Applied Hydronic systems

ME-series
Modular Chillers and heat pumps

Formidable.
In every aspect.

NEW

ME-series R32

EUROVENT CERTIFIED PERFORMANCE

Air source chillers and reversible heat pumps with Mitsubishi Electric variable speed scroll compressors and R32 low GWP refrigerant.
From 50 to 220 kW.

MECH-iS-G07 | MEHP-iS-G07

1 2 3 4 5 | 1 2 3 4 5

Brand	1	**ME** - Mitsubishi Electric
Unit type	2	**CH** - Chiller unit **HP** - Heat pump unit
Technology	3	**i** - Inverter driven
Compressor type	4	**S** - Scroll
Refrigerant	5	

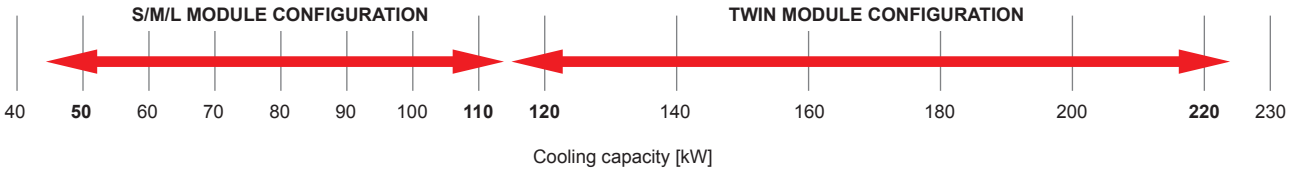
NEW

MECH-iS-G07 and MEHP-iS-G07 are the new Mitsubishi Electric chiller and heat pump ranges designed with the utmost care in terms of quality and details. Dedicated to different applications, from comfort to industrial or IT cooling processes, MECH-iS-G07 and MEHP-iS-G07 achieve top-level energy efficiencies, in the most compact footprints in their category.

Extended range

7 new sizes developed in 3 compact modules to fit any thermal load request up to 110 kW, extendable up to 220 kW through the optional twin module configuration, the connection of two modules of the same size.

CAPACITY RANGE



S MODULE
50 / 60 / 70 kW

M MODULE
80 / 90 kW

L MODULE
100 / 110 kW

Key technologies

Electrical Control Box

W3000+ control software, available with standard keyboard or touch screen, features proprietary settings, to perfectly manage each single product dynamic.

Compact keyboard (STD)

7 inch touch screen
(opt.)

KIPLink (opt.)
Full access by simply scanning the QR code

Complete Hydronic Kit Options

Factory-installed several pumps (with VPF options) and buffer tank (opt.)

Slingle-head in-line pump

Twin-head in-line pump

Source side heat exchanger

V-shape micro-channel coils for chillers and Cu/Al coils for heat pumps with several optional coil types and treatments available.

Complete Fan assembly

with high-efficiency EC fans as std

Inverter scroll compressors

with acoustical enclosure as std

Fans & Compressors' drivers

EMI filters and DC reactors included

Mitsubishi Electric quality

MECH-iS-G07 and MEHP-iS-G07 ranges have been perfectly designed to achieve the highest quality standards, adopting the Japanese Poka Yoka technique.

Poka-yoke

The 'Zero Defects' idea

Poka Yoke is a Japanese term that means "mistake-proofing" approach applied on the equipment manufacturing processes. This implies activities that help an equipment operator avoid (yokeru) mistakes (poka) and defects, and the selection of technological choices that make maintenance activities as easy as possible.

Scroll compressor

- Proprietary Mitsubishi Electric compressor
- VSD compressor with BLDC motor for outstanding seasonal efficiencies
- Motor's shape designed to reduce vibrations and to assure the lowest sound power emissions
- Injection gas refrigerant into compressor with medium temperature for increased capacity and efficiency
- All rotating parts are designed to guarantee absolute reliability in every operating condition
- Unrivalled operating map to suit every kind of application: Comfort, Process or IT Cooling without any limitation

SCROLL COMPRESSOR

COMPRESSOR CONFIGURATIONS

i = inverter

S MODULE

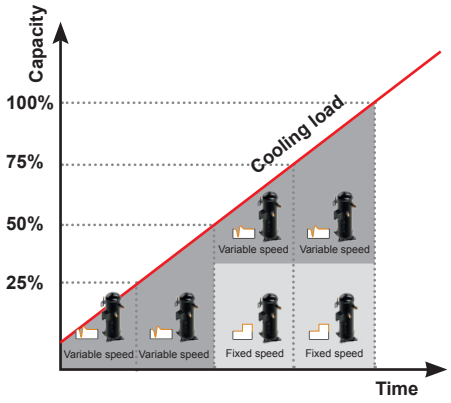
1+i = 1 x inverter
1 x on/off

M MODULE

1+i = 1 x inverter
1 x on/off

L MODULE

VSD single-compressor or **VSD solution (1+i) tandem configuration,** Mitsubishi Electric proprietary technology

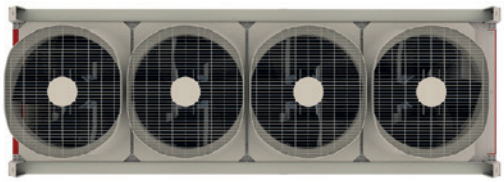


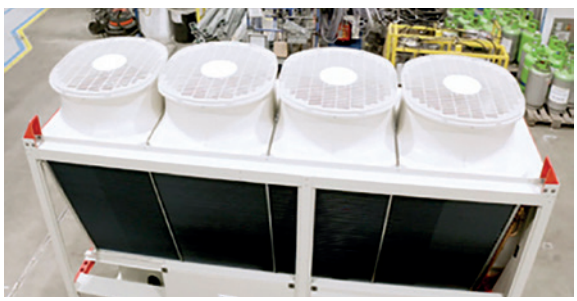
- High seasonal efficiency
- Stable leaving water temperature
- Continuous capacity modulation
- Perfect and accurate load delivery in all working conditions

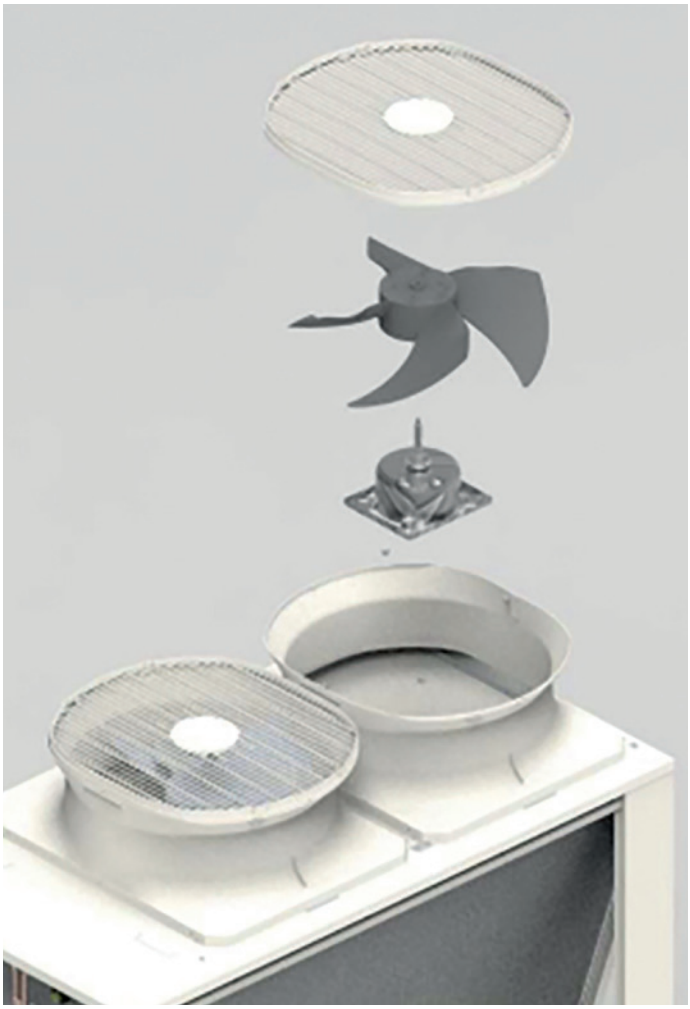
Axial fan

High performing, 700mm-diameter variable speed axial fans (with inverter driven BLDC motor).
Fan, fan motor, inverter and the layout of the external bell mouth are Mitsubishi proprietary technologies, for the highest efficiency and very low sound power levels.
High-end-components designed to achieve very high efficiencies, minimizing the sound level of the unit.
POKA-YOKE Philosophy: smart design in order to avoid mistakes during assembly operations and to simplify maintenance operations. Quick couplers for fans for an easier and quick connection.

AXIAL FAN







Why R32?

MECH-iS-G07 and MEHP-iS-G07 with R32 refrigerant are key in the company's path towards the creation of a greener future

The reduced GWP level of this refrigerant gas tackles both direct and indirect global warming, offering customers a concrete forward-looking solution for your building and a concrete alternative to traditional refrigerants.

R32

Low GWP
-66% GWP vs R410A

Safety Class A2L

Reduced Environmental Impact

- ODP - Ozone Depletion Potential
- One-third GWP that R410A
- F-Gasphasedown compliant

Performance & Envelope

- Ideal for the next generation of equipment
- Requires less refrigerant volume per kW
- High refrigeration and thermal conductivity
- Low pressure drops
- Affordable and readily available

Reliability

- Easy to handle, reuse, and recycle
- Low toxicity, low flammability
- A single component refrigerant

Designed down to a fine art

Groundbreaking performance. Especially in partial load

A

MECH-iS-G07 and MEHP-iS-G07 bring brilliant performance, particularly in partial load conditions, thus helping individuals and business reduce the energy bill of their HVAC system.

MECH-iS-G07			
up to	**EER:** 3.3	**SEER:** 5.6	**SEPR HT:** 6.5

EER – conditions: evap. 12/7 C, air 35 C – NET values [EN14511 – EN14825]
SEER – Regulation (EU) N.2281/2016
SEPR-HT – Regulation (EU) N.2281/2016

MEHP-iS-G07				
up to	**COP:** 3.4	**SEER:** 4.6	**SCOP LT:** 4.6	**SCOP MT:** 3.5

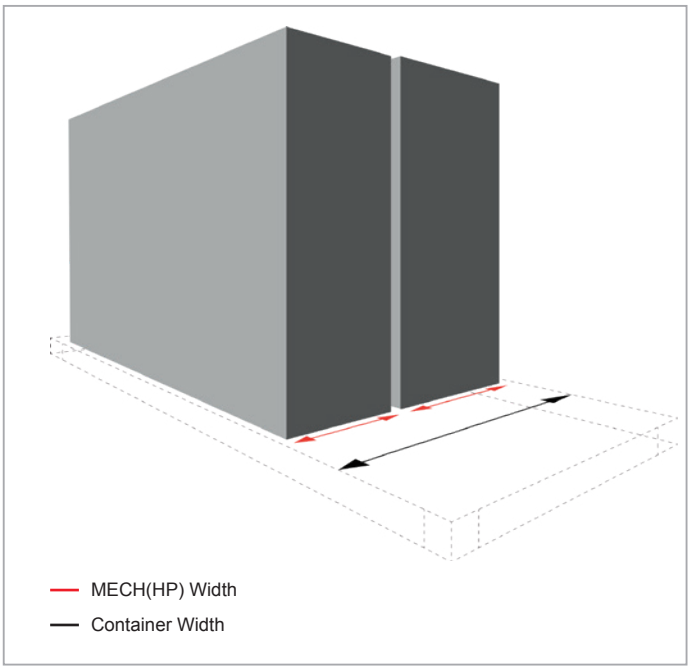
COP – conditions: cond. 40/45 C, air 7(6) C – NET values [EN14511 – EN14825]
SCOP LT – Regulation (EU) N.813/2013
SCOP MT – Regulation (EU) N.813/2013

Supreme class quietness

Best-in-class sound levels without additional accessories. MECH-iS-G07 and MEHP-iS-G07 units are equipped as standard with the acoustical enclosure for compressors and hydronic kits.

Best-in-class footprint

Extremely compact footprint, among the best in the category. The reduced width of the units is ideal for multi-unit transportation, optimizing the shipping spaces and shipment via container.

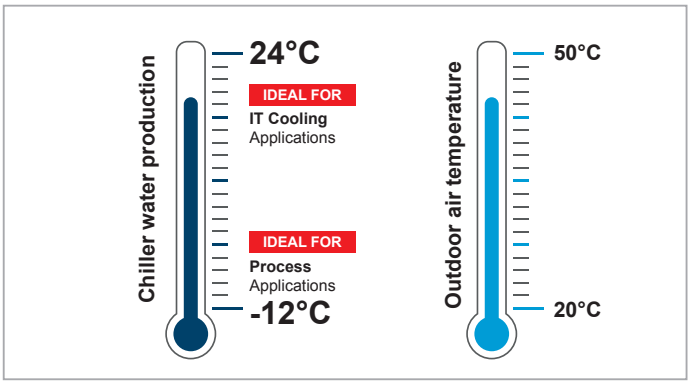


Wide operating range

Going beyond ordinary limits of standard heat pumps and chillers, MECH-iS-G07 and MEHP-iS-G07 ranges achieve extreme water temperatures, making these units ideal for many uses from Comfort to Process and IT Cooling applications.

Matching mission critical applications requirements

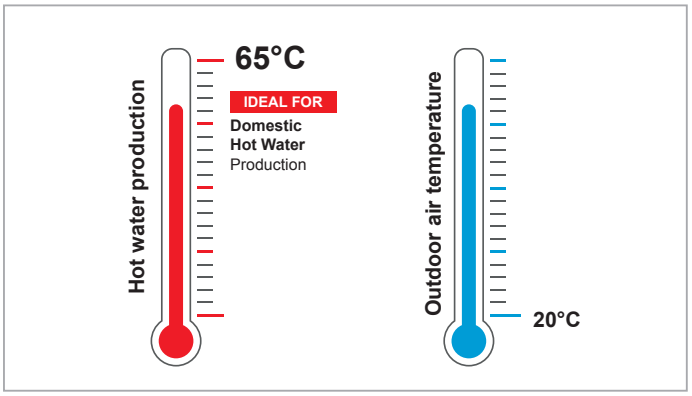
MECH-iS-G07 can operate with outdoor temperatures up to **+50 C** and chilled water temperatures from **-12 C** to **+24 C**, significant values which make these units ideal for Process and IT Cooling applications.



One unique unit for heating, cooling and producing hot water

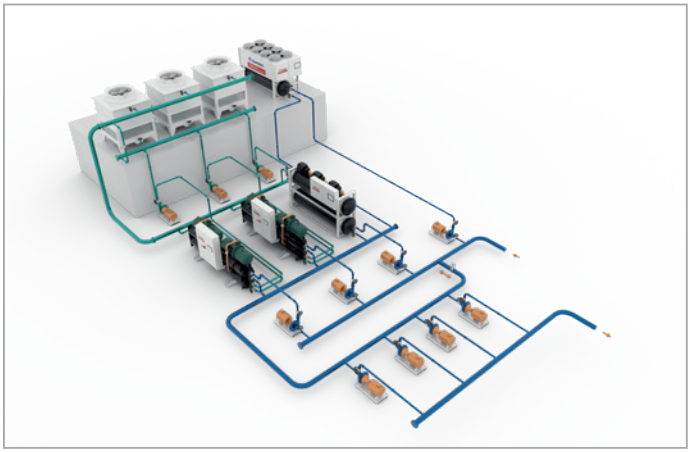
MEHP-iS-G07 can produce, alone and without any auxiliary accessory, both medium temperature water for space heating and cooling, and hot water for domestic use up to 65 C. These key features make MEHP-iS-G07 an interesting alternative for classic gas or fuel oil heating systems.

- Use of renewables sources
- Considerable energy savings
- Green footprint



Group control systems integrated solutions

LAN MULTI MANAGER



Architecture	Exploits proprietary LAN technology to connect a group of chillers and heat pumps.
Interfacing	Completely integrated in the units.
Applications	**• Multi Manager** Comfort, Process and IT Cooling applications. Chillers and heat pumps. **• HPC** **IT cooling** applications. Chillers and CRAHs (Computer Room Air Handlers)
Function	Smart management of the group of units with dynamic master logic, stand-by management, load and resource management.

Smart coordinated defrost

Smart control logic for coordinating the non-simultaneous start of defrosting cycles of a group of heat pumps:

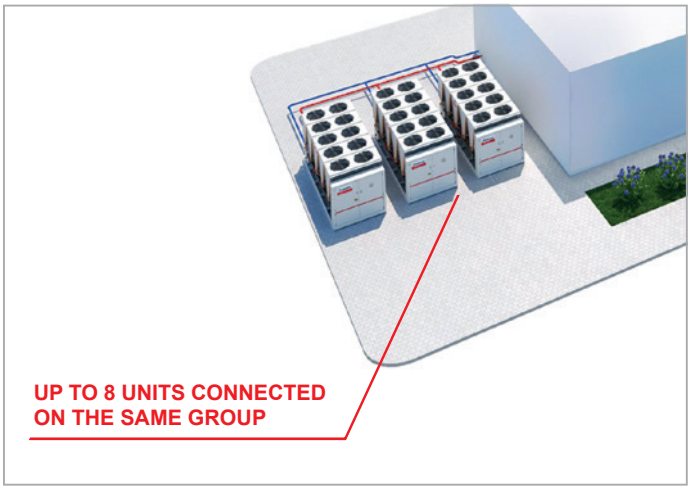
PATENT PENDING
MITSUBISHI ELECTRIC
PATENT PENDING

- Minimization of the energy required for defrost
- Increase of the maximum heat output of the system which can be constantly supplied
- Increased system efficiency
- Minimum impact on leaving water temperature

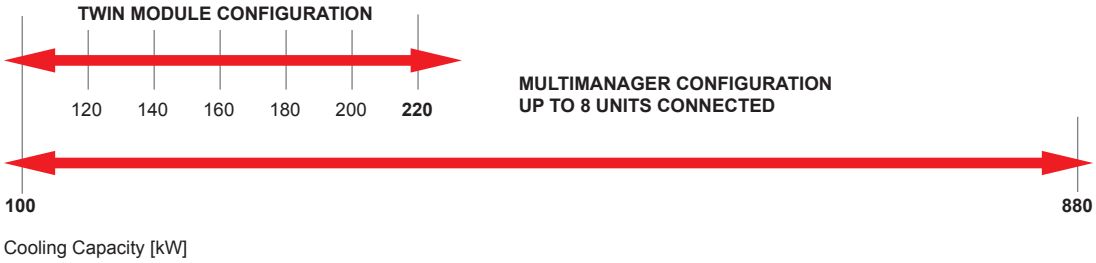
Multimanager

With opt. 1541 and 1542 – MULTI MANAGER, MECH-iS and MEHP-iS ranges feature **embedded LAN logics for an easy connection between group of units.** The entire cooling equipment works as one, with **one master unit that coordinate and optimize the operation of the unit group**.

- **Up to 8 units connected on the same group.**
- **Load sharing and Sequencing logics f**or the smart distribution of thermal loads among the units.
- **No simultaneous start-ups of different unit's compressors,** to prevent dangerous current peaks, but a selectable units' start-up sequence
- **Stand by unit management with automatic unit rotation.**
- **Dynamic master with succession priority:** one master unit is elected to coordinate the equipment group and once it becomes disconnected, the candidate unit takes full control.
- **Resource prioritymanagement:** In case of a varying group of units, with different technologies, it is possible to set the usage priority of each unit, making the most of the available thermal resources.



RANGE EXTENSION UP TO 880KW.MAXIMUM EFFICIENCY ON PARTIAL LOADS CONDITIONS.



Dynamic master with succession priority

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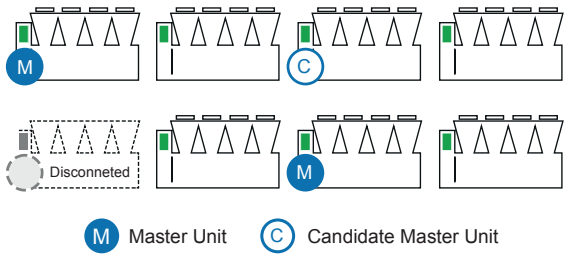


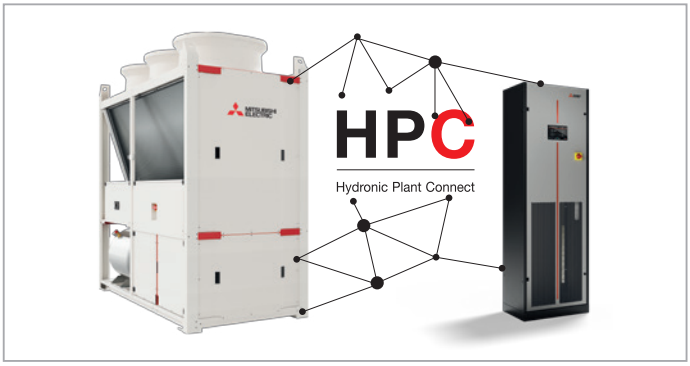
Resource priority management

In case of a varying group of units, with different technologies, it is possible to set the usage priority of each unit, making the most of the available thermal resources.

HPC (Hydronic Plant Connect)

System approach: Chillers + CRAHS

A complete Mitsubishi Electric cooling package dedicated to your high efficiency data center.**Up to 20 groups of CRAHs are connected to the group of chillers.**
Proprietary LAN network for the optimization of the entire cooling system: CRAHs, chillers, FC availability, fans, pumps, and valves.



