×2. Please add the refrigerant at the field.

*7 These values are based on Regulation (EU) No.517/2014.

*Please don't use the steel material for the water piping material.

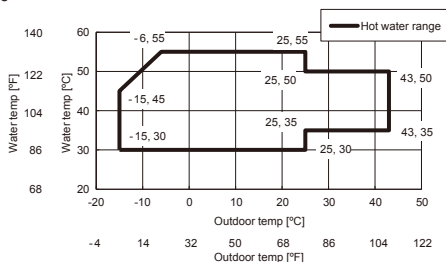
*Please always make water circulate, or pull the circulation water out completely when not in use.

*Please do not use groundwater or well water in direct.

*The water circuit must be closed circuit.

*Due to continuous improvement, the above specifications may be subject to change without notice.

*8

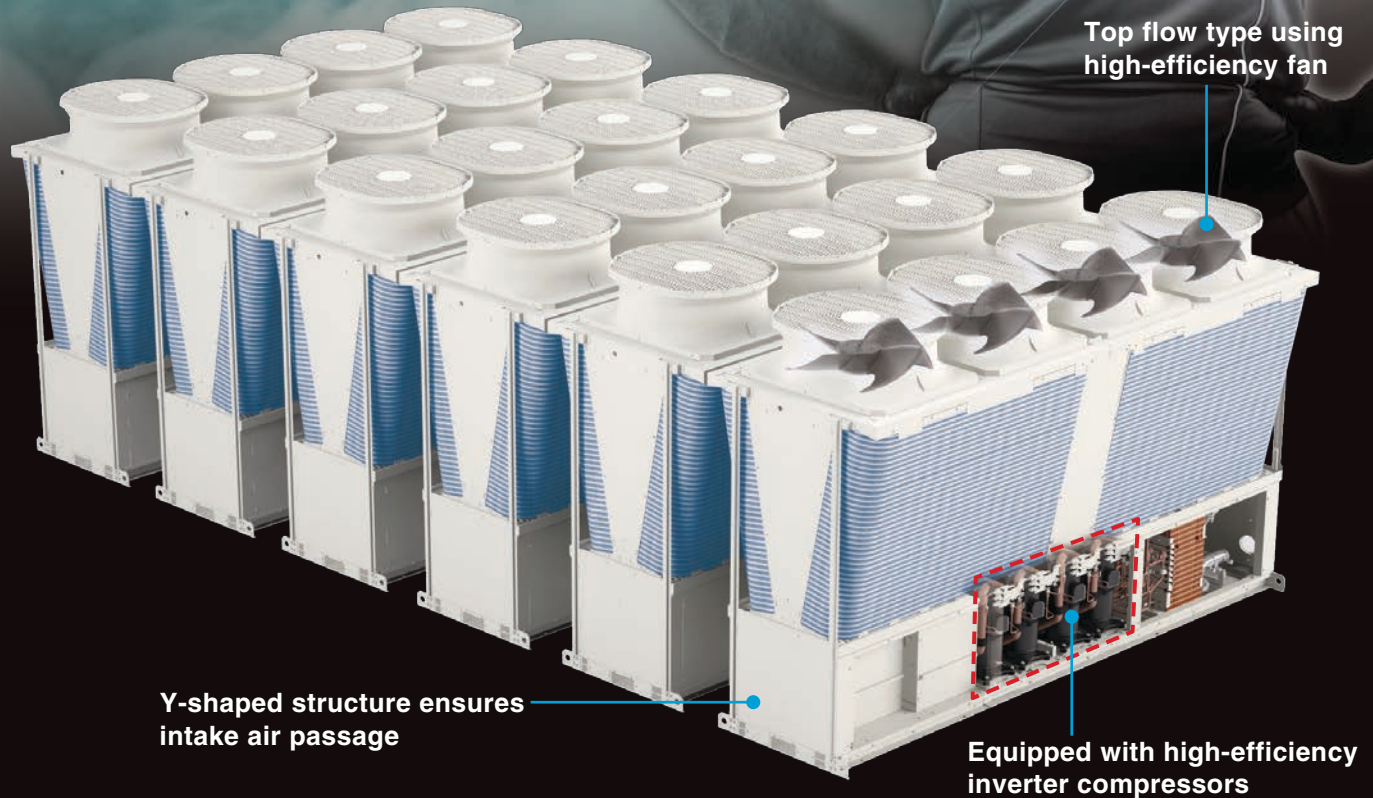


Unit converter	
kcal/h	= kW x 860
BTU/h	= kW x 3,412
lbs	= kg/0.4536
cfm	= m³/min x 35.31

Modular Chiller

P1500/P1800 New

EAHV-P1500YBL EAHV-P1800YBL
EAHV-P1500YBL-H EAHV-P1800YBL-H
EACV-P1500YBL EACV-P1800YBL



1 High energy saving performance by the use of inverter compressors

- High energy-saving performance thanks to high-performance inverter compressor and proprietary Y-shaped construction.

2 High functionality of modular chiller

- Up to 6 units of each module can be connected among 1 group, so capacity can be increased up to 360HP(60HP × 6 units).
- The combination control of modules to compress the capacity of backup.
- Optimum frequency control when connecting multiple units ensures energy savings.
- Emergency operation mode and rotation operation are available.

3 Saving space and construction work

- Inside header series available for space savings and construction savings of piping components.

High energy saving performance

The rated and seasonal energy efficiency ratios have been increased to achieve high energy saving performance.

Rated efficiency

Eurovent efficiency class Rank A achieved*1

Model	EER	COP
P1500	3.19	3.29

* EAHV model

The use of the high-efficiency inverter compressors achieves high energy saving performance. The 50 HP model has cooling EER and heating COP rating corresponding to energy saving class A.

*1 Compliant with EN14511

Seasonal efficiency

Model	SEER
P1500	4.62 ^{*1}
P1800	4.58 ^{*1}

* EAHV model

The use of the high-efficiency inverter compressors ensures optimum operation according to the operation load. The compressors can operate efficiently even during nighttime and intermediate seasons with low load, thereby saving energy throughout the year.

*1 Under normal cooling conditions at outdoor temp 35°DB/24°WB(95°FDB/75.2°FWB) outlet water temp 7°C(44.6°F) inlet water temp 12°C(53.6°F). Pump input is included in cooling capacity and power input based on EN14511.

Key components save energy

By controlling the frequency of the inverter compressors, the rated efficiency and the seasonal efficiency are higher. This achieves optimum energy saving according to the operation load.

Equipped with high-efficiency inverter compressors

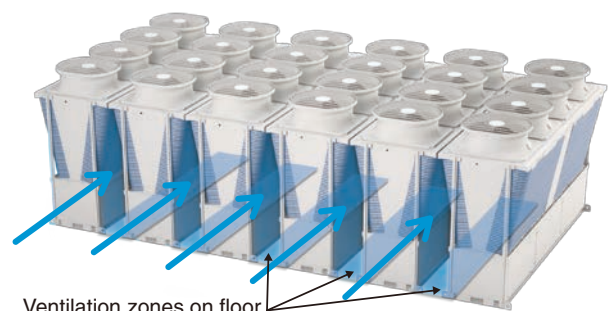
Each module is equipped with four high-efficiency inverter compressors, developed by Mitsubishi Electric. The four compressors operate as two pairs. The inverters observe the load and control the compressors so that they can optimally operate in one module.

The compressors use the IH warmer method. Heat is generated by the magnetic material characteristics of the motor core unit to prevent liquid refrigerant from remaining in the compressor when the unit stops. This reduces standby power when the module is stopped compared to the crankcase heater method.



Unique Y-shaped structure

When the modules are connected, the intake air passages can be ensured on the floor and sides. This structure contributes to effective operation.



High functionality of modular chiller

The capacity among 1 group can be increased to up to 360 HP by combining modules.

- Large-capacity 50 HP and 60 HP modules are increased.

Six 60 HP modules (= 360 HP) can be installed on a floor area of 8.53 m × 5.2 m including the service space.

* Only modules with the same capacity can be combined.



Heat Pump	EAHV-P1500YBL(-N)
Heating Only	EAHV-P1500YBL-H(-N)
Cooling Only	EACV-P1500YBL(-N)

Heat Pump	EAHV-P1800YBL(-N)
Heating Only	EAHV-P1800YBL-H(-N)
Cooling Only	EACV-P1800YBL(-N)

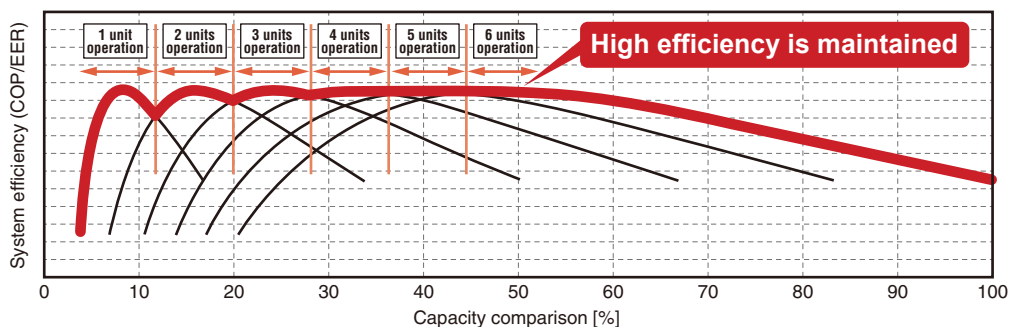
* (-N) indicates an inside header model.



Optimum frequency control for further energy saving

When multiple units are connected, the frequency of each compressor is controlled during operation to increase the efficiency of each unit, achieving high energy saving performance. This control can be implemented by simply connecting to our unique M-NET without needing any other on-site design.

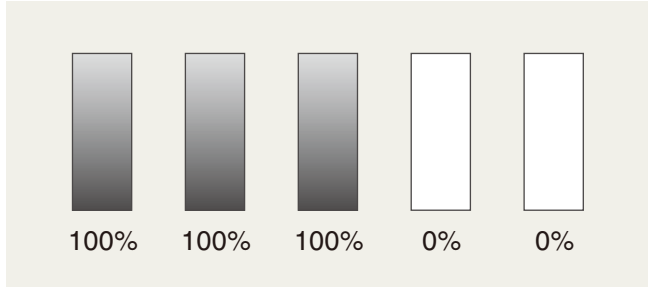
* The following is an example of operation.



When the overall system load is 60%

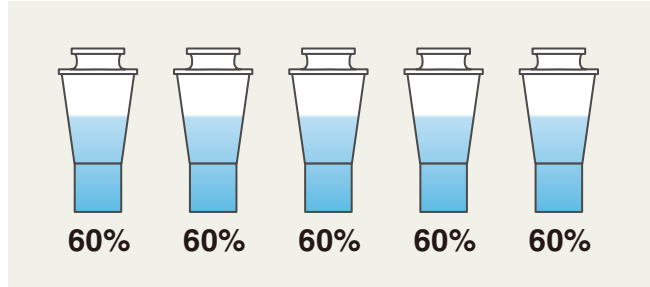
* The following is an example of operation.

Without optimum frequency control



With non-inverter compressors, it is only possible to turn the unit on or off, and the compressor frequency cannot be adjusted according to the required capacity.

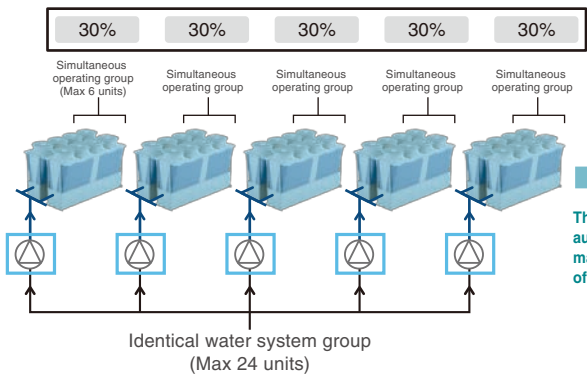
With optimum frequency control



Our modules are equipped with inverter compressors, so the system can be operated in frequency ranges in which the efficiency of each unit is high. Optimum frequency control of each unit increases the efficiency of the whole system.

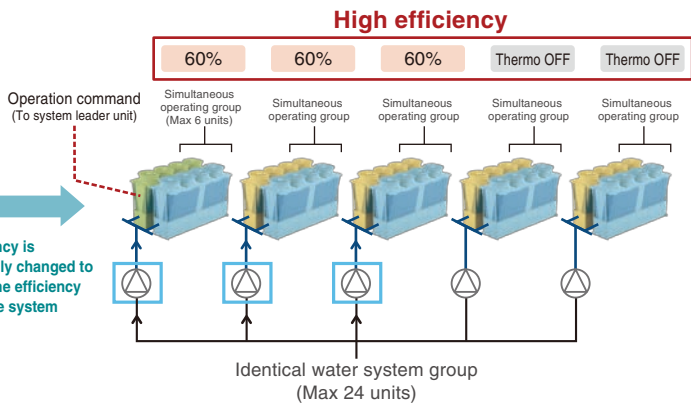
When the overall system load is 30%

Without optimum frequency control



Since the compressors of all groups are running at inefficient frequencies, the efficiency of the whole system lower. In addition, all the pumps are operating becomes with the units, lowering the system efficiency further.

With optimum frequency control



The load of identical water system groups is observed, and the frequency of each group can be controlled to increase the efficiency. As shown in the above image, when the overall system load is 30%, three groups are operated at 60% at which the efficiency of each group is high, and the remaining groups are set to the thermo OFF state. Then, the output of the pumps connected to the remaining group can be decreased, and the efficiency of the whole system can be increased. This control is completed by connecting to M-NET. There is no need to prepare sensors, and the instrumentation is simple.