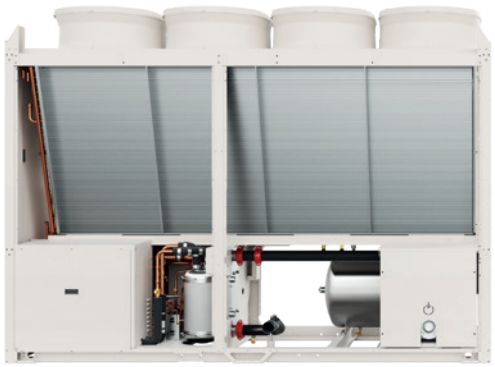
Main options

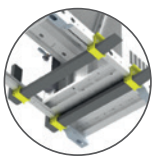
Energy Meter for BMS Energy Meter for W3000+	Acquires the electrical data and the power absorbed by the unit. Data is sent to the BMS or directly readable on the unit keyboard.
Thermal Energy Meter	Evaluates the cooling/heating capacity delivered by the unit.
External Capacity Cap	This option controls the maximum capacity output of the unit and it's ideal for full inverter or hybrid units.
Hydrophilic Treatment	Source side heat exchanger treatment that allows water droplets to flow off the surface (MEHP-iS-G07 only).
Hydronic Kits	Low or high head, fixed or variable speed, single or twin pumps and buffer tank always integrated in the unit.
Auxiliary Source and DHW Management	Functions for plants requiring the production of DHW in a storage tank. (MEHP-iS-G07 only).
Multifunction Card	Night mode, hydraulic decoupler probe for pump activation and User Limit Control Function.
Modular Installation Kit	Two modules of the same size can be connected thanks to a dedicated kit: • structural and mechanical connection for reinforcement and safety • hydraulic connections • a software connection through multi-unit multi manager control

Simplified operations during installation, commissioning and service of the units

Thanks to an accurate design it was possible to include with meticulous detail every mechanical and electrical component for an easier and more effective maintenance

EASY AND EFFECTIVE MAINTENANCE OPERATIONS





Forklift brackets for lateral handling of the units

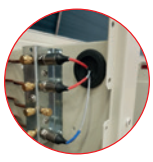
Extremely easy power cable connection thanks to the precise design of the structure with the front entrance or from the basement of the unit and a convenient direct connection to the electrical connectors

In and out hydraulic connections label directly printed on the metal frame

The electrical power panel is separated from the electrical control panel and from the compressor and fans drivers box

EASY AND EFFECTIVE MAINTENANCE OPERATIONS

Hinged speed drivers boxes for an easier access to each internal component



Easy access to the service points

Quick electrical couplings for fans

Huge benefits for every kind of application

Comfort applications

- Top-level performance at partial loads
- Extremely silent and compact unit
- Large operating map down to -20 C of outdoor air temperature; up to 65 C of hot water pr oduction in heat pump mode
- Plug & Play solution, thanks to integrated pumps kit + buffer tank
- Domestic Hot Water production (for MEHP-iS-G07)
- Optimized for heating mode (MEHP-iS-G07)

Process Applications

- Large operating map down to -12 C of evaporator leaving water temperature and down to -20 C of outdoor air temperature
- Extremely high reliability components
- Fully accessible service points for an easier maintenance
- Refrigerant leak detection options available
- Several coil solutions including e-coated microchannel, Cu/Al, pre-painted fins, fin guard silver and hydrophilic treatments (for MEHP-iS-G07)

IT Cooling applications

- MECH-iS-G07 combined with w-MEXT creates a complete Mitsubishi Electric System ideal for small and medium data centers
- High leaving water temperature up to 24 C
- LAN functions with up to 8 units
- HPC software for optimizing the entire chillers

+ CRAHs systems

- Wide option availability ideal for this kind of application (demand limit, external capacity cap, thermal energy meter)

Factory acceptance

Factory acceptance test experience

Test your heat pump before installation and make sure its performance is totally reliable.

Factory acceptance test

Factory Acceptance Test is available as additional service in order to test the unit under specific conditions.
Carried out within modern and sophisticated facilities, this service gives the customer the possibility to choose among different test options in order to:

- Verify unit operation under severe conditions
- Check performance, both at full and partial loads
- Test the unit with low outdoor air temperature operation
- Detect sound emissions
- Time the fast restart

GENERAL TECHNICAL DATA

MECH-iS-G07			0051	0061	0071	0082	0092	0102	0112
Power supply	(1)	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	50,09	60,11	70,14	80,14	90,23	100,2	110,2
Total power input	(1)	kW	15,16	19,13	26,89	26,24	32,57	31,43	37,90
EER	(1)	kW/ kW	3,296	3,147	2,606	3,057	2,767	3,191	2,908
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(4)	kW	50,00	60,00	70,00	80,00	90,00	100,00	110,00
EER	(1)(4)	kW/ kW	3,280	3,110	2,580	3,020	2,740	3,150	2,870
COOLING WITH PARTIAL RECOVERY									
Cooling capacity	(5)	kW	51,97	62,36	72,77	83,15	93,61	104,00	114,30
Total power input	(5)	kW	14,66	18,50	25,99	25,37	31,48	30,39	36,64
Desuperheater heating capacity	(5)	kW	12,68	16,19	23,11	22,16	27,82	26,37	32,15
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN COOLING									
Water flow	(1)	l/s	2,395	2,874	3,354	3,833	4,315	4,792	5,270
Pressure drop at the heat exchanger	(1)(4)	kPa	15,6	22,5	30,6	23,6	29,9	28,3	34,2
PARTIAL RECOVERY USER SIDE IN REFRIGERATION									
Water flow	(1)	l/s	0,612	0,781	1,116	1,070	1,343	1,273	1,552
Pressure drop at the heat exchanger	(1)	kPa	8,57	14,0	28,5	12,9	20,4	12,9	19,1
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
16°C/10°C									
Cooling capacity	(2)	kW	54,69	65,32	75,82	87,60	98,20	109,4	120,1
Total power input	(2)	kW	15,47	19,61	27,69	26,82	33,41	32,06	38,73
EER	(2)	kW/ kW	3,529	3,332	2,736	3,269	2,940	3,408	3,103
23°C/15°C									
Cooling capacity	(3)	kW	62,37	73,93	85,00	100,1	111,5	124,7	136,4
Total power input	(3)	kW	15,86	20,25	28,85	27,55	34,52	32,81	39,78
EER	(3)	kW/ kW	3,925	3,640	2,941	3,640	3,232	3,802	3,427
EXCHANGERS									
16°C/10°C									
Water flow	(2)	l/s	2,181	2,605	3,024	3,494	3,917	4,362	4,788
Pressure drop at the heat exchanger	(2)	kPa	12,9	18,5	24,9	19,6	24,7	23,4	28,2
23°C/15°C									
Water flow	(3)	l/s	1,868	2,215	2,546	2,999	3,339	3,735	4,086
Pressure drop at the heat exchanger	(3)	kPa	9,50	13,3	17,6	14,5	17,9	17,2	20,6
REFRIGERANT CIRCUIT									
Compressors nr.		N°	1	1	1	2	2	2	2
Number of capacity steps		N°	0	0	0	0	0	0	0
No. Circuits		N°	1	1	1	1	1	1	1
Regulation			Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Min. capacity step		%	27	27	27	22	22	20	20
Refrigerant			R32	R32	R32	R32	R32	R32	R32
Theoretical refrigerant charge		kg	8,00	8,00	8,00	11,0	11,0	13,0	13,0
Oil charge		kg	3,50	3,50	3,50	7,00	7,00	7,00	7,00
Rc (ASHRAE)	(6)	kg/kW	0,16	0,13	0,12	0,14	0,12	0,13	0,12
FANS									
Quantity		N°	2	2	2	3	3	4	4
Air flow		m^3/s	6,86	7,01	7,01	9,84	9,84	12,97	12,97
Total fans power input		kW	0,96	1,00	1,00	1,41	1,41	1,88	1,88
NOISE LEVEL									
Total sound Pressure	(7)	dB(A)	45	46	48	48	49	50	50
Total sound power level in cooling	(8)(9)	dB(A)	77	78	80	80	81	82	82
SIZE AND WEIGHT									
A	(10)	mm	2085	2085	2085	2600	2600	3225	3225
B	(10)	mm	1100	1100	1100	1100	1100	1100	1100
H	(10)	mm	2400	2400	2400	2400	2400	2400	2400
Operating weight	(10)	kg	630	630	630	830	830	940	940

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Plant (side) cooling exchanger water (in/out) 16,00°C/10,00°C; Source (side) heat exchanger air (in) 35,0°C.
3 Plant (side) cooling exchanger water (in/out) 23,00°C/15,00°C; Source (side) heat exchanger air (in) 35,0°C.
4 Values in compliance with EN14511
5 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C; Plant (side) heat exchanger recovery water (in/out) 40,00°C/45,00°C.
6 Rated in accordance with AHRI Standard 550/590
7 Average sound pressure level at 10m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
8 Sound power on the basis of measurements taken in compliance with ISO 9614.
9 Sound power level in cooling, outdoors.
10 Unit in standard configuration, without optional accessories.

TECHNICAL DATA SEASONAL EFFICIENCY IN COOLING (EN14825 VALUE)									
MECH-iS-G07			**0051**	**0061**	**0071**	**0082**	**0092**	**0102**	**0112**
SEASONAL EFFICIENCY IN COOLING (REG. EU 2016/2281) AMBIENT REFRIGERATION									
Prated,c	(1)	kW	50,0	60,	70,0	80,0	90,0	100,0	110,0
SEER	(1)(2)	-	5,29	5,28	4,98	5,15	5,12	5,32	5,29
Performance ηs	(1)(3)	%	209,0	208,0	196,0	203,0	202,0	210,0	209,0

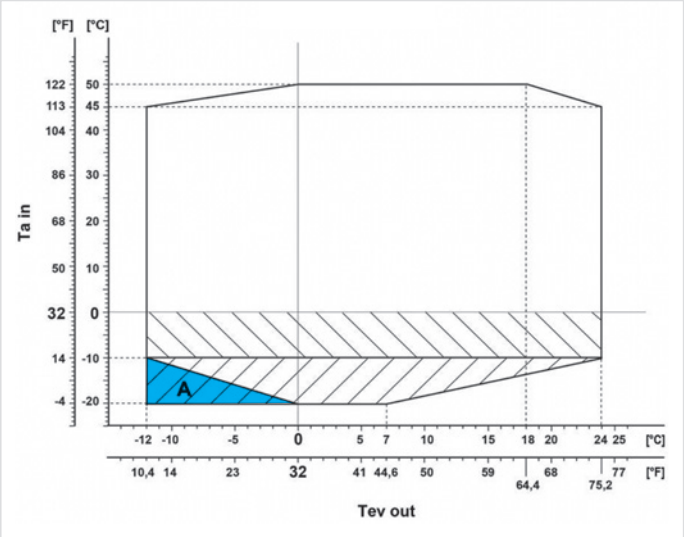
Notes:
(1) Parameter calculated according to [REGULATION (EU) N. 2016/2281]
(2) Seasonal energy efficiency ratio
(3) Seasonal space cooling energy efficiency
The units highlighted in this publication contain R32 [GWP100 677] fluorinated greenhouse gases.

TECHNICAL DATA SEASONAL EFFICIENCY IN COOLING (EN14825 VALUE)									
MECH-iS-G07			**0051**	**0061**	**0071**	**0082**	**0092**	**0102**	**0112**
SEASONAL EFFICIENCY IN COOLING (REG. EU 2016/2281) HIGH TEMPERATURE PROCESS COOLING									
Prated,c	(1)	kW	50,0	60,0	70,0	80,0	90,0	100,0	110,0
SEPR HT	(1)(3)	-	6,29	5,96	5,18	6,27	6,04	5,98	5,89

Notes:
1 Seasonal energy efficiency of high temperature process cooling [REGULATION (EU) N. 813/2013]
3 Seasonal space cooling energy efficency

OPERATING LIMITS - GRAPHS

COOLING MODE



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Tev out Evaporator leaving water temperature

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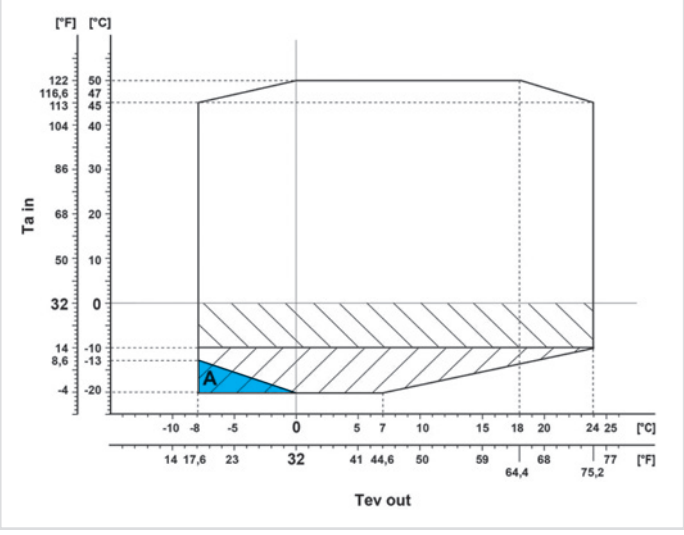
Antifreeze heaters on pipes, pumps*, and buffer tank* (opt. 2432 or 2433) *if present.
Extra insulation on heat exchangers (opt. 2641)

A — Operation betwen -10 °C / 14 °F and -20 °C / -4 °F of outdoor air temperature is allowed for wind protected installations (wind speed lower than 2 m/s - 6,56 ft/s)

In particular operating conditions the unit can work with forced ventilation, at partial loads or with derating compressors. For any specific information please referto the ElcaWorld software selection.

For the specific temperature limits of each model please refer to the selection software ElcaWorld.

COOLING MODE /D VERSION



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For the specific temperature limits of each model please refer to the selection software ElcaWorld.

GENERAL TECHNICAL DATA

MEHP-iS-G07			0051	0061	0071	0082	0092	0102	0112
Power supply	(1)	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
COOLING ONLY (GROSS VALUE)									
Cooling capacity	(1)	kW	48,10	53,11	60,09	68,39	74,18	85,99	93,98
Total power input	(1)	kW	17,00	19,95	25,48	24,91	30,10	31,86	37,61
EER	(1)	kW/kW	2,829	2,668	2,357	2,747	2,465	2,696	2,500
COOLING ONLY (EN14511 VALUE)									
Cooling capacity	(1)(2)	kW	48,00	53,00	60,00	68,30	74,10	85,90	93,80
EER	(1)(2)	kW/kW	2,810	2,640	2,340	2,730	2,450	2,680	2,480
HEATING ONLY (GROSS VALUE)									
Total heating capacity	(3)	kW	49,92	59,86	69,87	79,89	89,85	100,1	110,0
Total power input	(3)	kW	14,39	17,65	21,98	23,95	28,53	29,65	34,19
COP	(3)	kW/kW	3,465	3,403	3,177	3,343	3,151	3,382	3,216
HEATING ONLY (EN14511 VALUE)									
Total heating capacity	(3)(2)	kW	50,00	60,00	70,00	80,00	90,00	100,3	110,3
COP	(3)(2)	kW/kW	3,440	3,380	3,150	3,320	3,120	3,350	3,180
COOLING WITH PARTIAL RECOVERY									
Cooling capacity	(4)	kW	49,90	55,10	62,34	70,95	76,96	89,22	97,50
Total power input	(4)	kW	16,44	19,28	24,62	24,09	29,10	30,81	36,36
Desuperheater heating capacity	(4)	kW	14,39	17,02	21,96	20,98	25,61	26,76	31,89
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN COOLING									
Water flow	(1)	l/s	2,300	2,540	2,874	3,270	3,547	4,112	4,494
Pressure drop at the heat exchanger	(1)	kPa	14,4	17,6	22,5	17,2	20,2	20,8	24,9
HEAT EXCHANGER USER SIDE IN HEATING									
Water flow	(3)	l/s	2,410	2,889	3,373	3,856	4,337	4,832	5,311
Pressure drop at the heat exchanger	(3)	kPa	15,8	22,7	31,0	23,9	30,2	28,7	34,7
PARTIAL RECOVERY USER SIDE IN REFRIGERATION									
Water flow	(4)	l/s	0,695	0,822	1,060	1,012	1,236	1,292	1,539
Pressure drop at the heat exchanger	(4)	kPa	11,1	15,5	25,7	11,6	17,3	13,3	18,8
REFRIGERANT CIRCUIT									
Compressors nr.		N°	1	1	1	2	2	2	2
Number of capacity steps		N°	0	0	0	0	0	0	0
No. Circuits		N°	1	1	1	1	1	1	1
Regulation			Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Min. capacity step		%	27	27	27	22	22	20	20
Refrigerant			R32	R32	R32	R32	R32	R32	R32
Theoretical refrigerant charge		kg	12,0	12,0	12,0	18,0	18,0	25,0	25,0
Oil charge		kg	3,50	3,50	3,50	7,00	7,00	7,00	7,00
Rc (ASHRAE)	(5)	kg/kW	0,25	0,23	0,20	0,27	0,24	0,29	0,27
FANS									
Quantity		N°	2	2	2	3	3	4	4
Air flow		m³/s	5,89	5,89	5,89	8,89	8,89	11,77	11,77
Total fans power input		kW	0,88	0,88	0,88	1,41	1,41	1,88	1,88
NOISE LEVEL									
Total sound Pressure	(6)	dB(A)	59	60	62	62	63	63	63
Total sound power level in cooling	(7)(8)	dB(A)	77	78	80	80	81	82	82
Total sound power level in heating	(7)(9)	dB(A)	77	78	80	80	81	82	82
SIZE AND WEIGHT									
A	(10)	mm	2085	2085	2085	2600	2600	3225	3225
B	(10)	mm	1100	1100	1100	1100	1100	1100	1100
H	(10)	mm	2400	2400	2400	2400	2400	2400	2400
Operating weight	(10)	kg	710	710	710	960	960	1085	1085

Notes:
1 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C.
2 Values in compliance with EN14511
3 Plant (side) heat exchanger water (in/out) 40,00°C/45,00°C; Source (side) heat exchanger air (in) 7,0°C - 87% R.H.
4 Plant (side) cooling exchanger water (in/out) 12,00°C/7,00°C; Source (side) heat exchanger air (in) 35,0°C; Plant (side) heat exchanger recovery water (in/out) 40,00°C/45,00°C.
5 Rated in accordance with AHRI Standard 550/590
6 Average sound pressure level at 1m distance, unit in a free field on a reflective surface; non-binding value calculated from the sound power level.
7 Sound power on the basis of measurements taken in compliance with ISO 9614.
8 Sound power level in cooling, outdoors.
9 Sound power level in heating, outdoors.
10 Unit in standard configuration, without optional accessories.

TECHNICAL DATA SEASONAL EFFICIENCY IN HEATING (EN14825 VALUE) - LOW TEMPERATURE APPLICATION

MEHP-iS-G07			0051	0061	0071	0082	0092	0102	0112
Power supply	(1)	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
WEATHER CONDITIONS - AVERAGE									
Rated heat output at Tdesignh	(1)(2)	kW	40	48	55	64	72	80	89
Bivalent temperature	(1)(2)	°C	-7	-7	-7	-7	-7	-7	-7
SCOP	(1)(2)		4,39	4,33	4,34	4,35	4,12	4,30	4,32
Seasonal space heating energy efficiency	(1)(2)	%	172	170	171	171	162	169	170
Seasonal space heating energy efficiency class	(1)(2)		A++	A++	A++	A++	A++	-	-

Notes:
1 Seasonal space heating energy efficiency class MEDIUM TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Type of calculation with variable flow and variable temperature.

TECHNICAL DATA SEASONAL EFFICIENCY IN HEATING (EN14825 VALUE) - MEDIUM TEMPERATURE APPLICATION

MEHP-iS-G07			0051	0061	0071	0082	0092	0102	0112
Power supply	(1)	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
WEATHER CONDITIONS - AVERAGE									
Rated heat output at Tdesignh	(1)(2)	kW	40	48	48	64	64	82	82
Bivalent temperature	(1)(2)	°C	-7	-7	-7	-7	-7	-7	-7
SCOP	(1)(2)		3,43	3,37	3,37	3,37	3,23	3,39	3,43
Seasonal space heating energy efficiency	(1)(2)	%	134	132	132	132	126	133	134
Seasonal space heating energy efficiency class	(1)(2)		A++	A++	A++	A++	A++	-	-

Notes:
1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Type of calculation with variable flow and variable temperature.

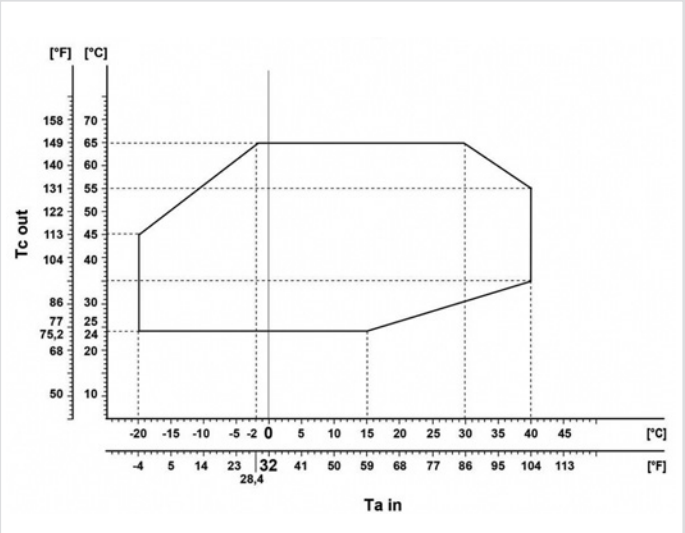
TECHNICAL DATA SEASONAL EFFICIENCY IN COOLING (EN14825 VALUE)

MEHP-iS-G07			0051	0061	0071	0082	0092	0102	0112
Prated,c	(1)	kW	48,0	53,0	60,0	68,3	74,1	85,9	93,8
SEER	(1)(2)	-	4,63	4,58	4,46	4,49	4,46	4,81	4,75
Performance ηs	(1)(3)	%	182,0	180,0	175,0	177,0	175,0	189,0	187,0

Notes:
1 Seasonal space heating energy efficiency class LOW TEMPERATURE [REGULATION (EU) N. 813/2013]
2 Type of calculation with variable flow and variable temperature.

OPERATING LIMITS - GRAPHS

HEATING MODE

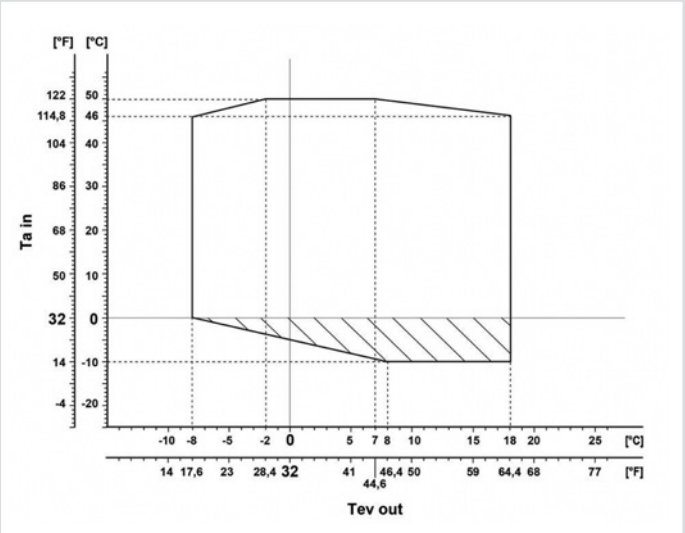


Ta in Outdoor air temperature
Tev out Condenser leaving water temperature

In particular operating conditions the unit can work with forced ventilation, at partial loads or with derating compressors. For any specific information please referto the ElcaWorld software selection.

For the specific temperature limits of each model please refer to the selection software ElcaWorld.