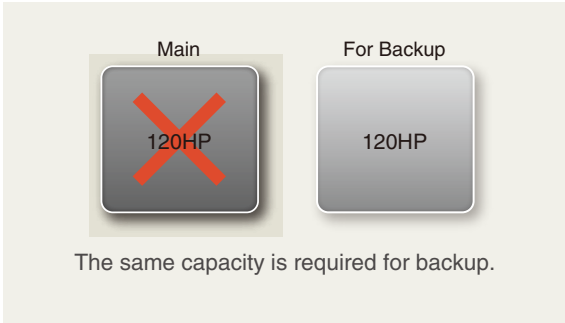


Operation of optimum frequency control

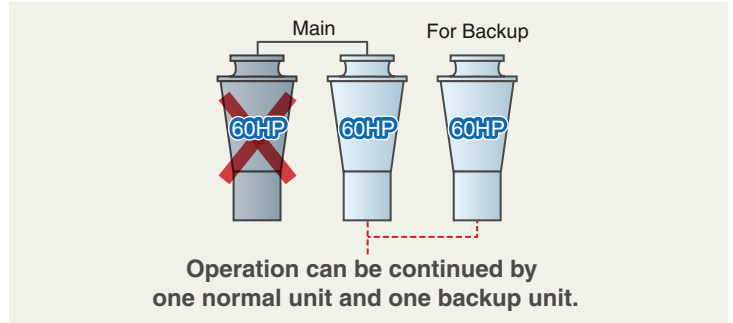
- a) One system leader unit is specified to control the modules in the system.
- b) The board of the system leader unit collects the operating frequency of each module.
- c) The board of the system leader unit calculates the number of running units with which the system can be operated at high efficiency.
- d) The system leader unit transmits the start or stop command to each group leader unit.
- e) Each sub unit starts or stops according to the operation of the group leader unit.

Compression of the capacity of backup

Non-modular chiller



Mitsubishi Electric's modular chiller

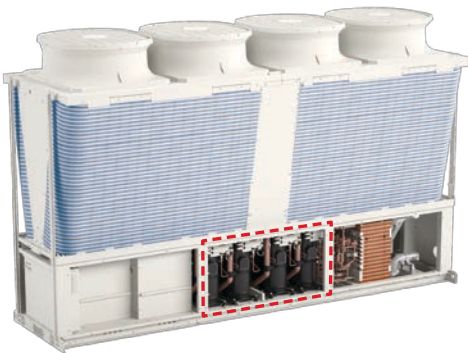


When a non-modular chiller is used as the main 120HP unit, it is required to prepare same capacity as a backup. When Mitsubishi Electric modular chiller is used, two units can be used even if one unit goes down, and the operation can be continued normally. It helps to compress the capacity of backup.

Emergency operation mode

When a single unit

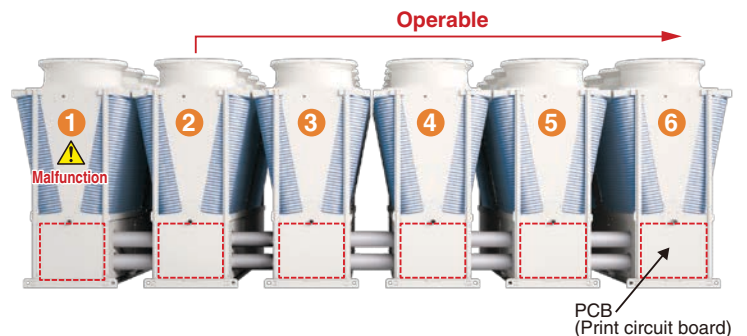
- The unit contains four compressors developed by Mitsubishi Electric.
- The four compressors operate as two pairs. If something is wrong with one of the two pairs, the other pair (2 compressors) can temporarily continue to operate.



When multiple units

- If one of the units goes down, the remaining units can continue to operate. Each unit has a function for independently controlling the outlet water temperature. Even if the main unit goes down, operation can be continued.

* Units that have been stopped by thermo OFF before the main unit goes down are kept in the thermo OFF mode.



Rotation operation

When multiple modules are installed, the operating time of each module in the same system can be equalized according to the load of the whole system.



Saving space and installation saving

Selectable piping system

Standard piping and built-in header types are available. The optimum type can be selected according to the design and construction needs of the building.

Lineup

Standard piping type

Type without built-in pump or header

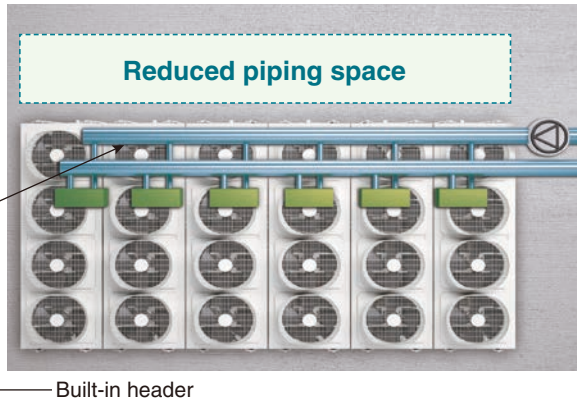


Advantages

The flexibility of design is high, and it is possible to select the most suitable number of pumps and water circuit for the on-site system.

Built-in header type (models with "-N" in the name only)

Type of built-in header piping for connection between modules



Advantages

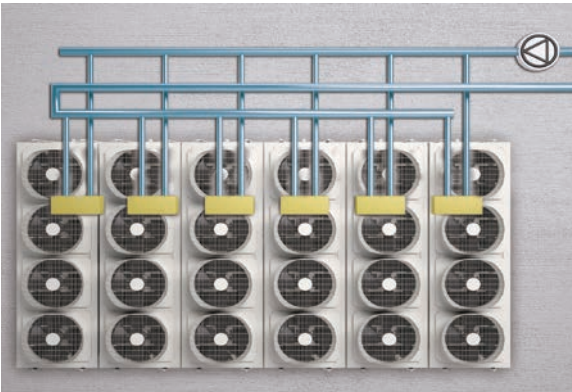
The piping space and number of connections are reduced, allowing simple construction and short construction times.

* It is not possible to build both the pump and the header in each module.

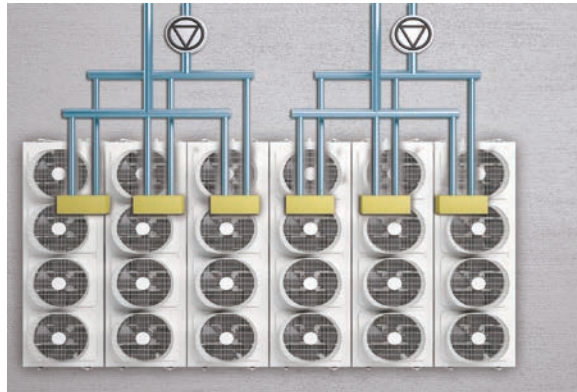
Standard piping type

The flexibility of design is high, and the system can be designed according to the on-site system and load pattern. Up to 24 units (4 groups x 6 units) can be connected to one system. The number of pumps and the piping structure can be designed according to the on-site.

<System with 6 chillers and one pump>



<System with 6 chillers and 2 pumps>



■ Built-in header type

(models with "-N" in the name only)

The piping to connect to other units is built into each unit. The number of piping connections is reduced (saving construction work and reducing the construction time), and the installation space can be also reduced.

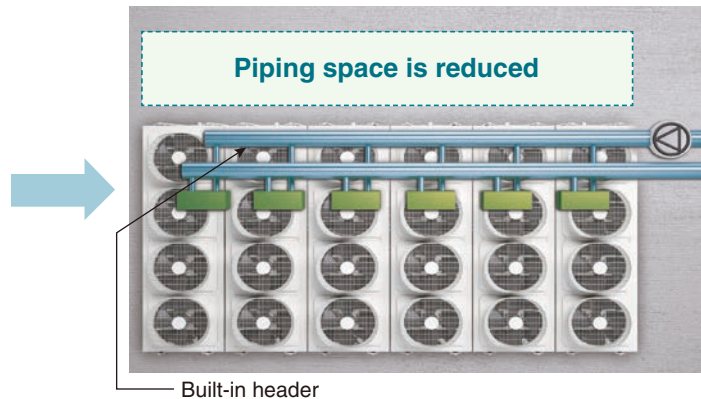
Space saving

Construction saving

<Standard piping construction>

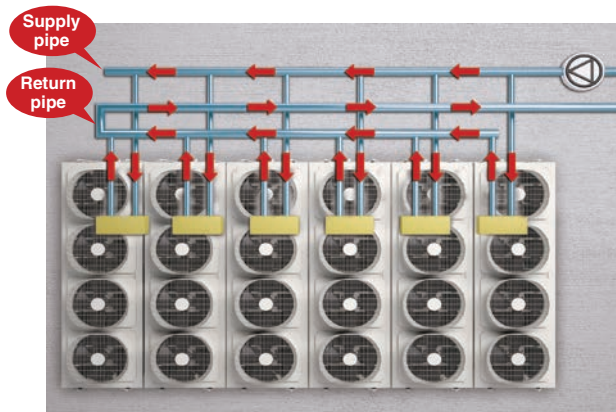


<Built-in header type>



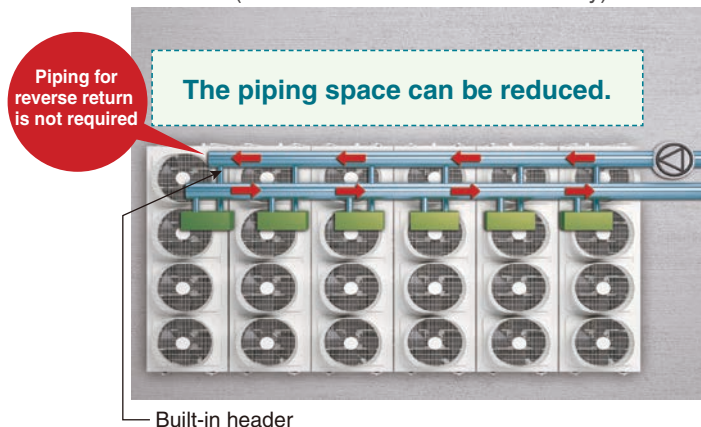
Space for return piping is not required

<Standard piping construction>



<Built-in header type>

(models with "-N" in the name only)



With standard piping construction, the customer must determine and design the return piping.

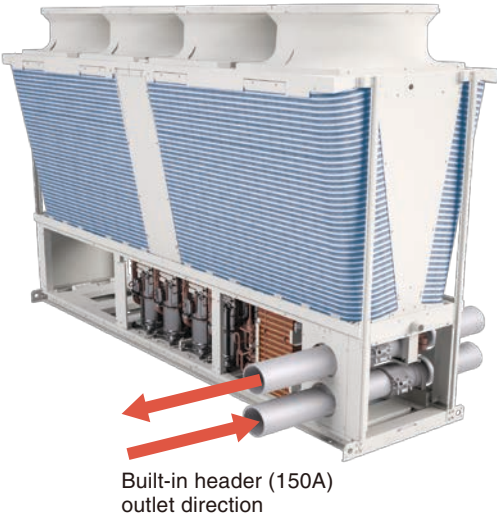
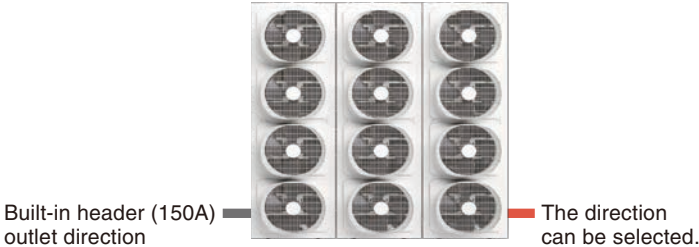
The supply pipe and return pipe of each module must have the same overall length and piping resistance to keep a balance among the flow rates to the modules. Therefore, piping space and equipment costs are required.

For the built-in header type, the size of the piping from the pump is increased, so that water pressure to the modules can be maintained stably regardless of the distance from the pump. It is unnecessary to prepare the piping for reverse return.

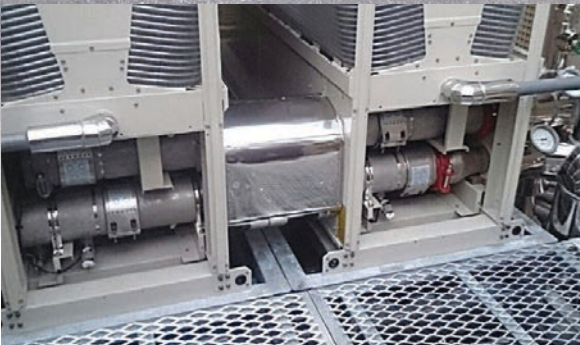
The piping space and equipment cost are reduced, because the modules are supplied with built-in piping.

Details of built-in header type modules

Up to six units with built-in headers can be connected. (Piping size: 150A)
When 6 units or a less are connected, flow adjustment and reverse return piping for each unit are unnecessary.