COOLING MODE



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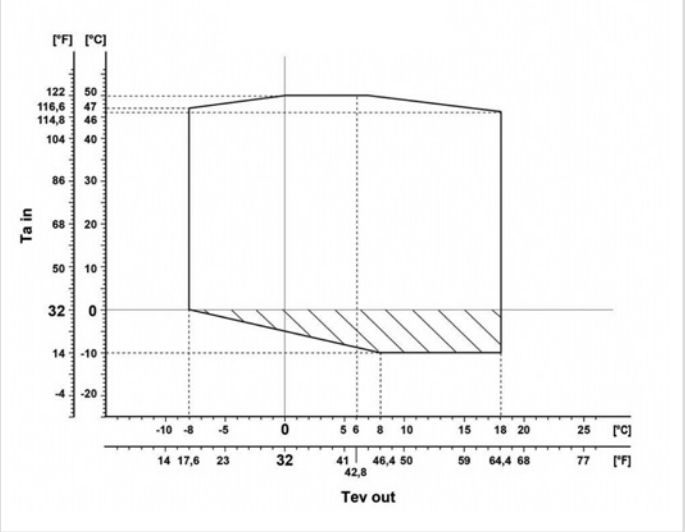
COOLING MODE /ID VERSION



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EAC(H)V Line

NEW

ME-series R32

The EAC(H)V Line allows for up to six individual units to be connected together. Available as a cooling only or heat pump version, the EAC(H)V Line is suitable for both comfort and process cooling applications.

Mitsubishi Electric's modular chiller line-up contributes to realizing high functionality, reliability and energy saving with its own control.
Three capacity modules with the side flow type of 30 HP, the top flow type of 50, 60 HP

Both the 50HP and 60HP models are available in two different refrigerant version, the traditional one R410A, and the new low GWP solution R32

A new generation of chiller technology

Mitsubishi Electric is the first name for comfort and effciency.

Founded in 1921, Mitsubishi Electric is now a global, market leading environmental technologies manufacturer. In the worldwide market, the Living Environment Systems Division provides pioneering solutions that heat, cool, ventilate and control our buildings in some of the most energy efficient ways possible.
Through our technical expertise, long experience and innovative product range, we enable building operators everywhere to significantly improve energy efficiency, reduce running costs and adhere to increasingly tough legislation. We believe that global climate challenges need local solutions.
There are number of challenges facing building owners and managers today, they must tackle ongoing requirements to reduce energy used in their buildings and their running costs, and our aim is to help them in achieving these goals.

At Mitsubishi Electric, we have evolved and today we offer advanced technology that really can make a world of difference. permettono la classificazione in **classe A+++ sia in raffrescamento che in riscaldamento.**

Why chillers?

Today's building owners and managers face the challenge of providing a comfortable, productive space that is also energy efficient.

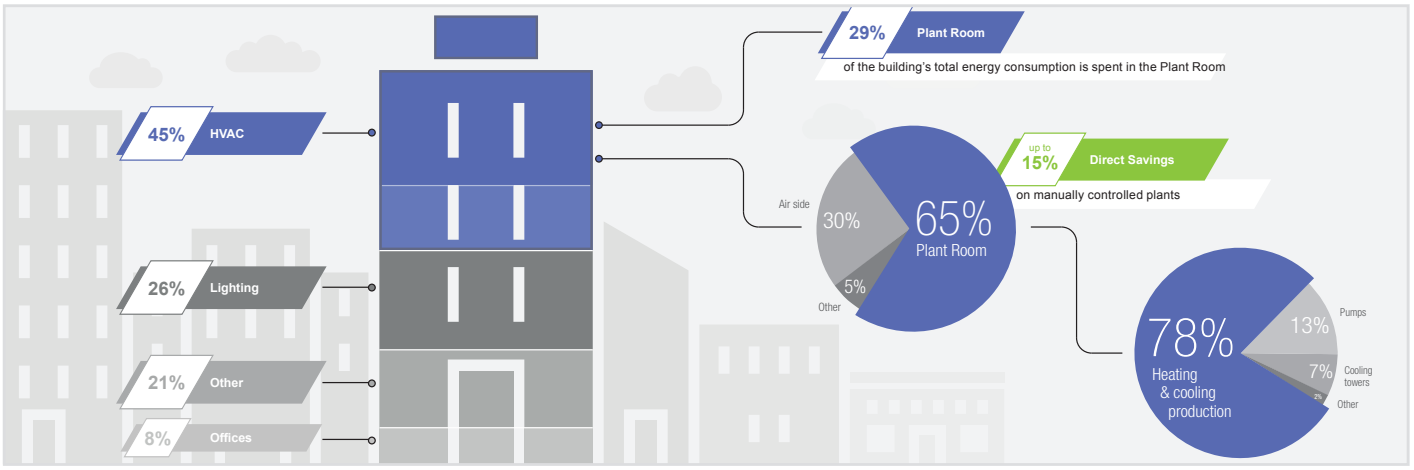
As the drive to reduce energy waste continues with further legislation, building services are being scrutinised to find more ways to optimise performance. Air conditioning is acknowledged as a significant energy user in buildings, therefore chillers can make a significant impact on the energy performance and running cost for many buildings. As manufacturers, we are being tasked with producing more efficient equipment and with enabling specifiers to compare products easily with regard to efficiency and performance.

In Commercial buildings HVAC accounts for 45% of total energy consumption

In commercial buildings, HVAC is by far the most energy intensive system, accounting for close to half of the total energy consumption. For this reason every efficiency improvement in HVAC performance can significantly reduce the energy profile of the building, turning HVAC optimisation into a value generating opportunity.

ErP Directive - Lot 21

The main impact of the ErP (Energy Related Products) Lot 21 will be on the way that chiller efficiency is measured. Ratings will be based on higher requirements for seasonal efficiency, and many older existing chillers will not comply. The ErP uses different performance parameters for different types of product to set the Minimum Energy Performance Standards (MEPS).



Source	Cooling Capacity	Minimum Efficency	
		Jan 2018	Jan 2021
Air Cooled	<400kW	149%	**161%**
Air Cooled	≥400kW	161%	**179%**
Water Cooled	<400kW	196%	**200%**
Water Cooled	≥400kW ≤1500kW	227%	**252%**
Water Cooled	≥1500kW	245%	**272%**

The latest chiller technologies help to address the ERP Directive by ensuring that they operate to meet the precise cooling demand of the building, conserving energy usage within the building. The main components of water and air cooled chillers are very similar.
The way we use buildings today is changing, and the energy demands are changing with them. So now is a good time to consider the benefits of upgrading chiller plant.
With legislation pushing buildings towards greater energy efficiency and reducing carbon, and new regulations bringing even more efficient chiller options, such as heat recovery, to the market, specifiers have every reason to take a look at the benefits of a modern chiller for both new construction and retrofit scenarios.

The impact of a chiller on the comfort of occupants should also be considered. With a modern, robust technology in place, building owners can be assured that they are providing a comfortable and healthy environment, as well as saving themselves energy costs in the long-term.

Best in class efficiency for energy saving performance by the use of inverter compressors

- Inverter compressor is automatically controlled according the load.
- Optimal control of fans by using inverters contributes to save energy.

High functionality of modular chiller

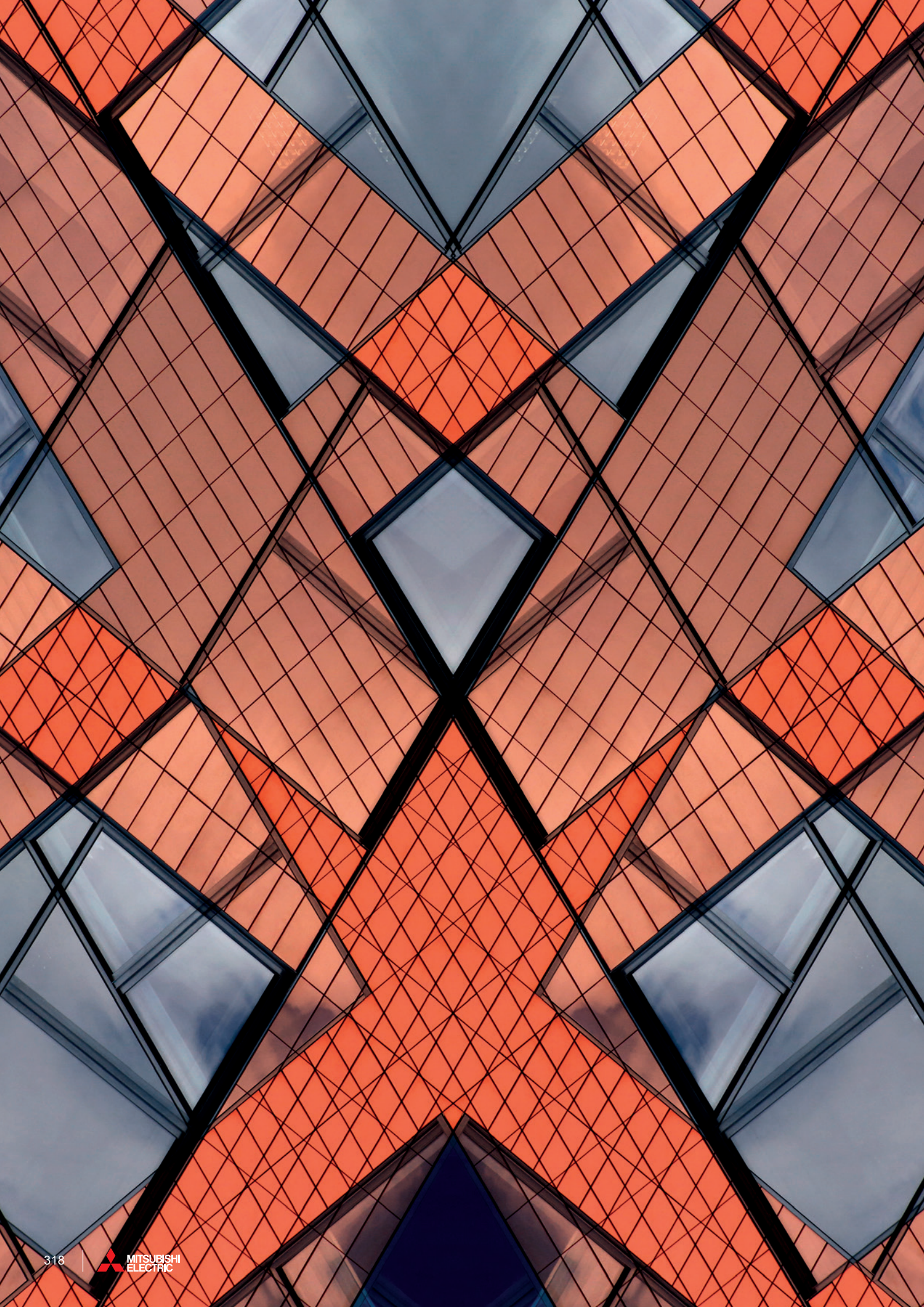
- Up to 6 modules can be connected.
- The combination control of modules helps to continue operation even when one module has stopped due to maintenance.

Saving space and installation work

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

Easy system control

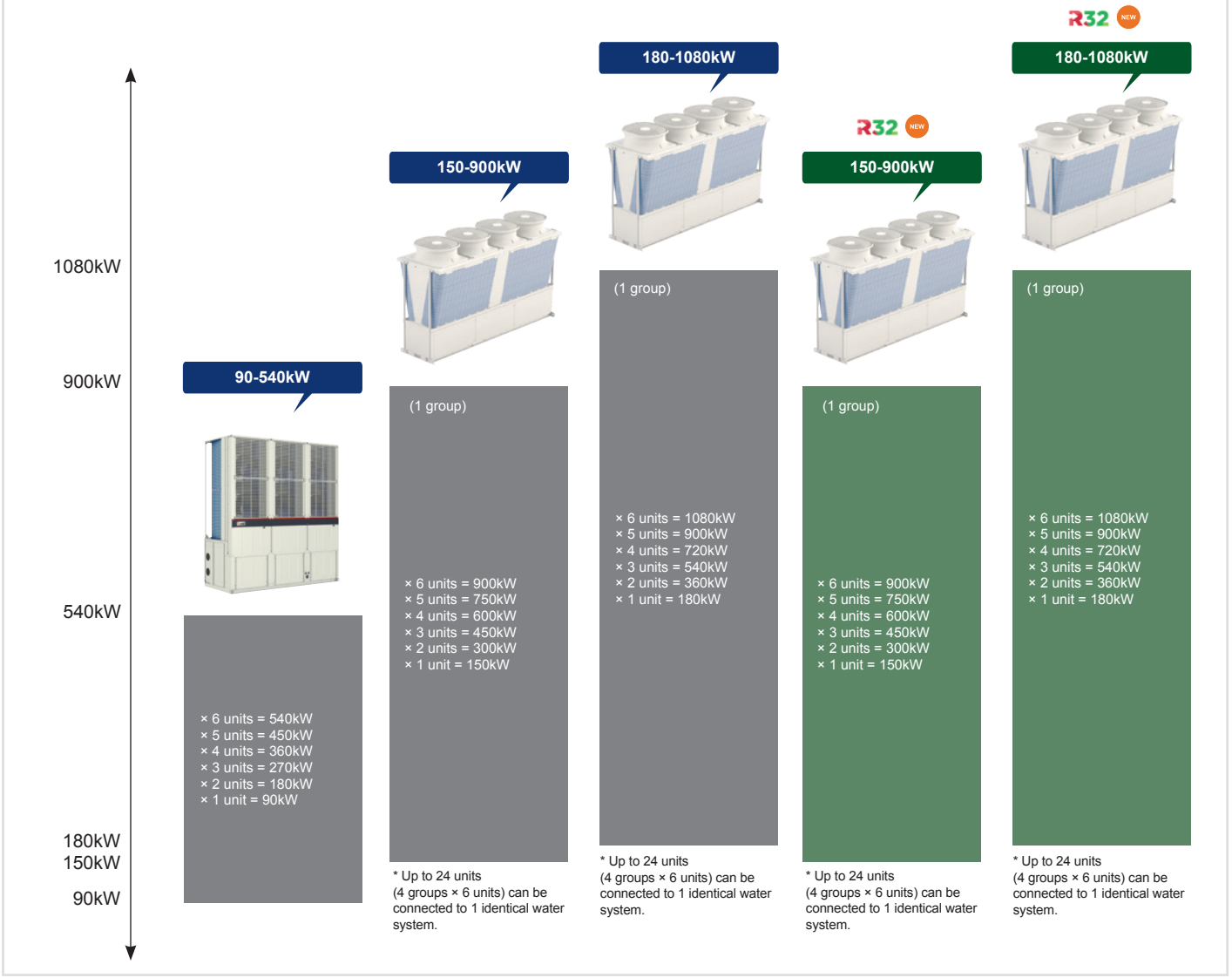
- Water temperature can be controlled remotely by using local remote controllers.
- By installing an AE-200E/A, it is possible to centrally control e-series and CITY MULTI at the same time.



Module line-up

	90kW module*1	150kW module	180kW module
			
Heat Pump	EAHV-P900YAL(-N)(-BS)	EAHV-P1500YBL(-N)(-BS)	EAHV-P1800YBL(-N)(-BS)
	EAHV-P900YAF(-N)(-BS)	EAHV-M1500YCL(-N)(-BS) R32 NEW	EAHV-M1800YCL(-N)(-BS) R32 NEW
Heating Only	EAHV-P900YAL-H(-N)(-BS)	EAHV-P1500YBL-H(-N)(-BS)	EAHV-P1800YBL-H(-N)(-BS)
	EAHV-P900YAF-H(-N)(-BS)		
Cooling Only	EACV-P900YAL(-N)(-BS)	EACV-P1500YBL(-N)(-BS)	EACV-P1800YBL(-N)(-BS)
	EACV-P900YAF(-N)(-BS)	EACV-M1500YCL(-N)(-BS) R32 NEW	EACV-M1800YCL(-N)(-BS) R32 NEW

* (-N) indicates model with built-in header.
*1 The amount of pre-charged refrigerant differs among models. YAF indicates full refrigerant charging model.



P900

R410A | ME-series

HIGH ENERGY SAVING PERFORMANCE BY THE USE OF INVERTER COMPRESSORS

BEST IN CLASS EFFICIENCY FOR ENERGY SAVING PERFORMANCE

ENERGY-SAVING TECHNOLOGY

UP TO 6 MODULES CAN BE CONNECTED

COMBINATION CONTROL FUNCTION

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.

Best in class efficiency for energy saving performance

High EER, High COP

- 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 3.30	COP 3.50

*EER shows the value at an outdoor air temperature of 35°C and cool waterinlet/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 SEER

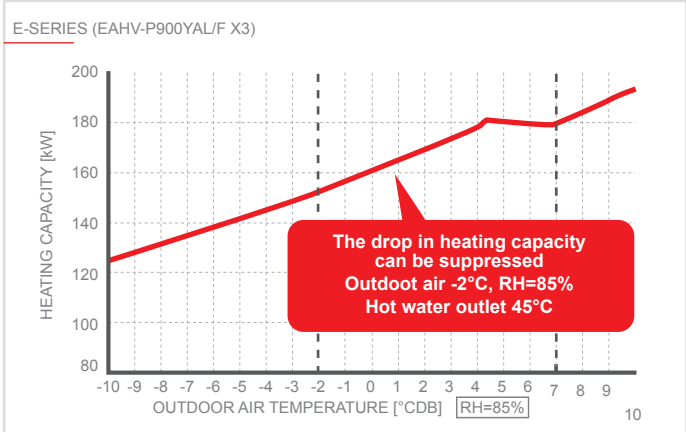
- Achieved the same SEER from 30 to 180 HP.

SEER 4.48

* SEER 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 included based on EN14511.

Suppression of heating capacity drop at low outside temperatures

- 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.



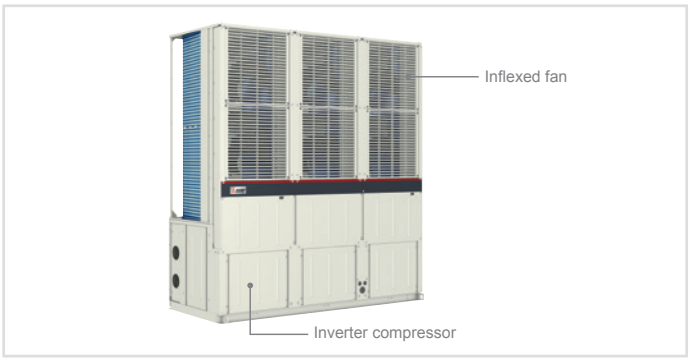
Energy-saving technology

High Efficiency Inverter Compressor

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

Two refrigerating cycles

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

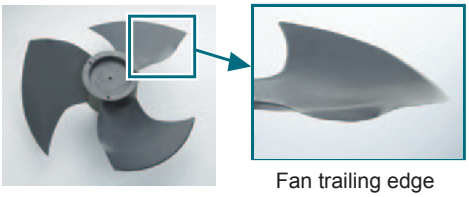


U-shaped High Performance Compact Air Heat Exchanger

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.

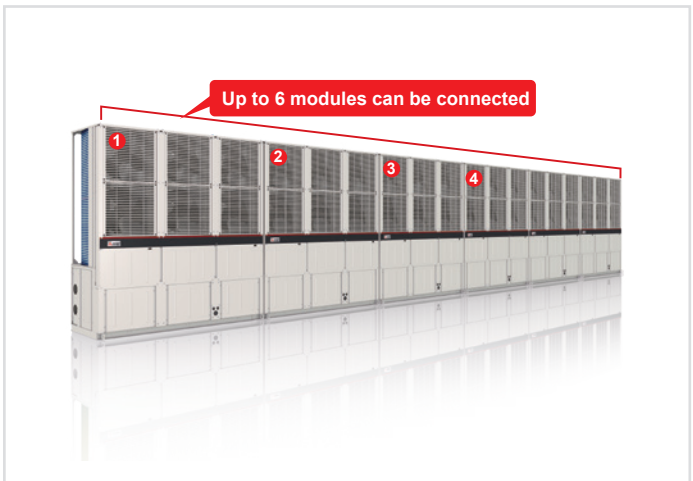

Fan trailing edge

Fan Inverter Control

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

Up to 6 modules can be connected

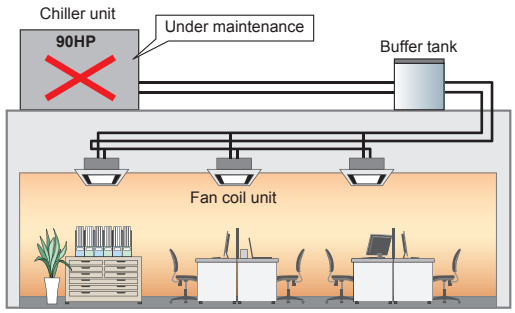
The total capacity can be increased to up to 30HP × 6 modules = 180HP. Because modules can be installed horizontally in a row. Installation in narrow places such as along building walls is possible.



Combination control function

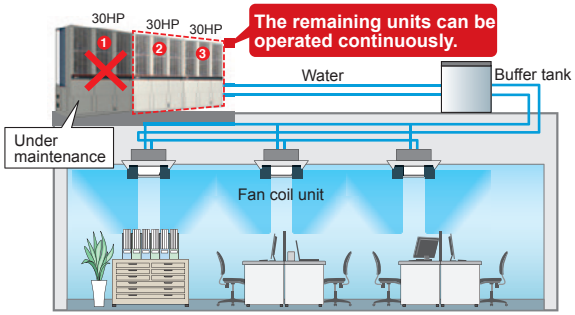
The flexible backup operation among the combined modules enables the continuous operation, even when one module is stopped due to maintenance.

Non-modular chiller



Since the chiller unit can not operate during maintenance, the timing of maintenance is limited.

Mitsubishi Electric modular chiller



With our module chiller system, even if one module is stopped, the remaining modules back the continuous operation up.

* When performing maintenance, please confirm that the remaining modules

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.

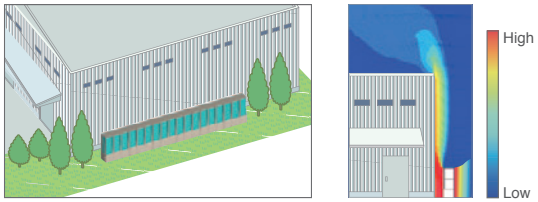
Installation example

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).

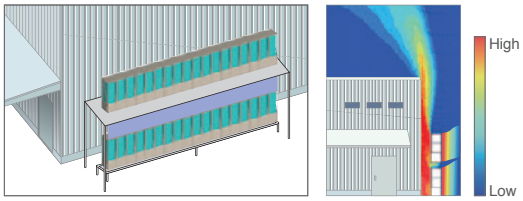
The figure shows the air blowing surface directed toward the wall (a diagonal blowing air guide is equipped as standard). Directing the air blowing surface toward the wall is effective in preventing short cycling.

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.

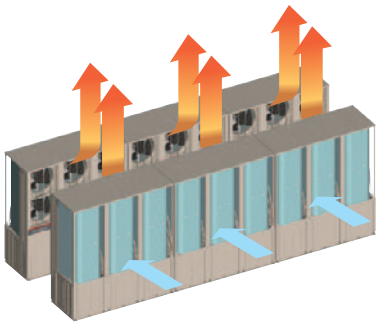
EXAMPLE OF INSTALLATION ALONG THE OUTER WALL OF A FACTORY

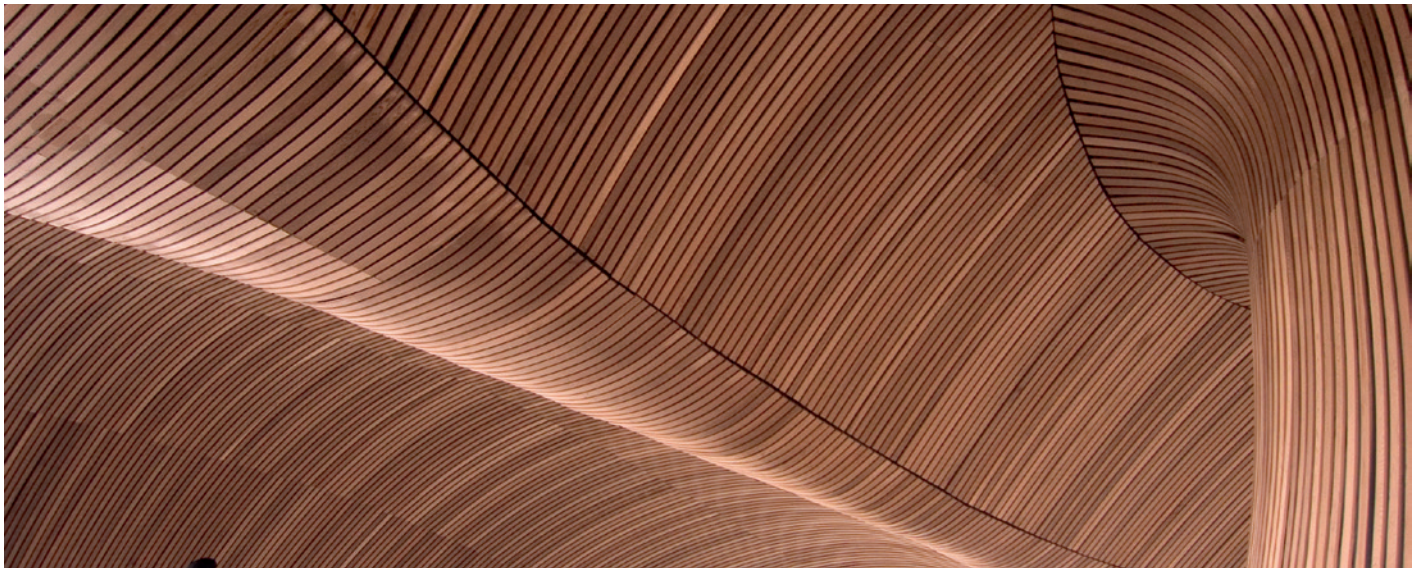


FRONT SURFACE-FACING DOUBLE-ROW INSTALLATION EXAMPLE



SINGLE-ROW DOUBLE-STACK INSTALLATION EXAMPLE





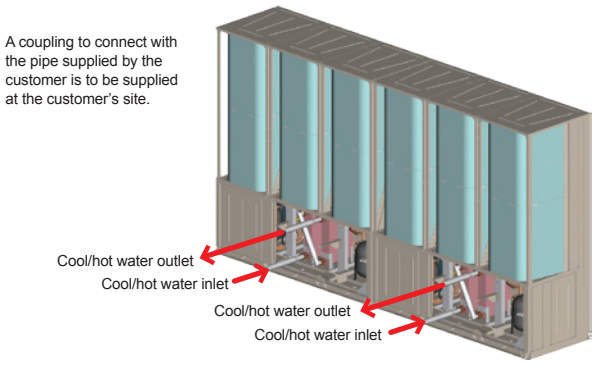
Inside Header

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

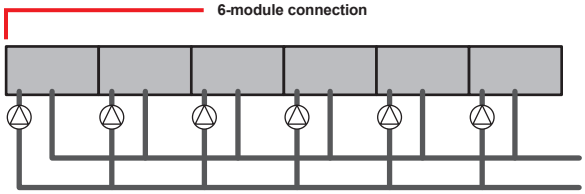
- The field water pipe header section that is usually required to connect the module to the field water pipe is now available as a manufacturer option (hereinafter referred to as the "inside header") which can be incorporated into the module at the factory before shipment (a supplied connection kit is used for the connection work at the customer's site).
- This allows for incorporating the field water pipe header section into the module.
- 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



FIELD WATER PIPE HEADER CONNECTION IMAGE *1
(in the case of installing one pump for each module)



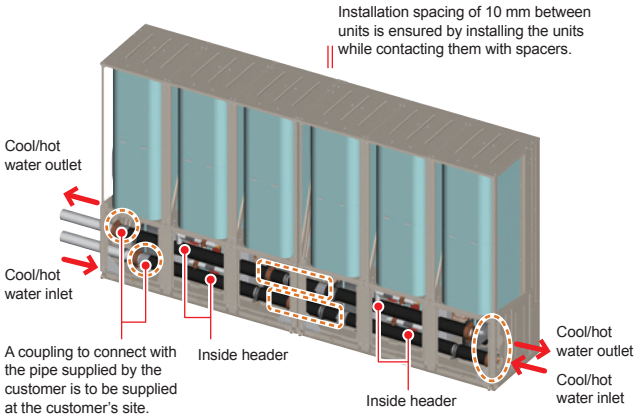
- Number of pumps: 6
- Pipes connected at the site: 12 points

*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

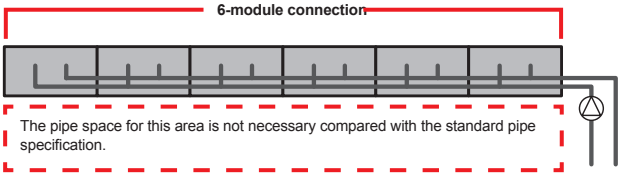
Inside Header Specification

(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



FIELD WATER PIPE HEADER CONNECTION IMAGE *1
(in the case of installing one pump for the system)

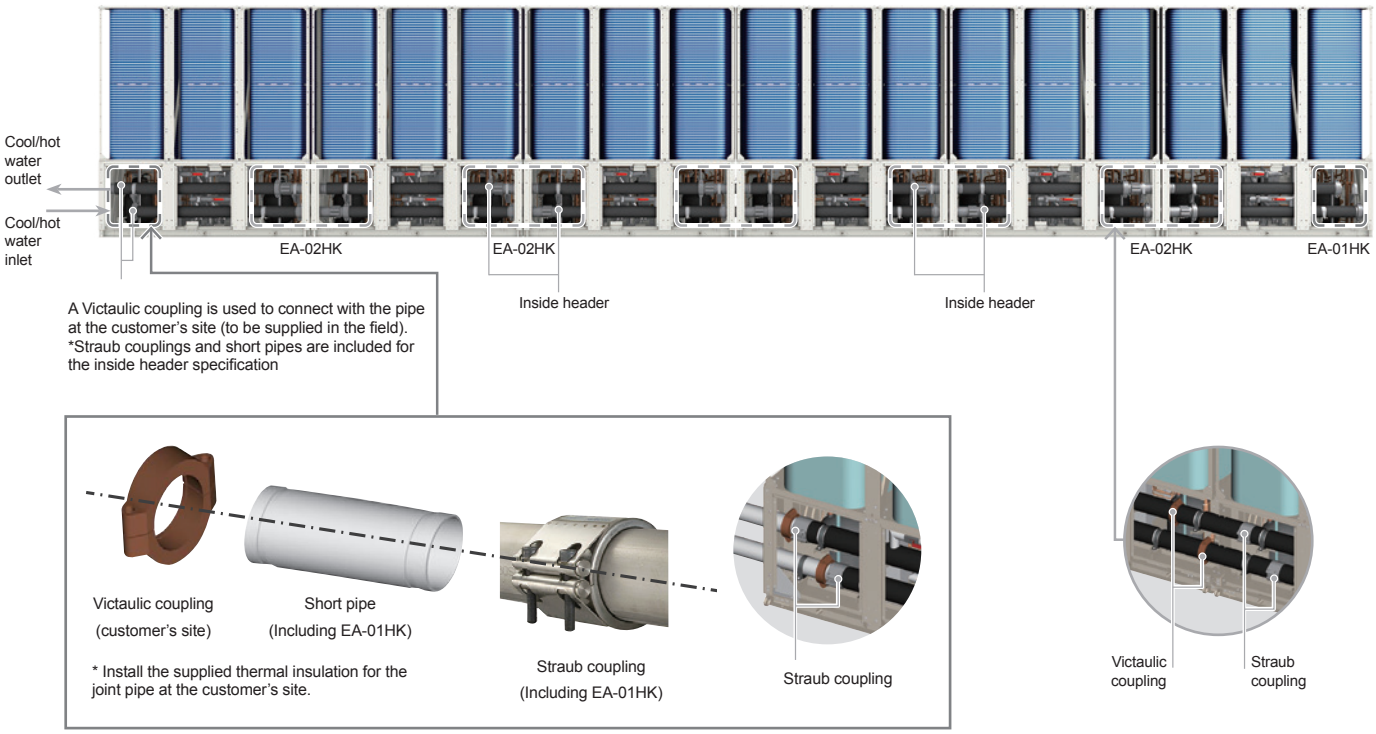


- Number of pumps: 1
- Pipes connected at the site: 2 points (10 internal connection points)

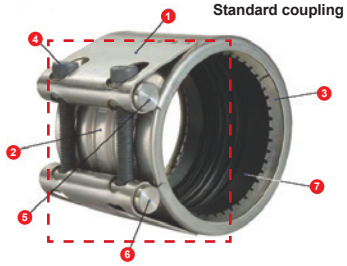
*1 Be sure to install a strainer near the chiller on the inlet side of the cool/hot water pipe to prevent the entry of foreign substances such as dirt and sand particles to the plate heat exchanger.

About Pipe Connection Kit

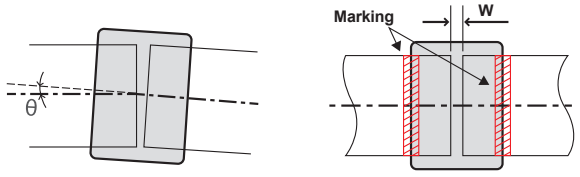
THIS FIGURE SHOWS 540 HP (EAHV-P900YAL/F-N×6) AS AN EXAMPLE.



STRUCTURE



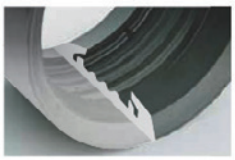
No.	Part name	Material
1	Casing	SUS 304
2	Sliding plate	SUS 301 or 304
3	Grip ring	SUS 301
4	Tightening bolt	SUS XM7
5	Rod washer	SUS 304
6	Rod nut	SUS 304
7	Rubber sleeve	EPDM



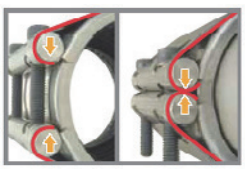
Allowable clearance and tilt range

Allowable pipe clearance value [W]=0 to 25 mm

Allowable pipe tilt angle [θ]=±2°

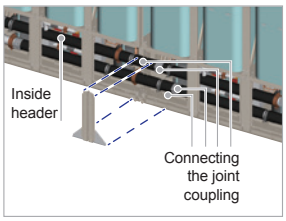


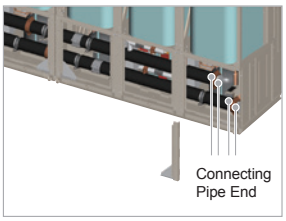
The sealed rubber has a lip structure to improve the water-stopping performance. Adjust the position of the Straub coupling so the marking on both sides can be seen.



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.

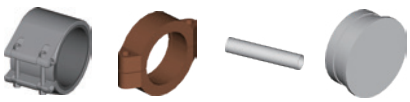
CONNECTING PIPE END
(Connection at Customer's Site)





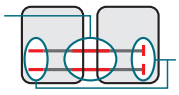
Capacity	Module (Inside header)	Optional parts -1- EA-01HK (model)	Optional parts -2- EA-02HK (model)
30 HP	1	1	0
60 HP (30 HP×2)	2	1	1
90 HP (30 HP×3)	3	1	2
120 HP (30 HP×4)	4	1	3
150 HP (30 HP×5)	5	1	4
180 HP (30 HP×6)	6	1	5

Optional parts -1- (Piping Kit) EA-01HK



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

Optional parts -2-



Optional parts -1-

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

Control technology

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

Unit Remote Control

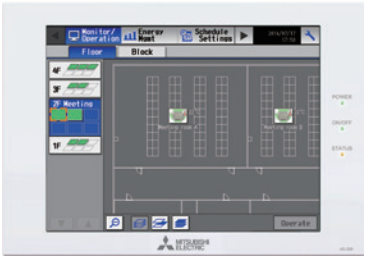
	 PAR-W31MAA
Control	Simultaneous control
Number of modules that can be connected	6
Number of units that can be connected	1
Number of supported water lines	1
ON/OFF	●
Cooling/heating switch	●
FAN operation switch for snowfall	●
Target outlet temperature setting	●
Scheduled operation	●
Individual error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

Centralized controller*

When connected to the AE-200E/A centralized controller or the EW-50A/E expansion controller, up to 6 e-series modules can be connected to 1 group for centralized monitoring and management.
Combined management of CITY MULTI is also possible.

* Centralized monitoring and management are possible only for M-NET-connected e-series units.

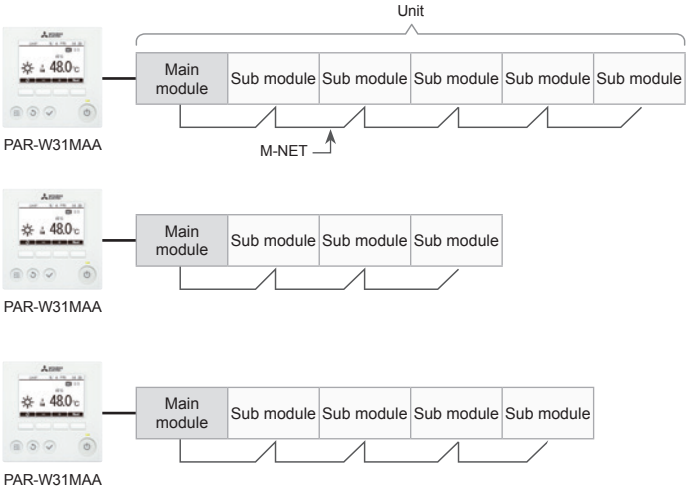
AE-200E/A



Monitoring on LCD touch panel and web browser

Monitoring of the operating condition—including the water temperature—of e-series units are possible from the LCD screen of the AE-200E/A or from a Web browser. Combined management of CITY MULTI is also possible.

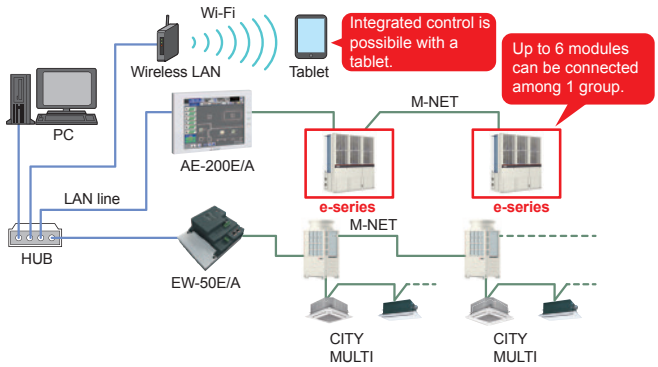
System configuration



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.

SYSTEM CONFIGURATION AE-200E/A



Technical specifications COOLING ONLY MODEL

MODEL			SET	EACV-P900YAL(-N)(-BS) EACV-P900YAF(-N)(-BS)	
Power source				3-phase 4-wire 380-400-415V 50/60Hz	
Capacity change mode				Capacity priority	COP priority
Cooling capacity *1 Water			kW	90.00	63.00
			kcal/h	77,400	54,180
			BTU/h	307,080	214,956
	Power input *2		kW	27.27	16.27
	Current input 380-400-415V		A	46.0 - 43.7 - 42.2	27.5 - 26.1 - 25.2
	Pump input is not included	EER		3.30	3.87
		ESEER		5.66	-
	Certified value by EUROVENT	EER *3		3.08	3.76
		ESEER *3 *4		4.71	-
	ESEER (Includes pump input based on EN14511) *3 *5			5.46	-
	SEER (Includes pump input based on EN14511) *3			4.88	-
	IPLV *6		kW/kW	6.34	-
	Water flow rate		m^3/h	15.5	10.8
Cooling capacity *7 *8 Brine(ethylene glycol 35wt%)			kW	56.73	39.34
			kcal/h	48,788	33,832
			BTU/h	193,563	134,228
	Power input *2		kW	25.98	15.78
	Current input 380-400-415V		A	43.9 - 41.7 - 40.2	26.7 - 25.4 - 24.4
	EER(Pump input is not included)			2.18	2.49
	EER(Includes pump input based on EN14511) *3			2.10	2.42
	Brine flow rate		m^3/h	11.5	8.0
Maximum current input			A	61	
Water pressure drop	Water *9		kPa	135	65
	Brine(ethylene glycol 35wt%) *8 *10		kPa	106	50
Temp range	Cooling		°C	Outlet water 5~25 *11	
	Water		°F	Outlet water 41~77 *11	
	Cooling		°C	Outlet brine -10~25 *8 *12	
	Brine(ethylene glycol 35wt%)		°F	Outlet brine 14~77 *8 *12	
	Outdoor		°C	-15~43 *11 *12	
			°F	5~109.4 *11 *12	
Circulating water volume range			m^3/h	7.7~25.8	
Sound pressure level (measured in anechoic room) at 1m *1			dB (A)	65	63
Sound power level (measured in anechoic room) *1			dB (A)	77	75
Diameter of water pipe (Standard piping)	Inlet		mm (in)	50A (2B) housing type joint	
	Outlet		mm (in)	50A (2B) housing type joint	
Diameter of water pipe (Inside header piping)	Inlet		mm (in)	100A (4B) housing type joint	
	Outlet		mm (in)	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)	957 (2110)	
	Inside header piping		kg (lbs)	992 (2187)	
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			2	
	Motor output		kW	11.7 x 2	
	Case heater		kW	0.045 x 2	
	Lubricant			MEL32	
Fan	Air flow rate		m^3/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	

*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 Pump input is not included.
*3 Pump is not included in e-series.
*4 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.
*5 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.
*6 Calculations according to standard performances (in accordance with AHRI 550-590).
*7 Under normal cooling conditions at outdoor temp 35°CDB/24°CWB (95°FDB/75.2°FWB) outlet brine temp -5°C (23.0°F) inlet brine temp 0°C (32.0°F).
*8 Set the dipswitch SW3-6 on both main and sub modules to ON.
*9 Under normal cooling conditions capacity 90kW, water flow rate 15.5m3/h
*10 Under normal cooling conditions capacity 56.73kW, brine flow rate 11.5m3/h
*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.

Technical specifications HEATPUMP MODEL

MODEL			SET	EAHV-P900YAL(-N)(-BS) EAHV-P900YAF(-N)(-BS)	
Power source				3-phase 4-wire 380-400-415V 50/60Hz	
Capacity change mode				Capacity priority	COP priority
Cooling capacity *1			kW	90.00	63.00
			kcal/h	77,400	54,180
			BTU/h	307,080	214,956
	Power input *3		kW	27.27	16.27
	Current input 380-400-415V		A	46.0 - 43.7 - 42.2	27.5 - 26.1 - 25.2
	Pump input is not included	EER		3.30	3.87
		ESEER		5.66	-
	Certified value by EUROVENT	EER *4		2.94	3.76
		ESEER *4 *6		4.71	-
	ESEER (Includes pump input based on EN14511) *4 *7			5.46	-
	SEER (Includes pump input based on EN14511) *4			4.88	-
	IPLV *8		kW/kW	6.34	-
	Water flow rate		m^3/h	15.5	10.8
Heating capacity *2			kW	90.00	63.00
			kcal/h	77,400	54,180
			BTU/h	307,080	214,956
	Power input *3		kW	25.71	16.96
	Current input 380-400-415V		A	43.4 - 41.2 - 39.7	28.6 - 27.2 - 26.2
	COP (Pump input is not included)			3.50	3.71
	COP (Includes pump input based on EN14511) *4			3.25	3.61
	SCOP (Reversible) Low/Medium (Includes pump input based on EN14511) *4			3.66/2.89	-
	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		m^3/h	15.5	10.8
Maximum current input			A	61	
Water pressure drop *5			kPa	135	65
Temp range	Cooling		°C	Outlet water 5~25 *9	
			°F	Outlet water 41~77 *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	7.7~25.8	
Sound pressure level (measured in anechoic room) at 1m *1			dB (A)	65	63
Sound power level (measured in anechoic room) *1			dB (A)	77	75
Diameter of water pipe (Standard piping)	Inlet		mm (in)	50A (2B) housing type joint	
	Outlet		mm (in)	50A (2B) housing type joint	
Diameter of water pipe (Inside header piping)	Inlet		mm (in)	100A (4B) housing type joint	
	Outlet		mm (in)	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)	987 (2176)	
	Inside header piping		kg (lbs)	1022 (2253)	
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			2	
	Motor output		kW	11.7 x 2	
	Case heater		kW	0.045 x 2	
	Lubricant			MEL32	
Fan	Air flow rate		m^3/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	

*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).
*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.

Technical specifications HEATING ONLY MODEL

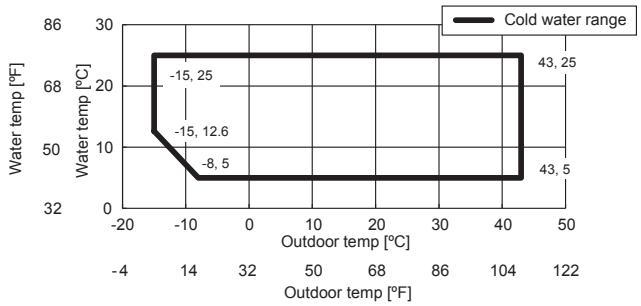
MODEL		SET	EAHV-P900YAL-H(-N)(-BS) EAHV-P900YAF-H(-N)(-BS)	
Power source			3-phase 4-wire 380-400-415V 50/60Hz	
Capacity change mode			Capacity priority	COP priority
Heating capacity *1		kW	90.00	63.00
		kcal/h	77,400	54,180
		BTU/h	307,080	214,956
	Power input *2	kW	25.71	16.96
	Current input 380-400-415V	A	43.4 - 41.2 - 39.7	28.6 - 27.2 - 26.2
	COP (Pump input is not included)		3.50	3.71
	COP (Includes pump input based on EN14511) *3		3.25	3.61
	SCOP (Reversible) Low/Medium (Includes pump input based on EN14511) *4		3.56/2.83	-
	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	m^3/h	15.5	10.8
Maximum current input		A	61	
Water pressure drop *5		kPa	135	65
Temp range	Heating	°C	Outlet water 30~55 *6	
		°F	Outlet water 86~131 *6	
	Outdoor	°C	-15~43 *6	
		°F	5~109.4 *6	
Circulating water volume range		m^3/h	7.7~25.8	
Sound pressure level (measured in anechoic room) at 1m *4		dB (A)	65	63
Sound power level (measured in anechoic room) *4		dB (A)	77	75
Diameter of water pipe (Standard piping)	Inlet	mm (in)	50A (2B) housing type joint	
	Outlet	mm (in)	50A (2B) housing type joint	
Diameter of water pipe (Inside header piping)	Inlet	mm (in)	100A (4B) housing type joint	
	Outlet	mm (in)	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)	987 (2176)	
	Inside header piping	kg (lbs)	1022 (2253)	
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		2	
	Motor output	kW	11.7 x 2	
	Case heater	kW	0.045 x 2	
	Lubricant		MEL32	
Fan	Air flow rate	m^3/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	

*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
*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.