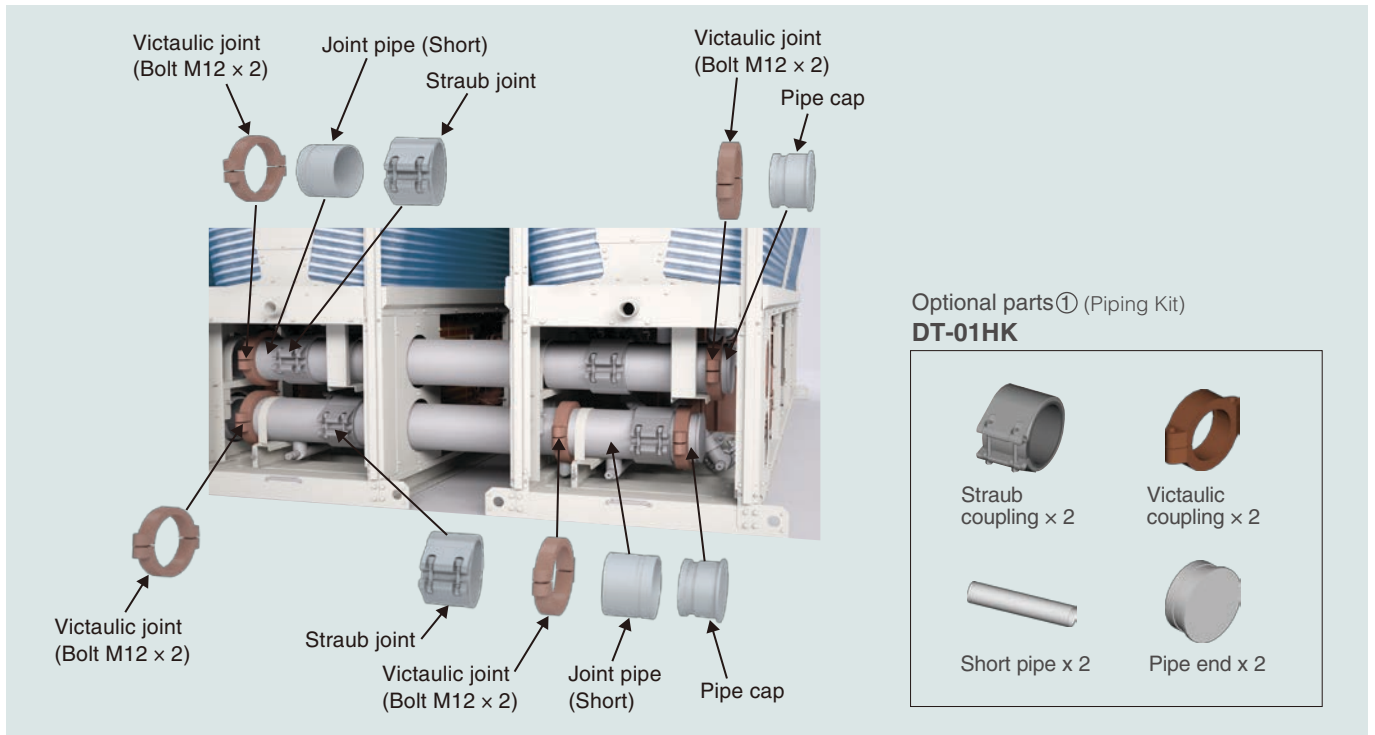
Example of construction for built-in header type modules



* Heat insulation of the connection piping between units must be applied on site.

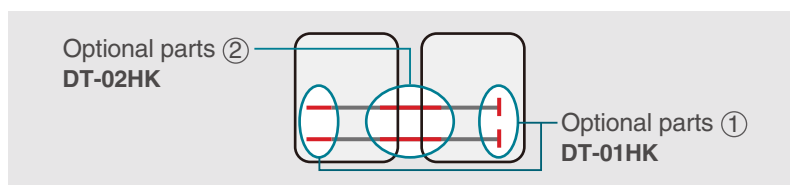
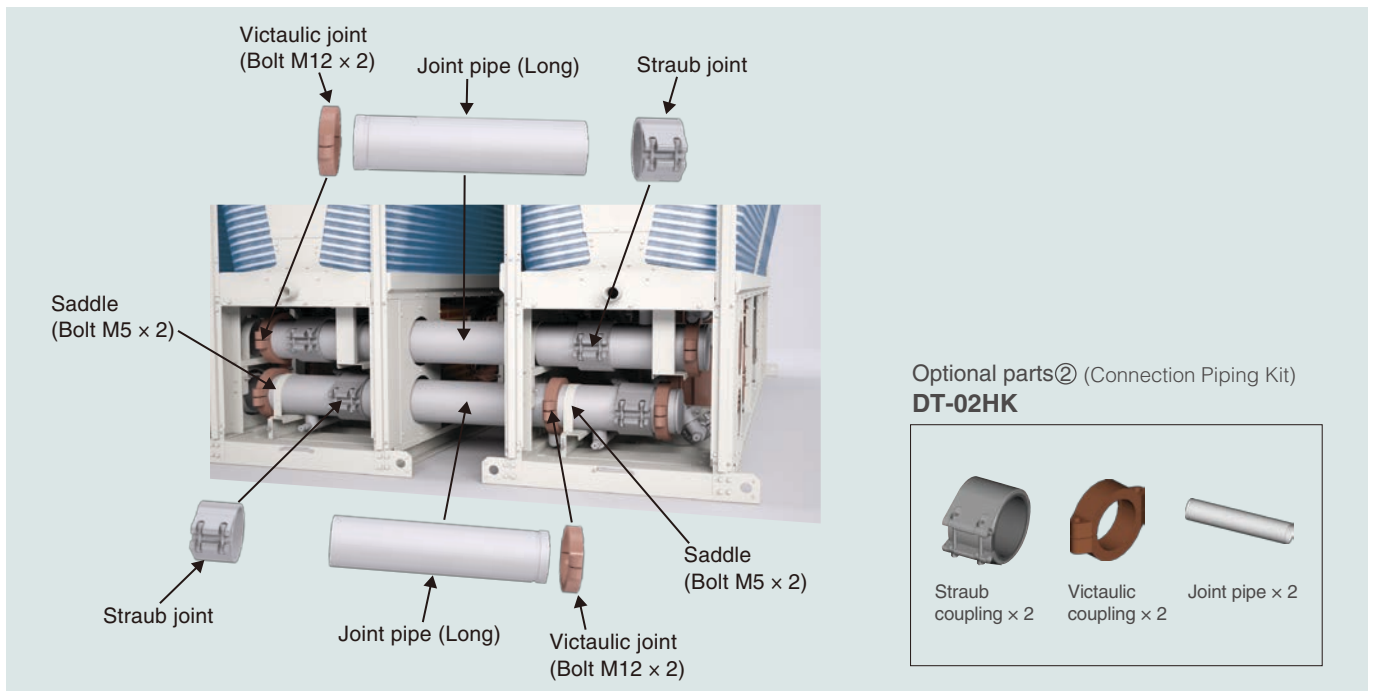
Procedure for installing the connection kit

Installation of end connection kit (DT-01HK, excluding panels)



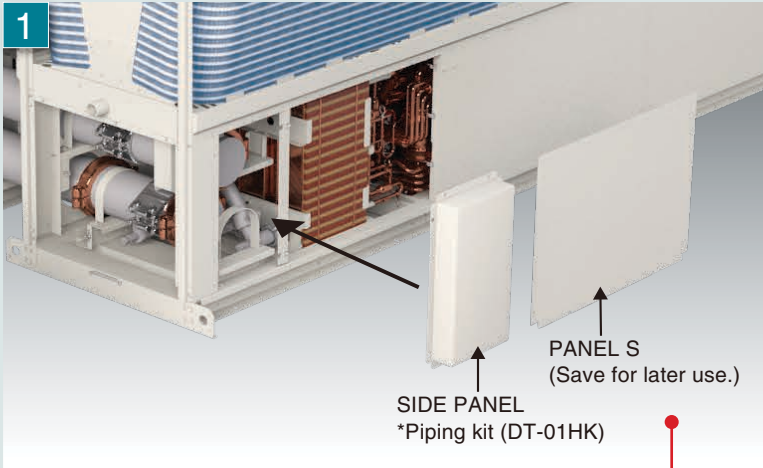
Installation of connection kit (DT-02HK, excluding panels)

* Please remove the panels before installing the connection kit.