Operating limits

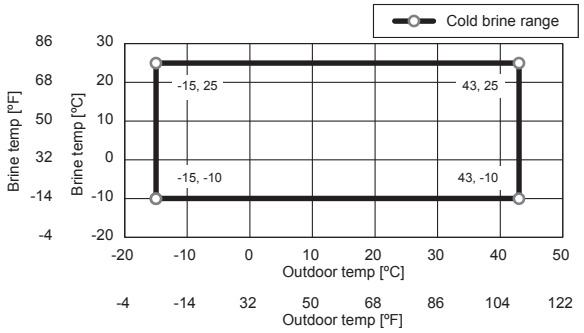
COOLING ONLY

*11

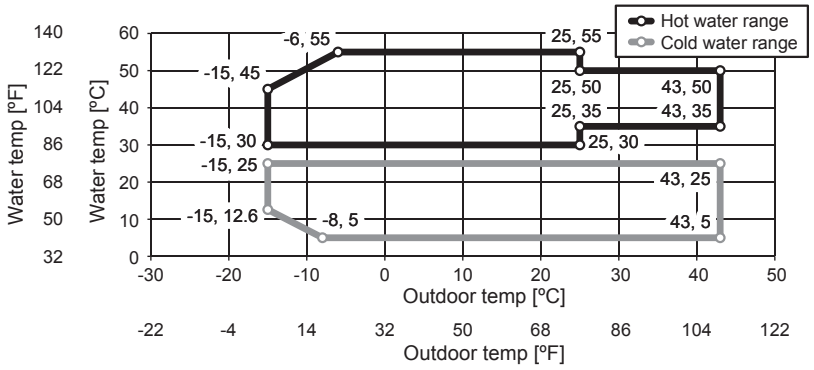


COOLING ONLY - BRINE MODE

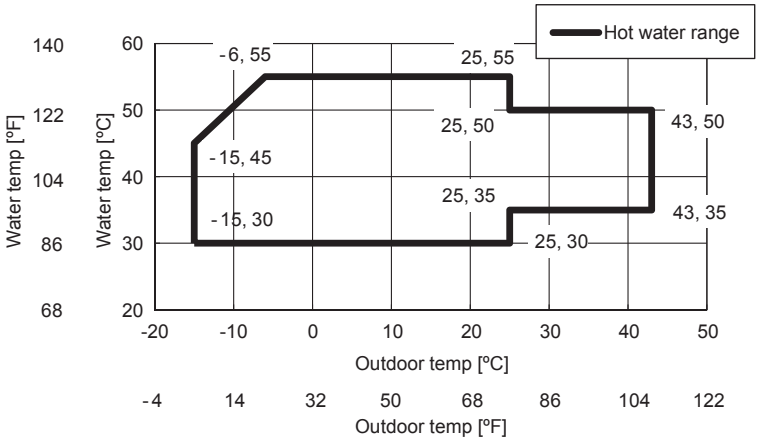
*12



REVERSIBLE HEAT PUMP



HEATING ONLY



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

P1500/P1800

R410A | ME-series

KEY COMPONENTS SAVE ENERGY

HIGH FUNCTIONALITY OF MODULAR CHILLER

BEST IN CLASS EFFICIENCY FOR ENERGY SAVING PERFORMANCE

OPTIMUM FREQUENCY CONTROL

IMPROVED REDUNDANCY & RESILIENCE

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

Best in class efficiency for energy saving performance

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

Rated efficiency

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.

Model **P1500**	Model **P1500**
EER 3.19[*1]	**COP 3.29**[*2]

[*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.
[*2] 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.

Seasonal efficiency

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.

Model **P1500**	Model **P1800**
SEER 4.62[*1]	**SEER 4.58**[*1]

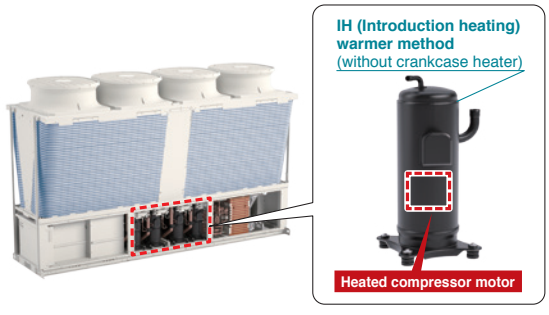
[*1] Compliant with EN14511

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.

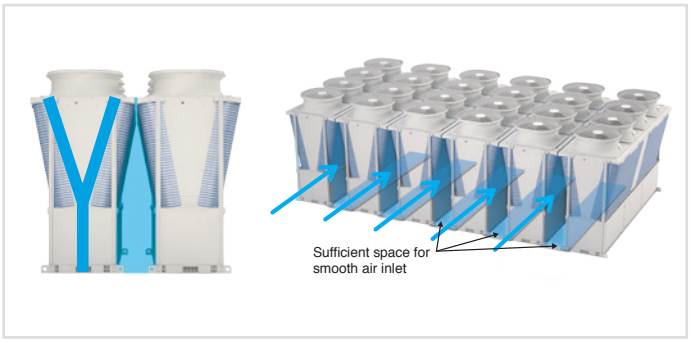
Equipped with high-efficiency inverter compressors

Each unit 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 unit. 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 compared to the crankcase heater method when the unit is stopped.



Use of Y-shape structure for effective operation

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

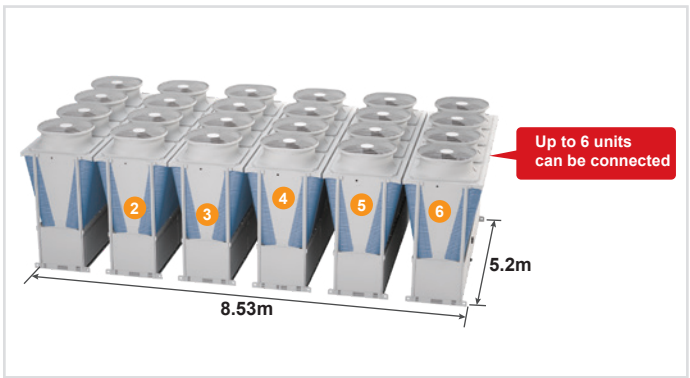
The capacity among 1 group can be increased to up to 360 HP by combining units.

Large-capacity 50 HP and 60 HP units are available. Even a 360 HP system using six 60 HP units can be installed in 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)

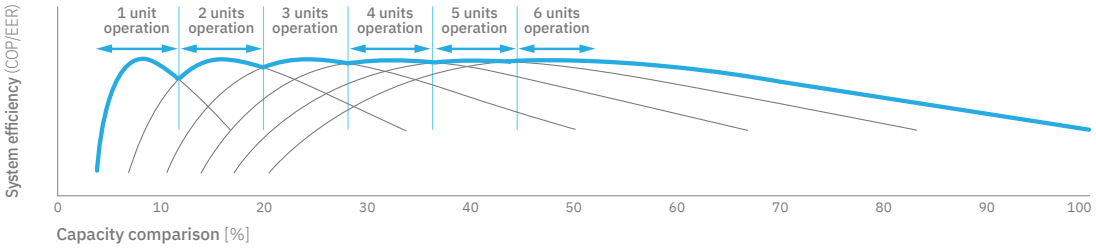


Optimum frequency control

When multiple modules are connected, the frequency of each inverter compressor is controlled during operation to increase the efficiency of each module, achieving a high energy saving performance.

This control can be implemented by simply using our unique M-NET control, without the need for any other on-site design.

HIGH EFFICIENCY IS MAINTAINED

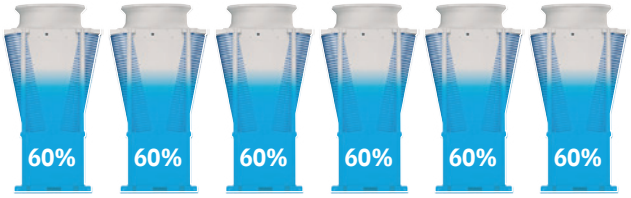


WHEN THE OVERALL SYSTEM LOAD IS 60%

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.

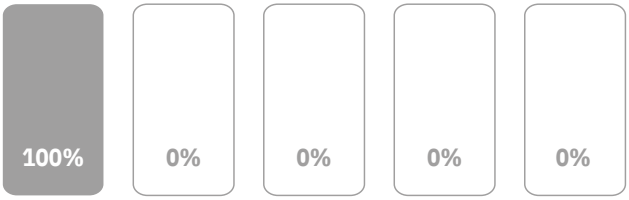
With optimum frequency control



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

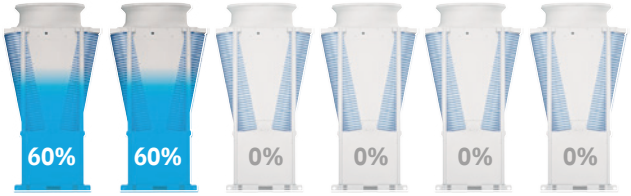
WHEN THE OVERALL SYSTEM LOAD IS 20%

Without optimum frequency control



Since the compressors are running at inefficient frequencies, the efficiency of the whole system is lower.

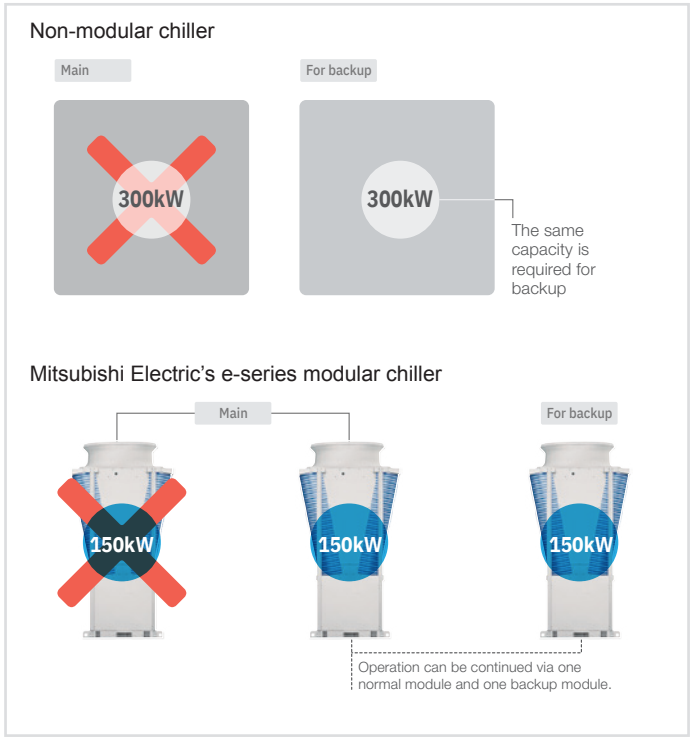
With optimum frequency control

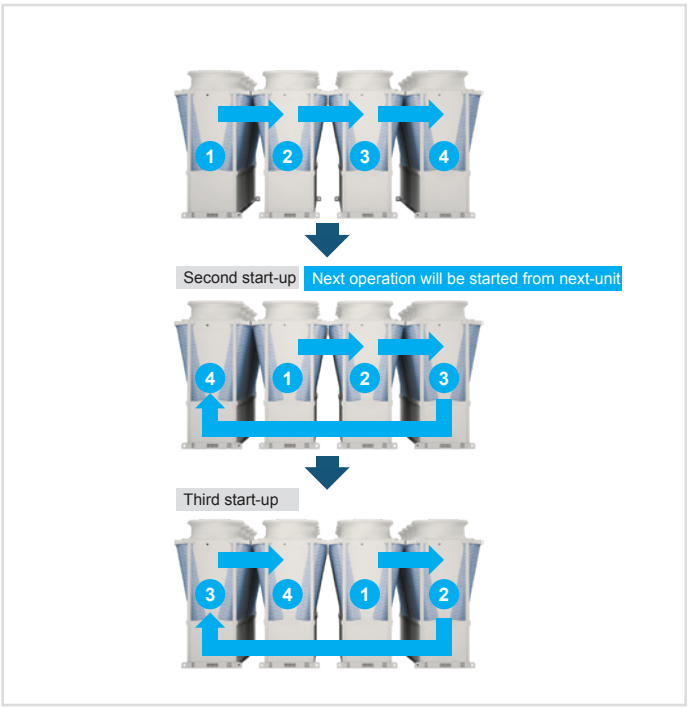


Peak efficiency is between 40 and 60%. In low load conditions, modules can be switched off to **keep remaining modules at optimum efficiency.**
The output of the pumps connected to the remaining group can be decreased, and the efficiency of the whole system is then increased. This control is achieved by connecting to M-NET. There is no need to prepare sensors, and the instrumentation is simple.

Improved redundancy & resilience

When a non-modular chiller is used as the main 300kW unit, as in this example, the same capacity would also be required as a backup. However, when a Mitsubishi Electric e-series modular chiller is used, two modules can still operate even if one module goes down, continuing normal operation. This reduces the backup capacity requirement.

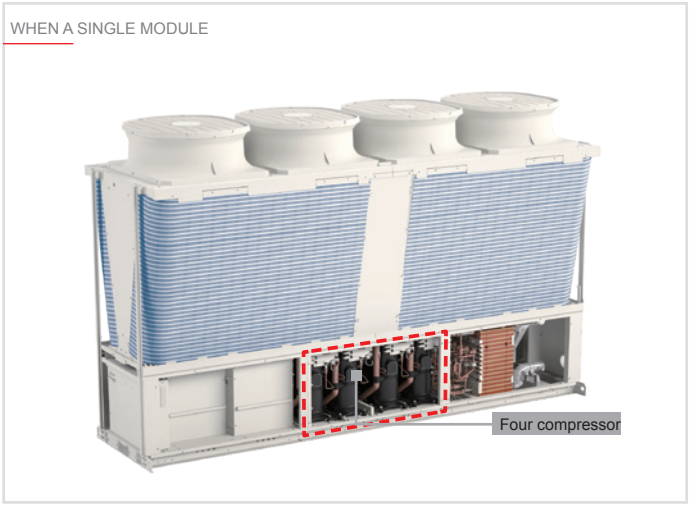




Emergency operation mode

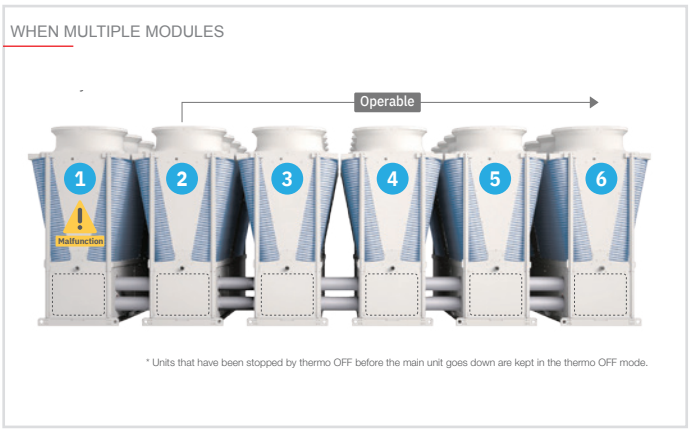
When a single module

The e-series module contains four compressors (two for the 90kW module) developed by Mitsubishi Electric. The four compressors operate as two pairs. If something is wrong with one of the two pairs, the other pair can temporarily continue to operate. The 90kW module achieves this by operating its two compressors independently.



When multiple modules

If one of the e-series modules goes down, the remaining modules can continue to operate. Each module can independently control the outlet water temperature. Even if the main module goes down, operation can be continued.



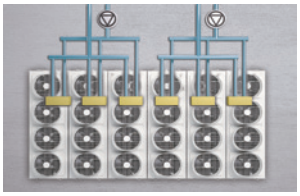
Procedure for installing the connection kit

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.

STANDARD PIPING TYPE

Type without built-in pump or header



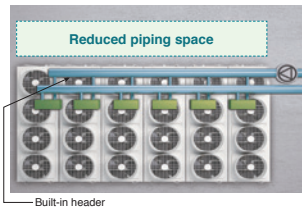
Advantages

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.
Advantages

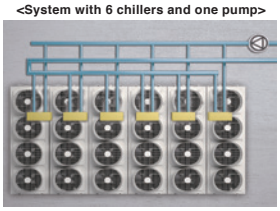
* It is not possible to build both the pump and the header in each unit.

Standard piping type

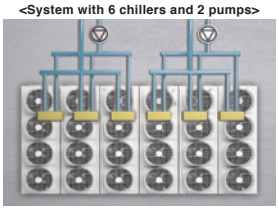
The flexibility of design is high, and the system can be designed according to the on-site system and load pattern. Up to 24 units (4 groups × 6 units) can be connected to one system. The number of pumps and the piping structure can be designed according to the on-site.

STANDARD PIPING TYPE

<System with 6 chillers and one pump>



<System with 6 chillers and 2 pumps>



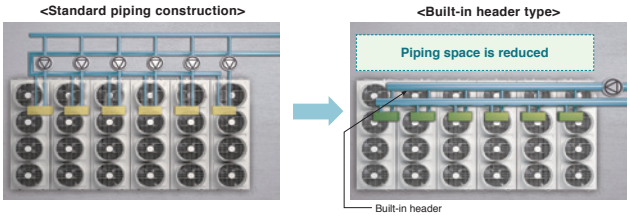
Built-in header type

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.

BUILT-IN HEADER TYPE

<Standard piping construction>

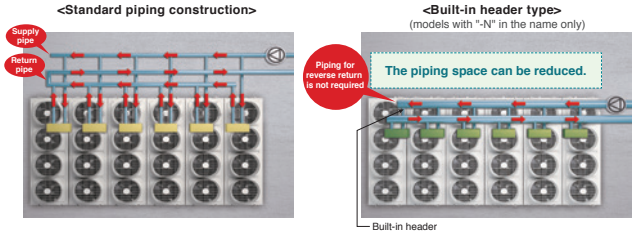
<Built-in header type>



SPACE FOR RETURN PIPING IS NOT REQUIRED

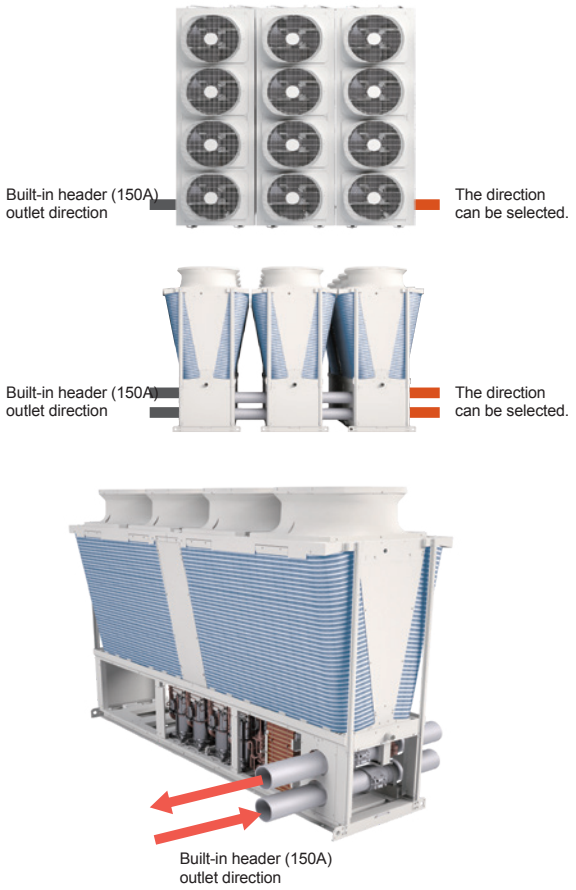
<Standard piping construction>

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



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.

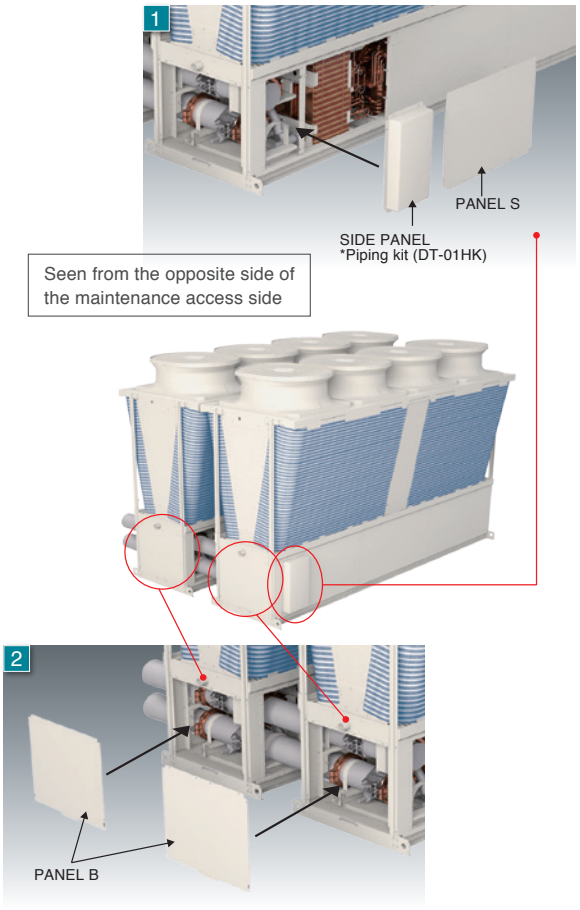


INSTALLATION OF PANELS

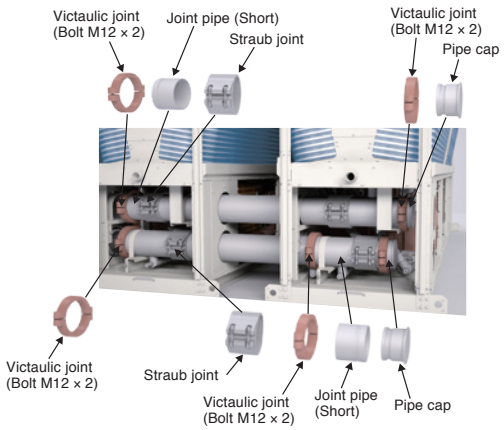
1 Install the panels on the end unit.

*Note: install panel S and then the closing panel.

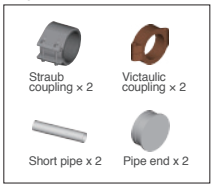
2 Install panel B.



INSTALLATION OF END CONNECTION KIT (DT-01HK, EXCLUDING PANELS)

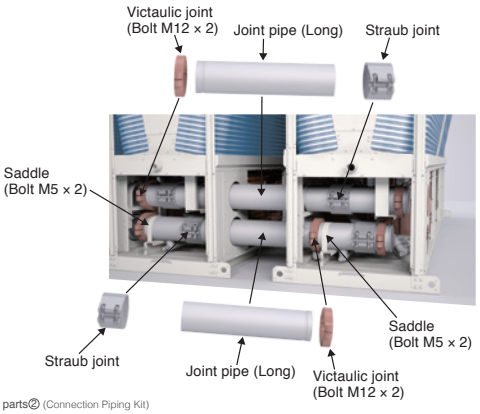


Optional parts① (Piping Kit)
DT-01HK

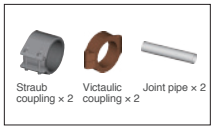


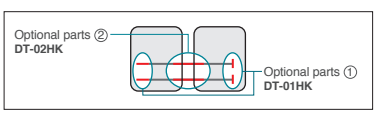
INSTALLATION OF CONNECTION KIT (DT-02HK, EXCLUDING PANELS)

* Please remove the panels before installing the connection kit.



Optional parts② (Connection Piping Kit)
DT-02HK





Control technology

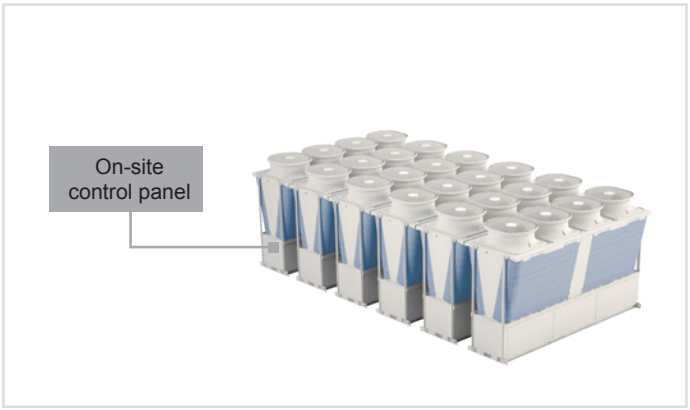
You can perform basic operations, such as starting, stopping, mode switching, water temperature setting and schedule setting, by connecting a remote controller.

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 unit.

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



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

Technical specifications COOLING ONLY MODEL

MODEL			SET	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	180.00
			kcal/h	129,000	154,800
			BTU/h	511,800	614,160
		Power input	kW	45.10	59.01
		EER		3.33	3.05
		IPLV *5		6.55	6.33
		Water flow rate	m^3/h	25.8	31.0
Cooling capacity(EN14511) *2			kW	148.58	177.76
			kcal/h	127,779	152,874
			BTU/h	506,955	606,517
		Power input	kW	46.52	61.25
		EER		3.19	2.90
		Eurovent efficiency class		A	B
		ESEER *6		4.74	4.45
		SEER		4.62	4.58
		Water flow rate	m^3/h	25.8	31.0
Current input		Cooling current 380-400-415V *1	A	77 - 73 - 70	
		Maximum current	A	111	
Water pressure drop *1			kPa	114	164
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	68
Sound power level (measured in anechoic room) *1			dB (A)	84	86
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	
		CO2 equivalent *4	t	25.06	
	Maximum additional charge	Weight	kg	48.0	
		CO2 equivalent *4	t	100.23	
	Total charge	Weight	kg	60.0	
		CO2 equivalent *4	t	125.29	
		Control		LEV	

*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.

Technical specifications HEATPUMP MODEL

MODEL			SET	EAHV-P1500YBL(-N)(-BS)	EAHV-P1800YBL(-N)(-BS)
Power source				3-phase 4-wire 380-400-415V 50/60Hz	
Cooling capacity *1			kW	150.00	180.00
			kcal/h	129,000	154,800
			BTU/h	511,800	614,160
	Power input		kW	45.10	59.01
	EER			3.33	3.05
	IPLV *7			6.55	6.33
	Water flow rate		m^3/h	25.8	31.0
Cooling capacity(EN14511) *2			kW	148.58	177.76
			kcal/h	127,779	152,874
			BTU/h	506,955	606,517
	Power input		kW	46.52	61.25
	EER			3.19	2.90
	Eurovent efficiency class			A	B
	ESEER *8			4.74	4.45
	SEER			4.62	4.58
	Water flow rate		m^3/h	25.8	31.0
Heating capacity *3			kW	150.00	180.00
			kcal/h	129,000	154,800
			BTU/h	511,800	614,160
	Power input		kW	44.59	55.68
	COP			3.36	3.23
	Water flow rate		m^3/h	25.8	31.0
Heating capacity(EN14511) *4			kW	151.42	182.24
			kcal/h	130,221	156,726
			BTU/h	516,645	621,803
	Power input		kW	46.01	57.92
	COP			3.29	3.15
	Eurovent efficiency class			A	B
	SCOP (Reversible) Low/Medium			3.24 / 2.85	
	Water flow rate		m^3/h	25.8	31.0
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	
Water pressure drop *1			kPa	114	164
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	12.9~34.0	
Sound pressure level (measured in anechoic room) at 1m *1			dB (A)	66	68
Sound power level (measured in anechoic room) *1			dB (A)	64	86
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)	1310 (2888)	
		Inside header piping	kg (lbs)	1326 (2923)	
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	0.92 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 *5	Type / GWP *6			R410A / 2088	
	Factory charged	Weight	kg	12.0	
		CO2 equivalent *6	t	25.06	
	Maximum additional charge	Weight	kg	48.0	
		CO2 equivalent *6	t	100.23	
	Total charge	Weight	kg	60.0	
		CO2 equivalent *6	t	125.29	
		Control		LEV	

*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.

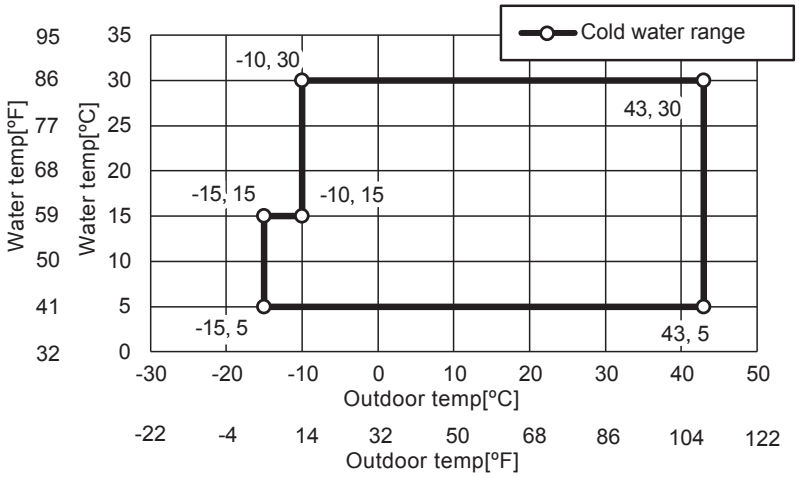
Technical specifications HEATYNG ONLY MODEL

MODEL			SET	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	180.00
			kcal/h	129,000	154,800
			BTU/h	511,800	614,160
		Power input	kW	44.59	55.68
		COP		3.36	3.23
		Water flow rate	m^3/h	25.8	31.0
Heating capacity (EN14511) *2			kW	151.42	182.24
			kcal/h	130,221	156,726
			BTU/h	516,645	621,803
		Power input	kW	46.01	57.92
		COP		3.29	3.15
		Eurovent efficiency class		A	B
		SCOP (Heating only) Low/Medium		3.20 / 2.83	
		Water flow rate	m^3/h	25.8	31.0
		Heating current 380-400-415V *3	A	76 - 72 - 69	
		Maximum current	A	111	
Water pressure drop *1			kPa	114	164
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			m^3/h	12.9~34.0	
Sound pressure level (measured in anechoic room) at 1m *1			dB (A)	66	67
Sound power level (measured in anechoic room) *1			dB (A)	84	86
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)	1310 (2888)	
		Inside header piping	kg (lbs)	1326 (2923)	
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	
		CO2 equivalent *4	t	25.06	
	Maximum additional charge	Weight	kg	48.0	
		CO2 equivalent *4	t	100.23	
	Total charge	Weight	kg	60.0	
		CO2 equivalent *4	t	125.29	
		Control		LEV	

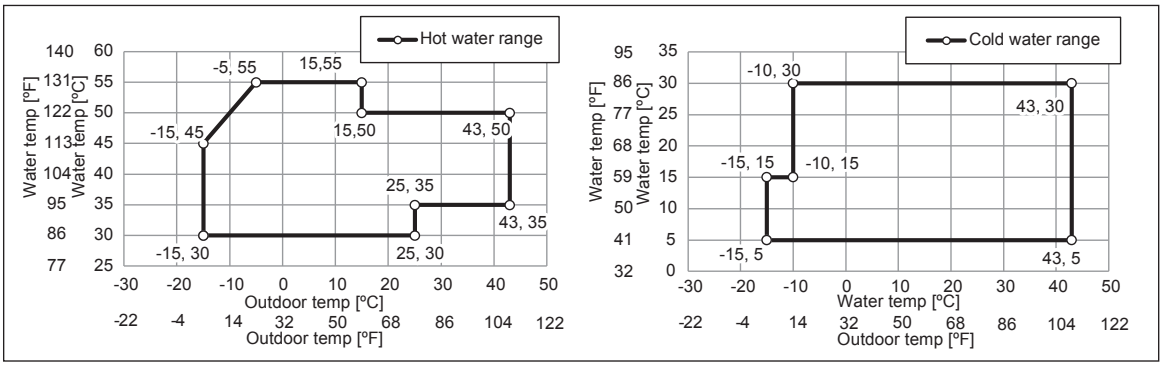
*1 Under normal heating conditions at outdoor temp 7°CDB/6°CWB(44.6°FDB/42.8°FWB) outlet water temp 45°C(113°F) inlet water temp 40°C(104°F). Pump input is not included in heating capacity and power input.
*2 Under normal heating conditions at outdoor temp 7°CDB/6°CWB(44.6°FDB/42.8°FWB) outlet water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

Operating limits

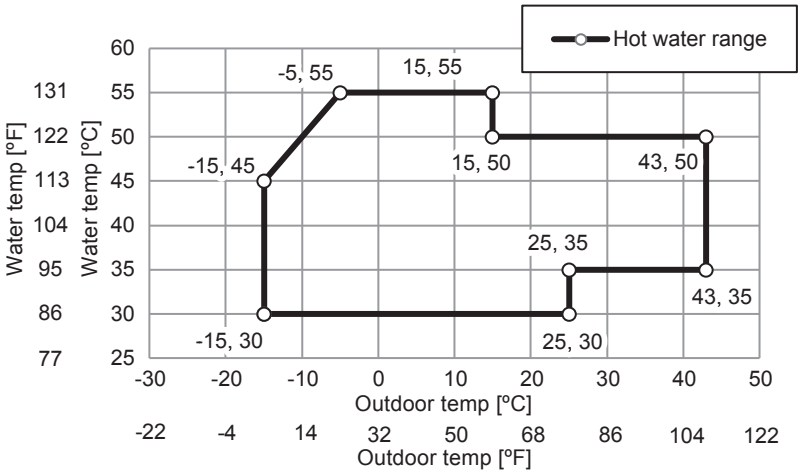
COOLING ONLY



REVERSIBLE HEAT PUMP



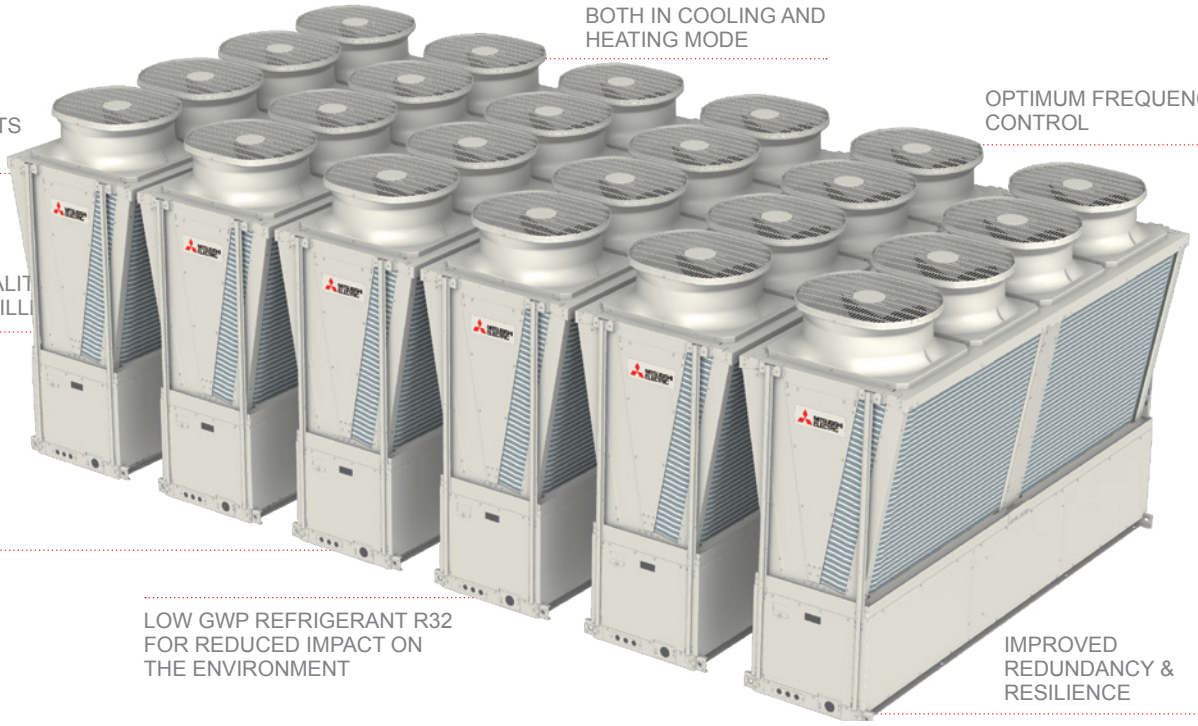
HEATING ONLY



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

M1500/M1800 NEW

R32 | ME-series



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

Best in class efficiency for energy saving performance

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

Rated efficiency

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.

Model **M1500**	Eurovent efficiency class Rank A achieved	Model **M1500**
EER 3.28[*1]		**COP 3.47**[*2]

[*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.
[*2] 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.

Seasonal efficiency

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.

Model **M1500**	SEERavg. +18% vs R410 version	Model **M1800**
SEER 5.52[*1]		**SEER 5.36**[*1]
SCOP 3.31[*1]		**SCOP 3.31**[*1]

[*1] Compliant with EN14511

Key Components and Technologies

The high-grade functionality, energy efficiency, and endurance of the e-series are achieved by Mitsubishi Electric's technology.

Compressor

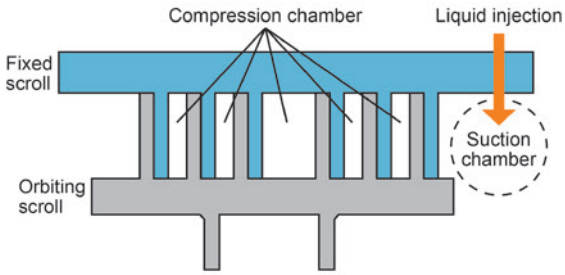
R32-compatible high-efficiency inverter compressor

Each unit has four high-efficiency R32-compatible inverter compressors. Compared to R410A, R32 has low pressure loss, contributing to better operation efficiency. The inverter compressor automatically controls the compressor frequencies based on various air-conditioning conditions such as outside air temperature and changes in load, helping to achieve higher seasonal efficiency.

Stable operation with a suction chamber injection mechanism

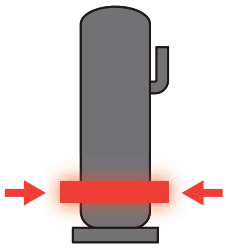
Returning the liquid refrigerant to the suction chamber suppresses a rise in the discharge temperature of R32 while the units are operated at low outside temperatures. The amount of injected refrigerant is adjusted according to the refrigerant state, allowing the units to operate in heating mode at an intake temperature as low as -20°C.

IH (induction heating) warmer



The e-series adopts an IH (induction heating) warmer to prevent refrigerant stagnation while the unit is stopped. The IH warmer suppresses standby power more than the belt case heater, which is wrapped around the compressor shell surface to constantly heat the compressor.

CASE HEATER



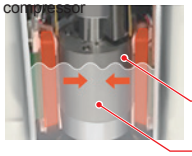
Heated from the outside with a heater

IH WARMER

The magnetic property of the iron motor core inside the compressor is used to heat the compressor shell and prevent refrigerant stagnation while the unit is stopped. In addition, compressor heating remains on for 30 minutes after operation is stopped, and subsequently is switched on and off every 30 minutes. Standby power consumption therefore is lower than a case heater.

Heated by energizing the motor

* Low voltage at a level that will not start up the compressor



Operation while the air conditioner is stopped

On/off is repeated every 30 minutes

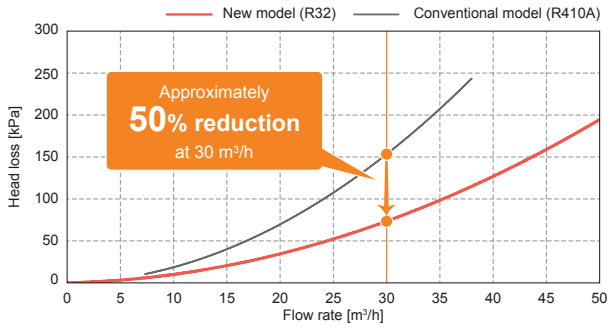
* Normally the compressor is heated while the unit is stopped to prevent liquid refrigerant from remaining in the compressor and to evaporate the liquid refrigerant in the compressor.

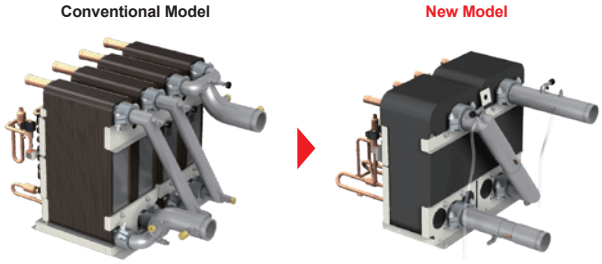
Water heat exchanger

Reduction in head loss

Head loss in the water pipe is reduced by the use of a different water heat exchanger and by reducing the number of water piping routes in the unit.

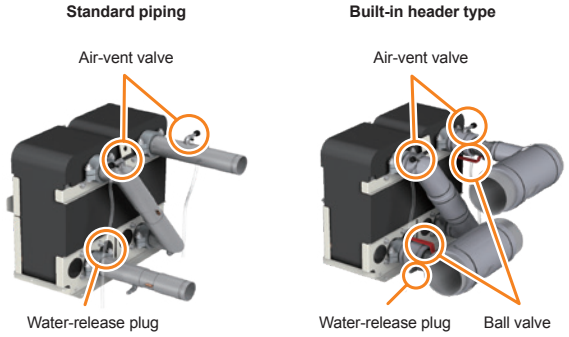
WATER HEAT EXCHANGER HEAD LOSS





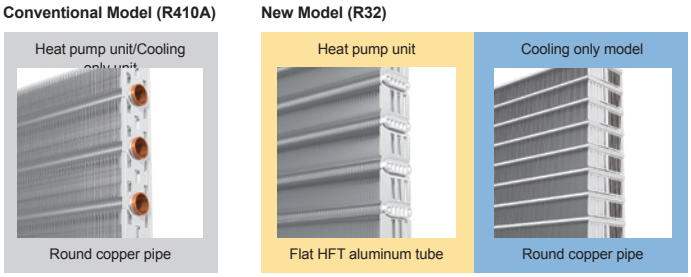
Water piping in the unit

• A water-release plug prevents water splashing when bleeding air.
• Separate air-vent valves are installed at both the inlet and outlet of the water pipes, allowing for easy water drainage just by plugging in and out the plugs.



Flat tube heat exchanger

Flat tubes are sub-divided into smaller fins to increase the contact area with the refrigerant, resulting in greater heat-exchanging efficiency. The cooling only models and the heat pump models have fins that are shaped differently to increase the overall heat-exchange efficiency of each model, resulting in reduced refrigerant volume, greater operating range, and higher operation efficiency.



Parallel flow condenser

The heat pump and cooling only models adopt different fins in consideration of the influence of drain water clogging during heating. The heat pump model uses a horizontal flat tube and the cooling only model uses a parallel flow condenser.
The shape of the corrugated fin used in the cooling only model increases the contact area with air and the amount of heat exchange in cooling operation.

FIN IMAGE

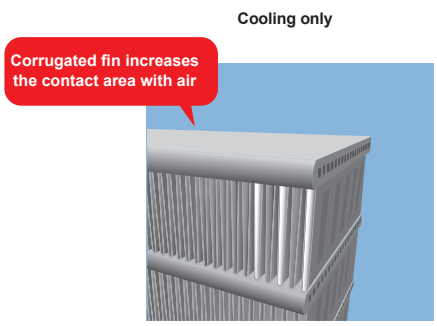
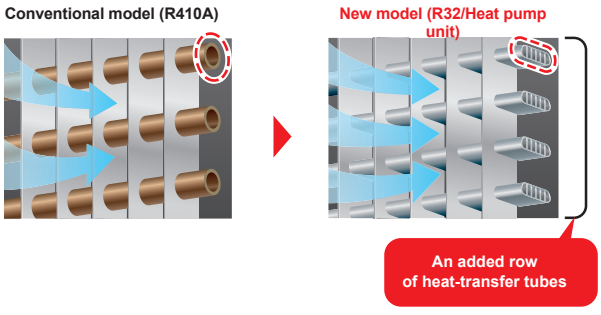
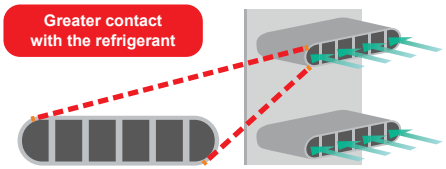


IMAGE OF THE FLAT TUBE



CROSS SECTION OF THE FLAT TUBE



The fins inside the flat tube divide the flow of refrigerant into multiple paths and improve heat-exchanger effectiveness. Flat tubes reduce wind resistance and increase the number of piping stages, resulting in an overall improvement in heat exchange efficiency.

Use of Y-shape structure for effective operation

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

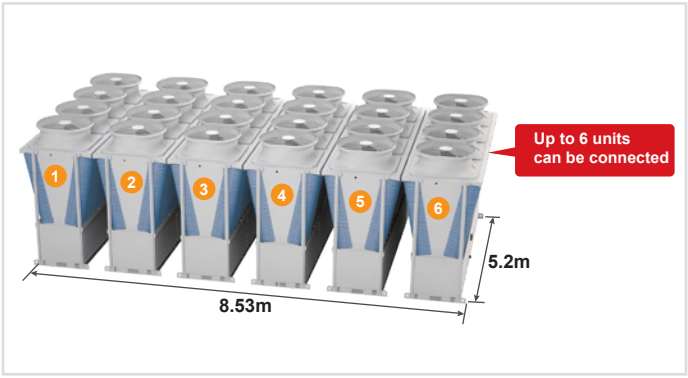
The capacity among 1 group can be increased to up to 360 HP by combining units.