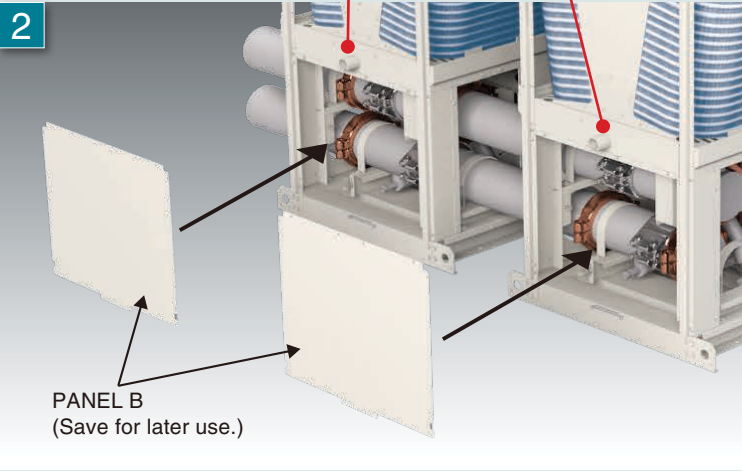
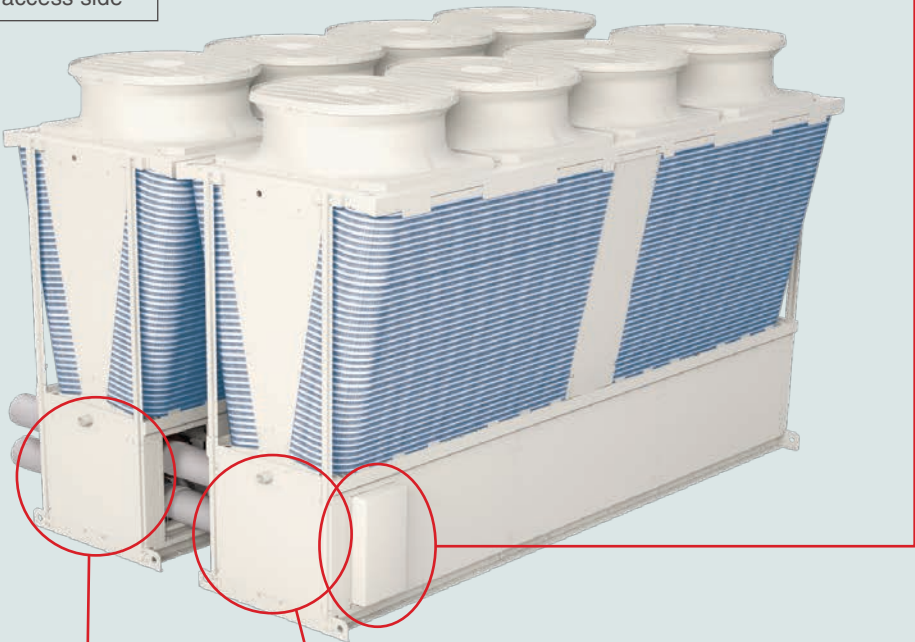


Installation of panels

- 1 Install the panels on the pipe cat.
* Note: Install panel S and then the closing panel.
- 2 Install panel B.



Seen from the opposite side of the maintenance access side



Control information

* P1500, P1800 models cannot connect to AE-200E/A, EW-50E/A.

Remote controller

You can perform basic operations, such as starting, stopping, mode switching, water temperature setting and schedule setting, by connecting a remote controller.



● Major functions

Operation/setting	ON/OFF
	Cooling/Heating/HeatingECO/Anti-freeze
	Snow/regular
	Demand
	Scheduled operation (daily/weekly)
Display	Operation mode
	Current water temperature
	Error code
Control function (function of chiller body)	Control of number of units
	Control to prevent simultaneous defrosting

External signal input

Basic operations, such as starting, stopping, mode switching and water temperature setting, can be performed by inputting external signals directly to the chiller body.

* Optional products, such as remote controllers, are not always required.



● Major functions

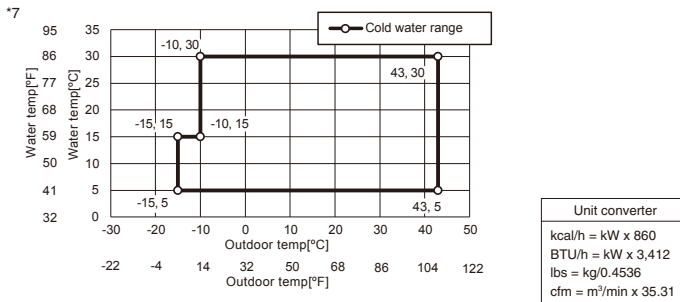
Input	ON/OFF
	Cooling/Heating
	Snow/regular
	Demand
	Target water temperature
Output	Operation mode
	Under operation
	Under defrosting
	Error
Control function (function of chiller)	Control of number of units
	Control to prevent simultaneous defrosting

Specifications (Cooling only model)