Large-capacity 50 HP and 60 HP units are available. Even a 360 HP system using six 60 HP units can be installed in 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-M1500YCL(-N)
Cooling Only	EACV-M1500YCL(-N)

Heat Pump	EAHV-M1800YCL(-N)
Cooling Only	EACV-M1800YCL(-N)

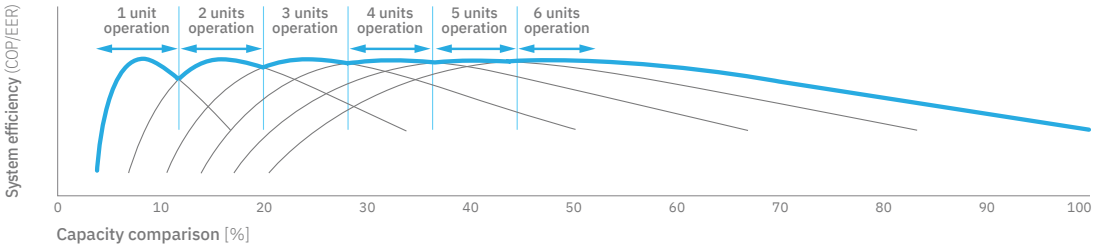


Optimum frequency control

When multiple modules are connected, the frequency of each inverter compressor is controlled during operation to increase the efficiency of each module, achieving a high energy saving performance.

This control can be implemented by simply using our unique M-NET control, without the need for any other on-site design.

HIGH EFFICIENCY IS MAINTAINED

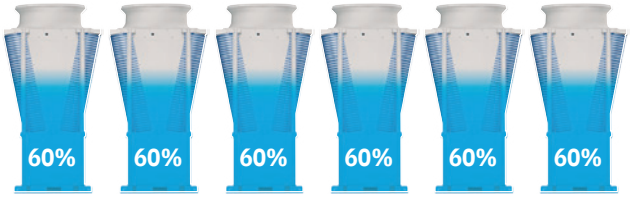


WHEN THE OVERALL SYSTEM LOAD IS 60%

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.

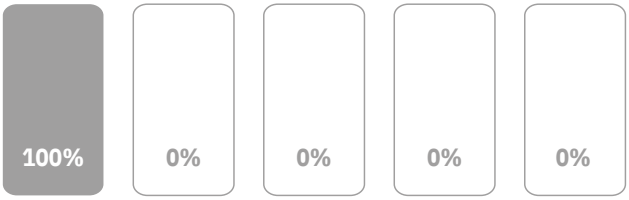
With optimum frequency control



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

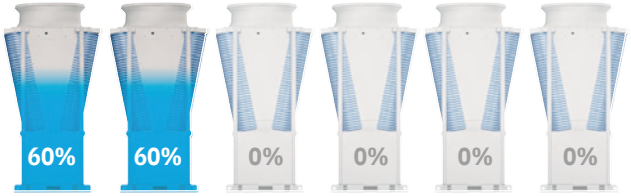
WHEN THE OVERALL SYSTEM LOAD IS 20%

Without optimum frequency control



Since the compressors are running at inefficient frequencies, the efficiency of the whole system is lower.

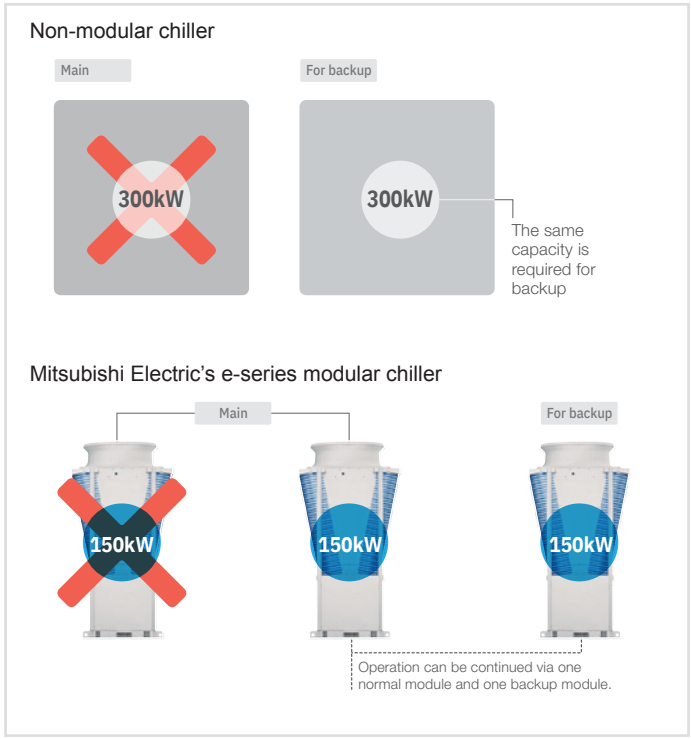
With optimum frequency control

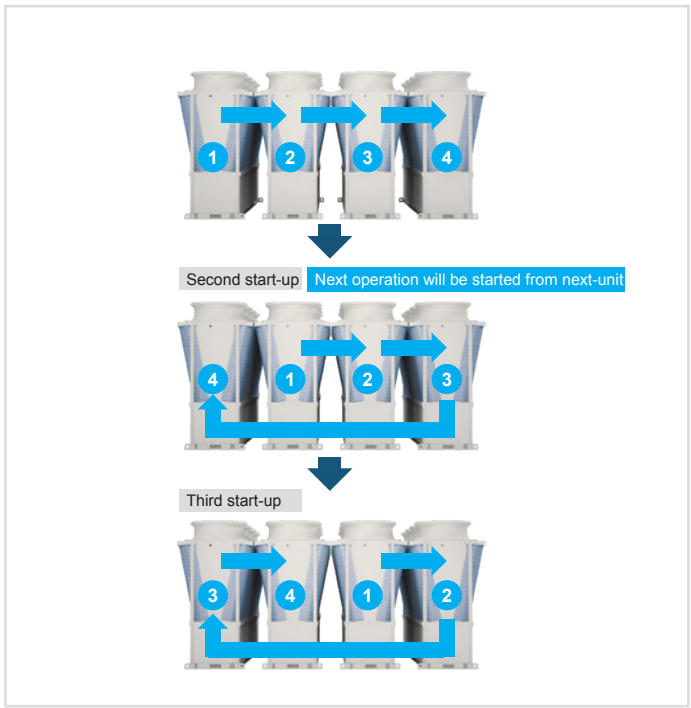


Peak efficiency is between 40 and 60%. In low load conditions, modules can be switched off to **keep remaining modules at optimum efficiency.**
The output of the pumps connected to the remaining group can be decreased, and the efficiency of the whole system is then increased. This control is achieved by connecting to M-NET. There is no need to prepare sensors, and the instrumentation is simple.

Improved redundancy & resilience

When a non-modular chiller is used as the main 300kW unit, as in this example, the same capacity would also be required as a backup. However, when a Mitsubishi Electric e-series modular chiller is used, two modules can still operate even if one module goes down, continuing normal operation. This reduces the backup capacity requirement.



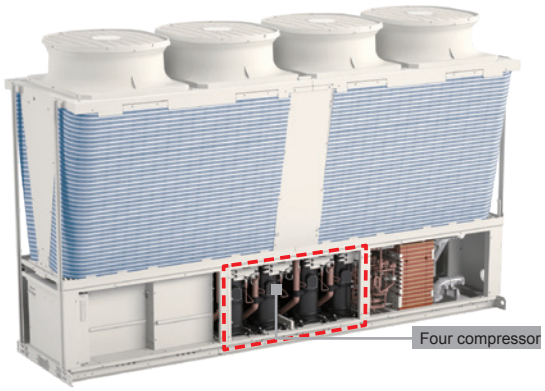


Emergency operation mode

When a single module

The e-series module contains four compressors (two for the 90kW module) developed by Mitsubishi Electric. The four compressors operate as two pairs. If something is wrong with one of the two pairs, the other pair can temporarily continue to operate. The 90kW module achieves this by operating its two compressors independently.

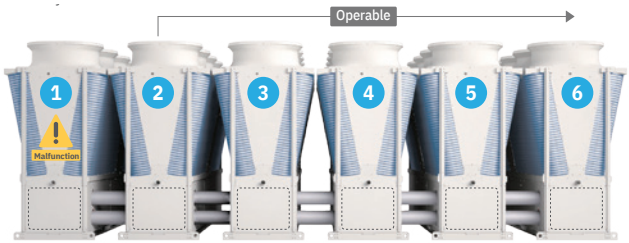
WHEN A SINGLE MODULE



When multiple modules

If one of the e-series modules goes down, the remaining modules can continue to operate. Each module can independently control the outlet water temperature. Even if the main module goes down, operation can be continued.

WHEN MULTIPLE MODULES



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

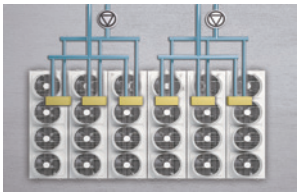
Procedure for installing the connection kit

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.

STANDARD PIPING TYPE

Type without built-in pump or header



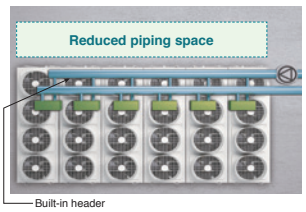
Advantages

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.
Advantages

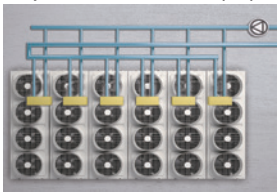
* It is not possible to build both the pump and the header in each unit.

Standard piping type

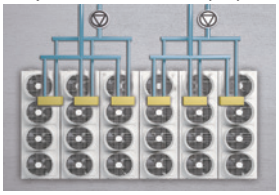
The flexibility of design is high, and the system can be designed according to the on-site system and load pattern. Up to 24 units (4 groups × 6 units) can be connected to one system. The number of pumps and the piping structure can be designed according to the on-site.

STANDARD PIPING TYPE

<System with 6 chillers and one pump>



<System with 6 chillers and 2 pumps>

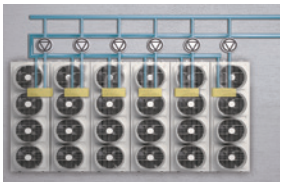


Built-in header type

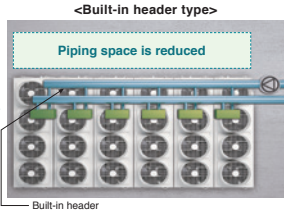
The piping to connect to other units is built into each unit. The number of piping connections is reduced (saving construction work and reducing the construction time), and the installation space can be also reduced.

BUILT-IN HEADER TYPE

<Standard piping construction>



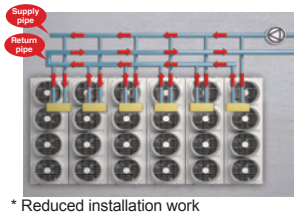
<Built-in header type>



* Less space and equipment cost

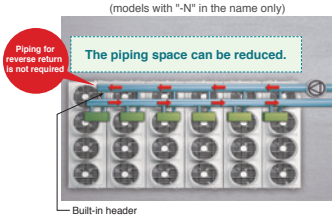
SPACE FOR RETURN PIPING IS NOT REQUIRED

<Standard piping construction>



<Built-in header type>

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



* Reduced installation work

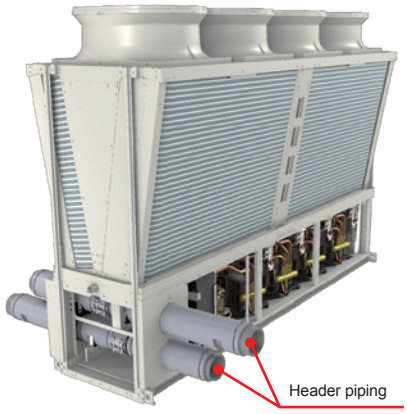
Details of built-in header type modules

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.

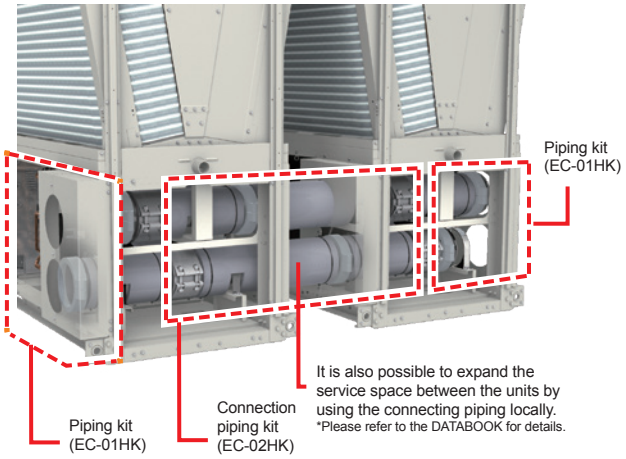
Built-in header type

Header pipings, which are normally required for connecting the unit to local water pipes, are built into the unit. Multiple units are easily connectable by using optional parts. This eliminates the need to procure water pipes for connecting the units, and reduces installation work.

BUILT-IN HEADER TYPE

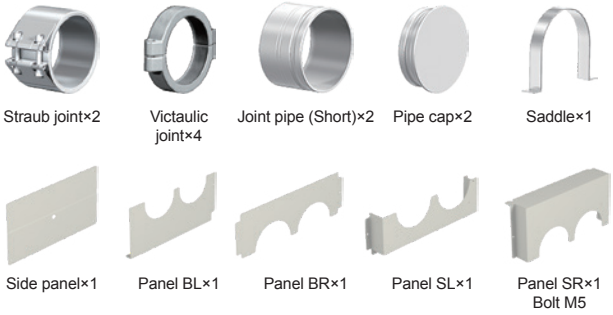


* This photo shows the angle from the piping side.



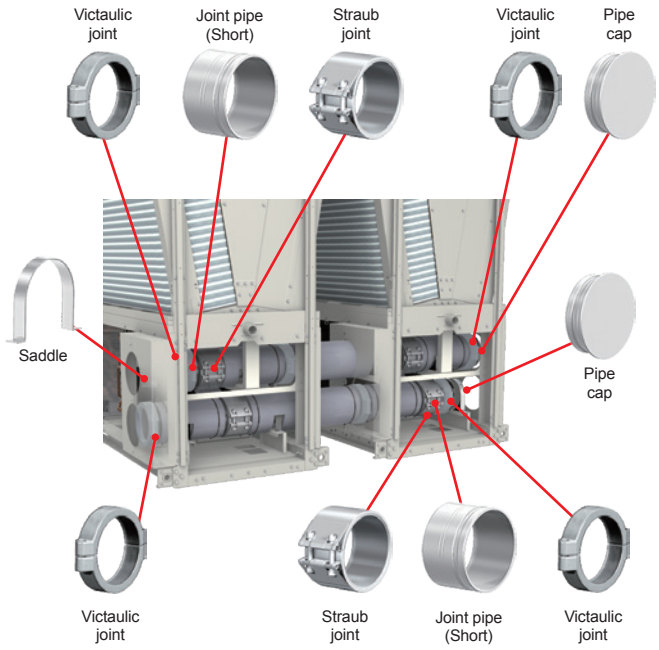
PARTS LIST

EC-01HK
Optional parts
(Piping kit)



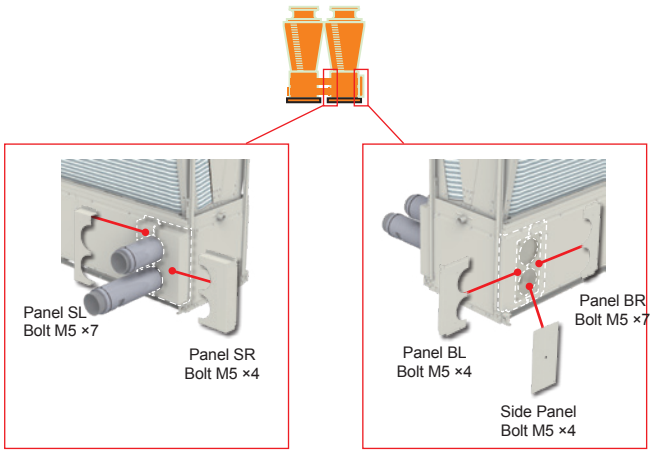
INSTALLING THE PIPING KIT (EC-01HK)

Header piping



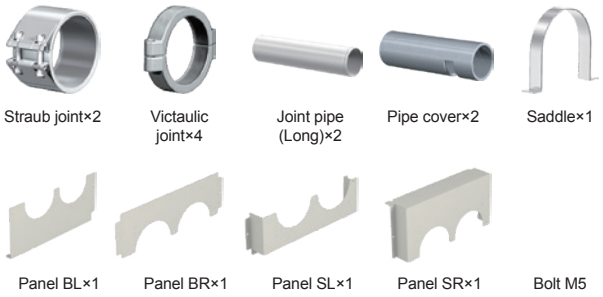
INSTALLING THE PIPING KIT (EC-01HK)

Panel



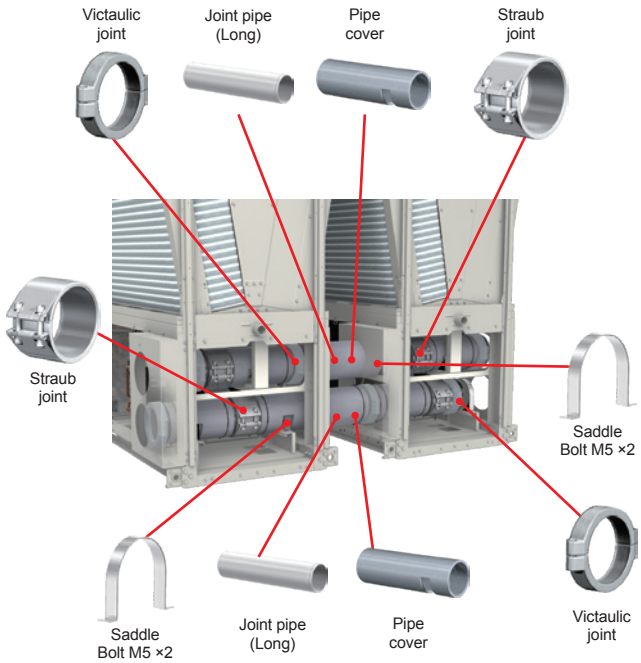
PARTS LIST

EC-02HK
(Connection piping kit)



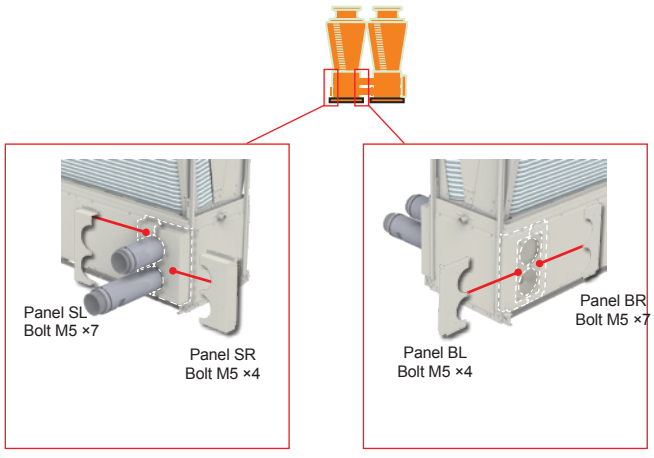
INSTALLING THE PIPING KIT (EC-02HK)

Header piping



INSTALLING THE PIPING KIT (EC-02HK)

Panel



Easy control

The water temperature in each module can be controlled by using local remote controller PAR-W31MAA or by using centralized controller AE-200E. The control method can be selected at the request of each customer.

Remote controller
PAR-W31MAA

Centralized controller
AE-200E

External signal input

Basic operations, such as operation command, mode switching and water temperature setting, can be performed by inputting external signals directly to the unit.

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

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

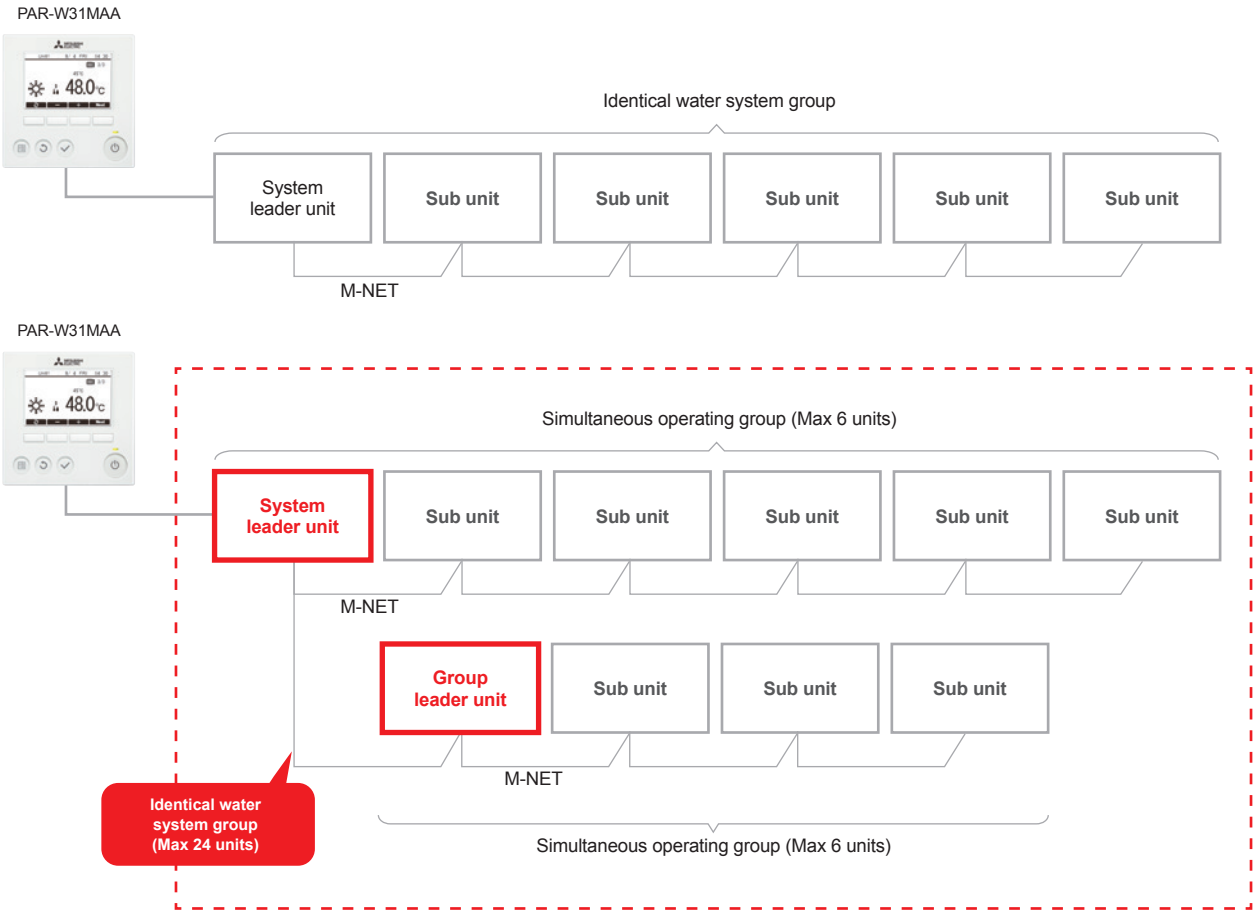
Remote controller

Basic operations, such as ON/OFF, mode switching, water temperature setting and schedule setting, can be performed by connecting a remote controller.