Model		EACV-P1500YBL(-N)(-BS)	EACV-P1800YBL(-N)(-BS)	
Power source		3-phase 4-wire 380-400-415V 50/60Hz		
Cooling capacity *1		kW	150.00	
		kcal/h	129,000	
		BTU/h	511,800	
	Power input	kW	45.10	
	EER		3.33	
	IPLV *5		6.55	
Cooling capacity(EN14511) *2	Water flow rate	m ³ /h	25.8	
		kW	148.58	
		kcal/h	127,779	
		BTU/h	506,955	
	Power input	kW	46.52	
	EER		3.19	
	Eurovent efficiency class		A	
	ESEER *6		4.74	
	SEER		4.62	
	Water flow rate	m ³ /h	25.8	
Current input	Cooling current 380-400-415V *1	A	77 - 73 - 70	
	Maximum current	A	111	
Water pressure drop *1		kPa	114	
Temp range	Cooling	°C	Outlet water 5-30 *7	
		°F	Outlet water 41-86 *7	
	Outdoor	°C	-15-43 *6	
		°F	5-109.4 *6	
Circulating water volume range		m ³ /h	12.9-34.0	
Sound pressure level (measured in anechoic room) at 1m *1		dB (A)	66	
Sound power level (measured in anechoic room) *1		dB (A)	84	
Diameter of water pipe (Standard piping)	Inlet	mm (in)	65A (2 1/2B) housing type joint	
	Outlet	mm (in)	65A (2 1/2B) housing type joint	
Diameter of water pipe (Inside header piping)	Inlet	mm (in)	150A (6B) housing type joint	
	Outlet	mm (in)	150A (6B) housing type joint	
External finish			Polyester powder coating steel plate	
External dimension HxWxD		mm	2350 x 3400 x 1080	
Net weight	Standard piping	kg (lbs)	1240 (2734)	
	Inside header piping	kg (lbs)	1256 (2769)	
Design pressure	R410A	MPa	4.15	
	Water	MPa	1.0	
Heat exchanger	Water side		Stainless steel plate and copper brazing	
	Air side		Plate fin and copper tube	
Compressor	Type		Inverter scroll hermetic compressor	
	Maker		MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Quantity		4	
	Motor output	kW	11.7 x 4	
	Lubricant		MEL32	
Fan	Air flow rate	m ³ /min	265 x 4	
		L/s	4417 x 4	
		cfm	9357 x 4	
	Type, Quantity		Propeller fan x 4	
	Starting method		Inverter	
Motor output	kW	0.94 x 4		
Protection	High pressure protection		High pres.Sensor & High pres.Switch at 4.15MPa (601psi)	
	Inverter circuit		Over-heat protection, Over current protection	
	Compressor		Over-heat protection	
Refrigerant *3	Type / GWP *4		R410A / 2088	
	Factory charged	Weight	kg	12.0
		CO ₂ equivalent *4	t	25.06
	Maximum additional charge	Weight	kg	48.0
		CO ₂ equivalent *4	t	100.23
	Total charge	Weight	kg	60.0
CO ₂ equivalent *4		t	125.29	
Control			LEV	

Note.

- *1 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB(95°FDB/75.2°FWB) outlet water temp 7°C(44.6°F) inlet water temp 12°C(53.6°F). Pump input is not included in cooling capacity and power input.
- *2 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB(95°FDB/75.2°FWB) outlet water temp 7°C(44.6°F) inlet water temp 12°C(53.6°F). Pump input is included in cooling capacity and power input based on EN14511.
- *3 Amount of factory-charged refrigerant is 3(kg) x 4. Please add the refrigerant at the field.
- *4 These values are based on Regulation(EU) No.517 / 2014.
- *5 IPLV is calculated in accordance with AHRI 550-590.
- *6 ESEER is calculated in accordance with EUROVENT conditions.
- *Please don't use the steel material for the water piping.
- *Please always make water circulate, or pull the circulation water out completely when not in use.
- *Please do not use groundwater or well water in direct.
- *The water circuit must be closed circuit.
- *Due to continuous improvement, the above specifications may be subject to change without notice.
- *This model doesn't equip with a pump.



Specifications (Heatpump model)

Model				EAHV-P1500YBL(-N)(-BS)	EAHV-P1800YBL(-N)(-BS)		
Power source				3-phase 4-wire 380-400-415V 50/60Hz			
Cooling capacity *1	Power input	kW		150.00	180.00		
		kcal/h		129,000	154,800		
		BTU/h		511,800	614,160		
		EER		3.33	3.05		
		IPLV *7		6.55	6.33		
Cooling capacity(EN14511) *2	Power input	kW		148.58	177.76		
		kcal/h		127,779	152,874		
		BTU/h		506,955	606,517		
		EER		3.19	2.90		
		Eurovent efficiency class		A	B		
Heating capacity *3	Power input	kW		150.00	180.00		
		kcal/h		129,000	154,800		
		BTU/h		511,800	614,160		
		COP		3.36	3.23		
		Water flow rate	m ³ /h		25.8	31.0	
Heating capacity(EN14511) *4	Power input	kW		151.42	182.24		
		kcal/h		130,221	156,726		
		BTU/h		516,645	621,803		
		COP		4.61	57.92		
		Eurovent efficiency class		A	B		
Current input	Cooling current 380-400-415V *1	A		77 - 73 - 70			
		Heating current 380-400-415V *3	A		76 - 72 - 69		
			Maximum current	A		111	
Temp range	Cooling	°C		Outlet water 5-30 *9			
		°F		Outlet water 41-86 *9			
	Heating	°C		Outlet water 30-55 *9			
		°F		Outlet water 86-131 *9			
	Outdoor	°C		-15-43 *9			
	°F		5-109.4 *9				
Circulating water volume range				m ³ /h			
Sound pressure level (measured in anechoic room) at 1m *1				dB (A)			
Sound power level (measured in anechoic room) *1				dB (A)			
Diameter of water pipe (Standard piping)	Inlet	mm (in)		65A (2 1/2B) housing type joint			
		mm (in)		65A (2 1/2B) housing type joint			
	Outlet	mm (in)		150A (6B) housing type joint			
		mm (in)		150A (6B) housing type joint			
External finish				Polyester powder coating steel plate			
External dimension HxWxD				mm			
Net weight	Standard piping	kg (lbs)		1310 (2888)			
		kg (lbs)		1326 (2923)			
		MPa		4.15			
Design pressure	Water	MPa		1.0			
Heat exchanger	Water side			Stainless steel plate and copper brazing			
		Air side		Plate fin and copper tube			
Compressor	Type			Inverter scroll hermetic compressor			
	Maker			MITSUBISHI ELECTRIC CORPORATION			
	Starting method			Inverter			
	Quantity			4			
	Motor output	kW		11.7 x 4			
	Lubricant			MEL32			
Fan	Air flow rate	m ³ /min		265 x 4			
		L/s		4417 x 4			
		cfm		9357 x 4			
	Type, Quantity			Propeller fan x 4			
	Starting method			Inverter			
Protection	Motor output	kW		0.92 x 4			
Refrigerant *5	Type / GWP *6	Weight	kg		12.0		
			t		25.06		
			Maximum additional	kg		48.0	
				t		100.23	
				kg		60.0	
Total charge	CO ₂ equivalent *6	t		125.29			
				LEV			

Note.

- *1 Under normal cooling conditions at outdoor temp 35°DB/24°WB(95°FDB/75.2°FWB) outlet water temp 7°C(44.6°F) inlet water temp 12°C(53.6°F). Pump input is not included in cooling capacity and power input.
- *2 Under normal cooling conditions at outdoor temp 35°DB/24°WB(95°FDB/75.2°FWB) outlet water temp 7°C(44.6°F) inlet water temp 12°C(53.6°F). Pump input is included in cooling capacity and power input based on EN14511.
- *3 Under normal heating conditions at outdoor temp 7°DB/6°WB(44.6°FDB/42.8°FWB) outlet water temp 45°C(113°F) inlet water temp 40°C(104°F). Pump input is not included in heating capacity and power input.
- *4 Under normal heating conditions at outdoor temp 7°DB/6°WB(44.6°FDB/42.8°FWB) outlet water temp 45°C(113°F) inlet water temp 40°C(104°F). Pump input is included in heating capacity and power input based on EN14511.
- *5 Amount of factory-charged refrigerant is 3(kg) x 4. Please add the refrigerant at the field.