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

PAR-W31MAA

SYSTEM CONFIGURATION



Centralized controller*

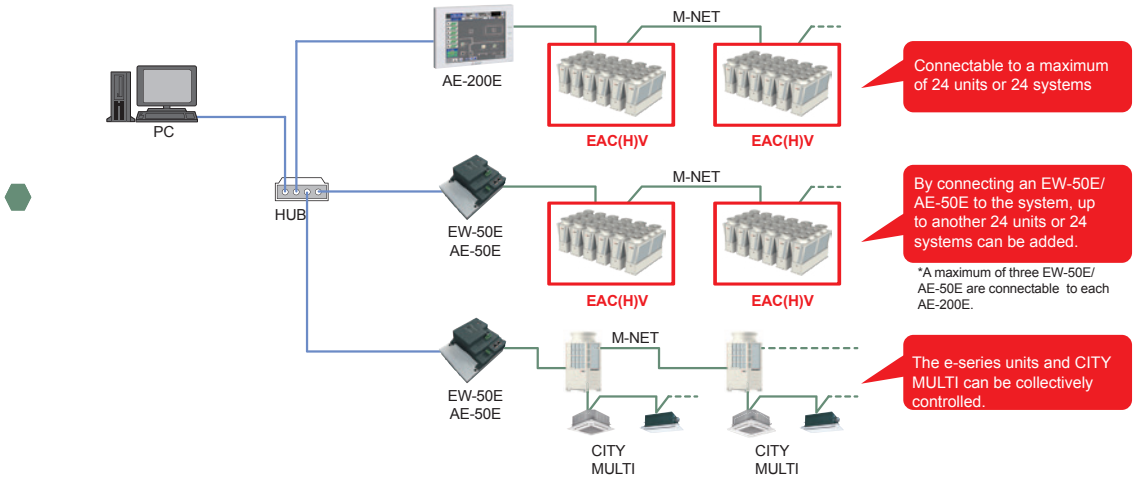
The e-series units are connectable to the AE-200E that centrally controls up to 24 units or 24 systems connected via M-NET.
By using EW-50E or AE-50E, the maximum number of connectable units can be further increased.
The use of AE-200E enables various operation settings and integrated control of the e-series and CITY MULTI.

*AE-200E with software Ver.7.80 or later can be connected.

Operation/setting	ON/OFF
	Cooling/Heating/HeatingECO/Anti-freeze
	Snow/Normal
	Scheduled operation (daily/weekly/annual)
	Target temperature
	Local control disabled (ON/OFF, operation mode, target temperature)
Display	WEB browser connected
	Operation mode
	Current water temperature
	Error code
	Outdoor temperature
Control function (function of chiller body)	Control of number of units Control to prevent simultaneous defrosting

Centralized controller
AE-200E

SYSTEM CONFIGURATION



BACnet® connection function

Connectable to a central monitoring device via AE-200E using BACnet®

* BACnet® is a registered trademark of ASHRAE in the United States of America.
* BACnet® can be connected to AE-200E with software Ver.7.90 or later.

Operation/setting	ON/OFF
	Cooling/Heating/Heating ECO/Anti-freeze
	Snow/Normal
	Target water temperature
	Local control disabled (ON/OFF, operation mode, target temperature)
Display	ON/OFF
	Cooling/Heating/Heating ECO/Anti-freeze
	Snow/Normal
	Local control disabled (ON/OFF, operation mode, target temperature)
	Inlet/outlet water temperature
	Collective error
	Communication error
	Individual unit error

Technical specifications COOLING ONLY MODEL

MODEL		SET	EACV-M1500YCL(-N)(-BS)	EACV-M1800YCL(-N)(-BS)
Power source			3-phase 4-wire 380-400-415V 50/60Hz	
Cooling capacity *1		kW	150.00	180.00
		kcal/h	129,000	154,800
		BTU/h	511,800	614,160
	Power input	kW	44.73	57.02
	EER		3.35	3.16
	IPLV *4		6.42	6.31
	Water flow rate	m^3/h	25.8	31.0
Cooling capacity(EN14511) *2		kW	149.18	178.80
		kcal/h	128,295	153,768
		BTU/h	509,002	610,066
	Power input	kW	45.55	58.22
	EER		3.28	3.07
	Eurovent efficiency class		A	B
	SEER		5.52	5.36
	Water flow rate	m^3/h	25.8	31.0
Current input	Cooling current 380-400-415V *1	A	76 - 72 - 69	96 - 91 - 88
	Maximum current	A	120	
Water pressure drop *1		kPa	55	78
Temp range	Cooling	°C	Outlet water 5~30 *5	
		°F	Outlet water 41~86 *5	
	Outdoor	°C	-15~52 *5	
		°F	5~125.6 *5	
Circulating water volume range		m^3/h	12.9~34.0	
Sound pressure level (measured in anechoic room) at 1m *1		dB (A)	65	67
Sound power level (measured in anechoic room) *1		dB (A)	83	85
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)	1039 (2291)	
	Inside header piping	kg (lbs)	1067 (2352)	
Design pressure	R410A	MPa	4.15	
	Water	MPa	1.0	
Heat exchanger	Water side		Stainless steel plate and copper brazing	
	Air side		Salt-resistant corrugated fin & aluminium micro channel	
Compressor	Type		Inverter scroll hermetic compressor	
	Maker		MITSUBISHI ELECTRIC CORPORATION	
	Starting method		Inverter	
	Quantity		4	
	Motor output	kW	11.7 x 4	
	Lubricant		MEL46EH	
Fan	Air flow rate	m^3/min	270 x 4	
		L/s	4500 x 4	
		cfm	9534 x 4	
	Type, Quantity		Propeller fan x 4	
	Starting method		Inverter	
	Motor output	kW	0.92 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 x charge		R32 x 4.7 (kg) x 4 *3	
	Control		LEV	

*1 Under normal cooling conditions at outdoor temp 35°C DB / 24°C WB (95°F DB / 75.2°F WB) 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°C DB / 24°C WB (95°F DB / 75.2°F WB) 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 IPLV is calculated in accordance with AHRI 550-590.
*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 directly.
*The water circuit must be closed circuit.
*Due to continuous improvement, the above specifications may be subject to change without notice.
*This model is not equipped with a pump.

Technical specifications HEATPUMP MODEL

MODEL		SET	EAHV-M1500YCL(-N)(-BS)	EAHV-M1800YCL(-N)(-BS)
Power source			3-phase 4-wire 380-400-415V 50/60Hz	
Cooling capacity *1		kW	150.00	180.00
		kcal/h	129,000	154,800
		BTU/h	511,800	614,160
	Power input	kW	44.73	57.02
	EER		3.35	3.16
	IPLV *6		6.42	6.31
	Water flow rate	m^3/h	25.8	31.0
Cooling capacity(EN14511) *2		kW	149.18	178.80
		kcal/h	128,295	153,768
		BTU/h	509,002	610,066
	Power input	kW	45.55	58.22
	EER		3.28	3.07
	Eurovent efficiency class		A	B
	SEER		5.52	5.36
	Water flow rate	m^3/h	25.8	31.0
Heating capacity *3		kW	150.00	180.00
		kcal/h	129,000	154,800
		BTU/h	511,800	614,160
	Power input	kW	42.61	53.09
	COP		3.52	3.39
	Water flow rate	m^3/h	25.8	31.0
Heating capacity(EN14511) *4		kW	150.82	181.20
		kcal/h	129,705	155,832
		BTU/h	514,598	618,254
	Power input	kW	43.43	54.29
	COP		3.47	3.34
	SCOP Low temp. application/Medium temp. applic.		3.31 / 2.88	
	Water flow rate	m^3/h	25.8	31.0
Current input	Cooling current 380-400-415V *1	A	76 - 72 - 69	96 - 91 - 88
	Heating current 380-400-415V *3	A	72 - 68 - 66	90 - 85 - 82
	Maximum current	A	120	
Water pressure drop *1		kPa	55	78
Temp range	Cooling	°C	Outlet water 4~30 *7	
		°F	Outlet water 39.2~86 *7	
	Heating	°C	Outlet water 25~55 *7	
		°F	Outlet water 77~131 *7	
	Outdoor (Cooling)	°C	-15~52 *7	
		°F	5~125.6 *7	
	Outdoor (Heating)	°C	-20~43 *7	
		°F	-4~109.4 *7	
Circulating water volume range		m^3/h	12.9~34.0	
Sound pressure level (measured in anechoic room) at 1m *1		dB (A)	65	67
Sound power level (measured in anechoic room) *1		dB (A)	83	85
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)	1280 (2822)	
	Inside header piping	kg (lbs)	1307 (2881)	
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	11.5 x 4	
	Lubricant		MEL46EH	
Fan	Air flow rate	m^3/min	270 x 4	
		L/s	4500 x 4	
		cfm	9534 x 4	
	Type, Quantity		Propeller fan x 4	
	Starting method		Inverter	
	Motor output	kW	0.92 x 4	
	External static press.	Pa	20	
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 *5	Type x charge		R32 x 11.5 (kg) x 4 *5	
	Control		LEV	

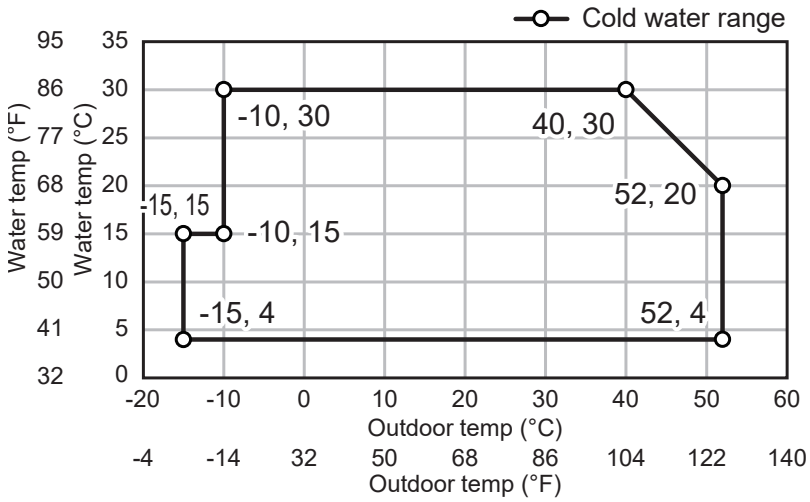
*1 Under normal cooling conditions at outdoor temp 35°C DB / 24°C WB (95°F DB / 75.2°F WB) outlet water temp 7°C (44.6°F) inlet water temp 12°C (53.6°F). Pump input is not included in cooling capacity and power input.
*2 Under normal cooling conditions at outdoor temp 35°C DB / 24°C WB (95°F DB / 75.2°F WB) 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°C DB / 6°C WB (44.6°F DB / 42.8°F WB) 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°C DB / 6°C WB (44.6°F DB / 42.8°F WB) 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 IPLV is calculated in accordance with AHRI 550-590.
*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 directly.
*The water circuit must be closed circuit.
*Due to continuous improvement, the above specifications may be subject to change without notice.
*This model is not equipped with a pump.

Operating limits

COOLING ONLY

Operable in cooling mode at an intake air temperature of up to 52°C.

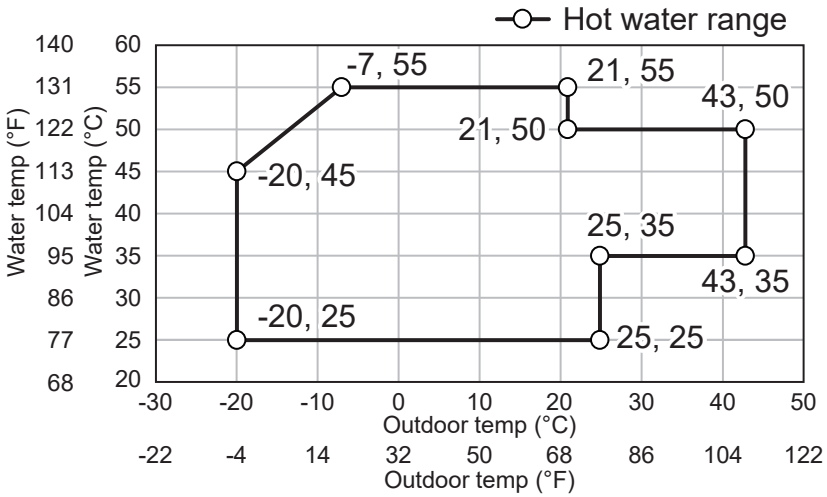
The use of the flat tube heat exchanger has made it possible to increase the maximum intake air temperature from 43°C to 52°C in cooling mode, extending the cooling performance of the units in intense heat and in collective installation.

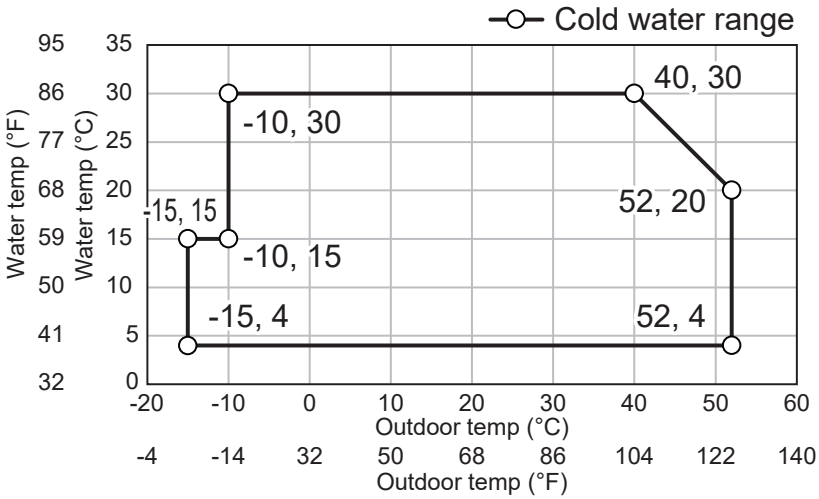


REVERSIBLE HEAT PUMP

Operable in heating mode at an intake air temperature of down to -20°C.

The new model has a greater heating capacity range due to the flat tube heat exchanger and the suction chamber injection mechanism of the compressor. It is operable at the minimum intake air temperature of -20°C and the minimum outlet water temperature of 25°C. The new model is suitable for use in manufacturing lines requiring heating throughout the year.



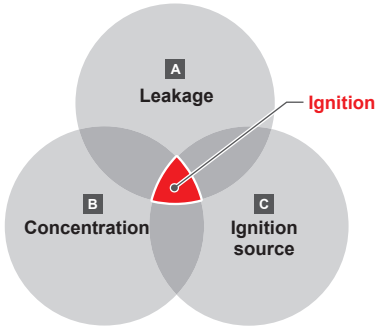


R32 refrigerant properties

Under the conditions shown below, there is a possibility that R32 could burn.

	R32	R410	R22
Chemical formula	CH_2F_2	CH_2F_2/CHF_2CF_3	$CHClF_2$
Composition (blend ratio wt. %)	Single composition	R32/R125 (50/50 wt %)	Single composition
Ozone depletion potential (ODP)	0	0	0.055
Global warming potential (GWP) *1	675	2088	1810
LFL(vol.%) *2	13.3	-	-
UFL(vol.%) *3	29.3	-	-
Flammability *4	Lower flammability (2L)	No flame propagation (1)	No flame propagation (1)

*1 IPCC 4th assessment report
*2 LFL: Lower flammable limit
*3 UFL: Upper flammable limit
*4 ISO 817:2014
*5 R32 consistency is higher than LFL*2 and lower than UFL*3.

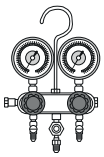
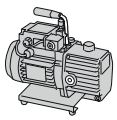
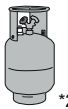


A **Do not leak refrigerant.**
<Installation> • Vacuum drying should be done.
Do not release refrigerant into the atmosphere unnecessarily.
• Follow "Installation points of charging refrigerant."
<Repair/Removal> • Refrigerant should be recovered.

B **Prevent concentration.**
• Follow "Installation restrictions".

C **Keep ignition sources away from the unit.**
• Do not braze pipes that contain refrigerant. Before brazing, refrigerant should be recovered.
• Do not install the unit while electricity is on. Turn off electricity and check using a tester.
• Do not smoke during work and transportation.

Note: Both R32 / R410A emit toxic gas when exposed to naked flame.

TOOLS	Gauge manifold	Charge hose	Electronic weight scales	Charge valve	Electric leak tester (Gas leak detector)	Vacuum pump	Vacuum pump adapter	Refrigerant recovery equipment	Refrigerant recovery cylinder
								 *1	 *2
R32	Shareable *3	Shareable *3	Shareable *3	Shareable *3	Shareable *3	Shareable *3	Shareable *3	Shareable *3	EXCLUSIVE
R410									EXCLUSIVE

NOTE: Be sure to confirm with the manufacturers that the electric leak tester, vacuum pump and refrigerant recovery equipment are compliant with R32.
*1 Refer to catalogs provided by the manufacturers of the tools above to ensure that the tools are usable with R32.
*2 Do not use R32 and R410A in combination in the same refrigerant recovery cylinder.
*3 The types of tools required for R32 units and R410A units are the same. Each tool must be used only with either R32 units or R410A units.

PROCEDURE FOR CHARGING REFRIGERANT

Before work	Confirmation of refrigerant type	Confirm the spec label.
Work	Confirmation of installation restrictions	Be sure to follow "Installation restrictions".
	Charging of additional refrigerant	Use a gauge manifold, charge hose and charge valve compliant with R32.
	Gas leak inspection	Use a leak tester compliant with R32.

Installation restrictions

Do not install the unit where combustible gas may leak
- If combustible gas accumulates around the unit, fire or explosion may result.

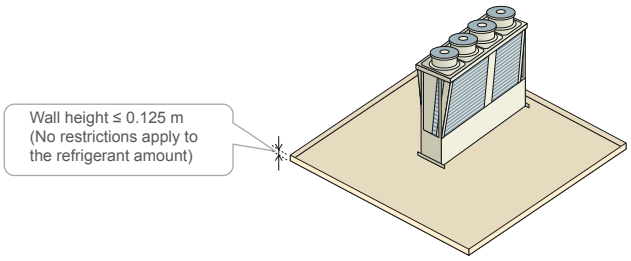
- Provide sufficient space around the unit for effective operation, efficient air movement, and ease of access for maintenance.
- All restrictions mentioned in this manual apply not only to new installations but also to relocations and layout changes.
- Refer to the Installation manual for other precautions on installation

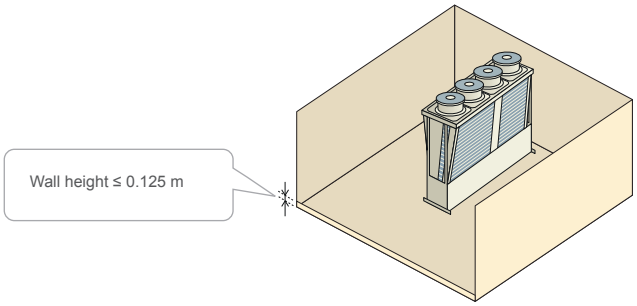
Installation space requirement
- Do not install the unit inside a building such as the basement or machine room, where the refrigerant may stagnate.
- Install the unit in a place where at least one of four sides is open.

CORRECT INSTALLATION

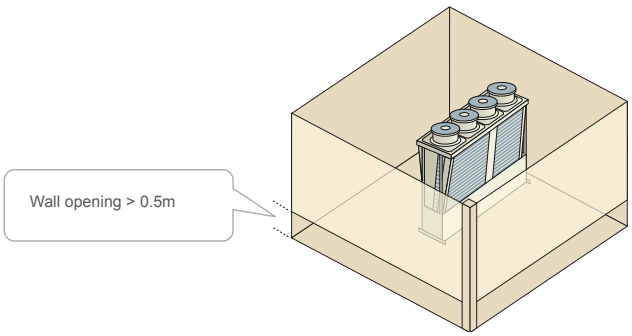
If the unit needs to be installed in a space where all four sides are blocked, confirm that one of the following situations (A or B) is satisfied.

A Install the unit in a space with a wall height of ≤ 0.125 m.

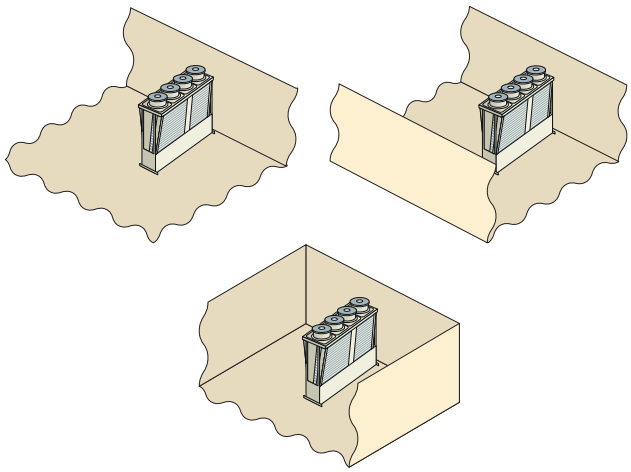




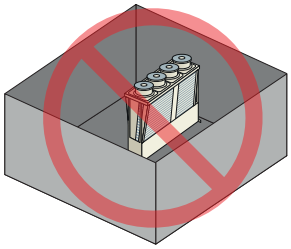
B Create an appropriate ventilation opening.



CORRECT INSTALLATION



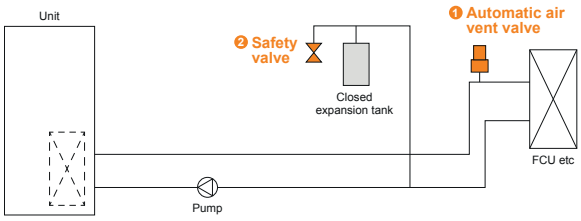
INCORRECT INSTALLATION



Regulatory requirements for safety

See below for information on installing a safety device on the air cooled chilling unit system

* Safety devices shall be regularly inspected, maintained, and replaced in accordance with relevant laws, regulations, and the instructions of the manufacturers.
* The requirements listed below were established based on IEC60 335-2-40 (Edition 5.0) G.G.6. See the original standards for fu rther information on selecting a safety device.



Required items	Note
Automatic air vent valve	* In the event of a failure of the waterside heat exchanger in the unit, the refrigerant may leak from the automatic air vent valve, so install it in a place where the refrigerant will not accumulate, such as outdoors.
Safety valve	* In the event of a failure of the waterside heat exchanger in the unit, the refrigerant may leak from the safety valve, so install it in a place where the refrigerant will not accumulate, such as outdoors.