*6 These values are based on Regulation(EU) No.517 / 2014.

*7 IPLV is calculated in accordance with AHRI 550-590.

*8 ESEER is calculated in accordance with EUROVENT conditions.

*Please don't use the steel material for the water piping.

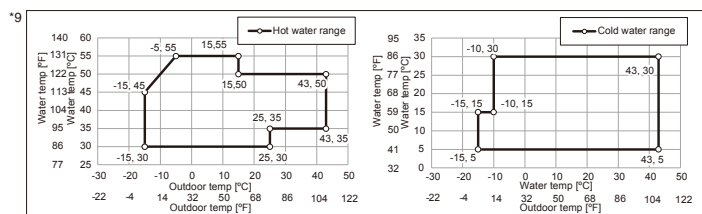
*Please always make water circulate, or pull the circulation water out completely when not in use.

*Please do not use groundwater or well water in direct.

*The water circuit must be closed circuit.

*Due to continuous improvement, the above specifications may be subject to change without notice.

*This model doesn't equip with a pump.



Unit converter	
kcal/h = kW x 860	
BTU/h = kW x 3,412	
lbs = kg/0.4536	
cfm = m ³ /min x 35.31	

Specifications (Heating only model)

Model		EAHV-P1500YBL-H(-N)(-BS)	EAHV-P1800YBL-H(-N)(-BS)	
Power source		3-phase 4-wire 380-400-415V 50/60Hz		
Heating capacity *1		kW	150.00	
		kcal/h	129,000	
		BTU/h	511,800	
	Power input	kW	44.59	
	COP		3.36	
Heating capacity(EN14511) *2	Water flow rate	m³/h	25.8	
		kW	151.42	
		kcal/h	130,221	
		BTU/h	516,645	
	Power input	kW	46.01	
COP			3.29	
Eurovent efficiency class		A	B	
SCOP(Heating only) Low/Medium		3.20 / 2.83		
Water flow rate		m³/h	25.8	
Heating current 380-400-415V *1		76 - 72 - 69		
Maximum current		111		
Water pressure drop *1		114		
Temp range	Cooling	°C	Outlet water 30-55 *5	
		°F	Outlet water 86-131 *5	
	Outdoor	°C	-15-43 *4	
		°F	5-109.4 *4	
Circulating water volume range		m³/h		
Sound pressure level (measured in anechoic room) at 1m *1		dB (A)		
Sound power level (measured in anechoic room) *1		dB (A)		
Diameter of water pipe (Standard piping)	Inlet	65A (2 1/2B) housing type joint		
	Outlet	65A (2 1/2B) housing type joint		
Diameter of water pipe (Inside header piping)	Inlet	150A (6B) housing type joint		
	Outlet	150A (6B) housing type joint		
External finish		Polyester powder coating steel plate		
External dimension HxWxD		mm		
Net weight	Standard piping	2350 x 3400 x 1080		
	Inside header piping	1310 (2888)		
Design pressure	R410A	1.5		
	Water	MPa		
Heat exchanger	Water side	Stainless steel plate and copper brazing		
	Air side	Plate fin and copper tube		
Compressor	Type	Inverter scroll hermetic compressor		
	Maker	MITSUBISHI ELECTRIC CORPORATION		
	Starting method	Inverter		
	Quantity	4		
	Motor output	kW	11.7 x 4	
	Lubricant		MEL32	
Fan	Air flow rate	m³/min	265 x 4	
		L/s	4417 x 4	
		cfm	9357 x 4	
	Type, Quantity	Propeller fan x 4		
	Starting method	Inverter		
Protection	Motor output	kW	0.94 x 4	
	High pressure protection	High pres.Sensor & High pres.Switch at 4.15MPa (601psi)		
	Inverter circuit	Over-heat protection, Over current protection		
Refrigerant *3	Type / GWP *4		R410A / 2088	
	Factory charged	Weight	kg	12.0
		CO2 equivalent *4	t	25.06
	Maximum additional	Weight	kg	48.0
		CO2 equivalent *4	t	100.23
	Total charge	Weight	kg	60.0
		CO2 equivalent *4	t	125.29
Control		LEV		

Note.

*1 Under normal heating conditions at outdoor temp 7°CDB/6°CWB(44.6°FDB/42.8°FWB) outlet water temp 45°C(113°F) inlet water temp 40°C(104°F). Pump input is not included in heating capacity and power input.

*2 Under normal heating conditions at outdoor temp 7°CDB/6°CWB(44.6°FDB/42.8°FWB) outlet water temp 45°C(113°F) inlet water temp 40°C(104°F). Pump input is included in heating capacity and power input based on EN14511.

*3 Amount of factory-charged refrigerant is 3(kg) x 4. Please add the refrigerant at the field.

*4 These values are based on Regulation(EU) No.517 / 2014.

*Please don't use the steel material for the water piping.

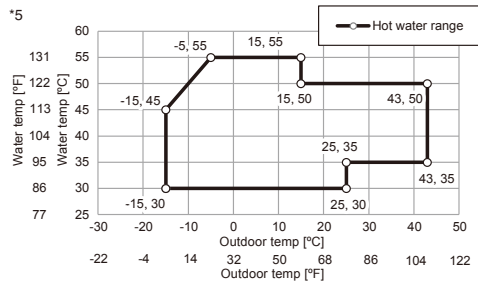
*Please always make water circulate, or pull the circulation water out completely when not in use.

*Please do not use groundwater or well water in direct.

*The water circuit must be closed circuit.

*Due to continuous improvement, the above specifications may be subject to change without notice.

*This model doesn't equip with a pump.



Unit converter	
kcal/h	= kW x 860
BTU/h	= kW x 3,412
lbs	= kg/0.4536
cfm	= m³/min x 35.31



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

⚠ Warning

- Do not use refrigerant other than the type indicated in the manuals provided with the unit and on the nameplate.
 - Doing so may cause the unit or pipes to burst, or result in explosion or fire during use, repair, or at the time of disposal of the unit.
 - It may also be in violation of applicable laws.
 - MITSUBISHI ELECTRIC CORPORATION cannot be held responsible for malfunctions or accidents resulting from the use of the wrong type of refrigerant.
- Our air-cooled Chilling Units contain a fluorinated greenhouse gas, R410A (GWP:2088). This GWP value is based on Regulation (EU) No. 517/2014 from IPCC 4th edition. In case of Regulation (EU) No. 626/2011 from IPCC 3rd edition, this is as follows. R410A (GWP:1975)

For more information, please visit www.mitsubishi-electric.co.nz or call our Customer Service Team on **0800 784 382**



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